



MAPPING AND SIZE ESTIMATION OF KEY POPULATIONS IN SOMALILAND

Final Report

JULY 2016



International Organization for Migration (IOM)
The UN Migration Agency

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unicef 

Title of the project

Study on Mapping and Size Estimation of Key Populations in Somaliland

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This is a study by the Ministry of Health (MoH) of Somaliland with technical support from the International Organization for Migration (IOM) and financial support from UNICEF Somalia.

Collaborating institutions

MoH of Somaliland

AIDS commission: Somaliland National AIDS Commission

IOM Somalia

UNICEF Somalia

Joint UN Team on AIDS for Somalia

Civil society organizations in Somaliland working with key populations

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Abbreviations and acronyms

AIDS	Acquired immunodeficiency syndrome
CI	Confidence interval
FGD	Focus group discussion
FSW	Female sex workers
HIV	Human immunodeficiency virus
HTC	HIV testing and counselling
IBBS	Integrated Biological and Behavioural Surveillance
IEC	Information education and communication
IOM	International Organization for Migration
KI	Key informant
KII	Key informant interview
MCH	Maternal and child health
MHD	Migration Health Division
MOH	Ministry of Health
MSM	Men who have sex with men
NGO	Non-governmental organization
PWID	People who inject drugs
RDS	Respondent-driven sampling
SOLNAC	Somaliland National AIDS Commission
STI/STD	Sexually Transmitted Infections/Diseases
TLS	Time location sampling
TWG	Technical working group
UNICEF	United Nations Children's Fund

Executive summary

Background

Few prevalence and incidence studies on human immunodeficiency virus (HIV) among vulnerable women and their clients have been conducted in Somaliland. Studies among vulnerable women in Hargeisa found an HIV prevalence of 5.1 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 form informed policies and intervention measures, a study on HIV mapping and size estimation of high-risk population groups was conducted in Somaliland. This study aimed at establishing the location and size estimates of vulnerable women and their clients in Hargeisa.

Methodology

Research was conducted through a cross-sectional study. The study population was comprised of vulnerable women and clients of vulnerable women. The clients of vulnerable women constituted truck drivers and their assistants, police and military personnel, khat and tea clients. A total of 780 respondents participated in the study. To arrive at the key population estimates, this study employed a combination of methods, including geographical mapping and wisdom of the crowd. However, the unique service multiplier method was not applicable in Hargeisa 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 vulnerable women. The questionnaires were administered, and data was collected using mFieldWork mobile application. Data was cleaned and analysed to establish locations and plausible bounds.

Findings

Vulnerable women

The estimated numbers of vulnerable women in Hargeisa is 1,126. The greatest proportion of vulnerable women (66.1%) is youth aged 15 to 35 years. There is a similar trend of days and times in the week when sex work activity is at a peak among the two study groups. Vulnerable women activities in Hargeisa peak on Thursdays (48.3%) in the evenings (56.0%). Essential routine health services for vulnerable women include STI/STD screening and treatment, HIV testing and counselling, cervical cancer screening and treatment, and condom use. The proportion of vulnerable women who had received any of these health services within 12 months before the survey was 29.7 per cent in Hargeisa. The majority of vulnerable women are willing to attend a drop-in centre dedicated to serving vulnerable women with essential health services, such as HTC, STI/STD screening and treatment, cervical cancer screening, and condom provision. Fear of being recognized as a vulnerable woman is a major reason deterring vulnerable women from seeking essential health services. Among the vulnerable women who reported receiving health services, most received them from governmental facilities including maternal and child health clinics.

Clients of vulnerable women

There was a significant number of male clients of vulnerable women in Hargeisa. In Hargeisa, the vulnerable women clients were comprised of khat clients, tea clients, truckers and Somaliland police. The population size estimates among clients of vulnerable women generated through geographical method closely approximate those of the wisdom of the crowd method. The estimated totals of male clients of vulnerable women is 1,559 to 1,828 in Hargeisa. Across the three study sites, the sex activity is hidden, and the majority of male clients of vulnerable women meet the vulnerable women at agreed homes, khat- and tea-selling shops. According to male vulnerable women client respondents, they mostly engage vulnerable women on Thursdays and Fridays during the evening hours (5 p.m.–8 p.m.).

