

**Determinants of drug use trajectories and HIV
risks among women who inject drugs in coastal
Kenya**

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The candidate achieved 180 credits for assessment of taught modules within the blended learning PhD programme.

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List of Abbreviations.

ART	Antiretroviral therapy
CBO	Community-based organization
CDC	Centers for Disease Control
FGD	Focus Group Discussion
HIV	Human Immunodeficiency Virus
IDI	In-depth Interview
MAT	Medically Assisted Therapy
MSM	Men Who Have Sex with Men
NACC	National AIDS Control Council
NSP	Needle and Syringe Exchange Programme
NASCOP	National AIDS and STI Control Programme
OST	Opioid Substitution Therapy
SRH	Sexual and Reproductive Health
STI	Sexually Transmitted Infection
UN	The United Nations
UNAIDS	The Joint United Nations Programme on HIV and AIDS
UNODC	The United Nations Office on Drugs and Crime
USA/US	United States of America
WHO	World Health Organization

Publications resulting from this secondary analysis /thesis.

Mburu G, Limmer M, Holland, P. (2019). Role of boyfriends and intimate sexual partners in the initiation and maintenance of injecting drug use among women in coastal Kenya. *Addict Behav.* 2019 Jan 17;93:20-28. doi: 10.1016/j.addbeh.2019.01.013. [Epub ahead of print]

Mburu G, Limmer M, Holland P. (2019). HIV risk behaviours among women who inject drugs in coastal Kenya: findings secondary analysis of qualitative data. *Harm Reduct J.* 2019 Feb 6;16(1):10. doi: 10.1186/s12954-019-0281-y.

Prior articles from the primary study relevant to this thesis.

Ayon, S., Ndimbii, J., Jeneby, F., Abdulrahman, T., Mlewa, O., Wang, B., . . .

Mburu, G. (2017). Barriers and facilitators of access to HIV, harm reduction and sexual and reproductive health services by women who inject drugs: role of community-based outreach and drop-in centers. *AIDS Care*(Oct 25), 1-8. doi: 10.1080/09540121.09542017.01394965.

Mburu, G., Ndimbii, J., Ayon, S., Mlewa, O., Mbizvo, M., Kihara, C., & Ragi, A.

(2018). Contraceptive use among women who inject drugs: Motivators, barriers and unmet needs. *Women's Reprod Health*, 5(2), 99–116. doi:<https://doi.org/10.1080/23293691.2018.1463737>

Ndimbii, J., Ayon, S., Abdulrahman, T., Mahinda, S., Jeneby, F., Armstrong, G.,

& Mburu, G. (2018). Access and utilisation of reproductive, maternal, neonatal and child health services among women who inject drugs in Coastal Kenya: findings from a qualitative study. *Sex Reprod Healthc*, 18, 48-55. doi:<https://doi.org/10.1016/j.srhc.2018.10.002>.

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LORD, you have granted me peace;
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The Bible, Isaiah 26:12, BSB.

Determinants of drug use trajectories and HIV risks among women who inject drugs in coastal Kenya.

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ABSTRACT.

Within a backdrop of rising drug use in Kenya, this thesis applies the social ecology theory to elaborate the determinants of drug use trajectories and attendant HIV risks among women who inject drugs. This thesis comprises four parts. The first part is an overview of the epidemiology of injecting drug use. The second part is a literature review exploring 1) conceptualisation, 2) health impacts, and 3) determinants of drug-use trajectories. Based on a synthesis of 142 sources from four databases, literature suggests that the main phases of drug use consist of initiation, transition to injecting, and chronic addicted injecting. Additionally, drug use has significant negative impacts on the health of injectors. Although prior research has explored and identified micro- and macro-level determinants of injecting drug use, trajectory studies among women, particularly in sub-Saharan Africa, are rare. Based on this gap, the third part of this thesis explores determinants of drug use trajectories and HIV risks among 45 women, using secondary analysis of qualitative data. This study found that initiations, transitions, and chronic drug injecting, and the attendant HIV risks were not determined by a single factor but by multiple and intersecting social-ecological determinants located at the individual, interpersonal and societal-structural levels. By employing the social ecology theory, the importance of joblessness, gender inequity, economics, drug availability, and health systems in shaping trajectories and HIV risks was identified. The fourth part discusses these findings, and demonstrates that this study contributes to an empirical understanding of women's drug use trajectories and HIV risks, advances scarce literature relating to qualitative secondary data analysis, and identifies the need to place intersectionality central to the future application of the social ecology theory. To limit women's drug-injecting and attendant HIV risks, it is essential to focus on upstream social-structural determinants, alongside the currently emphasised individual and interpersonal determinants.

1 BACKGROUND.

1.1 Introduction.

This thesis concerns itself with the problem of illicit drug use, particularly heroin. For a variety of reasons, illicit drug use tends to persist. The injection of illicit drugs, however, is particularly associated with adverse health outcomes. While this is true in both men and women, this thesis addresses women. Despite the public health importance of injecting drug use, there is limited research on female injectors, especially in sub-Saharan Africa. Specifically, there is limited data elucidating what causes women in Kenya to start taking drugs, transition to injecting, or maintain chronic drug-injecting. Additionally, there is scarce data concerning how these women are exposed to Human Immunodeficiency Virus (HIV). Without these data, their vulnerabilities will continue to be unknown, and public health programmes will be unable to respond to their needs effectively.

In the following **section 1.2**, the problem of global illicit drug use and its contribution to the global HIV epidemic is introduced. **Section 1.3** presents an overview of injecting drug use and its role in the spread of HIV in Kenya. **Section 1.4** illustrates how a lack of data is currently hindering the formation of services for Kenyan drug-injectors. **Section 1.5** states the aims of this study in response to the above research gap.

1.2 Overview of injecting drug use globally.

Drug abuse has a long history in human civilisation. The majority of abused drugs have historically been harnessed for medical analgesic purposes. Over time, however, illegitimate use of drugs has risen. According to the United Nations Office on Drugs and Crime (UNODC) (2016), 250 million people aged 15–64 years use at least one illicit drug annually. Cannabis, amphetamines, cocaine, and opiates such as heroin are the most commonly abused drugs globally (UNODC, 2016). In 2014, cannabis was used by an estimated 183 million people, amphetamines and cocaine by 75 million, and opiates by 33 million (UNODC, 2015, 2016). Over the five-year period 2009–2014, cannabis was cultivated in 129 countries, opium poppy (from which heroin is derived) in 49 countries, and coca (from which cocaine is derived) in seven countries (UNODC, 2016). While cannabis is produced in Asia, Africa and Latin America, heroin is predominantly produced in South Asia, and cocaine in Latin America (UNODC, 2016). These variations in production in turn stimulate trafficking.

Patterns of illicit drug use vary substantially, ranging from the occasional use of one substance to the regular use of a combination of several drugs (UNODC, 2016). On its part, polydrug abuse ranges from the occasional use of alcohol and cannabis to the daily use of stronger drugs such as heroin and cocaine

(Jones, Mogali, & Comer, 2012; Leri, Bruneau, & Stewart, 2003). Abuse of these substances is often compounded by illegitimate use of prescription opioid drugs (Darke, 2011). Indeed, different constellations of illicit drug use are often driven by the synergistic effects of different drugs (WHO, 2004), development of tolerance (UNODC, 2016), or supply factors (Horyniak et al., 2015).

Illicit drug use is a cause of a significant burden of disease. In 2013, cannabis, amphetamines, opiates, and cocaine accounted for a combined 12 million years of life lost (Murray et al., 2015). Opiates, which include natural opioids (such as heroin) and synthetic prescription drugs (such as oxycodone) are the largest contributors to these statistics (Murray et al., 2015). Annually, 200,000 deaths are attributed to illicit drugs, mostly from opiate overdose (UNODC, 2016). Besides overdose, illicit drug use is associated with suicides, viral infections (Degenhardt et al., 2013), job losses, homelessness, family breakdown, and other social harms (Crofts, Louie, Rosenthal, & Jolley, 1996).

Although illicit drugs can be consumed in a number of ways, such as smoking, snorting, ingesting or injecting, severity of health consequences depends on the mode of use. Injecting is particularly linked to more severe harms (UNODC, 2016). Drug injectors have an elevated risk of death when compared to non-injectors (Mathers et al., 2013). Furthermore, viral infections such as HIV and

hepatitis C are predominantly transmitted via injecting rather than other modes of drug use (Degenhardt et al., 2013). In a review, Tavitian-Exley, Vickerman, Bastos, and Boily (2015) found that injecting cocaine, amphetamines or heroin *tripled* the incidence of HIV compared to the non-injecting use of these drugs.

1.2.1 Contribution of injecting drug use to the global HIV epidemic.

The link between drug-injecting and HIV is important given that HIV is the ninth largest contributor to the global burden of disease (Murray et al., 2015). Currently, 38.8 million people are infected with HIV globally, and 2.6 million acquire it annually (Wang et al., 2016). According to the Joint United Nations Programme on HIV/AIDS (UNAIDS, 2016), two-thirds of HIV incidence and prevalence occurs in sub-Saharan Africa. Universally, HIV is transmitted via a variety of ways, including anal or vaginal sex, from infected mothers to their children, or through infected blood and needles (De Cock, Jaffe, & Curran, 2011). Unsurprisingly, transmission via contaminated needles is prominent among injectors (Case et al., 2012).

During illicit drug injection, injectors commonly share needles and syringes, resulting in direct inoculation of other peoples' blood into their own blood stream (Golub et al., 2007). Despite the risks involved, norms operating within groups of injectors entrench such practices – which are often reinforced by a lack of

needles – to enhance the risk of HIV transmission (Khan, Awan, Qureshi, Razaque, & Zafar, 2009; McCurdy, Williams, Kilonzo, Ross, & Leshabari, 2005). Indeed, unsafe injecting *directly* accounts for a third of new HIV cases outside sub-Saharan Africa, and 13% of global HIV prevalence (UNAIDS, 2015). Of the 15.6 million injectors globally, 2.8 million (17.8%) are infected with HIV (Degenhardt et al., 2017). Drug injecting also contributes to *indirect* spread of HIV when infected injectors sexually transmit it to their partners (Doherty, Garfein, Monterroso, Brown, & Vlahov, 2000; Strathdee & Sherman, 2003).

1.2.2 Public health response to injecting drug use globally.

In order to limit the negative health consequences of injecting drug use, the United Nations (UN) recommends free provision of a comprehensive package of harm reduction services to all injectors (WHO, UNODC, & UNAIDS, 2009). This package consists of clean needles and syringes, opioid substitution therapy (OST), condoms, health education, treatment for drug overdose, and diagnosis and treatment of infections such as viral hepatitis, tuberculosis (TB), HIV, and other sexually transmitted infections (STIs) (WHO et al., 2009).

By providing sterile needles and syringes to injectors in exchange for used ones, needle and syringe exchange programmes (NSPs) prevent transmission of HIV and other blood-borne viruses (Aspinall et al., 2014; Dutta, Wirtz, Baral,

Beyrer, & Cleghorn, 2012; MacArthur et al., 2014). OST is the mainstay of the medical management of addiction, whereby methadone and other drugs that mimic narcotics are prescribed to minimise withdrawal symptoms, thereby reducing the frequency of drug-injecting (MacArthur et al., 2014). On its part, treatment of HIV with antiretroviral therapy (ART) reduces deaths among injectors already infected with the virus (Dutta et al., 2012).

The 2009 UN recommendation of a harm reduction approach was a notable departure from its traditional approach of eradicating illicit drugs (Hilton, Thompson, Moore-Dempsey, & Janzen, 2001). The UN has long-standing international conventions for controlling illicit drugs, aimed to achieve abstinence at the individual level, and elimination of drug trading globally. These include the UN single convention on narcotic drugs (1961), the UN convention on psychotropic substances (1971), and the UN convention against illicit trafficking in narcotic drugs and psychotropic substances (1988). The shift towards harm reduction as a policy objective, evident in the 2009 UN recommendation is notable given that *'harm reduction does not seek to eliminate drug use; instead, it focuses on minimizing the personal and social harms and costs associated with drug use and spread of HIV'* (Hilton et al., 2001, p. 357).

Despite these recommendations, worldwide coverage of harm reduction interventions remains low. In 2010, Mathers et al. found that worldwide, only two needle-syringes were distributed per injector per month, only 8% of all injectors received OST, and only 4% of all HIV-infected injectors received ART. Seven years later, an updated review found very modest increases: less than three needle-syringes were distributed via NSP per injector per month, 16% of injectors were receiving OST, and the proportion of HIV-infected injectors receiving ART was uncertain due to data scarcity (Larney et al., 2017).

Studies suggest that injectors' poor access to harm reduction services results from their stigmatisation (Kiriazova et al., 2016), lack of income to cater for transport to facilities (Mlunde et al., 2016; Nambiar, Stooze, & Dietze, 2014), continued injecting (Lert & Kazatchkine, 2007; Nambiar et al., 2014), homelessness or mobile lifestyles (Whittaker et al., 2015), and frequent arrests and detention (Hayashi et al., 2015; Milloy et al., 2010). Additionally, negative interactions with health providers (Azim, Bontell, & Strathdee, 2015) and insufficient data about injectors also contribute (Mathers, Cook, & Degenhardt, 2010). Although these obstacles affect all injectors, women are disproportionately affected (UNODC, 2015), as described in **chapter 2**.

1.3 Overview of injecting drug use in Kenya.

Historically, Europe, North America and parts of Australasia have been the epicentre of injecting drug use (Aceijas, Stimson, Hickman, & Rhodes, 2004). The largest numbers of injectors living with HIV live in these regions (Degenhardt et al., 2017). However, maritime routes in eastern and southern Africa are increasingly being used to traffic heroin and cocaine from Asia and South America, some of which is consumed in the region (UNODC, 2016).

This is not an entirely new phenomenon. In the late 1990s, Susan Beckerleg, a sociologist who pioneered drug use research in coastal Kenya, reported how heroin was being trafficked in Mombasa, Kilifi, Malindi, and Lamu, albeit on a small scale (Beckerleg, 1995; Beckerleg, Telfer, & Sadiq, 2006). According to Deveau, Levine, and Beckerleg (2006), Kenya's location along the Indian Ocean and her historical maritime trade ties with Indo-Asia facilitates drug trafficking. Similarly, a '*surge in the availability of strong, cheap heroin*' has also been reported in neighbouring Tanzania, which also borders the Indian Ocean (Zamudio-Haas, Mahenge, Saleem, Mbwambo, & Lambdin, 2016, p. 2).

Tourism has also been linked with rising levels of illicit drug use along the East African coast (Beckerleg & Hundt, 2004; Peake, 1989). Notably, drug use is not confined to tourists, but also features among locals whose purchasing power is

boosted by tourism. Alluding to the link between economics, mobility and drug use, Beckerleg, Telfer, and Hundt (2005) argue that the rise in drug abuse at the coast is a natural result of economic growth and cultural globalisation. Indeed, the growth of Nairobi as an economic hub has created an alternative transnational route for drug trafficking (UNODC, 2016). According to Deveau et al. (2006), and Schuberth (2014), law enforcement has lagged behind Kenya's economic growth, enabling drug traffickers to ease through seaports and airports. Not surprisingly, drug use is highest at the coast and in Nairobi (Kurth et al., 2015; Tun et al., 2015).

1.3.1 Impact of injecting drug use on the HIV epidemic in Kenya.

Kenya is classified by UNAIDS (2016) as a having a high burden of HIV. It has a generalised HIV epidemic, with a national prevalence of 5.6%, amounting to 1.6 million people (NACC, 2014; NASCOP, 2014). Annually, 100,000 HIV infections occur in Kenya, mainly among adults (NACC, 2014). In this context, heterosexual sex with multiple casual partners is the primary risk factor for both men and women (Gelmon, Kenya, Oguya, Cheluget, & Haile, 2009).

Because of the historically low contribution of injecting drug use to the national HIV epidemic, injectors have received limited attention (Nieburg & Carty, 2011). Injecting drug use accounts for 3.8% of all incident HIV cases nationally

(Gelmon et al., 2009). However, the importance of injecting drug use comes to the fore when prevalence within this sub-population is considered. For instance, 18.3% of the 18,000 injectors nationally are infected with HIV (NACC, 2014; Tun et al., 2015). This prevalence is three times the national rate of 5.6% (NASCO, 2014). Furthermore, prevalence among injectors is higher at the coast, where 20.5% are infected (Kurth et al., 2015).

The HIV prevalence among injectors in Kenya is among the highest in sub-Saharan Africa, and is consistent with the known concentration of HIV among injectors globally (Degenhardt et al., 2017). Indeed, a recent review of 21 high HIV burden countries concluded that *'while injecting drug use is relatively rare in sub-Saharan Africa, it is the main driver of HIV in Mauritius and Kenya'* (Petersen, Myers, van Hout, Pluddemann, & Parry, 2013, p. 1).

The growing importance of injecting drug use as a driver of HIV has also been noted in other sub-Saharan African countries including Tanzania (Khalid et al., 2014), Mauritius (Johnston, Saumtally, Corceal, Mahadoo, & Oodally, 2011; Petersen et al., 2013), Ghana (Messersmith et al., 2015), and Nigeria (Eluwa, Strathdee, Adebayo, Ahonsi, & Adebajo, 2013). According to UNAIDS (2015), this rise in drug-injecting could accelerate the spread of HIV in sub-Saharan Africa, given that the disease is already widespread within heterosexual adults.

1.3.2 Public health response to injecting drug use in Kenya.

The Government of Kenya has ratified the three UN conventions on narcotic drugs and psychotropic substances noted in **section 1.2.2**. Pursuant to these ratifications, the Narcotic drugs and psychotropic substances (control) Act was legislated in 1994 (National Council for Law Reporting, 2012). The Act formed a basis for the establishment of the Anti-Narcotics Unit of the Kenya Police which enforces drug laws, and the National Authority for the Campaign Against Alcohol and Drug Abuse (NACADA), which conducts public education, advocacy and multi-sectoral prevention of drug abuse.

In 2013, the Ministry of Health endorsed a harm reduction approach within the National HIV and AIDS Strategic Plan (NAS COP, 2013b), and in the following year, introduced free NSP and OST in state-run health facilities (NACC, 2014). Consistent with the global paradigm shift referred to earlier, the above national strategy heralded a change from abstinence to harm reduction. Apart from government health facilities, a few independent community-based organisations (CBOs) have historically provided free *basic* services to injectors, especially at the coast where drug use is rife (Beckerleg, 2001; Deveau et al., 2006; Nieburg & Carty, 2011). These services include education, counselling, and HIV testing (Ayon et al., 2017; Beckerleg, 2001; Deveau et al., 2006).

Before the introduction of the harm reduction policy, provision of safe injecting equipment, (including by CBOs), was negligible as it was not explicitly sanctioned by public health policy (NAS COP, 2013b). Despite the endorsement of harm reduction by the government, only a minority of injecting drug users in Kenya access the recommended service package (NACC, 2014). In 2014, only 15% of all injecting drug users were reached by the national NSP services, the majority of whom were men (NACC, 2014). In 2015, 23% of injectors in Nairobi and 4% in Coast Province reported sharing needles or syringes, mainly due to poor access to these commodities (Kurth et al., 2015).

In the same year, Rhodes, Ndimbii, Guise, Cullen, and Ayon (2015, p. 867) reported that access to OST was limited, asserting that '*poverty of drug treatment opportunity*' was widespread. These authors noted a deficiency of free state-run rehabilitation services on the one hand, and on the other, a widespread inability of injectors to afford fee-based private sector rehabilitation services. One year later, Guise, Rhodes, Ndimbii, Ayon, and Nnaji (2016) found that stigma prevented male and female injectors from accessing health services in the capital city (Nairobi) and two coastal towns (Malindi and Ukunda).

1.4 Current need for data related to injecting drug use in Kenya.

According to Ayon et al. (2017), the poor coverage of harm reduction services is partly attributable to the nascent nature of harm reduction programming nationally. This claim is consistent with that of Rhodes, Closson, Papparini, Guise, and Strathdee (2016), who state that harm reduction services are still in development across much of East Africa. However, Ayon et al. (2017) argue that a lack of data is also hindering the development of these services.

Despite the government's commitment to respond to drug-injecting, the National AIDS and STI Control Programme (NASCOP) concedes that obtaining data from injectors is *'challenging due to the hidden nature of this group and criminalization of drug use in Kenya'* (NASCOP, 2013a, p. 13). Indeed, a previous situation analysis of drug use in Kenya had documented a *'lack of epidemiologic data needed for planning and implementing effective services for this population'* (Nieburg & Carty, 2011, p. 6), specifically a scarcity of national statistics regarding the size, location, and access to services by injectors.

Additionally, Guise et al. (2016) noted a lack of information regarding pathways of drug use in Kenya, and whether these differ by gender. In Kenya, women constitute 10% of all injectors (UNODC & ICHIRA, 2012), yet according to Ayon et al. (2017), very little data relating to them exists. Without understanding how

women commence their drug use, transition to injecting, or maintain drug-injecting, developing effective harm reduction and HIV interventions tailored to them will be difficult.

The purpose of this study then, is to contribute relevant data for planning gender-sensitive services for female injectors. Specifically, this study focuses on the following research questions:

- 1) What are the drug use and sexual behaviour characteristics of women who inject drugs in the coastal towns of Kilifi and Mombasa in Kenya?
- 2) What factors determine the ways in which these women initiate, transition and maintain their injecting drug use?
- 3) What HIV risks are encountered by these women in the course of their injecting drug use, and how do these come about?
- 4) How might a better understanding of the determinants of trajectories of drug use and HIV risks encountered by women who inject drugs inform services and policy development in Kenya?

1.5 Summary.

This chapter has demonstrated that injecting drug use is a significant public health problem. As opposed to Europe, Australasia and North America, injecting drug use is a relatively recent phenomenon in sub-Saharan Africa. Nonetheless, the rise of drug-injecting in sub-Saharan Africa could further exacerbate the HIV epidemic in a region where the virus is already widespread among heterosexual adults. In Kenya, data regarding injecting drug use and its determinants among women is rare, yet this information is required to inform gender-sensitive interventions. This study aims to respond to this research gap, which is further elaborated in the following **chapter 2**.

2 LITERATURE REVIEW.

2.1 Introduction.

This chapter focuses on trajectories of illicit drug use. It provides an overview of what is known about trajectories, that is, progression of drug use from non-injecting to chronic injecting of illicit drugs, the impact that different trajectories of injecting drug use have on health, and factors that determine trajectories of injecting drug use, and in doing so, identify existing research gaps. The following questions guide this review:

1. How are trajectories from non-injecting to injecting drug use conceptualised?
2. What is the impact of different drug use trajectories on the health of injecting drug users?
3. What factors are known to influence trajectories of drug use among injecting drug users?
4. What theories have been proposed to explain trajectories of illicit drug use?
5. What knowledge gaps exist concerning trajectories of illicit drug use and their determinants?

The above research questions and findings inform this chapter and the study as a whole. This chapter presents findings related to questions 1, 2, 3 and 5, while theoretical conceptualisation of drug use trajectories (question 4) is outlined in **chapter 3. Section 2.2** describes the review methodology, while **sections 2.3** and **2.4** present the findings. The chapter concludes with a summary of current literature gaps and limitations of this literature review.

2.2 Methodology.

2.2.1 Initial scoping.

In the first step, a scoping search was conducted in PubMed in February 2017 to understand the breadth of existing trajectory literature. An analysis of retrieved titles showed that literature regarding initiation, transition and chronic illicit drug use existed, focusing on different drugs. Using a mapping and gap analysis approach, it was clear that few of these studies concerned women. Literature scoping, mapping and gap analysis are commonly employed to summarise broad scientific information and to refine research directions (Popay et al., 2006). In this review, initial scoping and mapping facilitated refinement of the review questions. It also facilitated contemporaneous matching of literature gaps with potential research questions that could be answered using an existing dataset, via secondary data analysis.

2.2.2 Literature search and sources.

As a second step, a systematic literature search was conducted in four databases between February and September 2017. These were: PubMed, Web of Science, CINAHL (Cumulative Index to Nursing & Allied Health Literature), and PsycINFO. A broad search was conducted to identify studies focusing on 1) injecting drug use 2) people who inject drugs 3) trajectories of drug-injecting.

Table 1. Literature search terms.

Parameter	Specific focus	Search terms
<i>Domain</i>	Injecting and other forms of illicit drug use	injecting drug use OR illicit drug use OR substance-related disorders OR inject OR intravenous
<i>Population</i>	Injecting drug users	people who inject drugs OR injecting drug user OR drug user OR drug inject
<i>Phenomena of interest</i>	Patterns of drug use	initiate OR initiation OR transition OR relapse OR trajectory OR trajectories OR addict
	Nature of drugs	heroin OR narcotic OR opioid OR opiate

Search terms were kept broad to enhance the sensitivity of the search. Searches confined to female drug users returned limited yields in relation to other search domains, such as trajectory or theories of drug use. For this reason, the search terms related to gender were broadened. MeSH terms, synonyms, Boolean operators (AND, OR), proximity functions, wildcards (\$) and truncations (*) were used to construct search strings (Jahan, Naveed, Zeshan, & Tahir, 2016). Due to resource constraints, the search was limited to English publications. No other limits were applied. Additionally, key texts detailing the statistics (UNODC, 2015), natural history (Darke, 2011), theories (Lettieri, Sayers, & Pearson, 1980) and gender aspects (Campbell & Ettore, 2011) of drug use and were drawn upon to enable a thorough understanding of the existing literature as recommended by Green, Johnson, and Adams (2006).

2.2.3 Inclusion and exclusion criteria.

A total of 3757 citations were imported into EndNote software (Clarivate Analytics Inc). Studies of injectors were included regardless of design, quality, publication date, interventions, comparator, or settings, as long as they reported data relevant to at least one of the research questions. Studies were excluded if they were duplicates (n=802) not published in English (n=13), not concerned with illicit (n=913) or injecting drug use (n=701) (**Figure 1**).

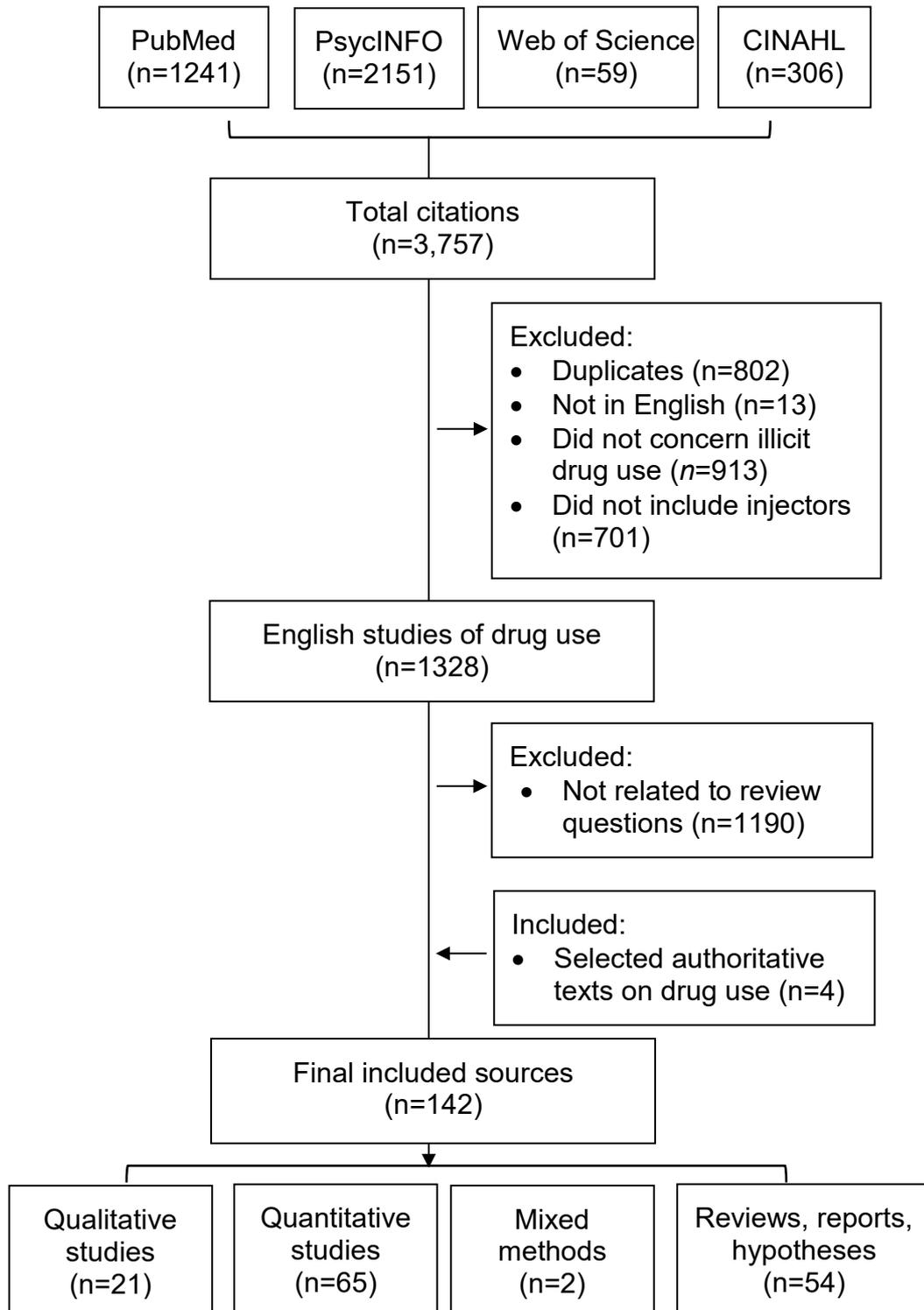


Figure 1. PRISMA chart showing selection of literature sources.

2.2.4 Summary of included literature sources.

Ultimately, 142 sources were included. These sources included qualitative studies (n=21) cross-sectional surveys (n=39), a nested case-control study (n=1), cohort studies (n=25) mixed method studies (n=2), theoretical reviews or hypotheses (n=34), epidemiologic reviews (n=13), books/book chapters (n=6), and a grey report (n=1). These sources reported on the four research questions, albeit with significant overlaps. For instance, 52 sources contained data relevant to multiple research questions. Overall, trajectories were reported in 32 sources, initiation in 32, transition in 26, addiction in 44, health impacts in 59, and theories of drug use in 38 sources (**Appendix 2**).

Regarding gender, eight primary studies were exclusively among men, six were exclusively among women, and 63 included both genders. In 62 of the 63 studies involving both genders however, men comprised the majority of participants. Nonetheless, 31 sources expounded on gender dimensions of drug use, such as differences in progression, access to treatment, or influences from intimate partners, as described later in **section 2.3.3.2**.

Regarding geographic focus, only nine of the included primary papers were conducted in sub-Saharan Africa, specifically Kenya (n=2), Tanzania (n=4), Mauritius (n=1), Ghana (n=1) and Nigeria (n=1). Two reviews focused on Africa.

Although some of these African papers reported on initiation, transition and chronic drug use, none focused on trajectories as a whole (**Appendix 2**).

2.2.5 Data extraction.

The 142 included studies were organised into several subfolders in Endnote to facilitate data extraction. Extracted information pertained to 1) nature of drug use trajectories, 2) health impacts of drug use trajectories, 3) determinants of trajectories, and 4) theories employed to explain drug use trajectories.

2.2.6 Synthesis.

Narrative synthesis was used, as it is particularly useful in summarising information from different study designs (Mays, Pope, & Popay, 2005). The multiplicity of review questions and the heterogeneity of included studies precluded a meta-analysis (Snilstveit, Oliver, & Vojtkova, 2012). Using the extracted data as the starting point, text summarising the findings was crafted under each review question. Besides providing a general synthesis of existing literature and concepts, the synthesis identified consistencies, contestations, potential gaps, and limitations. Although it used a narrative to tell the 'story' of the results, the synthesis was highly systematic. This systematic approach aided transparency and minimised bias by including all available information

(Mays et al., 2005). According to Jahan et al. (2016), the narrative approach adopted in this review is also well suited for summarising theoretical perspectives.

2.3 Findings from the literature review.

2.3.1 Trajectory approach in studies of drug use.

The most significant work on drug use trajectories has been performed by Hser and colleagues in the USA. In their most prominent writing on the subject, Hser, Longshore, and Anglin (2007, p. 227) define a trajectory as '*a pathway or line of development over the life span*'. This is a generic derivation from Corbin and Strauss' (1991) original definition of the trajectory of chronic illness. In their seminal model, Corbin and Strauss (1991) elucidated eight phases of chronic illnesses, that is: pre-trajectory, onset, acute, crisis, stable, unstable, downward and dying phases. Dorsett (1991) later suggested adding a recovery phase to the model. Corbin and Strauss's (1991) framework has been used to explore the course of different chronic conditions, including stroke (Burton, 2000), cancer (Reed & Corner, 2015), and diabetes (Walker, 1991). In the context of drug use, Hser, Longshore, et al. (2007) argue that drug use trajectories provide a useful framework for organising drug use phases over the life course, as well

as identifying critical events, potential turning points, and factors contributing to the persistence or change in drug use.

