MAPPING AND SIZE ESTIMATION OF KEY POPULATIONS IN SOMALIA

Final Report

JULY 2016

International Organization for Migration (IOM)
The UN Migration Agency

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International Organization for Migration (IOM)
The UN Migration Agency

SOMALILAND NATIONAL HIV/AIDS COMMISSION
SOLNAC

unicef

Title of the project

Study on Mapping and Size Estimation of Key Populations in Somalia

Study ownership

This is a study by the Ministry of Health (MoH) of Somalia with technical support from the International Organization for Migration (IOM) and financial support from the United Nations Children's Fund (UNICEF) Somalia.

Collaborating institutions

MOHs of the Federal Government of Somalia, Somaliland and Puntland

AIDS Commissions: Somali National AIDS Commission, Somaliland National AIDS Commission and Puntland AIDS Commission

IOM Somalia

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Joint UN Team on AIDS for Somalia

Civil society organizations in Somalia working with key populations

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Abbreviations and acronyms

AIDS	Acquired immunodeficiency syndrome
FGD	Focus group discussion
FSW	Female sex worker
HIV	Human immunodeficiency virus
HTC	HIV testing and counselling
IBBS	Integrated Biological and Behavioural Surveillance
IOM	International Organization for Migration
MCH	Maternal and child health
MHD	Migration Health Division
MoH	Ministry of Health
MSM	Men who have sex with men
NGO	Non-governmental organization
PAC	Puntland AIDS Commission
PWID	People who inject drugs
RDS	Respondent-driven sampling
SNAC	Somali National AIDS Commission
SOLNAC	Somaliland National AIDS Commission
STI/STD	Sexually transmitted infections/diseases
TWG	Technical working group
UNICEF	United Nations Children's Fund

Executive summary

Background and rationale

A few studies have examined the prevalence and incidence of human immunodeficiency virus (HIV) among female sex workers (FSWs) and their clients in Somalia. Studies among FSWs in Hargeisa found an HIV prevalence of 5.2 per cent in 2008 and 4.8 per cent in 2014. The lack of clear size estimates of population groups that are of high risk to HIV infection implies that national HIV prevention plans are not driven by evidence and may result in a mismatch between populations most in need and those who receive the available resources. To help formulate informed policies and intervention measures, a study on HIV mapping and size estimation of high-risk population groups was conducted in Somalia. This study aimed at establishing the location and size estimates of FSWs and their clients in Mogadishu, Bossaso and Hargeisa.

Methodology

Research was conducted through a cross-sectional study using both quantitative (largely) and qualitative methodologies. The study population was comprised of FSWs and clients of FSWs. The clients of FSWs constituted truck drivers and their assistants, port workers, fishermen, seafarers, police and military personnel, khat and tea clients. A total of 2,877 respondents participated in the three study sites namely Mogadishu, Hargeisa and Bossaso. To arrive at the key population estimates, this study employed a combination of methods including geographical mapping, unique service multiplier and wisdom of the crowd. Both geographical mapping and unique service multiplier methods were used to arrive at the FSW population estimates in Mogadishu. However, the unique service multiplier method was not applicable in Hargeisa and Bossaso since there was no documented data on health services such as HIV testing and counselling (HTC) or sexually transmitted infections/diseases (STI/STD) screening and treatment specific to FSWs. The questionnaires were administered, and data were collected using mFieldWork mobile application. Data was cleaned and analysed to establish locations and plausible bounds.

Findings

Female sex workers

The estimated numbers of FSWs in Mogadishu, Hargeisa and Bossaso are 963, 1,126 and 911 respectively. The greatest proportion of FSWs (66.1%) is youth aged 15 to 35 years. Majority of FSWs in Mogadishu (57.3%) and Hargeisa (61.2%) meet their male clients either at their own homes or those of their clients. In Bossaso, FSWs mostly find their male clients at tea-selling shops (49.1%). Across the three study sites, there is a similar trend of days and times in the week when FSW activity is at a peak. In Mogadishu, the peak days for FSW activities are on Fridays (41.1%) during evening hours (46.8%). FSW activities in Hargeisa and Bossaso peak on Thursdays (48.3% and 76.6%) in the evenings (56.0% and 54.0% respectively). Essential routine health services for FSWs include STI/STD screening and treatment, HTC, cervical cancer screening and treatment and condom use. The proportion of FSWs who had received any of these health services within 12 months before the survey was 71.9 per cent, 29.7 per cent, 46.9 per cent in Mogadishu,

Hargeisa and Bossaso respectively. Only 2.2 per cent of FSWs in Mogadishu had received free condoms within 12 months before this study. The majority of FSWs are willing to attend a drop-in centre dedicated to serving FSWs with essential health services such as HTC, STI/STD screening and treatment, cervical cancer screening and condom provision. Fear of being recognized as a FSW is a major reason deterring FSWs from seeking essential health services. Among the FSWs who reported receiving health services, most received them from governmental facilities including maternal and child health (MCH) clinics.

Clients of FSWs

In Mogadishu and Bossaso, FSW clients consisted of fishermen, port workers, khat clients, seafarers, army and police personnel and truckers. In Hargeisa, the FSW clients were comprised of khat clients, tea clients, truckers and Somaliland police. The population size estimates among clients of FSWs generated through geographical method closely approximate those of the wisdom of the crowd method. The estimated totals of male clients of FSWs are 2,202 to 2,599 in Mogadishu, 1,559 to 1,827 in Hargeisa, and 3,467 to 3,530 in Bossaso. Across the three study sites, the sex activity is hidden, and the majority of male clients of FSWs meet the FSWs at agreed homes, khat- and tea-selling shops. According to male FSW client respondents across the three study sites, they mostly engage FSWs on Thursdays and Fridays during the evening hours (5 p.m.–8 p.m.).

Conclusion and recommendations

FSWs and their male clients exist and operate in hidden ways in Mogadishu, Hargeisa and Bossaso. The data generated from this study can be used to enhance HIV prevention programme planning and implementation for FSWs and their clients, to form the basis for subsequent population size estimates and impact evaluations, and to improve programme coverage by directing efforts to locations with the greatest need as demonstrated by the findings of this study. In accordance with the findings of this study, indicating that the majority of FSWs and their clients are not seeking essential health services, prompt HIV interventions targeting FSWs and their clients should be implemented. These services ought to include at least HTC, STI/STD screening and treatment, cervical cancer screening (FSWs only) and condom provision. It will be essential to create separate databases for FSWs and their clients to guide the monitoring and evaluation of HIV interventions targeting these populations. This can be achieved by registering the key populations into the programme(s) and issuing them unique identifiers. Access to FSWs and their clients can be done with initial seeds of these key populations who then recruit more members into the programme(s). Essential health service provision can thereafter be tracked per unique individual in the programme. While this study contributes to the ongoing HIV programming in the studied locations, similar studies should be conducted in other locations to develop a more targeted national response for the key populations.

1. Introduction

1.1. Background

In 2014, the population of adult people living with human immunodeficiency virus (HIV) in Somalia was estimated to be 29,726 (comprising of an estimated 9,531 people in Somaliland, 16,363 in South Central and 3,832 in Puntland) (UNAIDS, 2015). A total of 2,338 new HIV infections among adults aged 15 years or above were reported in 2014 (ibid.). Although global studies have indicated a disproportionate high HIV prevalence among female sex workers (FSWs) than the general population, few studies in Somalia have examined the prevalence and incidence of HIV among FSWs and their clients. In 2014, a study by the International Organization for Migration (IOM) among FSWs in Hargeisa found an HIV prevalence of 4.8 per cent (IOM, forthcoming). Other previous studies conducted among key populations include the Somali hotspot mapping (Testa, 2010), two integrated biological and behavioural surveillance (IBBS) studies in Hargeisa (Testa and Kriitmaa, 2008; IOM, forthcoming) and an HIV Rapid Assessment in Mogadishu (IOM, 2014). In 2011, a study estimated a total of 400 FSWs in Berbera and 1,000 FSWs in Bossaso (UNAIDS, 2015). However, these studies did not establish the size of FSW clientele nor that of other key population groups such as men who have sex with men (MSM) and people who inject drugs (PWID). In Hargeisa, sex work among FSWs and their clients was characterized by high numbers of sexual acts and extremely low knowledge of HIV (Kriitmaa et al., 2010).

Having up-to-date data on estimates and distribution of populations at risk of HIV infection is critical to inform the development, implementation and monitoring and evaluation of interventions among these groups (WHO, 2011). Furthermore, population size estimates are key information for advocacy, setting targets for prevention, service delivery and estimating resource needs at national and subnational levels. Aside from FSWs, their male clients have been identified as a critical bridge group in HIV/AIDS transmission National AIDS Control Organisation, 2006). They act as “vectors” for HIV transmission, linking FSWs (with a high HIV seroprevalence) to the general population of women (such as wives and girlfriends) who have a lower HIV prevalence.

To arrive at estimates of key populations, different methods of mapping and size estimation have been used across the globe (WHO, 2014). These methods ranged from direct observation and counting to surveys or samples of key populations (namely service or unique object multiplier methods, capture–recapture with overlapping surveys of the same population) and surveys of the general population (i.e. network scale-up method or directly asking a behaviour among the general population) (Abdul-Quader, Baughman and Hladik, 2014). In Afghanistan, for instance, a geographical mapping approach was used to estimate the population of FSWs in three cities: Kabul, Jalalabad and Mazār-i-Sharif. A total of 1,160 FSWs were captured with 91 per cent of the mapped FSWs belonging to home-based typology (World Bank, 2008). The study also captured a total of 1,465 injectable drug users and approximately 130 MSMs. The fewer number of MSMs reported was partially attributed to MSM activities being generally highly secretive and stigmatized compared to other groups of key populations. The study failed to employ mixed size estimation methods that are much needed to boost scientific robustness. In an effort to establish the population estimates of MSMs in Tbilisi and Batumi in Georgia, several methods were used, including capture–recapture, network scale-up, multiple multiplier, the wisdom of the crowd, and Handcock’s respondent-driven sampling (RDS) based method. Data was extrapolated to yield 17,200 MSM (11,700 MSM–17,600 MSM) in Georgia (Chikovani et al., 2008).