Conclusion and recommendations

Vulnerable women and their male clients exist and operate in hidden ways in Hargeisa. Most of the vulnerable women (59.4%) are youths aged 15 to 35 years. The majority of sexual activities take place at their homes or the homes of their clients. Khat- and tea-selling shops are significant entry points to access and supply of sex work. The data generated from this study can be used to enhance HIV prevention programme planning and implementation for vulnerable women 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 vulnerable women and their clients are not seeking essential health services, prompt HIV interventions targeting vulnerable women and their clients should be implemented. It will be essential to create a database of vulnerable women 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. 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 HIV in Somaliland is estimated at 9,531, while in South Central at 16,363 and Puntland at 3,832 (UNAIDS, 2015). Few prevalence and incidence studies on HIV among vulnerable women and their clients have been conducted. In 2014, the International Organization for Migration (IOM) managed study among vulnerable women in Hargeisa found an HIV prevalence of 4.8 per cent (Kriitmaa et al., 2010). In 2014, there were a total of 2,338 new HIV infections among adults aged 15 years or above (UNAIDS, 2015). Other previous studies conducted among key populations include Somali hotspot mapping (Testa and Kriitmaa, 2008), two integrated biological and behavioural surveillance (IBBS) studies in Hargeisa (Kriitmaa et al, 2010; IOM, forthcoming) and HIV rapid assessment in Mogadishu (IOM, 2014). In 2011, a total of 400 vulnerable women in Berbera and 1,000 vulnerable women in Bossasso were estimated at the upper limits (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 vulnerable women 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 (World Health Organization (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 vulnerable women, 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 female sex workers (with a high HIV seroprevalence) to the general population of women (such as wives, 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 (that is, network scale-up method or directly asking a behaviour among the general population) (Abdul-Quader, Baughman and Hladik, 2014). For instance, in Afghanistan, a geographical mapping approach was used to estimate the population of vulnerable women (1,160) in three cities: Kabul, Jalalabad and Mazār-i-Sharif with 91 per cent of vulnerable women mapped belonging to home-based typology (World Bank, 2008). Injectable drug users were 1,465 whereas MSMs were less than 130. The fewer number of MSMs reported could be partially attributed to MSM activities being generally highly secretive and stigmatized compared to other groups of key populations. Other than geographic mapping, this study did not employ mixed size estimation methods that are much needed to make the study scientifically robust. In an effort to establish the population estimates of MSMs in Tbilisi and Batumi (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., 2014).

Across Africa, several methods of estimating the numbers of vulnerable women and sex workers have 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. The best estimate for Maputo was 13,554, Beira 6,802 and Nampula 6,929. In Kenya, the capture–recapture method was used to determine the number of vulnerable women in Kisumu city, indicating a total of 1,350 vulnerable women (Vuylsteke, 2010). Similarly, in Mauritius during an IBBS survey, the multiplier method was used utilizing RDS to arrive at a total of 771 vulnerable women (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 this study was to establish the location and size estimates of vulnerable women and clients of vulnerable women in Hargeisa.

This study was limited to Somaliland vulnerable women and clients of vulnerable women (uniformed services, truck drivers, khat clients and tea clients). 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, vulnerable women and their clients are disproportionately affected by HIV and therefore exhibit high HIV prevalence and incidence rates (UNAIDS, 2015). While male clients of vulnerable women constitute a core group for HIV transmission, their size estimates and locations in Hargeisa were almost unknown before this study (IOM, 2014). Clients of vulnerable women 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 vulnerable women and their clients is essential to scale up HIV programming. Furthermore, to efficiently allocate appropriate resources, estimates of the numbers of vulnerable women and their clients in Hargeisa 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 vulnerable women and their clients.

2. Methodology

2.1. Target populations

The target population groups in this study consisted of vulnerable women and clients of vulnerable women, such as uniformed service personnel (police and army), truckers, 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 vulnerable women, their clients (truckers, military and police personnel, and male clients of both tea and khat sellers).

Vulnerable women: Women who have engaged in sexual activity with men in exchange for money or goods in the last 12 months in Hargeisa.

Male clients of vulnerable women: Men who pay money or provide goods in exchange for sex service with FSW during the past 12 months in Hargeisa.

Truckers: Long-distance and intracity truck drivers and their assistants in Hargeisa.

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

Tea clients: Men who consume tea at tea-selling shops in Hargeisa.

Khat clients: Men who consume khat at khat-selling shops in Hargeisa.

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

Typologies

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 vulnerable women: Vulnerable women who solicit clients on the street or in public places, such as major street intersections, parks, bus stops and marketplaces.

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

Home-based vulnerable women: Vulnerable women 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 vulnerable women: Vulnerable women 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 vulnerable women who operate in a similar fashion as brothel-based vulnerable women. However, since most of the bars and lodges operate in unison, these typologies are put together in one category. These vulnerable women 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 vulnerable women: Vulnerable women 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 vulnerable women: Vulnerable women 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 location of this study was in Hargeisa, Somaliland.

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 vulnerable women and their clients. This was essential to minimize potential bias resulting from a single method. Data on multiple estimates was 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, health service multiplier method and wisdom of the crowd (for clients of vulnerable women).

2.4.1. Geographical mapping

To describe the key physical locations of the hotspots and their respective typologies in Hargeisa, this study essentially relied on a geographic approach. Key locations herein referred to as “hotspots” are localities where vulnerable women 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 vulnerable women or clients of vulnerable women 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 vulnerable women 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. This was achieved using two sequential steps:

Step 1: Focus group discussions (FGD) with vulnerable women were convened at a mutually agreed location that was safe to both the enumerator and the focus group participants. Information was systematically gathered from vulnerable women 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 vulnerable women, 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.

