INTEGRATED BIOLOGICAL AND BEHAVIOURAL SURVEILLANCE SURVEY AMONG VULNERABLE WOMEN IN HARGEISA, SOMALILAND

Final Report

AUGUST 2017

International Organization for Migration (IOM)

The UN Migration Agency

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SOMALILAND NATIONAL HIV/AIDS COMMISSION
SOLNAC

unicef

Acknowledgements and contributors

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Abbreviations and acronyms

AIDS	Acquired immunodeficiency syndrome
ANC	Antenatal care
ARV	Antiretroviral
CSO	Community service organization
GARPR	Global AIDS Response Progress Reporting
HIV	Human immunodeficiency virus
HTC	HIV testing and counselling
IBBS	Integrated biological and behavioural surveillance
IOM	International Organization for Migration
JUNTA	Joint UN Team on AIDS
M&E	Monitoring and evaluation
MHD	Migration Health Division
NSP	National Strategic Plan
NGO	Non-governmental organization
PSE	Population size estimation
RDS	Respondent-driven sampling
RDS-A	Respondent-driven sampling Analyst
RDS-AT	Respondent-driven sampling analyst tool
SBCC	Social and behaviour change communication
SOLNAC	Somaliland National AIDS Commission
STI	Sexually transmitted infection
UNAIDS	The Joint United Nations Programme on HIV and AIDS
UNDP	United Nations Development Programme
UNGASS	United Nations General Assembly Special Session
VCT	Voluntary counselling and testing
WHO	World Health Organization

Executive summary

Background

Human immunodeficiency virus (HIV) prevalence in Hargeisa, Somaliland, is 1.1 per cent according to recent antenatal care surveillance published by the World Health Organization. However, data among key populations at higher risk of HIV is minimal, with only one sero-survey ever undertaken in Hargeisa, with vulnerable women in 2008. Funding for HIV activities in Somalia was received in late 2013 from the Global Fund to fight AIDS, Tuberculosis and Malaria via the principal recipient UNICEF Somalia, to undertake a second round of surveillance with vulnerable women. The survey was implemented by the International Organization for Migration (IOM), Somaliland National AIDS Commission and Joint UN Team on AIDS.

Methods

An integrated biological and behavioural surveillance (IBBS) survey among vulnerable women was undertaken from February to March 2014. A total of 97 vulnerable women participated in the study, undergoing pre- and post-test counselling, rapid HIV and syphilis testing through blood sample collection via intravenous blood draw, and urine sample collection for remote chlamydia and gonorrhoea testing. Respondents returned one week later for the chlamydia and gonorrhoea test results. All vulnerable women also participated in a structured interview using electronic data collection via smartphones. Due to security concerns, recruitment stopped before reaching the target sample size (n = 196); however, convergence was reached on the primary key variable of HIV prevalence. Data from 2008 were re-analysed using the new RDS Analyst for comparing results.

Results

There are no statistically significant differences in age or education across the two surveys. However, place of birth significantly varied, with population estimates of Ethiopians having decreased to 9.5 per cent in 2014, compared with 69.2 per cent in 2008. HIV prevalence is stable across the two surveys at 5.1 per cent in 2014, and 4.8 per cent in 2014. Even though there is a slight decrease in HIV and syphilis prevalence, this change is not significant as confidence intervals overlap. For the first time, estimates of chlamydia and gonorrhoea in vulnerable women in Somaliland are available at 0.7 per cent and 0.4 per cent, respectively. The average age of first vaginal sex is consistently low, with most vulnerable women reporting an average age of first vaginal sex below 18 years across both survey rounds (66.9% in 2014 and 85.3% in 2008).

The age of first paid sex appears to be higher in 2014 (53.8% >18) than in 2008 (37.9% >18), showing statistical significance. There is also a significant difference in the distribution in number of paying clients between 2008 and 2014, with a mean difference of 0.96 more paying clients in 2014. More women in 2014 meet clients by the roadside (36.7% in 2014, 13.4% in 2008). Forced sexual intercourse in the past 12 months remains at nearly a fifth of all vulnerable women (18.3% in 2014, 23.7% in 2008). There is a striking difference across the two surveys in the amount received for last sexual intercourse, with more women earning more than USD 5 at their last sexual encounter in comparison with USD 2-5 in 2008. The most common occupations of clients are khat sellers (28%), businessmen (20.8%) and truckers (15.7%). This same trend was evident in 2008.

Across both surveys, the majority of vulnerable women had heard of male condoms, and nearly two thirds (60.1%) of vulnerable women have used a condom in 2014, compared with only a quarter in 2008 (25%). Condom use at last sex with client is slightly improved, but remains low (31.5% in 2014, 25.6% in 2008). Fewer vulnerable women indicated that clients objected to condom use in 2014 (11%) than in 2008 (39.7%), possibly indicating differences in behaviour among clients across the two surveys. The proportion of vulnerable women who have been given condoms in the last 12 months remains low across both surveys (3.8% in 2014 and 0.7% in 2008). Pharmacies (58.1%) were the most commonly mentioned locations as to where vulnerable women would like to obtain condoms.

The majority of vulnerable women have heard of HIV or AIDS (97.3% in 2014 and 96.2% in 2008). There is a significant change in proportion of vulnerable women who know a person living with HIV, from 16.5 per cent in 2008 to 38.4 per cent in 2014. Overall, the composite Global AIDS Response Progress Reporting indicator for knowledge which is a composite variable of five questions, shows that knowledge overall has remained the same (10.4% in 2014 and 6.3% in 2008). Across both rounds of surveillance, few vulnerable women know where to obtain an HIV test (3.5% in 2014 and 3.6% in 2008); however, there is a significant difference in HIV testing rates across the two surveys. Nearly 10 times more women (21.3%) had an HIV test in the last 12 months and received results in 2014, compared with 2008 (2.4%).

Conclusion and recommendations

HIV prevalence among vulnerable women has remained five times higher compared with pregnant women in the general population, indicating they are an important population in the epidemiology of HIV in Somaliland, as well as a priority population for prevention, care and treatment services. While improvements have been shown in HIV testing among vulnerable women, condom usage remains low and knowledge inconsistent. Targeted interventions considering the high stigma and discrimination of vulnerable women, as well as the security situation, are urgently needed, including social and behaviour change communication interventions emphasizing correct and consistent condom usage, increased advocacy around HIV and AIDS, and increased routine HIV testing. A population size estimation of vulnerable women is needed to ascertain the scope of the concentrated epidemic. There are further many documented lessons learned from this IBBS survey with vulnerable women. Notably, creating an enabling environment to work with key populations in Somaliland is pertinent to the success of any research or intervention activity. Overall, this second round of IBBS survey collected a large amount of information, and has now established a second data point with one key population of interest in Somaliland. This data should lead to evidence-based interventions, as well as guide future surveillance and research activities, in alignment with the newly launched National Strategic Plan for the Somali HIV and AIDS response in the years 2015–2019. An IBBS survey should be repeated again in two to four years pending resource availability.

1. Introduction

1.1. Somaliland context

Following the fall of the Siad Barre regime, the north-west area of the Republic of Somalia, known as Somaliland, declared independence from the State of Somalia on 18 May 1991. Ever since 1996, there has been a moderately stable political system, including a system of governance and administration. This has included a multiparty legislative system, adoption of a new constitution in 2001, local elections in 2002 and democratic presidential elections in 2003, 2005 and 2010. Nevertheless, Somaliland has yet to be recognized by the international community as an independent State.