Research on the trajectory of illicit drug use primarily focuses on three critical phases: 1) initiation of illicit drug use, 2) transition to injecting, and 3) long-term drug addiction (Darke, 2011; Hser, Longshore, et al., 2007; Strang, Gossop, & Stimson, 1990; Teruya & Hser, 2010). Within these three phases, further constellations may exist. Indeed, Hser, Hoffman, Grella, and Anglin (2001) have elucidated six possible states over the trajectory of heroin injecting including: occasional use, daily use, abstinence, participation in OST (that is, treatment with methadone), incarceration, and death. Darke (2011) asserts, however, that initiation, transition, and long-term addiction remain the most notable milestones, and that therefore, drug use is inherently progressive. Indeed, heroin abuse is commonly preceded by use of substances such as alcohol, tobacco, and cannabis (Li, Zhou, & Stanton, 2002), and existing literature explores this antecedent progression¹. However, this thesis is concerned with the progression along the above key milestones.

¹ For example literature exploring gateway substances (Kandel, 2002; Kandel, Yamaguchi, & Chen, 1992). Gateway theory posits that regular use of certain substances (such as cannabis) predicts progression to heroin and cocaine.

In support of Darke's (2011) assertion that use of heroin is progressive, several studies indicate that its use typically starts with nasal inhalation (that is, snorting or sniffing) or smoking, before escalating to injecting (Darke, 2011; Malekinejad & Vazirian, 2012; Mars, Bourgois, Karandinos, Montero, & Ciccarone, 2014; Robins & Slobodyan, 2003). In the Netherlands, a third of smokers transitioned to injecting within five years (van Ameijden, van den Hoek, Hartgers, & Coutinho, 1994), while in the US, a fifth of heroin smokers moved to injecting over seven years (Neaigus et al., 2001). In a qualitative study from Tanzania, the transition to injecting was reported to occur six months to two years after starting to smoke (McCurdy et al., 2005). More recently, Darke's (2011) analysis of 73 studies from 14 high-income countries found that the average time interval from non-injecting to injecting use of opiates was eight years. Rarely do injectors commence heroin use via injecting, for example in a Mexican study by Morris et al. (2012).

Once they start injecting, subgroups of injectors follow different trajectories along these milestones. For example, one UK and three US cohort studies identified at least six distinctive trajectory profiles: high stable use, low use, escalating/increasing use, early cessation (within 3-5 years of starting to inject), late decelerated use/ late cessation (after a decade of starting to inject) and frequent relapse (Genberg et al., 2011; Grella & Lovinger, 2011; Hser, Huang,

Chou, & Anglin, 2007; Hser et al., 2017). These diverse patterns suggest that drug use careers are not always homogenous. Heterogeneity of trajectories is also evidenced by the varying proportion of drug users who go through repeated cycles of discontinuation and relapse.

This heterogeneity notwithstanding however, for a vast majority, drug injecting careers have a certain fate: long-term use, terminating in death. Transitioning backward, for example from injection back to smoking or snorting of heroin is rare (Swift, Maher, & Sunjic, 1999), unless drug treatment is provided to alter the natural trajectory, as documented in the USA by Des Jarlais et al. (2007).

Additionally, it is rare to see high levels of addicted heroin injectors successfully quitting drug use and, where this is reported, it is attributed to intensive support from harm reduction programmes. In two studies where support to quit was continuously provided, 42% (n=86) of injectors remained drug-free over ten years in England (Rathod, Addenbrooke, & Rosenbach, 2005), and 80% (n=374) did so over three years in the USA (Robins, Davis, & Goodwin, 1974). Such high levels of quitting are rare however, and as asserted by Darke (2011), chronic addiction and early death is the norm for most injectors of narcotics.

2.3.2 Impact of trajectories of drug use on the health of injectors.

With almost no exception, studies exploring the relationship between injecting drug use and health outcomes found that prolonged use of heroin and other injectable narcotics adversely affects the health of injectors. To start with, the duration of continuous drug-injecting was associated with poor health outcomes in two large cohort studies (Hser, Huang, et al., 2007; Kertesz et al., 2012). In an illustrative example, after following a cohort of young adult initiators of cocaine, opioids, and amphetamines in the USA over an 18-year period, Kertesz et al. (2012) found that continued drug use into middle age increased the likelihood of unsafe drug use and death, compared to those in whom drug-using trajectories were interrupted early on in their injecting careers.

Additionally, specific phases of the trajectory have different impacts on the well-being of injectors. The initial act of using illicit substances is characterised as generally innocuous in terms of physical health, although it may have a psychological impact on the injector's self-image (Li et al., 2002; Mars et al., 2014; Rhodes et al., 2011; Robins & Slobodyan, 2003). While long-term smoking or snorting of heroin and other narcotics has negative health impacts, Darke (2011) and Des Jarlais et al. (2014) assert that transition to injecting is a watershed moment in regard to the severity of health impacts. As noted in

section 1.2, infections such as HIV and hepatitis C are more likely to occur among drug injectors compared to non-injectors (Degenhardt et al., 2011).

Following transition to injecting, certain timeframes are more important in determining individual health outcomes. According to Garfein, Vlahov, Galai, Doherty, and Nelson (1996), the most important window of opportunity to prevent parenteral acquisition of infections such as hepatitis C is during the first year of drug injecting. Furthermore, sexual behaviour during the initial period of drug injection is particularly determinant of HIV infection (Garfein et al., 1996).

These claims are supported by studies in the Netherlands (van Ameijden et al., 1994), Canada (Montain et al., 2016) and the USA (Des Jarlais et al., 1999) showing that the risk of HIV infection is highest immediately following transition to injecting. Consistent with these findings, other studies found that condomless sex was more prevalent around the time of transition among men in the USA (Mackesy-Amiti, Boodram, Williams, Ouellet, & Broz, 2013), while sex work was heightened among injecting compared to non-injecting Malay women (Loeliger et al., 2016). These findings suggest that there are critical periods over the life course during which adverse events may alter an injector's health, sometimes manifesting as overt disease much later.

Besides ill-health, drug injecting was associated with high mortality rates in a review of 58 studies conducted by Degenhardt et al. (2011). In this review, overdose, suicides, and HIV-related immunosuppression contributed to injectors' deaths. In sum, a variety of health-related harms emanate from drug-injecting, including viral infections and premature deaths.

2.3.3 Factors influencing drug use trajectories.

Existing literature suggests that several factors shape trajectories of drug use among injectors. In this synthesis, these influences are classified based on their source as 1) individual, 2) proximal or 3) distal factors.

2.3.3.1 Individual factors.

Individual (endogenous or intrapersonal) factors are eminent in a group of studies that typically depict injectors as people who seek drugs for pleasure, relaxation or experimentation (Harocopos, Goldsamt, Kobrak, Jost, & Clatts, 2009; Kermode, Longleng, Singh, Bowen, & Rintoul, 2009; Li et al., 2002). In some studies, drugs are depicted as compensating for deficits in coping mechanisms (Boys et al., 2002; Kirtadze et al., 2015) while in others, curiosity (Harocopos et al., 2009), psychological reinforcement (Crofts et al., 1996; Simmons, Rajan, & McMahon, 2012), and temperaments of users (Maremmani

et al., 2009) feature heavily as either causing or sustaining drug use. These psychological influences are often tempered by cognition: injectors were reported to express dismay at their own transition to injecting (Mars et al., 2014), or as stopping injecting due to a fear of HIV, overdose, or of being labelled an addict (Bravo et al., 2003; Des Jarlais et al., 2007; Small, Fast, Krusi, Wood, & Kerr, 2009).

In a shift from the typical characterisation of injectors as eager drug consumers, Barrett, Joe, and Simpson (1990) suggest that injecting behaviour emanates from psychological proneness to drug abuse. Following their examination of 424 opioid addicts over 12 years in the Drug Abuse Reporting Programme (DARP) study, Barrett et al. (1990) found that psychological proneness contributed to opioid addiction throughout the trajectory, and that this proneness was especially heightened in the later phases of addiction. Drawing heavily from findings from several cross-sectional studies (such as Darke and Ross (1997), Pugatch et al. (2001) and Rossow and Lauritzen (1999)) that found a high prevalence of anxiety, depression and other childhood mental health problems among injectors, Darke (2011) claims that psychiatric and psychological vulnerability predicts heroin injection. However, scholars such as Maremmani et al. (2009) have previously questioned these sorts of claims due to the difficulty of establishing causal relationships.

Despite these debates, research focusing on psychological factors has found that the addictive potential of certain drugs predicts their persistent use (Darke, 2011). This association, which is particularly strong among opioids, suggests a convergence between psychological factors and neurochemical properties of the drugs themselves. Opioids have a remarkably high addictive potential, second only to tobacco (Darke, 2011; Nutt, King, Saulsbury, & Blakemore, 2007). In an illustrative cross-sectional study (n=691), O'Keefe, Horyniak, and Dietze (2016) observed that people who initiated injecting with heroin were one and a half times more likely to progress to regular injecting use compared with those who initiated injecting other drugs such as methamphetamines.

Apart from psychological and neurochemical factors, another group of studies explores the role of socio-demographic factors (such as age, gender, education, social class, income, and race). A consistent finding from these studies is that early onset of non-injecting drug use increases risk of transition to injecting, and the cumulative duration of injecting following transition (Debeck et al., 2013; Grella & Lovinger, 2011; Neaigus et al., 2006; Woodcock, Lundahl, Stoltman, & Greenwald, 2015).

Several studies reported that Black and Hispanic people in the USA were more likely to exhibit high-volume stable use (Hser et al., 2017), relapse (Robins &

Slobodyan, 2003), and long-term injecting (Hser, Huang, et al., 2007). However, Hser, Huang, et al. (2007, p. 559) aver that these racial patterns are essentially a reflection of '*relatively lower socioeconomic status or constrained access to care or utilization of services*' among disadvantaged ethnic groups.

2.3.3.2 Proximal influences: family, gender norms, peers, and culture.

Literature suggests that childhood family interactions influence drug use trajectories later in life. In their exploration of injecting drug use among a Canadian cohort of young adults aged over 21 years (n=395), Hadland et al. (2012) found that childhood sexual abuse independently doubled the risk of initiating drug-injecting. In a subsequent analysis of this prospective cohort, Debeck et al. (2013) found that childhood physical abuse also almost doubled the odds of progressing to regular injecting among recent initiators.

Gender was a prominent theme across both quantitative and qualitative studies. Among quantitative studies, one group of three studies found no gender differences in the cumulative proportions of men and women who initiated injection in Canada (Ahamad et al., 2014) and the US (Neaigus et al., 2001; Roy, Boivin, & Leclerc, 2011). A second group of two studies reported that the time from non-injecting to injecting varied by gender, albeit in different directions. In India, females transitioned to injecting faster than males (Ambekar

et al., 2015), whereas in the USA, women took 1.65 years longer (Bluthenthal, Wenger, Chu, Bourgois, & Kral, 2017).

On their part, qualitative studies examining the perspectives of injectors emphasise the role of sexual partners in shaping drug use: numerous studies found a disproportionate influence of males upon their female partners in terms of initiating drug use or transitioning to injection (Bryant, Brener, Hull, & Treloar, 2010; Cheng et al., 2016; Debeck et al., 2013; Evans et al., 2003; Goldsamt, Harocopos, Kobrak, Jost, & Clatts, 2010; Higgs, Owada, Hellard, Power, & Maher, 2008; Hser, Anglin, & McGlothlin, 1987; Simmons et al., 2012).

This influence ranged from associative patterns (Dwyer et al., 1994; Evans et al., 2003; Neaigus et al., 2001; van Ameijden et al., 1994), having '*a sexual partner present at the first injection*' (Debeck et al., 2013, p. 468), to receiving first injection from a partner (Harocopos et al., 2009; Kirtadze et al., 2015; Lee et al., 2013; MacRae & Aalto, 2000). Six studies reported that coercion or emotions played an important role in men's influence on their female sexual partners' transition to injecting, and sharing of injecting equipment (Bravo et al., 2003; Evans et al., 2003; Frajzyngier, Neaigus, Gyarmathy, Miller, & Friedman, 2007; Higgs et al., 2008; Kirtadze et al., 2015; MacRae & Aalto, 2000; Simmons et al., 2012). There are rare exceptions, such as Neaigus et al. (2001) who

found that male and female intimate partners influenced each other equally. On the whole, however, evidence supports the view that women are more influenced by their male sexual partners than vice versa, reflecting a power imbalance favouring males.

This imbalance was common among married or cohabiting couples in Australia, Scotland and the USA, where male partners more commonly acquired drugs, prepared them, and obtained injecting needles, compared to their female partners (Bryant et al., 2010; MacRae & Aalto, 2000; Simmons et al., 2012). The male domination of tightly woven injector networks forced women in Georgia and Australia to partner with men in order to find drugs, even if they were not a couple (Bryant et al., 2010; Kirtadze et al., 2015). Indeed, studies found that drug peddling and acquisition was mainly conducted by men, who also tended to be the majority users (Kirtadze et al., 2015; Simmons et al., 2012). Furthermore, these studies suggest that once women partnered with men to acquire drugs, they were eventually forced to inject with the men, and were more likely to end up sharing needles with them (Bryant et al., 2010; Kirtadze et al., 2015).

Tuchman (2015), Goldsamt et al. (2010), and Kirtadze et al. (2015) found that gender imbalances in decision-making regarding the acquisition, preparation,

and distribution of the drugs within groups of injectors explained men's influence on women's drug use patterns. In a US study of transition to injecting among couples, Simmons et al. (2012) found that the patriarchal nature of drug acquisition weakened women's decision-making regarding which drugs to buy or how to use them, often forcing them to transition to injecting. This is not to mean that women are passive agents whose drug use is *always* determined by men. Hser et al. (1987) reported that some women initiated themselves by self-injecting and acquired their own drugs for example. However, the male domination of these processes and decisions in most included studies forced women to reluctantly inject together with men, thereby denying them the opportunity to prepare their own share of drugs, and in so doing produced gender differences in injecting risks.

In Georgia for instance, the '*predetermined non-privileged status of a woman*' meant that '*she received very little respect, was considered untrustworthy*', and ultimately, '*she came second in a line for the syringe if the group was lacking syringes*' (Kirtadze et al., 2015, p. 75). In England, analyses of 547 injecting episodes found that women received used needles from men significantly more often than men received from women (Bennett, Velleman, Barter, & Bradbury, 2000), and similar patterns were observed in Australia by Dwyer et al. (1994).

Furthermore, while women were generally more careful not to share needles, men took risks by voluntarily sharing needles among themselves in Tanzania (McCurdy et al., 2005; Williams et al., 2007). Even when women tried to minimise their risks by enrolling onto drug treatment, for example in Vietnam, their ongoing sexual relationships with their spouses continued to expose them to sexually- and injecting-transmitted infections (Higgs et al., 2008). In Australia, women were more likely to report that they had been sharing needles with a person who they later found out was HIV-infected (Dwyer et al., 1994). Taken together, literature supports Pinkham and Malinowska-Sempruch's (2008) claim that women often face gender and power inequalities that determine their drug use and harms therefrom.

Apart from gender-based influences, peer influence features heavily in studies of drug use trajectories. Demonstrating the prominent influence of other injectors in shaping drug use, seven studies reported that the majority of injection initiation events among men and women were directly or indirectly facilitated by people who were already injecting (Crofts et al., 1996; Goldsamt et al., 2010; Harocopos et al., 2009; Kermode et al., 2009; Morris et al., 2012; Sherman, Smith, Laney, & Strathdee, 2002; Small et al., 2009).

To illustrate this point, Morris et al. (2012) reported that only 11% of 1052 drug injectors in Mexico initiated injection by themselves. In another cohort study in Vancouver, Cheng et al. (2016) reported that 49% of 253 young adults received assistance with injecting in the initial period of their drug-injecting. Even when men were not involved in the initiation of drug use, female peers were noted to have a significant influence in two US studies by Tuchman (2015) and Doherty, Garfein, Monterroso, Latkin, and Vlahov (2000). In another US study, women were significantly more likely than men to cite social network influence as a reason for initiating injecting (Frajzyngier et al., 2007).

In explaining these findings, evidence suggests that social interactions provide grounds for the permeation of prevailing peer norms. For instance, having peers who think injecting is 'OK' was reported as a reason for starting to inject in the USA (Neaigus et al., 2006; Neaigus et al., 2001). Elsewhere, spending time with injectors facilitated exposure, interaction and communication with them, creating opportunities for peer norms that condone injecting to spread (Harocopos et al., 2009; McCurdy et al., 2005; Neaigus et al., 2006; Small et al., 2009). Furthermore, notions of masculinity encouraged transition into injecting among male drug users in India and Indonesia (Kermode et al., 2009; Nasir & Rosenthal, 2009). Although implicit moral codes among injectors required them to dissuade new drug users from injecting, these ethics were

either ignored in Australia (Small et al., 2009), or were ineffective in the face of determined would-be injectors in Moldova (Rhodes et al., 2011).

Besides peer norms, cultural values shape transition in specific contexts. Among the Indo-Chinese in Australia, smoking heroin was more culturally acceptable than injecting (Swift et al., 1999). In Georgia, cultural disapproval of women injectors forced them to hide while injecting (Kirtadze et al., 2015). In the US, women reduced their heroin intake faster when offered OST in attempts to comply with cultural disapproval of their injecting (Grella & Lovinger, 2011).

In sum, proximal factors such as family, gender, peer, and cultural norms influence trajectories of drug use. These influences do not always operate in isolation. For instance, Harocopos et al. (2009) found that peer influences intersected with individual curiosity in a context where administering drugs with a needle became acceptable and even appealing to new recruits. In these contexts, non-injectors gradually replaced their initial stigmatising view of injecting with a curious desire for drugs, leading to their first assisted injection.

2.3.3.3 Distal and macro-level influences.

Several studies shift away from individual and proximal factors toward structural determinants, adhering to the position that escalation of drug use cannot be

fully understood without considering the structural context in which it occurs (Chami et al., 2013; Hser, Huang, et al., 2007; Werb et al., 2010). Here, structural context refers to structural policies and the ways in which services such as housing, policing and health care are organised and provided.

In their exploration of injecting drug use among a cohort of 405 young Canadian adults, Debeck et al. (2013) found that a lack of housing was independently associated with injection initiation. In another study, Chami et al. (2013) followed up 422 injection-naïve individuals over six years and reported that participants residing in a Vancouver east side neighbourhood that had received limited investment in housing and social welfare services were twice as likely to inject drugs compared to those from more affluent neighbourhoods. Similar findings were reported in three US studies in which residence in deprived neighbourhoods was associated with higher levels of relapse and sustained injecting compared with more affluent neighbourhoods (Genberg et al., 2011; Hser et al., 2017; Robins & Slobodyan, 2003). A common finding reported by Barrett et al. (1990), Sherman et al. (2002) and Simmons et al. (2012) was the ubiquity of drugs in poor neighbourhoods, which they also claimed contributed to initiation, transition and chronic injecting.

Not surprisingly, availability of drugs is often linked to law enforcement. However, the nature of policing was itself identified as an adverse structural driver of injecting trajectories. In India, Mexico and Russia, police regularly harassed and arrested injectors who possessed methadone or sterile needles/syringes, causing them to stop accessing OST, continue injecting or share contaminated needles (Chakrapani, Newman, Shunmugam, & Dubrow, 2011; Miller et al., 2008; Mimiaga et al., 2010; Rhodes et al., 2003). In Thailand, Werb et al. (2009) observed that police presence did not spur abstinence; instead, injecting of heroin continued covertly, often with used needles. Similar consequences resulted from a heightened policing of injectors in the US and Mexico (Beletsky et al., 2014; Flath, Tobin, King, Lee, & Latkin, 2017; Miller et al., 2008). Thus, Werb et al. (2009) argue that to have a positive impact, policing of drug use should be aligned with harm reduction rather than abstinence.

Hser et al. (2017) suggest that structural influences of trajectories operate simultaneously and *cumulatively*. Indeed, several studies reported that a combination of *multiple risk factors* shaped the initiation of illicit drug use, transitioning to injecting, or chronic injecting (Crofts et al., 1996; Hser et al., 2017; Neaigus et al., 2006; Robins et al., 1974). In these studies, clustering of poor housing, homelessness, incarceration, unemployment, and legal problems was found among injectors. Conversely, in a multivariable analysis of

1633 injectors, protective factors associated with cessation of injecting included having personal or professional social support, a regular place to stay, and formal employment (Luchenski et al., 2016).

Yet, studies suggest that these protective factors are rarely proactively provided to injectors. Darke (2011) suggests that the societal disregard of drug users causes them to be ignored, often leading to a vicious cycle of deprived social status, inadequate housing, acquisitive crime, hostile policing, incarceration, unemployment, and more homelessness. In turn, joblessness causes transition to injecting in order to save costs since the effect of injected heroin is expected to last longer than smoked or snorted forms (Bravo et al., 2003; Kermode et al., 2009; Mars et al., 2014; McCurdy et al., 2005; Nasir & Rosenthal, 2009; Sherman et al., 2002; Simmons et al., 2012; Swift et al., 1999; Tuchman, 2015).

An important structural factor which positively altered drug trajectories and associated harms was treatment, particularly drug-free residential rehabilitation, and treatment with methadone or similar drugs. An assessment of short-term inpatient detoxification, outpatient methadone (OST), long-term residential rehabilitation, and outpatient drug-free treatment modalities found that six months or more in the latter two modalities and enrolment in OST were associated with reductions in drug use among 2,966 addicts in the USA.

Furthermore, retention in rehabilitation for six months or more was also associated with reductions in illegal activity, and improvements in full-time employment (Hubbard, Craddock, & Anderson, 2003; Hubbard, Craddock, Flynn, Anderson, & Etheridge, 1997). In another USA study, Hser et al. (2006) found that medical treatment reduced cocaine use over a 12-year period, and enabled abstinence for at least five years among 266 addicted users. In a cross-sectional study of 1663 Canadian injectors (noted above), Luchenski et al. (2016) found that accessing health and social services was associated with at least six months of injection cessation.

Despite its importance, a global review by Greenfield et al. (2007) found that women were less likely to enter drug treatment than men. UNODC (2015) reported that although one-third of drug users globally are women, only a fifth of drug users on treatment are female. In an example of how women miss treatment opportunities, Zamudio-Haas et al. (2016) found that gender norms barred Tanzanian women from gathering in outdoor areas where male injectors congregate, which prevented them from being reached by outreach teams that provide treatment. Thus, despite its benefits, women have inadequate access to OST. Unsurprisingly, female injectors are considered '*hard to reach*' due to their rare contact with health services (Hunter & Judd, 1998, p. 267).

Thus, studies suggest that structural factors, such as housing, policing and treatment, shape drug use trajectories. These factors may intersect with others, such as the cost of drugs or gender norms, to affect drug use. In Kenya, where limited data on trajectories exists, one study found that *'structural and social factors interact with individual experiences of addiction to increase the risk of transitions to injecting'* (Guise, Dimova, Ndimbii, Clark, & Rhodes, 2015, p. 1).

2.3.4 Current gaps in the literature.

Based on the reviewed studies, two important gaps were identified. Foremost among these was that there is a paucity of studies from sub-Saharan Africa, including Kenya. Most trajectory studies emanate from North America, Europe, Australia, the Middle East and Asia. Since Beckerleg's (1995) work, few groups of investigators have researched injecting drug use in Kenya, such as Guise et al. (2015), Rhodes, Guise, et al. (2015) and Kurth et al. (2015). Some limited studies have emerged in Tanzania (Lambdin et al., 2013; McCurdy et al., 2005; Williams et al., 2007; Zamudio-Haas et al., 2016), Mauritius (Johnston et al., 2011), Ghana (Messersmith et al., 2015), and Nigeria (Eluwa et al., 2013). Although some of these African studies report on initiation, transition or chronic addiction of drug use, none focus on the trajectory as a whole (**Appendix 2**). It is possible that the lack of studies from French-speaking African countries (as

well as Latin America) may have resulted from the language limits applied during the literature search. However, the paucity of data on trajectories in sub-Saharan Africa is underscored by three reviews of HIV infection that found limited research on injecting drug use in the region (Asher, Hahn, Couture, Maher, & Page, 2013; MacAllister et al., 2015; Papworth et al., 2013).

Studies discussed in this review are mainly from high- or middle-income countries that have better availability of medical treatment with OST, residential rehabilitation, and welfare systems that provide social support for drug users (Appel, Ellison, Jansky, & Oldak, 2004), all of which moderate drug use. Indeed, several cohort studies included in this review were among treatment entrants. Consequently, the results of this review may not be readily applicable to Kenya and other sub-Saharan countries where treatment and social support for drug users are not well established.

Furthermore, potential context-specific differences in trajectories could be accentuated by HIV infection, which increases mortality among injectors as described by Degenhardt et al. (2011). Indeed, Rhodes (2009) asserts that HIV-related harms of drug injection are highly linked to the context within which drug-injecting occurs. This is important in sub-Saharan Africa and the Kenyan coast where HIV is already prevalent. The point here is that the nature of drug

trajectories and its determinants, and the relative importance of these, is likely to depend on social and structural contexts in such a way as to limit the universal generalisability of the findings described in this review.

The second significant gap is related to female injectors. Despite evidence of gender-related influences on drug use trajectories, data related to women is limited. Much of what is known about trajectories of drug use and attendant HIV risks globally has been generated from research with sub-populations of injecting drug users that are highly visible and accessible, who mostly constitute men. As indicated in **section 2.2.4**, only six of the studies included in this review specifically focused on women, while men dominated the remaining studies. Trajectories and perspectives of women are relatively invisible.

Indeed, a recent review by Larney, Mathers, Poteat, Kamarulzaman, and Degenhardt (2015, p. 100) reported that although there are 3.5 million female drug users globally, they are underrepresented in studies of drug use, causing a '*pronounced lack of data*' related to them. To counter this deficiency, El-Bassel and Strathdee (2015, p. 94) aver that '*women-specific thinking and consideration of the social, micro, and macro contexts of women's lives*' should be enhanced in drug-related research, interventions, and policies, ensuring that

'a women-specific risk environment that reflects the unique lives and contexts of women who use drugs' is considered.

Understanding injecting drug use and the contexts within which this occurs among women is especially required to inform HIV prevention, given that gender differences in HIV vulnerability are closely associated with injecting and sexual behaviours, which are in turn determined by male domination in injection and sexual decision-making. In a study that included both genders, for instance, women had high rates of HIV compared to men (Eluwa et al., 2013). As noted earlier, women have higher rates of receiving used needles from the other gender compared to males, often due to their subjugated social position, and are also more likely to report multiple sexual partners, anal sex, and commercial sex work in countries such as Australia and Tanzania (Dwyer et al., 1994; Lambdin et al., 2013; McCurdy et al., 2005; Williams et al., 2007). Noting that overlapping sexual and injecting partnerships inequitably amplifies HIV risks in women due to a gender imbalance in decision-making, Evans et al. (2003) highlight the need to understand and prevent *both* injecting and sexual risks among female injectors.

Responding to the above research gaps is particularly critical in Kenya, where HIV prevalence is high, women who inject drugs are poorly researched, and

coverage of harm reduction services is limited. Although the previously cited Kenyan study by Guise et al. (2015, p. 8) *'did not discern any particular differences in transitions according to gender'*, the authors suggested that *'additional analysis of the increased vulnerability of women, and how risk for transitions and other drug-related harms, is gendered and is structured by gender relationships in this context is necessary'*. In this mixed-gender study, Guise et al. (2015) argued that HIV and harm reduction programmes in Kenya should respond to contextual pathways of drug use, taking into account structural influences, with an objective of interrupting transitions to riskier modes of drug consumption.

2.3.5 Limitations of this review.

Despite the above assertions, this review does not provide an exhaustive account of all existing literature. As in any review, the synthesis was inevitably selective, seeking to highlight findings and concepts that were deemed essential for this study, focusing primarily on the nature of trajectories, their impacts and antecedent determinants, and theories related to drug use (presented in the next chapter). Despite the effort to apply the inclusion and exclusion criteria rigorously, bias in study selection cannot be ruled out. Although an extensive search was conducted, it is neither possible to capture

all studies nor the nuances of included publications in a single review. Inevitably, this review pools together and homogenises context-specific findings, focusing only on key ideas and emerging trends.

As noted in **section 2.2.3**, studies with varying designs, measures, analytical approaches, and outcomes were included, introducing a high degree of heterogeneity. Although alternative review methodologies – such as meta-analysis – might have led to more nuanced or specific results, the feasibility of such an approach was precluded by the diverse nature of the research questions (Snilstveit et al., 2012). While systematic, the search may have missed relevant studies, and for practical reasons, non-English studies were excluded. Nevertheless, it is unlikely that the main findings of this review would be different, in as far as the diversity of trajectories, their impacts and determinants are concerned.

2.4 Summary.

This chapter reports contemporary conceptualisation of trajectories of drug use and the wide-ranging impacts of these on the health of injectors. Results suggest that there are drug-related, proximal and distal determinants of whether, and how, people initiate drug use, transition to injecting, and maintain chronic drug-injecting. Trajectories were not homogeneous, nor could they be

divorced from the cumulative impacts of injectors' personalities, lived experiences, social circumstances, or structural macro-environments. Overall, literature suggests that females differ from their male counterparts in their drug use trajectories, for various contextual reasons. At the same time, there is a paucity of data related to trajectories of drug use from sub-Saharan Africa and among women. The next chapter describes the theories that have been utilised to elaborate and understand trajectories of drug use.

3 THEORETICAL FRAMEWORK.

3.1 Introduction.

In the previous chapter, it was demonstrated that there is a need to understand drug use trajectories and HIV risks among women who inject drugs in Kenya. The next task then is to identify a theoretical framework through which these issues could be elucidated. According to Grant and Osanloo (2014, p. 19), the choice of a theory is guided by *'the research problem, the study's purpose, and design'*, which for this study is to understand how women experience their drug use and concurrent HIV risks, and thus inform potential interventions.

To achieve this aim, this study applies the social ecology theory to identify the determinants and potential mitigations of drug use trajectories and attendant HIV risks among women. It is important, however, to first situate the chosen theory within potential alternatives.

The objective then, of this chapter is twofold. First is to summarise existing literature in relation to the fourth review question stated in **section 2.1**, that is, 'What theories have been utilised to understand trajectories of drug use?' The second objective is to elaborate the suitability, implications, and limitations of employing the social ecology theory in this study.

In keeping with the first objective, **section 3.2** presents a summary of theories of drug use identified in the literature review. **Section 3.3** introduces the reader to the social ecology theory chosen for this study, and **sections 3.4 to 3.7** highlight its suitability and implications for this study. The subsequent **section 3.8** summarizes the limits of the theory, and how these were mitigated. The chapter concludes in **section 3.9** with an assertion that despite its limitations, the theory is well suited for this study.

3.2 Theories of drug use.

Many theories for understanding drug use have been proposed. Marvin Snyder, the then Director of the Division of Research at the National Institute on Drug Abuse in the USA, noted the following in 1980:

One of the more striking aspects of drug research over the last few years is the relative upsurge of various models and theories explaining, wholly or in part, the problems of drug abuse (Lettieri et al., 1980, p. xi).

Indeed, literature abounds with theories of drug use spanning across neuroscience, biology, psychiatry, psychology, and sociology (Altman et al., 1996; Lettieri et al., 1980). Positing different causes of drug use, these theories prescribe diverse approaches for addressing it (**Table 2**).

Table 2. Theories of drug use.

Categories.	Illustrative theories.	Hypothesis.
Neuroscientific theories.	Dopaminergic reward theories.	Anticipation of reward drives drug use.
	Opioid receptor theories.	Consummate effects of reward drive drug use.
Biological theories.	Hereditary theories.	Inherited genes predispose to drug use.
	Vulnerability theories.	Drug users are likely to abuse drugs due to their vulnerability.
Psychological theories.	Personality theories.	People use drugs as a remedy for weak or excessive traits.
	Instrumental behaviour theory.	Positive or negative reinforcement drive drug use.
	Cue exposure theory.	Environmental cues act as classical conditioning.
	Cognitive and rational choice theories.	Drug use could be purposeful, or due to poor self-regulation.
Sociological theories.	Peer influence theory.	Peer norms, family contexts, socialisation and shared values shape drug use.
	Family discord theory.	
	Social ecology theory.	Interaction with multiple social determinants drives drug use.

