MINISTRY OF HEALTH

GEOGRAPHIC MAPPING OF MOST AT RISK POPULATIONS FOR HIV (MARPs) IN KENYA

National STI/AIDS Control Programme (NASCOP) and National AIDS Control Council (NACC)

June 2012

Geographic Mapping of Most at Risk Populations (MARPs) for HIV Collaborating

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- National AIDS Control Council (NACC)
- University of Manitoba, Centre for Global Public Health (UoM CGPH)
- Kenya AIDS Control Project, Universities of Manitoba and Nairobi (KACP)
- Centre for HIV Prevention and Research, University of Nairobi (CHIVPR)
- Impact Research and Development Organisation (IRDO)
- Hope Worldwide Kenya (HWWK)
- International Centre for Reproductive Health, Kenya (ICRH-K)
- US Centers for Disease Control and Prevention (CDC)
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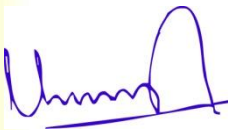
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Foreword

The high burden of HIV infections among Key Populations (KPs) (female sex workers (FSW), male sex workers (MSW) and people who inject drugs (PWIDs) in Kenya has been long recognized, but effective preventive interventions have largely not been taken to scale. This is partly due to a lack of accurate information on where KPs are based, their numbers, and the alignment of programme implementation with the locations where KPs operate. This report presents findings of a national geographical mapping exercise conducted in 2011/2012 to assess the locations and population size of KPs in Kenya, to facilitate targeted HIV prevention services for this population.

The approach used for the geographical mapping, consisted of interviews with secondary key informants to identify "hot" spots frequented by FSW, their operational dynamics and the estimated numbers of KPs in those spots. This was followed by validation of the estimates through interviews with KPs at each spot identified. The mapping covered Nairobi, the capital city of Kenya, and 50 other major urban centres in all of the traditional eight administrative provinces in Kenya, except North Eastern Province, situated near the border of Kenya and Somalia, which was excluded for security concerns.

This study represents the first single largest KPs size estimation exercise in Kenya. The data contained in this report can be used to enhance HIV prevention programme planning and implementation for KPs, to form the basis for impact evaluations, and to improve programme coverage by directing efforts to locations with the greatest need. Population estimates are however, not static. As programmes are scaled-up to serve KPs, these estimates will equally be updated.

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Acronyms

AIDS   Acquired Immune Deficiency Syndrome
CDC   Centers for Disease Control and Prevention, US
CGPH   Centrefor Global Public Health, University of Manitoba
CHIVPR Centre for HIV Prevention and Research, University of Nairobi
CI   Confidence Interval
FHI   Family Health International
FSW   Female Sex Worker
GDP   Gross Domestic Product
HIV   Human Immunodeficiency Virus
ICRHK   International Centre for Reproductive Health, Kenya
IDU   Injecting Drug Users
IRDO   Impact Research and Development Organization
KACP   Kenya AIDS Control Project
KAIS   Kenya AIDS Indicator Survey
KDHS   Kenya Demographic and Health Survey
KNBS   Kenya National Bureau of Statistics
KNASP   Kenya National HIV and AIDS Strategic Plan
MARPs   Mostatrisk populations for HIV
Max   Maximum
Min   Minimum
MSM   Men who have sex with men
MSWs   Male Sex Workers
NACC   National AIDS Control Council
NASCOP National STI and AIDS Control Programme
NCAPD   National Coordinating Agency for Population and Development
PEPFAR President's Emergency Plan for AIDS Relief (United States government)
PMTCT   Prevention of Mother to Child Transmission of HIV
PRB   Population Reference Bureau
RDS   Respondent Driven Sampling
SD   Standard Deviation
SPH   School of Public Health, University of Nairobi
STI   Sexually Transmitted Infection
ToT   Training of Trainers
UNAIDS Joint United Nations Programme on HIV/AIDS
UNODC   United Nations Office on Drugs and Crime
UoM   University of Manitoba
WHO   World Health Organization

Executive Summary

A national mapping study of most-at-risk populations (MARPs)for HIV infection in Kenya was conducted from October 2011 to February 2012. The MARPS of interest included female sex workers (FSWs), high risk men who have sex with men (including primarily male sex workers (MSWs) and men who have sex with men (MSM) who cruise sites frequented by men who sell sex), and injecting drug users (IDUs). The mapping covered seven of Kenya's eight administrative provinces, namely Nairobi, Coast, Central, Eastern, Rift Valley, Nyanza and Western. North Eastern province was excluded from the exercise due to security concerns, but extrapolations were made for size estimates of female sex workers in North Eastern province as well. The overall goal of the mapping exercise was to provide accurate information on the size, locations and characteristics of most-at-risk populations for HIV in key urban and semi-urban areas of Kenya, with a view to helping to improve the scale, quality and impact of HIV prevention programmes among these populations. The mapping approach used was a geographic one, and was different from that described in the World Health Organization and the Joint United Nations Programme on HIV and AIDS's (WHO &UNAIDS)*Guidelines on Estimating the Size of Populations Most at Risk to HIV* (2010), because the principal outcome of the exercise was to provide specific geographical locations where sexual activity among MARPs occurs, so that HIV prevention programmes for MARPs could identify the locations and use them as a basis for delivering prevention programmes and services. The specific objectives of the study were to:

1) Identify key locations where MARPs congregate and can be reached for HIV prevention programmes and services;

2) Describe the typology of MARPs (e.g. brothel-, street- or venue-based); and

3) Estimate the size of MARPs populations. The data generated through this geographic-based methodology provide an important starting point for micro-level planning HIV prevention programmes for MARPs, including the prioritization of cities/towns and locations for establishing MARPs programmes. The methodology applied involved collecting data at two levels:

Level 1, interviews were conducted with carefully selected secondary key informants to identify spots where MARPs may be found, their operational dynamics, and the estimated minimum, maximum and usual numbers of MARPs who frequent the spots;

Level 2 involved validation of the existence of the spots and size estimates through interviews with members of the most-at-risk populations themselves at the identified spots. Thisreport includes a detailed discussion of the mapping methodology.

The mapping exercise covered the entire city of Nairobi and at least seven major urban centres in each of the other provinces. In total, 51 urban centres, including Nairobi, were covered. The population of the urban centres selected for mapping outside of Nairobi represented 70% of the towns with 5,000 or more population in each province. A total of 11,609 secondary key informant interviews were conducted for Level 1 activityin the seven provinces, with more than 1,000 key informants per province. Data collected at Level 1 provided estimates for the different MARP groups, but it was only after Level 2 validation through interviews with FSWs, MSWs/MSM or IDUs from the identified spots that final estimates were derived. See the main report for more detail on Level 1 and Level 2 activities.

Female sex worker spots and population size estimates

Female sex workers were defined as women who exchange anal, vaginal and/or oral sex for money or other items of value, primarily with men (Ministry of Public Health and Sanitation, 2010). A total of 10,670 active FSW spots were identified through the mapping exercise, with about a quarter (24%) of these being in Nairobi and 17% each in Rift Valley and Western provinces. Of the 2,539 active FSW spots identified in Nairobi, 21% were located within Starehe constituency, which encompasses the Nairobi central business district, while 14% each were in Embakasi and Kasarani constituencies, both large and densely populated residential areas. A total of 774 active FSW spots were identified in Mombasa city, with 34% and 32% of these being in Kisauni and Changamwe constituencies, respectively.

The estimated population of FSWs in the towns mapped was 103,298 (range 77,878 to 128, 717). The estimated number of FSWs per province, based on the towns mapped, is presented in the figure below.
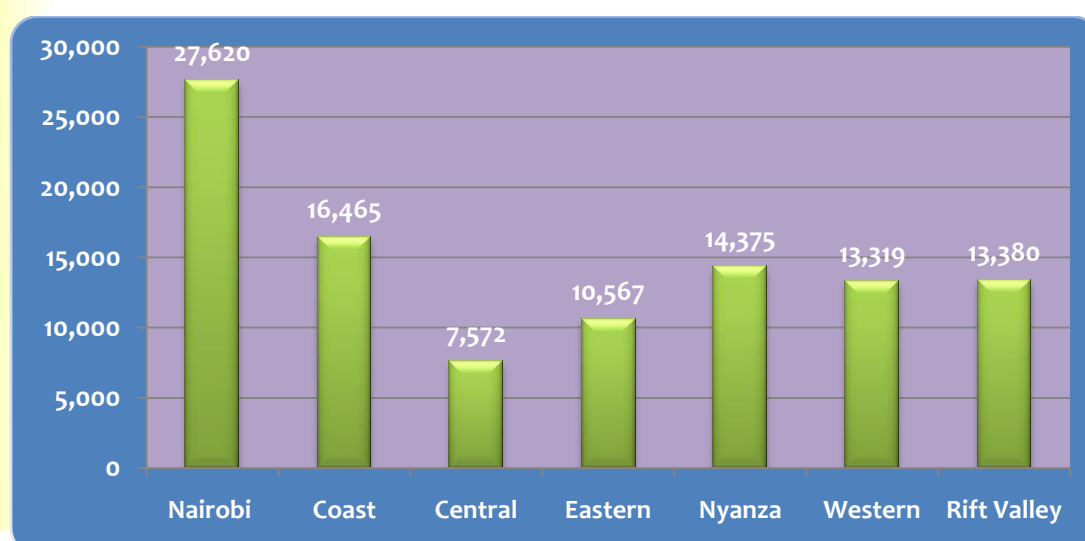
Estimated number of FSWs by province

The estimated number of FSWs was analyzed further by the type of spot from where they operate. Sex work spot typologies defined in Kenya's *National Guidelines for HIV/STI Programmes for Sex Workers* (2010) were used, namely: street-based, home-based, bar-based, road (truck stop)-based, sex den-based, venue-based, escort services and massage parlours. A detailed description of these typologies is included in the report. The figure below shows the distribution of FSWs in each of the provinces mapped by spot typology.
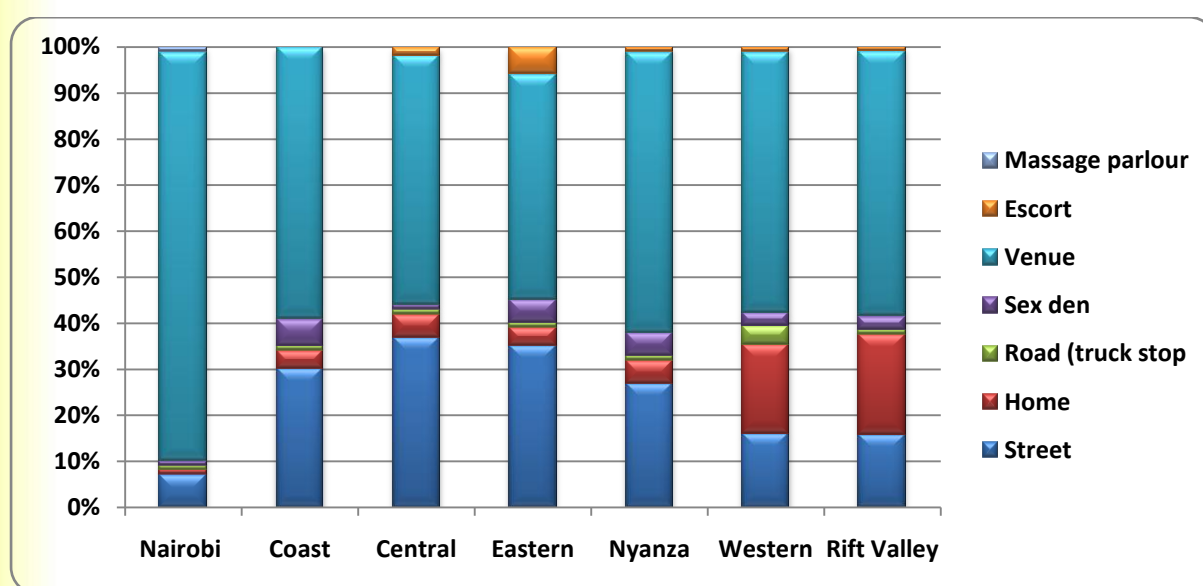
Proportional distribution of average number of FSWs by spot typology

Street-based FSWs as a proportion of all FSWs was higher in Central (37%), Eastern (35%), Coast (30%) and Nyanza (27%) provinces than in Western (16%), Rift Valley (16%) and Nairobi (7%) provinces. Venue-based FSWs were predominant in Nairobi (88%), while home-based FSWs were more common in Rift Valley (22%) and Western provinces (19%) than elsewhere. Coast (6%), Eastern (5%) and Nyanza (5%) provinces had the highest proportions of FSWs operating from "sex-dens". Truck-stop sex work was more common in Western province (4%), likely because of the truck stop towns at the border of Kenya and Uganda.

FSW population estimates were extrapolated to the national urban population. The extrapolated national estimate for the FSW population was 138,420 (range 107,552 to 169, 288). The table below displays the extrapolated and per capita FSW population by province.

Extrapolated and per capita FSW population by province

Province	Total population	Urban female population (15+ years)	Urban female population (15-49 years)	Extrapolated female sex worker population from mapping	Percentage of urban women (15+ years) sex workers	Percentage of urban women (15-49 years) sex workers
Nairobi	3,138,369	889,221	735,907	27,620	3%	4%
Central	4,383,743	491,124	368,343	13,584	3%	4%
Coast	3,325,307	415,929	346,007	19,778	5%	6%
Eastern	5,668,123	354,256	292,170	16,149	5%	6%
North Eastern	2,310,757	90,454	89,892	2,189	2%	2%
Nyanza	5,442,711	375,965	333,573	19,406	5%	6%
Rift Valley	10,006,805	645,647	566,564	23,708	4%	4%
Western	4,334,282	192,213	174,408	15,985	8%	9%
Total	38,610,097	3,454,808	2,906,864	138,420	4%	5%

However, the proportion of urban women of reproductive age who could be sex workers varied among the individual towns mapped. Some towns had estimates of the percentage of urban women of reproductive age who could be sex workers of 20% or more, namely: Kisii (21%) and Bondo (20%), both in Nyanza province; Voi (22%) in Coast province; Webuye (20%) in Western province; and Maua (36%), Makindu (36%) and Emali (70%), all in Eastern province. This information underlines the importance of using local data to inform the provision of HIV prevention programmes and services.

MSW/MSM active spots and population size estimates

This mapping defined men who have sex with men (MSM) as "thosemales who have sex with males, regardless ofwhether or not they have sex with women or have a personal or social gay or bisexual identity" (UNAIDS, 2011). However, the focus of the mapping was onmale sex workers (MSWs), defined as"men who exchange sex for money or items of value withother men but may also exchange sex for money with women" (Ministry of Public Health and Sanitation [MOPHS], Kenya, 2010) and high-risk males who cruise pick-up locationslooking for male sex partners. A total of 1,585 spots frequented by MSWs/MSM were identified and validated through the mapping exercise.

Based on data from the towns mapped, anestimate of 10,033 (range 7,426 – 12,641) MSWs/MSM was made, with the majority (38%) being in Nyanza province, and 17% and 16%inNairobi and Coast provinces, respectively, as shown in the figure below.
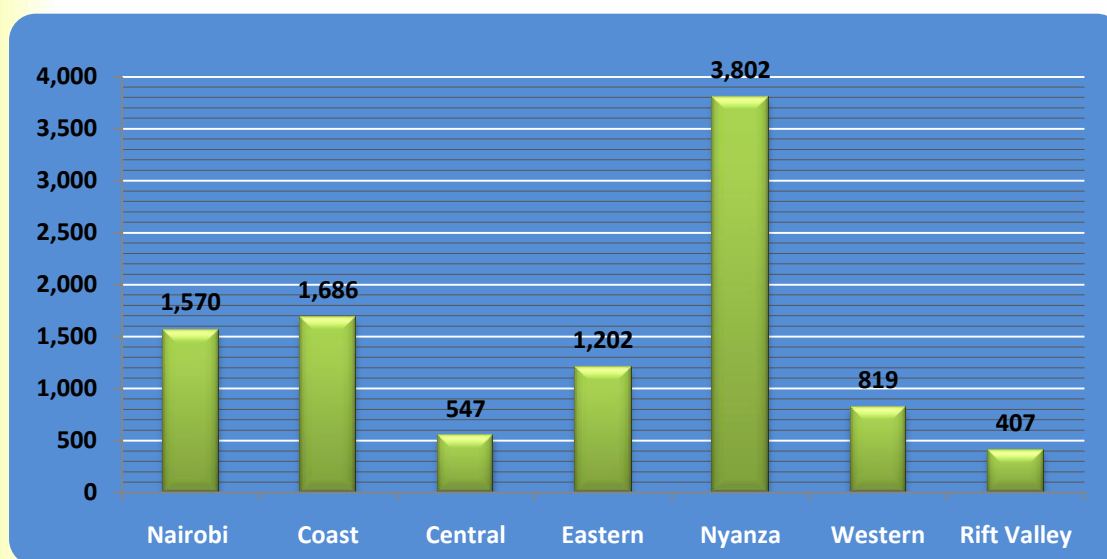
Estimated number of MSWs/MSM, by province

The MSW/MSM population estimates were not extrapolated to the national level. It is not entirely clear why Nyanza had a higher number of MSWs/MSM than the combined estimates for Nairobi and Coast provinces. Possible explanationsare that the mapping in that region might have captured lower-risk MSM as well, or that MSWs/MSM were more visible in that region. Indeed, NASCOP representatives have observed that Kisumu city has been known to be more tolerant to MSWs/MSM.

Similar to FSWs, MSW/MSM population estimates were further analyzed by the type of spot from where they operated, as shown in the figure below.
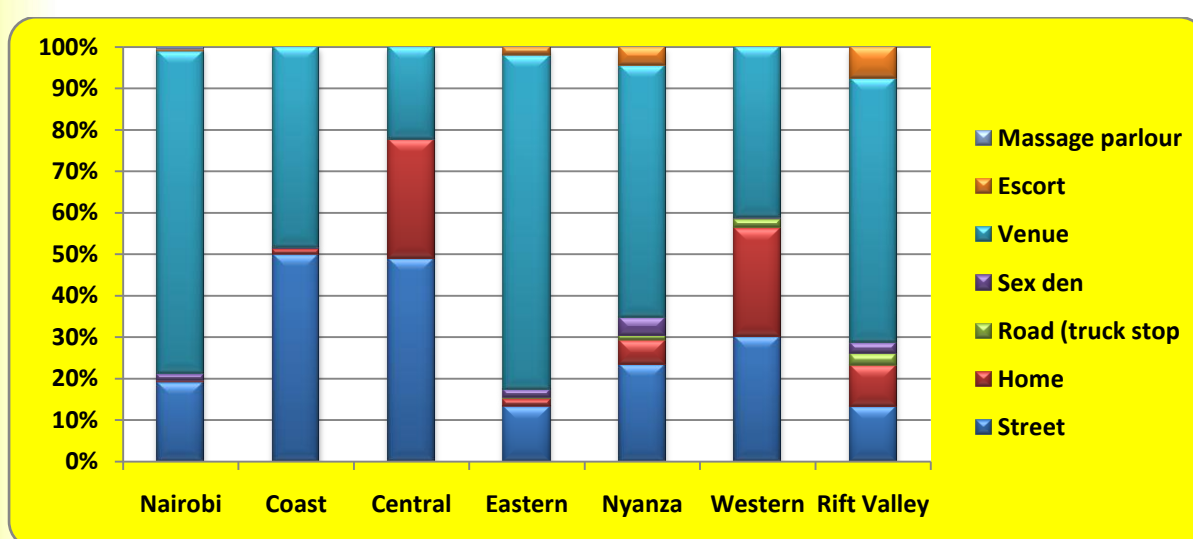
Proportional distribution of MSWs/MSM by typology of spot

Venue-based MSWs/MSM were more common in Eastern (81%), Nairobi (78%), Rift Valley (65%) and Nyanza (61%) than elsewhere. Street-based MSWs/MSM were more prevalent in Coast (50%) and Central (49%) than in the other provinces. Home-based MSWs/MSM were more common in Central (29%) and Western (26%) provinces, and to some extent, Rift Valley (10%) than in the other provinces. MSWs/MSM involved with escort service-based spots were generally few.

IDU spots and population size estimates

This mapping study captured active rather than ever-users of injection drugs. An injecting drug user was defined as a person who injects drugs for non-therapeutic purposes, irrespective of the type of drug injected (WHO, UNODC, UNAIDS technical guide for countries to set targets for universal access to HIV prevention, treatment and care for injecting drug users. World Health Organization 2009).

A total of 919 IDU spots were identified through the exercise, with Coast province accounting for 35% of the total number, followed by Nyanza and Western (both 17%) and Nairobi (16%). An IDU population of 7,850 (range 5,822 – 9,877) was estimated from the towns mapped, with 35% and 19% of the IDU population being in Coast province and Nairobi city, respectively. The IDU population estimates were not extrapolated to the national level. The figure below displays the distribution of estimated IDU population by province.
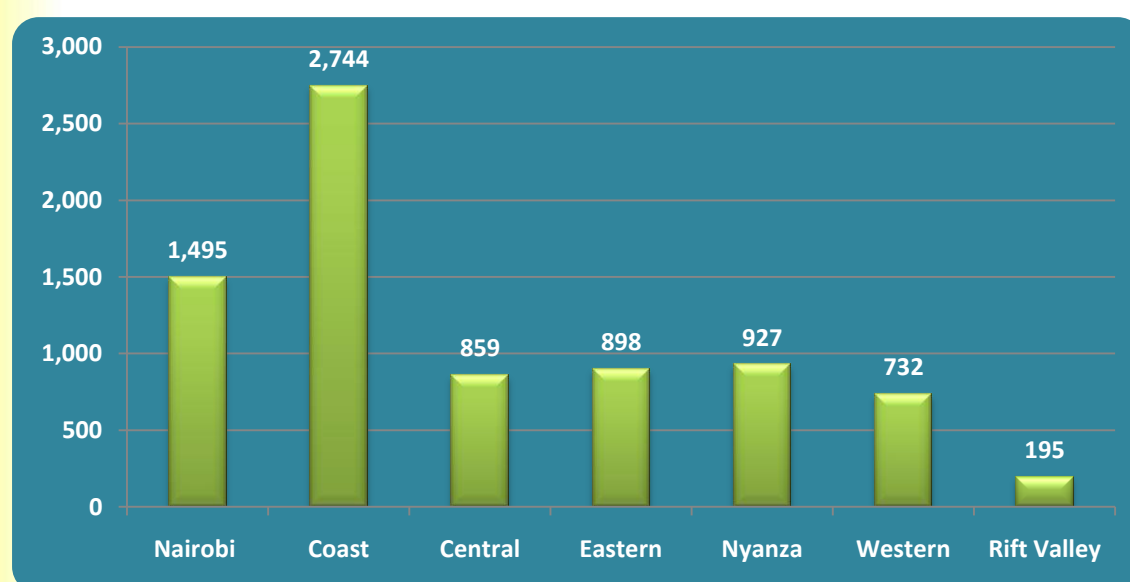
Estimated IDU population by Provinces

Unlike FSW and MSW/MSM spots, IDU spots were categorized into only two typologies: street-based and home-based/venue-based. Street-based IDU spots included all public areas, such as open fields, backstreets, unfinished buildings, etc., where IDUs meet for purposes of buying or injecting drugs. Injection drug use within the privacy of homes or at venues such as bars, night clubs, etc., were classified as a home/venue-based typology. Street-based IDUs were dominant in Coast (95%), Central (62%), Nairobi (61%) and Nyanza (57%) provinces. In contrast, home/venue-based IDUs were more prevalent in Western (85%), Rift Valley (73%) and Eastern (55%) provinces.

Limitations

Potential limitations of the geographic mapping approach that we used should be acknowledged. First, because the methodology initially identifies spots frequented by MARPs through secondary key informants, there is the possibility of missing some spots and either over- or under-estimating some MARP groups depending on the extent of their visibility. Second, the geographic mapping methodology relies on numeric estimates rather than a count of MARPs at the spots identified, which may lead to variability in the estimates derived. The methodology addresses this limitation through averaging estimates for spots identified by a large number of secondary key informants, and validating estimates for spots identified by the least number of secondary key informants through interviews with the MARPs themselves. Third, since the methodology is not individually based, it could overestimate the size of MARPs if MARPs frequent multiple locations. However, since the methodology is rapid and focuses on the minimum, maximum and usual number of MARPs at a spot on a given day, the range of estimates (minimum to maximum) is unlikely to be skewed substantially. Moreover, the final estimates derived are adjusted to reflect the extent to which MARPs frequent multiple spots, based on primary key informant interviews. Fourth, since the method relies on finding MARPs through locations, it can miss those who do not primarily operate at locations, or at locations that can be readily identified. However, it should be noted that in the context of planning HIV prevention programmes for MARPs, individuals who are disconnected from larger networks or congregations of other MARPs (e.g. solitary IDUs or MSM with low rates of partner change) tend to be at lower risk, and less strategically important for HIV prevention.

Conclusions

This study provides the first national level data for Kenya that can be used in HIV prevention programmes for MARPs for a variety of purposes, including: a) enumeration or registration of MARPs for programme planning purposes; b) identification and allocation of peer educators in programme sites; c) programme implementation planning; d) setting up individualized tracking systems for MARPs, for programme monitoring purposes; and e) as baseline figures for evaluation purposes.Indeed, two of the organizations contracted for the implementation of the mapping exercise are already applying the mapping data in their programmes to allocate peer educators to hot spots and set programme performance targets. One of these organizationshas also used the mapping protocol and data collection tools to conduct mapping in one of the towns in its area that was not included in the initial mapping exercise. As FSW, MSW-MSM and IDU spots can change rapidly, programmesshould update MARP estimates on at least an annual basis, and national mapping should be conducted with an interval of four to five years to track overall changes in populations' sizes.

1.   Background

1.2. Introduction

Kenya is situated in the eastern part of the African continent and is bordered by Ethiopia (north), Somalia (northeast), Tanzania (south), Uganda (west), and South Sudan (northwest). Kenya has an estimated population of 39 million, with an estimated annual population growth rate of 2.8 per cent. The country is divided into eight administrative provinces, which are to be transformed into 47 countiesaccording to the new constitution that came into effect in August 2010. The country has the region's largest economy and serves as a regional financial and transportation hub.