1.2. Overview of the HIV epidemic in Somaliland

Somaliland is the most developed region across Somalia in terms of integrated prevention, treatment, care and support, with four sites in Berbera, Hargeisa, Burao and Borama providing antiretroviral (ARV) treatment. HIV and AIDS awareness is low, compounded by a lack of awareness and advocacy activities. The Somaliland National AIDS Commission (SOLNAC) coordinates the HIV response in Somaliland, with technical and financial support from UN agencies and non-governmental organizations (NGOs).

There is currently minimal information available to assist in identifying the drivers of the HIV epidemic, as antenatal care (ANC) surveillance is the only continuous source of prevalence data. The overall prevalence of HIV among pregnant women in Somaliland has remained relatively stable since 2004 at just over 1 per cent over the past three rounds of ANC surveillance, with a reported HIV prevalence of 1.3 per cent in 2004, 1.4 per cent in 2007 and 1.1 per cent in 2010 (Joint UN Team on AIDS, 2010)..i However, the sentinel surveillance does not target key populations who may be at greater risk compared to the general population (World Health Organization (WHO), Somaliland National AIDS Commission (SOLNAC), Somaliland, Ministry of Health and Labour and UNICEF, 2010). The only sero-surveillance data for key populations in Somaliland is a result of the first Integrated Biological and Behaviour Surveillance (IBBS) survey carried out in Hargeisa with vulnerable women in 2008 (Kriitmaa et al., 2010). This survey found an HIV prevalence of 5.2 per cent, and sexual intercourse as the primary type of transmission, with no reported injecting drug use within the population. Table 1 provides a summary of the available HIV data in Somaliland to date.

Table 1: Summary of HIV prevalence data in Somaliland, 2004–2013

Year	Type of evidence	Population	Study area	Authors/ Investigators	Journal/ Report	Sample size	Prevalence	Other results / Primary recommendations
2010	ANC Surveillance	Pregnant women	All three zones of Somalia – multiple sites across Somaliland (Borama, Hargeisa, Burao, Daami Internally Displaced Persons (IDP) site, Berbera)	World Health Organization (WHO), SOLNAC	WHO Report	N=1,776	1.1%	• Further surveillance with key populations needed
2008	IBBS	Vulnerable women	Hargeisa	IOM, SOLNAC, UNICEF	AIDS 2010	N=237	5.2%	• Low and inconsistent condom usage • Low levels HIV knowledge
2007	ANC Surveillance	Pregnant women	All three zones of Somalia – multiple sites across Somaliland (Borama, Hargeisa, Burao, Daami IDP site, Berbera)	WHO, SOLNAC	WHO Report	N=1,766	1.4%	• Surveillance should be expanded beyond ANC sites
2004	ANC Surveillance	Pregnant women	All three zones of Somalia – multiple sites across Somaliland (Borama, Hargeisa, Burao, Daami IDP site, Berbera)	WHO, SOLNAC	WHO Report	N=1,561	1.3%	• Linked testing next round of surveillance • Respondent-driven sampling for key populations

There are contextual aspects in Somaliland that may affect and potentially augment the spread of the epidemic, such as mobility caused by frequent droughts and instability in other parts of Somalia resulting in population movement. While migration in and of itself may not necessarily lead to increases in HIV incidence, the environments and conditions associated with migration may lead to increased risk of transmission (Haour-Knipe et al., 2013). Factors including cross-border movement across higher and lower prevalence zones, engagement with shifting sexual behaviours, access to drugs, as well as changes in access to information and health services consequently resulting in changes in health-seeking behaviour, are likely to influence transmission (Kriitmaa et al., 2010).

There is currently no sero-surveillance data for other populations at higher risk including truckers and uniformed service personnel. In addition, no further recent data exists for vulnerable women other than the IBBS survey completed in 2008. It is therefore speculated that the HIV epidemic in Somaliland may be higher within these key populations. There are, however, other studies which have not collected sero samples. In 2009, a qualitative study was conducted by IOM, SOLNAC and partners examining the behaviour of vulnerable women and their clients both in Somaliland and Somalia (Testa, 2010). This study revealed the presence of high-risk sexual behaviour among vulnerable women and their clients and thus the potential for elevated HIV prevalence in these populations. Furthermore, prior to the start of the 2008 IBBS survey, a formative assessment was undertaken to ascertain the feasibility of undertaking a second round of IBBS survey.

1.3. Formative assessment

The formative assessment was undertaken in late August 2013 by IOM and SOLNAC, with funding from the Swedish International Development Cooperation and the Norwegian Agency for Development Cooperation through the Partnership on Health and Mobility in East and Southern Africa. The objectives of the formative assessment included the following:

- An assessment of the feasibility of conducting an IBBS survey with key populations;
- Gathering of information around social network properties;
- Seed selection;
- Acceptability of respondent-driven sampling as a sampling approach; and
- Survey logistics.

The current most widely accepted methodology to undertake an IBBS survey with a hidden population is respondent-driven sampling (RDS) (Johnston et al., 2010). RDS requires a particular type of formative research to be conducted to assess the overall feasibility of undertaking an RDS study. Results from the formative assessment showed that an IBBS survey with vulnerable women, truck drivers and uniformed services would indeed be feasible, and the report recommended different sampling approaches and corresponding logistical recommendations for each key population. The primary findings around vulnerable women included the following:

- Vulnerable women are more visible than originally thought, and key locations and venues have been identified. The population size of vulnerable women in Hargeisa is likely larger than 500; however, a more robust population size estimation (PSE) exercise is needed.
- Existence of pimps in Hargeisa has been documented for the first time, and in larger numbers. Approximately one third of vulnerable women respondents indicated that they operate through a pimp.
- Vulnerable women are willing to participate in a follow-up survey and would provide samples for HIV and STI testing.

- Estimated network sizes are large enough to sustain an RDS study; however, one third of the vulnerable women that respondents knew were below the age of 18.
- Multiple types/modalities by which vulnerable women engage in sex are present, therefore seeds should represent a variety from each type.
- Location of a dedicated RDS site should be a home or hospital, and sites should be open during the latter part of the afternoon and into the evening.
- Incentive amounts for vulnerable women participation in research are sensitive, with potential for inflation. They should therefore be carefully reviewed with seeds, and should aim to be similar to within reach of the amounts allocated for the previous IBBS survey, and this formative research (USD 5 for an interview, no biological sample collection). Also, financial incentives are not the only motivation for participation. Awareness raising and information provision are also important to vulnerable women, and therefore there is negotiation in this area.

The final recommendation around the vulnerable women population was that a follow-up IBBS survey, following the 2008 IBBS in Hargeisa, is indeed feasible using RDS and should be conducted in order for trends in data to be established and utilized. The recommendations stated the IBBS should be conducted as soon as possible while this formative information was still relevant. The results of the assessment were incorporated throughout this research protocol (IOM Somalia and SOLNAC, 2008).