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 GPS coordinates of hotspots where the security situation allowed. Venue profiling data was collected by interviewing key informants at the hotspots about the 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 vulnerable women or vulnerable women on average peak days. Estimated 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. Health service multiplier method

Using RDS, a small convenience sample of vulnerable women was identified and recruited to form the seeds, from which a small pool of initial informants was nominated to help reach other participants through their social networks who meet 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 vulnerable women. 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 vulnerable women were subjected to a short survey that had specific questions on targeted health services received including HIV testing and counselling (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 vulnerable women who had received the aforementioned services was also used to derive the FSW population size estimates in Mogadishu. The formula that was used for the multiplier method was (UNAIDS, 2012):

$$S = N/P$$

Where:

S = size of the FSW population

N = number of vulnerable women 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, Zhang 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 vulnerable women or clients of vulnerable women they believed to be present in Hargeisa. 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 MoH, Somaliland National AIDS Commission (SOLNAC), Global Fund subrecipient organizations and UNICEF. 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.

2.5. Involvement of local stakeholders and community

Vulnerable women 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 vulnerable women in study implementation to gain their support and get access to other vulnerable women. Some of the leaders among the vulnerable women 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:

$$N_0 = [(t)^2 * (p)(q)] / (d)^2$$

Where:

N_0 = 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 vulnerable women from the previous IBBS survey for sex workers: HIV prevalence among vulnerable women and condom use among clients of FSW).

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 vulnerable women was selected in each study location. Since access to other study groups (such as clients of vulnerable women) was much

easier than vulnerable women and the actual numbers of the groups were large, the study aimed to sample at least 179 per group per location. The minimum total sample size was therefore 780, 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 vulnerable women who are HIV infected	5.2	73	64
Percentage of vulnerable women 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
Vulnerable women	64
Truck drivers	179
Uniformed service personnel (police and military)	179
Khat clients	179
Tea clients	179

Inclusion criteria for vulnerable women:

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 vulnerable women:

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 vulnerable women:

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

- 15 years or above;
- Working as uniformed personnel (police and army), truckers 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 vulnerable women:

- Unable to provide informed consent; and
- 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 vulnerable women 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 vulnerable women. Two FSW FGDs in each study site were conducted to generate a list of hotspots in Hargeisa.

2.8. Ethical considerations

Before the commencement of data collection, research approval for this study was sought from MoH Somaliland and SOLNAC. 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 780 respondents comprising 64 vulnerable women and 716 male clients of vulnerable women. The majority of respondents for vulnerable women clients were men constituting 73.7 per cent in Hargeisa. Most of the respondents for vulnerable women clients were aged between 30 and 39 years (37.2%). This was similar to respondents of vulnerable women who were also mostly aged between 30 and 39 years (46.9%). When categorized as youths and non-youths, the majority of vulnerable women (59.4%) were youths aged 15–35 years. In addition, the mean age of vulnerable women in Hargeisa was 36 ± 10.1 years as shown in Table 3.

Table 3: Characteristics of study respondents

Characteristic	Category	Hargeisa, n (%)
Clients of vulnerable women		
Gender	Male	528 (73.7)
	Female	188 (26.3)
Age group (years)	15–19	10 (1.4)
	20–29	223 (31.1)
	30–39	266 (37.2)
	40–49	160 (22.3)
	>= 50	57 (8.0)
	Mean \pm SD age (Years)	35 \pm 9.11
	Age range (Years)	17–65
Vulnerable women		
Gender	Female	64
Age group (years)	15–19	2 (3.1)
	20–29	12 (18.8)
	30–39	30 (46.9)
	40–49	15 (23.4)
	>= 50	5 (7.8)
	Mean \pm SD age (Years)	36 \pm 10.13
Age range (Years)	18–70	
Vulnerable women age group by youth or non-youth (years)		
	15–35	38 (59.4)
	>=36	26 (40.6)
Type of respondent		
	Truckers	179 (22.9)
	Police personnel	179 (22.9)
	Vulnerable women	64 (8.4)
	Khat sellers	179 (22.9)
	Tea sellers	179 (22.9)
	Total	780