In Africa, several methods of estimating the numbers of FSWs have also been used. In Mozambique, three methods – two multipliers (unique event multiplier and unique object multiplier) and an estimate based on literature review (or document analysis) – were used to arrive at best

estimates of FSW population sizes using RDS (National Institute of Health, United States Centers for Disease Control and Prevention, University of California, San Francisco, 2013). They yielded varied population sizes: Maputo 13,554, Beira 6,802, and Nampula 6,929. In Kenya, the capture–recapture method was used to determine the number of FSWs in Kisumu city, which yielded a total of 1,350 FSWs (Vuylsteke, 2010). Similarly, in Mauritius during an IBBS survey, the multiplier method was used utilizing RDS to arrive at a total of 771 FSWs (AIDS Unit, 2010).

In conclusion, numerous past studies have adapted different methods for estimating the sizes of key populations based on their local contexts. Most studies have applied more than one size estimation method. The challenge with this has been to address the substantial discrepancies in the estimates yielded by different methods. Owing to the complexity of interpreting key populations size estimates, establishing a consistent technical working group of experts to analyse, document and disseminate results is critical for using key population size estimates to strengthen a country's HIV/AIDS response (Dongbao et al., 2014).

1.2. Purpose and scope of the study

The main objective of the study was to establish the location and size estimates of FSWs and clients of FSWs in Mogadishu, Bossaso and Hargeisa. This study specifically sought out to:

(a) Identify demographics, locations, hotspots, typologies and size estimates of FSWs and their clients in Mogadishu, Hargeisa and Bossaso; and

(b) Establish the health-seeking behaviour of FSWs in Mogadishu, Hargeisa and Bossaso.

This study was limited to Somali FSWs and clients of FSWs (uniformed services, truck drivers, fishermen, seafarers, khat clients, tea clients and port workers). This study did not include other categories of key populations namely PWID, MSM and the transgender people.

1.3. Rationale/justification of the study

Globally, FSWs and their clients are disproportionately affected by HIV and therefore exhibit high HIV prevalence and incidence rates (UNAIDS, 2015). While male clients of FSWs constitute a core group for HIV transmission, their size estimates and locations in Hargeisa, Bossaso and Mogadishu were almost unknown before this study (IOM, 2014; IOM, forthcoming). Clients of FSWs comprise a key priority group for any HIV/AIDS intervention. Efforts to reduce the transmission of HIV infection within the male client group might therefore help in slowing the spread of HIV. Thus, knowing the locations and proportions of both FSWs and their clients is essential to scale up HIV programming. Furthermore, to efficiently allocate appropriate resources, estimates of the numbers of FSWs and their clients in Hargeisa, Bossaso and Mogadishu are needed. The size estimates of populations at high risk of HIV infection will help policymakers understand the scope of the epidemic (Okal et al., 2013). These estimates can be used for targeted HIV prevention, care and treatment, planning and monitoring among the FSWs and their clients.

2. Methodology

2.1. Target populations

The target population groups in this study consisted of FSWs and clients of FSWs, such as uniformed service personnel (police and army), truck drivers, fishermen, port workers, khat clients and tea clients. For the purpose of this study, key terms will be operationally defined as follows:

Key population: Groups at a high risk of HIV infection comprising FSWs, their clients (truckers, fishermen, port workers, seafarers, military and police personnel, and male clients of both tea and khat sellers).

Female sex workers (FSWs): Women who have engaged in sexual activity with men in exchange for money or goods in the last 12 months in Mogadishu, Bossaso or Hargeisa.

Male clients of FSWs: Men who pay money or provide goods in exchange for sex service with FSWs during the past 12 months in Mogadishu, Bossaso or Hargeisa.

Truckers: Long-distance and intracity truck drivers and their assistants in Mogadishu, Bossaso or Hargeisa.

Port workers: Individuals working as manual labourers in the ports of Mogadishu and Bossaso.

Fishermen: Persons who work on boats/ships at sea and earn income through fishing in Mogadishu and Bossaso.

Uniformed service personnel: Individuals who belong to any uniformed services including African Union peacekeeping forces, military and police in Mogadishu, Bossaso or Hargeisa.

Seafarers: Individuals who sail or work on the ships in Mogadishu or Bossaso.

Tea clients: Men who consume tea at tea-selling shops in Mogadishu, Hargeisa and Bossaso.

Khat clients: Men who consume khat at khat-selling shops in Mogadishu, Hargeisa and Bossaso.

Hotspot: A place where FSWs solicit or find their clients. It is not necessarily a place where sexual acts take place.

Typology: Refers to the type of hotspots, such as bar with lodging, bar without lodging, sex den/brothel, strip club, street/highway, home, casino, beach, guest house/hotel/lodging, massage parlour, tea kiosk, khat kiosk and park.

Street-based FSWs: FSWs who solicit clients on the street or in public places, such as major street intersections, parks, bus stops and marketplaces.

Brothel-based FSWs: FSWs who live in a brothel house – a place where a small group of FSWs is managed by a female brothel manager (auntie) or an agent. These FSWs do not go out of the brothel to solicit their clients; instead, the clients come to them at the brothel.

Home-based FSWs: FSWs who usually operate from their homes, contacting their clients on the phone or through word of mouth, or through a network of operators and pimps. The family might or might not be involved in the sex industry.

Venue-based FSWs: FSWs who are based in various venues including bars/casinos/night clubs/massage parlours. Not all, but most of the women working in these venues provide sexual services to the clients. This typology also includes lodge-based FSWs who operate in a similar fashion as brothel-based FSWs. However, since most of the bars and lodges operate in unison, these typologies are put together in one category. These FSWs do not solicit publicly for clients, as clients themselves visit these venues and solicit these sex workers either directly or through the venue managers.

Hotel-based FSWs: FSWs who operate in various hotels and are solicited either by the client directly, or the solicitation is mediated by some hotel staff such as waiters.

Saloon-based FSWs: FSWs who work in various saloons and are approached in the saloon by the client either directly, or through the saloon owner.

2.2. Study locations

The locations of this study were in Mogadishu, Bossaso and Hargeisa. Mogadishu is located in the coastal Banaadir region on the Indian Ocean. Bossaso is a city in the north-eastern Bari province. It is located on the southern coast of the Gulf of Aden. Both Mogadishu and Bossaso have seaports as opposed to Hargeisa.

2.3. Study design and sampling technique

This study used a cross-sectional descriptive study design. It simultaneously involved several methodologies to arrive at the size estimates and location of FSWs and their clients. This was essential to minimize potential bias resulting from a single method. Data on multiple estimates were compared and reconciled. Consensus was reached among technical working group (TWG) members on a range of plausible estimates and the “best” point estimates.

2.4. Mapping and size estimation methods

This study employed three size estimation methods namely geographical mapping, unique object multiplier method (for FSWs) and wisdom of the crowd (for clients of FSWs).

2.4.1. Geographical mapping

To describe the key physical locations of the hotspots and their respective typologies in Hargeisa, Bossaso and Mogadishu, this study essentially relied on a geographic approach. Key locations herein referred to as “hotspots” are localities where FSWs or their clients solicit or get their clients, and sometimes their numbers can be quantified while in these locations. The rationale for this approach was based on programmatic experience in diverse settings across the globe, which has shown that most FSWs or clients of FSWs congregate and/or meet clients in specific geographic locations. Accordingly, the approach focused on identifying these locations, characterizing each in terms of specific “spots” within that location and the operational characteristics of the sexual networks there (that is how and where FSWs meet clients/partners and where sexual transactions

occur). This approach enabled estimates of the numbers of key population members that frequent the specific locations and spots in Hargeisa, Bossaso and Mogadishu. This was achieved using two sequential steps:

Step 1: Focus group discussions (FGD) with FSWs were convened at a mutually agreed location that was safe to both the enumerator and the focus group participants. Information was systematically gathered from FSWs regarding the locations of hotspots where key population members congregate and/or meet casual or paying sexual partners. All hotspots in each of the three study sites were listed. For each hotspot, information on the typology, estimated minimum and maximum numbers of clients and FSWs, peak days and times, was gathered. The key informant team drew, on flip charts, the map of the zone indicating all the listed hotspots and landmarks, such as roads, mosques and schools. Regarding FSW clients size estimation through this method, enumerators listed all known hotspot locations for respective study target populations. This was followed by visiting the listed locations and conducting interviews with respondents who are members of the respective FSW client population.

Step 2: Site validation and profiling of listed hotspots to characterize and estimate the sizes of key populations were thereafter conducted by enumerators and selected few key informants who participated in hotspot listing. During the walk through different hotspots, enumerators took the global positioning systems (GPS) coordinates of hotspots where the security situation allowed. Venue profiling data was collected by interviewing key informants at the hotspots. Details of the sex work operation, such as the type of venue, duration of operation, operation days and times, peak days and times, services provided at each venue, numbers of clients of FSWs or FSWs on average peak days were captured by the enumerators. Population number estimates listed during hotspot listing were compared to and averaged with population estimate numbers established during hotspot validation for the same set of hotspots listed. This was computed for each hotspot in each of the three study sites. The sum of individual hotspot averages per study site yielded the geographical population estimate for that site.