1.4. Rationale

Vulnerable women and other key populations at higher risk are often difficult to reach with HIV and AIDS prevention programmes, due to highly stigmatized and often illegal behaviours. However, in order to prevent the spread of HIV and AIDS among vulnerable women as well as the general population, it is important that they access these services (WHO, UNFPA, UNAIDS, and Network of Sex Projects). IBBS surveys worldwide are an essential component informing national HIV responses. These studies have been shown to be particularly useful in providing insight into behaviours of subpopulations who are challenging to reach through traditional household surveys, but who are likely to be at higher risk of HIV infection or transmission, such as vulnerable women and their clients. It is recommended that these studies be undertaken on a regular basis, in order to provide trend analysis data for target groups in consistent geographical locations. This data should then be utilized to inform programming and interventions, and conducted regularly as part of the routine activities of an HIV response.

Despite the latest ANC sero-surveillance survey in Somaliland in 2010, there are no extensive operational studies to identify the vulnerabilities and drivers of the HIV epidemic in Somaliland. Data from the few available sources indicate that the HIV epidemic is concentrated among the key populations in Somaliland. This means that resources for HIV have to be spent on interventions exclusively planned for these groups through effective and successful combination of prevention models that integrate behavioural, biomedical and structural interventions to address the immediate risks and underlying causes of vulnerability of these groups to HIV infection.

IOM, SOLNAC, the Ministry of Health and local partners therefore implemented a formative study with key populations, to provide data on the feasibility of conducting an IBBS survey, which would then provide raw data about the drivers of the epidemic in Hargeisa, and provide a trend analysis by comparing results with the 2008 IBBS. Hargeisa, Somaliland, was selected as the site for implementation of the RDS based on the relatively stable security context allowing access by the lead researcher, and also because one data point was already established, in 2008.

2. Research objectives

The overall objective of the IBBS survey was to establish epidemiological and behavioural risk correlates of HIV and STI among vulnerable women in Hargeisa, Somaliland via:

- Measurement of HIV, syphilis, chlamydia and gonorrhoea prevalence among vulnerable women in Hargeisa;
- Determination of HIV and STI knowledge, attitudes, risk behaviours, treatment-seeking behaviours and preferred sources of HIV/STI information; and
- Provision of follow-up measures of HIV and STI behavioural and biological prevalence estimates to measure trends over time.

3. Methodology

3.1. Overview of RDS

Globally, vulnerable women comprise a highly stigmatized and difficult-to-reach population, thereby eliminating the possibility of using traditional survey methods, such as population-based surveys. In response to these challenges, a specialized surveillance method has been developed to provide a probability-based sampling via peer referral. This method is known as RDS, and it was used as the study design in the IBBS survey in Hargeisa in 2009, and was selected as the study design for this follow-up survey as well.

RDS is cross-sectional in nature, providing a snapshot of the population in question at a given time. The theoretical overview of RDS has been well established in published literature (Heckathorn, 1997 and 2002). In summary, RDS begins with the selection of seeds who are known members of the key population. The seeds are instructed to refer a restricted number of peers from their social network, who in turn are enrolled and instructed to refer other peers. Continuing in this way, the target sample size is eventually reached, through these peer referral chains. The number of referrals per person is usually restricted to three in order to ensure that recruitment chains progress through distinct social networks, rather than the sample recruited from one purposively selected seed. Coded coupons are utilized to link the recruiter and their recruits, and a primary incentive is given for completion of the survey including both the behavioural and biological components, while a secondary incentive is given for each successfully recruited peer. RDS reduces the biases inherent in referral methods through statistical adjustments that attempt to account for social network size and similarity among persons within social networks. Although sampling begins with a purposely chosen set of initial subjects (i.e. seeds), the composition of the final sample approaches independence from the starting point. Recruitment progresses until both the sample size is met and equilibrium or convergence (i.e. the point at which you reach stability across the sample on given indicators) is achieved. Analysis using specialized software, such as Respondent-Driven Analyst Tool (RDS-AT) or Respondent-Driven Sampling Analyst (RDS-A), is used to produce population prevalence estimates and confidence intervals of variables, adjusted according to social network sizes and the similarities in characteristics of persons within their social networks.

RDS has been successfully utilized worldwide to recruit key populations at higher risk of HIV including vulnerable women in Viet Nam, Papua New Guinea and Somalia, people who inject drugs in the Russian Federation and New York, and men who have sex with men in Uganda and Bangladesh, to name just a few of the published RDS surveys worldwide (Johnston, 2006; Yeka et al., 2006; Kriitmaa et al., 2010; Stormer et al., 2006; Frost et al., 2006; and McKnight et al., 2006).

3.2. Eligibility criteria for participant selection

In an effort to allow for comparability across the various rounds of surveillance, as well as allow comparison across other research in Somaliland with the same population group, definitions are kept as similar as possible across activities. In this instance, the same definition for vulnerable women was used as in the previous round of surveillance in 2008.

To participate in the study, individuals had to satisfy all of the below criteria:

- Female;
- Aged 16 years and above;

- Exchanged sexual intercourse (vaginal and/or anal) for money, gift or favour in the past three months in Hargeisa, Somaliland;
- Have not already participated in the survey;
- At the time of the study, participants must have been living and working in Hargeisa, Somaliland;
- Possession of a valid coupon;
- Ability to give informed consent; and
- Consent to both the behavioural questionnaire and biological components of the survey.

3.3. Sample size

The sample size was calculated based on a standard sample size calculation as follows:

$N=(z)^2 P(1-P) / W^2$

Where:

N = Sample Size

Z = Z score corresponding to confidence interval

P = Expected proportion of outcome of interest

W = Width of the interval (i.e. margin of error, +/-5% is 0.10)

The calculation took into consideration eight key indicators from the previous IBBS survey. Table 2 illustrates the key indicators and resulting sample sizes.

Table 2: Indicators used to determine sample size from IBBS survey with vulnerable women in 2008

#	Indicator	Population estimation	Resulting sample size (N)	With design effect (x2)
1	% vulnerable women infected with HIV (UNGASS 23)	5.2%	75.75	151.50
2	Condom use at last sex (UNGASS 18)	24.0%	280.28	560.57
3	Condom used consistently with clients in past month	4.3%	63.23	126.47
4	Ever heard of male condom	72.3%	307.74	615.49
5	Less than 5 clients in past 30 days	35.6%	352.30	704.59
6	% of vulnerable women who had HIV test in past 12 months and knew result	0.0%	0.00	0.00
7	Ever had HIV test	4.0%	59.01	118.01
8	% of vulnerable women who correctly identified ways of preventing transmissions and rejected major misconceptions (UNGASS 14)	6.9%	98.71	197.42

Note: UNGASS – United Nations General Assembly Special Session.

Using the above eight indicators based on the sample size calculation with a 95 per cent confidence interval and ±5 per cent precision, a sample ranging from n=63 to n=352 is required. The same calculations with a design effect of two (as recommended in RDS studies) generated sample sizes across the eight indicators ranges from n=126 to n=705.

Equilibrium or convergence is the point at which the RDS sample proportions for each variable no longer change (or change very minimally) regardless of how many more individuals you recruit. Each variable may reach equilibrium at different waves of the research, and this, balanced with a need to reach the estimated sample size, provides indicators and guidance on when to begin reducing the number of coupons given out (i.e. coupon distribution may be reduced from three, to two, and then one in the final stages of the research) to eventually close data collection.

Due to the relatively small estimated population size of vulnerable women in Hargeisa, the sample size calculations must strike a balance between feasibility and acceptable precision.[1] The IBBS in 2008 estimated HIV prevalence as the indicator to calculate sample size, resulting in a desired sample size of n=147, however the study continued to n= 237 after reaching equilibrium on desired variables, and closing data collection using coupon reduction.