Kenya's economy is predominantly agricultural, with a strong industrial base.The country's gross domestic product (GDP) has fluctuated significantly since attaining political independence in 1963. The first decade of independence saw an annual GDP growth rate of 6.6 per cent, spurred largely by agricultural productivity. Economic performance in the 1980s stagnated and was sub-optimal in the 1990s, with annual growth of less than 2 per cent. From 2003 onwards, Kenya embarked on an ambitious economicgrowth programmesthat saw the growth recover to 2.8 per cent in 2003, 4.3 per cent in 2004, 5.8 per cent in 2005, 6.1 per cent in 2006 and a peak of 7.0 per cent in 2007. However, economic growth then slackened, declining to 2.0 per cent in 2008. There has been modest recoveryinannual economic growth since 2008, rising to 2.6 per cent in 2009,while the projection for 2011/2012 year was5 per cent. In 2008, the Government of Kenya launched a blueprint to transform the country into a newly industrialized middle-income status by 2030, called *Kenya Vision 2030*. Accordingly, Kenya's overall developmentprogrammes, including HIV and AIDS responses, are now aligned with this framework.

Since the first case of HIV was detected in Kenya in 1985, HIV prevalence peaked by the year 2000 at about 10 per cent, and now adult HIV prevalence has stabilized at about 6.3 per cent, according to the most recent Kenya Demographic and Health Survey (KDHS), 2008—2009. Kenya has been severely affected by the AIDS epidemic and is home to an estimated 1.4 million people living with HIV.About 1.2 million children have been orphaned by AIDS, and in 2009, 80,000 people were estimated to have died from AIDS-related illnesses.

Heterosexual sex is the primary mode of HIV transmission in Kenya, and the epidemic varies greatly across demographic groups and regions. According to the KDHS 2008-2009, HIV prevalence was 8.0per cent and 4.0 percent among women and men aged 15-49 years, respectively. The peak prevalence among women was at age 40-44 years (14 percent), while prevalence among men was highest at age 35-39 years (10 percent). HIV prevalence in Kenya also

shows regional heterogeneity, with Nyanza province having the highest prevalence, as shown in Figure 1 below.
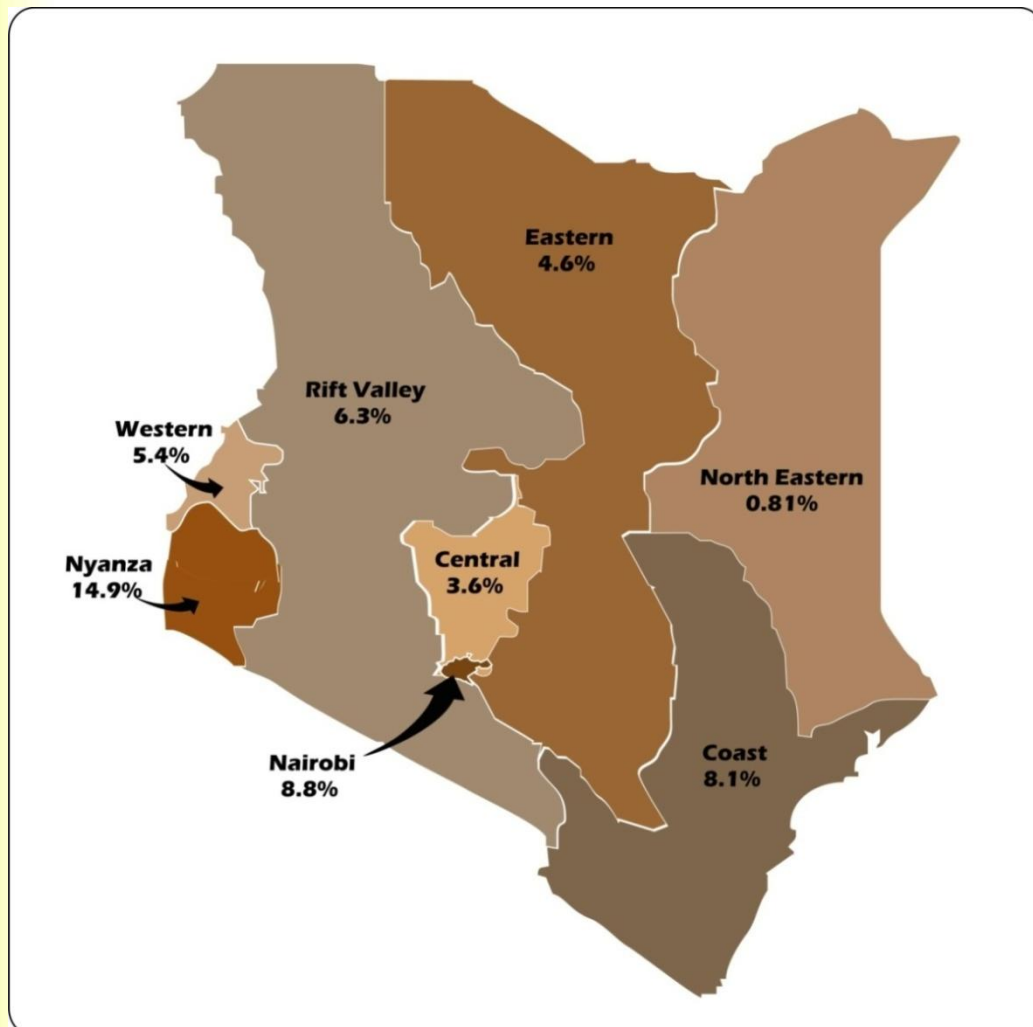
Figure 1: HIV prevalence by province, Kenya

Source: National AIDS/STI Control Programme (NASCOP), Kenya. (2009). *2007 Kenya AIDS Indicator Survey: Final Report.* Nairobi, NASCOP.

Self-reported data from recent national surveys, including the 2007 Kenya AIDS Indicator Survey (KAIS) and the KDHS 2008-2009, have shown promising improvements in behaviors that help slow the spread of HIV, including an increase in reported condom use, delay in sexual debut, and reduction in the number of sexual partners. However, there is recognition that intensified HIV prevention interventions targeting most at risk populations are necessary to bring the epidemic under control.

1.2. The History of HIV/AIDSin Kenya

Female sex workers were the first major group affected by the HIV/AIDS epidemic in Kenya, and a study conducted in 1985 reported that HIV prevalence was as high as 61 percent among a group of female sex workers in Nairobi (Ngugi et al., 1988).The Government of Kenya was quick to respond to the epidemic. One of the first responses was to publicize information and to launch a poster campaign urging people to use condoms and avoid unsafe sex. Subsequently, the Ministry of Health launched a health and education programme. HIV appeared to be spreading rapidly among the general population, and HIV prevalence among pregnant women in the capital Nairobi increased from 6.5 per cent to 13 per cent between 1989 and 1991. An estimated 100,000 people had already died from AIDS by 1994, and about 1 in 10 adults were infected with HIV.

HIV prevalence showed a peak in the general population in 2000 at 13.4 per cent and declined steadily to 6.9 per cent in 2006 (Cheluget et al., 2006). The decrease in prevalence coincided with the rapid expansion of preventive interventions since 2000, which resulted in changes in sexual behavior and increased use of condoms. The decline has also been attributed to the large number of people dying from AIDS in Kenya, which totaled 150,000 in 2003 alone, before the expansion of access to HIV treatment.

Currently, Kenya's HIV epidemic has been categorized as generalized, although it tends to differ according to location, sex and age. It has been estimated that nearly half of all new infections in 2008 were transmitted through heterosexual sex in the context of steady relationships, and 20 percent during casual heterosexual sex. Moreover, high HIV prevalence among some most at risk populations, including sex workers, injecting drug users (IDUs), and men who have sex with men (MSM), have been found. Altogether, these groups are estimated to have contributed a third of all new HIV infections in Kenya in 2008 (National AIDS Control Council [NACC], 2009). However, this may be an under-estimate, as it does not take into account upstream sources of infection among those in steady relationships. Other groups considered to be most at risk of HIV infection in Kenya include truck drivers and cross-border mobile populations.

1.3. Understanding the magnitude of MARPs in Kenya

Many people in Kenya are still not being reached with HIV prevention and treatment services. Just under half of adults who need treatment and only 1 in 3 children needing treatment are receiving it. Under the leadership of the National AIDS Control Council (NACC) and the National AIDS and STI Control Programme (NASCOP), HIV prevention services for most at risk populations (MARPs) in Kenya have expanded over the past one to two years, with new funding for HIV prevention directed at MARPs being provided by the US President's Emergency Plan for AIDS Relief (PEPFAR) programmes of the Centers for Disease Control and Prevention, US (CDC), and the United States Agency for International Development (USAID). Some MARP mapping

exercises have been undertaken in Nairobi, Mombasa and Kisumu and elsewhere over the past few years(Vuylsteke et al., 2010; Geibel et al., 2007; NASCOP, 2012), buthereare large gaps in mapping coverage, and more detailed information was deemed necessary to inform prevention programmeplanning and implementation. Both the Government of Kenya and prevention programme implementers agreed that there wasa critical need to develop a better understanding of MARP locations and size estimates throughout the country.The mapping exercise described in this report sought to expand and update current understanding regarding MARP size estimations and locations. Similar mapping exercises managed in recent years by the same mapping team in India, Pakistan, Sri Lanka, the Maldives and Bhutan have proven to be extremely useful in the planning and implementation of targeted interventions in those countries[1].

Recent strategic planning by Kenya's National AIDS Control Council (NACC) and the National AIDS and STD Control Programme (NASCOP) has identified some key national priorities for prevention. A principal aim of the Kenyan National HIV and AIDS Strategic Plan 2009/10 – 2012/13 (KNASP III) is to reduce the number of new HIV infections by using evidence-based approaches to HIV prevention. These priorities include scaling up focused behavior change interventions in most at risk populations, strengthening prevention programmes for positive persons, expanding male circumcision services, scaling up prevention of mother to child transmission of HIV (PMTCT) coverage and quality, and focusing on changing social norms around multiple/concurrent partnerships.

The strategy also emphasizes that implementation processes should be evidence-based to ensure that they are effective and will achieve a substantial population-level impact. To do this, there are two imperatives: 1) highly effective implementation structures and processes to ensure that key intervention packages can be scaled up with quality; and 2) a robust knowledge translation process to ensure that prevention strategies and programmes are science-based.

The first step in developing targeted interventions for most at risk populations is assessing their location, size and basic operational characteristics. As noted above, experience in diverse settings of South Asia including India, Pakistan, Sri Lanka, Bhutan and the Maldives has shown that structured mapping can provide accurate estimates of the size and location of MARPs, and thereby provide guidance for the scoping and targeting of HIV prevention programmes and services. Based on its wide experience, the World Bank and the University of Manitoba'sCentre for Global Public Health, partnered with NASCOP, NACC, the University of Nairobi and other partners to conduct a geographic mapping of MARPs in Kenya. This report presents the findings of the mapping study.

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[1] See for example "National STD/AIDS Control Program, Ministry of Healthcare and Nutrition, Sri Lanka, UNAIDS, World Bank and University of Manitoba. Mapping key populations for HIV prevention in Sri Lanka", March 2010.

2. Geographic Mapping Methodology

2.1. Key Objectives:

The overall goal of the mapping exercise was to provide accurate information on the size, locations and characteristics of most at risk populations for HIV (MARPs) in key urban and semi-urban areas of Kenya, with a view to improving the scale, quality and impact of HIV prevention programmes among these populations. The specific objectives were:

1. To complete a geographic mapping of the locations of female sex workers, injecting drug users and high risk men who have sex with men in selected urban and semi-urban centres in Kenya.

2. To estimate the population sizes of the MARPs, and describe the operational typology of MARPs in each location.

2.2. Included most at risk populations

The following populations were targeted for mapping, based on HIV epidemiological data and HIV prevention priorities in Kenya.

- Female sex workers, including all sub-typologies.
- High risk men who have sex with men, including primarily male sex workers, and males who cruise pick-up locations looking for male sex partners.
- Injecting drug users.

2.2.1. Female sex workers

Kenya's *National Guidelines for HIV/STI Programmes for Sex Workers* (Ministry of Public Health and Sanitation, 2010) defines female sex workers as, 'women who exchange anal, vaginal and/or oral sex for money or other items of value primarily with men.' Female sex work is the most prominent type of sex work in Kenya. A number of typologies of sex work spots e.g. street-based, home-based, bar-based, road (truck stop)-based, sex den-based, venue-based, escort services and massage parlours,have been identified in previous studies and in the national guidelines, and all of these typologies wereexplored in the currentmapping exercise. A description of the sex work spot typologies is provided below.

Typologies of sex work spots

Street-based
- Streets, car parks and/or other public places where sex workers solicit clients. Sexual services are provided in the street, in the car, brothels, homes or hotels.
- Taxi drivers or bar owners may facilitate access to sex workers, but most street-based sex workers operate independently.

Home-based
- Exchange of sex for money in one's home.
- Allows the individual sex worker and client to retain their privacy.
- Clients contact sex workers directly and set up appointments to meet with them or frequent the home of known sex workers.

Road (truck stop)
- Sexual services are provided in lodgings along the road or in the trucks. Sex is exchanged with the truck drivers for cash, transport or accommodation.
- Sex workers usually operate independently from the truck stop without gatekeepers or "controllers".

Sex den
- An establishment with a number of rooms that clients and sex workers can use for sexual activities (similar to a brothel, but it is not regulated).
- Clients visit the sex den to drink and make contact with the sex workers.
- The client may use a room at the sex den or take the sex worker to another location.

Venue-based
- A designated structure or location where sex workers exchange sex for money.
- Includes locations such as bars, hotels, areas around flower farms, and other locations where a large number of people, especially men, congregate.

Escort service
- The most discreet type of spot.
- Escort services are usually run by a management team that requires a certain percentage of the money sex workers receive from clients.
- Clients usually contact an escort (i.e. sex worker) by calling a listed phone number, through a contact, hotel staff or online.
- Services are provided at the client's home or a hotel room.

Massage parlour
- Massage parlours are premises licensed and opened to the public for the provision of massage services.
- Massage parlour owners usually facilitate this interaction and require a portion of the money given to the sex worker by the client.

Source: Ministry of Public Health and Sanitation, Kenya (2010). *National Guidelines for HIV/STI Programmes for Sex Workers.*

2.2.2. High-risk men who have sex with men

This mapping, defined men who have sex with men (MSM) as "thosemales who have sex with males, regardless ofwhether or not they have sex with women or have a personal or social gay or bisexual identity" (UNAIDS, 2011). However, the focus on the mapping was onmale sex workers (MSWs), defined as"men who exchange sex for money or items of value withother men

but may also exchange sex for money with women" (Ministry of Public Health and Sanitation [MOPHS], Kenya, 2010) and males who cruise pick-up locations looking for male sex partners. The definition of high-risk men who have sex with men did not include those men who might have had sex with other men as part of sexual experimentation or very occasionally depending on special circumstances.

2.2.3. Injecting drug users

An injecting drug user is defined as a person who injects drugs, for non-therapeutic purposes, irrespective of the type of drug injected. This mapping study focused on active injectors only, rather than previous injectors.

2.3. Study sites

The mapping of MARPs in Kenya coveredseven out of the eight administrative provinces in Kenya: Nairobi, Central, Eastern, Nyanza, Western, Coast and Rift Valley. North Eastern province was excluded because of security concerns. All of Nairobi was mapped, and within each of the other provinces covered, at least seven major towns and municipalities were selected for mapping. The population of the urban centres selected for mapping outside of Nairobi represented 70 per centof the towns with 5,000 or more population in each province. Because of time and resource constraints, it was not possible to include the remaining towns with 5,000 or more population. However, province-wide size estimates were made through modeling, extrapolated from the towns that were mapped. The factors taken into account in the selection of urban and semi-urban locations in each province for mapping were as follows:

1. Headquarters of the old districts (some are current counties in Kenya's evolving administrative structure).
2. Population of at least 5,000 people in the headquarters.
3. Local knowledge of HIV prevention programme implementers on areas where MARPs may be found.

A total of 51 towns spread across the seven provinces were selected for mapping, in consultation with NASCOP and other local partners. The towns selected for mapping in each province are listed in Table 1, with additional data on their core urban population, based on the 2009 population census.

Table 1: Urban centre's selected for mapping of MARPs in Kenya, 2011

Province	Districts	Selected urban centres	Core urban population (2009 census)
Nairobi	All eight administrative districts: Kasarani, Embakasi, Dagoretti, Makadara, Langata, Starehe, Kamukunji and Westlands	Entire City	3,133, 518
Central	1. Kiambu East	Kiambu Municipality	76,093
	2. Nyeri North/South	Nyeri Municipality	63,626
	3. Thika West	Thika Municipality	136,576
	4. Ruiru	Ruiru Municipality	236,961
	5. Kirinyaga Central	Kerugoya Municipality	16,369
	6. Nyandarua North	Nyahururu Municipality	31,952
	7. Muranga North	Muranga Municipality	23,949
Eastern (Upper)	1. Embu	Embu Municipality	35,736
	2. Chuka	Chuka Township	7,971
	3. Imenti North	Meru Municipality	38,833
	4. Igembe	Maua Municipality	15,536
Eastern (Lower)	1. Machakos	Machakos Municipality	41,917
	2. Machakos	Mavoko Municipality	110,396
	3. Kibwezi	Makindu Town	7,884
	4. Nzaui	Emali Town	7,024
	5. Machakos	Matuu Town	5,888
	6. Kitui	Kitui	20,419
Coast	1. Mombasa	Mombasa City	915,101
	2. Kilifi	Kilifi Municipality	44,257
	3. Kilifi	Mtwapa Township	48,625
	4. Kilifi	Mariakani Township	24, 055
	5. Taita Taveta	Voi Township	17,152
	6. Taita Taveta	Taveta Township	17,465
	7. Malindi	Malindi Township	84,150
	8. Ukunda	Ukunda	60,971
Nyanza	1. Kisumu	Kisumu City	259, 258
	2. Bondo	Bondo Township	14,745
	3. Siaya	Siaya Municipality	20, 923
	4. Kisii	Kisii Municipality	61, 892
	5. Migori	Migori Municipality	53, 100
	6. Nyamira	Nyamira Township	12, 719
	7. Homa Bay	Homa Bay Municipality	28, 361
Western	1. Kakamega	Kakamega Municipality	69, 502
	2. Bungoma East	Webuye Township	23, 318
	3. Bungoma South	Bungoma Municipality	55, 867
	4. Busia	Busia Municipality	40, 740
	5. Mumias	Mumias Township	38, 960
	6. Vihiga	Vihiga Municipality	36, 398
	7. Teso North	Malaba Township	16, 480

Table 1: Urban centre's selected for mapping of MARPs in Kenya 2011(Contd.)

Province	Districts	Selected towns	Core urban population (2009 census)
Rift Valley	1. Nakuru	Nakuru Municipality	286, 411
	2. Naivasha	Naivasha Municipality	91,993
	3. Narok	Narok Township	38, 653
	4. Kajiado	Kajiado Township	14, 631
	5. Kajiado	Namanga Township	9, 066
	6. West Pokot	Kapenguria Municipality	20, 880
	7. Trans Nzoia	Kitale Municipality	75, 782
	8. Uasin Gishu	Eldoret Municipality	252, 061
	9. Laikipia East	Nanyuki Municipality	31, 826
	10. Kericho	Kericho Municipality	42, 029
	11. Kajiado	Ongata Rongai	66,042

Figure 2 provides a visual display of the distribution of the towns with 5,000 or more population mapped vis-à-vis towns that were not mapped in each of the provinces.

Figure 2: Mapped towns

2.4. Methodology for geographic mappingof MARPs

The mapping methodology applied was based on a geographic approach, which identifies the key locations where MARPs can be found and enumerated. The approach included two sequential steps:

Level 1: In the first level, information was gathered systematically from carefully selected secondary key informants (KIs) regarding locations or spots ("hot spots") where MARPs congregate for the purpose of meeting casual or paying sexual partners, and/or gather for the purposes of buying or administering injecting drugs. A spot was considered active even if only one or a few MARPs frequented it. The key informants provided the physical addresses of such spots along with the estimated minimum, maximum and usual number of MARPs that could be found at the spots.

To facilitate Level 1 data collection, each town was divided further into smaller zones based on population estimates, local knowledge of areas where MARPs may be found and other physical features and landmarks. Interviews were conducted with about 60 secondary key informants in each zone. Key informants were asked about spots where MARPs could be found and their estimated minimum, maximum and usual numbers within a specific zone rather than the entire town. The product of Level 1 activity was a comprehensive list of unique spots where MARPs may be found, the typology of the spot, operational dynamics of each spot (peak and non-peak times) and estimated minimum, maximum and usual number of MARPs at each spot.

Level 2: The second stage involved visits to the spots identified at the first level for validation and profiling in order to characterize and estimate the size of the MARPs through interviews with MARPs themselves. A few MARPs were recruited in each of the towns mapped to assist data collectors with identifying the members of their groups at the identified spots for validation interviews. The validation process determined the existence of a spot, whether or not the spot was frequented by MARPs (in other words, if the spot was active or inactive) and the estimated minimum, maximum and usual number of MARPs who frequented active spots.

In the validation, spots that were mentioned by the least number of secondary key informants atLevel 1were given priority in the case of FSW spots, because these were the most likely to have been incorrectly identified. FSW spots that were mentioned by three or fewer key informants at Level 1, and all MSW/MSM and IDU spots, regardless of their frequency of mention, were visited and validated. For the spots validated, only validated data were used in generating population size estimates while for those spots not re-visited, an average of the estimates from

secondary key informants at Level 1 were used. Pre-designed forms were developed consultatively with NASCOP and other partners for data collection forLevel 1 and Level 2 (see Appendix).

2.5. The Mapping Process

The mapping process incorporates four main activities, as shown below in Figure 3.

1. Pre-mapping exercise
2. Level 1 (L1)
3. Level 2 (L2)
4. Compilation of results

Figure 3: A schematic representation of the various steps of the mapping approach

2.5.1. The pre-mapping activities

Pre-mapping activities were undertaken to establish the necessary logistical and conceptual foundations for the mapping data collection. The key pre-mapping activities included the following:

- Acquisition and review of detailed maps of the target cities or towns.
- Segmentation of each large city or town into zones based on logical administrative and/or neighborhood units.
- Recruitment of local field team members based on their experience working with MARPs and field research experience.
- Training of field staff on the concepts and implementation of the mapping methodology, including definitions of key terms and concepts relevant to the local situation.

- Meetings with local officials and stakeholders, including law enforcement agencies, to inform them about the purpose and nature of the mapping activity, and to garner their support and
- Development of a field monitoring process and a detailed work plan for the local mapping exercise.

Collecting Level 1 and Level 2 data entailed the processes already described.

2.5.2. Data management

Critical to the geographical mapping methodology is data management. The data collected at Level 1were edited by a data management team and corrected for names of zones, missing MARP typologies, and any missing estimates of spots (e.g. spots without any estimates of key sub-population size). Part of the data editing and cleaning process includedstandardizing spots' names to reduce duplication. The data were also entered into a Microsoft Access database specifically designed for the study, and then used for generating a list of unique spots and population estimates. The fully analyzeddata provided minimum and maximum estimates by MARP group and typology,for each site and location. To arrive at a point estimate, the average ("mean") of the minimum and maximum estimates were calculated.

2.6. Study Implementation Process

As already described, mapping of MARPs is preceded by a number of critical pre-mapping activities. This section of the report explains the following pre-mapping and actual mapping activities undertaken.
- Study protocol development
- Identification of implementing partners
- Selection of towns to be mapped and acquisition of maps
- Training of field teams
- Data collection
- Data processing and analysis

2.6.1. Study Protocol Development

The technical team of the University of Manitoba, along with consultants from the University of Nairobi,and NASCOPdeveloped the study protocol. The study protocol was approved by Kenyatta National Hospital Ethical Review Committee and then by NASCOP, who subsequently wrote letters of authorization for field work.

2.6.2. Identification of Implementing Partners

As part of the protocol development process, potential implementing partners were invited to incorporate their recommendations into the mapping project methodology. Based on these discussions, implementing partners with considerable experience in programme implementation and research with MARPs were identified for each province (See Table 2).

Table 2: List of study implementation partners

	Province	Study implementation partners
1	Coast	International Centre for Reproductive Health, Kenya (ICRH-K)
2	Northeastern	International Centre for Reproductive Health, Kenya (ICRH-K)
3	Nyanza	Impact Research and Development Organization (IRDO)
4	Western	Impact Research and Development Organization (IRDO)
5	Eastern	University of Nairobi, Centre for HIV Prevention and Research (CHIVPR)
6	Central	University of Nairobi, Centre for HIV Prevention and Research (CHIVPR)
7	Rift Valley	Hope Worldwide Kenya
8	Nairobi	Kenya AIDS Control Project (KACP), University of Nairobi

Each of the selected partners developed a budget for fieldwork, which was used as a basis for drawing up contracts with them for the mapping exercise.

2.6.3. Acquisition of Maps

Another important pre-mapping activity was the selection of towns for mapping and acquisition of detailed geographic maps of the selected towns. Geographic maps for the selected towns were obtained from the Kenya National Bureau of Statistics (KNBS), the government agency that oversees official data collection, including census data. The official maps from the KNBS offered an additional advantage of demarcating clear boundaries of towns, which was necessary for purposes of zoning and planning fieldwork.

2.6.4. Training of Field Teams

Training of field teams was conducted after finalization of the list of towns to be mapped. The approach to the training was to train a cadre of master trainers from each implementing partner who would then train their field teams on the mapping methodology, and also on field monitoring and quality assurance procedures. For this purpose, an initialtwo-day training of trainers (ToT) workshop was conducted targeting field team supervisors, data managers and study site coordinators from each implementing partner. The study technical team also provided considerable support for training of field data collection teams.

The University of Manitoba technical team conducted the first training for key mapping project staff from all the implementing partners to create a clear understanding of the mapping methodology. Training for the rest of the provinces was led by the local University of Manitoba staff, with additional support, as a way of transferring skills, from University of Manitoba partners from Pakistan with vast experience in mapping field operation procedures.Representatives from NASCOP also participated in many of the trainings. Table 3 below summarizes training dates for the different implementing partners.

Table 3: Type of training conducted and dates for different implementing partners

Province	ToT training	L1 field work training	L2 fieldwork training
Nairobi	Oct. 6-8, 2011	Oct. 21 – 22, 2011	Nov. 10-11, 2011
Central	Oct. 6-8, 2011	Oct. 31 – Nov. 1, 2011	Dec. 6-7, 2011
Eastern	Oct. 6-8, 2011	Oct. 31 – Nov. 1, 2011*	Dec. 6-7, 2011
Coast	Nov. 7-8, 2011	Nov. 21 -22, 2011	Dec. 19-22, 2011
Nyanza	Nov. 7-8, 2011	Nov. 24-25, 2011	Dec. 13-14, 2011
Western	Nov. 7-8, 2011	Nov. 24-25, 2011	Dec. 13-14, 2011
Rift Valley	Nov. 7-8, 2011	Jan. 5-6, 2012	Feb. 10-11, 2012

*Training for the lower region of Eastern Province was conducted on November 3-4, 2011.