2.4.2. Unique service multiplier method

Using RDS, a small convenience sample of FSWs was identified and recruited to form the seeds, of which a small pool of initial informants were nominated and helped reach other participants through their social networks who met the eligibility criteria. The seeds were required to meet the inclusion criteria. They were selected based on the following: (a) their social connection to the FSW communities; (b) ability to explain the purpose of the study; (c) enthusiasm about the study aims; and (d) diverse demographics (age, education and socioeconomic status). Their peers who then enrolled in the study were considered the first wave of participants. Each participant in the first wave who completed the survey was then requested to lead the enumerator to other FSWs. Successive waves of recruitment continued until the sample size of 64 was reached per study site. Each FSW was given USD 5 as compensation for their time taken to participate in the study. Consenting FSWs were subjected to a short survey that had specific questions on targeted health services received including HTC, condom distributions and STI/STD screening. The population size estimate was then calculated using the unique service multiplier method. The proportion of respondents in the survey who were offered or received any of the aforementioned services in designated facilities run by non-governmental organizations (NGOs) in the three study sites was established. Data on actual numbers of FSWs who had received the aforementioned services was also used to derive the FSW population size estimates in Mogadishu. The formula (UNAIDS, 2010) that was used for the multiplier method was:

$S = N/P$

Where:

S = size of the FSW population

N = number of FSWs at each of the three study sites who received an essential health service in the last one year

P = proportion of respondents in the FSW size estimation survey

2.4.3. Wisdom of the crowd

This size estimation method is based on the assumption that the central tendency in the response of population members on the overall size of the population approximates or is proportional to the actual number of members in that population (Lee, Shang and Shi, 2011; Giles, 2005). Key to this approach are several assumptions: (a) persons in a large sample tend to have unique information or perspectives about the population in question; and (b) when individuals in the sample are asked the same question, individual responses are not influenced by others in the sample, and in an aggregate, any extreme outliers in responses tend to cancel each other out. This study posed additional questions in the behavioural survey instrument administered by an interviewer; for example, participants were asked about how many FSWs or clients of FSWs they believed to be present in a particular location (specifically in Mogadishu, Hargeisa or Bossaso). Descriptive statistics comprising median, range and quartile were then computed.

2.4.4. TWG consensus

Stakeholder consensus was reached after data analysis. Stakeholders in the TWGs synthesized the new information and estimates gathered during the study and interpreted the results. Stakeholders included representatives from the MoHs, national AIDS commissions, Global Fund subrecipient organizations, UNICEF, World Health Organization and civil society organizations. This was then followed by the presentation of preliminary point estimates for population sizes, identification of median estimates from all methods used and also elicitation of feedback and expert opinions on the estimates from the stakeholders. Preliminary findings were presented to the Joint UN Team on AIDS members (UNICEF, United Nations Population Fund, United Nations Development Programme and IOM) in Nairobi who synthesized the findings and gave their input. In Mogadishu, aside from TWG, a different forum with representation from different organizations were convened to discuss the findings. This included additional civil society organizations, Ministry of Justice, Ministry of Religion, media and religious groups. TWG members agreed on the estimate plausibility bounds. Plausibility bounds are not the same as statistical confidence intervals but rather bounds established that make “plausible sense” in the Somali context.

2.5. Involvement of local stakeholders and community

FSWs are generally a hidden and hard-to-reach population, especially in the Somali context where stigma levels against this population are high. This study involved FSWs in study implementation to gain their support and get access to other FSWs. Some of the leaders among the FSWs were hired as enumerators. Furthermore, key persons in different governmental departments and other gatekeepers of information were identified and involved in the study from its initial phases. Meetings were conducted with local officials and stakeholders, including law enforcement agencies, to inform them about the purpose and nature of the mapping and size estimation study, and to garner their support.

2.6. Sample size calculation

The sample size of this study was calculated based on Cochran's formula as follows:

$N_o = [(t)^2*(p)(q)]/(d)^2$

Where:

N_o = sample size

T = Z score corresponding to 95 per cent confidence interval, 1.96

p = Expected proportion of outcome of interest (this will be based on two key indicators among FSWs from the previous IBBS survey for sex workers: HIV prevalence among FSWs and condom use among clients of FSWs[19])

d = the alpha level a priori at 0.05

Table 1 shows the key indicators and resulting sample sizes. Using the above two indicators, a sample ranging from n=64 to n=179 was required. Considering the security risks and accessibility to the target populations, a minimum sample of 64 FSWs was selected in each study location. Since access to other study groups (such as clients of FSWs) was much easier than FSWs and the actual numbers of the groups were large, the researchers aimed to sample at least 179 per group per location. The minimum total sample size was therefore 2,877 as shown in Table 2.

Table 1: Key indicators and respective sample size

Indicator	Value (Percentage)	Cochran's sample size	Cochran's correction formula: Population <50,000
Percentage of FSWs who are HIV infected	5.2	73	64
Percentage of FSWs reporting the use of condom with their most recent client	24	280	179

Table 2: Sample sizes for different study populations

Key populations	Minimum estimated sample size
FSWs	192
Truck drivers	537
Uniformed service personnel (police and military)	358
Fishermen/Seafarers	358
Port workers	358
Khat clients	537
Tea clients	537

Inclusion criteria for FSWs:

To participate in the study, individuals were required to satisfy all the following criteria:

- Aged 15 or above;
- FSWs; and
- Ability to voluntarily consent and sign the informed consent form.

Exclusion criteria for FSWs:

Respondents required only one of the following criteria to be excluded from the study:

- Unable to provide informed consent; or
- Under the influence of drugs or alcohol (where the influence of this substance may impair the validity of consent) as noted by the person taking consent.

Inclusion criteria for clients of FSWs:

To participate in the study, individuals were required to satisfy all the following criteria:

- 15 years or above;
- Working as a port worker, trucker, fisherman, uniformed personnel (police and army), seafarer or be a male or female client of tea and khat sellers; and
- Ability to voluntarily consent and sign the informed consent form.

Exclusion criteria for clients of FSWs:

Respondents required only one of the following criteria to be excluded from the study:

- Unable to provide informed consent; or
- Under the influence of drugs or alcohol (where the influence of this substance may impair validity of consent) as noted by the person taking consent.

2.7. Data collection and analysis

Both qualitative and quantitative data were collected. Quantitative data was collected through the mFieldWork platform. Data collection was conducted between February and March 2016. Data collection tools were deployed through smartphones. This allowed for remote monitoring of data collection and study activities. The lead research team monitored the data collection process online via a Web application, ensuring high-quality and efficient monitoring. This method of data collection and study monitoring has been proven to be cost-effective, time-efficient and accurate through several studies that IOM conducted including the IBBS for FSWs and their clients. After data collection, data cleaning was done before analysis. To ensure timely editing, errors identified during data collection were immediately addressed before further data collection by the involved enumerator. The enumerators were given daily feedback on their performance and guided appropriately in case they had any challenges. Data sets from Excel were exported into statistical package for social sciences for data analysis. Qualitative data was collected through key informant interviews and FGDs with FSWs. Two FSW FGDs in each study site were conducted to generate a list of hotspots in Mogadishu, Hargeisa and Bossaso.

2.8. Ethical considerations

Before the commencement of data collection, ethical approval for this study was sought from MoH's research and ethical review committees under the Government of Somalia, Government of Somaliland and Government of Puntland. Informed consent from every participant was sought before their participation. Potential respondents under the influence of any substance that could impair their judgement were not interviewed. Participation in this study was completely voluntary. The interviews and collected data were kept anonymous and confidential. No names or personal details that could identify a respondent were used to capture details of the respondents.

3. Study findings and discussion

3.1. Profile of study participants

This study recruited a total of 2,877 respondents comprising 192 FSWs and 2,685 male FSW clients. Across the three study sites, majority of the respondents for FSW clients were men constituting 86.5 per cent, 73.5 per cent and 73.7 per cent in Mogadishu, Bossaso and Hargeisa respectively. Most of the respondents for FSW clients were aged between 20 to 29 years (38.8%), unlike respondents of FSWs who were mostly aged between 30 to 39 years (40.7%). When categorized as youths and non-youths, majority of FSWs (66.1%) were youths aged 15–35 years. Mogadishu had the largest (71.9%) number of youths who were FSWs. In addition, the mean age of FSWs in Somalia was 32±9.53 years as shown in Table 3.

Table 3: Characteristics of study respondents

Characteristic	Category	Mogadishu, n (%)	Bossaso, n (%)	Hargeisa, n (%)	Total, n (%)
Clients of FSWs					
Gender	Male	774 (86.5)	789 (73.5)	528 (73.7)	2,091 (77.9)
	Female	121 (13.5)	285 (26.5)	188 (26.3)	594 (22.1)
Age group (Years)	15–19	31 (3.5)	35 (3.3)	10 (1.4)	76 (2.8)
	20–29	388 (43.4)	431 (40.1)	223 (31.1)	1,042 (38.8)
	30–39	275 (30.7)	377 (35.1)	266 (37.2)	918 (34.2)
	40–49	160 (17.9)	140 (13.0)	160 (22.3)	460 (17.1)
	>= 5w0	41 (4.6)	91 (8.5)	57 (8.0)	189 (7.1
	Mean±SD age (Years)	32±9.28	33±9.70	35±9.11	33.3±9.36
	Age range (Years)	17–66	15–68	17–65	15–68
FSWs					
Gender	Female	64	64	64	192
Age group (Years)	15–19	11 (17.2)	5 (7.8)	2 (3.1)	18 (9.4)
	20–29	13 (20.3)	25 (39.1)	12 (18.8)	(26.0)
	30–39	28 (43.8)	20 (31.3)	30 (46.9)	(40.7)
	40–49	10 (15.6)	14 (21.9)	15 (23.4)	(20.3)
	>= 50	2 (3.1)	0 (0.0)	5 (7.8)	7 (3.6)
	Mean±SD age (Years)	32±8.98	31±8.72	36±10.13	32±9.53
	Age range (Years)	16–50	15–48	18–70	15–70
FSW age group by youth or non-youth (Years)					
	15–35	46 (71.9	43 (67.2)	38 (59.4)	127 (66.1)
	>=36	18 (28.1)	21	(32.8)	26 (40.6)
Type of respondent					
	Truckers	179 (18.7)	179 (15.7)	179 (22.9)	537 (18.7)
	Port workers	179 (18.7)	179 (15.7)	**	358 (12.4)
	Fishermen	132 (13.8)	164 (14.4)	**	296 (10.3)
	Seafarers	47 (4.9)	15 (1.3)	**	62 (2.2)
	Army personnel	60 (6.3)	6 (0.5)	*	66 (2.3)
	Police personnel	119 (12.4)	173 (15.2)	179 (22.9)	471 (16.4)

Characteristic	Category	Mogadishu, n (%)	Bossaso, n (%)	Hargeisa, n (%)	Total, n (%)
	FSWs	64 (6.7)	64 (5.6)	64 (8.4)	192 (6.6)
	Khat sellers	179 (18.7)	179 (15.7)	179 (22.9)	537 (18.7)
	Tea sellers	*	179 (15.7)	179 (22.9)	358 (12.4)
	Total	959	1,138	780	2,877

* Indicates that the category of FSW clients was not studied.