Neuroscientific theories posit that illicit drugs trigger the release of neurotransmitters (Nutt, 1996), leading to reward-seeking behaviours, such as urgency and cravings (Altman et al., 1996) or consummate behaviours such as bliss and sedation (Di Chiara & North, 1992). These theories posit that when exposed to drugs for prolonged periods, the brain develops tolerance, and when drugs are stopped, brain adaptations are no longer opposed, causing withdrawal symptoms such as dysphoria, depression, and anxiety (Koob, Stinus, Le Moal, & Bloom, 1989). Ongoing drug use is then required to control these symptoms, thereby sustaining addiction (Koob et al., 1989). Unsurprisingly, neuroscientists endorse the use of pharmaceutical drugs – such as methadone, buprenorphine or naltrexone which mimic or oppose opioids – to halt drug use (Altman et al., 1996).

Biological theories hypothesise that biological mechanisms underlie drug use. Good examples are hereditary theories that suggest genetic predispositions to alcohol (Heath et al., 1997) or heroin (Yuferov, Levran, Proudnikov, Nielsen, & Kreek, 2010). Other examples are vulnerability theories that proclaim a genetic basis for drug-related impulsivity and risk-taking (Baldacchino, Balfour, & Matthews, 2015; Kreek, Nielsen, Butelman, & LaForge, 2005). Notably, biological theorists do not claim that such processes fully account for people's

drug use. When these theories are empirically tested, it is difficult to isolate the contribution of genes from drug users' environment (Heath et al., 1997).

On their part, psychological theories posit that an individual's personality determines their drug use. Their central claim is that people of certain personalities use drugs in order to maximize reward (positive reinforcement) or minimise punishment (negative reinforcement) (Maremmani et al., 2009; McAuliffe & Gordon, 1974). Within this general proposition, psychologists place varying emphases on the role of instrumental use, cues, classical conditioning (Carter & Tiffany, 1999), breakdown of self-control (Diaz & Fruhauf, 1991) or rational discounting of future consequences (Becker & Murphy, 1988). Despite these disparities, psychologists adhere to the belief that the problem of drug use lies within individuals and their loss of control, and thus prescribe psychotherapeutic methods as a remedy (Skog, 1999).

A common feature across neuroscientific, biological, and psychological theories is their reductionist view of drug use. Cami and Farré (2003) assert that despite their plausibility, neuroscientific, biological, and psychological theories offer partial, narrow, and often overlapping rather than holistic, explanations of drug use. Similarly, Tretter (1998, p. 47) argues that '*unimodal interpretation*' of addiction in a '*pluralistic society*' is not useful as it ignores the multiplicity of risk factors for drug consumption. According to Tretter (1998), multiple potential

explanations of drug use could co-exist. Furthermore, drug use has several phases, such as initiation, transition, and chronic addiction, often featuring cycles of cessation and relapse (Darke, 2011), and influences (including genetic) can vary along this trajectory (Barrett et al., 1990).

Sociological theories eschew explanations primarily based on genetic and personality traits. Instead, they emphasise that illicit drug use is a socially produced problem (Szapocznik & Coatsworth, 1999). Social theorists do not refute genetic and psychological vulnerabilities, nor the biological mechanisms underlying addiction and withdrawals. They do also not assume that individuals are entirely passive. Instead, they acknowledge the role of social structures in ways that are absent in biological and psychological theories, by asserting that drug use behaviour emanates from the dynamic interactions of an individual with their cultural, economic, and structural environment (Wallace, 1999). Thus situations, social relationships, and social structures operate in concert with an individual to lead to drug use (Lukoff, 1980).

Indeed, sociologists such as Szapocznik and Coatsworth (1999), who examine general substance abuse along the life course, assert that drug use emanates from the social contexts in which a person is born, grows up, schools, or works. It follows then, that sociologists, in response to what they see as a complex

social problem, advocate for socially-oriented solutions to mitigate risk factors or enhance protective factors in drug users' social contexts. Thus, to be effective, such interventions must not be confined to individual levels in the way that pharmaceutical, psychiatric or psychological interventions are, but should also be aimed at modifying the broader social environment (Wallace, 1999).

Within this general premise, two groups of sociological theories exist. On the one hand are theories that focus on micro contexts such as peer influence and family systems/family discord theories, and on the other hand is the social ecology theory that includes wider macro-environments (such as social and health services/policies). Thus, the inclusion of macro-environmental determinants distinguishes social ecology theory from other sociological theories focusing on peers and families (Sallis, Owen, & Fisher, 2008). Unsurprisingly, social-ecological theorists give prominence to how the inequitable distribution of resources and power drive drug-using behaviours. In a review that validates this claim, Shahram (2016, p. 167) '*identified significant relationships between social determinants of health and substance use*' among women in Canada. Their claim that women's drug use was a product of legal, policing and economic macro-environment is consistent with findings presented in **chapter 2 (section 2.3.3)** showing that macro-level determinants such as income/cost, housing, policing, and treatment shape drug use trajectories.

In sum, a significant amount of literature exists on drug use theories that hypothesise that drug use can be explained – and therefore be mitigated – by neuroscientific, biological, psychiatry, psychological, or sociological mechanisms. Inevitably, **Table 2** is not an exhaustive list of all existing theories. However, the above narrative is representative in capturing the main typologies of drug use theories. The next section describes the rationale for selecting the social ecology theory for this study, highlighting its utility, implications, and limitations.

3.3 Social ecology theory.

Social ecology refers to the immediate physical, social and structural environment in which people exist, or a phenomenon occurs (Golden & Earp, 2012). Historically, social ecology theory emerged in recognition of the role that social contexts play in shaping health behaviour and outcomes. In part, it was birthed in response to a critique of health promotion programmes that over-relied on individual-level interventions while failing to account for wider social determinants of health (Golden & Earp, 2012).

In his seminal work, Urie Bronfenbrenner (1977), argued that health was influenced by what he labelled micro, meso and exo environments. In his model, the ecological environment is conceived as a set of concentric

structures, each inside the next. A decade later, McLeroy, Bibeau, Steckler, and Glanz (1988) advanced Brofenbrenner's (1977) framework, and proposed five levels of determinants of health, that is, intrapersonal, interpersonal, institutional, community and public policy factors (**Figure 2**).

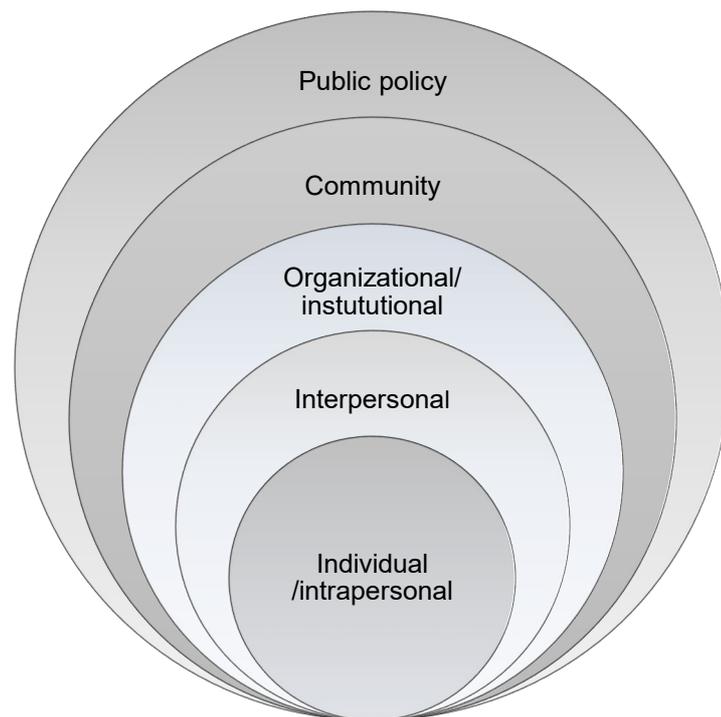


Figure 2. Social-ecological model from McLeroy et al. (1988).

Since McLeroy et al.'s (1988) iteration, other authors have utilised the model, while varying the labels and shapes of constituent ecological domains (Fisher et al., 2005; Kumpfer & Turner, 1990; Mason, Cheung, & Walker, 2004;

Mattheus, 2010; Mburu, Ram, Oxenham, et al., 2014; Whitehead, 2007). Despite this proliferation, the central feature remains the same: they all identify different influences of health behaviour located within and *external* to an individual. From a health promotion perspective, the emergence of social ecology theory epitomised a shift from '*popular theoretical models used to explore health behaviour...such as social cognitive theory, the theory of reasoned action and the health belief model, which... while useful, do not take into consideration the availability of resources from a community perspective and their relationship to health outcomes*' (Mattheus, 2010, pp. 2118–2119).

Golden and Earp (2012) assert that exploring population health through a social-ecological lens recognises that individuals are embedded within larger social systems that affect their health. It is in their application of this thinking that prominent scholars such as Marmot, Friel, Bell, Houweling, and Taylor (2008) have popularised the concept of social determinants of health.

Besides identifying influences on individual health, a social-ecological approach provides a framework for identifying and situating solutions to ill-health. For example, Mburu, Ram, Oxenham, et al. (2014), Robinson (2008) and McLeroy et al. (1988) identify interventions for a range of public health problems using this approach. After using the theory to identify and situate influences of health

and wellbeing, these authors then identify corresponding interventions to counter negative determinants of health within these social-ecological domains

McLeroy et al. (1988) assert that domains of social ecology theory signify both the *settings*, as well as the *nature* of potential interventions. For instance, they state that intrapersonal interventions may focus on individual knowledge, interpersonal interventions on social relationships, and institutional interventions on policies. In this way, the theory facilitates the identification of different combinations of interventions to improve health. Because Bronfenbrenner (1977) does not restrict which attributes of social ecology to include when applying the theory, each iteration of the social-ecological model is '*behaviour-specific*', a function that allows the theory to be widely applicable to diverse conditions and populations (Sallis et al., 2008, p. 465).

The above functions of the theory – which are summarised in the following **Table 3** – are particularly pertinent to this study given its goal of identifying both the drivers and potential interventions of drug use and HIV risks among women injectors.

Table 3. Principles of social-ecological models (Sallis et al., 2008)

1. There are multiple influences on specific health behaviours, including factors at the intrapersonal, interpersonal, organisational/institutional, community, and public policy levels.
 2. Influences on behaviours interact across these different levels.
 3. Ecological models should be behaviour-specific, identifying the most relevant potential influences at each level.
 4. Multi-level interventions should be most effective in changing behaviour.
-

3.4 Importance of a social-ecological lens in explaining drug use.

As illustrated previously in **Table 2**, the majority of contemporary theories of drug use advance narrow individual-level (genetic and psychological) or interpersonal (peer and family context) explanations of drug use, while neglecting macro-structural influences (such as law enforcement or treatment). By necessity, theoretical discourse must focus on a specific aetiological hypothesis. However, most theories employ scientific lenses that obliterate broader macro-environmental influences, and in the process, peter out the potential that altering these macro-influences could have on drug use. A lesser amount of attention has been paid to the wide-ranging influences of drug use

beyond the micro-contexts of individuals, their families, and peers (Rhodes, 2009; Wallace, 1999). Consequently, structural macro-environmental phenomena that could facilitate or constrain a change in drug use behaviour – such as policing or availability of treatment – remain relatively invisible in theoretical (and to some extent empirical research) terms, yet they affect the agency of drug users to change their drug use.

The practical significance of the relative absence of wider macro-environmental influences in the theoretical elaboration of drug use is that harm reduction programmes also ignore them. Harm reduction programmes in East Africa are reported as becoming more evidence-based (Rhodes et al., 2016) at a time when there is increasing recognition that *'interventions are more likely to be effective if they are theory based – namely, if they draw upon a theoretical underpinning of the established determinants of behaviour'* (Panter-Brick, Clarke, Lomas, Pinder, & Lindsay, 2006, p. 2811). As highlighted earlier, the choice of theories used to explore drug use has an impact on the potential solutions that are proposed, and indeed, such theories may result from, or reinforce, certain societal views of drug users. Therefore, selecting theories is not necessarily a value-free exercise.

Of central concern to public health however, is the following question: precisely *how* can individuals who are on a path to chronic addiction be assisted to quit or limit the harms of their injecting drug use? More specifically for this study, what influences women's injecting careers, and therefore, what kinds of interventions should be part of harm reduction services?

Numerous authors have asserted that focusing on individuals without considering the public policy, policing and other structural contexts in which drug use occurs is ineffective in addressing harms of drug use (Beletsky et al., 2015; Flath et al., 2017; Miller et al., 2008; Rhodes, Wagner, Strathdee, Davidson, & Bourgois, 2012; Wallace, 1999). These authors assert that while necessary, a change within individuals alone – such as increased knowledge, without structural changes in their communities and societies – cannot make a long-lasting impact in mitigating drug use. Consequently, the use of theories that only focus on micro-contexts might not provide the best illustration of all possible ways through which such drug users might be assisted to quit drug use or minimise harms from it.

As an alternative, a theoretical conceptualisation that encompasses and extends beyond the proximal micro-level influences is needed if the entire range of proximal, distal, and macro-level influences described in **chapter 2** are

to be mitigated. Indeed, as argued by Bronfenbrenner (1977, p. 4), while advancing the social ecology theory, *'the detection of such wide-ranging influences becomes possible only if one employs a theoretical model that permits them to be observed'*. Adherents to this belief also exist in other disciplines including health promotion, where practitioners now focus on wider community-services, policy and economic factors to improve, for example, oral health and diabetes, rather than confining their interventions solely to individuals (Fisher et al., 2005; Mattheus, 2010).

The inclusion of structural influences is particularly salient for this study given that drug policy and treatment systems are currently being developed in Kenya (Rhodes et al., 2016). While important, focusing on individual and interpersonal factors can all too easily camouflage the way in which socially constructed classes of 'undeserving' persons can affect public policy, drive structural 'neglect' of (often homeless) drug users, or cause them to be aggressively policed. For instance, Darke (2011) asserts that social actors and policy makers often problematise drug users, often seeing them as delinquent or petty criminals. Thus, social and policy responses to illicit drugs often marginalise addicts. Even when their poor health outcomes are evidenced, the well-being of injectors is not prioritised due to what Darke (2011, p. 2) refers to as the *'who cares factor'*. Harsh policies related to whether, or how, injectors are treated or

policed often diminishes their agency to manage their drug use or limit harms therefrom (Beletsky et al., 2015). Indeed, injectors often self-stigmatise due to society's default problematisation of addicts instead of the underlying socio-structural problems which drive them to drugs in the first place (Weinberg, 2000).

Citing Merton (1957), Lukoff (1980) asserts that governmental policy objectives are often enforced by institutional mechanisms designed to achieve such goals. On one end, abstinence is often accompanied by strict policing, while liberal harm reduction policies promote investments in voluntary treatment and safer injecting facilities / shooting galleries. Given the long-standing emphasis on abstinence and individual agency in Kenya, a theoretical emphasis on drug users' ecology would be useful in identifying how the recently introduced harm reduction policy can be expanded to further limit drug use and its harms.

3.5 Application of the social ecology theory in prior studies.

Although the social ecology theory has rarely been used in studies of drug use, the acceptance of Bronfenbrenner's (1977) view that multiple ecological influences determine health outcomes has spurred several researchers to explore the risks of drug use across the entire spectrum of the social ecology. For example, Mason et al. (2004) applied the theory to identify risks associated

with adolescent substance abuse. In this study, adolescents' ecological profiles consisted of personal risk (depression and stress), social risk (social network members' drug use, pressure to use, and negative activities), and macro-environmental risk (number of crimes, poverty level, alcohol outlets, and availability of boys' and girls' clubs and libraries).

In their two-part study, Kumpfer and Turner (1990) identified self-efficacy, family climate, peer influence, school bonding, and school climates as determining drug use among American youths. When empirically tested using a confirmatory multivariable methodology on a high school sample (n=1,373), these variables were found to predict adolescents' substance abuse. In another study Bell, Carlson, and Richard (1998) found that narcotic drug use among adults in Texas was predicted by ecological variations in structural factors namely: social service disorganisation, neighbourhood income, and violence. While rare, empirical testing of ecological influences is relevant given assertions that structural influences may have *direct effects* on health behaviours rather than it just being the perception of such influences that matter (Sallis et al., 2008, p. 467, emphasis in original).

In sum, although the social ecology theory has been used in few drug use studies, it is a valid concept for examining drug use qualitatively. Socio-

ecological approach can facilitate teasing of injectors' perspectives regarding how their social contexts determine their drug use. The application of the theory in this study is appropriate given Lettieri et al.'s (1980, p. xix) assertion that drug use should be understood on the basis of '*one's relationship to self, others, and the wider society*'

3.6 Implications of adopting social ecology theory in this study.

Three key implications then, of applying the social ecology theory to understand drug use emerge. First, the theory builds upon the sociological assumption that the aetiology of drug use is predominantly social, being produced by interactions between individuals and their environments. The emphasis on macro-environmental factors, however, distinguishes social ecology theory from other sociological theories that focus on peers and families (Sallis et al., 2008). More specifically in the context of drug use, it situates drug use partly as a product of policies or structures such as economic inequalities, criminalisation, nature of policing, and drug treatment. By so doing, it pre-determines that harm reduction programmes should consider, rather than ignore, interventions that address these kinds of macro-influences of drug use. The intended outcomes of such interventions extend to economic, legal, or treatment policy changes, among others, besides the more traditional

individual, clinical, peer or family system outcomes. This has significant implications on how an enabling environment that aids injectors to limit their drug use and attendant risks is conceptualised.

Second, the shift from narrow to multiple influences facilitates a more comprehensive method of identifying which individual, social and structural factors are to be modified to optimally mitigate drug use and attendant harms. From this perspective, a social-ecological approach almost always proposes a combination of interventions, responding to multiple influences of drug use, with *'emphasis on policy and other macro-environmental contexts of behaviour'*. (Sallis et al., 2008, p. 465). This brings to the fore the multiplicity and linkages of influences, requiring context-specific identification of the range of influences operating in a given (set of) drug user(s). This function is particularly useful given the currently limited elaboration of drug use in Kenya.

3.7 Utility of social ecology theory in detailing women's drug use.

Third, by virtue of not specifying the content of each of the domains, and ways in which influences operate therein, social ecology theory allows the exploration of different dimensions of influence, which *'can include temporal, spatial, relational or contextual'* (Butterfield & Lewis, 2002, p. 508). Hence, although it is not a gender-specific theory, it is possible to use it to examine the relational

social ecology of female injectors. For example, Shahram et al. (2017) conceptualise women's drug use as a multifaceted phenomenon influenced by an interplay between personal and socio-cultural factors, specifically gender norms, trauma, colonialism, and culture. Although the authors did not apply the social-ecological framework *per se*, they elaborated how aboriginal Canadian women experienced their social contexts, and identified women's position in their culture as a critical ecological concept that influenced their drug use. Prevailing gender norms that facilitated gender power imbalances played a role in sustaining inequalities and driving women's drug use.

Universally, definitions of gender revolve around the identities and social roles of women and men, as constructed within social contexts (Money, 1973, 1985). At the most primary level, gender norms ascribe social roles, expectations, and appropriate behaviors for women and men. In turn however, gender norms determine how economic, political, cultural and other resources are distributed, resulting in gendered inequalities emanating from power dynamics that predominantly disadvantage women (Connell, 1987). Indeed, Connell's (1987) theory of gender and power asserts that (heterosexual) gender inequality can be attributed to the sexual division of labour (which economically favours men), sexual division of power (which gives men power and authority over women), and cathexis (which exploits social norms and affective relations in favour of

men). As noted in **chapter 2**, gendered acquisition and decision-making regarding consumption of drugs is detrimental to women.

Besides, gender beliefs may operate beyond women's micro-contexts. In their feminist critique of the politics of drug treatment, Campbell and Ettore (2011) claim that drug use among women is driven by social and structural determinants including political, legal, cultural and socioeconomic factors, often enacted through inequitable gender beliefs. Indeed, other authors argue that gender is an institutionalised social structure that goes somewhat further than just assigning social roles, expectations, and behaviors for women and men (Martin, 2004; Risman, 2004). According to Campbell and Ettore (2011), the structural function of gender explains why policy makers in patriarchal societies systemically ignore the needs of women. As a structure, gender is permeated with power regarding how resources are distributed, often favouring males (Martin, 2004).

These claims are supported by findings presented in **chapter 2** showing that while treatment is beneficial, fewer women than men access it (Greenfield et al., 2007) arguably '*because it is delivered in ways that they cannot take up*' (Campbell & Ettore, 2011, p. 1). Although deeply embedded, a society's '*background*' gender beliefs are often the root cause of behaviours, actions and

policies that reproduce gender inequality (Ridgeway, 2009, p. 145). Functionally, this structural attribute '*situates gender at the same level of social significance as the economy and policy*' (Risman, 2004, p. 429).

The argument here is that, as a phenomenon across women's ecology, gender determines how women view themselves, how others (including men and policy makers) view them, and also whether resources and opportunities (such as treatment) are provided to them. Thus gender acts via gender-role socialisation, interactional expectation, and as a deeply embedded social structure, to create *unique* experiences of drug injecting among women, which could potentially modify their vulnerability to HIV. It is therefore relevant to explore how gender determines the risks and protective factors for injecting drug use and associate harms, *both* as a micro-and macro determinant.

As such, the social ecology theory is suited to understand the realities produced by gender norms and relations at the individual and interpersonal domains, while providing contexts for situating and elaborating the structural operation of gender (for example within the societal-structural domain). Because they are deeply embedded, gender beliefs were assumed to be operating *structurally* in the background in this study, which is a sound postulation, given the preceding narrative, and the patriarchal norms in the study context noted in **section 4.6**.

3.8 Utility of social ecology theory in elaborating HIV risks.

An added advantage of the socio-ecological approach in this study is its consistency with literature related to HIV epidemiology (Mayer, Pizer, & Venkatesh, 2008). In their article focusing on the history of HIV, Merson, O'Malley, Serwadda, and Apisuk (2008) claim that although HIV risks have been traditionally viewed through a behavioural lens, the importance of biomedical and structural risks is emerging. Behavioural risks include multiple sexual partners, sharing of drug injecting equipment, and low use of condoms. Biomedical risks are related to individual physiology, such as circumcision (or lack of it), while structural factors extend to issues such as the impact of policies and laws on HIV transmission (Kippax, 2012; Padian et al., 2011).

Over the last decade, studies have shown that exposure to HIV risks are not just determined by people's behaviours and biomedical factors, but that they are also '*socially produced; that is, they are patterned by socio-cultural, economic and political forces*' (Kippax, 2008, p. 489). For instance, gender power, roles, or norms increase vulnerability of women to HIV infection, especially in sub-Saharan Africa where heterosexual sex is the primary mode of its transmission (Wingood & DiClemente, 2000).

In countries where policing of drug use is not aligned to public health goals, studies show that criminalisation of personal possession of needles, syringe confiscation, frequent arrests and fear of the police all contribute to a rise in risky injecting behaviours, and diminished access to HIV prevention services among criminalised (and often hidden) injecting drug users (Chakrapani et al., 2011; Flath et al., 2017; Miller et al., 2008; Mimiaga et al., 2010; Rhodes et al., 2003). These authors portray *'law enforcement as a structural determinant of health'* among injectors, including those accessing NSP services (Beletsky et al., 2015, p. 1872). Thus, HIV risks extend from individuals themselves to their social and structural environments, suggesting that for marginalised populations such as injectors, employing a social-ecological approach can be useful for mapping such risks and locating potential solutions.

Although the social ecology theory has not been extensively used in HIV research, a group of reputed HIV scholars led by Baral, Logie, Grosso, Wirtz, and Beyrer (2013, p. 1) recently proposed using a *'modified social-ecological model to help visualize multi-level domains of HIV infection risks.'* In their view, such a model acknowledges *'multiple levels of risk'* and forms a basis for the *'integration of evidence-based biomedical, behavioural, and structural interventions'*. Baral et al.'s (2013) model is composed of five domains of HIV risks, namely: individual, network, community, policy and the stage of the HIV

epidemic. These authors argue that '*by adding the stage or level of the HIV epidemic to the social-ecological model*' proposed by McLeroy et al. (1988) their modified model takes into account '*population-level epidemic dynamics*', which may differ based on local HIV prevalence (p.2).

Thus, while retaining consistency with the epidemiology of HIV, social ecology theory creates spaces for the exploration of behavioural, biomedical and structural factors influencing HIV risks. The social-ecological approach links HIV risks to the immediate physical, social and structural environment in which people live, thereby highlighting the socially embedded nature of these risks. Rhodes (2009, p. 193) conveys the concept of socially embedded harms of drug use by coining the concept of 'risk environments' of drug use, arguing that '*risk is situated differentially in local contexts*'. As a whole, these arguments provide additional impetus for utilising social ecology theory in this study.

3.9 Limitations and potential pitfalls of social ecology theory.

The advantages of social ecology theory notwithstanding, there are definitional and operational assumptions that need to be taken into account if this theory is to be meaningfully applied to understand injecting drug use among women.

To start with, the theory does not predict the result or nature of the different influences at each level. Rather, it is left to the researcher to work out these influences. Golden and Earp (2012, p. 364) state that these influences could affect individuals differently, based on their unique personalities, contexts, and practices. The authors emphasise the dynamic nature of these influences by stating they are *'interactive and reinforcing'*. According to Sallis et al. (2008) interaction of influences is a core principle of the theory (**Table 3**). The process of unpacking how different influences produce certain patterns of drug use and HIV risks among women therefore needs to take into account inherent dynamism and variation in how these influences affect different people. In this study, an interpretive approach was used to understand how these influences and their variabilities might have acted upon different individuals to produce observable behaviours.

Another limitation of the theory is related to Stokols's (1992) assertion that social contexts are themselves multi-layered, given that neighbourhoods and institutions are embedded in larger economic and social structures. In his writings, Stokols (1992, 1996) argues that the social, physical, and cultural influences on a person's health behaviour and outcomes tend to be cumulative. Because different factors may cumulatively and concurrently operate to

produce the realities and experiences of female injectors, expecting and understanding the simultaneous nature of these influences would be important.

Yet, although both Stokols (1992), Sallis et al. (2008), and Golden and Earp (2012) highlight the simultaneous nature of these influences, they do not provide guidance on how to account for it during analysis. Identifying and unpacking the interaction of influences relies on the researcher. The risk here is that factors may be analysed as if they are isolated, while in reality they exist as interacting and reinforcing influences. Given this risk, potential interactions were intentionally sought and emphasised throughout the analysis in this study.

Another potential pitfall of using the theory is its fractional application. Despite its wide utility in locating multiple influences and developing interventions, a review by Golden and Earp (2012) found that most studies on ecology of health behaviour focus on individual and interpersonal levels, and ignore the wider community, societal and policy spheres. Such partial application is avoided in this study by taking into account the entire spectrum of ecological domains.

Finally, it is notable that terminologies describing the various domains and levels within the social ecology theory tends to vary, and that the limits of these domains are imprecisely defined. For example, some scholars refer to the first level as individual/intrapersonal/ microsystem, the second level as

interpersonal/ community/ institutional/ organisational/ mesosystem/ exosystem, and third level as societal/ institutional/ structural/ policy/ public policy/ macrosystem or physical environment (Fisher et al., 2005; Kumpfer & Turner, 1990; Mason et al., 2004; Mburu, Ram, Oxenham, et al., 2014; McLeroy et al., 1988; Whitehead, 2007).

The overlapping nature of these domains causes authors to use different permutations of terms, which can limit comparative application. However, because the theory's utility is in locating influences of behaviours, the definition and limits of these domains are user-defined, rather than being rigidly delineated by the theory. This provides the flexibility to explore and define precisely where influences are emerging from. Thus the approach in this study was to develop a social-ecological model specific to it, and the terms adopted were iteratively informed by the data. In the final iteration, these were individual, interpersonal and societal-structural domains. As argued by Sallis et al. (2008), social ecology theory is widely adaptable as demonstrated by its widespread application across several populations and health issues, and this flexibility is exploited in this study.

3.10 Summary.

The conceptual shift from viewing drug use as emanating from narrow and unitary causes such as neurotransmitters, genes or personality to a phenomenon brought about by multiple causes has promoted the application of social ecology theory and with it, a social determinant perspective of drug use. In the context of a growing recognition that individual, social and structural factors influence health behaviour and outcomes, the application of social ecology theory in this study can be justified on several bases, including its 1) utility in identifying and locating influences of drug use trajectories and HIV risks, 2) utility in defining the nature of potential interventions to mitigate these influences, 3) utility in elaborating how gender norms intersect with the social contexts of women to produce drug use and associated risk behaviours, 4) consistency with existing literature and empirical findings demonstrating the multiple and ecologically-located influences of drug use and HIV risks, 5) compatibility with the qualitative methodology that seeks to elaborate perceived experiences of external influences, and 6) the implementation-focus of this study and the nascent nature of harm reduction in Kenya. While the theory is appropriate for this study, it has limitations. However, these were actively mitigated. The chapter that follows describes this study's methodology.

4 METHODS.

4.1 Introduction.

This study was based on secondary analysis of qualitative data. In the following **sections 4.2, 4.3, and 4.4**, the aims, research questions and objectives of the secondary analysis are presented. In **sections 4.5 to 4.12**, a brief description of the primary study is provided. **Sections 4.13 to 4.17** critique and justify the application of secondary analysis of qualitative data in this study. Potential pitfalls of this approach are unpicked, including the epistemological tensions inherent in secondary analysis of qualitative data, and how these limitations were mitigated. **Section 4.18** describes the database and the analysis conducted. The chapter concludes in **section 4.19** with a discussion of ethical and dissemination elements of this study.

4.2 Aim of secondary analysis.

The aim of this study is to document determinants of drug use trajectories and HIV risks among women who inject drugs, through secondary analysis of qualitative data.

4.3 Secondary research questions.

The secondary research questions are as follows:

- 1) What are the drug use and sexual behaviour characteristics of women who inject drugs in the coastal towns of Kilifi and Mombasa in Kenya?
- 2) What factors determine ways in which women involved in this study initiate, transition and maintain their injecting drug use?
- 3) What HIV risks are encountered by these women in the course of their injecting drug use, and how do these come about?
- 4) How might a better understanding of the determinants of trajectories of drug use and HIV risks encountered by these women inform services and policy development in Kenya?

4.4 Secondary study objectives.

The objectives of this study are to 1) document participants' drug use and sexual characteristics, 2) describe determinants of participants' drug use trajectories, 3) identify HIV risks and their determinants in the sample, and 4) discuss the contributions, limitations and implications of this study.

4.5 The primary study design and aims.

Conducted in 2015, the primary study aimed to identify needs, social determinants and barriers to the achievement of optimal sexual and reproductive health (SRH) among female injectors. It explored four research questions via in-depth interviews (IDIs) and focus group discussions (FGDs):

- 1) What are the specific SRH service needs of females who inject drugs in Mombasa and Kilifi, Kenya?
- 2) What are the social determinants of access to SRH services among females who inject drugs in Mombasa and Kilifi?
- 3) What factors hinder access to SRH services among women who inject drugs?

4.6 Setting of the primary study.

The study was conducted in the Coast Province of Kenya, which is home to 3.3 million people, and 46% of the 18,000 Kenyan injectors (NAS COP, 2013a). Similar to the national trends alluded to in **section 1.3.1**, women at the coast have a higher prevalence of HIV compared to men (NAS COP, 2014), partly due

to gender differences in HIV risks, such as early sex debut (Sia, Onadja, Nandi, Foro, & Brewer, 2014) and sexual violence (Sarna et al., 2009).



Figure 3. Map of Africa showing Kenya's location along the Indian Ocean.

Due to its high prevalence and long history of drug use, the coastal region provides an ideal setting for exploration of drug use among women. Specifically, data were collected in Mombasa and Kilifi.



Figure 4. Map of Kenyan coast showing study towns of Mombasa and Kilifi.

In these two towns, drug use is intertwined with tourism activities (Beckerleg & Hundt, 2004; Peake, 1989). A third of all tourists arriving in Kenya visit Mombasa and adjacent towns of Kilifi, Lamu and Malindi (Akama & Kieti, 2007). Local residents have remained poor, however, partly due to the seasonality of tourism (Akama & Kieti, 2007). Indeed, half of Mombasa residents live below the minimum income required to meet basic personal needs, which in Kenya is

1 US dollar per day (Akama & Kieti, 2007). During this study, the cost of a sachet of heroin was 200 Kenya Shillings (KES), an equivalent of 2 US dollars.