3.2. FSW population size estimation in Hargeisa

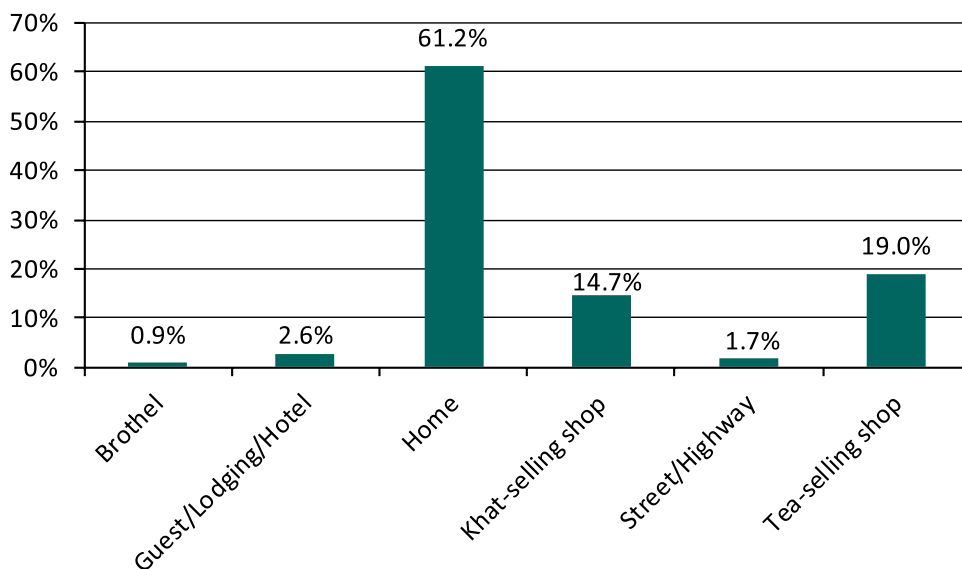
3.2.1. Geographical mapping

Three vulnerable women FGDs were held to describe the locations where vulnerable women operate in Hargeisa. This was followed by the validation and verification of identified hotspots. In addition, face-to-face interviews were conducted with the 64 FSW respondents. Sex work in Hargeisa is largely hidden. The vulnerable women 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 vulnerable women meet their male clients as shown in Figure 1. Based on the geographical population estimation method, a minimum of 842 and maximum of 1,409 vulnerable women exist in Hargeisa. The average number of vulnerable women estimated in Hargeisa is therefore 1,126 vulnerable women, as shown in Table 4.

Table 4: Hargeisa FSW hotspots and estimates

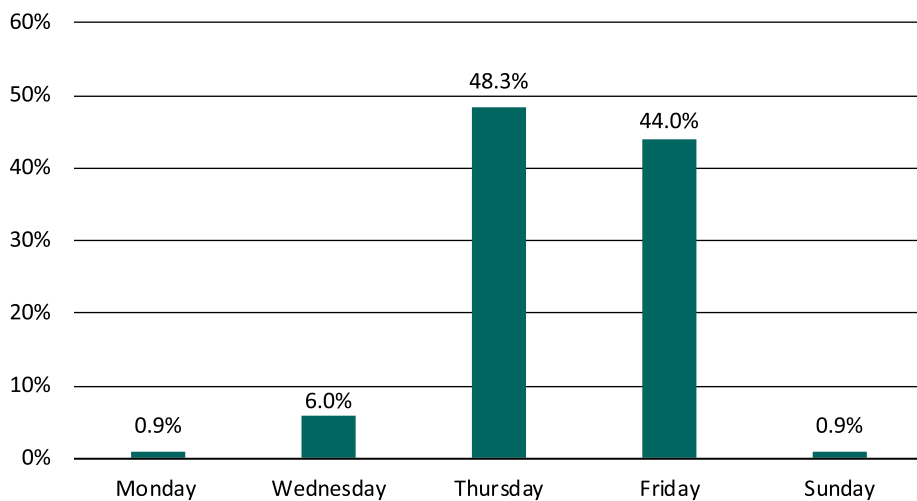
Location	Sum of minimum vulnerable women	Sum of maximum vulnerable women	Sum of average vulnerable women
October	10	8	9
Ahmed Dhagax	9	13	11
Ayah 4	12	10	11
Badacas	20	32	26
Cabaaye	8	10	9
Cakaara	38	50	44
Calaamadaha	8	10	9
Central Market	83	140	112
Daami	108	177	142
Digale	13	18	16
Fakinka	15	30	22
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 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 1: Distribution of FSW hotspots in Hargeisa

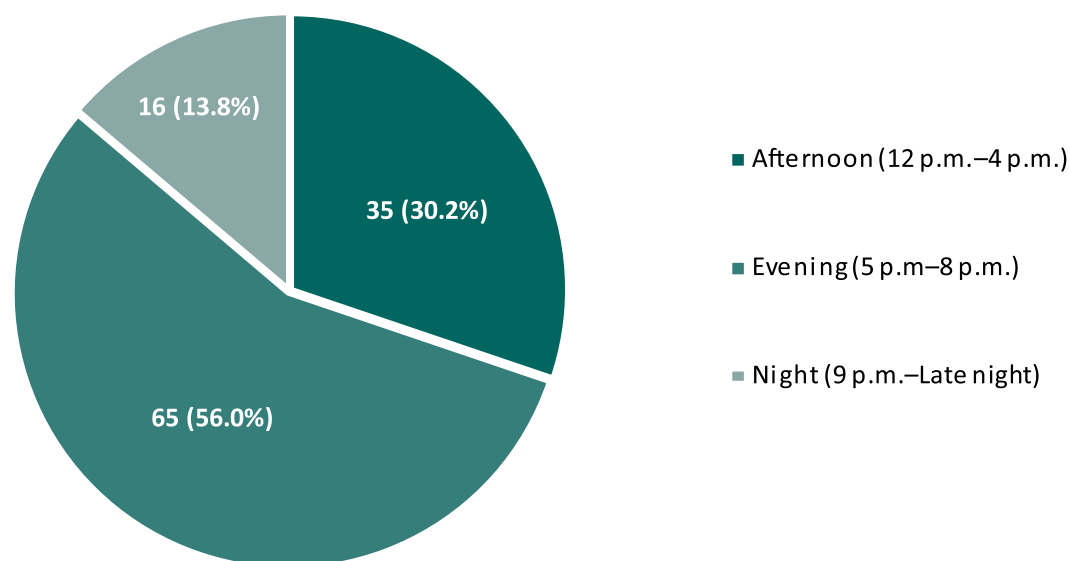


The peak days for FSW operations are on Thursdays (48.3%) and Fridays (44.0%) as shown in Figure 2. The peak time when vulnerable women meet their clients in Hargeisa is in the evenings (5 p.m.–8 p.m.). This trend is similar to that seen in Mogadishu.