For this study, the last indicator, percentage of vulnerable women who correctly identify ways of preventing transmission and reject major misconceptions (UNGASS 14) will be used, as it strikes a balance between all the indicators, while not surpassing the estimated total population size of n=500 (according to the formative assessment). **As such, the desired sample size was 197**.

3.4. Behavioural questionnaire

The same IBBS survey tool used in the 2008 surveillance was reviewed and updated. The tool was translated, pre-tested and amended at the start of data collection. The questionnaire was broken up into the following sections, those bolded are sections added to the 2013 survey, not included in the 2008 survey. The questionnaire was administered by trained research assistants, using a smartphone for electronic data collection.

(a) Demographic Characteristics

(b) Sexual History: Numbers and Types of Partners

(c) Male Condoms

(d) Female Condoms

(e) STI and STI Treatment-Seeking Behaviour

(f) Knowledge, Opinions and Attitudes

(g) Substance Use

(h) Media and HIV Intervention Programme Exposure

(i) Stigma and Discrimination

(j) Networks, Support and Plans for the Future

[1] It is noted that to date, there has not been a population size estimation exercise for key populations in Somaliland, as such estimations are based on estimations from the formative research. Of the 125 vulnerable women surveyed, more than half (58.5%) think the population size of vulnerable women in Hargeisa is more than 500. Tertiary and secondary key informants estimate the population is ranging between less than 100 to more than 500, and from 300 to more than 500, respectively.

3.5. HIV and STI testing

Serological testing for HIV and syphilis was done using rapid/point-of-care tests on site using serum blood from an intravenous blood draw. Rapid tests were used, which have the advantage of generating same-day results within a short period of time and requiring minimal skills and equipment. The type of testing strategy used was linked anonymous – chosen because it allows the client to know their HIV status and be referred for services at the same time as there are minimum identifiers (in order not to breach confidentiality). The confidentiality of each respondent was maintained, as the HIV counsellor was the only person on site to know the respondents' test results. The testing algorithms recommended by WHO for HIV and syphilis testing in low prevalence countries were used, and a strategy developed by study partners for chlamydia and gonorrhoea testing, given there are no WHO approved rapid test kits for these STI. The testing algorithms are outlined below. All respondents were referred to Hargeisa Group Hospital HIV Counselling and Testing centre for further evaluation, management and follow-up, as needed.

- HIV testing: Serial testing, first assay is performed, if negative then reported as negative; if positive, two additional simultaneous tests conducted, if positive result reported as positive and recommended for follow-up confirmatory testing and treatment. All positive and one in every 10 negative samples were sent to Nairobi, Kenya for ELISA testing.[2]
  - Collodial Gold HIV 1/2
  - Determine HIV 1/2
  - Unigold HIV 1/2
- Syphilis testing: One assay is performed, if negative then reported as negative; if positive, reported as positive and recommended for follow-up confirmatory testing and treatment. All positive and one in every 10 negative samples were sent to Nairobi, Kenya for rapid plasma regain (RPR).
  - Determine Syphilis TP
- Chlamydia and gonorrhoea testing: Urine specimen collection and shipment to Nairobi for Polymerase Chain Reaction (PCR). The Abbott RealTime PCR assay will be used for the detection of Chlamydia trachomatis and/or Neisseria gonorrhoea from the plasmid DNA of urine specimens.

[2] University of Nairobi, Kenya AIDS Control Project, Laboratory.

4. Data management and analysis

Smartphones were used for electronic data collection, to reduce the amount of data entry, and to also increase the quality of the data collected by ensuring skip patterns were followed and reduce instances of missing data. Electronic data collection also speeds up the process from the end-of-data collection to beginning of data analysis. Magpi, previously known as EpiSurveyor, was utilized to electronically programme the electronic questionnaires, and then transferred to smartphones. Data was uploaded on a daily basis to the data warehouse and backed up daily to the lead researcher's password-protected computer. A small amount of data entry was still required for the network size forms, biological testing data, recruitment forms and coupon rejecter forms. This data entry was done on site, reviewed by the field team leader, and sent to the lead investigator on a weekly basis.

Behavioural data (from the Magpi data warehouse) was exported into Excel and merged with biological test results. The Excel file was converted into a text file and imported into RDS-A to calculate Population Proportion Estimates. The RDS-A estimator used was Gile's Sequential Sampler,[3] with a population size estimate of n=1,000, 0.95 confidence interval and 10,000 bootstraps. It was the intention of investigators to then export weights into Statistical Package for the Social Sciences to conduct multivariate analysis; however due to early closure of the survey and resulting small sample size, multivariate analysis was not possible, and therefore univariate and bivariate analysis was conducted in RDS-A. Networks were visually mapped using Gephi software. Standard IBBS indicators for key populations were included and analysed, as well as all Global AIDS Response Progress Reporting (GARPR) indicators.[4]

[3] Gile's Sequential Sampler estimator is one of the multiple estimators that can be used within RDS-A.
[4] Previously known as United Nations General Assembly Special Session (UNGASS) indicators.

5. Survey disruption

Data collection commenced in early February 2014. Within a month, the IBBS team finished interviewing nearly half of the target sample (n=197) and collected biological specimens (blood and urine) from all study respondents. Just as the data collection was progressing, however, a number of security incidents disrupted the activities and eventually forced the IBBS team to discontinue the research on 2 March 2014. Following these security incidents, IOM and SOLNAC originally closed the IBBS site temporarily. Following multiple meetings between IOM, SOLNAC and all stakeholders, it was jointly decided to not reopen the site. It was agreed by all partners that continuing data collection was no longer feasible for the safety and security of both the IBBS survey team as well as the research respondents. Following the security incidents and corresponding flawed media reports, it had become public knowledge that the study was focusing on vulnerable women, who are already vulnerable and highly stigmatized, and therefore IOM was no longer able to ensure the safety and confidentiality of the study respondents. Furthermore, the security incidents and erroneous rumours had made it extremely difficult to recruit new vulnerable women into the survey. Despite the aforementioned obstacles, IOM managed to collect data from nearly 100 vulnerable women respondents (n=97), and therefore it was jointly decided by stakeholders and technical expertise in the field of HIV surveillance to proceed with analysis of the current data set. This small data set of 97 respondents is what is presented in the following sections. Lessons learned from this experience have been well documented, and are presented in the final recommendations section of this report.