Heroin is a common drug at the Kenyan coast (Deveau et al., 2006), similar to national trends. In a recent study, 93% of all Kenyan injectors injected heroin 2–3 times daily (Kurth et al., 2015). At the coast, heroin is commonly injected by itself, or smoked within rolls of cannabis or tobacco (Beckerleg, 1995; Beckerleg et al., 2005). In this context, the (purer) white heroin has partly replaced the (impure) brown heroin predominant in the 1990s (Beckerleg, 1995). Heroin is injected into superficial veins in the arms, legs, groin or neck (Beckerleg, 1995), typically at injectors' houses, or at public dens, called *maskani*. These dens tend to be private rooms, back alleys, or road-side wooded areas akin to the *mageto* (rented rooms) and *maskani* (hangout places) described in coastal Tanzania by McCurdy et al. (2005).

Gender norms in coastal Kenya align with traditional identities of men as breadwinners who control decision-making within families (Sarna et al., 2009). Despite gender segregation during social activities being customary among coastal residents (Gower, Salm, & Falola, 1996), Beckerleg et al. (2005) noted that men and women often injected drugs together.

Swahili is widely spoken at the coast and is the national language in Kenya. To exclude outsiders from their conversations, however, Beckerleg et al. (2005) noted that injectors often use corrupted forms of Swahili. During this study for example, participants used unfamiliar words such as *makete* ('sachet'), *kubwenga* ('to inject'), *arosto* ('drug withdrawal') or *teja* ('a drug user').

4.7 Primary study sites.

The primary study sites consisted of two community-based organizations (CBOs): Reach out Centre Trust (REACH OUT) in Mombasa and the Muslim Education and Welfare Association (MEWA) in Kilifi. These CBOs were providing harm reduction services through outreach workers who reached out to injectors in their own localities, providing them with clean needles, syringes, HIV-testing, condoms and health education (Ayon et al., 2017). The CBO offices served as informal drop-in centres where basic health services were provided by counsellors, clinical officers, nurses and paralegals (Ayon et al., 2017). These CBO services were expanded in 2014 to include basic SRH interventions. Drug users who required advanced services were referred to tertiary government health facilities (**Table 4**).

Table 4. Services provided at the study sites from Ayon et al. (2017).

Service domain	Outreach-based services	Services at drop-in centres	Referrals to other health facilities
<i>HIV</i>	Condoms, HIV testing and education.	HIV testing and counselling services.	HIV treatment, testing of hepatitis C and Tuberculosis.
<i>Harm reduction</i>	Clean needle and syringes, alcohol swab, cotton wool.	Addiction counselling, first aid for violence and overdose.	Provision of opioid substitution therapy (OST) with methadone.
<i>Sexual and reproductive health</i>	Information on family planning and provision of tampons and oral contraceptive pills.	Pre-natal education, provision of short-term reversible contraceptives.	Long-acting contraceptives, ante-natal care, and cervical cancer screening.
<i>Social and child-care services</i>	Transport to drop-in centres and health facilities.	Personal hygiene items, day shelter, diapers for babies.	Referrals for post-rape and legal assistance.

4.8 Participants' recruitment.

Recruitment procedures are detailed in Ayon et al. (2017). In short, women who injected drugs were invited to participate in the primary study during outreach. Outreach workers informed women about the aims of the study, including the benefits and potential harms of participating, basic overview of the eligibility

criteria and the fact that they would be interviewed individually or as a group. Women who expressed interest were provided with a study information sheet, screened for eligibility, and if eligible, scheduled for IDIs or FGDs.

To participate, women had to be aged ≥ 18 years to allow independent consent, be within the reproductive ages of 18–49 years, and have injected drugs within the past 90 days. Recruitment was informed by data saturation in relation to the primary questions, and a total of 45 women were included. Of these, 24 took part in IDI, and 21 participated in three FGDs across the two sites. Although the two sites are similar in terms of HIV, drug use, and other social conditions, sampling was split between them to ensure relevance of results to the two CBOs. Additionally, combining IDIs and FGDs was anticipated to gather complementary data from the women (Ayon et al., 2017). Apart from the women, five key stakeholders, of whom three were women, were purposively sampled across the two sites and interviewed to provide data for triangulation purposes (**Table 5**).

Table 5. Primary study participants recruited at the two study sites.

Methodology	Participants	Mombasa	Kilifi	Total
<i>In-depth interviews</i>	Women who inject drugs	12	12	24
	Community health worker	0	1	
<i>Key stakeholder interviews</i>	Ministry of Health official	0	1	5
	Programme manager	1	0	
	Outreach worker	1	1	
<i>Focus group discussions</i>	Women who inject drugs	2 sessions (n=11)	1 session (n=10)	21

4.9 Consent procedures.

On the day of appointment, interviewers went through the participant information sheet and informed participants that they retained a right to withdraw from the study at any time. Participants were provided with an opportunity to ask questions and taken through the consent form. Each participant was asked to sign a consent form, agreeing 1) to be involved in a

study IDI or FGD for an hour, 2) that their participation was voluntary, 3) that the information that they provided was confidential and that their personally identifiable data would not be divulged if a public report of the study was made, 4) that the conversation would be recorded and findings published publicly, but the audio and other data will be kept safe, and 5) that the investigators could divulge to the outreach team information about participants whom they thought were in danger based on the information they disclosed in the course of the IDIs and FGDs.

4.10 Data collection.

Data were collected in private rooms within CBOs, or in stakeholders' offices by two researchers. IDIs and FGDs explored participants' drug use, SRH, HIV testing and experiences accessing services. IDIs and FGDs were conducted in Swahili or English, were audio-recorded, and lasted 45–60 minutes. At the end of the IDIs and FGDs, a brief questionnaire was used to collect socio-demographic and drug use data from participants.

4.11 Ethical approval of the primary study.

The ethics committee of the National Commission for Science, Technology and Innovation approved the primary study (**Appendix 3**).

4.12 Summary of primary study findings.

Data related to the primary research questions showed that participants had low utilisation of contraception, high rates of unplanned pregnancies (Mburu et al., 2018), and poor attendance to pre- and post-natal clinics (Ndimbii et al., 2018). Their utilisation of SRH services at public facilities was prevented by user fees, transport costs, and stigma (Ayon et al., 2017).

4.13 Motivation for secondary analysis.

The motivation to embark on this PhD topic emanated from my recent exposure to the issue of injecting drug use. I first became familiar with injecting drug use in 2010 when I was involved in designing HIV programmes in South East Asia. My previous work had focused on sexual transmission of HIV, which is the primary mode of HIV transmission in sub-Saharan Africa, where I had worked prior to 2010. With time, my interest in injecting drug use grew, reinforced by data showing the growing importance of injecting drug use as a cause of new HIV infections in sub-Saharan Africa.

In 2015, I was involved in the primary study described above. As a collaborator of the primary research team, I participated in drafting the primary study protocol and research tools. Naturally, I followed the data collection with

interest, but did not participate in the IDIs or FGDs themselves. When data collection was completed, I participated in co-authoring primary manuscripts.

On further exploration of the data however, I quickly realised that a significant amount of data existed outside of the realm of SRH. Having become aware of the paucity of studies focusing on female injectors during the primary protocol development, my goal and motivation was to avail relevant data that could pragmatically inform local services and policies related to female injectors. After preliminary data perusal, I generated a list of potential questions for secondary analysis which I gradually and iteratively refined based on the existing data. I became interested in exploring trajectories of drug use and HIV risks among the sample as part of my PhD. It was within this context that I explored the suitability of secondary analysis as described forthwith.

4.14 Definition and justification for secondary analysis.

On the basis of her extensive work on elucidating it, this study adopted Heaton's (1998, p. 1) definition of secondary analysis, as '*the utilisation of existing data, collected for the purpose of a prior study in order to pursue a research interest which is distinct from that of the original work*'. While Heaton's (1998) definition applies to this study, it is important to state that secondary data analysis covers a wider spectrum of scenarios. According to Seale (2011) these include

situations where a secondary analyst (i) may have been involved in planning the primary research and collecting the data, (ii) participated in the primary fieldwork as a data collector only, or (iii) may not have participated in the primary research at all, for example in the case of data repositories.

Secondary analysis was advantageous for this study for a number of reasons. First is the economy of time and resources, which several commentators, including Seale (2011), Szabo and Strang (1997), Duncan (1991), Castle (2003), and Hofferth (2005) agree about. Proponents of secondary research such as Hofferth (2005), Castle (2003) and Szabo and Strang (1997) argue that at a micro-level, secondary data analysis can side-step costly primary data collection, which is particularly prohibitive to students. Economic pressures also operate at macro-levels, where researchers are obliged by funders to deposit and share their datasets in order to minimise research wastage (Corti & Thompson, 1998, 2006; Seale, 2011).

Besides cost, scholars such as Seale (2011) and Brakewood and Poldrack (2013) argue that researchers are ethically obliged to utilise datasets that already exist to answer additional research questions, as long as such data can answer desired questions.

Another justification for utilising secondary data analysis in this study is the recent call by Larney et al. (2015) to intensify global research related to female injectors. As illustrated in **chapter 2**, there is a current lack of data related to women who inject drugs in Kenya. Hofferth (2005) points out that secondary data analysis allows rapid generation of data related to current issues of interest to policymakers, which is advantageous if such data would require many months to collect. In the Kenyan context, possession and consumption of injecting narcotic drugs use is illegal, criminalised and stigmatised (NAS COP, 2013a). Secondary analysis circumvents difficulties of finding adequate samples of injectors who are described as '*hidden*' in Kenya (NAS COP, 2013a, p. 13). Female injectors are particularly hard to find, as highlighted by Hunter and Judd (1998). The distinct advantage here then, besides economics and ethics, is the timing, given the current data gaps related to a rare population.

4.15 Epistemological and ontological approach.

Qualitative methods are particularly suited for studying populations involved in illicit activities, such as drug use, as it allows the building of rapport and access to information that may not be obtained through quantitative surveys. This is relevant to the present study which aimed at making sense of participants'

interpretation of their drug use and HIV risks, uncovering their explanations of these, and the meanings that they attached to them.

Understanding how different circumstances affected participants' drug use and HIV risks required assuming that women would first *interpret* what their contexts were, the meanings they attached to them, and the influences they had on their drug use and sexual behaviours. This would then be followed by my own *interpretation* of what the participants mean in their responses. Furthermore, a third level of *interpretation* operates when I interpret the findings in relation to the social-ecological framework. These considerations necessitated me to assume an interpretivist stance towards the data, whilst using a new theory to interpret the findings. My interpretivist intention, then, was to conduct a theory-led interrogation, organisation and reconstruction of the participants' reality based on my own interpretation of what the participants interpreted their circumstances to be, and how they understood those circumstances to have influenced their injecting drug use and HIV risks.

Ontologically, it was assumed that reality is dependent on participants' subjective interpretation and descriptions of it, and that their interpretation of their reality is subject to further interpretation by a researcher (Bryman, 2012). Interpretivists like myself assume that reality is relative, that is, multiple realities

exist, and that access to it is only achievable through social constructions such as language and shared meanings. Relativistic thinking opposes the application of positivism in social research, and its objectivist assumption that reality and its meaning occurs independent of perception. Given the individualised and varying nature of people's perception and interpretations of their circumstances, pluralities of participants' constructions and perspectives were intentionally sought and engaged with.

Furthermore, the use of secondary data to respond to multiple research questions lends support, at least to some extent, to the ontological *multiplicity* of facets of participants' realities, which contrasts with the positivist assumption of a singular reality. The known importance of social contexts in determining patterns of drug use further precludes positivistic approaches which can subdue multiplicity of social contexts (Goldenberg, 2006). Indeed, the ability to perform secondary analysis legitimises claims that the same qualitative data can provide varied insights to different facets of participants' realities based on questions that we seek to answer, and perspectives utilised in the analysis (Heaton, 1998; Hinds, Vogel, & Clarke-Steffen, 1997). The emphasis on theory-led but relativistic interpretation here is especially important because such novel application of '*theory gives data new interpretation and meaning*' (Torraco, 1997, p. 118). Because research questions and analytical lenses can

vary, the same textual data offers glimpses into different facets of their realities, as interpreted and described by participants and then by the researcher.

4.16 Limitations of secondary analysis.

However, several issues arose when secondary analysis was being contemplated. To start with, I was faced with the problem of potential data gaps. Both Thorne (1994) and Bryman (2012) point out that secondary analysis is often plagued with data gaps because variables of interest to a secondary analyst may not have been collected in the primary study. Indeed, the active role of a primary researcher in primary data construction influences the direction of research inquiry (Thorne, 1994), and therefore determines what knowledge is created.

Apart from not having participated in the IDIs or FGDs, I had not ventured into the drop-in centres where the primary data were collected. According to Bryman (2012), Seale (2011) and Thorne (1994), a lack of familiarity with the context where primary data were generated can limit interpretation and de-contextualise qualitative data. Furthermore, the interpretivist approach adopted in this study created opportunities for me to influence what this thesis says about women's drug use and HIV risks. My gender, background, values, and profession were likely to influence the analysis. Indeed, impartiality in

qualitative analysis is difficult to achieve (Bryman, 2012), yet the potential for researcher bias was heightened given that I was not involved in the initial construction of the data. This limitation seemed an impediment to a valid interpretation of the data.

Additionally, given the inherent limitation related to co-construction of data, several commentators assert that in-depth documentation of original interview contexts is essential for secondary analysis (Fielding & Fielding, 2000; Hammersley, 1997; Heaton, 1998; Savage, 2005). Yet there was little documentation of the primary study context in the form of field observations, notes, or diaries. Even if some notes had been available, such would be inadequate or biased as researchers generally select what to note in study diaries (Bishop, 2007). Mental notes and implicit contextual nuances are lodged within an interviewer's mind (Hammersley, 1997), yet it is impossible to deduce this tacit knowledge from a diary or indeed, a dataset (Seale, 2011). Still, the lack of *any* documentation seemed to be a significant impediment.

Besides, details of IDI and FGD dynamics and body language – which are important in making sense of participants' circumstances – were missing from my dataset. Although this is the case in most other secondary analyses (Castle, 2003; Seale, 2011), this lack was particularly important given the criminalised

nature of drug use. While critical, it was impossible to fully decipher the interactions that occurred during data collection (which was itself a few years ago). I considered visiting the study sites to build a better mental picture (and tacit knowledge) of the context. However, doing so would have negated the economic gains of secondary analysis, while never really unearthing the context for the original IDIs and FGDs. While artefacts such as transcripts and audio files existed, they could not substitute this shortcoming. I became acutely aware that construction of knowledge begins and is largely dependent on the initial IDIs and FGDs, yet I could not reconstruct these contexts.

4.17 Mitigating limitations of secondary analysis.

However, according to Moore (2005), the pursuit of secondary analysis should *not* be about recreating the context of the original project, but rather to re-contextualise the production of new data and knowledge. This argument offered an incentive to select a theoretical framework which aided the re-contextualisation of new findings. The intention here was not to recreate or understand the interactions and the interview situations under which the primary data were collected. The social ecology theory began, in an exploratory form, to form a picture of the social context surrounding drug use and HIV risks. Using this theory, it was possible to re-construct the social, interpersonal,

economic, institutional and other contexts within which women's actions occurred, to gain an insight to the interpretations that women made of those contexts, and the meanings that they then assigned to their behaviours *under those contexts*.

Yet it should not be assumed that de-contextualised data is the ideal starting point in secondary analysis. On the contrary, Bryman (2012), and Thorne (1994) argue that erroneous results can emerge from wholly de-contextualised data. However, the de-contextualisation that these authors warn against includes the wider social and structural contexts in which data collection occurs, and not just the interview contexts. In this thesis, these broader contexts were reconstructed from the women's accounts and formed a backbone of the theory-led analysis. The risk of de-contextualising the wider context was further mitigated by the fact that I was generally familiar with the primary study, and thus belong to a group of other researchers who have re-used their own data such as Corti and Thompson (2006) and Hinds et al. (1997). I had participated in developing the primary study protocol and tools as a named collaborator, and in co-authoring subsequent manuscripts.

Additionally, the application of an established theoretical framework was useful in mitigating my influence on the findings, despite my interpretivist stance. In a

theory-led analysis, '*concepts are selected based on how closely they are aligned with the theoretical model and the real-world phenomenon they are supposed to represent*' (Torraco, 1997, p. 124). Hence the interpretation of the data was aligned with the theoretical domains of the social ecology. This was facilitated by a rigorous use of linked texts and memos that identified sources/locations of influences, codes related to these domains, as well as themes that were consistent with the theory (for example 'risk environment').

Because I understand Swahili, I acquired the original audio files and listened to them repeatedly in an attempt to understand the data better, instead of just relying on transcribed data. Before investing time in analysing the data, I examined the completeness of interviews, the extent to which topic guides were utilised, the quality of probing, and the consistency between audio files and the transcribed data. I acquired and double-checked all paper questionnaires containing participants' data, and they were complete and consistent. I was satisfied with the quality of the dataset before embarking on the analysis.

An insurmountable limitation is that my absence from the initial IDIs and FGDs had an impact on what and how phenomena were initially explored, which could limit the extent to which the dataset could answer the secondary research questions, manifesting as data gaps. In a faux paradox however, the impetus

to *pragmatically* utilise this dataset was supported by Long-Sutehall, Sque, and Addington-Hall's (2011) argument that prevention of unnecessary loss of confidentiality is a strong justification for secondary analysis of sensitive data from elusive populations, even when the potential for data gaps exist.

Despite these pragmatic and mitigating strategies, limitations persist. No matter how rigorous, secondary analysis may not rectify any power dynamics or social response bias created during primary IDIs and FGDs. It is difficult to state the effect that primary researchers themselves had on women's performance and honesty. Nevertheless, these residual limitations were not considered by the author as sufficient to warrant fresh primary data collection, but ones that require discussion in relation to the data analysis and overall study findings.

4.18 Data Analysis.

4.18.1 Description of the dataset.

The dataset utilised for secondary analysis included 1) audio files from three FGDs and 29 IDIs (24 from women and five from key stakeholders), 2) corresponding transcripts of these audio files, and 3) original paper questionnaires containing participants' socio-demographic data. **Appendices**

4–7 show the primary data collection tools, while **Appendix 8** shows the data sharing agreement setting out the terms of utilisation of the dataset.

4.18.2 Analysis procedures.

In keeping with research question 1, and specific objective 1, drug use and sexual behaviours of participants were summarised in Microsoft Excel. Due to the small sample size, these data were primarily used to contextualise the qualitative data, rather than to perform additional quantitative analysis.

For the IDI and FGDs data, a thematic analysis as described by Bryman (2012) was conducted, through which predominant patterns relating to determinants of drug use trajectories and HIV risks in the sample were sought. Guided by the theoretical framework, thematic analysis was conducted as follows.

Transcripts were read and re-read for familiarisation purposes, and audio files listened to for clues of interview dynamics (Bryman, 2012). Transcripts were then entered into QSR Nvivo®, which as Bazeley (2007) notes, is a useful software for aiding qualitative analysis, while being mindful that the rigour of computer-assisted qualitative data analysis fully depends on the researcher.

In keeping with research question 2 and specific objective 2, provisional nodes were created relating to 1) initiation of drug use, 2) transition to injecting, and 3) maintenance of chronic injecting. The last of these nodes included a child node related to relapse. These nodes were then populated with preliminary codes constituting labelled fragments of text quotes from participants, which allowed utilisation of different textual segments for multiple codes (Pope, Ziebland, & Mays, 2000). Codes were refined dynamically in keeping with emerging patterns of influences on drug use. Because these influences emanated from different domains of the social ecology, codes were also cross-labelled as being individual, interpersonal, or societal-structural, as appropriate.

Similarly, in keeping with research question 3 and specific objective 3, nodes related to risky HIV behaviours were created and populated with coded text segments related to injecting, sexual or other determinants of HIV risk exposure. Similarly, these were cross-labelled as individual, interpersonal or social-structural in nature.

Codes were iteratively sorted and categorised to generate preliminary descriptive themes while remaining open to discover more codes and themes (Charmaz, 2000). Codes were iteratively altered or combined with existing ones, as recommended by Miles and Huberman (1984) and Pope et al. (2000).

By necessity, this approach used a constant comparison approach described by Silverman (2001), where participants' responses were continuously compared to identify similarities, differences and emerging patterns. Unusual cases were sought, which according to Atkinson (2005) and Mays and Pope (2000), prevents unnecessary homogenisation of qualitative findings.

The coding process was documented through memos identifying the purpose and meaning of each code (Lincoln & Guba, 1985). Memos aided rigour and transparency by serving as a reminder of the overall conceptual linkage between the codes, themes and the theoretical framework (Bryman, 2012). Quotes were extracted from participants' transcripts and displayed under relevant themes in order to safeguard the validity, reliability and transparency of interpretation as suggested by Chiovitti and Piran (2003). Once descriptive themes were derived, analytical themes were formulated with reference to literature, theory, and my own experience regarding injecting drug use.

This analytical process of inductive abstraction of data from participants' words into descriptive/semantic and analytical/latent themes is epistemologically consistent with both interpretivism and constructionism. Additionally, the use of theory-led coding was based on the belief that explanations of women's use of drugs and HIV risks lay in their individual, interpersonal or societal-structural

contexts. These domains were themselves delineated based on interpretations of women's explanations of their drug use and sexual behaviours.

4.19 Ethical considerations.

4.19.1 Ethical approval.

This secondary analysis was approved by the Research Ethics Committee of the Faculty of Health and Medicine, University of Lancaster (**Appendix 9**). A statement of the independent role of the candidate as the secondary analyst is displayed in **Appendix 10**.

4.19.2 Confidentiality.

To assure anonymity, personally-identifiable information, such as names, were not used. Instead, unique codes were utilised throughout the analysis and subsequent publications.

4.19.3 Access to and storage of data.

I travelled to Kenya in February 2017 and physically acquired the dataset, comprising of paper questionnaires, audio files and electronic transcripts. The

transcripts and audio files were held in a password protected computer and the paper questionnaires were locked in a cabinet at all times at my home. Apart from myself, two academic supervisors had access to the transcripts. Following successful completion of this PhD study, all paper questionnaires will be shredded, and all data subsequently held securely in electronic format. All these data will be permanently deleted within a maximum of ten years from initial data collection.

4.19.4 Applicability of primary consent to secondary analysis.

As noted in **section 4.9**, participants consented to the information they provided being analysed and published, including their social demographic, drug use, and all other non-personally identifiable information. Because I was a named collaborator of the primary research team, and I then used the primary dataset for secondary analysis, the participants would reasonably anticipate that I would publish their data in confidence. Although participants consented to what they said being published, they were not informed about secondary analysis. This was because secondary research questions were not anticipated. Because the precise primary research questions were not outlined in the consent form, it may be argued that participants were not necessarily consenting to the research questions; rather they were consenting to the

confidential use of their data through a process of scientific analysis and publication.

Even if the possibility of secondary analysis were explicitly mentioned, the value of merely mentioning that possibility is contested as insufficient by Hinds et al. (1997) and Brakewood and Poldrack (2013). Although it may be seen as explicitly permitting secondary analysis, Brakewood and Poldrack (2013) argue that mentioning the possibility of future secondary analysis still leaves room for uncertainty regarding the precise secondary research question(s). Yet, they argue, it is often impossible to determine future research questions, as is also the case with exploratory primary research (Heaton, 2004).

To reconcile this problem with the ethical use of secondary data, Thome (1998) proposes that both the intent and relationship between primary and secondary research questions should form the basis for interpreting the applicability of initial consent to secondary data analysis. Similarly, Bishop (2007, p. 8) asserts that regardless of whether research is primary or secondary, determination of consent should not rest on whether the research questions are known in advance, *'but specificity of research purposes known in advance'*. This suggestion was applied in this study. In this regard, it is argued that, although the data were analysed within a PhD study, which is somewhat different to the

context of analysis of the primary question, participants were not consenting to specific contexts of analysis, but rather, to the overall purpose, process and confidential nature of it, and by the primary research team, with whom I was a named collaborator. Thus the primary determinant of the applicability of participants' consent was their expectation of privacy rather than whether the data was used to answer primary or secondary questions. Additionally, the over-riding *purpose* of both the primary and secondary analysis is the same, that is, to provide evidence that can inform policy and services for a vulnerable population of female injectors. This overall purpose was itself disclosed to women in advance, during recruitment.

These arguments justify the applicability of primary consent for this study despite its distinct secondary research questions. Indeed, Munhall (1988) recognised the constantly changing directions of qualitative data exploration and analysis over two decades ago. In keeping with her argument, it is asserted here that reconciling a static consent with an ongoing, changing and dynamic process of qualitative research can only occur if we are willing to accept that qualitative consent is effectively a *process and purpose* consent.

4.19.5 Benefits of research to participants.

Although this study does not confer direct benefits to participants, it will provide information for improving services to injectors in the study context. As argued by Brakewood and Poldrack (2013), secondary data analysis maximises the benefits of research by using data to examine multiple research questions. Furthermore, this study responds to the obligation upon researchers to generate knowledge that protects the health of the broader population, such as preventing HIV.

4.19.6 Dissemination.

In keeping with the ethical obligation to disseminate research findings, the results of this study are being disseminated through university-wide seminars, scientific conferences, journal articles, and a PhD thesis. Findings will be shared with the investigators of the primary study and the participating CBOs.

4.20 Summary.

This chapter has presented the methodology of this study, focusing on the decisions made, their limitations, mitigation strategies, and potential implications for the results. The next three chapters present the main findings.

5 FINDINGS I. SAMPLE CHARACTERISTICS.

5.1 Introduction.

This chapter responds to the first research question, which is, ‘What are the drug use and sexual behaviour characteristics of the women who inject drugs in the Kenyan coastal towns of Kilifi and Mombasa?’ These characteristics were not documented in the primary study, yet are relevant to this thesis.

At the beginning of this secondary analysis, it was known – based on primary analysis – that the sample was relatively young (mean age 28.5 years), and poorly educated, with a fifth (18%) not having had any formal education. Over half (53%) were single, while the rest either had a live-in partner (27%), or were married (18%). Most relied on sex work (29%), ‘hustling’, or casual labour for income. Over a quarter (27%) were homeless and over half (53%) had been imprisoned in their lifetime. Most had at least one child (82%), did not use contraception (69%) or attend antenatal care during pregnancy. These data are reported in primary papers (Ayon et al., 2017; Mburu et al., 2018; Ndimbii et al., 2018) and are summarised in **Appendix 1**.

Building on these findings, **sections 5.2** and **5.3** present new data related to the drug use characteristics, HIV testing and sexual behaviours of participants.

5.2 Drug use characteristics.

On average, women had used drugs for nine years via injection or other ways. Within this period, they had injected for the last two years, suggesting that most took seven years from starting to smoke or snort drugs, to injecting them.

The commonest drug, used by 85% of the participants, was heroin. However, patterns of its use varied. It was used on its own by 27% of the women, and in combination with other drugs by over half (58%) of them. These combinations involved alcohol, cigarettes, cannabis (locally known as bhang), rohypnol, khat (locally known as miraa), solvents (locally known as glue) or cocaine.

Cocaine itself was the primary drug of choice among 9% of participants, and a few others (4%) used it together with other drugs, particularly heroin or rohypnol. Rohypnol is a benzodiazepine (flunitrazepam) with sedative and hypnotic effects. Khat is a plant (scientific name: *Catha edulis*) whose unprocessed young leaves are chewed to release the psychoactive stimulant, cathinone. Sniffing glue was reported by one participant. Glue is a local term for a range of industrial adhesives that contain intoxicating solvents which are sniffed or inhaled for euphoric effects. As can be deduced from the foregoing, polydrug use was common among the sample: 60% of participants used multiple substances, while 40% used one 'main' drug (**Table 6**).

Table 6. Drug use characteristics of the study sample.

Characteristic	IDIs (n=24)	FGDs (n=21)	Total (n=45)	%
Drug use				
Duration using drugs (mean years, SD)	7.8 (4.9)	9.1 (6.3)	8.5 (5.6)	-
Duration injecting (mean years, SD)	3.3 (2.6)	2.0 (2.0)	2.6 (2.5)	-
Main drugs used				
Heroin	11	1	12	27%
Heroin, Alcohol, +/- Cigarettes	3	1	4	9%
Heroin, Cannabis, and Cigarettes	1	6	7	16%
Heroin and Rohypnol	4	3	7	16%
Heroin, Cannabis, and Rohypnol	1	2	3	7%
Heroin, Rohypnol, and Alcohol	1	1	2	4%

Heroin, Cannabis, and Khat	1	1	2	4%
Heroin and Glue	0	1	1	2%
Cocaine	1	3	4	9%
Cocaine and Rohypnol	0	1	1	2%
Cocaine and Heroin	0	1	1	2%
Unknown	1	0	1	2%

Abbreviations: SD=standard deviation.

Although specific data relating to the amounts of drugs consumed were not collected, data from the IDIs and FGDs revealed that most women consumed stable amounts of these drugs, which gradually increased over time due to tolerance. A few exceptions to this stable consumption were noted however, among women who consumed unusually large quantities of drugs during sex work. Data from IDIs and FGDs suggested that on typical days, participants injected twice or thrice, most commonly in the evening and in the morning when withdrawals were anticipated.

5.3 HIV testing and sexual behaviours.

As shown in the following **Table 7**, 96% of the women had been tested for HIV. However, 7% were not aware of their HIV status, either because they had not

received their results, or had not been tested at all. A quarter (22%) of the women were HIV positive, 62% were HIV negative, and 9% were unwilling to disclose their status.

Findings suggested that condom use among the sample was generally low. Only a third (31%) of participants were using a condom consistently. Almost a third (29%) were inconsistent condom users, and another third (31%) reported never using condoms. Not surprisingly, seven of the ten participants who were infected with HIV reported that they used condoms inconsistently. However, the sample's sexual activity varied widely as shown in the following **Table 7**.

In other findings that indicated women's risk of HIV, a third (29%) of the sample had drug-using intimate partners. Overall, 11% reported that their primary sexual partners were injectors, while 18% had partners who smoked or snorted drugs. Notably, 20% (n=9) reported that their primary sexual partners did not use any drugs. Since 49% of the women were single and not in stable relationships, they were not required to respond to questions regarding their partners' drug use. Finally, 29% had a history of being sexually assaulted, and 48% had previously experienced physical or other forms of violence (**Table 7**).

Table 7. HIV testing and sexual behaviours among the study sample.

Characteristic	IDIs (n=24)	FGDs (n=21)	Total (n=45)	%
HIV Testing				
<i>Ever tested</i>				
Yes	23	20	43	96%
No	0	1	1	2%
Unknown	1	0	1	2%
<i>Last tested</i>				
In last month	2	5	7	16%
1-3 months	13	9	22	49%
3-6 months	3	2	5	11%
Over 6 months	0	0	0	0%
Over 1 year	5	4	9	20%
Unknown	1	0	1	2%
N/A	0	1	1	2%
<i>Where tested</i>				
Outreach	4	9	13	29%
Hospital/clinic	12	6	18	40%
Drop-in-Centre	5	4	9	20%

Prison	2	0	2	4%
Unknown	1	1	2	4%
N/A	0	1	1	2%
Collected results				
Yes	23	19	42	93%
No	0	1	1	2%
Unknown	1	0	1	2%
N/A	0	1	1	2%
HIV status				
Positive	7	3	10	22%
Negative	13	15	28	62%
Unknown	1	2	3	7%
Not willing to disclose	3	1	4	9%
Main sexual partners' drug use				
Injecting	4	1	5	11%
Smoking	4	4	8	18%
None	6	3	9	20%
N/A	9	13	22	49%
Unknown	1	0	1	2%
Last time had sex				
Last 7 days	10	3	13	29%

1-4 weeks	3	4	7	16%
1-3 months	3	4	7	16%
>3 months	5	10	15	33%
Not disclosed	2	0	2	4%
Unknown	1	0	1	2%
Condom use				
Always	9	5	14	31%
Sometimes	4	9	13	29%
Never	10	4	14	31%
Not disclosed	0	3	3	7%
Unknown	1	0	1	2%
Sexually harassed				
Yes	6	7	13	29%
No	16	14	30	67%
Not disclosed	1	0	1	2%
Unknown	1	0	1	2%
Sexually assaulted				
Yes	2	11	13	29%
No	17	10	27	60%
Not disclosed	1	0	1	2%
Unknown	1	0	1	2%

Other violence

Yes	11	11	22	49%
No	11	10	21	47%
Not disclosed	1	0	1	2%
Unknown	1	0	1	2%

5.4 Summary.

Previously published data from the primary study depicted poorly educated women with high rates of incarceration, homelessness and unemployment. The novel analysis presented in this chapter shows that polydrug use was common, with a notable prominence of khat, and absence of methamphetamines. Heroin was the most commonly injected drug. The period between starting to use illicit substances to injecting averaged seven years. Additionally, data revealed women's low use of condoms, prevalent sex work, and sexual partnerships with male injectors, all of which increase potential exposure to HIV. The next two chapters report further findings related to trajectories of drug use and HIV risks.