** Indicates that the category of FSW clients does not exist in the specific location.

3.2. FSW population size estimation in Mogadishu

Female sex work is illegal in Somalia, and therefore it is practiced in a hidden manner. This study used two study methods in Mogadishu to locate and estimate the number of FSWs. These methods included geographical mapping and unique service multiplier methods. The outcome of each method is presented below.

3.2.1. Geographical mapping

Two FGDs were held at the Somali Women Development Centre and IOM offices. The FGDs comprised four FSWs each. This included an FSW enumerator and other FSWs selected from different districts and age groups so as to capture as much information as possible. The FGDs explored and listed all possible hotspots, including their locations and population estimates across Mogadishu. This was followed by verification of hotspots. Face-to-face interviews with 64 FSWs were conducted across Mogadishu. The four FSWs who participated in the FGD acted as initial seeds to recruit, through RDS, the desired sample size (64 FSWs) for face-to-face interviews with an FSW enumerator. To underscore the hidden nature of the sex work industry, the FSWs who attended the FGDs refused to be filmed or recorded. This study established a total of 90 hotspots in Mogadishu. The majority of the FSW hotspots in Mogadishu are homes (60.0%), as shown in Figure 1. Based on the geographical population estimation method, a minimum of 571 and maximum of 931 FSWs exist in Mogadishu. The average number of FSWs estimated in Mogadishu using the geographical mapping method is therefore 750.

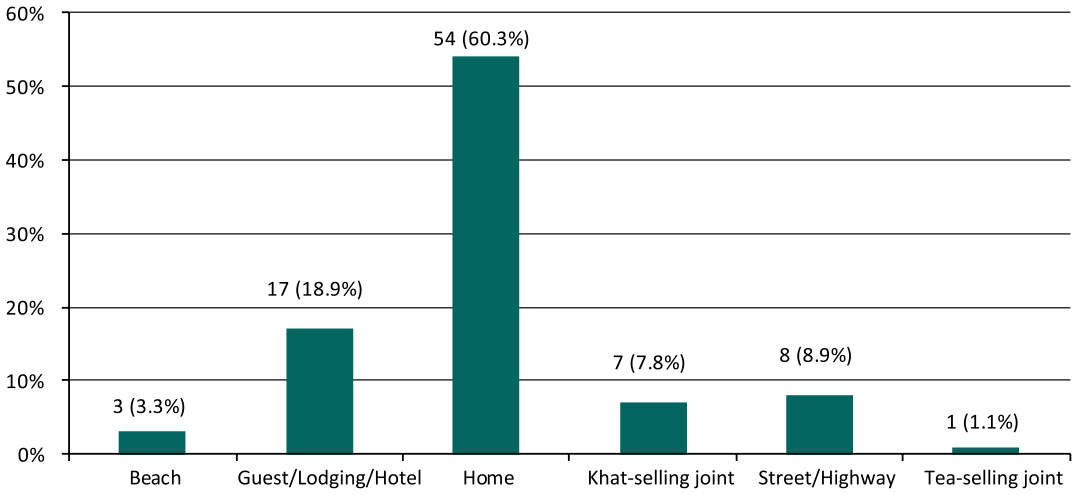
Table 4: Mogadishu FSW population estimates

District	Minimum FSWs	Maximum FSWs	Average FSWs
Abdiaziz	53	75	64
Boondhere	31	45	38
Daynile	25	41	33
Dharkenley	112	204	158
Hamar Jajab	79	127	103
Hamar Weyne	24	38	31
Hawl Wadag	21	31	26
Hodan	37	49	43
Kaaraan	5	9	7
Shangaani	45	81	62
Shibis	43	77	60
Waabari	9	15	12
Wadajir	38	66	52
Warta Nabada	7	13	10
Yaqshid	42	60	51
Total	**571**	**931**	**750**

3.2.1.1. Distribution of hotspots in Mogadishu

The major meeting places of FSWs and their male clients in Mogadishu are at homes (60.0%) as shown in Figure 1. This could be largely because of the hidden nature of the sex work industry in Somalia since it is illegal. Islam, the religion of most Somalis, also prohibits sex work.

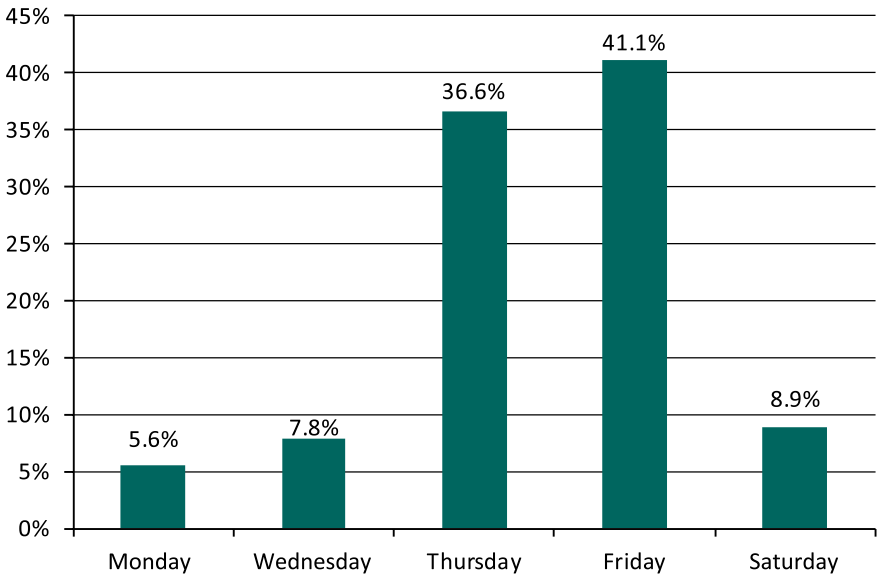
Figure 1: Distribution of hotspots in Mogadishu



3.2.1.2. Variation in daily sex activity

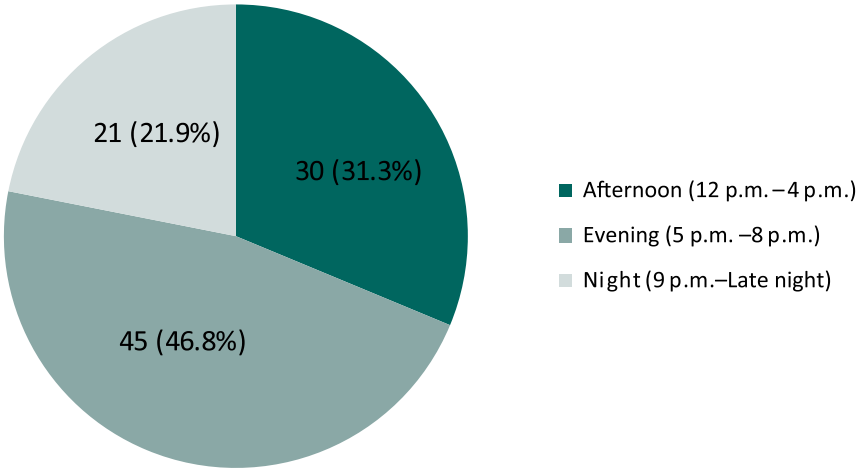
This study established that FSWs in Mogadishu operate actively on specific days in a week. Thursdays (36.6%) and Fridays (41.1%) are the peak days for FSW operations as shown in Figure 2. Furthermore, during peak days, the majority of FSWs (46.8%) meet their clients in the evenings (5 p.m.–8 p.m.) as indicated in Figure 3. This pattern is noteworthy for HIV interventions targeting FSWs in Mogadishu. Access to the FSWs will be much easier if done during off-peak days, as FSWs will be busy with their clients on Thursdays and Fridays.

Figure 2: Variation in sex work activities in a week



Note: The rest of the days not represented in this bar chart were not mentioned (0.0%) to be peak days.

Figure 3: Variation in FSW activities per day



Note: Morning (before 12 noon) was not mentioned (0.0%) to be peak time in Mogadishu.

3.2.2. Unique service multiplier

This study investigated four health services essential for FSWs to estimate the FSW size. These health services included HTC, cervical cancer screening and treatment, STI screening and treatment and distribution of condoms. Documented data on the above services was obtained from different facilities including Banadir Hospital, MCH clinics at Hodan, Buulo Hubey, Yakshid, Shibis and Hamar Jajab as shown in Table 5.