Figure 2: Variation in sex work activities in a week



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

Figure 3: Variation in vulnerable women's activities per day

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

3.3. Health services' access and perception among vulnerable women

3.3.1. Health services uptake among vulnerable women

Essential health services among vulnerable women include HTC, cervical cancer screening and testing, STI screening and treatment and condom education and distribution. Less than half of the vulnerable women respondents in Hargeisa had received at least one health service. Among those vulnerable women who reported having received health services, 42.1 per cent of vulnerable women in Hargeisa reported having received HTC. In addition, 31.6 per cent of vulnerable women reported having received both HTC and STI screening and treatment. Correct and consistent use of condoms among vulnerable women and their clients is key to curbing the spread of STI/STDs including HIV. Conversely, none of the vulnerable women in Hargeisa had accessed free condoms within 12 months before this study, as shown in Table 5. This is an alarming gap that future HIV programmes at governmental levels should address to contain new infections among vulnerable women and their clients.

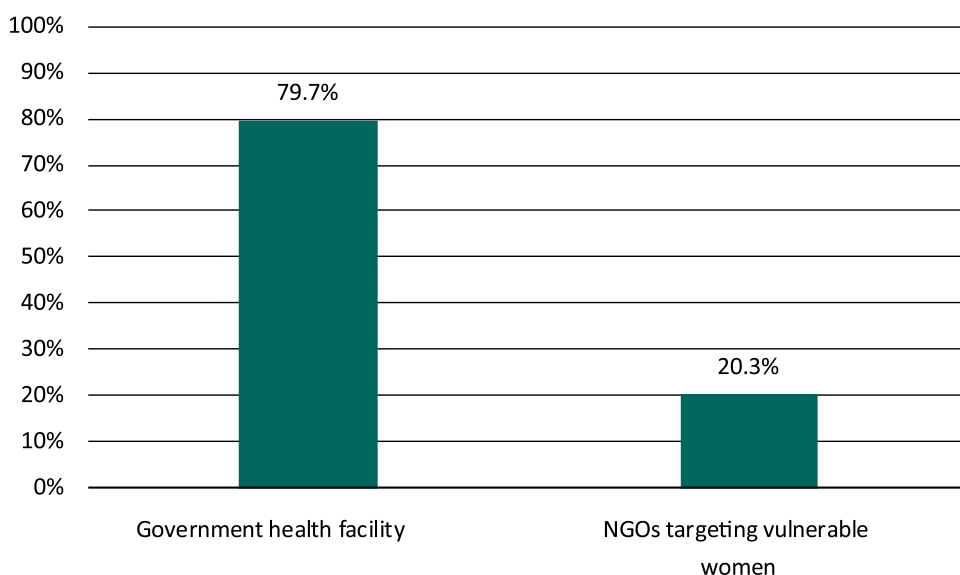
Table 5: Health service uptake among vulnerable women

Health services received in the past 12 months	Hargeisa, n (%)
HTC	8 (42.1)
STI screening and treatment	5 (26.3)
HTC and STI screening and treatment	6 (31.6)
HTC and free condoms	0 (0.0)
HTC, free condoms and STI screening and treatment	0 (0.0)
Total vulnerable women who received health services	19
Proportion of vulnerable women who received health services (%)	29.7

3.3.2. Preference of health facility to access health services

Across the three study sites, the majority of vulnerable women (79.7%) prefer to access the essential health services through governmental health facilities, as shown in Figure 4. The fact that sex work in Somaliland is illegal could in part explain this finding, indicating that vulnerable women prefer seeking health services from health workers working in governmental health facilities especially where maternal and child health (MCH) clinics exist. This could partially hide their identity as vulnerable women.