6 FINDINGS II: INITIATION, TRANSITION, AND ADDICTION.

6.1 Introduction.

This chapter responds to the second research question, that is, 'What factors determine ways in which women initiate, transition and maintain their injecting drug use?'

Sections 6.2, 6.3 and 6.4 focus on initiation into drug use, transition to injecting, and maintenance of injecting drug use respectively. In keeping with the social-ecological framework, factors influencing these trajectory phases were mapped onto the individual, interpersonal, and societal-structural domains of participants' social milieu. The chapter concludes in **section 6.5** by emphasising that while these influences were classified based on their source, they were operating concurrently to produce the observed drug use behaviour.

6.2 Beginnings of illicit drug use.

The primary question here is: Why do women start to use illicit drugs? Findings from the IDIs and FGDs suggested that women's involvement in illicit drugs was progressive, which is consistent with the escalating nature of drug use trajectories highlighted in **section 2.1**. Adding small amounts of heroin into their

cigarette or cannabis rolls, or mixing rohypnol into their alcohol was a typical starting point. Participants typically described their entry into drugs with phrases like “*I started to try the cocktail one*” (**Participant # 4, 26 years old, Mombasa**). Indeed, almost all women were using cigarettes, khat, alcohol or cannabis prior to, or alongside, their heroin or cocaine, as noted in **Table 6**. As one stakeholder remarked:

It all starts with these other small drugs, then they graduate to the hard stuff, and lastly, they graduate to injecting (**Stakeholder # 1, outreach worker, Mombasa**).

As noted above, the expectation is that women would have ‘graduated’ from cigarettes, cannabis, khat, alcohol and rohypnol, and finally to smoking or injecting heroin or cocaine. This assertion notwithstanding, it was not always possible to isolate the specific progression of drug use across these substances, partly because participants were asked to describe how they started to use drugs in general, rather than the specific sequence. Despite this lack of clarity, most participants remembered the specific circumstances surrounding their entry into illicit drug use, explored forthwith.

6.2.1 Initial curiosities and nudging hardships.

Throughout the IDIs and FGDs, women's accounts suggested that initiation events were dominated by individual factors, specifically, coping with personal loss and curiosity. Accounts from seven women depicted initiation into drug use as a feature of their psychological adjustment to hardships such as broken love relationships, loss of a spouse, or unplanned pregnancy. In a typical case, a participant who had used drugs for five years described how her broken relationship led her to use drugs, mentioning that "*I got into drugs through love*" (**Participant #11, aged 26 years, Kilifi**). She further explained that:

It was because of a man whom I loved. My family didn't want him, so they forced us to separate. That caused my entry into drug use. I saw it as a way of removing stress... (**Participant #11, aged 26 years old, Kilifi**).

Five participants pin-pointed unexpectedly getting pregnant as a cause of their entry into drug use, and this influence seemed to particularly affect unmarried women. In an illustrative example, an unmarried participant who was in a relationship with a man who was both a drug user and a peddler described how her unplanned pregnancy led her to drug use. Asserting the importance of her pregnancy in causing her to start illicit drug use, she pointed out that even

though she had been in a long-term relationship with a drug user, she had not used drugs until she got pregnant. Asked if she was using drugs during the initial duration of her intimate relationship she mentioned that “*I had not started...then I got pregnant, and after that, I started to snort*” (**Participant # 12, aged 23 years, Kilifi**). Across the five women, the effect of unexpected pregnancy was predicated on the absence of partner support or interest, with one reporting that her partner “*denied*” having impregnated her (**Participant # 3, aged 26 years, Mombasa**).

In another example of how drug use was a coping mechanism, one participant mentioned that she started using drugs following the death of her husband:

When he [my husband] was around, I was not using drugs. I started using when I became confused in life. The best friends who welcomed me were those persons who use drugs. So I decided just to taste it, just once. That first tasting is what spoilt my life (**Participant # 1, aged 33 years, Kilifi**).

As implied in the above excerpt, a change in this participant’s circumstances provided an impetus to start using drugs. Hers was a particularly illustrative case because even though her partner was a drug dealer, she did not use drugs while he was alive, and only resorted to using them after his death. Her

'confusion in life' indicated difficulty in coping with the circumstances surrounding her partner's death, who "*was a criminal...and he died in an accident during his work*" (**Participant # 1, aged 33 years, Kilifi**). An outreach worker also suggested that drugs provided a refuge for women, who "*being in hardship, seek refuge in drugs*" (**Stakeholder # 1, outreach worker, Mombasa**).

6.2.2 Intersection of curiosity, hardships and peer influence.

While coping with personal hardships contributed to initiation into illicit drug use, it would be simplistic to isolate them as *causing* drug use on their own. Social influences were commonly at play. While curiosity was driven by a cognitive desire to know how drugs "*feel*" (**Stakeholder # 1, outreach worker, Mombasa**) or "*taste*" (**Participant # 11, aged 26 years, Kilifi**), it operated within social gatherings.

Indeed, several women attributed their initiation to peer influence. However, the context and circumstances differed. Five women explicitly blamed peers, for example stating that "*I started using drugs after being introduced to it by my friends*" (**Participant # 5, aged 19 years, Mombasa**). However, in the account of the above participant who had lost her husband, drug-using peers were not

necessarily encouraging her to inject, rather they were providing support in times of difficulties.

In apparent contradiction with the assertion that peer influence enabled initiation into drug use, two older women conscientiously tried to discourage new recruits from starting to use drugs, suggesting that peer influence was also a moderator of initiation into drug use. One participant who had been using drugs for 15 years recounted how she would actively dissuade would-be initiators:

You might see a person who is not a drug user trying to force herself to use. You try to persuade the person not to take, but the person wants to know how it tastes or how it reacts. I usually pity them because I know it is a disease; it is just that we don't want them to be in a situation like ours (**Participant # 8, aged 30 years, Kilifi**).

In the face of agency and curious self-determination of would-be initiators, moral attempts to dissuade new users were generally ineffective. The above participant described the moral conundrum brought about by her inability to stop others from starting to use heroin despite its harms, saying that "*it is a very difficult situation...because I know how [bad] this drug [heroin] is*" (**Participant # 8, aged 30 years, Kilifi**).

6.2.3 Initiating drug use to get along with an intimate partner.

Apart from drug-using peers, intimate partners were a predominant source of influence to enter into drug use among four women. Initiation into drug use often occurred as a result of women acquiescing to their partner's drug use. At least two women engaged with drugs in the pursuit of intimacy, or to fulfil perceived ideals of a good relationship with intimate partners. One participant from Kilifi (mentioned previously), who associated her drug use with getting pregnant recounted how she started to use drugs in the hope that she would get along with her drug-using intimate partner. When asked why she started using drugs, she said it was "*because the person who impregnated me was selling [drugs]*". She went on to state that:

He impregnated me, and was staying right there at home, so I decided to use [drugs] with the hope that we could get along (**Participant # 12, aged 23 years, Kilifi**).

The confluence of a life event and desire to get along with her partner is also notable here. Yet, this participant's situation illustrates the primacy of her intimate relationship in her decision to start smoking heroin at a time when it was detrimental to the health of her unborn child. Stakeholders suggested that inequitable affective attachments influenced women's entry into drug use. For

example, one claimed that “women are *highly influenced because their vulnerability is very high*” (**Stakeholder # 1, outreach worker, Mombasa**).

Elaborating on this emotional vulnerability, this stakeholder went on to assert that “*women are very easily trapped into drugs because they tend to have friendships with male peers*” (**Stakeholder # 1, outreach worker, Mombasa**).

However, women themselves did not necessarily depict this influence as having resulted from gendered affective imbalance. Instead, it was stakeholders who suggested that the vast trust that women had in their partners made them vulnerable to their influences:

It is very easy when a female has a partner who is using drugs for her to be driven into drug use. It is very easy because the trust is very high upon the partner (**Stakeholder # 1, outreach worker, Mombasa**).

While some intimate partners facilitated women’s entry into drug use, a few others moderated it, similar to the ‘positive’ peer influence noted earlier. One participant, whose partner was a snorter (but not an injector) indicated that her boyfriend dissuaded her from using heroin; but she only understood why when she experienced it for herself:

After tasting and you experience its effects first-hand, that is when you understand, you can't know its effects before. He used to explain it to me, but it is not important now **(Participant # 11, aged 26 years, Kilifi)**.

As can be noted from the foregoing, intersections between intimate partners or peers on the one hand, and hardships or curiosity on the other, nudged women towards drug use.

6.2.4 Drugs are everywhere.

At the same time, entry into drug use was made easy by the availability of drugs in the study context. Explaining women's paths to addiction, a stakeholder claimed that "*they have come into the drugs because of the lifestyle we have today; drugs are everywhere*" **(Stakeholder # 1, community health worker, Kilifi)**. This stakeholder further suggested that the ubiquity of drugs worked in concert with joblessness to create conditions for women to enter into drug use:

They don't even have work to do. They are looking for jobs but there are no jobs. So they enter into drugs and get into many other problems **(Stakeholder # 1, community health worker, Kilifi)**.

In sum, the social context in which drug use was initiated was one in which several influences intertwined to facilitate it. The point here is that consistent with social ecology theory, few of these women offered a single distinct reason as to why they started using drugs. For the vast majority, it was clear that several factors contributed to their entry into illicit drug use, although there were often very specific prompts, which were then reinforced by other factors.

6.3 Different beginnings...same transition?

Having used different women's and stakeholders' accounts to construct a picture of how women began their illicit drug use, the next milestone to consider is transition. The primary question here is: why do women transition from smoking, sniffing or snorting to injecting drugs such as heroin? All the women who participated in this study had indeed gone through this transition, and the primary quest here was to identify reasons why they had transitioned.

Before describing these reasons, however, three points are worth highlighting. First is that stakeholders viewed the transition from other modes of drug use to injecting as an important milestone. It was repeatedly said that after starting to use 'soft' substances, women "*graduate to the hard stuff, and lastly they graduate to injecting*" (**Stakeholder # 1, outreach worker, Mombasa**).

The second point is that in contrast to this stakeholder's depiction, the transition to injecting was not always homogenised, abrupt or terminal. Instead, injecting and non-injecting drug use often overlapped. For example, one participant who had used drugs for 15 years stated: "*I started smoking, and as the time went by, I started injecting myself; so I use both methods*" (**Participant #8, aged 30 years, Kilifi**). Another woman who had used drugs for 12 years stated that "*I inject, and when tired of injecting I snort/sniff*" (**Participant #9, aged 36 years, Kilifi**). However, all the women self-identified as injectors (and injecting as their *main* method of drug use), even though some smoked or snorted on occasion.

The third point is that there were limited data illuminating transition decisions due to the limited focus on transition in the primary study. Because participants were asked to describe how they started to use drugs generally, it was not always possible to isolate the transition to injecting itself. Nonetheless, three key influences emerged, as described below.

First, keeping the company of injectors influenced at least six women to accept and adopt injecting practices. In an illustrative quote, one said that:

I had started smoking a little bit, I continued smoking for some time, then I got into the company of those who injected themselves. I stopped

smoking and started injecting myself (**Participant #7, aged 32 years, Kilifi**).

As women continued to snort or smoke heroin, the need to maintain a certain level of pleasurable effect prompted transition to injecting. In one participant, the diminishing reaction to smoked or snorted heroin (due to tolerance) prompted transition:

I smoked, but at times I didn't feel [any effects], so I had to find the one for injecting (**Participant #8, aged 30 years, Kilifi**).

Similar to the intersecting nature of influences operating at the beginning of injecting careers, tolerance intersected with economic factors to bring about women's transition. Given the limited sources of income that women had, acquiring drugs was economically challenging for most. In the words of one, *"getting drugs is hard; sometimes you can even stay for a whole day before finding more money for injecting"* (**Participant #8, aged 30 years, Kilifi**).

Due to tolerance, the effects of smoked heroin wore out quickly necessitating frequent consumption. Given the perceived longer-lasting effects of injected heroin, it is unsurprising that transitioning was seen as an economic imperative:

You find it is better to inject to avoid using a lot of money when smoking. You can use more money smoking than injecting. Injecting is good because you can inject yourself twice, and then stay until evening
(Participant #8, aged 30 years, Kilifi).

Driven by both economic costs and tolerance, injecting initially occurred intermittently and reluctantly, until women finally found themselves predominantly doing so:

So you start injecting yourself slowly like that. I did that until in the end I used injection **(Participant #8, aged 30 years, Kilifi).**

In sum, while transition was often gradual rather than abrupt or terminal, peer norms, tolerance and economic imperatives operated in concert to facilitate it.

6.4 The road to long-term addiction.

Having transitioned, a variety of factors influenced participants' journey to chronic and addicted drug-injecting. Indeed, all of the women saw themselves as addicts and typically described themselves as such:

I am a drug user, and a drug user who is addicted (**Participant #7, aged 24 years, Mombasa**).

Women's self-perception as addicts was accentuated when they contrasted their initial enjoyment of drugs with their current entrapment. For instance, a participant (mentioned previously) who got into drugs after unexpectedly falling pregnant contrasted her initial motives with the addiction that had eventually materialised:

I saw it as a way of removing stress and forgetting about that man at that time, but I was getting [hooked] into drugs (**Participant #11, 26 years old, Kilifi**).

The initial enjoyment of drugs typically morphed into an addiction, and women's need for drugs soon "*becomes a problem: they need it, they buy it. They start craving for the drug...they have to use every day, and that...is very hard to deal with*" (**Stakeholder # 1, outreach worker, Mombasa**). This addiction was reinforced by tolerance, such that "*consumption goes on and on, goes up and up, goes high and high. Not how it started. So after some time, it is a dependency*" (**Stakeholder # 1, outreach worker, Mombasa**). Although addicted injection was universal across the sample, different influences acted to sustain it, as described forthwith.

6.4.1 Drug use as a cure.

A prominent theme related to chronic drug use was improving physical functioning. Women viewed chronic injecting as a necessity, failing which they would be physically “sick” (**Participant, FGD # 1, Mombasa**). This physical sickness was due to withdrawal, locally termed ‘arosto’, and was described as “*pain within the body*” (**Participant #11, aged 26 years, Kilifi**). Claiming that “*addiction is also like a disease*” (**Participant #1, aged 26 years, Mombasa**), many participants described how ‘arosto’ necessitated injecting in order to get rid of withdrawal symptoms, thereby rendering them unable to stop drug use:

If you try leaving or stopping drugs, you diarrhoea a lot, thus forcing us to turn back to drugs (**Participant, FGD # 2, Mombasa**).

Apart from this participant, a considerable number of other women asserted that in the face of ‘arosto’ their ongoing drug use was involuntary: injecting was a “*must*”, “*so as to feel that you are normal like other human beings*” (**Participant, FGD # 1, Mombasa**). Another explained that one has to “*snort or inject in the morning in order to feel alive*” (**Participant #10, aged 21 years, Mombasa**). Indeed, participants described their drug use almost like a therapeutic ritual that ‘cured’ them of withdrawal symptoms, with one asserting that: “*If I fail to inject [drugs], I get arosto [withdrawal]. I then have to inject in-*

order to heal. That is why we say, "Drunk in the morning" (Participant #10, aged 21 years, Mombasa). Like many others, this participant recognised her addiction, but had abandoned hope of overcoming it, lamenting that *"It is an awful life but what can we do?"* (Participant #10, aged 21 years, Mombasa).

Yet, improving physical functionality went somewhat further than just keeping withdrawals away: women injected drugs to enable them to carry out manual jobs as they needed income to sustain their drug use. One FGD participant emphasised that users needed to inject *"so that you get the energy to go and look for a casual job"* (Participant FGD#1, Mombasa). The immediate yet temporary effects of drugs on participants' psyche were also desired by three IDI participants who claimed that injecting drugs improved their work performance. Asked how she financed her drug use, one of them illustrated how she relied on drugs to boost her energy in order to perform manual labour:

I pick cashew nuts then I sell them and get that money. Sometimes I go to the farms and I am given a field to clear up. I ask for a small upfront payment so that I may come and take drugs and get the energy to carry out the work (Participant #9, aged 36 years, Kilifi).

As may be noted from this excerpt, injecting drugs to aid manual labour was compounded by the fact that these manual jobs were the source of income to cater for further drug purchases.

6.4.2 Stigma and exclusivity of drug users' relations.

As women continued to inject drugs, their identity as addicts caused them to gradually gravitate towards, and form friendships with, other female injectors:

You know when you start using illicit drugs, obviously people who do not use will refuse to associate with you. No one accepts to walk with you when you are a drug addict. You will have to associate with your fellow drug users (**Participant #7, aged 24 years, Mombasa**).

Thus, women's friendships were predicated on drug-using status, such that "*if you are using drugs you can't have a friend who doesn't use*" (**Participant #8, aged 30 years, Kilifi**). Women blamed stigmatisation of the 'teja' identity for their isolation and rejection by non-drug users. Asked if she had friends who did not use drugs, one participant responded:

It is difficult, it's difficult, it's difficult. These people cannot agree to be with someone who is snorting or injecting. They think a teja [drug user]

is a bad person. It is easier to get along with a colleague who uses drugs, with whom you can engage in a very long conversation. In short, I don't have friendships with someone who is not a drug user (**Participant #9, aged 36 years, Kilifi**).

Participants formed strong social bonds with each other, probably as a result of feeling excluded and stigmatised by the mainstream society. This closed-group socialisation created a supportive environment, but at the same time contributed to sustained drug-injecting practices through implicit peer influences. For instance, drug-using peers were frequently a source of short-term drugs for participants who had run out of money to purchase drugs. One asserted that *"if your peer doesn't have enough money, you cannot smoke alone...you smoke with the other person"* (**Participant FGD #1, Kilifi**). This reinforcement was particularly influential considering the boredom and limited socialisation options that women had. Consequently, they gravitated together, created subtle peer influences and norms that, in the long-term, sustained their injecting behaviour.

6.4.3 Intimate partners, gender norms and economic power.

Apart from the exclusivity of women's social relations, gender relations in the context of intimate partnerships were a prominent determinant of ongoing drug-

injecting. Intimate partners wielded significant influence, and were by far the most commonly encountered source of influence relating to women's chronic drug use. However, women tended to have two distinct perspectives regarding the influence of their intimate partners. For the majority, intimate partners sustained women's injecting, while for a few others, they moderated it.

Responding to a question regarding the role of intimate partners in their drug use one FGD participant stated that "*he takes care of your smoking*" (**Participant FGD #1, Kilifi**). This participant's response alluded to both the practical and economic roles that most intimate partners played in acquiring drugs for their women. Another woman recounted how her husband economically supported her injecting, stating that "*he normally gives me two hundred [shillings daily for drugs]*" (**Participant #4, aged 32 years, Kilifi**).

It was common to find that intimate partners were peddlers who supplied drugs in their local neighbourhoods, and as such, they also supplied the women:

My husband at times sells so you know I can't miss...I get it from there
(**Participant #8, aged 30 years, Kilifi**).

Having a partner who could provide drugs was seen as an asset in a context where getting drugs was said to be "*hard*" (**Participant #8, aged 30 years,**

Kilifi), and peddling was predominated by men. Among the 45 participants, only three were themselves peddlers.

Although intimate partners were expected to 'hustle' for drugs, several participants described situations in which their men depended on them to find drugs. Given that a third of the women had drug-using partners, it is not surprising that couples assisted each other to acquire drugs, and in the process, reinforced injecting behaviour:

There are times he doesn't have. When he lacks totally, I usually to go to search, and he too goes to search (**Participant #11, 26 years old, Kilifi**).

Although having stable intimate partners who were either injecting, smoking or snorting drugs was the scenario among 13 women, in several cases, intimate partners were non-drug users who provided drugs to women in transactional exchange for sex. In one unusual and unethical case, a woman was involved in a transactional sexual relationship with an outreach worker. This participant remarked that:

He [outreach worker] was ready to buy for me drugs and have sex with me. He would even buy me heroin. Imagine! (**Participant #10, aged 21 years, Mombasa**).

Economic power primarily drove the influence that intimate partners had on women's injecting. Yet the influence of intimate partners was a constant challenge to harm reduction programmes, whose intent was to extricate the women from injecting drug use. A manager at a CBO lamented that "*it is difficult for us to talk to them about not associating themselves with peddlers or spouses that use drugs*" (**Stakeholder # 3, Programme Manager, Kilifi**).

Despite observations that some intimate partners reinforced injecting drug use among women, it was clear that others were opposed to women's injecting. Seven women reported that their intimate partners tried to prevent their drug-injecting. Almost with no exception, these women were discordant with their intimate partners in terms of drug-injecting. Men who were dissuading women from injecting were either non-drug users, or were using drugs by smoking or snorting, but not via injecting, as exemplified by the following participant:

He doesn't use. He knows that I use, but he has sat me down and asked me to try and reduce (**Participant # 4, aged 32 years, Kilifi**).

Narratives from four women suggested that men who smoked or snorted heroin primarily intended to stop them from injecting, rather than to quit drug use altogether. These intimate partners disapproved of injecting because of its distinctive adverse effects:

Sometimes we differ because injecting is dangerous: while injecting, you might miss a vein, and swell. So you end up having many spots and swellings every time. It makes him angry; he does not find pleasure in that (**Participant #9, aged 36 years, Kilifi**).

Non-drug-using partners were particularly intent on getting their spouses to quit altogether. For example, a participant described how her non-drug-using partner had financed her rehabilitation sessions after conceiving:

He had tried to help me by all means, he even brought me to this rehab and enrolled me for seven days. He was determined not to desert me...but I just continued with the drugs. He told me he doesn't want it but I could not stay without using, so we had to call it quits. We separated when I was still pregnant (**Participant #12, aged 23 years, Kilifi**).

As noted above, efforts to dissuade women from injecting often failed, leading to relationship breakdown. In several cases, women were unable to stop injecting and often opted to inject in secret to sustain their relationships:

I usually pretend. I hide and pretend that I am smoking so that he doesn't know that I have injected myself (**Participant #8, aged 30 years, Kilifi**).

Nevertheless, discordancy concerning drug use frequently caused "*conflict*" (**Participant # 4, aged 32 years, Kilifi**) or "*misunderstanding*" (**Participant # 8, aged 30 years, Kilifi**) among couples. Despite these conflicts however, none of these women suggested that these influences from their men had been unpleasant. Most appreciated their partners' efforts and blamed themselves for failing to reduce or abstain from drugs, as exemplified by one woman (mentioned earlier) who remarked that "*he has tried advising me to stop, but it is difficult*" (**Participant #9, aged 36 years, Kilifi**).

6.4.4 Persistent drug-using social environments.

With time, many addicted women desired to leave drug use. However, several factors worked in concert to sustain their drug use through the creation of what may be termed as 'drug-using social environments'.

To start with, free rehabilitation services were insufficient. Rehabilitation was seen as an avenue for managing addiction, with participants typically claiming that *“unless I am taken from here to a rehabilitation centre, it is difficult to stop”* **(Participant #9, aged 36 years, Kilifi)**. Yet, among ten women and two stakeholders, there was a sense that the lack of rehabilitation services facilitated ongoing drug use. At the time of the study, there was one public rehabilitation centre (which offered methadone) at the provincial hospital with a bed capacity of less than 20, and a few private facilities. In explaining the lack of these services, a stakeholder mentioned that *“issues of drug use have not been prioritised”* **(Stakeholder # 3, Programme Manager, Kilifi)**. Another stated that *“women... have a right to be looked after, but as you know, drug users have been neglected for long, and addiction has now become a big issue”* **(Stakeholder # 1, outreach worker, Mombasa)**.

Findings suggested that this neglect was due to a negative perception of drug use in general, which particularly affected women. It was widely believed that *“it is a shame for a woman to be a drug user”* **(Stakeholder # 3, Programme Manager, Kilifi)**. Yet, while participants could not afford private facilities, enrolment at the public facility was depicted as difficult due to limited bed capacity. In an atypical desperate plea, an FGD participant asked the interviewer to *“help us to go to rehab”* promising that if taken, she *“will come*

out of there having left drugs and ready to look after my children” (Participant FGD # 1, Kilifi).

The lack of drug treatment services was claimed to affect women particularly, which suggested gender inequity, even within CBOs:

We don’t have a rehabilitation strategy for females who use drugs and those who are injecting. Like us REACHOUT, we don’t have a specific drug treatment centre for women; ours is specifically for men **(Stakeholder # 1, outreach worker, Mombasa).**

This stakeholder stated that they *“refer women to our partners like MEWA. They have a centre for women which is also not offering a complete rehabilitation package for women” (Stakeholder # 1, outreach worker, Mombasa).*

Despite assertions that residential rehabilitation was what women needed, even where drug treatment was available, relapse commonly occurred due to a combination of factors that included interpersonal influences, joblessness and personal difficulties. A Ministry of Health official blamed contact with peers for instigating relapses:

You are rehabilitating this person, then again, she meets with the same, same people that she was using the drugs with; relapsing is very easy **(Stakeholder # 2, Ministry of Health Official, Mombasa).**

While in rehabilitation, women maintained contact with, and affection for, their drug-using intimate partners, which facilitated their return to drug use. Because services were not routinely offered to couples, intimate partners were a constant challenge to CBOs that were providing short-term shelter to women:

When we house them at the temporary shelter and we do not host their spouses, it is a challenge for us because their spouses normally come saying that they want to see or to talk with the women. That bonding again makes them go back to risky behaviours **(Stakeholder # 3, Programme Manager, Kilifi).**

Additionally, peer norms were blamed by several women who, despite their intentions to quit, were frequently enticed by former peers to “*return to the same place again*” **(Participant, FGD #1, Mombasa).** Participants asserted, however, that this would mainly occur if one were jobless or idle, claiming that: “*if you are selling your wares, you won’t leave your work to follow them. But if you don’t have work, my goodness, you follow each other to the same place again*” **(Participant, FGD #1, Mombasa).**

These findings suggested that cues for injecting drug use were present in the environment in the form of acquaintances and familiar surroundings. Unsurprisingly, one participant emphasised that *“it will be good to go to rehab, but not a rehab which is nearby”* (**Participant #9, aged 36 years, Kilifi**). She continued that *“for me, I would like one that is far because of temptation. If it is nearby, someone from here will sympathise with you when you are suffering from arosto [withdrawal]. Someone will get it for you secretly; that happens a lot too”* (**Participant #6, aged 26 years, Kilifi**). As one stakeholder asserted, *“drugs are readily available, especially here in Mombasa”* (**Stakeholder # 2, Ministry of Health Official, Mombasa**). Indeed, due to the ubiquity of drugs relatives and empathetic friends had acquired drugs for two women when they were having withdrawals in hospitals or prisons:

When I gave birth, I had arosto [withdrawal]. Because she understood me, she would hide and bring me some through the [hospital] window
(Participant #10, aged 21 years, Mombasa).

Hence, women’s immediate social relationships and environments played a role in relapses and undermined the potential impact of harm reduction. Different influences intersected to create and sustain what might be termed ‘a drug-using social environment’. For instance, curiosity, peer influences, drug-

using intimate partner, and joblessness tended to occur together, in an environment where drug supply was already high. These factors often reinforced each other, and together increased the possibility that women would come into contact with drugs, enter into drug use, transition to injecting, and once they got hooked, sustain their drug injecting behaviour.

Participants were aware that they would not sustainably remain drug-free if they remained in these environments. The interplay of these influences fostered a philosophy of fate and hopelessness among some. Many described their plight by using surrendered phrases such as: “*but what can we do?*” (**Participant #10, aged 21 years, Mombasa**) or “*what kind of life is this that I am living?*” (**Participant #1, aged 33 years, Kilifi**). Others were “*tired with this life*” (**Participant FGD #1, Kilifi**). Another found it paradoxical that even her education did not prevent her from an undesired ‘end’ of being an addict:

If it’s studying, I have studied, but this is my end (**Participant #1, aged 33 years, Kilifi**).

As might be noted above, participants had resigned themselves to a perception of reality in which their addiction was inescapable, and had to be accepted as part of everyday life. At the same time, they resented it and suggested that harm reduction programmes and society as a whole presented a double

standard of requiring them to stop using drugs, even though their situation (for example joblessness or lack of rehabilitation) precluded them from successfully quitting drugs. To some of these women, it was paradoxical that society expected them to abstain yet did not offer them practical assistance to be rehabilitated:

I would love to leave drugs, but the method of leaving is difficult. Others come and tell us to leave yet they don't give us a way of leaving drugs
(Participant FGD # 2, Mombasa).

The degree to which women perceived these 'pro-drug use' environments to be operating varied from participant to participant. Nevertheless, it was clear that some considered residential drug treatment insufficient to halt their drug use. While acknowledging the need for rehabilitation, one older woman mentioned that *"unless I am taken from here to a rehabilitation centre in town, it would be difficult to stop. Nonetheless, even if it were so, it would still be difficult to stop"*
(Participant #9, aged 36 years, Kilifi).

Being aware of their environment, several women sought to shield their children from it. A participant who had two children and whose husband had died, mentioned that she *"wouldn't want my children to get into drugs. My children are in a children's home. I wouldn't want them to be in an environment like this"*

(Participant #1, aged 33 years, Kilifi). Indeed, it was claimed that many children were “*being raised in an unfavourable environment*” (**Stakeholder # 1, Outreach Worker, Mombasa**). Drugs had permeated into every family, such that “*each and every family that lives here in Mombasa has a drug use problem*” (**Stakeholder #1, Outreach worker, Mombasa**). Despite being generally stigmatised, drug use had started to become an accepted phenomenon in some neighbourhoods:

We are surrounded by people who have been taking these drugs for years. Drug use is considered a culture in some of our neighbourhoods, like here in Mombasa (**Stakeholder #1, Outreach worker, Mombasa**).

Unsurprisingly, these environments prevented abstinence by thwarting rehabilitation efforts. A programme manager at a CBO expressed his frustration:

At the end of the day, they will go back to the same environment, if we don't provide for them with programme [interventions]. The sustainable solution is that they work ...as an alternative for sex work...from this work they can have a source of income where they can shelter their children and themselves (**Stakeholder # 3, Programme Manager, Kilifi**).

Given the perceived negative impact of these environments on children, a stakeholder suggested that services “*should have a strategy to address issues of both the mom and the child...because [women] have nowhere to live, except in the streets*” (**Stakeholder # 1, Outreach Worker, Mombasa**). The contexts of women who injected drugs with children intersected with a cultural prescription of maternal responsibility to raise children, despite their economic disadvantage in a patriarchal society. Thus, a convergence of multiple factors created a thriving ‘drug-using social environment’ which had far reaching ramifications (**Figure 5**).

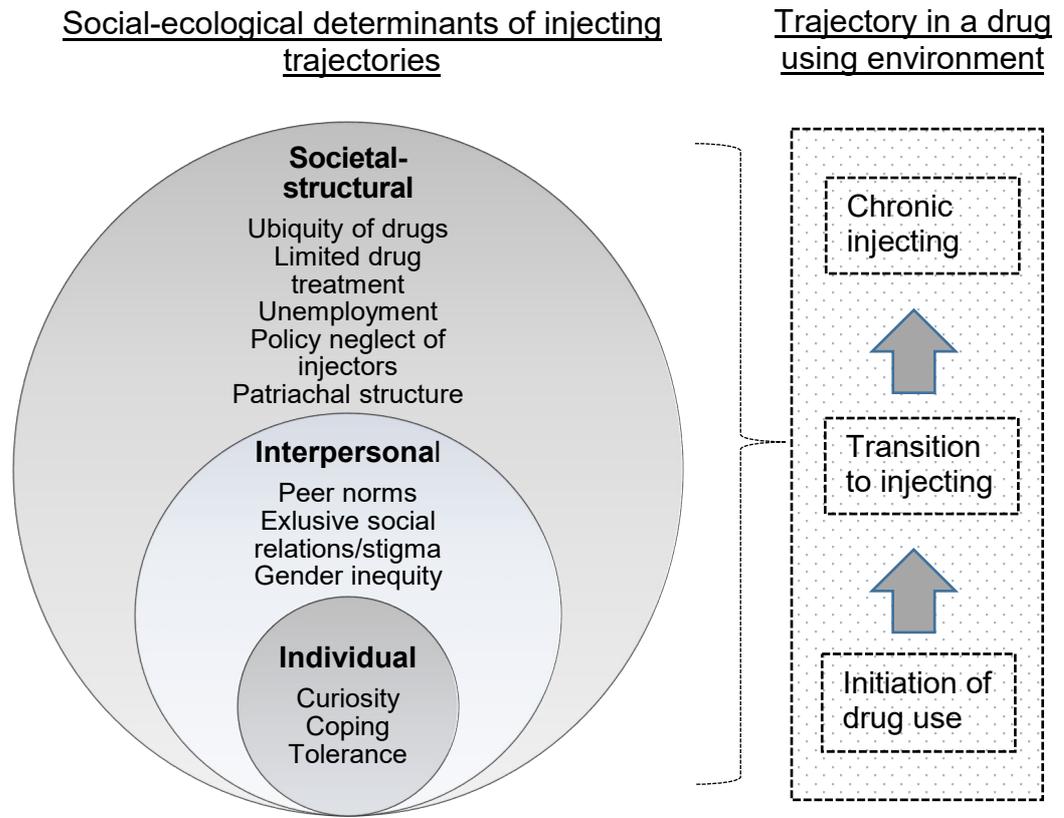


Figure 5. Influences of drug use trajectories in a drug using environment.