Table 5: Health service data among FSWs in the past 12 months

Health service	Banadir Hospital	MCH Hodan	MCH Buulo Hubey	MCH Yakshid	MCH Shibis	MCH Hamar Jajab
Number of FSWs who received condoms in the last one year	22	202	0	0	0	40
Number of FSWs who received HTC in the last one year	64	59	0	0	0	0
Number of FSWs who received STI screening/ treatment in the last one year	105	257	59	68	98	0
Number of FSWs who received cervical cancer screening in the last one year	0	2	0	0	0	0

Within the survey questionnaire for FSWs, a question was added to establish the proportion of FSWs who had visited the aforementioned facilities for essential FSW health services. From the survey, 46 FSWs out of 64 FSWs in Mogadishu reported to have received at least one of the aforementioned health services, with 8 FSWs reporting having received HTC as shown in Tables 6 and 7 respectively. However, among the above-mentioned facilities with documented data on health services offered to FSWs, the FSWs in the survey reported accessing the services at Banadir Hospital only.

Table 6: Banadir Hospital HTC health service data

Variable	Value
FSWs who reported during the survey having received HTC from Banadir Hospital	8
Documented number of FSWs who received HTC at Banadir Hospital	64

Proportion of FSWs in the survey who reported receiving HTC service at Banadir Hospital, P = 8/64*100 = 12.5%; N = 64

Estimated FSW, S = N/P

Therefore, S = 512 FSWs

Table 7: Banadir Hospital health service data on STI screening and treatment

Variable	Value
FSWs who reported during the survey having received STI screening and treatment from Banadir Hospital	7
Documented number of FSWs who received STI screening/treatment at Banadir Hospital	105

Proportion of FSWs in the survey who reported receiving STI screening/treatment service at Banadir Hospital, P = 7/64*100 = 10.9%; N=105

Estimated FSW, S = N/P

S = 963 FSWs

This 963 FSW population size estimate in Mogadishu closely approximates 931 FSW estimate yielded through the geographical method as the maximum estimate. Given that sex work in Somalia is hidden and few FSWs disclose to health workers the nature of their work, it is highly plausible that data on health services offered to FSWs is underreported. It is therefore prudent to use the population estimate of 963 FSWs derived using the unique health service multiplier method as the lower plausible bound FSW estimate in Mogadishu.

3.3. FSW population size estimation in Hargeisa

3.3.1. Geographical mapping

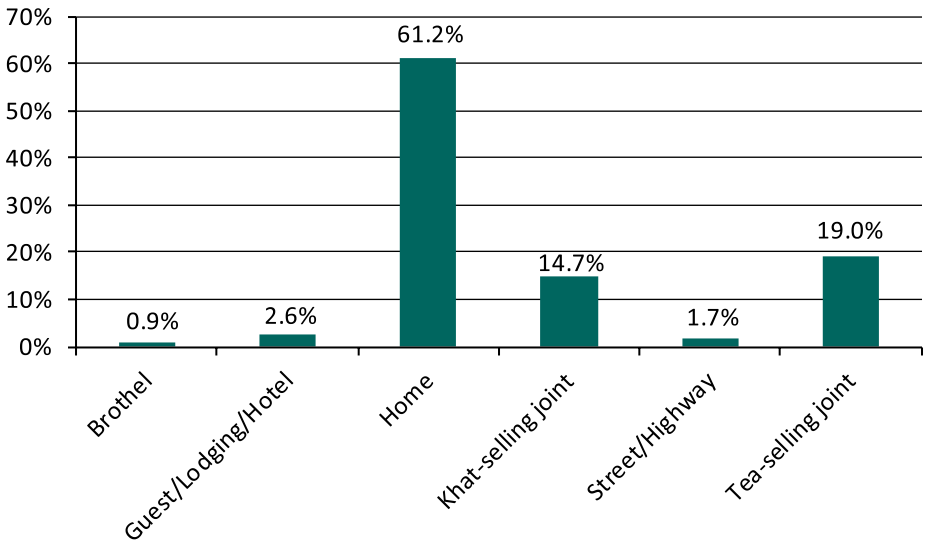
Unlike in Mogadishu, only the geographical mapping and size estimation method was applicable in Hargeisa to establish the size and location of FSWs, as there was no documented health service data specific to neither FSWs nor their clients. Three FSW FGDs were held to describe the locations where FSWs operate in Hargeisa district. This was followed by the validation and verification of identified hotspots. In addition, face-to-face interviews were conducted with the 64 FSW respondents. Just like in Mogadishu, sex work in Hargeisa is largely hidden. The FSWs operate mostly from home (61.2%) belonging to them or that of their clients. In addition, tea- and khat-selling shops are entry points where FSWs meet their male clients as shown in Figure 4. Based on the geographical population estimation method, a minimum of 842 and maximum of 1,409 FSWs exist in Hargeisa. The average number of FSWs estimated in Hargeisa is therefore 1,126 FSWs, as shown in Table 8.

Table 8: Hargeisa FSW population estimates

Hotspot location	Minimum FSWs	Maximum FSWs	Average FSWs
Ahmed Dhagax	9	13	11
Ayah 4	12	10	11
Badacas	20	32	26
Cabaaye	8	10	9
Cakaara	38	50	44
Calaamadaha	8	10	9
Central Market	83	140	112

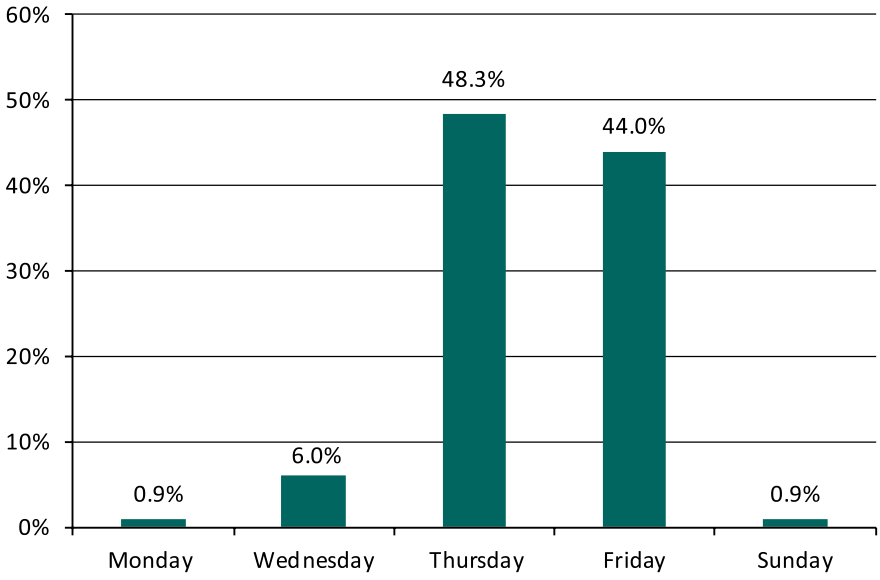
Hotspot location	Minimum FSWs	Maximum FSWs	Average FSWs
Daami	108	177	142
October	10	8	9
Digale	13	18	16
Fakinka	15	30	22
Faluuja	12	14	13
Goljano	12	20	16
Hargeisa main bridge	12	19	16
Hargeisa valley	37	67	52
Idaacada	21	41	31
Isha Borama	28	50	39
Jig Yar	60	123	92
Kilidhka	17	29	23
Koodbuur	5	9	7
Maqaaxida Inanta	14	18	16
Masalaha	10	15	12
Mohamed Mooge	30	51	40
New Hargeisa	49	73	61
Pepsi area	8	16	12
Qudhac Dheer	8	14	11
Shacab area	12	10	11
Sheedaha	6	10	8
State house	141	261	201
Xero Awr	8	16	12
Xusbiga	28	55	42
Total	**842**	**1,409**	**1,126**

Figure 4: Distribution of FSW hotspots in Hargeisa



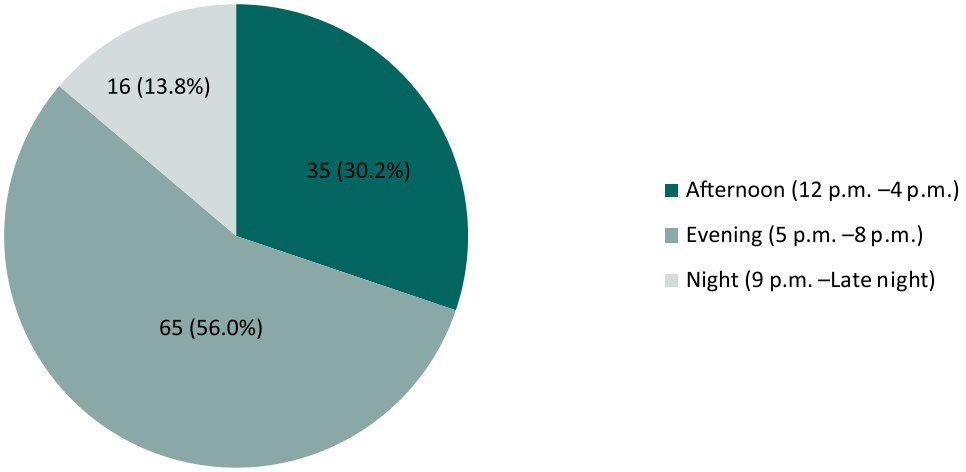
The peak days for FSW operations are on Thursdays (48.3%) and Fridays (44.0%) as shown in Figure 5. The peak time when FSWs meet their clients in Hargeisa is in the evenings (5 p.m.–8 p.m.). This trend is similar to that seen in Mogadishu.

Figure 5: Variation in sex work activities in a week



Note: The rest of the days not represented in this bar chart were not mentioned (0.0%) to be peak days.