2.6.5. Data Collection

As indicated above, data for the mapping of MARPs were collected at two levels:Level 1 interviews with secondary key informants to identify and generate a list of unique spots where MARPs could be found, different typologies and estimated numbers of MARPs at the identified spots; and Level 2 validation through interviews with MARPs themselves at the spots identified through Level 1.Throughout the data collection process, the University of Manitoba local staffundertook field monitoring and quality assurance visits to ensure high quality data from the field. Field monitoring visits wereconducted at least once for each field team during Level 1 data collection and at least twice during Level 2 data collection.

Additional measures to ensure data quality included the following:

a) At the field level, at the end of each day's work, interviewers reviewed the filled forms to ensure legibility, completeness and consistency of the data collected/recorded. In addition, all forms were edited in the field before handing them over to team supervisors.

b) Team supervisors checked all forms for completeness and validity.

c) Team supervisors visited at least 10per cent of the locations profiled by their field teams and personally verified the information obtained. Where errors were observed, the spots were validated again.

2.6.6. *Data processing and analysis*

Microsoft Access-based databases with in-built quality checks were developed by the University of Manitoba technical team for each data capturing tool developed. Data managers and data operators from each implementing partner were trained on data editing, data entry and data management. Data entry was conducted at the implementing partner level as a way of building capacity for the mapping exercise within the partner organizations. Data analysis was conducted by the University of Manitoba technical team. The subsequent chapters present the study results.

3. Estimates of female sex worker spots and population size

3.1. Number of secondary key informantinterviews

For purposes of data collection, each of the towns selected for mapping was broken down into smaller zones based on population, administrative boundaries, other important landmarks, and local knowledge of areas where MARPs may be found. Within each zone, approximately 60 interviews were conducted with secondary key informants to identify spots where MARPs solicit clients, engage in sexual activity or cruise, operational dynamics of the spots (peak and non-peak times), and estimated numbers of MARPs who frequent the spots. Key informants were identified from a variety of public places such as taxi ranks, bus stops, fuel stations, shopping malls, streets, bars, and other workplaces, etc. A total of 11,609 secondary key informant interviews were conducted for Level 1 activity in the seven provinces, with more than 1,000 key informants per province, as shown in Figure 4.
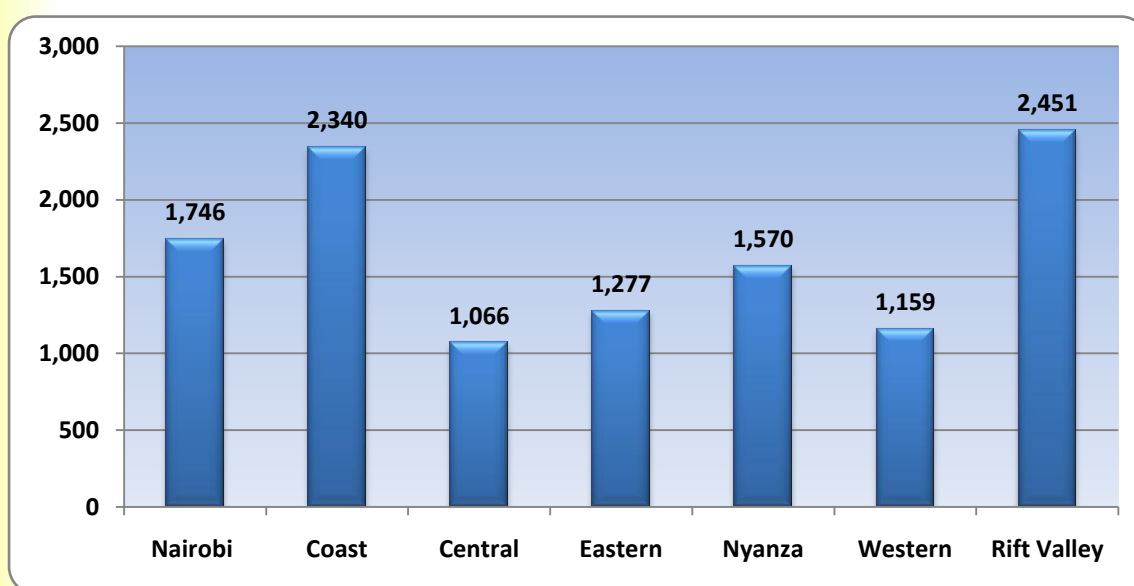
Figure 4: Total number of secondary key informant interviews, by province

The secondary key informants were predominantly male, as highlighted in Figure 5.
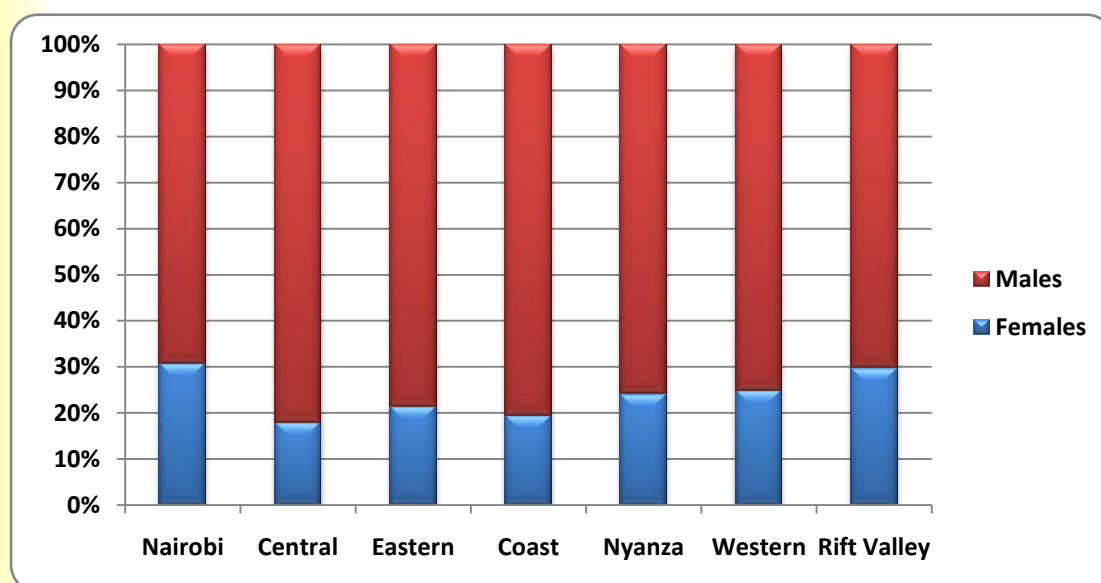
Figure 5: Gender distribution of key informants, by province

Many of the KIs were taxi drivers, bar owners, etc., who tended to be male. Over one-half (53.3%) of all secondary key informants had secondary or higher level of education. Educational status among key informants varied significantly by province. Central province had the largest proportion (16%) of secondary key informants with no formal education, as compared toNyanza (8.3%), Western and Rift Valley, each with 5.9 per cent, Nairobi (4.1%), Eastern (3.6%) and Coast (3.3%) . Nearly two-thirds (64.9%) of the secondary key informants in Eastern province had secondary or higher level of education as contrasted to Nairobi (58.7%), Rift Valley (54.2%), Nyanza (52.5%), Western (52.0%), Coast (51.8%) and Central (47.7%) (p<.001) provinces.

Educational attainment among secondary key informants varied significantly also by gender. Among the 672 secondary key informants who reported not to have any formal education, 504 (75.0%) were male. Similarly, among 2,882 who reported primary level educational attainment only, 74.8 per cent were male. However, the majority (75.9%) of those with secondary or higher level of education (n=5,999) were also male (p<.001).

3.2. Estimates of female sex worker spots

The primary aim of the geographic mapping approach was to identify spots frequented by MARPs and to derive an estimate of typologies of MARPs (FSWs, MSWs/MSM and IDUs) in each spot. Whereas data collected at Level 1 provided these estimates, it was only after Level 2 validation through interviews with at least one FSWfrom the identified spots that final estimates were derived. Additional data collected included the type of spot (street, home-based, road (truck

stop), sex den, venue-based, escort, and massage parlour), and the estimated minimum and maximum numbers likely to be found at the spot.

A total of 10,670 active FSW spots were identified through the mapping exercise with about a quarter (24%) of these being in Nairobi and Rift Valley and Western provinces (both 17%). Figure 6 shows the estimated number of active FSW spots by province.
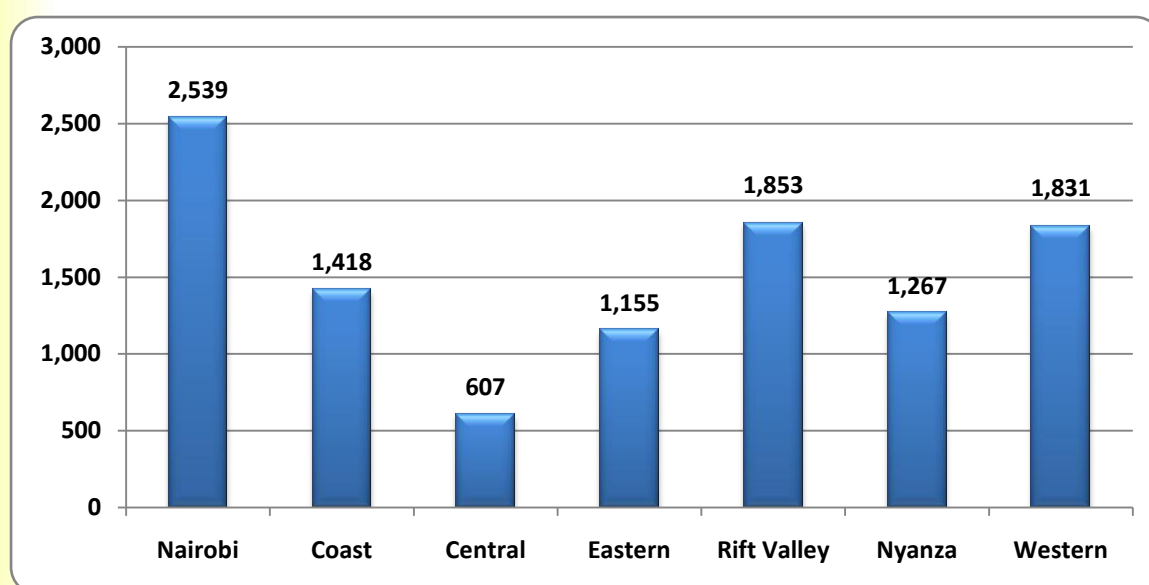
Figure 6: Estimated number of active FSW spots, by province

The estimated number of active FSW spots in the individual towns mapped is summarized in Table 4.

Table 4: Estimated number of active FSW spots in the towns mapped

Province	Town (or administrative units)	Estimated number of active FSW spots
Nairobi	Dagoretti	274
	Embakasi	367
	Kamukunji	256
	Kasarani	366
	Lang`ata	277
	Makadara	238
	Starehe	530
	Westlands	231
Sub-total		*2,539*
Central	Nyahururu	83
	Nyeri	111
	Kerugoya Kutus	107
	Murang`a	54
	Thika	85
	Kiambu	61
	Ruiru	106
Sub-total		*607*
Eastern	Kitui	69
	Machakos	150
	Emali	54
	Matuu	52
	Mavoko	140
	Makindu	74
	Embu	196
	Meru	211
	Maua	119
	Chuka	90
Sub-total		*1,155*
Coast	Mombasa	774
	Kilifi	69
	Mariakani	77
	Mtwapa	70
	Taveta	55
	Voi	59
	Malindi	232
	Ukunda	82
Sub-total		*1,418*

Table 4: Estimated number of active FSW spots in the towns mapped *(Contd.)*

Province	Town (or administrative units)	Estimated number of active FSW spots
Nyanza	Kisumu	534
	Bondo	104
	Siaya	67
	Kisii	215
	Migori	169
	Nyamira	93
	Homa Bay	85
Sub-total		*1,267*
Western	Kakamega	206
	Webuye	232
	Bungoma	294
	Busia	257
	Mumias	317
	Vihiga	427
	Malaba	98
Sub-total		*1,831*
Rift Valley	Nakuru	339
	Naivasha	152
	Narok	159
	Kajiado	39
	Namanga	46
	Kapenguria	145
	Kitale	178
	Eldoret	429
	Nanyuki	92
	Kericho	125
	Ongata Rongai	149
Sub-total		*1,853*
Grand Total		**10,670**

3.2.1. *Estimated number of active spots in Nairobi city, by administrative units*

Figure 7 shows the distribution of the estimated number of active FSW spots in Nairobi by administrative units (constituencies/districts).
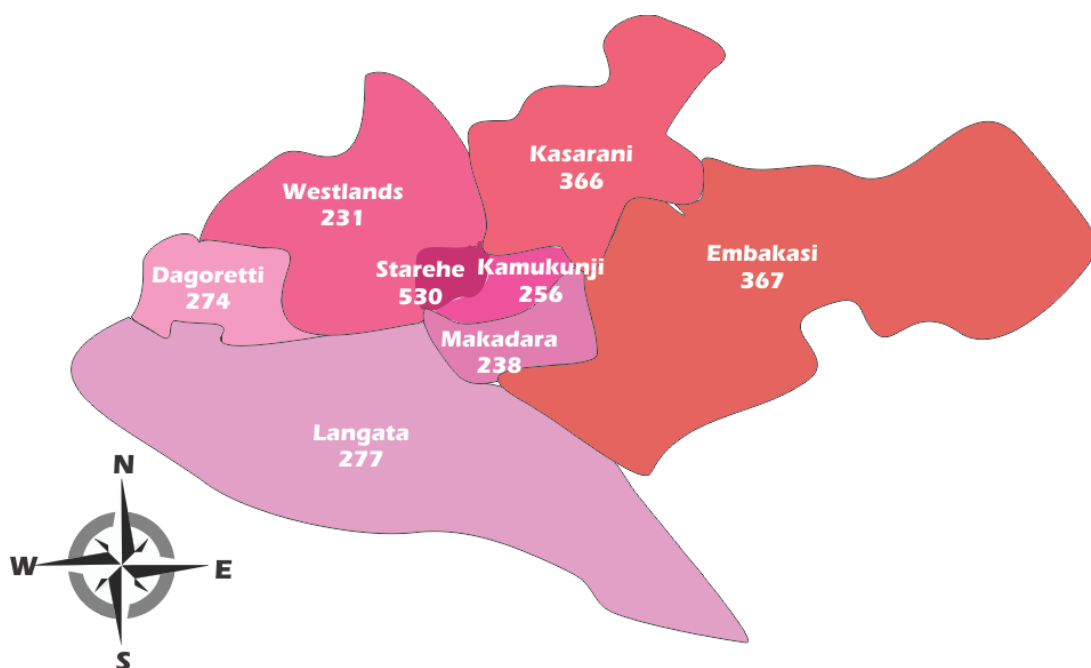
Figure 7: Estimated number of active FSW spots in Nairobi city by administrative units

Of the 2,539 active FSW spots identified in Nairobi, 21 per centwere located within Starehe constituency, which encompasses the Nairobi central business district, while 14 per centeach were in Embakasi and Kasarani constituencies, both large and densely populated residential areas.

3.2.2. Estimated number of active spots in Mombasa city, by administrative units

In Mombasa city, a total of 774 active FSW spots were identified. Figure 8 shows the distribution of active FSW spots by administrative districts/constituencies in Mombasa city.
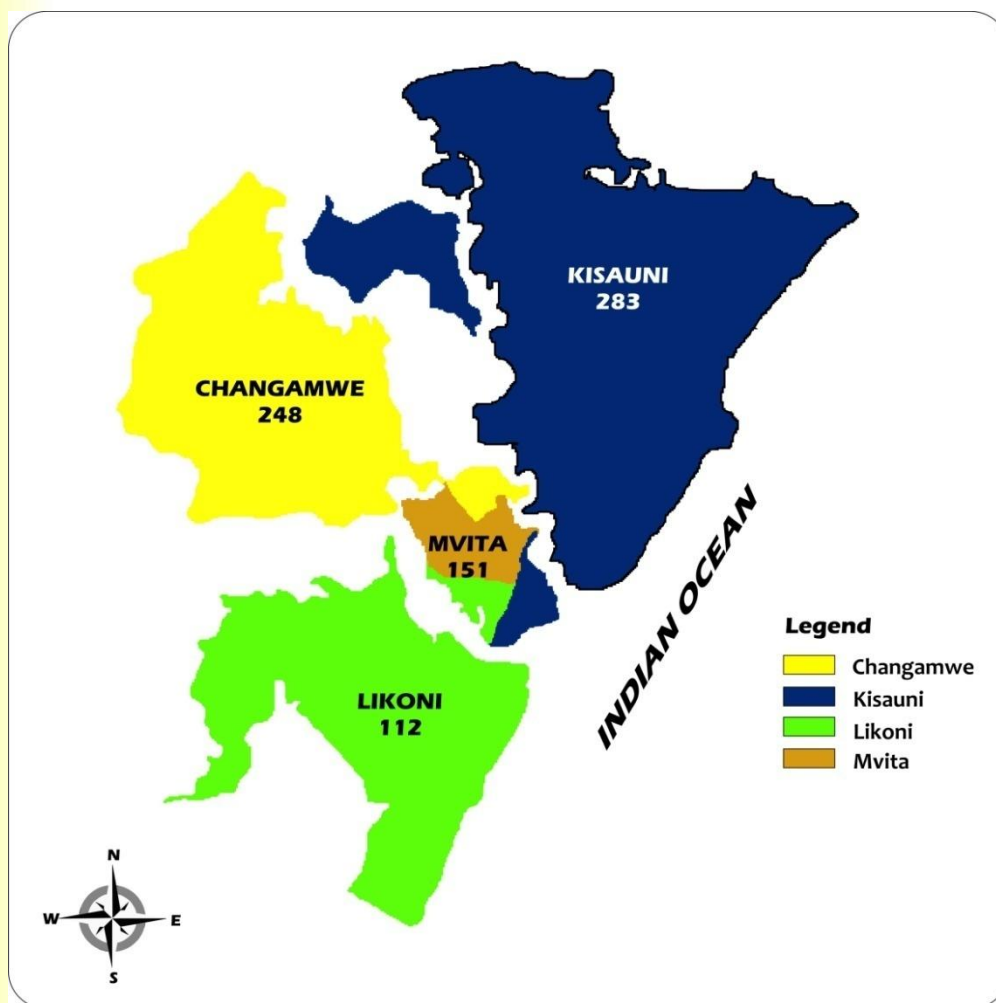
Figure 8: The distribution of active FSW spots by administrative units in Mombasa city

The majority of active FSW spots were to be found in Kisauni (34%) and Changamwe (32%) constituencies, which are large residential areas. Mvita constituency, which covers Mombasa city's central business district, had about three-timesfewer number of spots in comparison to Nairobi'sarea covering the central business district (Starehe constituency).

3.3. FSWPopulation Estimates

As MARPs may visit more than one spot, data validated through interviews with MARPs themselves enabledadjustments for overestimation of number of spots, the population size of MARPs, and double-counting of different spots frequented by MARPs. These factors were taken into account in deriving estimates of number of FSWs in the urban centres mapped. The key informants provided an estimate of minimum and maximum number of MARPs at each spot identified, which allowed for the calculation of minimum and maximum bounds, and a point

estimate of FSWs in each town. Figure 9 shows the estimated number of FSWs based on data collected from the towns mapped in each of the provinces.
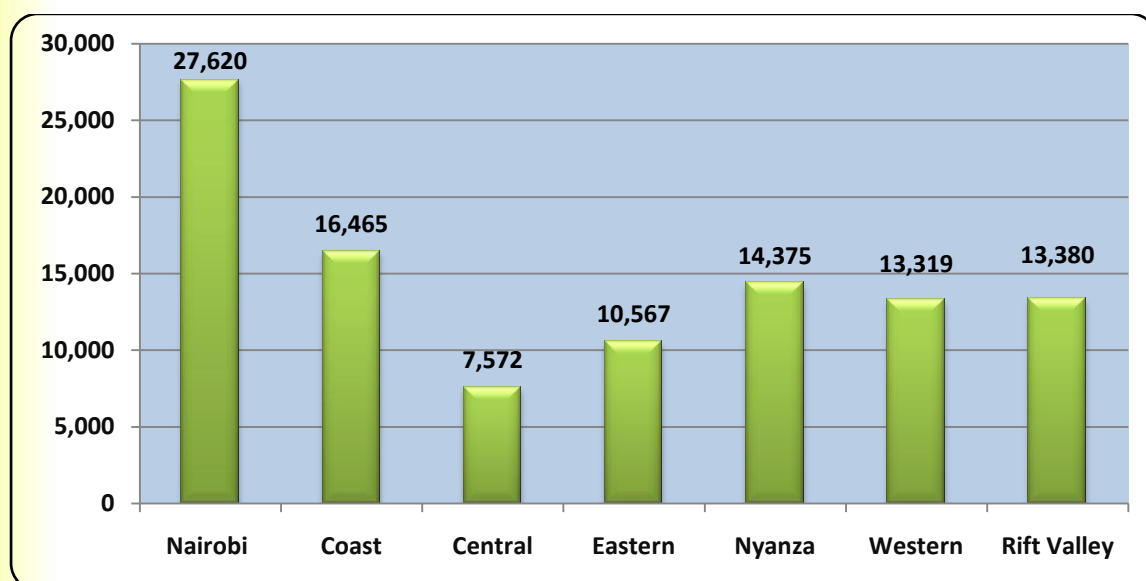
Figure 9: Estimated number of FSWs by province

The estimated population of FSWs in all the towns mapped was 103,298 (range 77,878 to 128, 717). In Coast province, the majority of FSWs were in Mombasa city (9,288, 56%), followed by Malindi (2,310, 14%) and Ukunda and Mtwapa, both with seven percent. In Nyanza, the towns with the highest number of FSWs were Kisumu city (4041, 28%), Kisii (4,063, 28%) and Migori (2,272, 16%). Nakuru town with an estimated 4,384 FSWs accounted for 33 per cent of the FSWs in Rift valley province, followed by Eldoret (2,442, 18%), Kericho (1,116, 8%) and Kapenguria (1,004, 8%) towns. In Western province, the majority of FSWs were in Vihiga (2,749, 21%), Busia (2,474, 19%) and Mumias (2,167, 16%) towns. Mavoko town accounted for 19 per cent (n=1,973) while Maua (n=1,555) and Meru (n=1,276) towns accounted for 15 and 12 per cent, respectively, of the FSWs in Eastern province. In Central province, Thika town had the largest number of FSWs (1,933, 26%) followed by Ruiru (1,808, 24%) and Nyeri (988, 13%) towns. Figure 10 provides a geographic visualization of the distribution of FSWs by province.
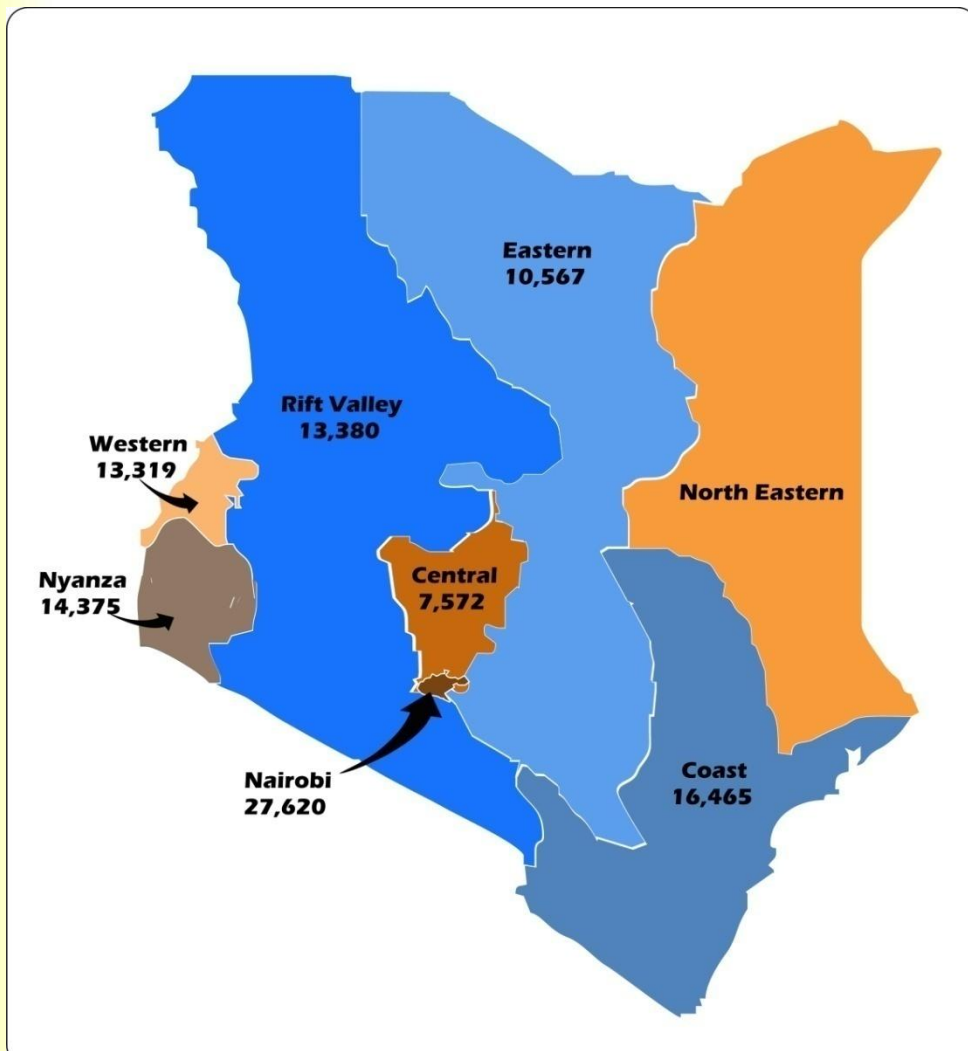
Figure 10: Geographic distribution of FSWs

Table 5 provides a summary of estimated number of FSWs in each of the towns mapped with minimum and upper bounds.