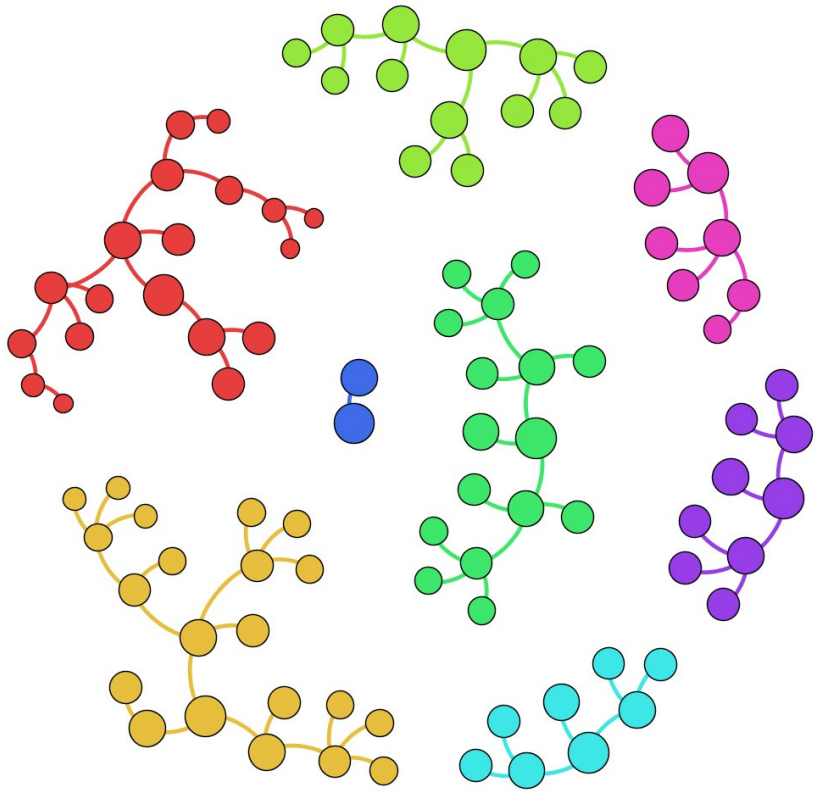
6. Study diagnostics

From early February to early March 2014, a total of 97 respondents were interviewed, including 8 seeds, at a dedicated IBBS site located in central Hargeisa. All 97 respondents provided blood and urine samples, and were tested for HIV, syphilis, chlamydia and gonorrhoea. The survey started with a total of 6 seeds initially, and in the second and third weeks, 2 more seeds were added.

6.1. Network properties

RDS is based on two important principles already described above, known as convergence and network size. The diagram illustrates the overall network visualization, displaying the eight seeds, each in a different colour, in order to represent the recruitment chains by seed.

Figure 1: Network visualization, seeds and recruitment by colour



In reference to network size, when study respondents were asked how many other vulnerable women they knew; the minimum was 1, the maximum was 98, the mean was 11.84, and a median of 8 (Table 4). When asked to further break down their network size according to other vulnerable women they knew who were, above the age of 16, lived and worked in Hargeisa, and they had seen in the last month, the numbers decreased slightly to a minimum of 1, maximum of 50, mean of 9.81, and a median of 6.

Table 3: Network size information

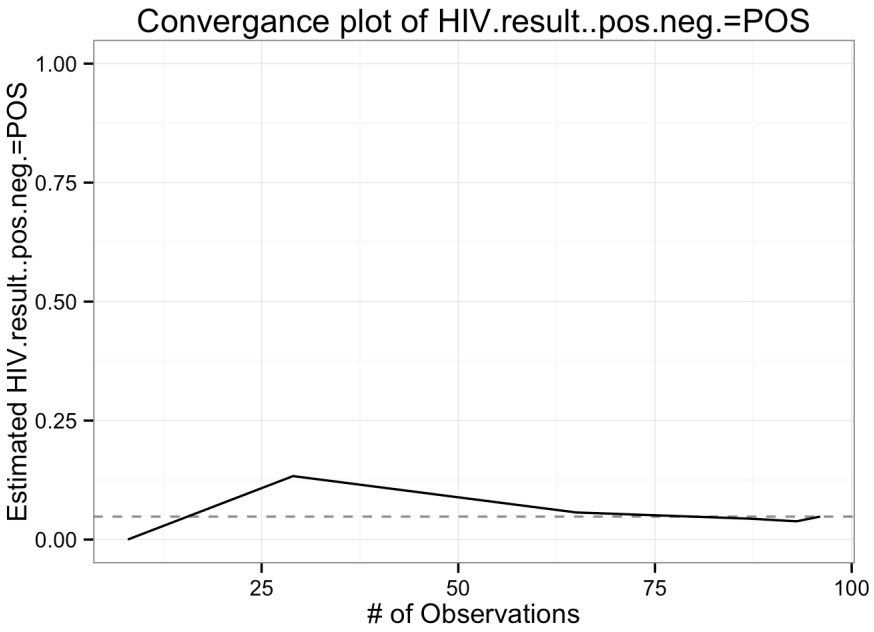
	Mean	Median	N
How many women, of whom you know their name and they know yours, have had sex in the last three months in exchange for money, gifts or favour?	11.84	8.0	96
Are above the age of 16?	11.3	7	96
Live and work (exchange sex) in Hargeisa?	11.7	7.5	96
Have seen them in the past one month?	9.8	6	96

6.2. Convergence

The objective of RDS is to meet equilibrium, also known as convergence, on key variables.[5] The first group of key variables of interest tested were GARPR indicators, including HIV prevalence, knowledge, HIV testing and condom usage at last sex with a client. Additional variables tested include age, nationality and education. Convergence plots and descriptions are included in figures 2 through 8 below.

Figure 2 presents the first convergence chart, illustrating convergence for HIV prevalence was reached. After approximately two thirds of the study (approximately n = 60), the HIV prevalence was stable. As such, the estimate of HIV prevalence from the survey can be fairly certain.

Figure 2: Convergence plot – HIV prevalence



Convergence for the GARPR indicator, "Condom used at last sex with a client" (Figure 3), shows a strong seed bias that started to diminish closer to the end of study (approximately at n=60). Convergence has not been reached, and therefore it is likely the study would have reached a different estimate if the recruitment progressed. As such, it is recommended that care be taken in interpreting this condom use estimate.

[5] The term equilibrium is used in RDS-AT, while convergence is used in RDS-A.

Figure 3: Convergence plot – Condom used at last sex with a client

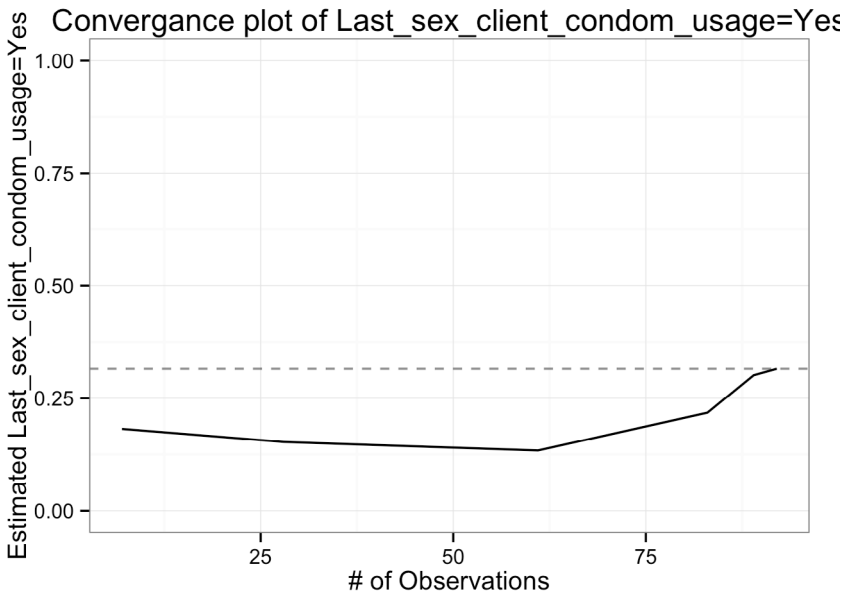


Figure 4 displays the convergence plot for the GARPR composite indicator, "Received an HIV test in the last 12 months and received the result". The early study participants had different HIV testing rates than the population estimate, showing a strong seed bias, which has decreased as the study progressed. Close to the end of the study, there are some weak signs of convergence, as the lines merge closer to each other.