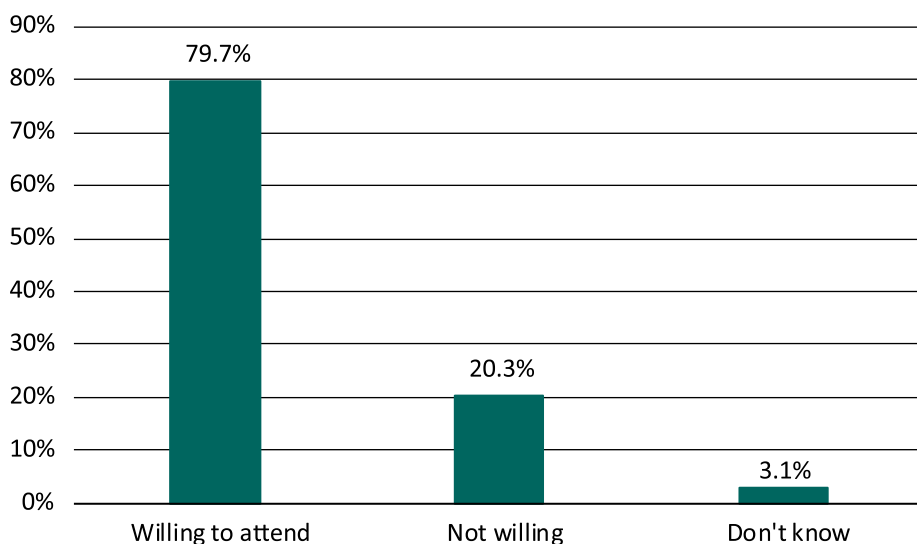
Figure 4: Preference of vulnerable women towards health facilities for essential FSW health services



3.3.3. Willingness to attend a centre dedicated to serving vulnerable women 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 vulnerable women and key populations at large. To assess readiness for such programming structures in Somaliland, vulnerable women were asked if they would be comfortable with such arrangements. The majority of vulnerable women in Hargeisa are likely to require more sensitization through HIV programmes to gain their support in establishing the drop-in centres and encourage their attendance.

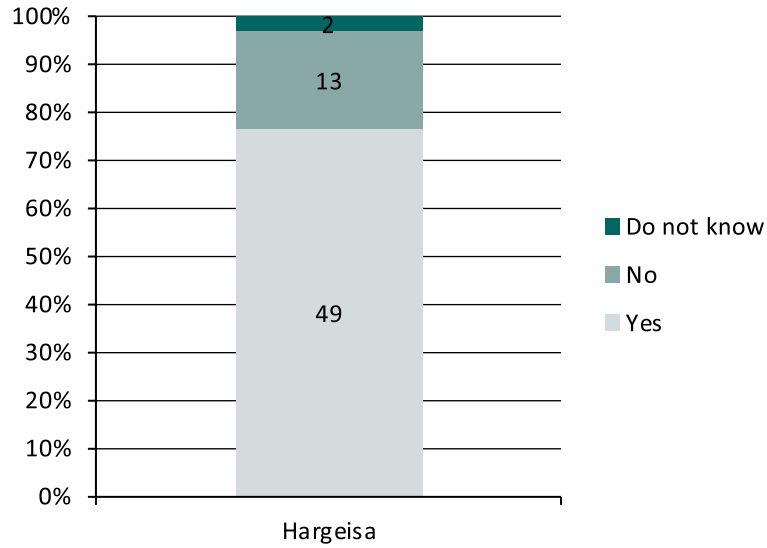
Figure 5: Vulnerable women who will attend centres dedicated to serving vulnerable women



3.3.4. Ease of accessing health services among vulnerable women

The respondents were asked to rate the accessibility of essential health services for vulnerable women in Hargeisa. The majority of vulnerable women in Hargeisa perceived the required health services as easily accessible, as shown in Figure 6.

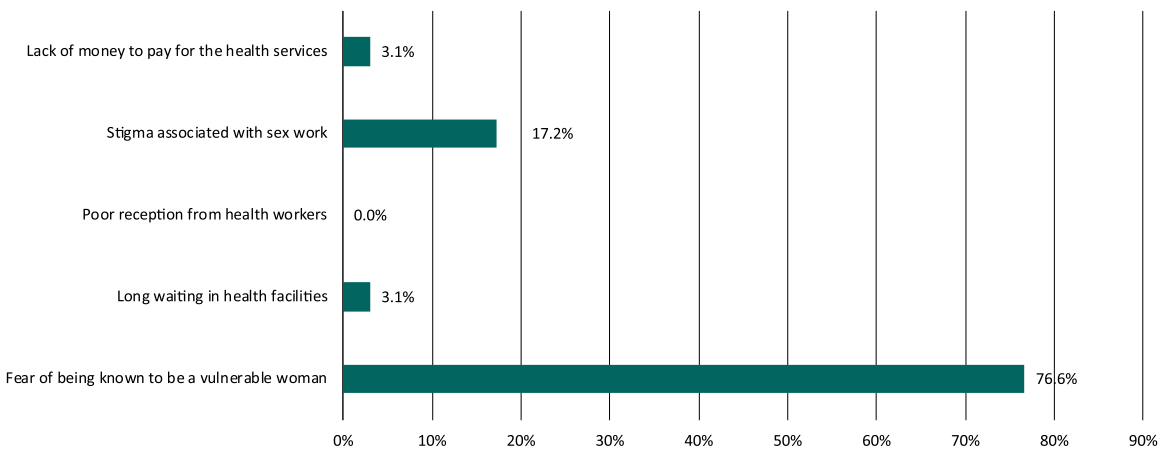
Figure 6: Vulnerable women who believe health services are accessible and within reach of vulnerable women



3.3.5. Reasons for vulnerable women not seeking health services

The major factors hindering most vulnerable women from seeking health services from health facilities are the fear of being recognized as vulnerable women (76.6%) and the stigma associated with sex work (17.2%) as demonstrated in Figure 7.