Table 5: Estimated number of FSWs in the towns mapped

Province	Town (or administrative units)	Estimated FSW population		
		Minimum	Maximum	Point-estimate
Nairobi	Dagoretti	1,878	2,987	2,433
	Embakasi	2,817	4,939	3,878
	Kamukunji	1,973	3,008	2,491
	Kasarani	2,834	4,748	3,791
	Lang`ata	2,195	3,514	2,855
	Makadara	1,922	3,042	2,482
	Starehe	5,230	8,296	6,763
	Westlands	2,231	3,627	2,929
Sub-total		*21,081*	*34,160*	*27,620*
Central	Nyahururu	609	993	801
	Nyeri	758	1,217	988
	Kerugoya Kutus	604	874	739
	Murang`a	346	538	442
	Thika	1,385	2,481	1,933
	Kiambu	661	1,062	862
	Ruiru	1,380	2,235	1,808
Sub-total		*5,743*	*9,400*	*7,572*
Eastern	Kitui	561	1,026	794
	Machakos	632	1,112	872
	Emali	848	1,512	1,180
	Matuu	407	673	540
	Mavoko	1,334	2,611	1,973
	Makindu	599	973	786
	Embu	827	1,237	1,032
	Meru	1,060	1,492	1,276
	Maua	890	2,219	1,555
	Chuka	458	662	560
Sub-total		*7,616*	*13,517*	*10,567*
Coast	Mombasa	6,917	11,660	9,288
	Kilifi	478	769	624
	Mariakani	478	771	624
	Mtwapa	917	1,319	1,118
	Taveta	378	600	489
	Voi	656	1,144	900
	Malindi	1,788	2,831	2,310
	Ukunda	811	1,413	1,112
Sub-total		*12,422*	*20,508*	*16,465*

Table 5: Estimated number of FSWs in the towns mapped *(Contd.)*

Province	Town (or administrative units)	Estimated FSW population		
		Minimum	Maximum	Point-estimate
Nyanza	Kisumu	3,228	4,854	4,041
	Bondo	1,310	2,041	1,676
	Siaya	377	568	473
	Kisii	2,990	5,136	4,063
	Migori	1,698	2,846	2,272
	Nyamira	665	1,047	856
	Homa Bay	774	1,216	995
Sub-total		*11,042*	*17,708*	*14,375*
Western	Kakamega	905	1,570	1,238
	Webuye	1,549	2,431	1,990
	Bungoma	1,540	2,448	1,994
	Busia	1,854	3,094	2,474
	Mumias	1,617	2,716	2,167
	Vihiga	2,031	3,467	2,749
	Malaba	554	862	708
Sub-total		*10,050*	*16,588*	*13,319*
Rift Valley	Nakuru	3,220	5,549	4,384
	Naivasha	568	1,282	925
	Narok	455	698	576
	Kajiado	226	338	282
	Namanga	325	365	345
	Kapenguria	766	1,241	1,004
	Kitale	635	994	815
	Eldoret	1,803	3,080	2,442
	Nanyuki	407	701	554
	Kericho	856	1,376	1,116
	Ongata Rongai	662	1,213	937
Sub-total		*9,923*	*16,837*	*13,380*
Grand Total		**77,878**	**128,717**	**103,298**

3.3.1. Estimated number of FSWs in Nairobi city by administrative units

Figure 11 illustratesthe distribution of FSWs by administrative units in Nairobi city.
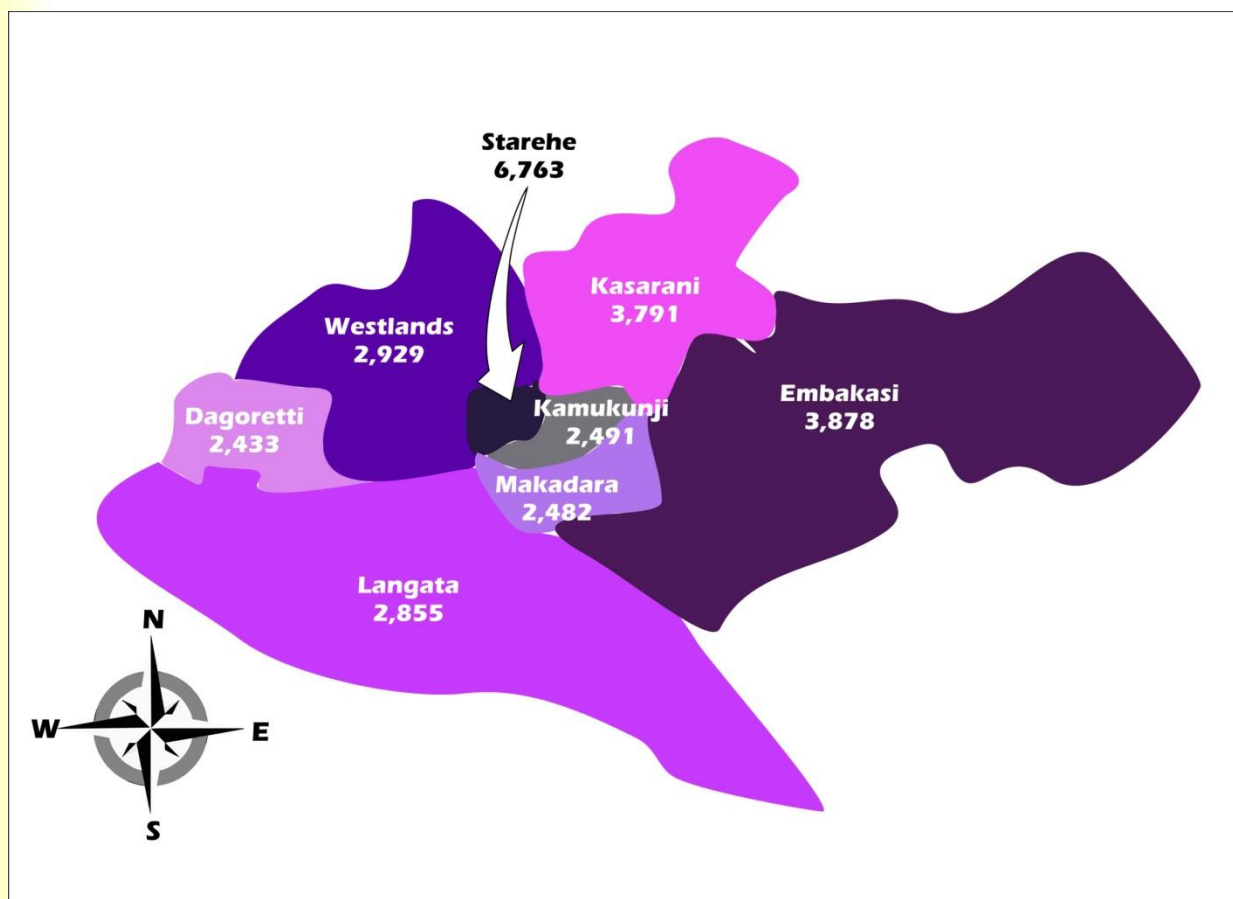
Figure 11: Distribution of FSWs by administrative units in Nairobi city

The number of FSWs corresponded to the number of active FSW spots already presented and indicated that in Nairobi, the largest number of FSWs (24%) were to be found in Starehe constituency, which covers the central business district area, followed by Embakasi and Kasarani constituencies, each with 14 per cent.

3.3.2. Estimated number of FSWs in Mombasa city by administrative units

Figure 12 illustrates the distribution of FSWs by administrative units in Mombasa city.
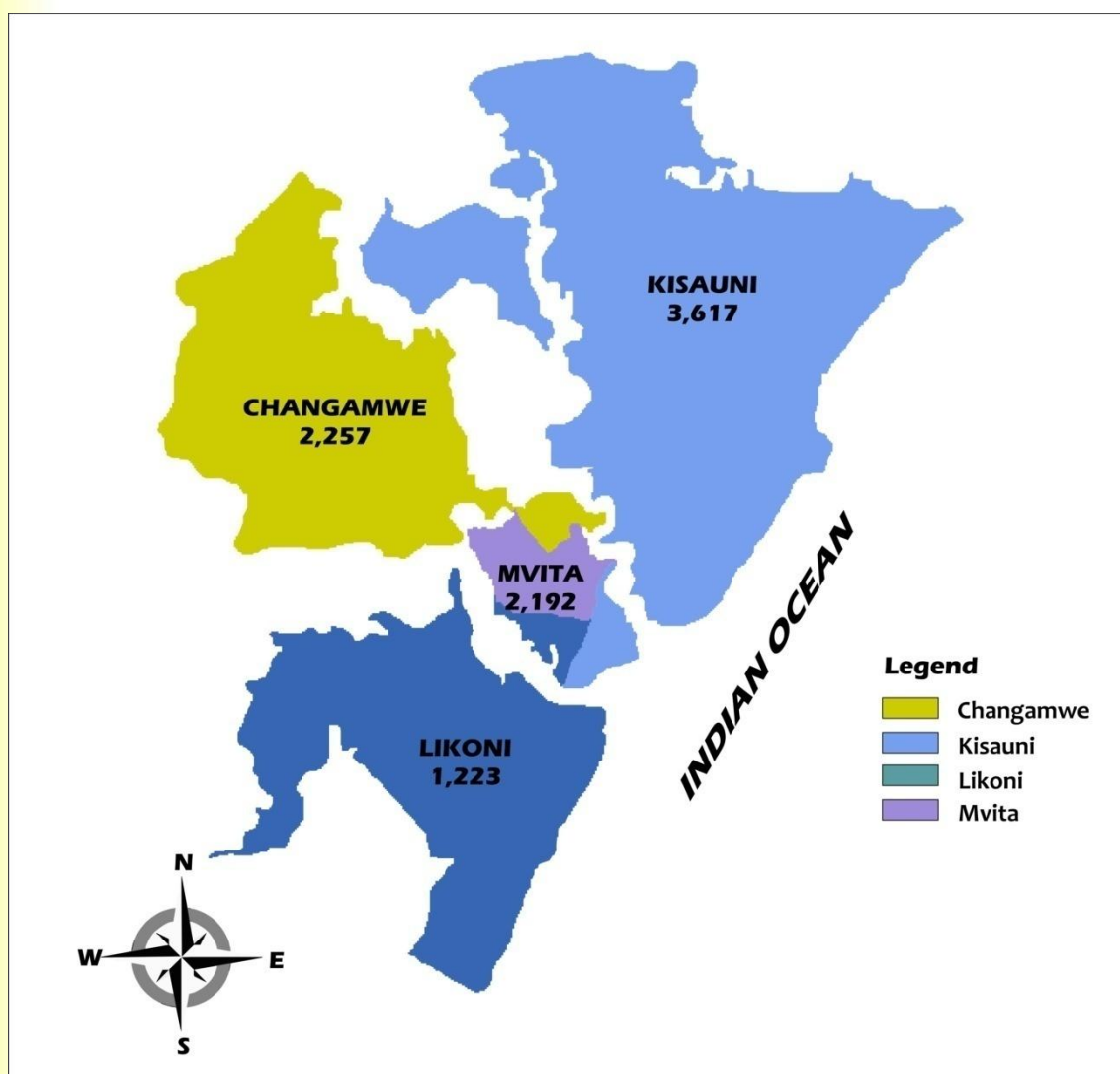
Figure 12: Distribution of FSWs by administrative units in Mombasa city

Over a third (39%) of the 9,288 FSWs in Mombasa city were to be found in Kisauni constituency, followed by Mvita and Changamwe constituencies, each with 24 per cent.

3.4. Estimates of FSWs by typology

The estimated number of FSWs was analyzed further by the type of spot from which they operated. Figure 13 shows the proportional distribution of the estimated number of FSWs in each province by spot typology.
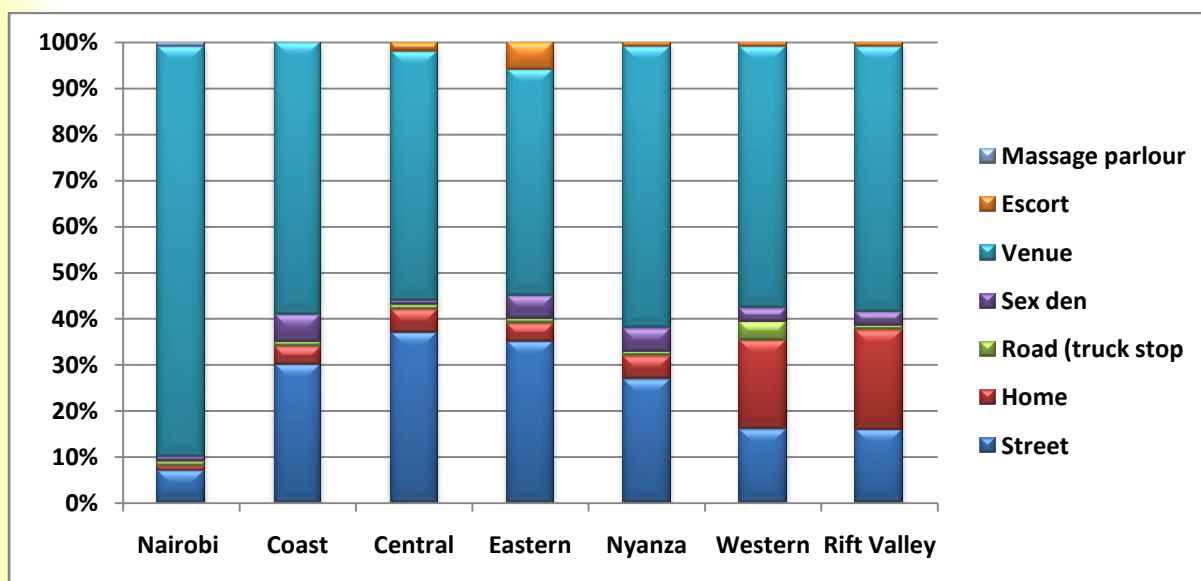
Figure 13: Proportional distribution of FSWs by spot typology

Street-based FSWs as a proportion of all FSWs was higher in Central (37%), Eastern (35%), Coast (30%) and Nyanza (27%) provinces than in Western (16%), Rift Valley (16%) and Nairobi (7%) provinces. Venue-based FSWs were predominant in Nairobi (88%) compared to all the other provinces, while home-based FSWs were more common in Rift Valley (22%) and Western provinces (19%) than elsewhere. Coast (6%), Eastern (5%) and Nyanza (5%) provinces had the highest proportions of FSWs operating from sex-dens. Truck-stop sex work was more common in Western province (4%),likely because of the truck stop towns at the border of Kenya and Uganda.

3.5. Number of FSWs per spot

The estimated number of FSWs per spot was calculated based on data on the number of active spots and estimated number of FSWs, and are presented for each town mapped in Table 6.

Table 6: Estimated number of FSWs per spot, by province and town

Province	Town (or administrative units)	Estimated number of FSWs per spot
Nairobi	Dagoretti	9
	Embakasi	11
	Kamukunji	10
	Kasarani	10
	Lang`ata	10
	Makadara	10
	Starehe	13
	Westlands	13
Sub-total		11
Central	Nyahururu	10
	Nyeri	9
	Kerugoya Kutus	7
	Murang`a	8
	Thika	23
	Kiambu	14
	Ruiru	17
Sub-total		12
Eastern	Kitui	12
	Machakos	6
	Emali	22
	Matuu	10
	Mavoko	14
	Makindu	11
	Embu	5
	Meru	6
	Maua	13
	Chuka	6
Sub-total		9
Coast	Mombasa City	12
	Kilifi	9
	Mtwapa	16
	Mariakani	8
	Voi	16
	Taveta	8
	Malindi	10
	Ukunda	14
Sub-total		12

Table 6: Estimated number of FSWs per spot, by province and town *(Contd.)*

Province	Town (or administrative units)	Estimated number of FSWs per spot
Nyanza	Kisumu	8
	Bondo	16
	Siaya	7
	Kisii	19
	Migori	13
	Nyamira	9
	Homa Bay	12
Sub-total		11
Western	Kakamega	6
	Webuye	9
	Bungoma	7
	Busia	10
	Mumias	7
	Vihiga	6
	Malaba	7
Sub-total		7
Rift Valley	Nakuru	13
	Naivasha	6
	Narok	4
	Kajiado	7
	Namanga	8
	Kapenguria	7
	Kitale	5
	Eldoret	6
	Nanyuki	6
	Kericho	9
	Ongata Rongai	6
Sub-total		7
Overall		10

3.6. Per capita number of FSWs

Female sex workers come from a pool of sexually active women (15-49 years old). Based on Kenya's 2009 Census, 43 per cent of the population in the country is under 15 years of age; a further 9 per cent are 50+ years old. The proportion of the population of reproductive age (15-49) is 48 per cent. Using gender disaggregated population data for each of the towns mapped, we calculated the number of female sex workers per 1,000 women of reproductive age as well as the proportion of women of reproductive age who could be sex workers in each of the towns mapped (See Table 7).

Table 7: Per capita number of FSWs based on mapping data

Province	Town	Total urban and peri-urban pop.	Total urban and peri-urban female pop.	Total adult pop. (15+ years)	Total female pop. (15-49 years)	Total female pop. (15+ years)	Estimated number of FSWs from mapping	Number of FSW per 1,000 women 15-49 years	Number of FSW per 1,000 adult pop. (15+ years)	% adult women 15+ years sex workers	% of women 15-49 years sex workers
Nairobi	Westlands	247,102	122,354	172,230	58,730	85,281	2,929	50	17	3%	5%
	Kasarani	525,624	258,940	366,360	124,291	180,481	3,791	30	10	2%	3%
	Embakasi	925,775	457,678	645,265	219,685	319,002	3,878	18	6	1%	2%
	Makadara	218,641	104,184	152,393	50,008	72,616	2,482	50	16	3%	5%
	Kamukunji	261,855	124,935	182,513	59,969	87,080	2,491	42	14	3%	4%
	Starehe	274,607	132,510	191,401	63,605	92,359	6,763	106	35	7%	11%
	Dagoretti	329,577	163,186	229,715	78,329	113,741	2,433	31	11	2%	3%
	Langata	355,188	169,352	247,566	81,289	118,038	2,855	35	12	2%	4%
Sub-total		*3,138,369*	*1,533,139*	*2,187,443*	*735,907*	*1,068,598*	*27,620*	*38*	*13*	*3%*	*4%*
Central	Kiambu	84,155	43,908	53,859	21,076	28,101	862	41	16	3%	4%
	Nyeri	119,353	59,791	76,386	28,700	38,266	988	34	13	3%	3%
	Thika	136,917	68,509	87,627	32,884	43,846	1,933	59	22	4%	6%
	Ruiru	238,858	119,711	152,869	57,461	76,615	1,808	31	12	2%	3%
	Kerugoya	19,422	10,241	12,430	4,916	6,554	739	150	59	11%	15%
	Nyahururu	36,450	18,839	23,328	9,043	12,057	801	89	34	7%	9%
	Murang'a	28,775	14,706	18,416	7,059	9,412	442	63	24	5%	6%
Sub-total		*663,930*	*335,705*	*424,915*	*161,138*	*214,851*	*7,572*	*47*	*18*	*4%*	*5%*

Table 7: Per capita number of FSWs based on mapping data *(Contd.)*

Province	Town	Total urban and peri-urban pop.	Total urban and peri-urban female pop.	Total adult pop. (15+ years)	Total female pop. (15-49 years)	Total female pop. (15+ years)	Estimated number of FSWs from mapping	Number of FSW per 1,000 women 15-49 years	Number of FSW per 1,000 adult pop. (15+ years)	% adult women 15+ years sex workers	% of women 15-49 years sex workers
Eastern	Embu	60,673	30,905	25,361	14,834	17,987	1,032	70	41	6%	7%
	Chuka	43,420	22,204	18,150	10,658	12,923	560	53	31	4%	5%
	Meru	53,627	27,209	22,416	13,060	15,836	1,276	98	57	8%	10%
	Maua	17,226	8,924	7,200	4,284	5,194	1,555	363	216	30%	36%
	Machakos	150,041	75,747	62,717	36,359	44,085	872	24	14	2%	2%
	Mavoko	137,211	62,355	57,354	29,930	36,291	1,973	66	34	5%	7%
	Makindu	8,621	4,560	3,604	2,189	2,654	786	359	218	30%	36%
	Emali	7,024	3,530	2,936	1,694	2,054	1,180	696	402	57%	70%
	Matuu	50,750	25,767	21,214	12,368	14,996	540	44	25	4%	4%
	Kitui	109,568	55,909	45,799	26,836	32,539	794	30	17	2%	3%
Sub-total		*638,161*	*317,110*	266,751	*152,213*	184,558	*10,567*	*69*	40	6%	*7%*
Coast	Mombasa	938,131	451,923	396,829	216,923	260,760	9,288	43	23	4%	4%
	Kilifi	48,826	24,987	20,653	11,994	14,417	624	52	30	4%	5%
	Mtwapa	48,625	24,491	20,568	11,756	14,131	1,118	95	54	8%	10%
	Mariakani	24,055	11,922	10,175	5,723	6,879	624	109	61	9%	11%
	Voi	17,152	8,577	7,255	4,117	4,949	900	219	124	18%	22%
	Taveta	19,865	9,817	8,403	4,712	5,664	489	104	58	9%	10%
	Malindi	118,265	59,073	50,026	28,355	34,085	2,310	81	46	7%	8%
	Ukunda	65,529	30,518	27,719	14,649	17,609	1,112	76	40	6%	8%
Sub-total		*1,280,448*	*621,308*	541,630	*298,228*	358,495	*16,465*	*55*	30	5%	*6%*

Table 7: Per capita number of FSWs based on mapping data *(Contd.)*

Province	Town	Total urban and peri-urban pop.	Total urban and peri-urban female pop.	Total adult pop. (15+ years)	Total female pop. (15-49 years)	Total female pop. (15+ years)	Estimated number of FSWs from mapping	Number of FSW per 1,000 women 15-49 years	Number of FSW per 1,000 adult pop. (15+ years)	% adult women 15+ years sex workers	% of women 15-49 years sex workers
Nyanza	Kisumu	388,311	194,433	178,235	93,328	105,188	4,041	*43*	23	4%	*4%*
	Bondo	33,468	17,479	15,362	8,390	9,456	1,676	*200*	109	18%	*20%*
	Siaya	22,568	11,767	10,359	5,648	6,366	473	*84*	46	7%	*8%*
	Kisii	81,801	40,647	37,547	19,511	21,990	4,063	*208*	108	18%	*21%*
	Migori	53,100	27,466	24,373	13,184	14,859	2,272	*172*	93	15%	*17%*
	Nyamira	41,668	21,605	19,126	10,370	11,688	856	*83*	45	7%	*8%*
	Homa Bay	58,936	30,860	27,052	14,813	16,695	995	*67*	37	6%	*7%*
Sub-total		*679,852*	*344,257*	*312,052*	*165,243*	*186,243*	*14,375*	*87*	*46*	*8%*	*9%*
Western	Kakamega	91,768	45,700	43,223	21,936	24,175	1,238	*56*	29	5%	*6%*
	Webuye	41,344	20,981	19,473	10,071	11,099	1,990	*198*	102	18%	*20%*
	Bungoma	55,867	28,198	26,313	13,535	14,917	1,994	*147*	76	13%	*15%*
	Busia	51,981	26,789	24,483	12,859	14,171	2,474	*192*	101	17%	*19%*
	Mumias	99,987	51,087	47,094	24,522	27,025	2,167	*88*	46	8%	*9%*
	Vihiga	118,696	61,889	55,906	29,707	32,739	2,749	*93*	49	8%	*9%*
	Malaba	21,477	10,961	10,116	5,261	5,798	708	*135*	70	12%	*13%*
Sub-total		*481,120*	*245,605*	*226,608*	*117,890*	*129,925*	*13,320*	*113*	*59*	*10%*	*11%*

Table 7: Per capita number of FSWs based on mapping data *(Contd.)*

Province	Town	Total urban and peri-urban pop.	Total urban and peri-urban female pop.	Total adult pop. (15+ years)	Total female pop. (15-49 years)	Total female pop. (15+ years)	Estimated number of FSWs from mapping	Number of FSW per 1,000 women 15-49 years	Number of FSW per 1,000 adult pop. (15+ years)	% adult women 15+ years sex workers	% of women 15-49 years sex workers
Rift Valley	Nakuru	307,990	152,109	139,519	73,012	83,204	4,384	*60*	31	5%	*6%*
	Naivasha	169,142	84,285	76,621	40,457	46,104	925	*23*	12	2%	*2%*
	Narok	38,653	18,793	17,510	9,021	10,280	576	*64*	33	6%	*6%*
	Kajiado	14,860	7,295	6,732	3,502	3,990	282	*81*	42	7%	*8%*
	Namanga	9,066	4,382	4,107	2,103	2,397	345	*164*	84	14%	*16%*
	Kapenguria	34,046	17,170	15,423	8,242	9,392	1,004	*122*	65	11%	*12%*
	Kitale	106,187	52,122	48,103	25,019	28,511	815	*33*	17	3%	*3%*
	Eldoret	289,380	142,784	131,089	68,536	78,103	2,442	*36*	19	3%	*4%*
	Nanyuki	38,198	18,697	17,304	8,975	10,227	554	*62*	32	5%	*6%*
	Kericho	101,808	49,525	46,119	23,772	27,090	1,116	*47*	24	4%	*5%*
	Ongata Rongai	40,178	20,907	18,201	10,035	11,436	937	*93*	51	8%	*9%*
Sub-total		*1,149,508*	*568,069*	520,727	*272,673*	310,734	*13,380*	49	26	4%	*5%*
Grand Total		**8,031,388**	**3,965,193**	**4,480,126**	**1,903,293**	**2,453,404**	**103,299**	*54*	**23**	**4%**	**5%**

Based on data in Table 7, overall, 5per cent of women of reproductive age (15-49 years) and 4 per cent of adult women (15 or more years old) in the towns mapped could be sex workers. Provincial-level estimatesofthe proportion of women of reproductive age (15-49 years) who could be sex workers, based on data from the towns mapped, were as follows: Western (11%), Nyanza (9%), Eastern (7%), Coast (6%), Central (5%), Rift Valley (5%) and Nairobi (4%). However, the proportion of adult women who could be sex workers varied among the individual towns mapped. Some towns had estimates of the percentage of urban women of reproductive age who could be sex workers of 20% or more, namely:: Kisii (21%), Bondo (20%), both in Nyanza province, Voi, Coast province (22%), Webuye (20%) in Western province, and Maua (36%), Makindu (36%) and Emali (70%), all in Eastern province.

The reasons for the higher proportion of women of reproductive age who could be sex workers in these towns are not entirely clear. However, Emali and Makindu are small towns located along the Northern Transport corridor linking the port city of Mombasa with Nairobi and the neighboring Uganda, Rwanda and South Sudan countries. These townsare primarilytruck stop centres, and it is possible that the majority of the women in the towns are involved in sex work. Maua town in Eastern province is renowned for khat production and the vibrant cash economy may explain a higher proportion of women in the town being involved in sex work. The mapping data, however, does not capture detailed HIV-related behavioral and biological indicators for assessing potential correlations between per capita FSW estimates and local HIV epidemics.

3.7. Characteristics of FSWs

For the validation of spots, interviews were conducted with at least one FSW at the spots identified. In addition to the estimation of the number of FSWs at the spots, data on selected socio-demographic characteristics and sexual behavior were collected from the FSWs interviewed. Even though not a random sample, these data provide indicative behavioralinformation that may help with programming. A total of 6,360 FSWs were interviewed across the seven provinces to validate spots.