Figure 4: Convergence plot – Received an HIV test in the last 12 months and received the result

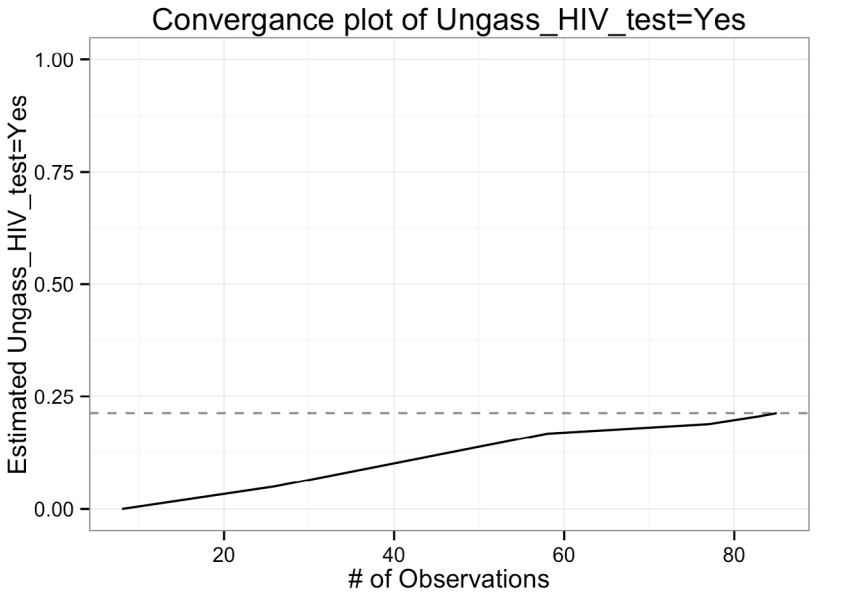


Figure 5 shows the convergence plot for the composite GARPR indicator for "Knowledge". The five knowledge questions include the following:

(a) Can the risk of HIV transmission be reduced by having sex with only one uninfected partner who has no other partners?

(b) Can a person reduce the risk of getting HIV by using a condom every time they have sex?

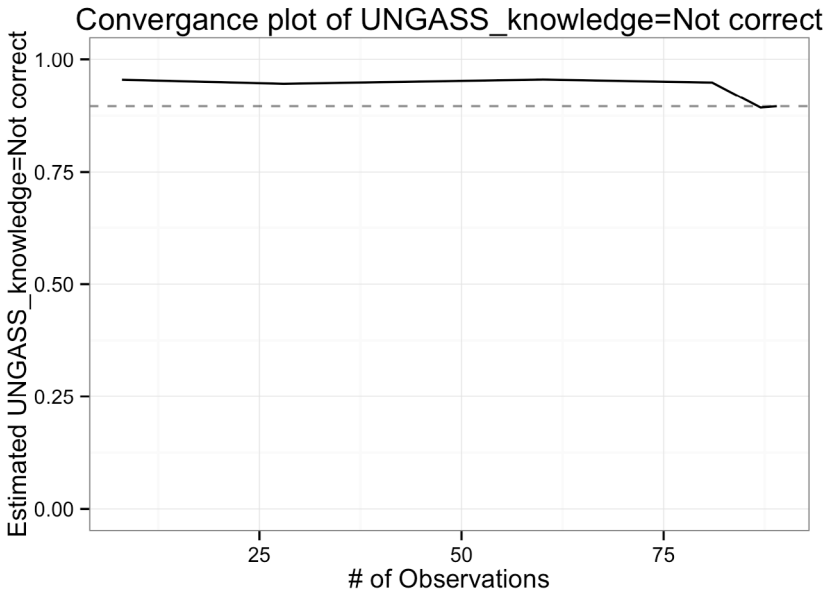
(c) Can a healthy-looking person have HIV?

(d) Can a person get HIV from mosquito bites?

(e) Can a person get HIV by sharing food with someone who is infected?

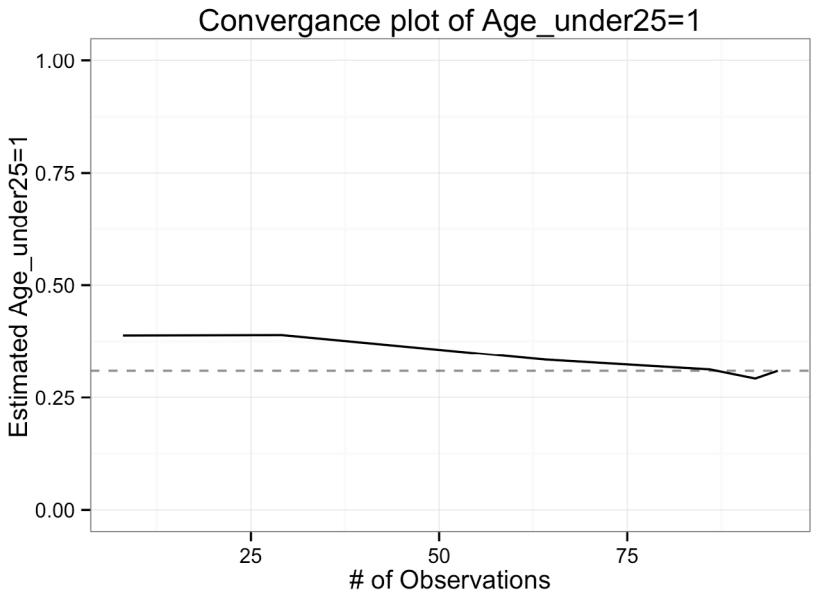
The figure shows that the estimate has been stable for most of the study; however, near the end of the study, there may have been a subgroup of participants with better knowledge that affected the knowledge estimate. As such, care should be taken when interpreting this estimate.

Figure 5: Convergence plot – GARPR composite knowledge variable



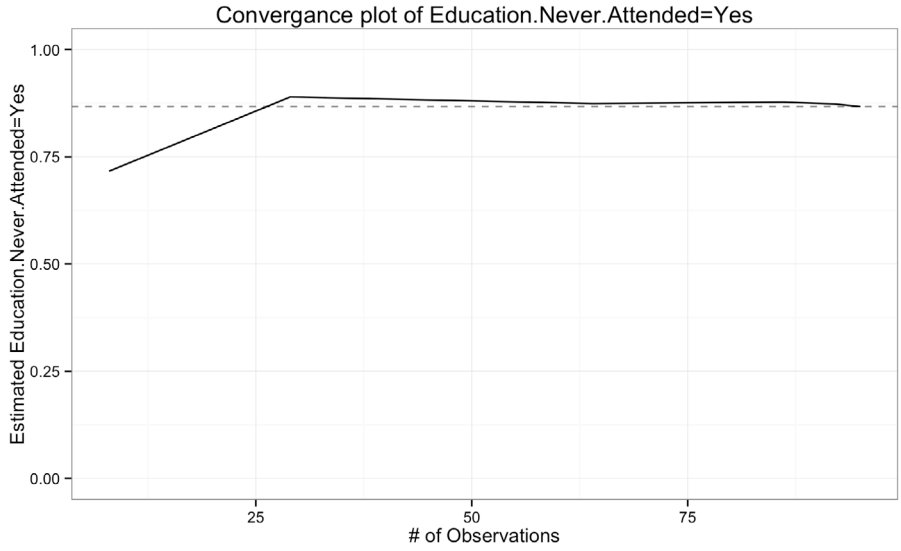
The next three convergence plots focus on sociodemographic indicators. The first (Figure 6) displays participants aged below 25. The initial phase of the survey showed a higher proportion of participants aged under 25 years. This proportion decreased as the study progressed, which is a sign of decreasing seed influence (e.g. seed bias). There are some signs of convergence near the end of study, and therefore this estimate is assumed to have been reached.