6.5 Summary.

Guided by the social ecology theory and thematic analysis, four important findings emerged. First is that trajectories of drug use among participants were maintained not by a single factor, but by a complex set of interacting influences and motivations, ranging from individual, interpersonal and societal-structural factors. Multiple influences such as tolerance, withdrawals, peers, availability

of drugs, unemployment/economics were in operation throughout the trajectory. These influences intersected and converged to form a complex sociological milieu of 'drug-using environments' that facilitated entry, transition and long-term drug use (**Figure 5**). Secondly, while most factors enabled progression along the trajectory, older drug-using women and intimate partners were an important source of both negative and positive influence of women's injecting drug use. Third, while both older and younger women were affected by unplanned pregnancies, this influence seemed more common among younger unmarried women. The next chapter describes HIV risks among the sample.

7 FINDINGS III: HIV RISKS.

7.1 Introduction.

This chapter responds to the third research question, that is, 'What HIV risks are encountered by women in the course of their injecting drug use, and how do these come about?' By identifying risks among the sample, the chapter achieves two objectives. First, it identifies HIV risk among women who were not already infected and living with HIV, providing insights about how they could acquire it in the future. The second is that it identifies risky behaviours among participants who were already living with HIV, illuminating how they might have acquired it, or could potentially transmit it to others in the future. As noted in **Table 7**, a fifth (22%) of the women were infected with HIV.

While identifying HIV risks was central to this enquiry, a critical part of the analysis was also to locate and contextualise the underlying drivers of risky behaviours. If specific influences drive these behaviours, then locating and mitigating such influences is central to HIV prevention. In keeping with the social ecology theory, identified influences were mapped onto individual, interpersonal, or societal-structural domains. **Sections 7.2 to 7.4** present these influences. The chapter then concludes in **section 7.5** with an emphasis on the concurrent and intersecting nature of these influences.

7.2 Individual-level influences of risky behaviours.

7.2.1 Skewed risk perception, gender norms, and trust.

Throughout the IDIs and FGDs, participants reported that they received education on HIV and drug use. They stated that outreach workers “*educate us*” regarding “*infections*” (**Participant # 7, aged 24, Mombasa**) and “*how to stop drug addiction*” (**Participant # 11, aged 26, Kilifi**). Indeed, 82% of the women had been reached by outreach workers (**Appendix 1**) and were aware that sharing needles presented a risk to HIV that was to be avoided. Some seemed defensive at the question of whether they shared needles, especially during IDIs, with one participant claiming that “*everybody uses their own needle*” (**Participant #4, aged 32 years, Kilifi**).

In contrast to the one-to-one IDIs however, data from FGDs revealed that sharing of needles was common. While IDI participants were keen to show that they did not share needles with others, which could be due to social desirability bias, FGD participants openly acknowledged that needles were frequently “*going around*” or “*travelling*” from person-to-person (**Participant, FGD #2, Mombasa**). Although participants were more emboldened to acknowledge the presence of needle-sharing in a group context, some sought to suggest that it was other women who practised it, and not themselves, further pointing to

potential social desirability bias in their responses. For example, one asserted that *“there are others who, if it is night and she gets a used needle on the road, and she is injecting, she would re-use it”* (Participant, FGD #2, Mombasa). Despite this kind of self-distancing, participants affirmed that sharing of needles was happening *“currently”* (Participant, FGD #2, Mombasa), and linked it to HIV infection among injectors:

You find that one needle travels among approximately seven people.

This issue is contributing a lot to HIV (Participant, FGD #2, Mombasa).

The central issue then is that, despite understanding the dangers of sharing needles and syringes, there was a disconnect between women’s knowledge and their needle-sharing behaviour, regardless of whether they attempted to conceal it or not. Exploration of participants’ accounts suggested that sharing of needles was due to a low perception of risk. In an illustrative example, one woman stated that participants *“think that the other person does not have the [HIV] virus; you say the needle is from your fellow, and that is why you see these issues of many infections coming in”* (Participant, FGD #2, Mombasa).

Apart from driving needle-sharing with peers, low perception of risk also occurred in the context of intimate partnerships, leading to unprotected sex among women who were married or in stable relationships. Due to low risk

perception, six women had participated in sexual activities with their husbands or stable partners that compromised their protection from HIV. All except one of these women's partners were injectors. As shown in **Table 7**, a tenth (11%) of the sample had stable partners who were injectors. Furthermore, roughly half of the women who never or inconsistently used condoms were married or cohabiting. Despite their partners being at high risk of HIV infection on account of drug-injecting, women were not deterred from having unprotected sex with them, as illustrated in the following exchange:

Q: When was the last time you had intercourse when high on drugs?

R: Last week.

Q: Explain to me how it was.

R: I was with my boyfriend, we just had it as usual, and we get intimate without a condom as I have no worries at all.

Q: Is your boyfriend also a drug addict?

R: Yes

Q: How does he use drugs?

R: He injects himself (**Participant #10, aged 30, Kilifi**).

As may be deduced from above, both unprotected sex and drug use during sex routinely occurred with partners. Other women's accounts suggested that low-risk perception intertwined with women's trust of their sexual partners. When

asked how long ago she had used heroin during sex, another participant who had reported that she never used condoms responded, “*yesterday but one, when I was with my husband, the man whom I can trust*” (**Participant #9, aged 36 years, Kilifi**).

While trust played a role, the extent to which sexual behaviours were under the full control by women was not always clear-cut. Women could have chosen not to trust their partners as much, and thereby control their exposure to infections from their partners. However, data suggested that these women were, at least to some extent, exposing themselves to HIV to fulfil perceived ideals of a good sexual relationship with their men, whom they *ought to trust*. Seven women felt compelled to take drugs to facilitate sex with intimate partners, often in the face of low libido or even discord:

Maybe you have differed, and for a long time you are not in the mood. You don't have the feelings. So you see, your partner forces you to use. He tells me “hold these two, one for you to inject and the other I will inject, then we will [have sex]” (**Participant #10, aged 21 years, Mombasa**).

As might be noted above, there was an implicit and opposing interplay between women's cognition and their behaviours with their partners. For example, the

above participant implied that she would not take drugs during sex, except to fulfil an expected sexual role, which also meant that condoms were not used, as this was the case among most married or cohabiting women. Referring to her husband, another participant stated that “*whenever he comes home he brings some [drugs] along for me. I have to take drugs for me to feel pleasure. Without drugs, it is like you are forcing me*” (Participant #9, aged 36 years, Kilifi).

In this context, risks were knowingly taken by women as they sought to fulfil what was expected of them, exemplifying how an inequitable cathexis and gender structure dictated they meet sexual obligations to their men. Indeed, stakeholders saw intimate partners as a powerful external influence on women, suggesting that women were relatively un-empowered to control their risk exposures. For instance, “*bonding with spouses*” was blamed for making women “*go back to risky behaviours*” (Stakeholder # 3, Programme Manager, Kilifi). Hence, inequitable gender norms, risk perception, and trust intersected to expose these women to HIV.

7.3 Interpersonal influences of injecting and sexual behaviours.

7.3.1 Perils of transactional relationships and sex work.

In contrast to the perceived low risk of infection among married or stable partners, women who engaged in transactional sexual relationships, whereby sex was exchanged for resources, recognised that they were at high risk of infections. In the sample, 18% of the women were married, whereas larger proportions were either single (53%) or cohabiting (27%). Because single or cohabiting women tended to be in transactional sexual relationships, transactional sex was more prevalent despite being perceived as risky.

These women commonly exchanged sex for drugs, protection and accommodation. Explaining how this typically occurred, a participant explained that *“there are young men who usually sell. Sometimes you have lacked [drugs], and he sees you. He will tell you: ‘have sex with me then I will give you a sachet. You can have one or two sachets, as long as you make me happy’.* So you have to accept” (Participant #8, aged 26 years, Mombasa). Stakeholders also reported a large number of women were involved in transactional relationships with peddlers:

To sustain the addiction behaviour, they have to make friendly relationships with peddlers if they are going to get free drugs. Free in quotes. They have to give their bodies to the peddlers for them to get drugs **(Stakeholder #3, Programme Manager, Kilifi)**.

It was expected that *“when you have a relationship with someone like that, and he sells, he provides you with drugs so that you can make him happy [sexually]”*. **(Participant #8, aged 26 years, Mombasa)**. Besides drugs, this participant, who was herself in a transactional relationship with a peddler claimed that she also gained social capital in exchange for sex. Explaining that peddlers were well connected socially, she explained that *“in other ways, he protects me from the bad things that happen at the drug dens. He will be the first person to be informed if the police are arresting people. He tells me to leave, or we leave together. He cannot leave me to be arrested, you see!”* **(Participant #8, aged 26 years, Mombasa)**.

However, women who engaged in transactional sex were highly vulnerable to their sexual partners, often getting exploited or even raped by them, as illustrated in the following excerpt:

There is a guy who used to accommodate me because I could not afford to pay for a house. He used to force me to have sex with him, it's like he

used to rape me...as in, I didn't like it. However, because it was rent, it was like a type of rent, it was compulsory for me to give it by way of sex. So I had to accept **(Participant #1, aged 33 years, Kilifi)**.

Women who were engaged in transactional sexual relationships for drugs or accommodation tended to be in serial casual relationships. However, transactional relationships involving multiple sexual partners was the norm among 13 women, comprising 29% of the sample, who were engaged in sex work. Multiple sex partners, which is a known risk factor for HIV, were so prevalent that women could have sex with more than ten men in a day. Emphasising the turnover of their sexual partners, one sex worker stated that *"regarding men, we exchange with them like clothes"* **(Participant, FGD#1, Mombasa)**. Others illustrated the multiplicity of their sex partners by stating that *"I roam about"* **(Participant #12, aged 21 years, Mombasa)**, *"I move here and there"* or *"I move like a bird"* **(Participant #3, aged 26 years, Mombasa)**.

While the multiplicity of sex partners is a concern in terms of HIV exposure, four women described specific situations that exposed them to potential infections, such as accidental condom breakage, as illustrated below:

To tell the truth, whenever I have no money to buy drugs, I go and sell my body. At times I go for prostitution and accidents happen, like a time

when the condom burst. In another incident, I had a client, but I realised that I didn't have a condom, but because I needed the money, I performed a blowjob without a condom (**Participant #10, aged 30 years, Kilifi**).

7.3.2 Drug use during sex work.

Additionally, risky sex practices were exacerbated by concurrent injecting of drug use during sex work. Having sex while high on drugs - colloquially referred to as 'being steam', was considered essential by a large number of women, involved in sex work. Injecting drugs during sex work enabled them to bear the shame of engaging in sex work:

I usually have sex when I am steam. It is very hard for me to have sex when I am sober because when I do sex work, I am in business, it is not something that I wish to do. So I have to use drugs and be steam so that I am not shy when I do sex work (**Participant #8, aged 26 years, Mombasa**).

Because women did not always have money to purchase drugs, it was common for them to ask prospective clients to buy drugs for them before sex, which

further entwined risks associated with drug injecting and sex work, while weakening their bargaining power:

If a man wants to have sex with me and at that time I have not injected, then I tell him “I cannot go with you because I have not injected yet”. He then he takes me to get drugs, but I am obliged to have sex with him. We use the drugs together, and then he uses me later (**Participant #10, aged 30 years, Kilifi**).

7.3.3 Intersections of sex work, violence, and power.

As can be deduced from the above quote, women often felt disempowered and commoditised, especially because they were less able to negotiate for condom use during sex when intoxicated. As noted in **Table 7**, a third (29%) of participants reported having been sexually harassed or assaulted, and almost all of these were involved in sex work. Accounts from six of these women suggested that rape and being cajoled to have unprotected sex was the norm rather than the exception during sex work. Describing an account of the last time she had sex while high on drugs, one participant who was a sex worker narrated that:

I had injected myself such that I didn't know myself. The following morning is when I found out that I had been raped. Do you understand? I realised that I didn't have clothes, I couldn't do anything, I couldn't even walk, I was bleeding. Afterwards, outreach workers from REACHOUT came to pick me and took me to the hospital. By good luck, I was tested for HIV and found that I didn't have it **(Participant #12, aged 21 years, Mombasa)**.

Sexual assaults were often preceded by demands to have condom-less sex, as illustrated by the following quote from a participant who reported using drugs during sex work:

The work we do... we are at high risk. Sometimes you go with someone, and he is rough, or wants to use you and doesn't want to pay you. If you resist, you are beaten. He tells you 'I want to have sex without a condom.' If you refuse, he will bring chaos **(Participant #7, aged 24 years, Mombasa)**.

Similar instances were described by two other participants whereby injecting drugs during sex work was followed by both sexual and physical violence, having been physically overpowered by men. Almost half (48%) of the participants reported having been exposed to physical and other forms of

violence, which almost always occurred when women did not yield to clients' demands.

As might be noted in the preceding quotes, women who were sex workers were cognisant of the risks associated with their profession, including the risk of HIV. It was clear that most of these women preferred to use condoms with their clients, with one insisting that "*they pay me for sex but using a condom*" (**Participant #11, aged 26 years, Kilifi**). Another stated:

Yes, sex work is my job, but even if it is my job, I always protect myself so much. I usually have sex with someone using a condom; if there is no condom, I don't have sex (**Participant #12, aged 21 years, Mombasa**).

Yet these women's accounts suggested that, despite being aware of risks, they were often precluded from practising safe sex. One participant explained how she would insert male condoms into her vagina in an attempt to minimise risks, having little power to ensure that clients use condoms:

They insist that they don't want to use condoms, so at times I agree because of arosto [withdrawal], but I take the male condom, tear it and insert it into my vaginal tract, so that when he ejaculates inside, the

sperms do not penetrate through and bring infections. I don't know if this helps or not? **(Participant #10, aged 30, Kilifi).**

7.4 Societal-structural influences of risky behaviours.

7.4.1 Economic influences of risky behaviours.

Despite assertions that sex workers were keen to protect themselves from infections, regular condom-use did not always occur among them. Economic pressures forced many of them to compromise their condom use in exchange for more money. Explaining how this occurred, an FGD participant narrated as follows:

Another one tells you, 'I have one thousand shillings, but I don't want to use a condom, but if you want sex with a condom, I will give you two hundred shillings'. Now you are compelled: seeing that the one thousand is a lot, you are forced to do it without a condom **(Participant, FGD #1, Mombasa).**

Explorations of processes by which participants entered into sex work suggested that joblessness and poverty were central factors. Five women, both old and young, explicitly blamed unemployment for their entry into sex work. As

an illustrative example, one woman who was living with HIV stated that “sex work has been my main means of getting money to use” (**Participant #8, aged 26 years, Mombasa**). Similar comments were obtained from those who were not living with HIV. One lamented that “[*Because*] I don’t have a job, I sleep with any man as long as he has money” (**Participant #2, aged 33 years, Kilifi**). Given her joblessness, another implied that sex work was inescapable, stating that “*It behoves to engage in sex work*” (**Participant #11, aged 30 years, Mombasa**). Another was emphatic about the inevitability of sex work:

It is a must. As a person who injects drugs, and I don’t have a job, I have to do that kind of work in order to get money for drugs. I am a person without work, and I sleep with all [kinds of] men as long as they pay me (**Participant #1, aged 26 years, Mombasa**).

Reflecting on the economic exigencies of drug-injecting, women rued the fact that sex work exposed them to HIV, yet it was almost inescapable. For example, one participant described “*sucking in blowjob*”, “*having sperms in my mouth*” “*condoms bursting*” and other forms of accidents, but she quickly added that “*I didn’t mind if there are any risks because I was in need of the money for buying drugs*” (**Participant #10, aged 30 years, Kilifi**). Others in FGDs rued their involvement in unwanted sex practices such as anal sex, yet they felt forced by

economic circumstances to engage in it, often without condoms. Agreeing with other FGD participants, one woman narrated how her clients would often demand unprotected anal sex stating “*I don’t want in front, I want behind’. In other words, he forces you, but you want that money, so you are forced to close your eyes*” **(Participant, FGD#1, Mombasa).**

Although outreach workers distributed free condoms, there were numerous cases whereby women had run out of them and engaged in unprotected sex as they lacked money to purchase condoms. Here, economics indirectly barred women from using condoms. This was particularly problematic for women who wanted to use condoms during sex work, and were HIV positive, as was the case with the following participant:

There are times we lack free condoms, and you are forced to buy, but at times it is hard: you have come onto the street, and you don’t even have 10 shillings to buy one. That is where the problem comes in **(Participant #8, aged 26 years, Mombasa).**

7.4.2 Inequitable gender expectations and vulnerabilities.

Paradoxically, women were expected to, and often took upon themselves the onus of ensuring that a condom was available during sex work, perhaps

because they were aware of the risks involved. Given their economic situation however, they were frequently unable to avail condoms themselves. Despite their male clients being able to afford condoms, they generally preferred condom-less sex, and regularly took advantage of women's lack, as explained by a participant (also cited above) who was living with HIV:

He will take that opportunity and say "it is not my fault that you don't have it, so let's proceed" (**Participant #8, aged 26 years, Kilifi**).

This situation created conditions for clients to acquire HIV from infected sex workers. More broadly however, differential gender responsibilities and expectations related to use of condoms placed women who were not infected with HIV at high risk of acquiring it when they could not avail condoms.

Underscoring the issue of gender vulnerability was an observation that most of the peddlers in the study context were male. Women were frequently exploited by male peddlers who were known to have multiple transactional sex partners and to use drugs too. Thus, the significance of the male predominance in peddling added a gender element to risks associated with transactional sex, since peddlers had the upper hand:

You can go to borrow drugs on credit, and they tell you 'what use is it to borrow? If you can sleep with me, I will give you even more. But because you have arosto [withdrawal] you are forced to do as he wishes **(Participant #10, aged 30 years, Kilifi).**

Just like other sex work clients, male peddlers frequently demanded that sex was condom-less. One participant who was HIV positive explained that *"normally at the drug injecting dens, where someone gives you drugs in exchange of sex, mostly we don't use condoms"* **(Participant #8, aged 26 years, Mombasa)**. A CBO programme manager noted that this convergence of addiction and the possibility that women could always engage in sex work increased their exposure to infections, noting that, *"women are vulnerable because of sex work and their need to use drugs"* **(Stakeholder #3, Programme Manager, Kilifi)**. Hence, although women seemed to benefit from their relationships with peddlers and transactional partners economically, this benefit was paradoxical in that it harmed them. In the words of this stakeholder, *"women see the peddlers and the spouses as their main backbone of support although in the real sense they are not"* **(Stakeholder #3, Programme Manager, Kilifi)**.

7.4.3 Intersecting gender, economic and health system influences.

While the emphasis here was on the women's economic needs, these influences occurred alongside others, including interpersonal influences. For instance, women reported that they were compelled to engage in sex work to support their own and their partners' drug use, especially in situations when men lacked drugs. Their partners frequently required them to "*go and hustle*" (**Participant #10, aged 30 years, Mombasa**). Similar to three others, this participant was cognisant of her partner's economic dependency on her, brought about her gender-related ability to engage in sex work, asserting that "*I am the one he is using as a means of survival*" (**Participant #10, aged 30 years, Mombasa**). Another participant who had been involved in transactional sex for accommodation (mentioned previously) narrated how her partner (who was a cocaine user) also required her to get drugs for him, in addition to sex in exchange for accommodation. Noting the paradoxical shift, she narrated that:

So it became I who was hustling. I could go to him for accommodation, but he did not have any means for getting drugs. He too stays and waits for me, it as if he were my child. So it's as if I am paying him through sex and by looking for what he will use for buying his cocaine. And it's been

a daily routine. I feel very annoyed, but I have no other choice
(Participant #1, aged 33 years, Kilifi).

Thus economic pressure, and a reluctance of male partners to cater for themselves and their spouses, intersected with gender vulnerability to enhance the risks that women were exposed to. Indeed, an outreach worker highlighted the confluence of these influences:

If a woman is into drugs, the risk is high, because they have double or multiple issues. They can do drugs, they can have a sexual partner who is a drug user, and at the same time, they might be involved in sex work with multiple other sex clients as well. So the risk is very high
(Stakeholder #1, Outreach worker, Mombasa).

Underscoring the issue of intersecting influences was the observation that apart from propelling sex work, economic factors intersected with health system factors to increase unsafe injecting practices. For instance, when asked to provide specific situations in which sharing of needles took place, participants in FGDs explained that sharing frequently occurred “*at night*” when they commonly run out of clean needles **(Participant, FGD #2, Mombasa)**. Another participant in this FGD explained that in these situations, women’s decisions regarding sharing needles depended on “*whether the chemist is still open*” and

whether they had “*money to buy [syringes]*” (**Participant, FGD #2, Mombasa**). However, few could afford to buy regularly. Thus although outreach workers did provide these commodities freely, they were inadequate to meet women’s needs around the clock. This poor health services organisation intersected with economic pressures to produce unsafe injecting practices.

7.5 Summary.

This chapter demonstrates the diverse HIV risks that women encountered due to their sexual and injecting behaviours, as summarised in **Figure 6**.

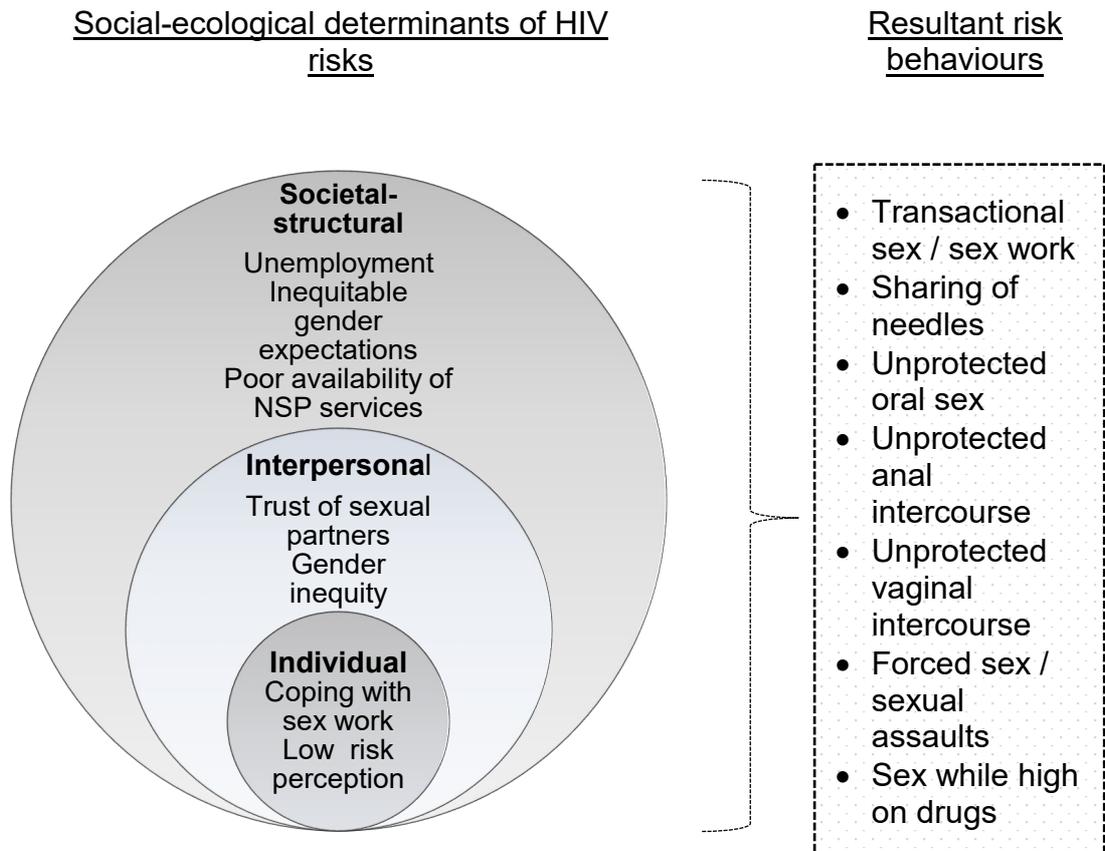


Figure 6. HIV risks encountered by women and their determinants.

The findings demonstrated that risky sexual behaviours and unsafe injecting practices were common and occurred due to a multiplicity of factors ranging from low-risk perception, inequitable gender norms and power, economic pressures, and poor availability of health commodities. Finally, similar to the convergence of different influences in creating a ‘drug-using environment’ noted in the previous chapter (**section 6.4.3**), individual, interpersonal and

societal-structural influences intersected to determine the HIV risks that women were exposed to in the course of their drug use. This environment created opportunities for women to acquire or transmit HIV and is consistent with the presence of an 'HIV risk environment' within the study context.

8 DISCUSSION.

8.1 Introduction.

Pursuant to this study's aims and objectives, this chapter brings together the information presented in the preceding chapters, to make a coherent conclusion to the study, with a focus on its contributions, limitations, and recommendations for policy and practice. It addresses the last question of this study, which is: 'How might a better understanding of the determinants of trajectories of drug use and HIV risks among women who inject drugs inform services and policy development in Kenya?'

To begin with, **sections 8.2** and **8.3** summarise the empirical, theoretical and methodological contributions of this study, while flagging limitations and opportunities for future research. **Section 8.4** discusses implications of the findings for harm reduction programmes and policies in the study setting. The chapter concludes by asserting the value of this study in bringing to the fore the social contexts of women injectors, and ways in which ecological factors therein influence drug use trajectories and attendant HIV risks.

8.2 Empirical contributions.

8.2.1 Drug use and sexual behaviours of women who inject drugs.

A significant contribution of this study is in advancing the understanding of injecting drug use and attendant HIV risks among women in Kenya. Although an emerging group of investigators, such as Guise et al. (2015), Rhodes, Guise, et al. (2015), and Kurth et al. (2015) have previously explored injecting drug use in Kenya, their study samples were predominantly male (74%, 70% and 85% respectively). There has been limited research focusing on female injectors, and none explicitly concentrating on trajectories of injecting drug use regardless of gender. Cognisant of this gap, Guise et al. (2015, p. 8) had highlighted the need to explore the *'vulnerability of women, and how risk for transitions and other drug-related harms, is gendered and is structured by gender relationships in this [Kenyan] context'*. Thus, the present study responds to a valid research gap concerning trajectories of injecting drug use and the vulnerabilities that produce HIV risks among women in Kenya.

Specifically, *and in response to the first research question*, this study found that women primarily injected heroin, mirroring the ubiquity of heroin nationally (Deveau et al., 2006; Guise et al., 2015; Syvertsen et al., 2016) and globally (Darke, 2011). Polydrug use, which is also predictive of poor health (Darke &

Ross, 1997) was rife in our sample. Additionally, a prominence of khat and an absence of methamphetamines in the repertoire of drugs that women consume emerged when compared to the global prevalence of illicit substances reported by UNODC (2016), as summarised in **chapter 1**. Consumption of khat is confined to East Africa and Yemen, although its harms are contested (Beckerleg, 2008).

The time from starting to use illicit substances to injecting averaged seven years, which is similar to the eight years reported in Darke's (2011) analysis of 73 studies from 14 high-income countries. Within this time, women had moved from using less harmful drugs such as cannabis and khat, to injecting heroin. This timeframe provides a window of opportunity to halt women's progression into injecting drug use. Additionally, participants were highly vulnerable to acquiring HIV infection via unsafe sexual and injecting practices, and a fifth were already infected with HIV. The repertoire of drugs, polydrug use, nature of sexual risks, and pace of trajectory progression identified among women in this study are all important empirical data that should inform local drug responses, as discussed later.

8.2.2 Factors influencing trajectories of women who inject drugs.

In response to the second research question, this study challenges the perception of linear and well-delineated trajectories. While linear trajectories might be expected to emerge from simple progressive phenomena, women's paths to drug use were complex and evolved in response to multiple factors. Thus, while trajectories might be generally linear across large populations, drug use progression may not necessarily bear a linear course at the individual level.

As a whole however, the study demonstrates the predominance of modifiable social determinants of drug use trajectories. This observation lends significant support to sociological theories of drug use, but it does not rule out other influences. Notably, the effects of tolerance and withdrawals, which apply across different theories and populations, were also found to be operating. Additionally, cognitive use of drug use occurred among women who made deliberate and rational decisions to inject drugs despite potential harm. However, recurring intersections between multiple individual, social and structural factors was predominant in explaining drug use, which is consistent with the sociological underpinnings of the social ecology theory.

Thus, throughout the trajectory, the convergence of psychological/neurological, economic/unemployment, peer norms, ubiquity of drugs, gender

inequity/norms and policy/societal neglect of injectors was prominent in explaining women's drug use. While gender inequity in power, cathexis and economics operated to shape drug injecting as proposed by Connell (1987), these influences were reinforced by a lack of drug treatment and rehabilitation services for women.

Additionally, this study found that being a woman or 'living out' the gender expectations of being a woman either amplified the risk of drug use and HIV at the individual, interpersonal and structural levels in a patriarchal society, which is consistent with Risman's (2004, p. 429) assertion that '*gender is embedded in the individual, interactional, and institutional dimensions of our society*'. Although treatment is a known modifier of drug use trajectory (Hser et al., 2006; Luchenski et al., 2016) the impact of its scarcity was particularly prominent in a context where these services are currently in development and harm reduction drug policy is nascent, having been neglected previously. Yet, the operation of gender as a structural determinant meant that the treatment needs of men and women were not seen as equally important. For example, consistent with predictions by Campbell and Ettore (2011), services at one CBO were designed specifically for men, while services at the other CBO could not fully meet needs of women.

Clearly then, the initiation, transition and progression of drug use were not necessarily caused by a 'problem' of the body, biological sex, or the mind, nor indeed by another singular factor. Rather, trajectories were shaped by a complex set of multiple intersecting influences across women's ecology, as hypothesised by social ecology theory. As women's individual and social circumstances differed, so too did the relative importance of these factors in influencing their drug use trajectories. For example, positive influences of intimate partners emerged when couples got pregnant or were discordant regarding injecting behaviours.

The diversity and overlapping nature of factors influencing women's drug use indicate the heterogeneity of women's social circumstances, but more importantly, it demonstrates the co-occurrence and intersections of these influences. These intersections occurred at a micro- (for example between curiosity and peer norms), macro-level (for instance between unemployment and lack of drug treatment) and across micro and macro levels (for example between unemployment/boredom, peer norms and ubiquity of drugs).

Furthermore, these intersections occurred through-out the trajectory from initiation, transition and chronic addiction. At a macro-level, a convergence of individual, interpersonal and societal-structural influences operated together to

produce a 'drug using environment' that created opportunities for women to come into contact with drugs, and continue using them. These findings advance studies showing clustering of *multiple risk factors* (Crofts et al., 1996; Hser et al., 2017; Neaigus et al., 2006; Robins et al., 1974) by showing that these factors intersect, and are experienced concurrently.

The multiplicity and broad nature of explanations of drug use that emerged from this study are consistent with a sociological and social determinant aetiology of drug use, which is premised on the hypothesis that drug using behaviours are produced by interactions between individuals and their environments (Lukoff, 1980). Yet, by giving prominence to social positions brought about by structural factors (such as unemployment), this study also gives prominence to the inequalities which women experience, and how these facilitate production of drug-using behaviours. Studies have shown that protective factors such as drug treatment, employment, housing, or positive social support may mitigate drug use for example, yet these protective factors are rarely accessible to poor or socially deprived individuals (Szapocznik & Coatsworth, 1999). In this study, women's deprived social positions provided contexts for risky or repeated use of drugs.

More specifically, initiation, transition, and relapse of drug use was pronounced among our sample of women who were predominantly homeless, unemployed, frequently imprisoned, socially excluded, experiencing difficulties accessing treatment, and facing inequitable gender norms in a patriarchal society. Although treatment was a protective factor, women's economic status meant they could not access it. Despite needing it, free treatment was rare, a finding that lends credence to claims that the Kenyan health sector is inequitable, as services are not accessible by the most needy (Chuma, Maina, & Ataguba, 2012).