Figure 7: Reasons for vulnerable women not seeking health services in Hargeisa



3.4. Clients of vulnerable women in Hargeisa

3.4.1. Geographical mapping

Geographical mapping was used to estimate the population of clients of vulnerable women who engage in sex with vulnerable women in Hargeisa (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. Based on geographical method, the estimated number of male clients who have sex with vulnerable women is 1,828 with 1,301 and 2,353 as lower and upper plausible bounds respectively as shown in Table 6.

Table 6: Best point estimates of vulnerable women clients from geographical mapping

Type of vulnerable women client	Best point estimate
Police personnel	369
Truckers	264
Khat clients	610
Tea clients	585
Total	1,828

3.4.2. Wisdom of the crowd – Hargeisa

Participants in the survey were asked for their best guess of the population size of male clients of vulnerable women, as an application of the wisdom of the crowd method. This method was used to form a population estimate of vulnerable women clients only, as they were less hidden compared to vulnerable women. Information about the sexual behaviour of vulnerable women tended to be well understood among vulnerable women networks themselves. In this survey, recruited vulnerable women clients were asked about their perception of the total number of vulnerable women clients in Hargeisa. According to research findings, the mean figures of vulnerable women clients is 1,559 in Hargeisa, as shown in Table 7. The mean numbers of vulnerable women 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 7: Population size estimates of vulnerable women clients by wisdom of the crowd method

Type of FSW client	Average
Police personnel	251
Military personnel	201
Truckers	313
Khat clients	474
Tea clients	320
Total	1,559

4. CONCLUSION

4.1. Vulnerable women

- (a) The estimated number of vulnerable women in Hargeisa 1,126.
- (b) Most of the vulnerable women (59.4%) are youths between the ages of 15 and 35 years.
- (c) The majority (61.2%) of vulnerable women in Hargeisa meet their male clients at homes.
- (d) Sex work activity peaks towards the end of the week. Sex work activities in Hargeisa peak on Thursdays (48.3%) in the evenings (56.0%) respectively.
- (e) Essential routine health services for vulnerable women include STI/STD screening and treatment, HTC, cervical cancer screening and treatment, and condom provision. The proportions of vulnerable women who had received any of these health services 12 months before the survey is 29.7 per cent. None of the vulnerable women in Hargeisa had received free condoms within 12 months before this study.
- (f) The majority of vulnerable women are willing to attend a centre dedicated to serving vulnerable women 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 vulnerable woman is the major reason deterring vulnerable women from seeking essential health services.
- (g) Among the vulnerable women who reported receiving health services, most of them received such services from governmental facilities including MCH clinics.

4.2. Clients of vulnerable women

- (a) There is a significant number of male clients of vulnerable women in Hargeisa. In Hargeisa, the vulnerable women clients comprise khat clients, tea clients, truckers and police personnel. The population size estimates among clients of vulnerable women 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 vulnerable women is between 1,559 and 1,828 in Hargeisa.
- (b) Across the three study sites, sex work is hidden, and the majority of male vulnerable women clients meet the vulnerable women at agreed homes. The male clients mostly engage vulnerable women on Thursdays and Fridays during evening hours (5 p.m.–8 p.m.). 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 Hargeisa.

4.3. Challenges

- (a) The MoH and SOLNAC 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.
- (b) Sex work among Somaliland is a taboo topic, especially among vulnerable women. Therefore, it took some time for enumerators to gain the confidence and trust of vulnerable women for them to open up and freely share necessary information.

- (c) To apply the unique service multiplier method, records of data were needed on vulnerable women 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 vulnerable women or vulnerable women clients hindered the application of unique service multiplier methods in Hargeisa.

4.4. Recommendations

- (a) This study provides essential robust estimates on the sizes of the vulnerable women and vulnerable women client populations in Hargeisa. This data can be used to enhance HIV prevention programme planning and implementation for vulnerable women 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.
- (b) Based on the findings of this study indicating that the majority of vulnerable women are not seeking essential health services, prompt HIV interventions targeting vulnerable women 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 vulnerable women.
- (c) It is critical to create a database of vulnerable women 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.
- (d) Programmes implementing HIV interventions among the vulnerable women and their clients in Hargeisa should endeavour to document and report health services provided to vulnerable women 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.
- (e) A comprehensive follow-up IBBS will also be essential to further support targeted HIV interventions for the vulnerable women and their clients in Hargeisa. This will be key to building on this study to establish the prevalence, biological and behavioural dynamics among the vulnerable women and their clients across the three sites.
- (f) HIV prevention strategies for vulnerable women should consider integrating HIV prevention services, including condom provision, into usual MCH programmes across the country, to reach those vulnerable women who may not be willing to receive health services from other NGOs, as they are most likely to expose their work status as vulnerable women.
- (g) 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 vulnerable women and their clients.
- (h) Given that the majority of vulnerable women fear being recognized and stigmatized as sex workers 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 vulnerable women or their clients.
- (i) 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.