Figure 6: Convergence plot – Below the age of 25



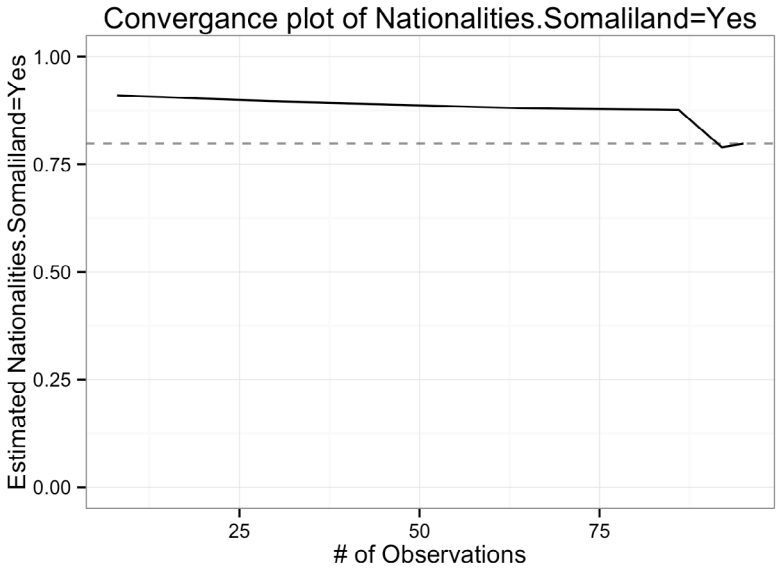
The convergence plot for "Education" (Figure 7) demonstrates clear signs of convergence from early on, at approximately n=30 respondents. This can be interpreted to mean that even if the study had progressed to its desired sample size of nearly n=200, this indicator would have likely remained the same, with most survey participants not having had any education.

Figure 7: Convergence plot – Education



In Figure 8, where nationality is presented, the plot illustrates that a higher proportion of respondents were from Somaliland than the estimated overall prevalence. In brief, this result raises concerns as to whether the overall population of vulnerable women in Hargeisa was reached, or simply a subset originally from Somaliland.

Figure 8: Convergence plot – Nationality



In general, reaching convergence is difficult when the sample size is small and chains are short. The main recommendation would be to reach more participants; however, as this was not possible in the case of this survey, a more robust estimator (Gile's Sequential Sampler) in RDS-A was used to lessen the seed bias, which focuses more on recruitment patterns.

6.3. Coupon rejection, recruiter information and reason for participation

In an RDS survey, information on coupon rejection and recruiters is collected to ascertain if there is any systematic bias in the way coupons are being given out (i.e. the way peers are recruited). Those recruiters who return to the site to collect secondary incentives are asked a series of questions. In total, 40 survey respondents returned to the site to collect secondary incentives. They indicated a mean of 2.28 coupons given out, and a median of 2, as is illustrated in Table 4. Not one recruiter indicated that a coupon was refused.

Table 4: Coupon rejector information

N	Coupons given out (mean; median)	Refusal
40	2.28; 2	0

When asked about reasons for participation, HIV and STI test results were the most common reasons given, mentioned by all respondents, followed by the incentive (95.8%), peer influence (75%) and interest in the study (72%), highlighted in Table 5.

Table 5: Reason for participation

	n/N	%
Why did you accept coupon and came into this study?		
Incentive	92/96	95.8
HIV test results	96/96	100.0
Syphilis test results	96/96	100.0
Peer influence	72/96	75.0
Study is interesting/useful	70/96	72.0
Had extra time	10/96	10.4
Other	0/96	0.0

When study respondents were asked about their relationship with their recruiter, most vulnerable women indicated a friend (94.3%) or co-worker (86.4%), as shown in Table 6.

Table 6: Relationship to recruiter

	n/N	%
Relationship with a person who gave the coupon		
Acquaintance	4/88	4.5
Friend	83/88	94.3
Roommate	0/88	0.0
Mother	3/88	3.4
Sister	0/88	0.0
Daughter	6/88	6.8
Neighbour	20/88	22.7
Co-worker	76/88	86.4
Stranger	0/88	0.0
Other	0/88	0.0
Number of times she has seen the recruiter in the last four weeks (mean = 3.22, median = 4.0)		
1	8/88	9.1
2	15/88	17.0
3	15/88	17.0
4	50/88	56.8
Age of the recruiter (mean = 24.9; median = 25.0)		
<26	50/88	56.8
26–35	37/88	42.0
>35	1/88	1.1

	n/N	%
Time known the recruiter	Mean = 4.3 years Median = 2 years	
Closeness to the recruiter		
Very close	4/88	4.5
Somewhat close	20/88	22.7
Not very close	64/88	72.7
Frequency of seeing the recruiter		
Every day	52/88	59.1
Once a week	34/88	38.6
Once a month	2/88	2.3
Less than once a month	0/88	0.0

7. Results

7.1. Interpreting the results

In the sections to follow, data is presented in the form of comparison tables between 2008 and 2014 data sets. Both the sample proportions (e.g. crude data from the samples) and the population prevalence estimates (adjusted based on network size and associated weights using an RDS estimator) are provided. Where population estimates are not provided, this is due to small sample sizes, and therefore population estimates could not be calculated (indicated by a dash/hyphen (-) in the tables). Where questions were not asked or not comparable across both surveys, this is indicated by *N/A* for "not applicable". Further, due to the small sample size, p values for significance have not been included throughout, but mostly mentioned throughout in relation to confidence intervals. Where confidence intervals overlap, statistical significance in the two estimates is unlikely. Where statistically significant differences occur, this is indicated in bold in the tables. For a few selected variables, t-tests were performed, and significance is denoted for results <0.05. Lastly, as the 2008 data was calculated in RDS-AT, before the newest RDS estimator knows as RDS-A was released, all data from 2008 has been recalculated with RDS-A. Thus, data presented here for the year 2008 survey differs from any previously published results by IOM, SOLNAC and partners, including the 2008 final technical report, and the published manuscript in *AIDS* in 2010. Lastly, "homophily" is an RDS term and describes the tendency for respondents to recruit people who have the same trait as themselves. More specifically, in RDS-A, this is the ratio of the number of recruits that have the same characteristic as their recruiter to the number that is expected if there were no homophily on the characteristics. A homophily value of 1 means there is no homophily. The values above 1 show presence of positive homophily (people are recruiting similar to themselves), values below 1 mean negative homophily (people are recruiting different from themselves). The value can be interpreted similar to odds ratio. For certain variables of interest, homophily is presented.