3.7.1. Age

Out of the 6,360 FSWs interviewed, 6,183 (97.2%) provided information on their year of birth. The mean age of the FSWs was 27.7 years (SD 6.3). A small minority (0.2%) of the female sex workers interviewed were below 15 years of age, with the youngest aged 12 years. Female sex workers in Nyanza Province were significantly younger than those in the other provinces (p<.001), as shown in Table 8.

Table 8: Mean age of FSWs interviewed for the mapping study

PROVINCE	MEAN AGE	STANDARD DEVIATION	SAMPLE SIZE
Nairobi	28.8	6.3	1,804
Central	28.6	6.1	162
Eastern	27.0	6.4	217
Coast	27.4	5.7	834
Nyanza	25.8	5.7	720
Western	28.3	6.8	1,326
Rift Valley	26.9	5.8	1,120
Total	**27.5**	**6.3**	**6,183**

3.7.2. Education

Overall, 2,575 (41.7%) of the FSWs had attained primary level education while 2,149 (34.8%) had attained secondary level education. Five per cent of the respondents had attained college level education while 13 per cent had attended post-primary vocational training. None of the FSWs had a University level education (see Table 9).

Table 9: Level of education among FSWs interviewed for the mapping study

Level of education	Province							
	Nairobi	*Central*	*Eastern*	*Coast*	*Nyanza*	*Western*	*Rift Valley*	*Total*
No formal education	36 (2%)	7 (4.3%)	10 (4.6%)	31 (3.7%)	53 (7.4%)	60 (4.5%)	68 (6.1%)	265 (4.3%)
Primary	388 (21.5%)	52 (32.1%)	87 (40.1%)	452 (54.3%)	380 (52.9%)	710 (53.5%)	505 (45.2%)	2,574 (41.7%)
Post-primary/ vocational	357 (19.8%)	40 (24.7%)	51 (23.5%)	59 (7.1%)	39 (5.4%)	94 (7.1%)	185 (16.5%)	825 (13.4%)
Secondary/A level	841 (46.6%)	59 (36.4%)	59 (27.2%)	257 (30.1%)	220 (30.6%)	422 (31.8%)	289 (25.8%)	2,147 (34.8%)
College	179 (9.9%)	4 (2.5%)	9 (4.1%)	31 (3.7%)	20 (2.8%)	35 (2.6%)	58 (5.2%)	336 (5.4%)
Other	4 (0.2%)	0	1 (0.5%)	2 (0.2%)	6 (0.8%)	5 (0.4%)	13 (1.2%)	31 (0.5%)
Total	**1,805**	**162**	**217**	**832**	**718**	**1,326**	**1,118**	**6,178**

The level of education among FSWs in Nairobi was relatively higher, as nearly half (46.6%) had attained secondary level education. Coast, Nyanza and Western provinces had over half of the respondents with primary level of education only. The differences in educational attainment among the FSWs interviewed for the mapping exercise was statistically significant (p<.001).

3.7.3. Marital status

Over one-half of the FSWs, 3,441 (55.2%) were single, while nearly a third, 1,975 (32%) reported to be divorced or widowed. Only a minority, 293 (4.7%) of the study respondents across the seven provinces were married. Table 10 provides a breakdown of marital status among FSWs interviewed for the mapping exercise by province.

Table 10: Marital status among FSWs interviewed stratified by province

Marital status	Province							
	Nairobi	*Central*	*Eastern*	*Coast*	*Nyanza*	*Western*	*Rift Valley*	*Total*
Single	773 (42.8%)	101 (63.1%)	159 (72.9%)	523 (62.9%)	373 (52.3%)	685 (51.6%)	793 (70.9%)	3,407 (55.2%)
Married	94 (5.2%)	8 (5.0%)	15 (6.9%)	24 (2.9%)	19 (2.7%)	89 (6.7%)	44 (3.9%)	293 (4.7%)
Divorced/ widowed	716 (39.6%)	42 (26.3%)	32 (14.7%)	245 (29.4%)	259 (36.3%)	476 (35.9%)	205 (18.3%)	1,975 (32.0%)
Cohabiting	225 (12.4%)	9 (5.6%)	12 (5.5%)	40 (4.8%)	62 (8.7%)	77 (5.8%)	76 (6.8%)	501 (8.1%)
Total	**1,808**	**160**	**218**	**832**	**713**	**1,327**	**1,118**	**6,176**

Nairobi had the lowest proportion of FSWs who were single, but the highest proportion of divorced/widowed and cohabiting sex workers in comparison to all the other provinces. Nearly three in four of FSWs in Eastern and Rift Valley provinces were single (p<.001).

3.7.4. Number of sexual partners per day

The number of sexual partners among FSWs was elicited through a question asking for number of partners on a normal day and a busy day. A single measure was derived from averaging the normal and busy day estimates. The mean number of sexual partners for the entire sample was 3.5 (SD 2.2). Table 11 provides a summary of mean number of sexual partners per day among FSWs interviewed, stratified by province.

Table 11: Mean number of sexual partners per day among FSWs interviewed, by province

PROVINCE	MEAN	STANDARD DEVIATION	SAMPLE SIZE
Nairobi	3.9	2.2	1,815
Central	4.6	4.1	160
Eastern	4.1	2.8	212
Coast	3.4	2.1	832
Nyanza	4.1	1.9	715
Western	2.7	1.7	1,327
Rift Valley	3.5	2.2	1,104
Total	3.5	2.2	6,165

Females sex workers in Western province had the least reported number of sexual partners per day. The differences by province in the mean number of sexual partners per day among FSWs interviewed was statistically significant ($p < .001$).

3.7.5. FSWs' participation in other economic activities

One-half of the FSWs interviewed reported that they were involved in other economic activities besides sex work. Examples included selling fruits and vegetables, providing cleaning services, working as a hairdresser or a bar waitress, among several others. Nyanza province had the highest proportion (63.2%), while Eastern province had the lowest proportion (35.6%) of FSWs reporting involvement with economic activities other than sex work. The corresponding figures for the other provinces were: Nairobi (47.3%), Central (40.7%), Coast (53.1%), Western (54.8%), and Rift Valley (42.5%).

4. Estimates of male sex worker/men who have sex with men spots and population size

Interviews at Level 1 also enabled the identification of spots where male sex workers and high-risk men who have sex with men (MSWs/MSM) seek male partners or engage in sexual activity. Similar typologies of spots as those for FSWs were identified for MSWs/MSM – street-based, home-based, road (truck stop)-based, sex den-based, venue-based, escort services, and massage parlour-based. All the MSWs/MSM spots identified through Level 1 interviews in each of the towns mapped were visited and validated through interviews with MSWs/MSMs themselves. During this validation, some new MSW/MSM spots were generated and also validated.

4.1. Estimates of MSWS/MSM spots

A total of 1,585 spots frequented by MSWs/MSM were identified and validated through the mapping exercise. Figure 14 shows the estimated number of MSW/MSM spots by province.
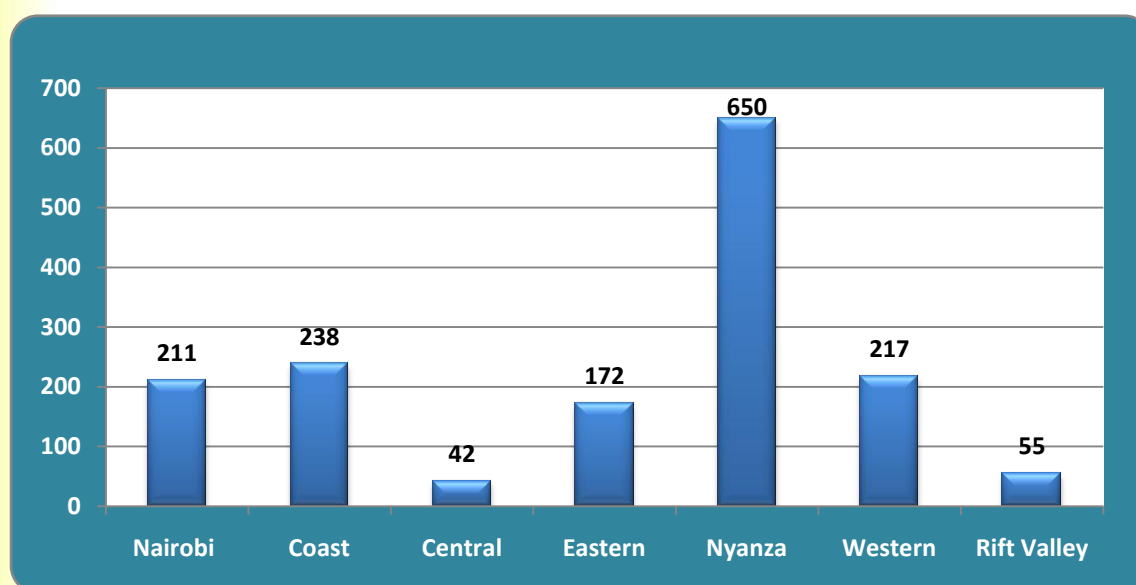
Figure 14: Estimated number of MSW/MSM spots by province

Of the 650 MSW/MSM spots in Nyanza province, 301 (46%) were in Kisumu city, the provincial headquarter and a further 105 (16%) in Migori, a commercial town along

a busy transport route linking Kenya with Tanzania. A possible explanation for the higher number of MSW/MSM spots in Nyanza province is that they may have included more cruising sites than in other provinces.

4.2. Estimated number of active MSW/MSM spots in individual towns mapped

The number of active MSW/MSM spots in the individual towns mapped is summarized in Table 12.

Table 12: Estimated number of active MSW/MSM spots in towns mapped

Province	Town (or administrative units)	Estimated number of active FSW spots
Nairobi	Westlands	116
	Kasarani	8
	Embakasi	1
	Makadara	14
	Kamukunji	3
	Starehe	36
	Dagoretti	3
	Langata	30
Sub-total		*211*
Central	Kerugoya Kutus	2
	Kiambu	10
	Muranga	5
	Nyahururu	3
	Nyeri	1
	Ruiru	10
	Thika	11
Sub-total		*42*
Eastern	Emali	8
	Machakos	67
	Makindu	6
	Mavoko	8
	Chuka	18
	Embu	5
	Maua	33
	Meru	27
Sub-total		*172*

Table 12: Estimated number of active MSW/MSM spots in towns mapped *(Contd.)*

Province	Town (or administrative units)	Estimated number of active FSW spots
Coast	Mombasa City	133
	Kilifi	18
	Malindi	41
	Mtwapa	17
	Ukunda	28
	Voi	1
Sub-total		*238*
Nyanza	Kisumu	301
	Bondo	52
	Homa Bay	51
	Kisii	66
	Migori	105
	Nyamira	36
	Siaya	39
Sub-total		*650*
Western	Bungoma	39
	Busia	32
	Kakamega	28
	Malaba	8
	Mumias	43
	Vihiga	42
	Webuye	25
Sub-total		*217*
Rift Valley	Nakuru	23
	Naivasha	*
	Narok	1
	Kajiado	
	Namanga	3
	Kapenguria	1
	Kitale	7
	Eldoret	17
	Nanyuki	1
	Kericho	*
	Ongata Rongai	2
Sub-total		*55*
Grand Total		**1,585**

* No MSW/MSM spot identified

4.3. MSW/MSM population estimates

The total population of MSWs/MSM in the towns mapped was 10,033 (range 7,425 to 12,641). Figure 15 shows the estimated number of MSWs/MSM in each of the provinces based on data collected from the towns mapped.
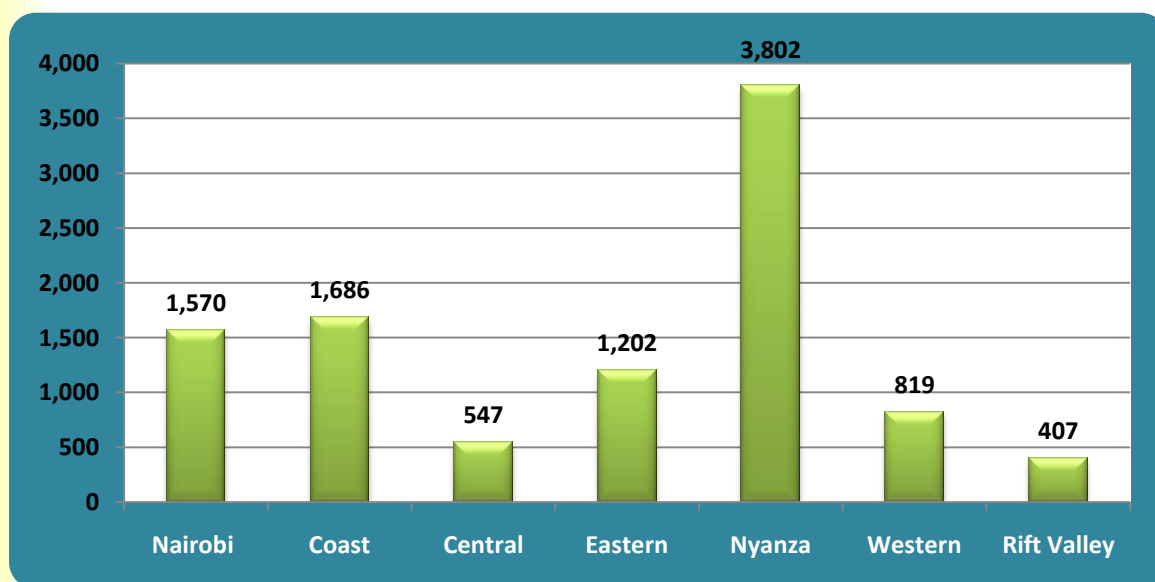
Figure 15: Estimated number of MSWs/MSM, by province

Consistent with the data on number of active MSW/MSM spots, Nyanza province had the largest number of MSWs/MSM with 1,630 (43%), 673 (18%) and 426 (11%) of that number being in Kisumu city, Migori and Kisii towns, respectively. It is not entirely clear why Nyanza province had a higher number of MSWs/MSM than the combined estimates for Nairobi and Coast provinces. *A possible explanation is that the mapping in that region may have captured low-risk MSM too or MSWs/MSM might have been more visible in that region than in the other provinces. This finding calls for further study of factors driving MSW activity and factors that may influence the accessibility and visibility of MSWs/MSM in different settings.*In Coast province, 782 (46%) of the MSWs/MSM were in Mombasa city followed by 326 (19%) in Malindi and 257 (15%) in Ukunda.Nearly half, 578 (48%) of the MSWs/MSM in Eastern province were in Machakos town, followed by 266 (22%) in Maua town. In Western province, Mumias, Vihiga and Kakamega towns were home to 22, 18 and 17 per cent of MSWs/MSM in the province,respectively. In Central province, most of MSWs/MSM were to be found in Muranga (184, 34%) and Ruiru (154, 28%) towns. About two-thirds (259, 64%) of the

MSWs/MSM in Rift Valley province were in Nakuru town while 95 (23%) were found in Eldoret town. Figure 16 provides a geographic visualization of the distribution of MSWs/MSM.
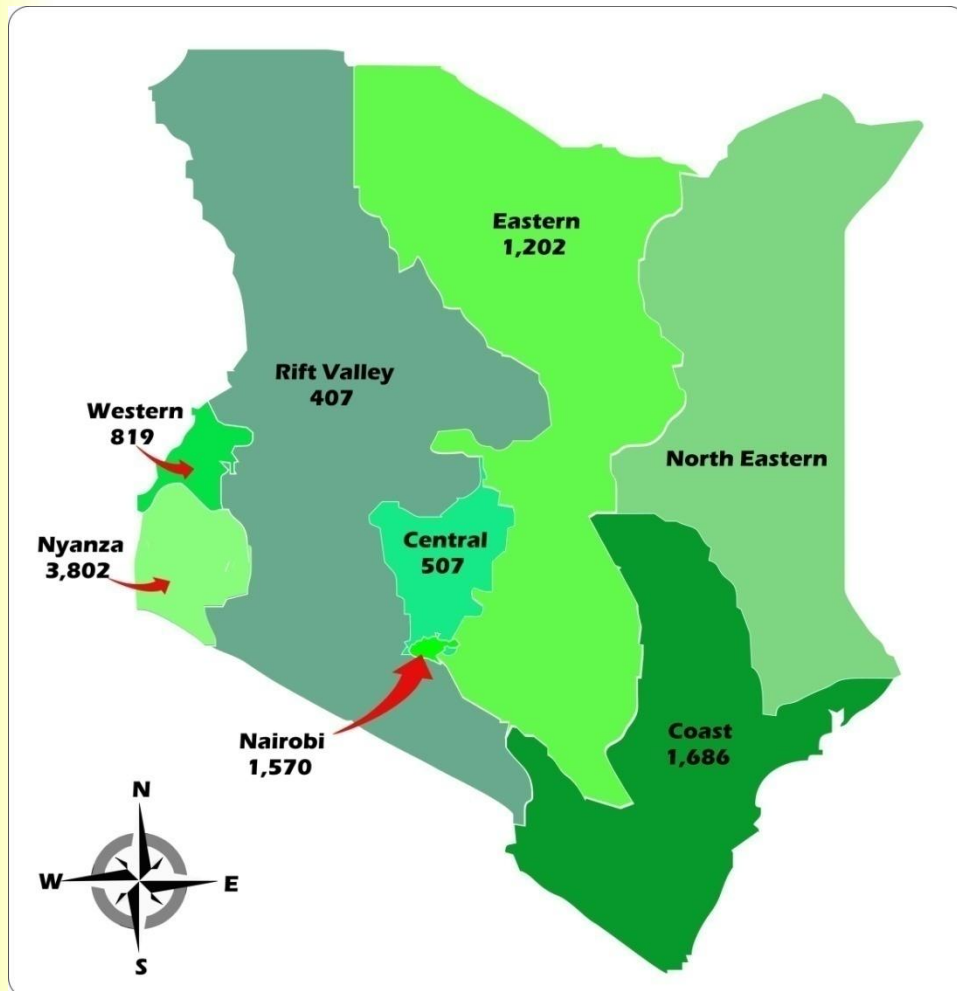
Figure 16: Geographic distribution of MSWs/MSM

4.3.1. *MSW/MSM population estimates in the towns mapped*

Table 13 provides a summary of the point estimate and minimum and maximum boundsof MSWs/MSM in each of the towns mapped.

Table 13: Estimated number of MSWs/MSM in the towns mapped

Province	Town (or administrative units)	Estimated population		
		Minimum	Maximum	Point estimate
Nairobi	Westlands	589	1029	809
	Kasarani	53	115	84
	Embakasi	3	6	5
	Makadara	95	168	131
	Kamukunji	12	17	14
	Starehe	242	426	334
	Dagoretti	13	25	19
	Langata	133	215	174
Sub-total		*1,140*	*2,000*	*1,570*
Central	Kerugoya Kutus	11	28	20
	Kiambu	50	73	62
	Muranga	177	191	184
	Nyahururu	18	31	25
	Nyeri	8	10	9
	Ruiru	104	204	154
	Thika	73	116	94
Sub-total		*441*	*653*	*547*
Eastern	Emali	15	47	31
	Machakos	294	863	578
	Makindu	9	21	15
	Mavoko	28	50	39
	Chuka	128	226	177
	Embu	20	38	29
	Maua	191	340	266
	Meru	53	80	66
Sub-total		*738*	*1,665*	*1,202*
Coast	Mombasa	539	1,026	782
	Kilifi	138	241	189
	Malindi	241	411	326
	Mtwapa	90	160	125
	Ukunda	198	316	257
	Voi	4	8	6
Sub-total		*1,210*	*2,162*	*1,686*
Nyanza	Kisumu	1,319	1,941	1,630
	Bondo	256	442	349
	Homa Bay	254	423	339
	Kisii	336	516	426
	Migori	518	827	673
	Nyamira	92	144	118
	Siaya	203	334	269
Sub-total		*2,978*	*4,626*	*3,802*

Table 13: Estimated number of MSWs/MSM in the towns mapped *(Contd.)*

Province	Town (or administrative units)	Estimated population		
		Minimum	Maximum	Point estimate
Western	Bungoma	102	167	135
	Busia	84	142	113
	Kakamega	101	171	136
	Malaba	26	37	32
	Mumias	140	216	178
	Vihiga	114	187	151
	Webuye	55	96	76
Sub-total		*622*	*1,016*	*819*
Rift Valley	Nakuru	192	327	259
	Naivasha			
	Narok	3	6	4
	Kajiado			
	Namanga	12	23	18
	Kapenguria	6	10	8
	Kitale	9	16	13
	Eldoret	67	123	95
	Nanyuki	2	5	4
	Kericho			
	Ongata Rongai	5	10	8
Sub-total		*296*	*519*	*407*
Grand Total		**7,426**	**12,641**	**10,033**

4.3.2. Estimated number of MSWs/MSM in Nairobi city by administrative units

Figure 17 shows the distribution of MSWs/MSM in Nairobi by administrative units.
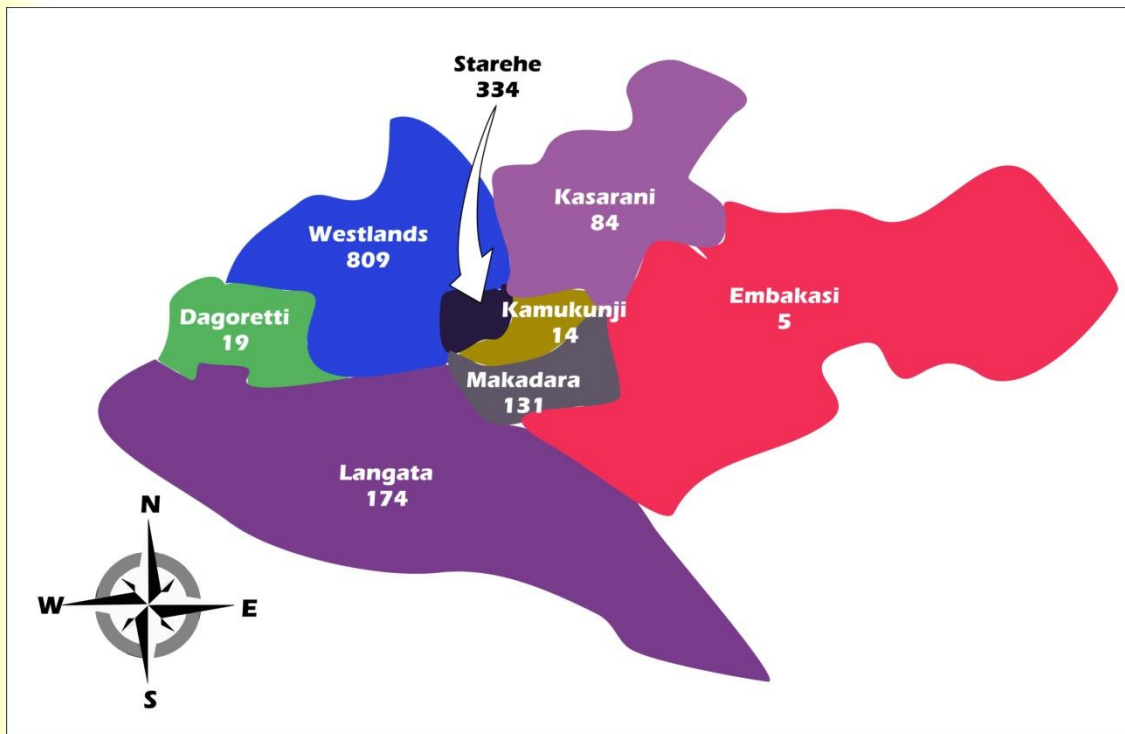
Figure 17: The distribution of MSWs/MSM in Nairobi by administrative units

The majority (809, 52%) of MSWs/MSM in Nairobi operated from the Westlands area, which is a middle class residential and commercial area. The area covering the central business district (Starehe constituency) had 334 (21%) of the MSWs/MSM population in Nairobi, with Lang'ata area at 11 per cent and Makadara at 8 per cent.

4.3.3. *Estimated number of MSWs/MSM in Mombasa city, by administrative units*

Figure 18 shows the distribution of MSWs/MSM in Mombasa by administrative units.
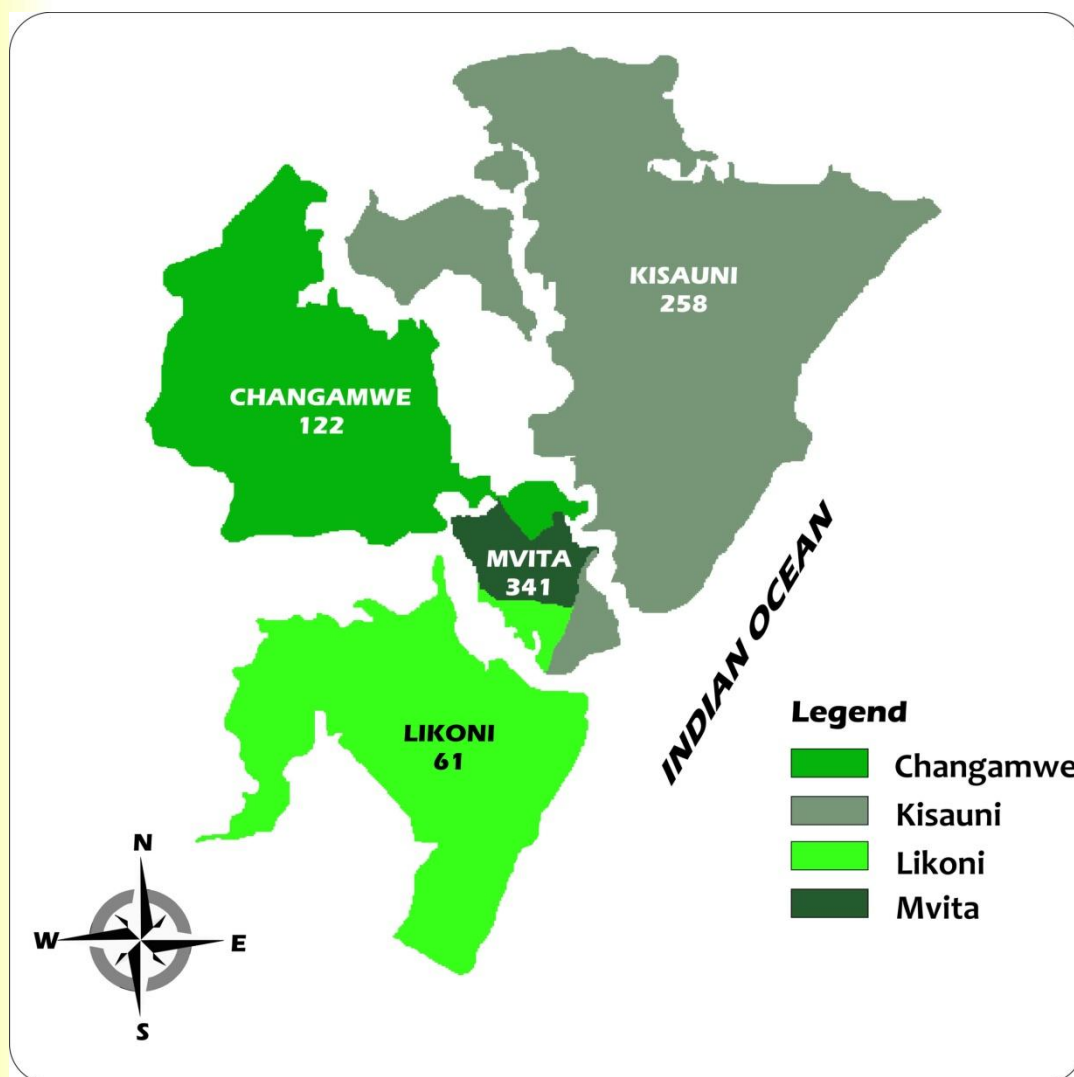
Figure 18: The distribution of MSWs/MSM in Mombasa city by administrative units

341 (44%) of MSWs/MSM in Mombasa city operated from the Mvita area, which covers the central business district. The densely populated Kisauni area accounted for one-third of the MSWS/MSM population in Mombasa city.