Figure 6: Variation in FSW activities per day



Note: Morning (before 12 noon) was not mentioned (0.0%) to be peak time in Hargeisa.

3.4. FSW population size estimation in Bossaso

3.4.1. Geographical mapping

Two FGDs with FSWs were convened to profile locations where FSWs operate and list all hotspots that exist in Bossaso district. This was followed by the validation of the listed hotspots. Each hotspot was described in terms of its location, type, days of the week and daily variations in FSW activities. FSW activity in Bossaso is characterized by numerous small hotspots (fewer number of FSWs per hotspot) where FSWs operate from. This study identified a total of 171 FSW hotspots. Findings revealed that khat- and tea-selling shops are hotspots that constitute major entry points for female sex work in Bossaso. In Bossaso, FSWs recruited in the FGDs revealed that there are specific khat-chewing houses called “bush houses” where FSWs meet with male clients. There are ready rooms there where sex acts take place in exchange for money or goods such as khat. Clients in these houses not only include Somali nationals but also immigrants from other countries, such as Yemen, Pakistan and the Islamic Republic of Iran. The FSWs alleged that

majority of these immigrants have no wives. The khat clients are mostly men who come with the intention of chewing khat and later engage in sexual activity with the FSWs. From the FGDs, the FSWs emphasized that these clients do not like using condoms and if they insist on using them, the client will leave her for another FSW who accepts not using a condom. Majority of the hotspots for FSWs are tea-selling shops (49.1%) and homes (21.6%), accounting for 46.3 per cent and 20.6 per cent of total FSW population in Bossaso. Based on geographical mapping and size estimation, the minimum number of FSWs in Bossaso is 742, whereas the maximum FSW estimate is 1,079. The mean estimate of FSWs in Bossaso is therefore 911 FSWs as shown in Table 9. Majority of the FSWs (76.6%) engage in sex activities on Thursday during evening hours (5 p.m.–8 p.m.) as demonstrated in Figures 8 and 9.

Table 9: Bossaso FSW population estimates

Hotspot location	Minimum FSWs	Maximum FSWs	Average FSWs
Aakhiro Moog next to city Brava shop	7	8	8
Ajuuke near to Wellman	4	6	5
Basketka	5	7	6
Bush – Qayilad, central MCH/Pidam University/Nation link	15	29	22
Bushaashka – Beachka/Aljazera/Ethiopianka/Golciise/ Kaambo/Lagu/Galiyo/Qoyan/Raxis/Tuurjaale/Xabashida	51	74	63
Bushka – Farjah, Axmed, Banaadir, Faduma Buraale	19	26	23
Bushka – Ima bile, Ina Gamadiid, Mahigaag, Maryan, Mihiyo, Maxubo	20	27	24
Bushka – Orgi Lage, Raga Iyo, Sacdiyo, Sahra dheer, Shugri Nuur	28	43	36
Bushka – Tawakal, Ugbad, Waji Qofweyn	8	18	13
Buula – Bacley, Urto	25	36	31
Bush – Maryan, Qayilaad, Waris, Sahra, Sareedo, Deeqa	33	52	43
Bushaashka – Negfish, Kaambo, Amina Burco, Caga Baruur	98	134	116
Buushka – Canjeex, Cigale, Deeqa, Faiso, Fartuun Soohooyo	18	27	23
Buushka – Farxiyo, Jeexinta, Johra Suus, Luul Gado	46	66	56
Buushka – Xalimo, Xaawo, Sahro, Maryan	34	51	43
Cali Aabihiis Dilay next to Suweto	20	31	26
Dunida sedexaad near to Xafada Bangiga	3	5	4
Guri – Boosh, Ceyni, Yasmin	22	31	27
Guriga – Xalimo, Shaafi, Samsam, Qaadka, Maxubo, Jeeri, Ifrax, Idil, Cali, Abihi, Amran	83	106	95
Guryahooda	9	11	10
Hoteel – Sameero, London, Somali Hotelada	61	80	71
Jeexa next to Raxiis	9	11	10
Kaama Sareeyo	3	4	4
Mafrish	35	66	51
Meelaha Lagu Qayilo next to Duceysane Shop	7	8	8
Suweto beach next to Kaambo	31	48	40
Waqda Qaadka	12	19	16
Xafatul Carab	23	34	29
Xeebta next to Kaambo/Suweto	13	21	17
Total	**742**	**1,079**	**911**

Figure 7: Distribution of hotspots in Bossaso

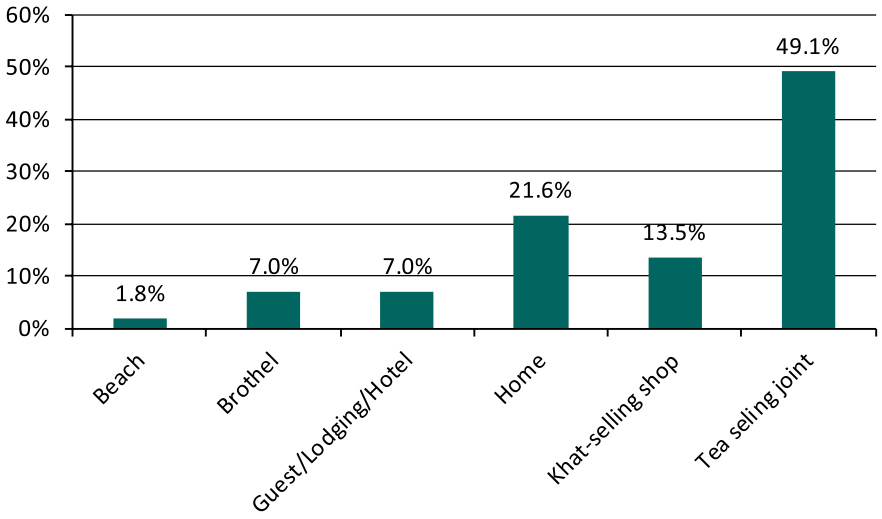
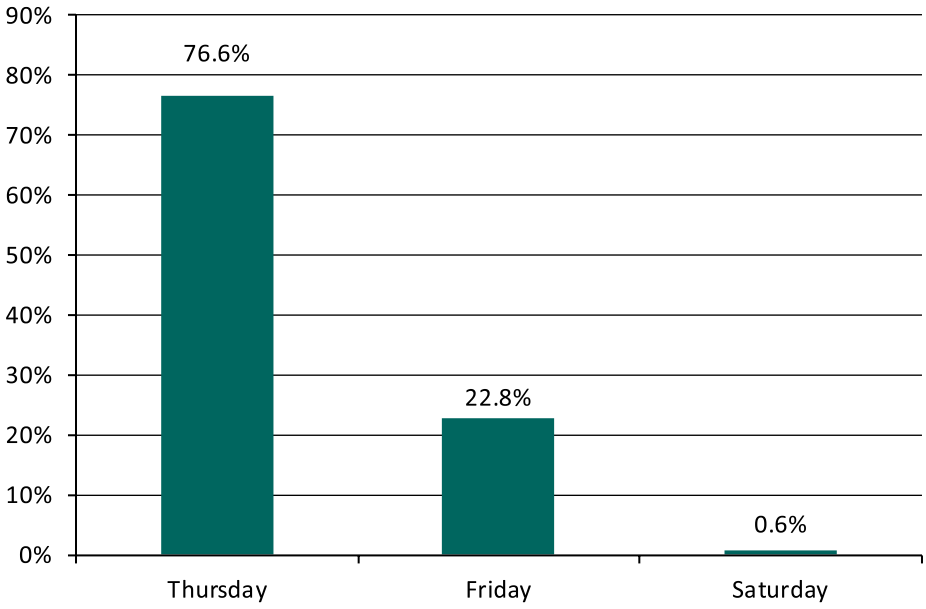
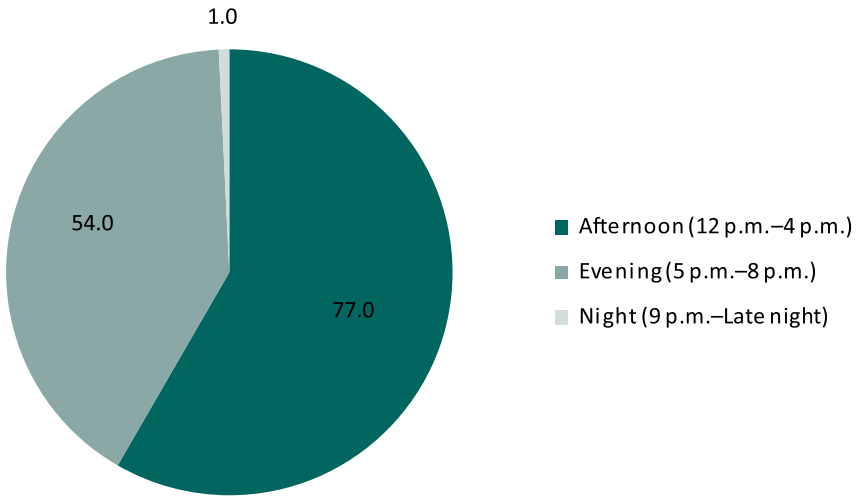


Figure 8: Variation in sex work activities in a week



Note: The rest of the days not presented in this bar chart were not mentioned (0.0%) to be peak days.

Figure 9: Variation in sex work activities in a day



Note: Night (9 p.m. to late night) was not mentioned (0.0%) to be peak time in Bossaso.