References

- Abdul-Quader, A.S., A.L. Baughman and W. Hladik
 2014 Estimating the size of key populations: Current status and future possibilities. *Current Opinion in HIV and AIDS*, 9:107–14. doi: 10.1097/COH.0000000000000041
- AIDS Unit, Ministry of Health and Quality of Life
 n.d. Integrated Behavioral and Biological Surveillance Survey among Female Sex Workers, 2010. Mauritius. Available from <http://health.govmu.org/English/Documents/ibbs.pdf>
- Chikovani, I. et al.
 2014 Population Size Estimation of Men Who Have Sex with Men in Georgia, 2014. Study Report. Available from www.researchgate.net/publication/275349517_Population_Size_Estimation_of_Men_Who_Have_Sex_with_Men_in_Georgia_2014
- Dongbao, Y. et al.
 2014 Estimating the size of key populations at higher risk of HIV infection: A summary of experiences and lessons presented during a technical meeting on size estimation among key populations in Asian countries. *Western Pacific Surveillance Response Journal*, 5(3): 43–49.
- Giles, J.
 2005 Wisdom of the crowd. *Nature*, 438:281. doi:10.1038/438281a
- International Organization for Migration (IOM)
 2014 HIV Rapid Assessment among Key Populations in Mogadishu, Somalia. IOM, Nairobi (unpublished).
 Integrated Biological and Behavioural Surveillance Survey among Female Sex Workers in Hargeisa, Somaliland (forthcoming).
- Kriitmaa, K. et al.
 2010 HIV prevalence and characteristics of sex work among female sex workers in Hargeisa, Somaliland, Somalia. *AIDS*, 24 Suppl 2:S61-7. doi: 10.1097/01
- Lee, M., S. Zhang and J. Shi
 2011 The wisdom of the crowd playing The Price Is Right. *Memory and Cognition*, 39(5):914–923.
- Lorenz, J. et al.
 2011 How social influence can undermine the wisdom of crowd effect. *Proceedings of the National Academy of Sciences*, 108(22):9020–9025.
- National AIDS Control Organisation (NACO)
 2006 National Behavioural Surveillance Survey (BSS) 2006: Female Sex Workers (Vulnerable Women) and their Clients. NACO, Ministry of Health and Family Welfare, Government of India.

National Institute of Health, United States Centers for Disease Control and Prevention, University of California, San Francisco (UCSF), Pathfinder International and International Training and Education Center for Health

2013 The Integrated Biological and Behavioral Survey among Female Sex Workers, Mozambique 2011–2012: Final Report. UCSF, San Francisco.

Okal, J. *et al.*

2013 Estimates of the size of key populations at risk for HIV infection: Men who have sex with men, female sex workers and injecting drug users in Nairobi, Kenya. *Sexually Transmitted Infections*, 89(5):366–71.

Surowiecki, J.

2004 *The Wisdom of Crowds: Why the Many are Smarter than the Few and How Collective Wisdom Shapes Business, Economies, Societies and Nations*. Doubleday Books, New York.

Testa, A.

2010 Somali HIV Hot-spot Mapping: Exploring HIV Vulnerability among Populations at Increased Risk 2008. IOM, Nairobi.

Testa, A. and K. Kriitmaa

2008 HIV and Syphilis Integrated Biological and Behavioural Surveillance (IBBS) Survey among Female Sex Workers in Hargeisa, Somaliland. IOM, Nairobi. Available from [www.migrationhealth-esafrica.org/sites/default/files/HIV & syphilis among female sex workers in Hargeisa Somaliland 2008.pdf](http://www.migrationhealth-esafrica.org/sites/default/files/HIV%20&%20syphilis%20among%20female%20sex%20workers%20in%20Hargeisa%20Somaliland%202008.pdf)

UNAIDS

2010 Guidelines on Estimating the Size of Populations Most at Risk to HIV. World Health Organization and UNAIDS, Geneva.

2015 Progress report for Somali HIV and AIDS response 2014. Available from www.unaids.org/sites/default/files/country/documents/SOM_narrative_report_2015.pdf

Vuylsteke, B *et al.*

2010 Capture–recapture for estimating the size of the female sex worker population in three cities in Côte d’Ivoire and in Kisumu, Western Kenya. *Tropical Medicine & International Health*, 15(12): 1537–1543. doi:10.1111/j.1365-3156.2010.02654.x

World Bank

2008 *Mapping and Situation Assessment of Key Populations at High Risk of HIV in Three Cities of Afghanistan*. South Asia Human Development Sector Series no. 23. World Bank, Washington, D.C.

World Health Organization (WHO)

2011 *Guidelines on Surveillance among Populations Most at Risk for HIV*. WHO, Geneva.

2014 *Consolidated Guidelines on HIV Prevention, Diagnosis, Treatment and Care for Key Populations*. July 2014. WHO, Geneva.

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