4.4. MSWs/MSM population by typology

MSWs/MSM population estimates were analyzed by the typology of spots from where they operated. Figure 19 shows the proportional distribution of MSWs/MSM by typology of spot.
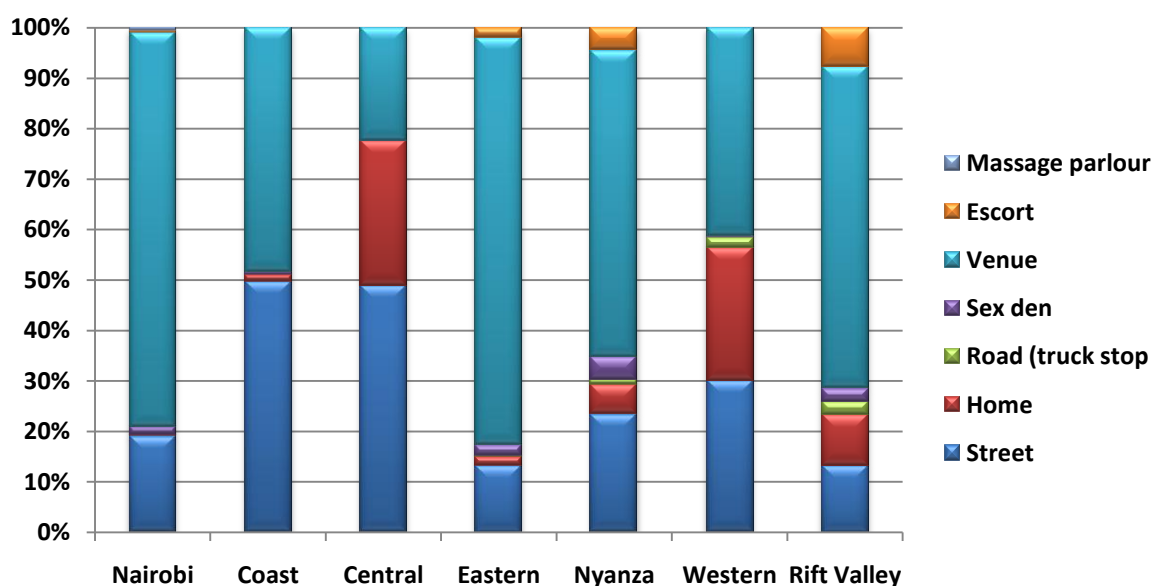
Figure 19: Proportional distribution of MSWs/MSM by typology of spot

About half of MSWs/MSM in Central and Eastern provinces operated from street-based spots. Street-based MSWs/MSM were less common in Eastern (13%) and Rift Valley (13%) than in Nairobi (19%), Nyanza (23%) and Western (30%) provinces. The majority of MSWs/MSM in Eastern (81%), Nairobi (78%), Rift Valley (65%) and Nyanza (61%) provinces operated from well known venues. Home-based MSWs/MSM were more common in Central (29%), Western (26%) and to some extent, Rift Valley (10%) provinces, but negligible in the other provinces. MSWs/MSM involved in escort services were generally few, with eight, four and two per cent of MSWs/MSM in Rift Valley, Nyanza and Eastern, respectively, belonging to this category.

4.5. Number of MSWs/MSM per spot

The estimated number of MSWs/MSM per spot was calculated based on data on the number of active spots and estimated number of MSWs/MSM, and are presented for each town mapped in Table 14.

Table 14: Estimated number of MSWs/MSM per spot, by province

Province	Town (or administrative units)	Estimated number of MSWs/MSM per spot
Nairobi	Westlands	7
	Kasarani	10
	Embakasi	5
	Makadara	9
	Kamukunji	5
	Starehe	9
	Dagoretti	6
	Langata	6
Sub-total		7
Central	Kerugoya Kutus	10
	Kiambu	6
	Muranga	37
	Nyahururu	8
	Nyeri	9
	Ruiru	15
	Thika	9
Sub-total		13
Eastern	Emali	4
	Machakos	9
	Makindu	3
	Mavoko	5
	Chuka	10
	Embu	6
	Maua	8
	Meru	2
Sub-total		7
Coast	Mombasa City	6
	Kilifi	11
	Malindi	8
	Mtwapa	7
	Ukunda	9
	Voi	6
Sub-total		7
Nyanza	Kisumu	5
	Bondo	7
	Homa Bay	7
	Kisii	6
	Migori	6
	Nyamira	3
	Siaya	7
Sub-total		6

Table 14: Estimated number of MSWs/MSM per spot, by province(Contd.)

Province	Town (or administrative units)	Estimated number of MSWs/MSM per spot
Western	Bungoma	3
	Busia	4
	Kakamega	5
	Malaba	4
	Mumias	4
	Vihiga	4
	Webuye	3
Sub-total		4
Rift Valley	Nakuru	11
	Naivasha	
	Narok	4
	Kajiado	
	Namanga	6
	Kapenguria	8
	Kitale	2
	Eldoret	6
	Nanyuki	4
	Kericho	
	Ongata Rongai	4
Sub-total		7
Overall		**6**

4.6. Characteristics of MSWs/MSM

4.6.1. Age

A total of 1,378MSWs/MSM were interviewed for the validation of spots, with the majority (46.6%) of them being in Nyanza province. The mean age of the MSWs/MSM was 26.1 years (SD 4.7). Only 4 (0.3%) of the MSWs/MSM interviewed reported to be less than 15 years of age with the youngest aged 12 years. Table 15 presents the mean age of MSWs/MSM interviewed, stratified by province.

Table 15: Mean age of MSWs/MSM interviewed, stratified by province

Nairobi	27.5	4.8	201
Central	27.3	5.2	26
Eastern	27.1	4.7	82
Coast	28.2	6.6	178
Nyanza	24.0	2.7	641
Western	29.1	4.4	215
Rift Valley	24.9	4.4	32
Total	**26.1**	**4.7**	**1,375**

MSWs/MSM in Nyanza province were significantly younger than those from the other provinces. Western and Coast provinces had the oldest MSWs/MSM (p<.001).

4.6.2. Education

Educational attainment among MSWs/MSM interviewed for the mapping exercise was relatively higher than among FSWs. Over two-thirds, 952 (67%) of the MSWs/MSM had attained secondary or college level education, while 76 (5.5%) reported to have studied up to university level. Table 16provides a summary of educational status among MSWs/MSM study respondents.

Table 16: Level of education among interviewed MSWs/MSM

Level of education	*Nairobi*	*Central*	*Eastern*	*Coast*	*Nyanza*	*Western*	*Rift Valley*	*Total*
No formal education	0	0	7 (8.6%)	3 (1.7%)	2 (0.3%)	0	0	12 (0.9%)
Primary	11 (5.4%)	3 (11.5%)	39 (48.1%)	80 (44.9%)	8 (1.3%)	60 (28.0%)	0	201 (14.7%)
Post-primary/ vocational	34 (16.7%)	4 (15.4%)	3 (3.7%)	3 (1.7%)	84 (13.2%)	2 (0.9%)	1 (3.1%)	131 (9.5%)
Secondary/A level	124 (60.8%)	13 (50.0%)	17 (21.0%)	74 (41.6%)	293 (46.0%)	112 (52.3%)	12 (37.5%)	645 (47.0%)
College	29 (14.2%)	5 (19.2%)	13 (16.0%)	16 (9.0%)	195 (30.6%)	40 (18.7%)	9 (28.1%)	307 (22.4%)
University	6 (2.9%)	1 (3.8%)	2 (2.5%)	2 (1.1%)	55 (8.6%)	0	10 (31.3%)	76 (5.5%)
Total	**204**	**26**	**81**	**178**	**637**	**214**	**32**	**1,372**

Compared to other provinces, a higher proportion (60.8%) of MSWs/MSM in Nairobi province had attained secondary level education while more (30.6%) MSWs/MSM in Nyanza as compared to other provinces had college level education.

4.6.3. Marital status

Over two-thirds, 1,070 (77.6%) of MSWs/MSM interviewed were single, 179 (13%) were married, while 90 (6.5%) were divorced or widowed. The rest, 39 (1.8%) reported to be cohabiting.

4.6.4. Payment for sex with men

Overall,67.8% of the 1,368study respondents who reported on their sexual behavior said that they were paid when they had sex with other men. Analyzed by province, almost all, (95.2%) of MSWs/MSM in Nairobi and91.5% of MSWs/MSM in Coast province reported that they were paid when they had sex with other men as compared to 76.9%, 72.7%and 68.3% in Central, Nyanza and Eastern provinces, respectively. Two-thirds of MSWs/MSM in Rift Valley also reported to have received payment for sex with men. Payment for sex with men was least common in Western province, where the practice was reported by only 6.5%of the respondents from that area. These regional differences in payment for sex with men were statistically significant (p<.001).

4.6.5. Weekly number of male sexual partners

The MSWs/MSM interviewed reported to have a mean of 3.54 (SD 3.50) male sexual partners per week. Table 17 provides a summary of reported mean number of male sexual partners among MSWs/MSM interviewed for the mapping study.

Table 17: Weekly mean number of male sexual partners among MSWs/MSM interviewed, stratified by province

Province	Mean	Standard deviation	Sample size
Nairobi	6.0	3.6	205
Central	12.9	11.2	26
Eastern	3.5	3.1	81
Coast	4.7	3.1	177
Nyanza	3.1	1.7	614
Western	0.2	0.8	210
Rift Valley	3.1	1.9	26
Total	**3.5**	**3.50**	**1,339**

MSWs/MSM from Western province had the least mean number of male sexual partners while Nairobi and Central provinces had the highest. The low number of weekly sexual

partners in Western province is consistent with the earlier observation that paid sex with men was less common in the province.

4.6.6. Payment for sex with women

Overall, 857 (62.6%) of MSWs/MSM reported that they also had sex with women. MSWs/MSM reporting sexual activity with women were more common in Western (95.8%), Eastern (87.8%) and Rift Valley (84.4%) provinces than in Nyanza, (67.0%), Coast (40.6%), Central (22.3%) and Nairobi (22.3%) provinces (p<.001). Nearly sixty per cent(59%) of the MSWs/MSM who reported to have sex with women said they were paid for such sexual activity.

4.6.7. Movement across spots

Over one-half, 728 (53%) of the MSWs/MSM interviewed reported that they solicited for male sexual partners at places other than the spot where they were interviewed for the mapping study. Over one-half, (56.5%) of the 857 MSWs/MSM who reported having sexual relations with women,also said they that they looked for female sexual partners at places other than the spot where they were found for the mapping interview.

5. Estimates of injection drug user spots and population size

Data on injection drug user (IDU) spots were also gathered through Level 1 interviews. An injecting drug user was defined as a person who injects drugs for non-therapeutic purposes, irrespective of the type of drug injected. Unlike FSW and MSW/MSM spots, IDU spots were categorized into only two typologies: street-based and home-based/venue-based. This was because of the small number of categories of spots. Street-based IDU spots included all public areas, such as open fields, backstreets, unfinished buildings, etc., where IDUs met for purposes of buying or injecting drugs. Injection drug use within the privacy of homes or at venues such as bars, night clubs, etc., were classified as a home/venue-based typology. All the spots identified through interviews with secondary key informants were visited and validated through interviews with IDUs themselves (primary key informants). During such validation, some new IDU spots were generated and also validated. The study captured only spots that were in current use and current users, rather previous users of injection drugs.

5.1. Estimates of IDU spots

A total of 919 IDU spots were identified through this exercise, with Coast province accounting for 35 per cent of the total number, followed by Nyanza and Western, each with 17 per cent and Nairobi (16%). Figure 20presents data on the distribution of IDU spots by province.
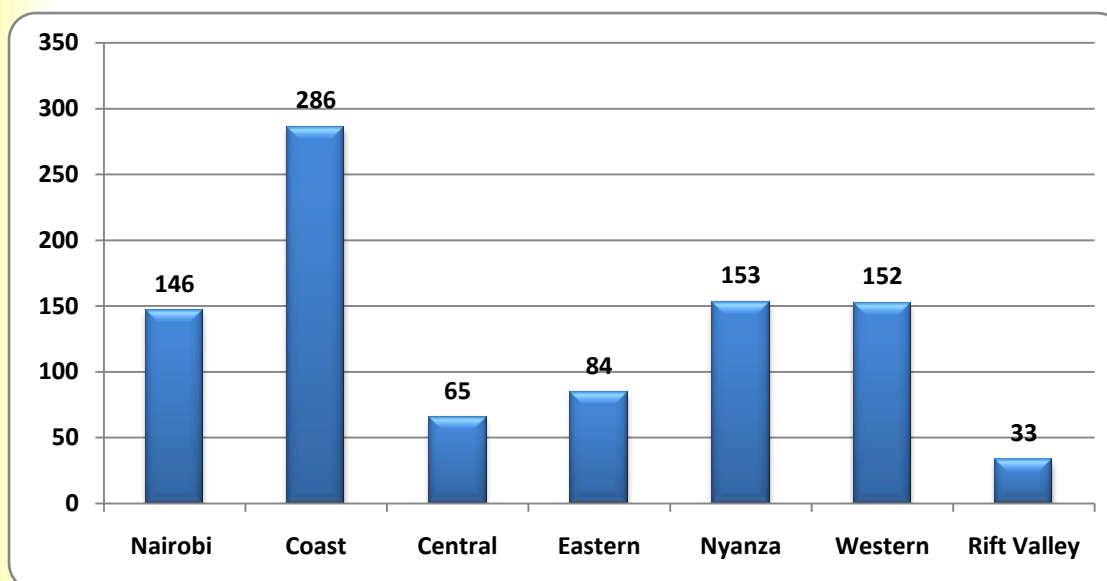
Figure 20: The distribution of IDU spots by province

The estimated number of active IDU spots inthe towns mapped is provided in Table 18.

Table 18: Estimated number of active IDU spots in towns mapped

Province	Town (or administrative units)	Estimated number of active IDU spots
Nairobi	Westlands	29
	Kasarani	21
	Embakasi	18
	Makadara	14
	Kamukunji	9
	Starehe	30
	Langata	25
	Dagoretti	0
Sub-total		*146*
Central	Kerugoya Kutus	2
	Kiambu	18
	Muranga	11
	Nyahururu	5
	Nyeri	5
	Ruiru	18
	Thika	6
Sub-total		*65*
Eastern	Kitui	1
	Machakos	14
	Makindu	1
	Chuka	15

	Embu	8
	Maua	21
	Meru	24
Sub-total		*84*
Coast	Mombasa City	223
	Kilifi	19
	Malindi	17
	Mariakani	1
	Mtwapa	15
	Ukunda	11
Sub-total		*286*

Table 18: Estimated number of active IDU spots in towns mapped *(Contd.)*

Province	Town (or administrative units)	Estimated number of active IDU spots
Nyanza	Kisumu	88
	Bondo	9
	Homa Bay	11
	Kisii	9
	Migori	29
	Nyamira	2
	Siaya	5
Sub-total		*153*
Western	Bungoma	27
	Busia	24
	Kakamega	27
	Malaba	8
	Mumias	20
	Vihiga	28
	Webuye	18
Sub-total		*152*
Rift Valley	Nakuru	19
	Naivasha	*
	Narok	2
	Kajiado	*
	Namanga	*
	Kapenguria	*
	Kitale	1
	Eldoret	7
	Nanyuki	1
	Kericho	*
	Ongata Rongai	3
Sub-total		*33*
Grand Total		**919**

* No IDU spot identified.

5.2. IDU population estimates

The mapping exercise estimated a total IDU population of 7,850 (range 5,822 to 9,877)in the seven provinces covered, with about a third (35%) of the total number being in the Coast province and nearly twenty per cent (19%) in Nairobi, as shown in Figure 21.
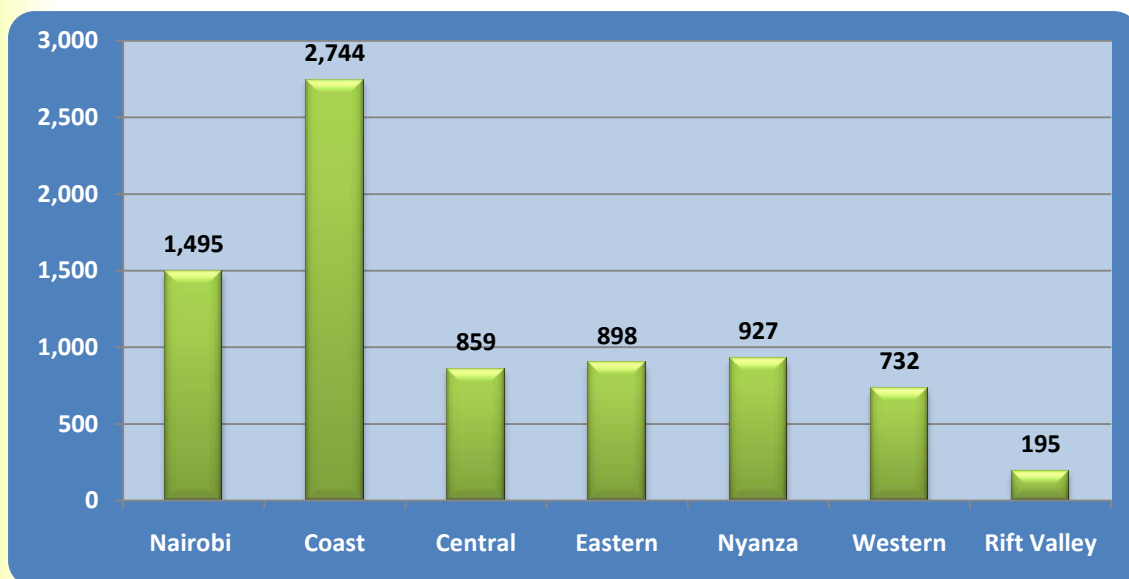
Figure 21: Estimated IDU population by provinces

In Coast province, the majority, 2101 (77%) of the IDUs were in Mombasa city. In Nyanza province, Kisumu city (424, 46%) and Migori town (309, 33%) accounted for the largest number of IDUs. About a third, 284 (32%) of IDUs in Eastern province were in Maua town, which is also the epicentre of khat production in Kenya, and 214 (24%) were in Machakos town. Ruiru (268, 31%) and Kiambu (269, 31%) in Central province had the largest number of IDUs in the area compared to the other towns that were mapped. In Western province, Bungoma (146, 20%), Kakamega (143, 19%) and Vihiga (109, 15%) had the largest share of IDUs.

Figure 22on page 60 provides a geographic visualization of the distribution of IDUs.
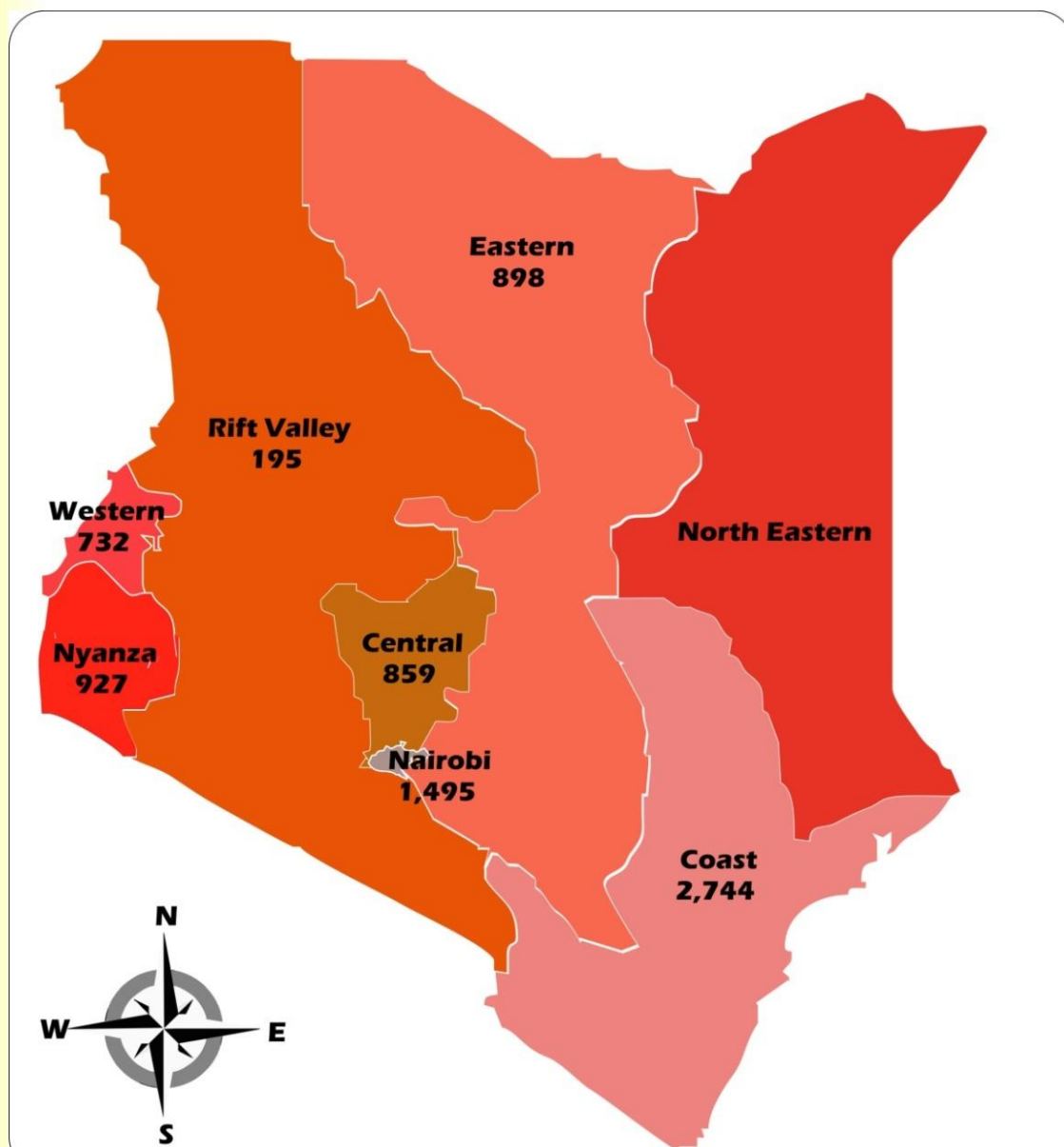
Figure 22: Geographic distribution of IDUs

Table 19: Estimated number of active IDU population in towns mapped

Province	Town (or administrative units)	Estimated population		
		Minimum	**Maximum**	**Point estimate**
Nairobi	Westlands	73	117	95
	Kasarani	219	310	264
	Embakasi	145	290	218
	Makadara	165	222	194
	Kamukunji	119	164	141
	Starehe	267	350	309
	Langata	227	321	274
	Dagoretti	0	0	0
Total		*1,215*	*1,774*	*1,495*
Central	Kerugoya Kutus	20	28	24
	Kiambu	211	326	269
	Muranga	84	163	123
	Nyahururu	32	75	54
	Nyeri	38	86	62
	Ruiru	195	342	268
	Thika	46	75	60
Total		*625*	*1,094*	*859*
Eastern	Kitui	15	25	20
	Machakos	156	272	214
	Makindu	1	5	3
	Chuka	113	189	151
	Embu	93	141	117
	Maua	242	326	284
	Meru	91	129	110
	Emali	0	0	0
Total		*711*	*1,086*	*898*
Coast	Mombasa	1,466	2,735	2,101
	Kilifi	119	282	200
	Malindi	207	300	253
	Mariakani	2	3	3
	Mtwapa	34	71	53
	Ukunda	97	172	134
Total		*1,925*	*3,562*	*2,744*

Table 19: Estimated number of active IDU population in towns mapped *(Contd.)*

Province	Town (or administrative units)	Estimated population		
		Minimum	**Maximum**	**Point estimate**
Nyanza	Kisumu	334	514	424
	Bondo	30	44	37
	Homa Bay	49	84	67
	Kisii	50	77	64
	Migori	233	384	309
	Nyamira	5	11	8
	Siaya	13	26	20
Total		*714*	*1,140*	*927*
Western	Bungoma	98	193	146
	Busia	82	152	117
	Kakamega	100	186	143
	Malaba	28	52	40
	Mumias	60	113	87
	Vihiga	75	143	109
	Webuye	62	120	91
Total		*505*	*959*	*732*
Rift Valley	Nakuru	84	178	131
	Naivasha	0	0	0
	Narok	6	8	7
	Kajiado	0	0	0
	Namanga	0	0	0
	Kapenguria	0	0	0
	Kitale	6	10	8
	Eldoret	19	45	32
	Nanyuki	4	7	6
	Kericho	0	0	0
	Ongata Rongai	8	14	11
Total		*127*	*262*	*195*
Grand Total		**5,821**	**9,877**	**7,850**

5.3. Distribution of IDUs by typology

Figure 23 shows the distribution of IDUs by typology in each of the provinces covered.
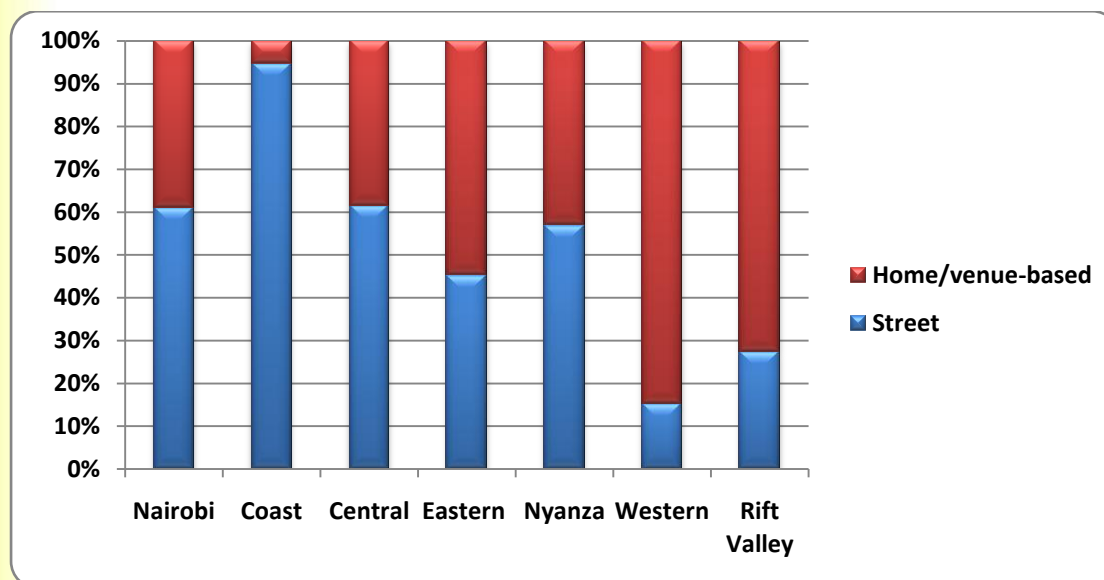
Figure 23: Distribution of IDUs by typology

Street-based IDUs were dominant in Coast (95%), Central (62%), Nairobi (61%) and Nyanza (57%) provinces. In contrast, home/venue-based IDUs were more prevalent in Western (85%), Rift Valley (73%) and Eastern (55%) provinces.