3.5. Health services' access and perception among FSWs

3.5.1. Health services' uptake among FSWs

Essential health services among FSWs include HTC, cervical cancer screening and testing, STI screening and treatment and condom education and distribution. In Mogadishu, 71.9 per cent of FSWs who participated in this study had received at least one of the above health services within 12 months before this study. However, less than half of the FSW respondents in Hargeisa and Bossaso had received at least one health service. Among those FSWs who reported having received health services, 50 per cent in Mogadishu reported receiving STI screening and treatment, whereas 42.1 per cent of FSWs in Hargeisa reported having received HTC. In Hargeisa, 56.7 per cent of FSWs reported having received both HTC and STI screening and treatment. Correct and consistent use of condoms among FSWs and their clients is key to curbing the spread of STI/STDs including HIV. Conversely, only two FSWs in Mogadishu and none in Hargeisa or Bossaso had accessed free condoms within 12 months before this study, as shown in Table 10. This is an alarming gap that future HIV programmes at governmental levels should address to contain new infections among FSWs and their clients.

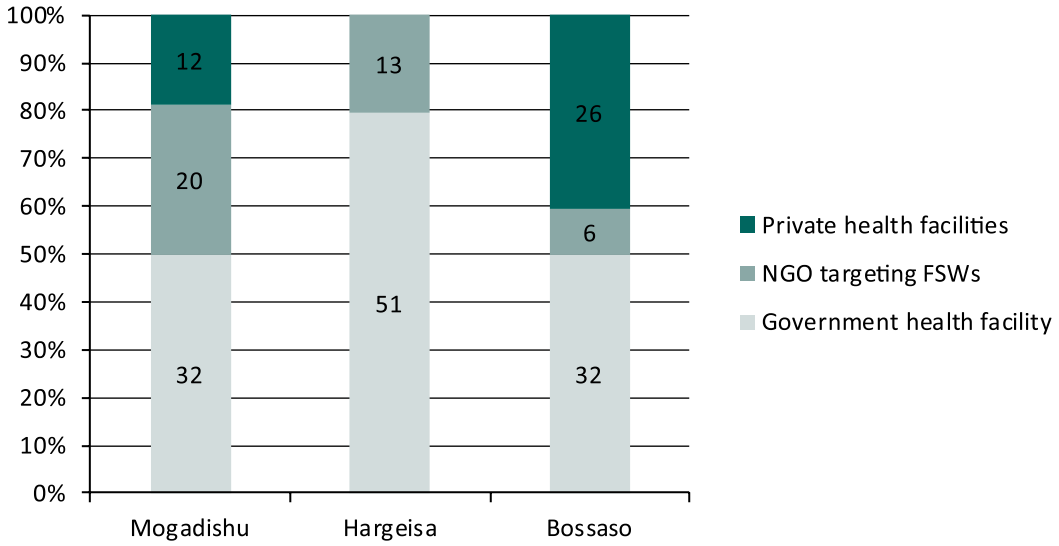
Table 10: Health service uptake among FSWs

Health services received in the past 12 months	Mogadishu, n (%)	Hargeisa, n (%)	Bossaso, n (%)
HTC	14 (30.4)	8 (42.1)	7 (23.3)
STI screening and treatment	23 (50.0)	5 (26.3)	6 (20.0)
HTC and STI screening and treatment	7 (15.2)	6 (31.6)	17 (56.7)
HTC and free condoms	1 (2.2)	0 (0.0)	0 (0.0)
HTC, free condoms and STI screening and treatment	1 (2.2)	0 (0.0)	0 (0.0)
Total FSWs who received health services	**46**	**19**	**30**
Proportion of FSWs who received health services (%)	**71.9**	**29.7**	**46.9**

3.5.2. Preference of health facility to access health services

Across the three study sites, majority of the FSWs prefer to access the essential FSW health services through governmental health facilities as shown in Figure 10. The fact that sex work in Somalia is illegal could in part explain this finding, indicating that FSWs prefer seeking health services from health workers working in governmental health facilities especially where MCH clinics exist. This could partially hide their identity as FSWs.

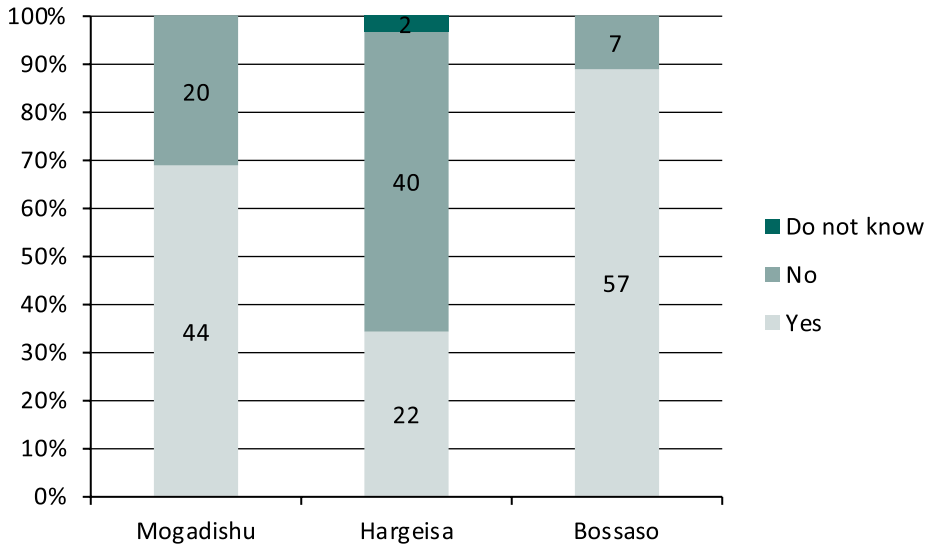
Figure 10: Preference of FSWs towards health facilities for essential FSW health services



3.5.3. Willingness to attend a centre dedicated to serving FSWs only

In most resource-limited settings in Africa, HIV programmes targeting key populations set up safe drop in centres that are more friendly and responsive to the health needs of the FSWs and key populations at large. To assess readiness for such programming structures in Somalia, FSWs were asked if they would be comfortable with such arrangements. Majority of the FSWs in Bossaso (89%) and Mogadishu (68.8%) would readily embrace this option as shown in Figure 11. However, the FSWs in Hargeisa are likely to require more sensitization through HIV programmes to gain their support in establishing the drop in centres and to encourage their attendance.

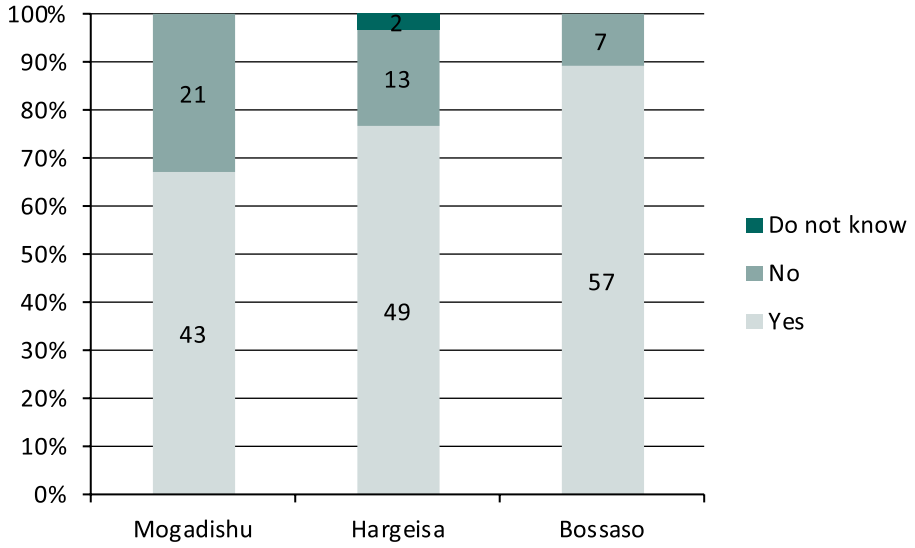
Figure 11: FSWs who will attend centres dedicated to serving FSWs



3.5.4. Ease of accessing health services among FSWs

The respondents were asked to rate the accessibility of essential health services for FSWs in their respective locations in Mogadishu, Hargeisa and Bossaso. Majority of the FSWs across the three sites perceived the required health services as easily accessible, as shown in Figure 12.

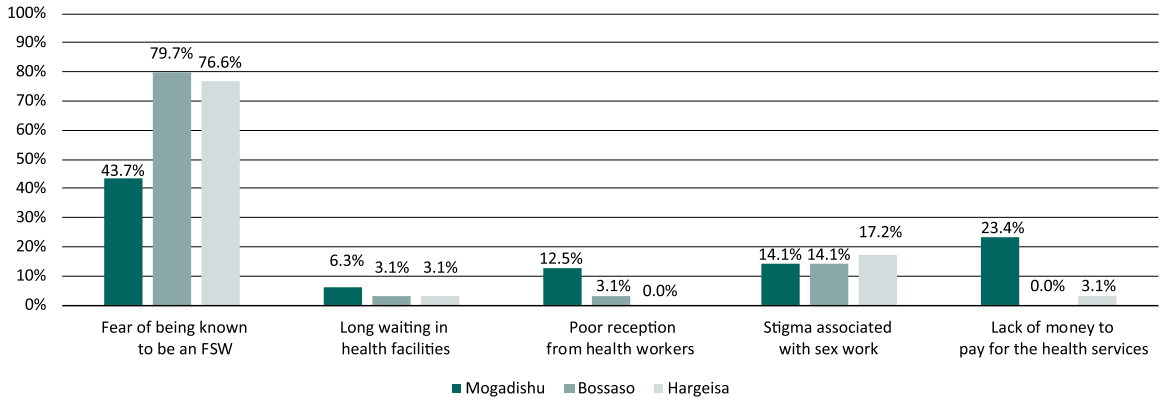
Figure 12: FSWs who believe health services are accessible and within reach of FSWs



3.5.5. Reasons for FSWs not seeking health services

The major factors hindering most FSWs from seeking health services from health facilities are the fear of being recognized as sex workers and the stigma associated with sex work. Bossaso FSWs bear the greatest fear of being known to be FSWs as indicated in Figure 13.