These observations support Shahram's (2016, p. 158) assertion that women's drug use '*is rooted in the social determinants of health*', through their influence on the process and context of their relationships, structures of accessing support, or prescribed gender norms, roles and decision-making. If people are predominantly situated in contexts where negative influences are many and protective structures few, they are likely to use drugs (Szapocznik & Coatsworth, 1999). Thus, to be effective, harm reduction interventions should address upstream social determinants of health inequities, as discussed later.

8.2.3 HIV risk behaviours and their determinants.

In response to the third research question, this study similarly found co-occurring and intersecting influences of HIV risks. As a primary finding, this study demonstrated the range of behaviours that expose women to HIV. As shown in **Figure 6** previously, these include unsafe injecting practices, unprotected oral vaginal or anal sex, sex while high on drugs, forced sex/rape, sex work, and other forms of transactional sex.

Besides the predominance, diversity and co-occurrence of these risky sexual behaviours, an important feature was the involuntary way in which women experienced them in the context of inequitable gender power and norms. For the most part, married and cohabiting women placed significant importance on, and affective investment in, their relationships and attendant gender expectations, while those engaged in transactional sex were insufficiently empowered to control their exposure to the sexual risks imposed on them by men. These dynamics clearly affected both women's HIV risk-taking and risk management, and have implications for HIV prevention, as discussed later.

With the exception of the practice of having sex while high on injected drugs, the rest of these injecting and sexual risk behaviours are not new, as they are documented in other studies. For instance, studies of women injectors in

Vietnam, Malaysia and Tanzania have documented unprotected oral, anal and vaginal sex as well as unsafe injecting in the context of intimate sexual relationships and sex work (Higgs et al., 2008; Loeliger et al., 2016; Zamudio-Haas et al., 2016). Sex work is particularly determinant of HIV acquisition among female injectors (Blouin et al., 2016).

This present study, however, makes a novel contribution to the literature by documenting the practice of sex while high on drugs among female injectors who participate in sex work. While accounts of people engaging in sex while intoxicated with drugs have been previously documented, these typically feature men who have sex with men (Bourne, Reid, Hickson, Torres-Rueda, & Weatherburn, 2015; Ross & Williams, 2001) and oral party drugs² rather than narcotics (Degenhardt et al., 2010; Plankey et al., 2007; UNODC, 2016; Vu, Maher, & Zablotska, 2015). In these previous studies, the practice of having sex while intoxicated with drugs is associated with unprotected sex, as it is in this study.

²Such as crystal methamphetamine, 3,4-Methylenedioxymethamphetamine (Ecstasy), Mephedrone, and Gammahydroxybutrate (GHB) (UNODC, 2015).

However, this study's findings extend this literature by distinguishing the gendered purpose of drug use during sex. It demonstrates that, while the driver of this behaviour among gay (and potentially other male) populations is to enhance sexual pleasure and performance (Green & Halkitis, 2006), its primary purpose among women injectors in this study is the need to withstand the shame and rigors of sex work. A few women injected drugs while fulfilling perceived sexual obligations to their intimate partners. Given the prevalence of sex work among female injectors, this practice should be considered an emerging HIV risk as injecting drug use becomes more prevalent in Kenya.

Findings related to influences of HIV risks bore similarity to those pertaining to drug trajectories in terms of their convergence and intersection, as well as their predominantly social and structural nature. HIV risk behaviours were natural exigencies of injecting drug use in the context of limited economic resources and inequitable gendered power, which both underlay the way in which sex work increased HIV vulnerability, for example by making it condom-less, or laden with sexual violence. Gender norms framed women as subordinate to men, and their choices were determined by the intersection between these beliefs and other determinants. The convergence of these factors created opportunities for potential acquisition of HIV, and is consistent with the hypothesis of social ecology theory which Rhodes (2009, p. 193) champions,

stating that '*harm from drug use is contingent upon social context, comprising interactions between individuals and environments*'. Thus, to limit HIV transmission effectively, these macro-environmental determinants deserve more attention as discussed later.

8.3 Conceptual shift toward intersecting social ecologies.

These empirical findings support the assertion that the social ecology theory is valuable in identifying multiple determinants and potential interventions to mitigate drug use trajectories and associated HIV risks. Although previous studies of drug use trajectories and HIV risks have elaborated individual, social and structural influences on (and potential solutions for) drug use, very few of these studies have employed the social ecology theory. Most focus on isolated micro or macro influences (Wallace, 1999).

Of the few studies that apply the model, the focus has been on the social ecology of adolescent substance abuse (Kumpfer & Turner, 1990; Mason et al., 2004) and the use of ecology-based geospatial methods to predict narcotic use among adults (Bell et al., 1998). Shahram et al. (2017) leveraged the concept of social determinants of health to examine injecting drug use among aboriginal Canadian women, and identified the interplay between personal, social and socio cultural factors driving it; specifically, gender norms, trauma, colonialism,

and culture. They do not apply the ecological framework *per se*, however. Even outside of drug use, public health studies utilising social ecology theory have been criticised for their partial application of the theory, since they rarely explore structural and policy issues (Golden & Earp, 2012).

By focusing on their entire ecology, this study was able to elaborate how women experienced their social contexts, and how these influenced their drug use and HIV risks. A primary contribution then of this study lies, therefore, in advancing the in-depth application of the socio-ecological framework to explore women's drug use trajectories and HIV risks across all domains. By employing the framework as a whole, this study shed light on macro-structural influences, and showed the importance of factors such as unemployment/joblessness and healthcare in influencing trajectories and HIV risks, alongside the more traditional micro-level influences.

A consequence of utilising the theory was the ability to demonstrate the intersecting nature of ecological determinants of drug use trajectories and attendant HIV risks. While individual, interpersonal and societal-structural factors were important, they did not necessarily exist as isolated constructs, and therefore focusing on each of these factors in isolation may not have unearthed intersections between, and even within, these domains of influences.

Without ample consideration of the ways in which intersections occurred, some findings may not have emerged. For example, interrogation of how intersections between individual, gender and structural factors occurred was central to the identification of ways in which these influences worked in concert, rather than in isolation, to form 'risk environments' in the study context. In reality, intersection of these determinants existed even though exploration of this phenomenon is not *explicitly* provided for by the framework, but merely assumed. In other words, it is clear from this study that intersectionality of influences operates more than is expressly acknowledged by the theory.

Granted, social ecology theorists assert that influences are assumed to be dynamic, multi-layered (Stokols, 1992), interactive, and reinforcing (Golden & Earp, 2012; Sallis et al., 2008). These theorists, however, do not provide guidance on how to ensure that interactions of influences are systematically explored during the analysis, a gap that this study suggests should be fulfilled with an intersectionality lens. The argument here is that future use of the social ecology theory ought to incorporate weighty intersectionality analysis as a core aspect of its application. Here, intersectionality would be the tool through which the dynamic nature of human experience and its interacting causes would be brought to life within a social-ecological analysis.

Indeed, intersectionality was originally coined by Kimberlé Crenshaw (1989) in response to the persistent exclusion of black American women from feminist and race studies despite them inhabiting the intersection of both of these worlds (Larson, George, Morgan, & Poteat, 2016). Thus, intersectionality approach is a mechanism for illustrating the convergence of different social locations, exclusions or marginalisations (Hankivsky & Christoffersen, 2008; Mburu, Ram, Siu, et al., 2014). It '*captures lived experiences produced by concomitant, interacting factors of social inequity*' (Hankivsky & Christoffersen, 2008, p. 272). As such, Larson et al. (2016) assert that intersectionality is crucial for elaborating the interconnections of power structures that create health inequalities.

For instance, although intersectionality is rarely used in drug use research, an Indonesian study noted that '*the intersection of socio-economic deprivation with...masculinity led many [men] into a drug injection career, making them vulnerable to HIV and other viral infections*' (Nasir & Rosenthal, 2009, p. 237). However, going further than this to fully consider the dynamic intersections of different axes of social inequity across the entire social ecology is critical in fully understanding peoples' experiences, and doing so requires an intentional application of intersectionality.

To illustrate this, intersectionality would be useful in identifying ways in which gender and economic axes of inequality intersect dynamically to affect exposure to HIV risks. Based on this study's initial findings, it is clear that the more economically able a woman is, the more likely she would use a condom during sex work, and vice versa. Yet intersectionality is able to tease out that better economic ability actually intersects with gender inequity to *increase rather than decrease* risk, when men who are better off economically offer higher pay for unprotected sex, and in a patriarchal society, this is enforced through inequitable gender power in decision making, and the gender-differentiated responsibility for availing a condom during sex work.

Another example is the illustration that while personal hardships occasioned by unexpected pregnancy led to drug use (and that pregnancy can only biologically occur among females), the effect of pregnancy itself was dynamically predicated by the power in decision making that intimate partners held. On the surface it is clear that gender inequality led women to use drugs in an attempt to acquiesce with their partners, and in order avoid bringing a child up alone in a patriarchal society where men were (or expected to be) economic providers.

However, using intersectionality, it is possible to show that through inequitable gender power, pregnancy had different impacts between men and women: men compelled women to stop using drugs when they were expectant, and when women couldn't, men ended relationships as they had the upper hand. These changing directions of influences can only be systematically and consistently teased out when we are willing to consider the dynamic ways in which axes of inequalities intersect, in this case, economic and gender inequalities. Hence, it is essential to consider that determinants are not simply additive or plainly cumulative, but are '*constituted and intersecting in dynamic and interactive ways*' (Larson et al., 2016, p. 965). This is the value of intersectionality approach.

Yet, application of intersectionality alone is insufficient, as such an approach could itself lead into the pitfall of selective consideration of some, but not all, potential determinants of health and their axes of inequality, which gave rise to the social ecology theory in the first place. As evident from the analysis by Larson et al. (2016), most studies of intersectionality focus on a few axes of inequality. Therefore, integration of intersectionality within ecological perspectives is essential to ensure that all potential determinants and axes of inequality are taken into account to the extent possible, and grounded in data.

The crux of the argument here is that there is a need to move from *social ecology* to *intersecting social ecology* as an advancement of the practical application of the social ecology theory. Intersecting social ecologies is hereby proposed as the unifying of intersectional and ecologic concerns and perspectives, conferring prominence to intersectionality as a critical mechanism (and not merely promulgating 'interaction' as a principle or assumption whose operationalization is undefined) through which social-ecological environments produce health behaviours.

8.4 Methodological contributions and limitations.

The proposition to apply intersectionality as a core part of social ecology theory befits the nature of secondary analysis, as an exploratory mechanism to gain new insights (Corti & Thompson, 2006). Secondary analysis is particularly beneficial when researching sensitive topics among marginalised and hard to reach populations, as it prevents unnecessary breaches of confidentiality (Long-Sutehall et al., 2011). Compared to quantitative disciplines however, secondary data analysis is relatively rare in qualitative studies (Bishop, 2007). In this study, it provided an expedient route of responding to prevailing information gaps concerning *hard to find* female injectors in Kenya, while

providing an avenue for generating hypothetical concepts that can be explored in future, such as intersecting social ecologies.

The qualitative dataset utilised in this study offered an opportunity to uncover and demonstrate complex social influences and intersections that would otherwise remain hidden. Participants' accounts provided *thick descriptions* of their social contexts, allowing appreciation of the complex ways through which they experienced factors that ultimately affected their drug-injecting and sexual behaviours. Combining IDIs and FGDs allowed complementary information to be obtained from different participant perspectives. Participants in FGDs divulged information that was concealed in IDIs, such as the practice of needle sharing. These methodological advantages were anticipated as noted in **section 4.8**.

However, a secondary analyst does not have a choice regarding the design of the original study. Instead, some of these benefits naturally emanated from decisions made in the primary study. Conversely, this study was affected by the known limitations of secondary data analysis highlighted in **section 4.16**. Chiefly, secondary analysis precluded the co-creation of knowledge that would have resulted had the secondary analyst directly interacted with participants in the study context. Consequently, there were limited data relating to the

transition to injecting due to the limited focus on this progression in the primary study. Additionally, the absence of the secondary analyst from the primary IDIs and FGD risked this study's findings being decontextualised to some extent.

To mitigate these limitations, a theory-led interpretation was utilised, in which the social ecology theory facilitated interpretative re-construction of the social contexts for the secondary research questions while giving new meaning to existing data (Torraco, 1997), thereby creating new knowledge (Moore, 2005). My aim was therefore *not* to recreate the context of the original project, but rather to re-contextualise the production of new knowledge related to drug use. Combined with my previous involvement in the primary study and rigorous use of linked codes, memos and themes, this approach prevented invalid or totally decontextualised results from emerging.

At the same time, adopting an interpretivist stance in which there is a recognition of the social construction of reality created a valid space for interpreting and re-constructing participants' social contexts. Yet this re-construction carries an inherent risk of researcher bias, which although common in qualitative research, is amplified by secondary analysis (Thorne, 1994). Aware of this risk, a more observant role was adopted, as suggested by Thorne (1994), facilitated by a dependence on rigorous analysis.

Thus, although the findings embody my own interpretation, they are grounded in the data. Yet, it is nearly impossible for qualitative analysis to be value-free in interpreting findings: my own clinical background may still affect this study's findings. Nevertheless, reflexivity was maintained by shifting the analytical focus from the findings to the process and methodology of the analysis, as other secondary analysts recommend (Bishop, 2007).

Having said that, the design, sampling strategy and eligibility criteria of the primary study may still have an impact on this study's findings. Given its focus on SRH, very young (<18 years) and older women (>50) were excluded from the primary study, yet age is a known determinant of drug use trajectory as indicated in the literature review (**section 2.3.3**). In this study, the influence of unexpected pregnancy in causing women to get into drug use was prominent among unmarried women, while older women were more likely to be a source of positive peer influence. Yet, because <18 and >50-year-olds were excluded, it is impossible to state how their experiences compare with the findings herein.

Additionally, this study may have been influenced by biases known to affect drug use studies, such as recall-bias of historical events (Best et al., 2008) and social response bias in relation to risky injecting behaviours (Latkin, Vlahov, & Anthony, 1993). As shown in **Appendix 1**, most of the participants (82%) were

in contact with outreach services, and their injecting and sexual behaviours may differ from those not accessing CBO-based harm reduction services, as is the case in other contexts (Nazari et al., 2016). Despite these sampling limitations, this study provides crucial findings that could be built upon to explore drug use among younger, older, and other women not in contact with outreach services.

Finally, the primary study's lack of focus on the actual progression of drug use precluded elaboration of detailed individual drug use trajectories, necessitating a pragmatic focus on factors that influenced these trajectories. For instance, it was not possible to determine the precise temporal progression of trajectories for each participant, which longitudinal studies are best suited to explore (Measham, Williams, & Aldridge, 2011). With the current sample, a life-history interviewing approach with narrative analysis as applied by Rance, Gray, and Hopwood (2017), would have facilitated a better elucidation of drug use escalation over the life course, yet this was precluded by the topic-based interviewing approach used in the primary study.

These limitations illustrate the actual, rather than idealised process of secondary analysis, which inevitably involved making decisions that hinged on the interplay between the existing data, and its suitability to answer desired questions, and if not, as was the case here, to be flexible and pragmatic in

making the best use of existing data. Other pragmatic secondary researchers such as Bishop (2007, p. 8) have '*confessed to shaping some initial research interests to conform to a project of data reuse*'.

Consequently, given the need for data regarding women's paths to addiction, this study used participants' data to pragmatically reconstruct contexts and determinants of their drug use trajectories and attendant risks. Even where sequential trajectory trends are re-created, this must be seen as an attempt to provide 'meta-data' information of the circumstances under which, as a collective, women progressed through initiation, transition and chronic use of illicit drug use, which is a weak substitute for the kind of detailed information that would arise had narrative and historical questioning been originally adopted in regard to these phenomena.

Overall, while some residual limitations exist, most were anticipated from the outset of the study, and were not necessarily unique to this study, as they apply to other secondary analyses. Mitigating strategies were applied throughout the study. For example, a theory that complemented the methodology and existing data – through its emphasis on social contexts and how these are experienced – was purposely adopted to mitigate risk of data de-contextualisation, and

transparency of the data analysis was maintained to show how conclusions were arrived at, thereby aiding independent judgement.

Still, it is emphasised here that the assertions made in this study are intended to provide exploratory and expedient findings on factors that influence trajectories and HIV risks, which can be built upon within future studies that address the above limitations. In the meantime, the data available in this thesis can pragmatically inform immediate service and policy interventions.

8.5 Implications for policy and practice.

8.5.1 Combined interventions to address drug use and HIV risks.

Given the findings of intersecting and multiple influences of drug use and HIV risks, and at the risk of over-simplification, our study suggests that, as a starting point, a combination of individual, interpersonal and structural interventions would be needed to mitigate the wide array of identified influences (**Figure 7**).

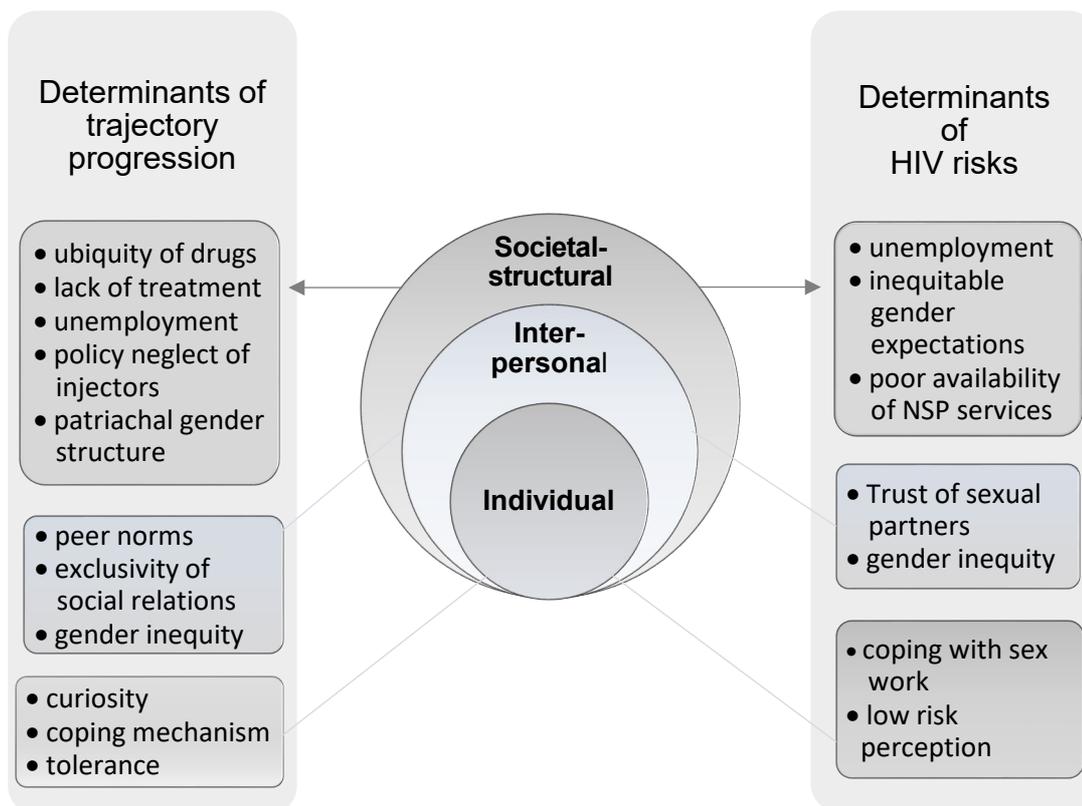


Figure 7. Determinants of drug use trajectories and HIV risks.

From a theoretical perspective, the assumption is that '*multilevel interventions should be most effective in changing behaviour*' (Sallis et al., 2008, p. 465).

Whatever their nature, interventions to halt trajectories and HIV risks should be combined as far as possible, and provided to women in an integrated fashion,

tailored to local contexts, recognising that just as influences reinforce each other, interventions are likely to reinforce each other too.

While the integrated provision of harm reduction and HIV interventions is emphasised in studies (Bachireddy et al., 2014; Guise et al., 2017), the reality is that even where overlapping needs are identified such as in the study context, integrated services are rare. As noted in a primary publication from this study's sample, *'long distances, multiple appointments, drug users' unfamiliarity with health facilities...impede women's access to health services'* (Ayon et al., 2017, p. 480). Noting the ubiquity of this problem globally, Strathdee, Shoptaw, Dyer, Quan, and Aramrattana (2012, p. 320) assert that interventions to mitigate HIV risks and arrest trajectories *'need to overcome tacit assumptions that IDUs can navigate through systems that are maintained as separate silos'*.

8.5.2 Mitigating upstream determinants of drug use and HIV risks.

A more particular recommendation from this study, given the consistency of our findings with Rhodes' (2009) concept of 'risk environments', is that interventions tackling upstream social determinants should form a core part of harm reduction efforts for female injectors. Current services globally tend to over-rely on individual and interpersonal interventions while ignoring institutional and policy domains (Baral et al., 2013). In Kenya, the National Guidelines for the

Comprehensive Management of the Health Risks and Consequences of Drug Use prescribe the harm reduction package recommended by WHO et al. (2009), with emphasis on the provision of needles, education and methadone (NASCOP, 2013b). The National Protocol for Treatment of Substance Use Disorders also emphasises facility-based medical treatment and community-outreach services (Ministry of Health, 2017), and this is reflected in NACADA's public education efforts (www.nacada.go.ke).

However, less thought-of influences such as unemployment/joblessness, inequitable economic power, and the lack of drug treatment also determined women's drug progression and HIV risks. As such, it is nearly impossible to adequately empower these women to adopt safer sex and injecting practices without addressing both the gender and economic drivers of these behaviours. Yet these upstream interventions are currently deficient in Kenya.

Indeed, findings suggest there has been longstanding neglect of issues of female injectors in Kenya, whose '*possible explanations include addictophobia, apathy, and inattention*' that affects drug users globally (Strathdee et al., 2012, p. 320). Yet, because of the nascent nature of harm reduction programming in Kenya, there is an opportunity to mitigate risk environments by investing in

macro social and health policies and interventions that address social determinants of drug trajectories and HIV risks.

As such, successful interventions that address these upstream social determinants will need to be provided to women. For instance, interventions that promote women's financial independence should be integrated into harm reduction services. Evidence from other countries supports this recommendation. In Indonesia, women who had independent income from their own earnings had more control over their drug use and attendant HIV risks (Lazuardi et al., 2012). Livelihood, microfinance, and employability interventions have also been shown to reduce both the numbers of sex clients and amounts of drugs consumed by female drug users who engaged in sex work in the USA (Sherman, German, Cheng, Marks, & Bailey-Kloche, 2006).

Similarly, given the role that the lack of alternative accommodation played in enhancing unwanted sexual risks upon cohabiting women in the current study, provision of low-threshold housing should be part of harm reduction responses. While requiring significant investment, access to stable housing has been shown to reduce drug use in Canada (Luchenski et al., 2016). Likewise, the lack of social support during pregnancy was a strong influence upon young women, suggesting the need for social protection linked to pregnancy/child

welfare, as has been implemented in other countries (Appel et al., 2004). As such, incorporating livelihood/microfinance, employability, housing and pregnancy/child welfare interventions into harm reduction could cushion women from the negative influences of their economic situation and intimate partners, on both the progression of drug use and sexual and injecting risks.

In addition to economic and livelihood interventions, health system interventions are needed to ensure universal accessibility of rehabilitation, treatment with OST, and clean needles, including at night when needle sharing was reported to be prevalent. For instance, instead of injectors having to buy syringes from pharmacies, pro-poor health policies allowing free distribution of syringes at pharmacies at the governments' expense could be explored.

Despite two CBOs being a source of condoms and syringes, they struggle to meet demand of services as they are not funded by the government (Ayon et al., 2019). Similar to other health-focused CBOs serving the urban poor in Kenya, these organizations are unable to fully fill the gap that is created by a lack of governmental services, and as a consequence, their beneficiaries '*still experience unimproved health outcomes despite CBO presence*' (Ekirapa, Mgomella, & Kyobutungi, 2012, p. 404). In addition, referrals to government facilities were not always successful due to stigma at such facilities (Ayon et

al., 2017). Thus, governmental policies/guidelines need to strengthen availability of services by mitigating negative attitudes among health workers.

Currently, there are few public drug treatment centres in the study context, and methadone is not authorised to be dispensed by CBOs, yet wide availability of methadone, residential drug treatment, free distribution of syringes via pharmacies, and designated safe-injecting spaces (called shooting galleries) all feature in countries that have successfully managed drug-injecting epidemics (Degenhardt et al., 2014). As such, policy shifts will be required to adopt similar evidence-based strategies and ensure that integrated and holistic harm reduction services are universally available. This will prevent HIV and reduce consumption of heroin.

Women and stakeholders reported that ubiquity of drugs in the study context contributed to initiation, chronic use and relapse of drug use. Although harm reduction does not focus primarily on elimination of drugs, an increased availability of drugs has had an impact on drug use in Kenya. As noted in **section 2.3.3.3**, and as emphasised by Barrett et al. (1990) and Simmons et al. (2012), availability of drugs is a known factor in increasing opportunities for drug use, suggesting that less availability would presumably limit it. According to Deveau et al. (2006), and Schuberth (2014), inadequate policing has

contributed to ubiquity of drugs in East Africa. While there are debates as to whether, and in what ways, drug control is effective or counterproductive (Baral et al., 2013; Flath et al., 2017), evidence in this study suggests that heroin use has increased in the study context partly due to its availability. Precisely how control of drug availability can be achieved is beyond the remit of this thesis. However, it can reasonably be concluded that policing of drugs needs to respond dynamically to the evolving drug use landscape in Kenya.

While all the above structural interventions have been proposed in other countries, they are particularly crucial for this study's impoverished, unemployed, homeless, and stigmatised participants, who live in a country known for its poor coverage of national health insurance, low expenditure on health, and poor availability of health services (Chuma & Maina, 2012). Thus, policymakers need to develop and implement umbrella policies that actively mitigate the inequalities facing women injectors, and reverse their limited access to power, resources, and treatment institutions. Structural reform of the health sector, employment and social welfare are needed to achieve this redistribution. To mitigate the often cumulative consequences of a biased gender system that result in substantially worse outcomes in women (Ridgeway & Correll, 2004), these policies need to specific focus on gender inequity.

Because it acknowledges the interactions between different influences, attending to upstream determinants within a social-ecological approach is not merely a matter of 'bolting on' employment, treatment, pregnancy/child welfare or livelihood schemes to existing micro-level interventions for women who inject drugs. In contrast, a social-ecological approach challenges the idea that determinants of drug use operate in isolation, and argues that these influences are interconnected or linked. This approach requires bringing to the fore the linkages and intersections of these influences, requiring context-specific identification of the particular influences in operation in a given (set of) drug user(s). Thus while these recommendations are highly relevant in the coastal towns of Mombasa and Kilifi, further evidence-based refinements would be needed in other Kenyan regions. Similar to determinants, intersections among interventions could also occur. These considerations are particularly salient given the limited elaboration of drug use contexts in Kenya.

8.6 Conclusion.

Reflecting back to the beginnings of this PhD, it is a sobering fact that since I embarked on it, many women in Kenya have started to use drugs, and in the process, acquired HIV. In Kenya, the phenomenon of injecting drug use is becoming prominent. Given that HIV is already generalised among

heterosexual population in Kenya, injecting drug use has the potential to accelerate the spread of HIV, especially among women who are traditionally more likely to be infected with the virus. The challenge for policymakers and programmes is how to address women's drug use and attendant HIV risks through gender-sensitive interventions. Yet, programmes have had limited data related to women who inject drugs. Little information on why women initiate drug use, transition to injecting, or maintain chronic injecting and ways in which they are exposed to HIV exists. It is within this background that I embarked on this thesis, and having come to the conclusion of this study, several key contributions are worth summarizing.

First, the literature review conducted in this thesis showed that researchers of drug use have mainly concentrated on men. In many contexts, female injectors have been ignored or dealt with perfunctorily. Indeed, this thesis located a valid and contemporary literature gap related to the lack of trajectory research among women, particularly in sub-Saharan Africa.

Second, this study successfully responded to this literature gap by elaborating determinants of drug use trajectories and HIV risks among women who inject drugs in Kenya. The findings showed that women's injecting and sexual behaviours should be viewed broadly as a product of their personal

circumstances, social and gender relationships, and social-structural contexts. Thus, the initiation, transition, and chronic drug use, as well as attendant injecting and sexual HIV risks were not determined by a single factor, but by multiple and intersecting social-ecological determinants located at the individual, interpersonal and societal-structural levels. In addition, this study advances our understanding of the gender-specific motivations of drug use during sex, highlighting its use as a coping mechanism in sex work among women, which is distinct from its pleasure-enhancing use among men.

Third, this study successfully advanced the application of secondary analysis, leveraging on its advantages while actively mitigating its limitations to respond to an urgent information gap. By pragmatically utilising rare secondary analysis of qualitative data to identify multiple intersecting social-ecological determinants of drug use trajectories and HIV risks, this study has brought Kenyan policymakers closer – I should hope – to developing interventions to extricate local women from drug use and associated HIV risks in a largely patriarchal society. Critically, this thesis argues that to address the convergence of the identified determinants, a combination of interventions spanning women's ecology should be central to harm reduction and HIV programmes, with emphasis on upstream interventions that have hitherto received limited attention. By employing the social ecology theory, the

importance of joblessness, gender inequity, ubiquity of drugs, economics, and health systems in shaping trajectories and HIV risks was identified. Few other studies have conducted social ecological exploration of drug use trajectories, but as anticipated, its application in this study was valuable in identifying both the determinants of drug use and HIV risks, as well as potential interventions.

Fourth, besides suggesting potential interventions for policy makers, this study lays the ground for future studies exploring the theoretical hypothesis of *intersecting social ecologies*, which brings together intersectionality and social ecology concepts. While identifying the need to place intersectionality central to the future application of the social ecology theory was an important contribution of this study, my immersion in this research transcended theoretical exposition of injecting drug use. Unpacking the social contexts of the women participants in this study relegated the stigmatised notions of stereotypical addicts that I had at the beginning of this PhD, and revealed the human-ness of these women, the complexity of their circumstances, and the often involuntary way in which they experienced various social ecological forces in their contexts that ultimately pushed them on a path of drug addiction and HIV exposure. Paradoxically, my own enlightenment made me self-aware of the little I knew – and perhaps continue to know – about women’s journeys to addiction, despite having engaged with injecting drug users as part of my work.

While the findings are obviously not comprehensive in every sense owing to the secondary nature of this analysis, they clearly suggest that more needs to be done to empower women who inject drugs involved in this study to take more control of their health and well-being. Starting with the determinants identified in this study will be essential.

9 APPENDICES.

Appendix 1. Previously published sample characteristics.

Appendix 1.1 Sociodemographic characteristics of the study sample.

Characteristic	In-depth interview (n=24)	Focus group discussi on (n=21)	Total (n=45)	%
Age				-
Mean (years, SD)	26.4 (7.3)	30.5 (5.8)	28.4	-
Range	19–36	22–45	19–45	
Intervals/distribution				
≤19	1	0	1	2%
20–29	13	19	32	71%
30–39	10	0	10	22%
40–49	0	2	2	5%
Education				
None	4	4	8	18%
Primary	13	10	23	51%
Secondary	6	6	12	27%
Post-secondary	0	1	1	2%
Unknown/ missing	1	0	1	2%
Marital status				
Married	5	3	8	18%
Live in partner	7	5	12	27%
Single	11	13	24	53%
Unknown/ missing	1	0	1	2%
Residence				
Own/rented home/flat	1	3	4	9%

With parents/family	5	3	8	18%
With spouse /partner	6	6	12	27%
With peers/friends	3	1	4	9%
Street/homeless	7	5	12	27%
Drop in centre	0	2	2	4%
Other temporary	1	1	2	4%
Unknown/ missing	1	0	1	2%
Religious beliefs				
Christian	13	11	24	53%
Muslim	9	10	19	42%
Unknown/ missing	2	0	2	4%
Income source				
Casual labour	2	5	7	16%
Food Kiosk	2	1	3	7%
Sex work	9	4	13	29%
Peddling	1	2	3	7%
Peer educator	0	1	1	2%
Family or partner	3	1	4	9%
Begging, hustling	5	6	11	24%
Plaiting	1	1	2	4%
Unknown/ missing	1	0	1	2%
Ever imprisoned				
Yes	15	9	24	53%
No	3	3	6	13%
Not disclosed	5	9	14	31%
Unknown/ missing	1	0	1	2%

Abbreviations: SD=standard deviation.

Appendix 1.2 Fertility and contraception use among the study sample.

Characteristic	In-depth interview (n=24)	Focus group discussion (n=21)	Total (n=45)	%
Number of children (mean, SD)	1.4 (1.4)	1.8 (1.2)	1.6 (1.33)	-
Current contraceptive				
Condoms	5	1	6	13%
Calendar	1	0	1	2%
Implant	2	0	2	4%
Herbal	1	0	1	2%
None	13	18	31	69%
Injection	1	2	3	7%
Unknown	1	0	1	2%

Abbreviations: SD=standard deviation.