5.4. Estimated number of IDUs per spot

Table 20 presents estimated number of IDUs per spot in each of the towns mapped.

Table 20: Estimated number of IDUs per spot

Province	Town (or administrative units)	Estimated number of IDUs per spot
Nairobi	Westlands	3
	Kasarani	13
	Embakasi	12
	Makadara	14
	Kamukunji	16
	Starehe	10
	Langata	11
	Dagoretti	*
Sub-total		10
Central	Kerugoya Kutus	12
	Kiambu	15
	Muranga	11
	Nyahururu	11
	Nyeri	12
	Ruiru	15
	Thika	10
Sub-total		13
Eastern	Kitui	20
	Machakos	15
	Makindu	3
	Chuka	10
	Embu	15
	Maua	14
	Meru	5
Sub-total		11
Coast	Mombasa City	9
	Kilifi	11
	Malindi	15
	Mariakani	3
	Mtwapa	4
	Ukunda	12
Sub-total		10
Nyanza	Kisumu	5
	Bondo	4
	Homa Bay	6
	Kisii	7
	Migori	11
	Nyamira	4
	Siaya	4
Sub-total		6

* No IDU spot identified.

Table20: Estimated number of IDUs per spot *(Contd.)*

Province	Town (or administrative units)	Estimated number of IDUs per spot
Western	Bungoma	5
	Busia	5
	Kakamega	5
	Malaba	5
	Mumias	4
	Vihiga	4
	Webuye	5
Sub-total		5
Rift Valley	Nakuru	7
	Naivasha	*
	Narok	4
	Kajiado	*
	Namanga	*
	Kapenguria	*
	Kitale	8
	Eldoret	5
	Nanyuki	6
	Kericho	*
	Ongata Rongai	4
Sub-total		6
Overall		**9**

* No IDU spot identified.

5.5. Characteristics of IDUs

5.5.1. Age

A total of 768 IDUs were interviewed for the mapping study. The distribution of the IDU respondents by province were as follows: Coast, 263 (34.2%), Western, 152 (19.8%), Nyanza, 149 (19.4%), Nairobi, 84 (10.9%), Eastern, 61 (7.9%), Central, 34 (4.4%) and Rift Valley, 25 (3.3%). Only 93 (12%) of the IDUs gave information on their age; the mean age for this group was 39.1 (SD 4.5).

5.5.2. Education

Nearly one half, 378 (49.4%) of the IDUs interviewed had attained secondary education or higher. Table 21 displays educational attainment among the sample of IDUs

interviewed. Because of low frequencies, the level of education among IDUs was not analyzed further by province.

Table 21: Educational attainment among the sample of IDUs interviewed

Level of education	Frequency (Percentage)
No formal education	14 (1.8%)
Primary	303 (39.6%)
Post-primary/Vocational	70 (9.2%)
Secondary/ A level	282 (36.9%)
College	79 (10.3%)
University	17 (2.2%)
Total	**765 (100%)**

5.5.3. Marital status

Over one half, 412 (53.7%) of the IDUs interviewed reported to be single, 150 (19.5%) were married, while 138 (18.0%) and 68 (8.9%) were cohabiting and divorced/widowed, respectively. Information on the gender of IDUs was not collected.

5.5.4. Drug use patterns

The IDUs interviewed reported to inject drugs for a mean of 2.6 (SD 1.4) times a day, with a maximum of eight times in a day. The drugs commonly injected were cocaine and heroin (brown sugar). More than three-quarters, 600 (78.1%) of the respondents reported that they injected at more than one location/place. The mean number of locations/places at which the IDUs exchanged or injected drugs was 2.4 (SD 1.3). Based on interviews with the primary key informants, about 36 per cent of the IDUs shared injection needles.

5.6. Overlap in MARP spots

We also analyzed data on the extent to which individual spots were frequented by more than one type of MARP group. There was a greater overlap between FSW and MSW/MSM spots than between FSW and IDU spots, or between MSW/MSM and IDU spots. About 86 percent of MSW/MSM spots and about 38 per cent of IDU spots in Nairobi were also frequented by FSWs. However, spots frequented by all three MARP categories were rare in Nairobi, with only 2 per cent of all the spots identified being of that type. In Coast province, about 50 per cent of MSW/MSM and 37 per cent of IDU spots were also frequented by FSWs while 9 per cent of FSW spots were frequented by

both MSWs/MSM and IDUs. The majority (90%) of MSWs/MSM spots, as compared to about 27 per cent of IDU spots in Western province, were also frequented by FSWs while less than 1 per cent of all the spots identified in the province were used by all the MARPs. In Nyanza province, about 79 per cent of MSW/MSM spots and 16 per cent of IDU spots also served as FSW spots, while 9 per cent of all spots identified were used by all the three MARP categories. About 80 per cent of MSW/MSM spots and 35 per cent of IDU spots in Rift Valley were also frequented by FSWs. Less than one percent of all spots identified in Rift Valley province were used by all the three MARP groups. In Central province, 50 per cent of MSW/MSM spots and 35 per cent of IDU spots were also frequented by FSWs while about 3 per cent of all the spots identified were used by all the MARPs. Nearly two-thirds (65%) of MSW/MSM spots and 35 per cent of IDU spots in Eastern province were also used by FSWs, while 5 per cent of all the spots identified in the province were used by all the three categories of MARPs.

6. Extrapolated national FSW estimates

6.1. Coverage of the mapping exercise

The population of urban centres outside of Nairobi covered for the mapping represented 70 per cent of the towns with 5,000 or more population in each of the provinces based on the 2009 census. Table 22 shows proportional coverage of the mapping of towns with 5,000 or more population.

Table 22: Mapping coverage of towns with 5,000 or more population, by province

Province	Population of towns with 5,000+			% population of selected towns
	Not selected	Selected	Total	
Central	409,355	585,526	994,881	59%
Coast	60,191	1,213,334	1,273,525	95%
Eastern	116,330	273,641	389,971	70%
North Eastern	268,804		268,804	0%
Nyanza	98,715	450,998	549,713	82%
Rift Valley	467,867	894,444	1,362,311	66%
Western	41,115	281,265	322,380	87%
Total	1,462,377	3,699,208	5,161,585	72%

Table 23 shows the coverage of the mapping exercise by class of town (5,000 or more and less than 5,000 population) by province.

Table 23: Mapping coverage by class of towns in each province

Province	Number of urban centres with 5,000+ population	Number (and proportion) mapped	Number of urban centres with <5,000 population	Number (and proportion) mapped	Total number of urban centres
Central	12	7 (58%)	19	0	31
Coast	13	8 (62%)	11	0	24
Eastern	12	7 (58%)	23	3(13%)	35
North Eastern	7	0	2	0	9
Nyanza	13	7 (54%)	19	0	32
Rift Valley	26	10 (38%)	37	1(3%)	63
Western	8	7 (88%)	12	0	20
Total	91	46 (50%)	123	4 (3%)	214

The mapping covered 46 per cent of urban centres with 5,000 or more population and 4 per cent of those with less than 5,000 population. The city of Nairobi was covered in entirety.

6.2. Extrapolated FSW estimates

The data collected from the mapping study were extrapolated to the national level. The extrapolation was made to urban population only as the mapping focused on urban and semi-urban areas. As North Eastern Province was not mapped, FSW size estimates from comparably-sized towns of over 5,000 population mapped throughout Kenya were extrapolated to North Eastern Province, and from there, to towns under 5,000 population. The following factors were taken into consideration in deriving extrapolated estimates.

a) The mapping covered about 70 per cent of the population of towns with 5,000 or more population

b) Over one-half (57.5%) of the FSWs visited more than one spot.

c) About 48 per cent of the Kenyan female population is of reproductive age (15-49 years).

The extrapolated national estimates for theurban FSW population was 138,420 (range 107, 552 to 169, 288). Tables24and 25provide national urban FSW estimates by towns mapped and not mapped and by class of town (5,000 or more or less than 5,000 population), respectively, for each province.

Table 24: National FSW population estimates, by mapped and not mapped towns

Province	Mapped			Not mapped			Total		
	Min	Max	Estimate	Min	Max	Estimate	Min	Max	Estimate
Central	5,743	9,400	7,572	5,216	6,810	6,013	10,959	16,210	13,584
Coast	12,422	20,508	16,465	2,782	3,845	3,313	15,204	24,353	19,778
Eastern	7,616	13,517	10,567	4,752	6,413	5,582	12,368	19,930	16,149
Nairobi	21,081	34,160	27,620	0	0		21,081	34,160	27,620
N. Eastern	0	0	0	1,890	2,488	2,189	1,890	2,488	2,189
Nyanza	11,042	17,708	14,375	4,201	5,861	5,031	15,243	23,569	19,406
Rift Valley	9,923	16,837	13,380	8,600	12,055	10,328	18,524	28,892	23,708
Western	10,050	16,588	13,319	2,235	3,098	2,666	12,285	19,686	15,985
Total	77,878	128,717	103,298	29,675	40,570	35,123	107,552	169,288	138,420

Table 25: National FSW population estimates, by town class (≥5,000 and ≤5,000 population)

Province	Towns 5000+ population			Towns<5000 population			Total		
	Min	Max	Estimate	Min	Max	Estimate	Min	Max	Estimate
Central	7,638	11,627	9,632	3,321	4,583	3,952	10,959	16,210	13,584
Coast	13,238	21,655	17,447	1,967	2,697	2,332	15,204	24,353	19,778
Eastern	7,066	12,057	9,561	5,302	7,873	6,588	12,368	19,930	16,149
Nairobi	21,081	34,160	27,620	0	0		21,081	34,160	27,620
N. Eastern	1,550	2,015	1,782	340	473	407	1,890	2,488	2,189
Nyanza	12,042	19,107	15,575	3,200	4,462	3,831	15,243	23,569	19,406
Rift Valley	12,107	20,044	16,076	6,416	8,848	7,632	18,524	28,892	23,708
Western	10,290	16,894	13,592	1,995	2,792	2,393	12,285	19,686	15,985
Total	**85,012**	**137,559**	**111,285**	**22,541**	**31,729**	**27,135**	**107,552**	**169,288**	**138,420**

Nairobi had the largest share (20%) of the FSW population in the country, followed in rank by Rift Valley (17%), Coast (14%), Nyanza (14%), Eastern (12%), Western (12%), Central (10%) and North Eastern (2%) provinces.

Figure 24provides a spatial distribution of extrapolated FSW estimates in Kenya.
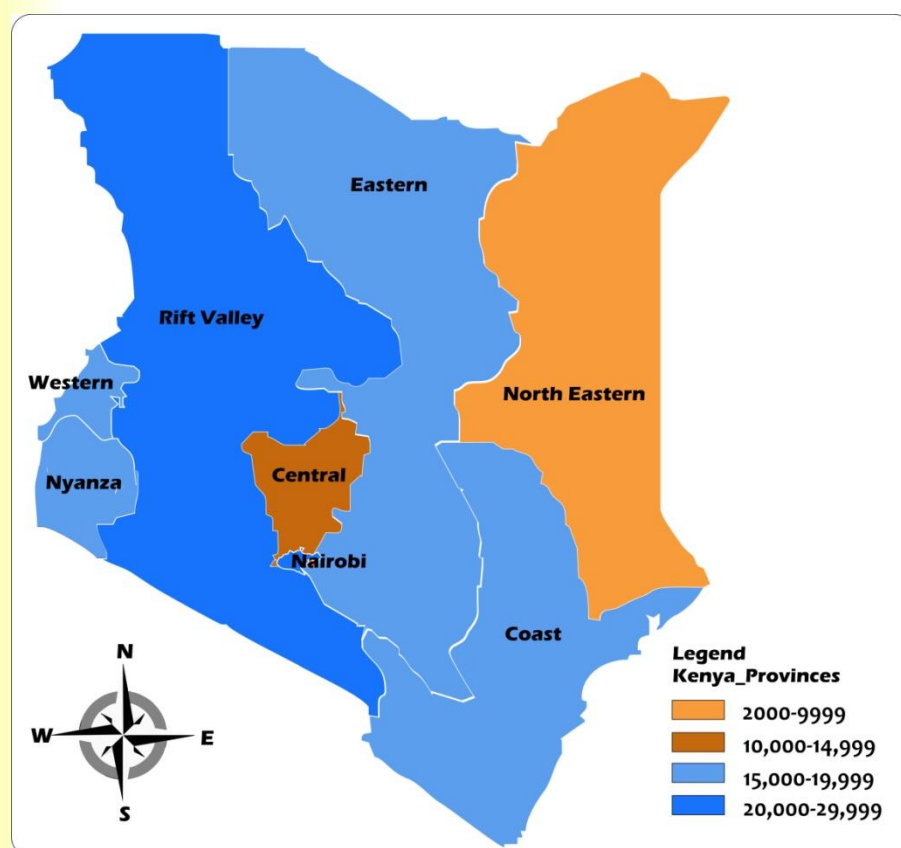
6.3. Per capita number of FSWs

The per capita number of FSWs was calculated based on adult population (male and female) and females of reproductive age (15-49 years). Based on the 2009 census, the proportion of the population below 15 years in each of the provinces was as follows: Nairobi (30.3%), Central (36.0%), Coast (42.3%), Eastern (41.8%), North Eastern (51.7%), Nyanza (45.9%), Rift Valley (45.3%) and Western (47.1%). In addition, the percentage of urban population in each province was as follows: Nairobi (100%), Central (34.4%), Coast (43.2%), Eastern (21.1%), North Eastern (17.8%), Nyanza (24.6%), Rift Valley (23.7%) and Western (16.2%). Overall, an estimated 43 per cent of the Kenyan population is below 15 years of age while 48 per cent of the female population is of reproductive age (15-49years) (National Coordinating Agency for Population and Development [NCAPD], 2011; Population Reference Bureau [PRB], 2011). Table 26 shows per capita number of FSWs per province based on extrapolated national FSW estimates.

Table 26: Per capita FSW population by province

Province	Total population	Total female population	Urban adult pop. (15+ years)	Urban female population (15+ years)	Urban female population (15-49 years)	Estimated number of sex workers from mapping	Number of sex workers per 1,000 urban adult population	Percentage of urban women (15+ years) sex workers	Percentage of urban women (15-49 years) sex workers
Nairobi	3,138,369	1,533,139	2,187,443	889,221	735,907	27,620	13	3%	4%
Central	4,383,743	2,230,760	965,125	491,124	368,343	13,584	14	3%	4%
Coast	3,325,307	1,668,628	828,879	415,929	346,007	19,778	24	5%	6%
Eastern	5,668,123	2,884,776	696,057	354,256	292,170	16,149	23	5%	6%
North Eastern	2,310,757	1,052,109	198,665	90,454	89,892	2,189	11	2%	2%
Nyanza	5,442,711	2,824,977	724,349	375,965	333,573	19,406	27	5%	6%
Rift Valley	10,006,805	4,980,343	1,297,272	645,647	566,564	23,708	18	4%	4%
Western	4,334,282	2,242,907	371,439	192,213	174,408	15,985	43	8%	9%
Total	38,610,097	19,417,639	7,269,229	3,454,808	2,906,864	138,420	19	4%	5%

The national estimated number of female sex workers per 1,000 adult population (males and females) was19. Restricted to the urban population, 4 per cent of the urban female population aged 15 years and above in Kenya could be female sex workers. Among urban female population of reproductive age (15-49 years), the extrapolated estimates suggested that nationally, 5 per cent of them could be sex workers, with Western (9%), Nyanza (6%), Coast (6%) and Eastern (6.0%) having a higher proportion thanRift Valley (4%), Nairobi (4%), Central (4%) and North Eastern (2%) provinces.

7. Discussion

7.1. Introduction

There are different methodologies for estimating the size of most at risk populations for HIV (MARPs), which involve data collection in the general population and among the most at risk populations themselves. The common approaches to population size estimation that involve data collection from MARPs are census, enumeration, capture-recapture, multiplier methods and respondent driven sampling (WHO & UNAIDS, 2010). The application of both the census and enumeration methods is hampered by the hidden nature of MARPs.

A popular methodology is that of capture-recapture. The capture-recapture method has itsgenesis in wildlife management,where the approach has beenused to track wildlife populations by capturing, tagging and recapturing. As applied in the estimation of populationsmost at risk to HIV infection, the method involves two independent captures (samples) of members of a population of interest (such as female sex workers). In the first step (capture), targeted members are identified, tagged and counted. The tagging may include issuing of unique identification cards or numbers. A second capture is done after some days in the same place,keeping track of those who have been re-tagged vis-à-vis those tagged for the first time. The overlap in tagging is used to estimate the size of the unknown population. The capture-recapture methodology, while appealing in its simplicity, is based upon complex assumptions that are often hard to meet in real life situations where MARPs may be found. In particular, the methodology assumes that the two samples (capture 1 and capture 2) are independent and not correlated. It is also assumed that each population member has an equal chance of selection. Moreover, the methodology assumesthat population members are correctly identified and classified as either 'capture' or 'recapture'. High mobility among MARPs also presents a challenge to the effective implementation of the method.

Respondent-driven sampling(RDS) is also a method that is sometimes used on its own or within the framework of capture-recapture methodology to estimate the population of MARPs. Respondent-driven sampling utilizes the social networks of the targeted population to facilitate the estimation of population size. RDS starts through purposive sampling of members of a population of interest ('seeds'), who are then

requested to recruit members of their peers using numbered coupons. Each member is given a limited number of coupons to reduce oversampling by those with larger social networks. The members so recruited are assessed for eligibility. A mathematical model, keeping track of whorecruited whom and their characteristics, is used to derive unbiased estimates of the population of interest. This method, however, is also based on complex assumptions, key ones being that the initial seeds are chosen with a probability proportional to their degree of participation in social networks,and that they recruit from their social networks randomly (Salgik and Heckarthorn, 2004). In practice, it has been shown that respondent-driven sampling has the potential to significantly oversample certain groups, thereby providing unrepresentative estimates of the size of the population of interest (Hathaway, et al., 2010; Salgik, 2012; Berchenko and Frost, 2011).

Another population size estimation method that is less commonly used is the multiplier method. This method builds upon service statistics to identify the proportion of MARPs served, and these data are then used in conducting further surveys to help derive an estimate of MARP population sizes. MARP population estimation methodologies that derive from data collection in the generalpopulation are population-based surveys, such as demographic and health surveys and approaches that build upon the social networks of the general population (network scale-up method). Population-based surveys sufferfrom the limitations of usually capturing only household-based respondents, and from disclosure biases due to stigma surroundingbehaviors that increase the risk for HIV, such as sex work and injection drug use. The geographic mapping methodology used in the current study identifies spots frequented by MARPs and estimates of MARP sizes at the spots identified through secondary key informants, and uses information from the MARPs themselves for validation of the spots and population estimates. This approach is transparent and devoid of any complex assumptions. It also has the advantage of identifying where MARPs are specifically located, and this information can be used in HIV prevention programmes for follow-up, through more detailed site mapping and micro-planning (Karnataka Health Promotion Trust, 2012). Limitations of this method are discussed below.

Whereas no national-level mapping of MARPs has been conducted in Kenya before the current study, some previous studies have estimatedthe size of MARPs in different localities, using primarily capture-recapture and RDSapproaches. In the next

section,our MARPsize estimates are compared with findings of previous studies to highlight areas of consistencies and to provide possible explanations for divergences.

7.2. FSW population size estimates

The current mapping exercise estimated that there are a total of 138,420 (range 107,552 – 169, 288) FSWs in Kenya, with 27,620 (20%) of that number being in Nairobi. In Nairobi, most (average 6,763; range 5,230 – 8,296; or 24.5%) of the female sex workers were to be found in Starehe Constituency, which covers the central business district. The Kenya AIDS Control Project, a collaborative initiative of the Universities of Manitoba and Nairobi, conducted a mapping of hot spots frequented by female sex workers and enumerated female sex workers in Nairobi's central business district, which is a part of Starehe constituency, using the capture-recapture method in 2009. The capture-recapture activities were conducted with an interval of 14 days. In the first capture, 3,070 female sex workers were identified while in the second one, 2,901 were identified, including 1,290 recaptures. Based on these data, the study estimated the FSW population in Nairobi's central business district at 6,904 (95% CI 6,690 – 7,118). This is very close to the estimate in our study for Starehe constituency.

In another study using a combination of respondent-driven sampling, multiplier methods, and "wisdom of the crowds" methods, the Population Council estimated 29,494 (range 10,000 – 54,467) female sex workers in Nairobi in 2010 (NASCOP, 2012). This estimate is also close to the one in our study, with the exception of the upper bound estimate, which was much higher in the Population Council's study.

There have been a few FSW population estimation studies in other towns as well. In 2008, Vuylsteke and colleagues (2010) conducted an estimation of the population of female sex workers in Kisumu City, Nyanza province, using the capture-recapture method. The study estimated the FSW population in the city at 1,350 (95% CI 1,261 – 1,443). Vuylsteke and colleagues, however, neither specifiedthe geographic scope covered by their study nor the typologies of sex work spots where the enumeration was conducted.Our mapping study captured multiple sex work spots and included Kisumu city and its suburbs and estimated the total FSW population in Kisumu at 4,041 (range 3,228 – 4,854).

Another large scale study involving an estimation of population sizes of female sex workers was the study, "Hotspot mapping of transactional sex on the Northern

Corridor Mombasa-Kampala" (Ferguson and Morris, 2007; Morris and Ferguson, 2006). This study focused on spots frequented by long-distance truck drivers for overnight stay, and as such, excluded major towns, which were not preferred by truckers for stop-over due to lackof parking space and concerns about costs and security. The method applied to estimate FSW populations consisted of focus group discussions at some of the hot spots, including questioning on the number of sex workers at the sites, and a survey of bars and lodgings at the sites, including questioning on the presence and proportion of FSWs among the clientele. Additionally, estimations of the percentage of sex workerspresent were made by bar managers and applied to actual counts.

From this work, the study team generated FSW population estimates for some of the towns that were also included in the current mapping. For instance, Ferguson and Morris' study estimated 250 FSWs in Mariakani town in Coast province, as compared to our estimate of 624 (range 478 – 769). Also, Ferguson and Morris estimated about 100 FSWs in Naivasha town, Rift Valley province and 300 in Malaba town, Western province, as compared to 925 (range 568 – 1,282) and 708 (range 554 – 862), respectively, in our study. The town with the largest number of FSWs in Ferguson and Morris' study was Busia (1,500), which in our study had an estimated 2,474 (1,854 – 3,094) FSWs. An important distinction between the size estimation methodologies in the two studies is that Ferguson and Morris' approach focused on clear, well known venues, and ourstudy captured multiple typologies of sex work, including street-based, home-based and venue-based, among others. Indeed, our study showed that home-based sex work was more prevalentthan venue- and street-based sex work in Rift Valley (22%) and Western (19%) provinces.

A previous study by the International Centre for Reproductive Health (ICRH), which was also an implementing partner for our study, had FSW estimates which were significantlyhigher than those obtained from the current study. ICRH conducted an enumeration of FSWs in selected towns in the Coast province in 2010 using the capture-recapture method. The study estimated the number of FSWs in Coast province to be 43,469, which was more than twice the extrapolatedestimate for the province from the present study (19,778, range 15,204 – 24,353). Similarly, the study by ICRH estimated the number of FSWs in Mombasa city to be 18,350 as contrasted to 9,288 (range 6,917to 11,660) from the current study. A comparison of FSW estimates for other towns included in both the ICRH and the current study were as follows: Voi (1,618 versus 900

in the current study); Mariakani (2,248 versus 624 in the current study) and Malindi (3,712 versus 2,310 in the current study). The reasons for these differences are not clear, but it is possible that the assumptions required in capture-recapture methods were not present. In any event, as prevention programmes are scaled up in all of these sites, more direct enumeration techniques will arrive at better estimates of the true populations sizes.

Direct comparison of MARP size estimates is not the only way of establishingconsistency of findings. Comparison of per capita estimates that relate the estimated FSW population to the total adult population or the population of women of reproductive age (15 – 49 years) is also useful. Based on data from the towns mapped in the current study, an estimated 5 per cent of urban females of reproductive age (15-49 years) could be sex workers in those towns. Similarly, extrapolations to the national level suggest that 5 per cent of urban women of reproductive age in Kenya nationallycould be sex workers. These estimates corroboratefindings from a study conducted in 1989 among a sample2,967 men and women of reproductive age (15-49 years), in which about 6 per cent of the female respondents reported to have exchanged gifts or money in return for sex in the preceding 12 months (Caraël et al., 1995).