Figure 13: Reasons for FSWs not seeking health services



Note: n=64 FSWs per study site.

3.6. Clients of FSWs – Mogadishu, Hargeisa and Bossaso

3.6.1. Geographical mapping

Geographical mapping was used to estimate the population of clients who engage in sex with FSWs. In Mogadishu and Bossaso, this category included fishermen, khat clients, tea clients, port workers, seafarers, Somali army and military personnel and truckers. Tea clients (respondents are tea sellers) in Mogadishu were not recruited into the study because of logistical reasons; the female enumerators were best suited to interview tea sellers. It was, however, not practical to use the few female enumerators to reach out to tea sellers within the planned study timelines. In Hargeisa, the clients of FSWs comprised tea clients, khat clients, truckers and police personnel. Army personnel in Hargeisa were not included in the study based on an agreement among TWG members, since previous studies had delinked significant engagement with commercial sex workers and HIV prevalence among this study group. The study categories across the three study sites were mutually agreed upon between the research consultant and the TWGs based on their local experiences and global studies conducted so far. Minimum and maximum estimates per hotspot were summed up and their averages presented. The minimum estimated number of male clients who have sex with FSWs is 1,801, whereas the maximum is 3,396. The average number of male clients of FSWs is thus 2,599 in Mogadishu. In Hargeisa, the best point estimate number of FSW clients is 1,827, with 1,301 and 2,353 as lower and upper plausible bounds respectively. In Bossaso, the lower and upper plausible bounds are 2,480 and 4,453 respectively, placing the best point estimate of FSW clients at 3,467 as shown in Table 11.

Table 11: Best point estimates of FSW clients from geographical mapping

Type of FSW client	Mogadishu	Hargeisa	Bossaso
Police personnel	190	369	457
Army personnel	53	*	46
Truckers	778	264	447
Port workers	765	**	620
Fishermen	136	**	545
Seafarers	32	**	108
Khat clients	645	609	1,056
Tea clients	*	585	188
Total	**2,599**	**1,827**	**3,467**

Note: * Indicates that the category of FSW clients was not studied.

** Indicates that the category of FSW clients does not exist in the target location.

3.6.2. Wisdom of the crowd: Mogadishu, Hargeisa and Bossaso

Participants (clients of FSWs) in the survey were asked for their best guess of the population size of male clients of FSWs, as an application of the wisdom of the crowd method. This method was used to form a population estimate of FSW clients only, as they were less hidden compared to FSWs. Information about the sexual behaviour of FSWs tended to be well understood among FSW networks themselves. In this survey, recruited FSW clients were asked about their perception of the total number of FSW clients in their respective sites (Mogadishu, Hargeisa and Bossaso). According to research findings, the mean figures of FSW clients are 2,202, 1,559 and 3,530 in Mogadishu, Hargeisa and Bossaso respectively, as shown in Table 12. The mean numbers of FSW clients generated through the wisdom of the crowd method closely approximate those generated using the geographical size estimation method aside from some variations in the types of FSW clients.

Table 12: Population size estimates of FSW clients by wisdom of the crowd method

Type of FSW client	Mogadishu	Bossaso	Hargeisa
Police personnel	186	367	251
Military personnel	118	375	201
Truckers	338	711	313
Port workers	268	304	**
Fishermen	128	351	**
Seafarers	44	184	**
Khat clients	605	691	474
Tea clients	515	547	320
Total	**2,202**	**3,530**	**1,559**

Note: **Indicates that the category of FSW clients does not exist.

4. Conclusion

This study used different methods to establish locations and size estimates of FSWs and their clients in Mogadishu, Hargeisa and Bossaso. These methods included geographical mapping, unique health service multiplier methods and wisdom of the crowd. Estimation of FSW population was mainly established using geographical mapping, with the unique health service multiplier method being applicable in Mogadishu. Findings from the geographical and wisdom of the crowd methods was compared and presented as a range population estimate for FSW clients.

The estimated number of FSWs in Mogadishu, Hargeisa and Bossaso are 963, 1,126 and 911 respectively. Most of the FSWs (66.1%) are youths between the ages of 15 and 35 years. Majority of FSWs in Mogadishu and Hargeisa meet their male clients at homes (57.3% and 61.2% respectively). In Bossaso, FSWs mostly meet their male clients at khat-selling shops. Across the three study sites, sex work activity peaks towards the end of the week. In Mogadishu, the peak days for FSW activities are on Fridays (41.1%) in the evenings (46.8%). On the other hand, FSW activities in Hargeisa and Bossaso peak on Thursdays (48.3% and 76.6%) in the evenings (56.0% and 54.0%) respectively. Essential routine health services for FSWs include STI/STD screening and treatment, HTC, cervical cancer screening and treatment and condom provision. The proportions of FSWs who had received any of these health services 12 months before the survey are 71.9 per cent, 29.7 per cent and 46.9 per cent in Mogadishu, Hargeisa and Bossaso respectively. Only 2.2 per cent of FSWs in Mogadishu and none in Hargeisa and Bossaso had received free condoms within 12 months before this study. The majority of FSWs are willing to attend a centre dedicated to serving FSWs with essential health services, such as HTC, STI/STD screening and treatment, cervical cancer screening and condom provision. The fear of being recognized as a sex worker is the major reason deterring FSWs from seeking essential health services. Among the FSWs who reported receiving health services, most of them received such services from governmental facilities including MCH clinics.

In Mogadishu and Bossaso, FSW clients comprise fishermen, port workers, khat clients, tea clients, seafarers, army and police personnel and truckers. In Hargeisa, the FSW clients comprise khat clients, tea clients, truckers and police personnel. The population size estimates among clients of FSWs generated through the geographical mapping method closely approximates that yielded by the wisdom of the crowd. Based on the yields from the aforementioned two methods, the total estimated number of male clients of FSWs is between 2,202 and 2,599 in Mogadishu, 1,559 and 1,827 in Hargeisa and 3,467 and 3,530 in Bossaso. Across the three study sites, sex work is hidden, and the majority of male FSWs clients meet the FSWs at agreed homes. The male clients mostly engage FSWs on Thursdays and Fridays during the evening (5 p.m.–8 p.m.) hours. Some variation was noted between reports from FSWs and those from FSW clients. In Bossaso, for instance, FSWs report tea-selling shops as major hotspots whereas FSW client's reports indicate khat-selling shops. However, based on the huge size estimates of FSW clients who are khat clients as indicated by findings of this study, it is clear that khat-selling shops constitute majority of the hotspots in Bossaso.

4.1. Challenges

This study was not devoid of challenges. To begin with, the MoH and PAC/SOLNAC/SCAC often had monetary expectations that partly contributed to delayed study buy-in and support. Furthermore, a number of focal points requested some compensation to support enumerators in gaining access to study participants. In addition, sex work among Somalis is a hidden topic, especially among FSWs. Therefore, it took some time for enumerators to gain the confidence and trust of FSWs for

them to open up and freely share necessary information. In order to apply the unique service multiplier method, records of data were needed on FSWs or their clients who received essential services such as HTC, STI screening and treatment, distribution of free condoms or cervical cancer screening. Lack of documented health service data on FSWs or FSW clients hindered the application of unique service multiplier methods in Hargeisa and Bossaso.

4.2. Recommendations

This study provides essential robust estimates on the sizes of the FSW and FSW client populations in Mogadishu, Bossaso and Hargeisa. This data can be used to enhance HIV prevention programme planning and implementation for FSWs and their clients, to form the basis for subsequent population size estimates, outcome and impact evaluations, and to improve programme coverage by directing efforts to locations with the greatest need. Based on the findings of this study indicating that the majority of FSWs are not seeking essential health services, prompt HIV interventions targeting FSWs and their clients should be implemented. The essential health services to be offered include condom provision, education and promotion, HTC, cervical cancer screening and STI screening and treatment. The key populations will be easily located through the mapped areas. Accelerated HIV prevention strategies should target youths who form the majority of FSWs. It is critical to create a database of FSWs and their clients. This can be achieved by registering the key populations into the programme(s) and issuing them with unique identifiers. The provision of the above-mentioned essential health services can thereafter be tracked per unique individual in the programme. Furthermore, programmes implementing HIV interventions among the FSWs and their clients in Mogadishu, Hargeisa and Bossaso should endeavour to document and report health services provided to FSWs and their clients. This can be disaggregated by age and gender. Such data will be essential for subsequent routine mapping and size estimations of key populations in the aforementioned areas.

A comprehensive follow-up IBBS will also be essential to further support targeted HIV interventions for the FSWs and their clients in Mogadishu, Bossaso and Hargeisa. This will be key to building on this study to establish the prevalence, biological and behavioural dynamics among the FSWs and their clients across the three sites. This can be scaled up to other regions in Somalia especially in towns along the coastal line. In addition, HIV prevention strategies for FSWs should consider integrating HIV prevention services, including condom provision, into usual MCH programmes across the country, to reach those FSWs who may not be willing to receive health services from other NGOs, as they are most likely to expose their work status as FSWs. Due to the high stigmatization of those engaged in sex work, the MoH/AIDS commissions ought to augment advocacy strategies and dialogues with community and religious leaders on the importance of HIV prevention strategies among FSWs and their clients. Given that the majority of FSWs fear being recognized as sex workers and being stigmatized for fear of being recognized as sex workers and being stigmatized whenever they visit health facilities, deliberate strategies ought to be put in place to train health-care providers on stigma reduction, and on gaining trust and maintaining confidentiality when attending to FSWs or their clients. While this study contributes to the ongoing HIV programming in the studied locations, similar studies should be conducted in other locations to support the scale-up of the national response targeting the key populations.

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