Appendix 1.3. Contact with outreach service among the study sample.

Characteristic	In-depth interview (n=24)	Focus group discussion (n=21)	Total (n=45)	%
Last contact with outreach services				
Less than a week	14	8	22	49%
1-2 weeks	6	4	12	27%
3-4 weeks	1	0	1	2%
>1 month	1	3	4	9%
No response	1	2	3	7%
Never	0	4	4	9%
Unknown	1	0	1	2%

Sources: Data reported in Appendix 1.1, 1.2 and 1.3, were originally reported in papers from the primary study (Ayon et al., 2017; Mburu et al., 2018; Ndimbii et al., 2018). All tables used with permission from Taylor and Francis Group, Refs: JB/CAIC/P18/1535 and P081718-02/UWRH.

Appendix 2. Summary of studies included in the literature review.

Author, (year)	Study type	Setting	Sample Size	% female	Trajectory Concept- ualisation	Factors affecting trajectories			Impact on Health and HIV	Theory of drug use	Gender analysis
						Initiation	Transition	Addiction			
Ahamad et al., (2014)	Prospective cohort.	Vancouver, Canada.	422	32.5%		X					X
Altman et al., (1996)	Review of theories.	Global.	n/a	n/a		X	X	X		X	
Ambekar et al., (2015)	Cross-sectional.	India.	300	32%					X		X
Asher et al., 2013	Systematic review of HIV	Sub-Sahara Africa.	n/a	Not reported					X		
Baldacchino et al., (2015)	Cross-sectional.	Dundee, UK.	109 ^β	0%						X	

Baral et al., (2013)	Review of HIV.	Global.	n/a	n/a				X	X	
Barrett et al., (1990)	Prospective cohort (the DARP study).	Chicago, USA.	424 addicts.				X			
Becker and Murphy (1988)	Hypothesis	Global.	n/a	n/a					X	
Beletsky et al., (2015)	Cross-sectional	Baltimore, USA.	308 NSP clients.	24.3%				X		
Beletsky et al., (2014)	Cross-sectional.	New York City.	514 IDUs.	21.7%				X		
Bell et al., (1998)	Cross-sectional.	Houston, Texas.	Survey data.	Not reported			X			
Bennett et al., (2000)	Cross-sectional.	Bournemouth and Bath, UK.	181 IDUs	50.1%				X		X
Bluthenthal et al., (2017)	Retrospective cohort.	Los Angeles and San Francisco.	776			X				

Boys et al. (2002)	Cross-sectional.	England and Wales.	3142 IDU in prisons ^β	24.5%		X				X	
Bravo et al., (2003)	Cross-sectional.	Seville, Madrid and Barcelona.	900 heroin users			X					X
Bronfenbrenner (1977)	Hypothesis of theory.	Global.	n/a	n/a	X						
Bryant al., (2010)	Cross-sectional.	New South Wales, Australia.	181 heterosexual IDU couples	50%				X			X
Burton (2000)	Hypothesis of theory.	Global.	n/a	n/a	X						
Cami and Farré (2003)	Hypothesis of theory.	Global.	n/a	n/a		X	X	X		X	
Campbell and Ettore (2011)	Hypothesis of theory.	Global.	n/a	n/a				X		X	
Carter and Tiffany (1999)	Hypothesis of theory.	Global.	n/a	n/a						X	

Chakrapani et al., (2011)	Mixed-methods study.	Manipur, India.	99 IDU, and 2 key informants.	0.3%				X	X		
Chami et al., (2013)	Prospective cohort, regression.	Vancouver, Canada.	422	31.5%		X					
Cheng et al., (2016)	Cohort and regression.	Vancouver, Canada.	253	36.76%			X	X	X		
Connell (1987)	Hypothesis of drug use / theory.	Global.	n/a	n/a							X
Corbin and Strauss (1991)	Hypothesis of drug use / theory	Global.	n/a	n/a	X						
Crofts et al., (1996)	Cross sectional survey	Melbourne, Australia	300	40%		X			X		
Darke (2011)	Drug use theory review (Book)	Global	n/a	n/a	X	X	X	X		X	

Darke and Ross (1997)	Cross-sectional survey.	New South Wales, Australia.	222 heroin injectors	41%				X			
Debeck et al., (2013)	Cross-sectional, regression.	Vancouver, Canada.	405 new injectors.	32%				X			
Degenhardt et al., (2011)	Systematic review of harm reduction.	Global	n/a	Not reported					X		
Des Jarlais et al., (2007)	Cross-sectional.	New York City.	264 former and 1760 current IDU ^β .	18%			X	X			
Des Jarlais et al., (1999)	Cross-sectional.	New York City.	5119 IDUs in treatment.	30.3%		X		X	X		
Des Jarlais et al., (2014)	Cross-sectional.	New York City.	322 former and 801 current IDU	18%	X		X		X		
Di Chiara and North (1992)	Hypothesis of theory.	Global.	n/a	n/a						X	

Diaz and Fruhauf (1991)	Hypothesis of theory.	Global.	n/a	n/a					X	
Doherty et al., (2000)	Cross-sectional	Baltimore, Maryland.	229 new injectors.	54%		X			X	X
Dorsett (1991)	Review of trajectory.	Global	n/a	n/a	X					
Dwyer et al., (1994)	Cross-sectional.	Sydney.	1,245 IDUs.	36.5%					X	X
Eluwa et al., (2013)	Cross-sectional with regression.	Six states, Nigeria.	1474 IDU.	6.5%					X	X
Evans et al., (2003) (the UFO Study).	Cross-sectional with regression.	San Francisco.	844 IDU (<30 years).	44.5%					X	X
Flath et al., (2017)	Cross-sectional with regression.	Baltimore, USA.	366 heroin injectors.	37%					X	
Frajzyngier et al., (2007)	Cross-sectional.	New York.	249 young injectors.	34%		X			X	X

Garfein et al., (1996)	Prospective cohort (the ALIVE study).	Baltimore City, USA.	716 IDUs	28.61%					X		
Genberg et al., (2011)	Prospective cohort study	Baltimore, USA.	1,697 IDUs	19%				X			
Golden and Earp (2012)	Review of ecology theory.	Global.	n/a	n/a						X	
Goldsamt et al., (2010)	Cross sectional study.	New York, USA.	146	30.8%		X					X
Greenfield, et al. (2007)	Review of drug treatment.	Global.	n/a	n/a	X						X
Grella and Lovinger (2011)	Prospective cohort.	California, USA	486	44.3%	X			X			X
Guisse et al., (2015)	Qualitative.	Malindi, Ukunda, Nairobi, Kenya.	50 IDU, 69 stakeholders, and 35 drug merchants.	26% (among IDU).			X		X		

Hadland et al., (2012)	Prospective cohort (the ARYS study).	Vancouver, Canada.	395	31.9%	X	X					
Harocopos et al., (2009)	Qualitative, nested in a longitudinal study.	New York, USA	54	30%		X					
Higgs et al., (2008)	Qualitative study.	Melbourne, Australia.	24	100%		X	X	X	X		X
Hser et al., (1987)	Cross sectional study.	California, USA.	567	0%	X	X					X
Hser YI,, et al. (2001)	Cohort study.	California Civil Addict Programme.	242 narcotics addicts.	0%	X				X		
Hser et al., (2007a)	Modelling study.	California, USA.	471 heroin addicts.	0%	X			X	X		
Hser et al., (2017)	Growth mixture modelling study.	USA (national).	795 opioid users on rehabilitation.	0%	X			X			

Hser et al., (2007b)	Review of trajectory.	Global.	n/a	n/a	X						
Hser et al., (2006)	12-year prospective cohort study.	California, USA.	321 addicted veterans ^β .	0%	X			X			
Hubbard et al., (1997; 2003)	Prospective cohort study (DATOS)	Various cities, USA	2,966 cocaine and heroin users	31.4%				X			
Johnston et al., (2011)	Cross-sectional study	Mauritius.	511 IDU	9%				X	X		
Kandel (2002)	Hypothesis/theory.	Global.	n/a	n/a						X	
Kermode et al., (2009)	Qualitative study	Manipur and Nagaland India	40 IDU	30%			X	X	X		
Kertesz et al., (2012)	Longitudinal cohort.	Birmingham, Chicago, Oakland, Minneapolis.	5115 ^β	3.6%	X			X			

Kippax (2008)	Theoretical perspective.	Global.	n/a	n/a					X	
Kippax (2012)	Review of HIV epidemiology	Global.	n/a	n/a				X		
Kirtadze et al., (2015)	Qualitative	Georgia.	55 IDU	100%		X	X	X	X	X
Koob et al., (1989)	Review of theories.	Global.	n/a	n/a	X				X	
Kreek et al., (2005).	Theoretical hypothesis.	Global.	n/a	n/a	X				X	
Kurth et al., (2015)	Cross-sectional study.	Nairobi and Coast, Kenya.	1785 IDU.	15%				X		
Lambdin et al., (2013)	Cross sectional	Dar es salaam, Tanzania.	1,898 IDU.	34%				X		
Larney et al., (2015)	Review of drug use	Global.	n/a	n/a				X		X
Lee et al., (2013)	Cross sectional with regression	Bangkok Thailand.	430 IDU.	19.3%				X		X

Lettieri et al., (1980)	Review of drug use theories (book).	Global.	n/a	n/a	X	X	X	X		X	
Li et al., (2002)	Cross-sectional, study.	Yunnan and Gunagxi Zhuang China.	833 IDU.	12%		X					
Loeliger et al., (2016)	Cross-sectional survey.	Kuala Lumpur, Malaysia	103 drug users.	100% (30% IDUs)					X		X
Luchenski et al., (2016)	Prospective cohort, regression.	Vancouver, Canada.	1663 IDU.	33.9%				X			
Lukoff (1980)	Review (theoretical book).	Global.	n/a	n/a						X	
MacAllister et al., (2015)	Systematic review of HIV/drug use.	West and Central African.	n/a	n/a					X		

Mackesy-Amiti et al., (2013)	Prospective cohort.	Chicago, USA.	561 injecting and non-IDUs.	37.3%		X			X		
MacRae and Aalto (2000)	Qualitative interviews.	Tayside, Scotland, UK.	90 IDU.	70%				X	X		X
Malekinejad and Vazirian. (2012)	Review of transitions.	Iran.	n/a	n/a			X		X		
Maremmani et al., (2009)	Cross-sectional study.	Italy.	59 heroin addicts on OST.	39.0%						X	
Mars et al., (2014)	Qualitative interviews & ethnography.	Philadelphia and San Francisco.	41 injectors.	48.7%		X	X				
Mason et al., (2004)	Case study of drug use.	USA.	1	100%						X	
Mayer et al., (2008)	Review of HIV ecology.	Global.	n/a	n/a					X	X	
McAuliffe and Gordon (1974)	Cross-sectional study	Baltimore, USA	64 heroin addicts.	4/64						X	

McCurdy et al., (2005)	Qualitative interviews.	Dar es Salaam, Tanzania.	51 IDU.	35.2%		X	X		X		
McLeroy et al., (1988)	Theory of ecological model.	Global.	n/a	n/a						X	
Merson et al., (2008)	Review of HIV epidemic	Global.	n/a	n/a					X		
Merton R. (1957)	Theoretical book chapter on social theory.	Global.	n/a	n/a						X	
Messersmith et al., (2015)	Qualitative interviews.	Kumasi, Ghana	30 injecting drug users	33%					X		
Miller et al., (2008)	Qualitative study (interviews).	Tijuana and Ciudad Juarez, Mexico.	43 heroin injectors.	44.1%				X	X		
Mimiaga et al., (2010)	Qualitative study (focus groups)	Kiev, Ukraine	16 IDU.	31%				X	X		

Money (1973,1985).	Theoretical papers on gender.	Global.	n/a	n/a						X	X
Montain et al. (2016)	Cross sectional, regression.	Vancouver, Canada.	1639 HIV-negative IDU.	16%					X		
Morris et al., (2012)	Cross-sectional.	Tijuana, Mexico	1,052 IDUs ^β	14%		X					
Nasir and Rosenthal (2009)	Qualitative (interviews).	Makassar, Indonesia	18 male IDUs	0%		X	X	X	X		
Neaigus A, et al. (2006)	Prospective cohort study.	New York, USA.	369 non-injecting heroin users.	34.4 %		X	X				
Neaigus et al., (2001)	Cross-sectional analysis.	New York City, USA.	575 former IDUs and non-injectors.	29%			X	X			
Nutt (1996)	Theory of addiction (review).	Global.	n/a	n/a				X		X	
O'Keefe et al., (2016)	Cross-sectional	Australia.	691 heroin injectors.		X		X	X			

Padian et al., (2011)	Review of HIV prevention.	Global.	n/a	n/a				X	X	
Papworth et al., (2013)	Epidemiological review.	West and Central Africa.	n/a	n/a				X		
Pinkham and Malinowska-Sempruch. (2008)	Review of harm reduction.	Global	n/a	n/a				X		X
Pugatch et al., (2001)	Retrospective cohort study.	Rhode Island, USA.	201 heroin IDUs and non-injectors.	36%		X				
Rathod et al., (2005)	Cohort study.	South East England.	86 heroin injectors.	Not reported			X	X		
Rhodes (2009)	Review/perspective on harms of drug use.	Global.	n/a	n/a				X		
Rhodes et al. (2011)	Qualitative.	Moldova.	42 heroin injectors.	24%		X	X			

Rhodes et al., (2015)	Mixed-method (modelling, qualitative)	Kenya.	109 IDU and 43 with stakeholders.	30%					X		
Rhodes et al., (2003)	Qualitative study.	Togliatti, Russia.	57 IDUs.	40%				X	X		
Rhodes et al., (2012)	Theoretical perspective of HIV 'risk'.	Global.	n/a	n/a					X		
Robins et al., (1974)	Retrospective cohort study.	Various cities, USA.	943 war veterans.	0%				X			
Robins and Slobodyan (2003)	Retrospective cohort study.	Various cities, USA	374 Vietnam war veterans	0%				X			
Rossow and Lauritzen. (1999)	Cross-sectional study.	Norway (national sample).	2051 drug addicts on treatment.						X		
Roy et al. (2011)	Prospective cohort, & regression.	Quebec, Canada.	946 street youth.	25.6%		X	X				X

Sallis et al. (2008)	Review of ecology of health.	Global.	n/a	n/a						X	
Shahram (2016)	Systematic review.	Canada	n/a	n/a	X					X	X
Shahram et al., (2017)	Qualitative.	British Columbia.	17 pregnant substance users.	100%						X	X
Sherman SG, et al. (2002)	Qualitative interviews.	Baltimore, USA	19 heroin users	45%		X					
Simmons et al., (2012)	Qualitative (ethnographic interviews).	New York.	25 couples.	50%		X					X
Skog (1999)	Theory of addiction (review).	Global.	n/a	n/a						X	
Small et al., (2009)	Qualitative study nested in a cohort study.	Vancouver, Canada.	26 street-involved youth.	46.1%		X	X				

Stokols (1992)	Theoretical hypothesis.	Global.	n/a	n/a						X	
Stokols (1996)	Theoretical hypothesis.	Global.	n/a	n/a						X	
Strang et al., (1990)	Book chapter (review) on trajectories.	Global.	n/a	n/a	X				X		
Swift et al., (1999)	Cross sectional survey.	Sydney, Australia.	200 heroin users	28%			X	X			
Szapocznik and Coatsworth (1999)	Theory on eco-development (book chapter).	Global.	n/a	n/a	X					X	
Teruya and Hser (2010)	Review of trajectories	Global.	n/a	n/a	X						
Tretter (1998)	Theoretical perspective on social ecology.	Global.	n/a	n/a	X					X	
Tuchman (2015)	Qualitative interviews).	New York, USA.	26 female injectors.	100%		X	X				X

UNODC. (2015)	Grey report (World Drug Report).	Global.	n/a	n/a	X			X			X
van Ameijden et al., (1994)	Nested case control in a prospective cohort.	Amsterdam, Holland.	184 non injecting drug users.	44%	X		X		X		
Walker (1991)	Review of trajectory framework for diabetes mellitus.	Global.	n/a	n/a	X						
Wallace (1999)	Theoretical literature review.	USA.	n/a	n/a	X					X	
Weinberg (2000)	Hypothesis from meta- synthesis of qualitative data (theory).	USA.	Not reported.	Not reported	X					X	
Werb et al., (2009)	Cross- sectional.	Bangkok, Thailand.	252 drug users ^β .	26.2%				X	X		

Werb et al., (2010)	At-Risk Youth Study(ARYS cohort study).	Vancouver, Canada.	222 street youths.	29.3%				X			
Williams et al., (2007)	Cross-sectional study.	Dar es Salaam, Tanzania	360	34.1%				X	X		X
Woodcock , et al., (2015)	Prospective cohort.	Detroit, USA .	562 out-of-treatment heroin IDUs.	29.9%			X	X			
Yuferov et al., (2010)	Review of addiction.	Global.	n/a	n/a						X	
Zamudio-Haas, et al., (2016)	Qualitative (interviews).	Dar es Salaam, Tanzania.	19 IDU on OST and 6 stakeholders.	68%				X	X		X

Abbreviations and symbols

IDU(s)= injecting drug user (s); n/a = not applicable; OST=opioid substitution therapy; UK= United Kingdom; USA= United States of America.

^β Samples used polydrug users of substances such as cocaine, opioids, amphetamines, cannabis, but included injectors.

Appendix 3. Primary study Research Authorization Certificate.



**NATIONAL COMMISSION FOR SCIENCE,
TECHNOLOGY AND INNOVATION**

Telephone: +254-20-2213471,
2241349, 310571, 2219420
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Email: secretary@nacosti.go.ke
Website: www.nacosti.go.ke
When replying please quote

9th Floor, Utalii House
Uhuru Highway
P.O. Box 30623-00100
NAIROBI-KENYA

Ref: No.

Date:

4th February, 2015

NACOSTI/P/15/8861/4510

James Ngerere Ndimbii
Kenya Aids NGOs Consortium (KANCO)
P.O. Box 69866-00400
NAIROBI.

RE: RESEARCH AUTHORIZATION

Following your application for authority to carry out research on "*Social determinants influencing access of sexual reproductive health among Female PWID in Kenya*" I am pleased to inform you that you and your co-researchers namely:

1. Onesmus Mlewa Kalama
2. Sylvia Awuor Ayon

have been authorized to undertake research in **Kilifi and Mombasa Counties** for a period ending **31st August, 2015.**

You are advised to report to **the County Commissioners, the County Directors of Education and the County Coordinators of Health, Kilifi and Mombasa Counties** before embarking on the research project.

On completion of the research, you are required to submit **two hard copies and one soft copy in pdf** of the research report/thesis to our office.


SAID HUSSEIN
FOR: DIRECTOR-GENERAL/CEO

Copy to:

The County Commissioner
Kilifi County.

National Commission for Science, Technology and Innovation is ISO 9001: 2008 Certified

Appendix 4. Demographic questionnaire (women who inject drugs).

Demographic characteristics-to be asked at the end of the interview

Age

No of Children

Period using drugs

Period injecting drugs

Type of drugs mainly used

Highest level of education

Primary

Secondary

Post-secondary

Religion

Where has been your main residence in the last three months?

How do you mainly earn your income?

Ever tested for HIV?

When was the last time you tested for HIV?

Did you get your results?

Where did you go for your test?

Are you comfortable sharing your results? Yes/No

If yes, what was your result?

Are you currently in a relationship?

How best can you describe it? (Married/ live-in partner/ casual partner
transactional partner/ commercial partner /other partner)

Does your current main sex partner inject drugs? Yes/No

When was the last time you had sex?

Are you currently using condoms as a form of contraception? Yes/No

Are you currently using any other contraceptive? If yes, which one?

When was the last time you were provided with free needles for injecting? (month)

Have you ever been sexually harassed? Yes/No

Have you ever been sexually assaulted? Yes/No

Have you ever experienced other forms of violence from a partner/spouse?

How many sexual partners have you had in the last three months?

Appendix 5. In-depth interview topic guide (women who inject drugs).

Interview topic guide

Self-identity and other behaviours

If you were to introduce yourself to a new person, how would you describe yourself?

Is using drugs part of your identity?

How many of your friends also use drugs?

Have you ever had sex while high on drugs? If yes, when was the last time?

Were you on a contraceptive? If yes, which one?

Do you have sex to get money? [prompt for explanation if yes]

Do you have sex to get drugs? [prompt for explanation if yes]

Do you have sex to get protection? [prompt for explanation if yes]

Perceptions and preferences related to service provision

When was the last time you visited a clinic for sexual and reproductive health services? (Probe for contraception, STI screening, STI treatment, HTC, pre-natal and ante natal clinic, post abortal services)

Were you able to get the services you needed?

What did you like about the services received? What did you not like?

Does the gender of the health service provider matter when accessing services?

Are you in contact with outreach workers? If yes, what do you like most about the way in which they interact with you?

Now let's talk about the nature of services that you would prefer:

How far would you be willing to travel to access services? Is distance that you travel to access services a concern?

Have you ever been screened for Cervical cancer? Why? Do you know where to get these services?

Contraception

Which methods of contraception have you heard about? Where did you hear about them?

Are you currently using any method of contraception? If no, why not? (Probe issues around unmet contraception need)

If yes, which one? Why did you choose that one? What do you like about it? What do you not like about it? (probe issues around Comprehensive sexuality counselling and choice)

How did you get the current method that you are using? What was the process? How easy or hard was it to get it?

Have you ever used any other method of contraception? (probe around coercions, availability, gender)

STIs

Do you think you are able to identify symptoms of sexually transmitted infections? If yes, which ones? Where did you get this information from?

Have you ever had an STI, or thought that you had one? If yes, which one(s)? (probe for all mentioned) How did you manage it? How easy or hard was it to manage?

Have you ever needed SRH services, but you were unable to access them? Why were you not able to access?

How would you describe your sexual and reproductive health?

How do health service providers of SRH services relate with women who inject drugs?

Have you had an opportunity to get tested, or wanted to get tested for HIV while attending SRH services? What was notable about that experience?

Sexual partnerships

Can you describe the sexual partners you have had in the last six months? How many were they? Were they all similar partnerships? What was the difference? How can you describe your relationship with them?

As best as you can, please describe the relationship with your last sexual partner

Do you discuss sexual and reproductive health issues with your friends? Injecting partners/other drug users? How easy or hard is it?

Do you discuss SRH with your sexual partner(s)? how easy or difficult is it?

Have you ever conceived unintentionally? How did you manage the pregnancy?

What are your thoughts on abortion? What do your friends have to say about it?

For those with children/Pregnancy

Can you describe to me about your last pregnancy experience?

Were you using drugs when you were pregnant?

Were you injecting? What were you injecting? Did you have access to SRH services? Did you have access to Methadone? From where did you give birth?

Who assisted?

Did your child get the necessary post-natal care? Was the child able to receive all the immunizations and vaccinations necessary?

Appendix 6. Focus group topic guide (women who inject drugs).

Focus Group Topic Guide

First go through the preliminaries and study information (Sheet A)

Broad questions for exploration:

Let's start with a broad question: What are the biggest challenges you face today?

What are the major SRH health issues faced by women who inject drugs?

Are there programmes that are currently addressing these needs?

Are you able to get services from these programmes?

Are these needs usually addressed? How are they addressed? Are there gaps?

Are you able to get information on: STIs prevention and management, contraception, ante natal and post-natal care, HIV testing and care, cervical cancer screening?

How easy or difficult is it to get such information?

How are you able to get this information?

Are there any barriers to getting SRH information?

Are you able to get services in relation to STIs prevention and management, contraception, ante natal and post-natal care, HIV testing and care, cervical cancer screening?

From where do you get these services?

Giving specific example, could you comment on how easy or difficult is it to get such services? (probe barriers)

What can be done to make access to SRH services easier for women who inject drugs?

Let's talk about what it's like to be a HIV positive woman who injects drugs:

What impact does having HIV have on a woman who is already injecting drugs?

Could you give examples to illustrate? (probe if there is double stigmatization, disclosure problems and relationship with family and peers, and friends)

Appendix 7. In-depth interview guide (key stakeholders).

Key stakeholder interview topic guide

How would you describe your role in relation to people who inject drugs?

What would you say are the major health changes in the last 2 years?
(researcher probe)

How would you describe reproductive health among women who use drugs?

Do you consider sexual and reproductive health among women who inject drugs a priority?

Do women who inject drugs consider their sexual reproductive health a priority?

What are the main sexual and reproductive health needs and priorities of women who inject drugs?

How would you rate the current responses to sexual reproductive health among female who use drugs?

Do women access sexual and reproductive services? What services do they access?

How would you describe the community response to the sexual and reproductive health needs of women who inject drugs?

In your opinion what do you think can be done to facilitate access to sexual and reproductive health services to women who inject drugs?

Is there anything you would like to add?

Appendix 8. Data sharing agreement.



DATA SHARING AGREEMENT

PREAMBLE

A data sharing agreement allows a researcher to share a limited data set with a colleague or another person or entity not associated with the primary study or research institution, or for the purpose of secondary analysis.

PURPOSE AND PARTIES

This data sharing agreement ('agreement') is between Dr. Gitau Mburu, of the University of Lancaster ('researcher'), and the investigators of the social determinants of sexual and reproductive health of women who inject drugs study ('*the SRH FIDU Study*').

This agreement establishes data sharing, authorization and limits of use of data arising from *the SRH FIDU Study*, with respect to data sharing, broad areas of exploration, confidentiality and publications.

BACKGROUND

1. **Whereas** data related to the above SRH FIDU Study was conducted in 2015.
2. **Whereas** the researcher was a named collaborator of the primary study, having been involved in the drafting of the protocol and data collection instruments pertaining to the SRH FIDU study.
3. **The researcher** now desires access and utilize the data in order to conduct secondary analyses as described below.

TERMS AND PROVISIONS

1. Data sharing

Investigators agree to provide the researcher with a copy of the original data detailed below for the purpose of secondary analysis according to researcher's approved research plan (the 'Analysis') within his Phd studies at the University of Lancaster. Data provided are as follows:

- Original interview and FGD transcripts
- Audio recorded interview and FGD data
- Copies of original proposal
- Research authorization documents 68541
- Others (please specify)

2. Confidentiality

Data provided by the investigators constitute confidential information. By signing this agreement, the researcher agrees to keep all data relating to the *SRH FIDU* study confidential and to securely store it within password protected folders and files, and not to use the data to attempt to obtain or derive information relating to an identifiable individual.

By signing this agreement, the researcher agrees that he will use the data for the agreed purpose and associated PhD obligations and will not transfer it to third parties, except for the purposes of PhD supervision. The researcher shall not to pass the data sets (or copies of them) to third parties without express permission of the investigators and without those third parties also having signed this agreement.

3. Liabilities

The investigators make no representations or warranties regarding the suitability of the data provided to Researcher for the analysis. By signing this agreement, the researcher agrees that he data set is provided on an "as is" basis and without warranty or liability of any kind.

4. Ethical review and responsibilities

Researcher agrees that he will inform the research team immediately (and will also inform any regulatory authority) of any ethical and confidentiality concerns identified as part of the analysis, who may take appropriate action regarding such confidentiality or safety concerns. Researcher agrees to comply with any additional requirements identified by Lancaster University Ethical Review Committee which will approve the analysis plan. By signing this agreement, the researcher agrees to use the dataset only as permitted by this agreement, or as required by law, or the Lancaster University Ethical Review Committee.

5. Broad areas of exploration

By signing this agreement, the researcher agrees to utilize the data to explore a possibility of research questions within the domains outlined below, the final determination of which will be contained in the proposal submitted for ethical approval. The researcher agrees to implement any required, appropriate and ethical tools and methodologies for the purpose of conducting the analysis.

Analysis	Research domains	Illustrative research questions	Role of researcher
Primary analysis	Sexual and reproductive health (including contraception, unwanted pregnancy, pregnancy experiences; cervical cancer screening prenatal and post-natal healthcare utilization)	What are the specific SRH needs of females who inject drugs in Kenya?	Collaborating author (with investigators)
		What are the social determinants for access to sexual reproductive health among females who inject drugs in Mombasa and Kilifi?	Collaborating author (with investigators)
		What factors hinder access to sexual and reproductive health among women who inject drugs?	Collaborating author (with investigators)
	Children of women who inject drugs	How can the contexts and social protection needs of children of women who inject drugs be described?	Collaborating author (with investigators)
Secondary analysis	Drug use patterns	What are the patterns of drug use in the sample?	Exclusive Phd analysis
	HIV risks	How do the social contexts and drug use patterns contribute to HIV vulnerabilities of the sample?	Exclusive Phd analysis
	Access to health and HIV services	General facilitators and barriers of access to HIV, health and harm reduction services of the sample	Exclusive Phd analysis
	Other, TBD	As approved in the final research plan	Exclusive Phd analysis

6. Publication

The researcher agrees to collaborate with the investigators to generate scientific peer reviewed journal publications related to the primary research questions, and may involve them to co-author publications arising from the completed secondary analysis, or provide a reference citation upon completion of secondary analysis and publication of thesis or papers. Researcher agrees to share published outcomes of the analysis with the investigators to provide reasonable assistance to utilize and implement any recommendations to improve services and inform policy related to provision of services for women who inject drugs in the study context. Ownership and copyright of peer reviewed publications shall be governed by intellectual property rules governing thesis and journal publications. The researcher shall only use the data solely for non-commercial purposes.

7. Effective dates, term and termination

This data sharing agreement is effective as of 13th February 2017. The term of this Agreement shall commence as of the effective date and terminate 5 years from effective date, or following completion of analysis, whichever is later. The principle investigators may terminate this agreement at any time by providing thirty (30) days prior written notice to researcher on reasonable basis of the researcher having breached a material condition of this agreement. IN WITNESS WHEREOF, each of the undersigned has caused this agreement to be duly executed in its name and on its behalf.

By: [Signature] Print Name: ONESMUS KAZAMA Print Title: PRINCIPLE INVESTIGATOR
 By: [Signature] Print Name: SYLVIA AYON Print Title: CO INVESTIGATOR
 By: [Signature] Print Name: JAMES HSIMBI Print Title: CO INVESTIGATOR
 By: [Signature] Print Name: GITAU MBURU Print Title: RESEARCHER

Appendix 9. Secondary analysis ethical approval.



Applicant: Gitau Mburu
Supervisor: Paula Holland and Mark Limmer
Department: Health Research
FHMREC Reference: FHMREC16082

24 April 2017

Dear Gitau

Re: Patterns of drug use and HIV risks among women who inject drugs in Kenya: secondary analysis of quantitative and qualitative data

Thank you for submitting your research ethics application for the above project for review by the Faculty of Health and Medicine Research Ethics Committee (FHMREC). The application was recommended for approval by FHMREC, and on behalf of the Chair of the Committee, I can confirm that approval has been granted for this research project.

As principal investigator your responsibilities include:

- ensuring that (where applicable) all the necessary legal and regulatory requirements in order to conduct the research are met, and the necessary licenses and approvals have been obtained;
- reporting any ethics-related issues that occur during the course of the research or arising from the research to the Research Ethics Officer at the email address below (e.g. unforeseen ethical issues, complaints about the conduct of the research, adverse reactions such as extreme distress);
- submitting details of proposed substantive amendments to the protocol to the Research Ethics Officer for approval.

Please contact me if you have any queries or require further information.

Tel:- 01542 592838

Email:- fhmresearchsupport@lancaster.ac.uk

Yours sincerely,

A handwritten signature in black ink that reads "Diane Hopkins".

Dr Diane Hopkins
Research Integrity and Governance Officer, Secretary to FHMREC.

Appendix 10. Statement on the candidate's role.

This thesis is based on a secondary analysis of qualitative data from a primary study that focused on sexual and reproductive health of women who inject drugs in coastal Kenya. The candidate was involved in the conceptualisation of the primary study from its inception in 2015. Alongside the primary study investigators, the candidate contributed to the design of the primary protocol, data collection tools, and primary analyses. Publications resulting from the primary study are noted at the beginning of this thesis.

Following the primary study, the candidate independently conducted secondary analysis of the primary dataset, focusing on the determinants of drug use trajectories and HIV risks among the sample, upon which this thesis is based. In February 2017, the candidate agreed with the primary research team to conduct the present secondary analysis independently. The terms of his access and use of the primary dataset for this purpose are documented in a data sharing agreement appended to this thesis (**Appendix 8**). Starting in May 2017, the candidate conducted this secondary analysis guided by a new theoretical framework. The candidate also drafted several first-authored papers based on this thesis. All submitted papers (noted at the beginning of this thesis) were conceptualised, analysed and written by the candidate.

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