The estimate from our study of 4 per cent of the Nairobi femalepopulation of reproductive age (15-49 years) potentially being sex workers is consistent with findings from previous studies in some major cities in sub-Saharan Africa. A study in Ouagadougou in Burkina Faso, West Africa, in 2000-2003 estimated 4.3 per cent of the adult female population in that city to be sex workers (Vandepitte, 2006), while a study in 2002 in Addis Ababa, capital of Ethiopia, and Niamey, capital of Niger in 2004, estimated 2.9 per cent and 2.1 per cent, respectively, of adult women in the two cities to be sex workers (Vandepitte, 2006; FHI, 2002). A study in a provincial town in Madagascar in 2001 estimated the percentage of all women in that town who could be sex workers to be 12 per cent. Locally, a previous study in Western province estimated that about 7 per cent of adult women in Busia, Mumias, Nzoia and Webuye urban centres could be sex workers (FHI, 1999). The corresponding estimates for some of these towns based on the current mapping study were: Webuye (18%), Busia (17%) and Mumias (8%). The per capita FSW estimatesfor some of the towns mapped werehigher than those reported in the literature. For instance, based on the mapping data, the proportion of women of reproductive age who could be sex workers was

estimated at 70% in Emali town, 36 per cent each in Maua and Makindu towns, all in Eastern province, Kisii (21%) and Bondo (20%) towns in Nyanza province, and 20 per cent in Voi town in Coast province. The reasons for the higher proportion of women of reproductive age who could be sex workers in these towns are not entirely clear. However, Emali and Makindu are small towns located along the Northern Transport corridor linking the port city of Mombasa with Nairobi and the neighboring Uganda, Rwanda and South Sudan countries. These towns are primarily truck stop centres, and it is possible that the majority of the women in the towns are involved in sex work. Maua town in Eastern province is renowned for khat production and the vibrant cash economy may explain a higher proportion of women in the town being involved in sex work. The mapping data, however, does not capture detailed HIV-related behavioral and biological indicators for assessing potential correlations between per capita FSW estimates and local HIV epidemics.

7.3. MSW/MSM population estimates

The current mapping study focused on high risk men who have sex with men, including male sex workers, and men who have sex with men who cruise sites frequented by men who sell sex. As such, the estimates derived from the study do not purport to represent the entire MSM population in Kenya. Based on data from the towns mapped, anda total of 10,033 (range 7,426 – 12,641) such MSWs/MSM were estimated, with 3802 (38%), 1,686 (17%) and 1,570 (16%), being in Nyanza, Nairobi and Coast provinces, respectively. The MSW/MSM estimates were not extrapolated to the national level. It is not entirely clear why Nyanza province had a higher number of MSWs/MSM than the combined estimates for Nairobi and Coast provinces. A possible explanation is that the mapping in that region may have captured low-risk MSM too, or that MSWs/MSM in that region might have been more visible than in the other provinces.

This finding calls for further study of factors driving MSW activity and factors that may influence the accessibility and visibility of MSWs/MSM in different settings. NASCOP representatives have observed that Kisumu city has been known to be more tolerant to MSWs/MSM, and that this could account for the relatively higher MSW/MSM estimates from that region. Geibel et al. (2007) estimated the population of men who sell sex to men in Mombasa cityat 739 (95% CI 690-798), which is quite consistent with the estimate of MSWs/MSM in the same city from our mapping of 782 (range 539 to

1026). Geibel et al.'s study also estimated 77 spots from where MSWs solicited for clients, which was lower than the 133 spots identified and validated through our mapping. A study by the PopulationCouncil in 2010, referred to earlier, estimated the MSM population in Nairobito be 10,000 (range 10,000 to 22,000) (NASCOP, 2012). The same study estimated the MSM population in Kisumu city to be 3,706 (range 1,797 – 4,493), as compared to the average of 1,630 (range 1,319 – 1,941) estimated for Kisumu city from the current mapping study. However, the study by the Population Council was based on methodologies with complex assumptions (respondent driven sampling, wisdom of the crowds and multiplier method),the validity of which in these study settings is difficult to ascertain. In addition, this study likely included a variety of MSM, and not just the MSWs and high-risk MSM targeted in our study, so direct comparison of the estimates from these studies is difficult.

7.4. IDU population estimates

Perhaps even more problematic is the estimation of the IDU population, and comparison of estimates across studies, as other studies may capture life-time drug users, current users, and users of drugs other than injection drugs. The current mapping study captured current rather than ever-users of injection drugs. An IDU population of 7,850 (range 5,822 – 9,877) was estimated from the towns mapped, with over one-third (35%) and 19 per cent of the population being in the Coast province and Nairobi city, respectively. Two studies, one by the Population Council, using methodologies that have already been described, and one by the United Nations Office on Drugs and Crime (UNODC) (NASCOP, 2012), have estimated IDU populations in some of the same towns covered by the current mapping that are difficult to reconcile with estimates from the present study. The Population Council's study in 2010 estimated the IDU population in Nairobi city alone to be6,107 (range 5,031 – 10,937). IDUs were defined in that study as those who had used needles for injection drugs in the past three months, so this would have included more than current users. In addition, these estimates were derived from interviews with only 263 IDUs from Nairobi whose recruitment lasted about three months, and final estimates were arrived at through discussion with stakeholders, including those implementing programmes targeting drug users.

In the UNODC study, respondent-driven sampling was used, involving a total of 474 IDUs.Based on interviews with these 474 IDUs in Nairobi, UNODC estimated the

population of IDUs in Nairobi to be 22,500 (range 8,000 – 60,000); in Coast province, the IDU population estimate was 26,667 (range 2,000 to 60,000). IDUs in the UNODC's study were defined as adults who had injected drugs in the last 12 months, so again, would have included a number of IDUs who were not current users. Given the variations in the reference periods for injection drug use in these studies, as well as the different methodologies, direct comparison of the estimates is difficult.

7.5. Limitations

Potential limitations of the geographic mapping approach that we used should be acknowledged. First, because the methodology initially identifies spots frequented by MARPs through secondary key informants, there is the possibility of missing some spots and either over- or under-estimating some MARP groups depending on the extent of their visibility. Injecting drug users and high-risk men who have sex with men, in particular, may be underestimated by the methodology, as they may operate from hidden spots. However, the methodology compensates for this limitation to an extent during the spot validation stage, where new spots are generated through primary key informant interviews.

Second, the geographic mapping methodology relies on numeric estimates rather than a count of MARPs at the spots identified, which may lead to variability in the estimates derived. The methodology addresses this limitation through averaging estimates for spots identified by a large number of secondary key informants, and validating estimates for spots identified by the least number of secondary key informants through interviews with the MARPs themselves. It is possible, however, that some secondary and primary key informants may still over- or under-estimate MARP numbers depending on their numeric orientation and competence.

Third, since the methodology is not individually based, it could overestimate the size of MARPs if MARPs frequent multiple locations. So, for example, if FSWs work in multiple bars, it is possible that the same FSWs could contribute to estimated numbers at multiple spots, thereby inflating the estimates. However, since the methodology is rapid and focuses on the minimum, maximum and usual number of MARPs at a spot on a given day, the range of estimates (minimum to maximum) is unlikely to be skewed substantially. Moreover, the final estimates derived are adjusted to reflect the extent to which MARPs frequent multiple spots, based on primary key informant interviews.

Fourth, since the method relies on finding MARPs through locations, it can miss those who do not primarily operate at locations. For example, sex workers who primarily contact clients through cell phones or through network operators are likely to be underrepresented in geographically based mapping. Similarly, IDUs who usually inject by themselves, or MSM who do not frequent defined locations to find new partners, will not be well-represented in geographically based mapping studies. However, it should be noted that in the context of planning HIV prevention programmes for MARPs, individuals who are disconnected from larger networks or congregations of other MARPs (e.g. solitary IDUs or MSM with low rates of partner change) tend to be at lower risk, and less strategically important for HIV prevention.

It should be noted that the geographic mapping method is meant primarily to:

1) Identify key locations where MARPs congregate and can be reached for HIV prevention;

2) Describe the typology of MARPs (e.g. brothel-, street- and venue-based FSWs); and

3) Estimate the size of MARPs. In this regard, it is meant to be an important starting point for micro-level planning of MARPsprogrammes, including the prioritization of cities/towns and locations for establishing MARPs programmes and determining the initial volume of services required. Therefore, the tools used for geographic mapping are kept short to enhance response rates among both secondary and primary key informants. Consequently, detailed data on HIV risk behavior, and access to and utilization of HIV preventive services among MARPs, which are of programmatic relevance, are not collected as part of the mapping process. Even when elements of such data are captured during the mapping exercise, they may not be representative of the overall most at risk populations. Detailed programme-related data would normally be collected subsequently, through programme management information systems, as programmes are developed to serve the MARPs with outreach and medical services. Behavioral and biological surveys could also be administered after the mapping is completed to obtain more detailed information on behavioral parameters and on STIs and HIV infection.

The mapping exercise, with subsequent programmatic enhancement, provides a scientifically valid sampling frame for such surveys.To take into account the rapidly changing nature of FSW, MSM and IDU spots and populations, prevention programmesshould update MARPs estimates on at least an annual basis, and national

mapping could be conducted with an interval of four to five years to track changes in the MARPs.

7.6. Conclusions

Size estimation of MARPs is not a straightforward process, and may be complicated by different methodologies used and the assumptionsthat are built into the methodologies. The mapping study reported here represents the first national-level mapping of the three categories of MARPs (female sex workers, high-risk men who have sex with men and injection drug users) to be conducted in Kenya. As estimates from this study may challenge some of the estimates previously available, it is important to develop a consensus on MARP sizes in Kenya. An advantage of ourgeographic mapping methodologyis that it is transparent, making it possible for stakeholders implementing programmeswith MARPs to continuously update the estimates. This mapping data can be used in MARPs programmesfor a varietyof purposes, including:

a) Thedetailed enumeration or registration of MARPs for programme planning purposes;
b) Identification and allocation of peer educators in programme sites;
c) Project implementation planning, including micro-planning at site level;
d) Setting up individualized tracking systems for MARPs; and
e) As baseline figures for monitoring and evaluation purposes.

Indeed, two of the organizations that were contracted for the implementation of the mapping exercise - Kenya AIDS Control Project (KACP) and Hope World Wide Kenya - are already applying the mapping data in their programmes to allocate peer educators tomany previously unrecognized hot spots, and to set programme performance targets. Hope World Wide Kenya also used the same mapping protocol and data collection tools to conduct mapping in one of the towns in its areathat was not included in the initial mapping exercise. It is our hope that this mapping report will be used in similar fashion by other HIV prevention programmes, to enhance and support prevention efforts among most at risk populations for HIV.

References

Berchenko, Y. and Frost, S. D. W. (2011). Capture-recapture method and respondent-driven sampling: their potential and limitations. *Sexually Transmitted Infections, 87(4)*: 267-268.

Caraël, M., Cleland, J., Deheneffe, J., Ferry, B. and Ingam. (1995). Sexual behavior in developing countries: Implications for HIV control. *AIDS, 9*: 1171-1175.

Cheluget, B., Baltazar, G., Orege, P., Ibrahim, M., Marum, L. H., and Stover, J. (2006).Evidence for population level declines in adult HIV prevalence in Kenya.*Sexually Transmitted Infections, 82(Suppl. 1)*, i21–i26. doi:10.1136/sti.2005.015990.

Family Health International (FHI).(1999). Behavioral Surveillance and STD Seroprevalence Survey in female sex workers in the Western province, Kenya, 1999. Nairobi, Kenya. Available online: www.**fhi**360.org/NR/rdonlyres/.../**kenya**1.pdf(accessed 12 January, 2012)

Family Health International (FHI).(2002). Mapping and census of female sex workers in Addis Ababa, Ethiopia. Available online:
www.who.int/.../mapping_census_female_sex_workers_ethiopia.pdf(accessed 3 November, 2011).

Geibel, S. , van der Elst, E. M., King'ola, N., Luchters, S., Gitambu,n E. M., Peshu, N., Graham, S. M., McClelland, R. S., Sanders, E. J. (2007). "'Are you on the market?' A capture-recapture enumeration of men who sell sex to men in and around Mombasa."*AIDS 21*:1349-1354.

Hathaway, A. D., Hyshka, E., Erickson, P. G., Asbridge, M., Brochu, S., Cousineau, M., Duff, C. and Marsh, D. (2010). Whither RDS? An investigation of respondent driven sampling as a method of recruiting mainstream marijuana users.*Harm Reduction Journal, 7*: 15.

Karnataka Health Promotion Trust. (2012). *A Systematic Approach to the Design and Scale-Up of Targeted Interventions for HIV Prevention among Urban Female Sex Workers*. Bangalore: Karnataka Health Promotion Trust.

Kruse, N., Behets, F., Vaovala, G., Burkhardt, G., Barivelo, T. R., Amida, X., Dallabetta, G. (2003).Participatory mapping of sex trade and enumeration of sex workers using capture-recapture methodology in Diego-Suarez, Madagascar.*Sexually Transmitted Diseases, 30*: 664-670.

Ministry of Public Health and Sanitation (MOPHS), Kenya (2010).*National Guidelines for HIV/STI Programmes for Sex Workers.*Nairobi: MOPHS.

Morison, L., Weiss, H., Buvé, A., Caraël, M., Abega, S., Kaona, F., Kanhonou, L., Chege, J., Hayes, R. (2001).Commercial sex and the spread of HIV in four cities in sub-Saharan African*. AIDS, 15 (Suppl. 4)*: S61-S69.

National AIDS Control Council, Kenya (NACC). 2009. *Kenya HIV prevention response and modes of transmission analysis*. Nairobi: NACC, March.

National AIDS and STI Control Programme (NASCOP), Kenya. (2009). *2007 Kenya AIDS Indicator Survey: Final Report*. Nairobi, NASCOP.

National AIDS/STI Control Programme (NASCOP). (2012). Most at risk populations: Unveiling new evidence for accelerated programming (meeting Abstract Book). March.

National Council for Population and Development (NCAPD). (2011). *State of Kenya Population 2011 (Kenya's 41 million people: Challenges and possibilities)*. Nairobi: NCAPD.

Population reference Bureau (PRB). (2011). *Kenya Population Data Sheet 2011*. Available online (Accessed 3 March 2012).

Salganik, M. J. (2012). Respondent driven sampling in the real world.*Epidemiology, 23(1)*: 148-150.

Salganik, M. J. and Heckathorn, D. G. (2004).Sampling and estimation in hidden populations using respondent driven sampling.*Sociological Methodology, 34*: 193-293.

The Joint United Nations Programme on HIV and AIDS [UNAIDS]. (2011). *UNAIDS Terminology Guidelines*. Geneva: UNAIDS.

Vandepitte, J., Lyerla, R., Dallabetta, G., Crabbe, F., Alary, M., & Buvé, A. (2006).Estimates of the number of female sex workers in different regions of the world*. Sexually Transmitted Infections, 82 (Suppl. III)*: iii18-iii25.

World Health Organization (WHO) and The Joint United Nations Programme on HIV and AIDS [UNAIDS]. (2010). Guidelines on estimating the size of populations most at risk to HIV. Geneva: WHO.

LEVEL 1 FORM

Mapping MARPs in Kenya 2011	KI SERIAL NO: ☐☐☐
DATE: ☐☐ / ☐☐ / ☐☐☐☐	KI NAME (OPTIONAL): _____
PROVINCE: _____ ☐ DISTRICT:_____ ☐☐	CONTACT INFORMATION: _____ _____
TOWN_____ ☐☐ ZONE NUMBER: ☐☐	SEX: MALE.........1 FEMALE.........2
FW1 UNIQUE ID : ☐☐	PROFESSION: _____
FW1 NAME : _____	
FS UNIQUE ID : ☐☐ FS NAME : _____	HIGHEST LEVEL OF EDUCATION ATTENDED: ☐

S. N	Spot name and address	Type of MARP	Type of spot	Contact for that spot	Time of Operation	Number of MARPs Min	Max
1.		FSW ☐					
		MSW ☐					
		IDU ☐					
2.		FSW ☐					
		MSW ☐					
		IDU ☐					
3.		FSW ☐					
		MSW ☐					
		IDU ☐					
4.		FSW ☐					
		MSW ☐					
		IDU ☐					
5.		FSW ☐					
		MSW ☐					
		IDU ☐					
6.		FSW ☐					
		MSW ☐					
		IDU ☐					
7.		FSW ☐					
		MSW ☐					
		IDU ☐					
8.		FSW ☐					
		MSW ☐					
		IDU ☐					

Education Level: *1-No formal education; 2-Primary; 3- Post-primary/vocational; 4-Secondary/'A' level; 5-College (Middle level); 6 – University*

Type of spot*: 1-Street; 2-Home based; 3-Road (Truck stop); 4-Sex Den; 5-Venue based; 6-Escort; 7-Massage parlour; 8-Others*

Time of Operation*: A-Morning; B-Afternoon; C-Evening; D-Night; E-Whole Day/24 Hours*

LEVEL 2 FORM – FSW SPOTS

Mapping MARPs in Kenya 2011	Date : ☐☐ ☐☐ ☐☐☐☐
Province_____ ☐☐ District_____ ☐☐	FW1 ID : ☐☐ FW1 Name : _____ FW2 Name : _____
Town_____ ☐☐ Zone:_____ ☐☐	FS ID : ☐☐ FS Name : _____ Type of SPOT* ☐
Spot Name _____ ☐☐☐☐	Spot Active Yes ☐ Non existent ☐
Spot name duplicated Yes No ☐ ☐	**Spot validation result**
Spot duplicate name: _____	Visited and validated by interview ....1 Visited and validated without interview ....2 Not visited, validated by L1 findings 3

***Type of spot**: 1-Street; 2-Home based; 3-Road (Truck stop); 4-Sex Den; 5-Venue based; 6-Escort; 7-Massage parlour; 8-Others*

Sl	INFORMATION ABOUT THE KEY INFORMANT (KI)	
1	In which year were you born?	☐☐☐☐
2	What is the highest level of education you attended?**	☐
3	What is your marital status?	SINGLE...1 MARRIED...2 DIVORCED/WIDOWED/SEPARATED.........3 COHABITING..4
4	How many clients do you usually have in a day? … On a…	NORMAL DAY ☐☐ BUSY DAY ☐☐
5	Do you do any work other than sex work?	YES ....1 NO............2
6	If yes, what other work do you do?	_____
7	Do you look for clients at other places apart from this one?	YES ....1 NO............2
8	If yes, at how many other different places do you look for clients?	☐
9	Please give me names of at most FIVE other places (and their location) where you look for clients. i)_____ ii)_____ iii)_____ iv)_____ v)_____	

Sl	SPOT PROFILE	
10	Code the venue with the response which best describes it.	STREET ....1 HOME...2 ROAD (TRUCK STOP).................3 SEX DEN.....................................4 VENUE..5 ESCORT......................................6 MASSAGE PARLOUR...................7 OTHERS......................................8
11	Which day/s of the week is the total number of FSWs visiting this spot more than usual (**Peak Day/s**)? **CIRCLE ALL APPLICABLE**	MONDAY......................................A TUESDAY.....................................B WEDNESDAY ....C THURSDAY...................................D FRIDAY.......................................E SATURDAY..................................F SUNDAY ....G
12	On these **peak days**, how many FSWs work/visit this spot? *(min – max)*	MIN ☐☐☐ MAX ☐☐☐
13	On the other **non-peak days**, how many FSWs work/visit this spot? *(min – max)*	MIN ☐☐☐ MAX ☐☐☐
14	What time of the day do more FSWs visit this venue **(Peak Time)**? **CIRCLE ALL APPLICABLE**	MORNING (BEFORE 12 NOON)...................... A AFTERNOON (12 PM-5 PM) .... B EVENING (5 PM-9 PM)...................................C NIGHT (9 PM-LATE NIGHT) .... D
15	Do FSWs seek clients at this spot?	YES ....1 NO............2
16	Does sex take place at this venue?	YES ....1 NO............2

**Education Level: *1-No formal education; 2-Primary; 3- Post-primary/vocational; 4-Secondary/'A' level; 5-College (Middle level); 6 – University*

LEVEL 2 FORM – MSW/MSM SPOTS

Mapping MARPs in Kenya 2011	Date : ☐☐ ☐☐ ☐☐☐☐
Province_____ ☐☐ District_____ ☐☐	FW1 ID : ☐☐ FW1 Name : _____
Town_____ ☐☐ Zone:_____ ☐☐	FW2 Name : _____
Spot Name _____ ☐☐☐☐	FS ID : ☐☐ FS Name : _____ Type of SPOT* ☐☐ Spot Active Yes ☐ ☐ existent ☐

Spot name duplicated Yes ☐ No ☐ Spot duplicate name: _____	**Spot validation result** Visited and validated by interview ....1 Visited and validated without interview ....2 Not visited, validated by L1 findings 3

***Type of spot**: *1-Street; 2-Home based; 3-Road (Truck stop); 4-Sex Den; 5-Venue based; 6-Escort; 7-Massage parlour; 8-Others*

Sl	INFORMATION ABOUT THE KEY INFORMANT (KI)	
1	In which year were you born?	☐☐☐☐
2	What is the highest level of education you attended?**	☐
3	What is your marital status?	SINGLE…………………………………………1 MARRIED……………………………..2 DIVORCED/WIDOWED/SEPARATED………3 COHABITING…………………………………4
4	How many men do you usually have sex with in a week?	☐☐
5	Are you paid in any way when you have sex with men?	YES ………..1 NO………..2
6	Do you also have sex with women?	YES ………..1 NO………..2
7	Are you paid in any way when you have sex with women?	YES ………..1 NO………..2
8	What work do you do?	_____
9	Do you look for male clients at other places apart from this one?	YES ………..1 NO………..2
10	Do you look for female clients at other places apart from this one?*(**CHECK Q. 6**)*	YES ………..1 NO………..2
11	Please give me names of at most FIVE other places (*and their location*) where you look for… **Male clients** **Female clients *(CROSS-CHECK Q. 6)*** i)_____ i) _____ ii)_____ ii) _____ iii)_____ iii) _____ iv)_____ iv) _____ v)_____ v) _____	

Sl	SPOT PROFILE	
12	Code the venue with the response which best describes it.	STREET..1 HOME .... 2 ROAD (TRUCK STOP)...............................3 SEX DEN..4 VENUE...5 ESCORT... 6 MASSAGE PARLOUR ....7 OTHERS...8
13	Which day/s of the week is the total number of MSWs visiting this spot more than usual (**Peak Day/s**)? **CIRCLE ALL APPLICABLE**	MONDAY ....A TUESDAY.. B WEDNESDAY ....C THURSDAY...D FRIDAY ....E SATURDAY...F SUNDAY...G
14	On these **peak days**, how many MSWs work/visit this spot?	MIN ☐☐☐ MAX ☐☐☐
15	On these **peak days**, how many MSM other than MSWs visit this spot?	MIN ☐☐☐ MAX ☐☐☐
16	On the other **non-peak days**, how many MSWs work/visit this spot?	MIN ☐☐☐ MAX ☐☐☐
17	What time of the day do more MSM/MSWs visit this venue (**Peak Time**)? **CIRCLE ALL APPLICABLE**	MORNING (BEFORE 12 NOON)...............A AFTERNOON (12 PM-5 PM) ....B EVENING (5 PM- 9 PM)............................C NIGHT (9 PM-LATE NIGHT) ....D
18	Do MSM/MSWs look for male partners/clients at this spot?	YES ………..1 NO………..2
19	Do MSM/MSWs look for female partners/clients at this spot?	YES ………..1 NO………..2
20	Does sex take place at this venue?	YES ………..1 NO………..2

** **Education:** *1-No formal education; 2-Primary; 3- Post-primary/vocational; 4-Secondary/'A' level; 5-College (Middle level); 6 – University*

LEVEL 2 FORM – IDU SPOTS

Mapping MARPs in Kenya 2011

Province_____   ☐☐ rict_____   ☐☐

Town_____   ☐☐   Zone:_____   ☐☐

Spot Name _____   ☐☐☐

Spot name duplicated   Yes ☐   No ☐

Spot duplicate name: _____

Date : ☐☐ ☐☐ ☐☐☐☐

FW1 ID : ☐☐   FW1 Name : _____
                    FW2 Name : _____
FS ID : ☐☐   FS Name : _____
Type of SPOT* ☐
Spot Active   Yes ☐   ☐ -existent   ☐

Spot validation result
Visited and validated by interview 1
Visited and validated without interview 2
Not visited, validated by L1 findings 3

*Type of spot: 1-Street; 2-Home based/Venue-based (FROM LEVEL 1 FORM)

Sl	INFORMATION ABOUT THE KEY INFORMANT (KI)		
1	In which year were you born?		☐☐☐☐
2	What is the highest level of education you attended?**		☐
3	What is your marital status?		SINGLE..1 MARRIED...2 DIVORCED/WIDOWED/SEPARATED.......3 COHABITING.......................................4
4	What work do you do?		_____
5	**DRUG USE** Which injectable drugs are commonly used in this area?		

	Drug name {Please record names of injectable drugs as provided by the respondent}	**HAVE YOU EVER INJECTED?**	**INJECTED IN LAST ONE WEEK?**
	a)	YES .....1 NO......2	YES ....1 NO............2
	b)	YES .....1 NO......2	YES ....1 NO............2
	c)	YES .....1 NO......2	YES ....1 NO............2
	d)	YES .....1 NO......2	YES ....1 NO............2
	e)	YES .....1 NO......2	YES ....1 NO............2
	f)	YES .....1 NO......2	YES ....1 NO............2

Sl		
6	How many times in a day do you usually inject drugs?	☐☐
7	Do you inject at any place other than this?	YES ....1 NO............2
8	If yes, at how many different places do you usually inject drugs ?	☐☐
9	Please give me names of at most FIVE other places (and their location) where you usually inject drugs. i)_____ ii)_____ iii)_____ iv)_____ v)_____	

Sl	SPOT PROFILE	
10	Code the venue with the response which best describes it.	STREET ....1 HOME-BASED/VENUE-BASED 2
11	Which day/s of the week is the total number of IDUs visiting this spot more than usual (**Peak Day/s**)? **CIRCLE ALL APPLICABLE**	MONDAY... A TUESDAY... B WEDNESDAY....................................C THURSDAY..D FRIDAY..E SATURDAY..F SUNDAY .... G
12	On these **peak days**, how many IDUs visit this spot? (min – max)	MIN ☐☐☐ MAX ☐☐☐
13	On the **peak days**, how many IDUs share injection needles? (min – max)	MIN ☐☐☐ MAX ☐☐☐
14	On the other **non-peak days**, how many IDUs visit this spot? (min – max)	MIN ☐☐☐ MAX ☐☐☐
15	What time of the day do more IDUs visit this venue (**Peak Time**)? **CIRCLE ALL APPLICABLE**	MORNING (BEFORE 12 NOON).......................A AFTERNOON (12 PM-5 PM) ....B EVENING (5 PM-9 PM)....................................C NIGHT (9 PM-LATE NIGHT) ....D
16	On **peak times of a day**, how many IDUs visit this spot?	☐☐
17	On **non-peak times of a day**, how many IDUs visit this spot?	☐☐

** **Education:** 1-No formal education; 2-Primary; 3- Post-primary/vocational; 4-Secondary/'A' level; 5-College (Middle level); 6 – University