7.2. Sociodemographics

The population is slightly older in 2014 compared to 2008, with a mean difference of approximately one year; however, this difference is not statistically significant due to overlapping confidence intervals (Table 7). There is evidence of difference in education level where, in 2014, fewer women have completed primary school than in 2008, 2.8 per cent and 13.3 per cent respectively. There is also a difference in place of birth; more women were born in Somaliland (84%) in 2014 compared to 2008 (20.8%). Additionally, in 2014, more Somaliland women were born in Hargeisa compared to 2008. The other significant differences are in marital status (less women were single in 2014), tribe (less Oromo in 2014), and age of circumcision (more women were under the age of 8 when circumcised in 2014 than in 2008). Table 7 presents the sociodemographic figures.

Table 7: Sociodemographic characteristics

Characteristic	2014				2008			
	Sample proportions		Population estimates		Sample proportions		Population estimates	
	n/N	%	%	95% confidence interval (CI)	n/N	%	%	95% CI
Age								
Aged under 20 years	5/95	5.3	-	-	23/219	10.5	8.8	5.0–12.6
Aged under 25 years	32/95	33.7	28.9	17.3–40.5	67/219	30.6	28.8	21.4–36.2
Age groups								
<26	34/95	35.8	31.2	19.8–42.7	78/219	35.6	33.7	25.2–42.3
26–35	35/95	36.8	34.2	22.2–46.2	80/219	36.5	37.2	30.1–44.2
>35	26/95	27.4	34.6	21.5–47.7	61/219	27.9	29.1	20.9–37.3
Highest level of education								
Never attended school	80/95	84.2	86.7	80.4–92.9	183/219	83.6	86.0	81.6–90.5
Did not complete primary	9/95	9.5	6.8	0.0–19.0	1/219	0.5	0.6	0.0–1.8
Primary	3/95	3.2	2.8	0.0–7.2	35/219	16.0	13.3	8.9–17.8
Secondary	3/95	3.2	3.3	0.0–8.5	0/219	0.0	-	-
College	N/A	N/A	N/A	N/A	0/219	0.0	-	-
University	0/95	0.0	-	-	0/219	0.0	-	-
Koranic school	0/95	0.0	-	-	0/219	0.0	-	-
Informal schooling	1/95	1.1	0.6	0.0–1.2	0/219	0.0	-	-
Other	0/95	0.0	-	-	0/219	0.0	-	-
Place of birth								
Djibouti	2/95	2.1	2.3	0.0–7.4	4/219	1.8	1.6	0.2–2.9
Ethiopia	10/95	10.5	9.5	1.9–17.0	157/219	71.7	69.2	53.5–84.8
Puntland	3/95	3.2	2.2	0.0–5.5	3/219	1.4	0.9	0.0–1.7
Somaliland	78/95	82.1	84.0	74.0–94.0	42/219	19.2	20.8	8.1–33.5
South Central Somalia	2/95	2.1	2.0	0.0–5.3	10/219	4.6	6.5	1.5–11.4
Other	0/95	0.0	-	-	3/219	1.4	1.1	0.0–2.2
Place of birth, region of Somaliland								
Hargeisa	63/78	80.8	82.4	67.3–97.6	18/42	42.9	35.4	11.2–59.7
Sahil	3/78	3.8	1.7	0.0–4.6	2/42	4.8	11.3	4.1–18.5
Togdheer	4/78	5.1	7.3	0.0–20.3	6/42	14.3	12.5	0.0–28.1
Sool	1/78	1.3	0.7	0.0–1.8	0/42	0.0	-	-
Sanaag	1/78	1.3	2.2	0.0–5.8	1/42	2.4	2.1	0.0–3.6
Awdal	1/78	1.3	0.7	0.0–3.9	4/42	9.5	8.9	0.0–19.7
Gebilay	5/78	6.4	4.9	0.0–10.5	9/42	21.4	22.0	0.0–49.2
Saylac	0/78	0.0	-	-	0/42	0.0	-	-
Caynabo	0/78	0.0	-	-	0/42	0.0	-	-
Odwane	0/78	0.0	-	-	0/42	0.0	-	-
Buhoodley	0/78	0.0	-	-	0/42	0.0	-	-
Bali Gubadley	0/78	0.0	-	-	1/42	2.4	5.7	0.0–18.2
Other	0/78	0.0	-	-	1/42	2.4	2.1	0.0–6.6
Origin *(Multiple answers)*								
Somalia	7/95	7.4	9.7	0.0–23.4	N/A	N/A	N/A	N/A
Somaliland	78/95	82.1	80.0	70.8–89.2	N/A	N/A	N/A	N/A
Ethiopia	7/95	7.4	7.0	0.0–19.9	N/A	N/A	N/A	N/A
Djibouti	2/95	2.1	2.3	0.0–6.1	N/A	N/A	N/A	N/A
Other	1/95	1.1	1.0	0.0–2.4	N/A	N/A	N/A	N/A
Currently has a valid identity card	37/95	38.9	31.4	20.2–42.5	N/A	N/A	N/A	N/A
Places from which one has a valid identity card *(multiple answers)*								
Somalia	0/95	0.0	-	-	N/A	N/A	N/A	N/A
Somaliland	32/95	33.7	28.0	17.2–38.9	N/A	N/A	N/A	N/A
Ethiopia	2/95	2.1	0.6	0.3–0.9	N/A	N/A	N/A	N/A
Djibouti	1/95	1.1	0.4	0.1–0.7	N/A	N/A	N/A	N/A
Other	0/95	0.0	-	-	N/A	N/A	N/A	N/A
Has a valid passport	2/94	2.1	1.9	0.0–4.7	N/A	N/A	N/A	N/A

Characteristic	2014				2008			
	Sample proportions		Population estimates		Sample proportions		Population estimates	
	n/N	%	%	95% confidence interval (CI)	n/N	%	%	95% CI
Places from which one has a valid passport								
Somalia	0/95	0.0	-	-	N/A	N/A	N/A	N/A
Somaliland	2/95	2.1	-	-	N/A	N/A	N/A	N/A
Ethiopia	0/95	0.0	-	-	N/A	N/A	N/A	N/A
Djibouti	0/95	0.0	-	-	N/A	N/A	N/A	N/A
Other	0/95	0.0	-	-	N/A	N/A	N/A	N/A
Has any other valid identification document	14/93	15.1	10.6	0.0–22.4	N/A	N/A	N/A	N/A
Type of other documents								
Voting card	12/14	85.7	-	-	N/A	N/A	N/A	N/A
Ethiopian ID	1/14	7.1	-	-	N/A	N/A	N/A	N/A
IDP Refugee card	1/14	7.1	-	-	N/A	N/A	N/A	N/A
Years lived in Hargeisa (2014 only)								
Born in Hargeisa	64/95	67.4	72.1	62.2–82.7				
<1 year	1/95	1.1	0.9	0.0–2.3				
1–3 years	21/95	22.1	18.0	10.1–26.0				
>3 years	9/95	9.5	8.8	2.7–15.1				
Time lived in Hargeisa (2008 only)								
Less than 7 days					1/209	0.5	0.2	0.0–0.4
7 days–1 month					0/209	0.0	-	-
1–2 months					2/209	1.0	0.4	0.0–1.2
3–6 months					12/209	5.7	4.7	2.2–7.2
7–12 months					31/209	14.8	16.2	10.5–21.9
1–2 years					43/209	20.6	20.6	13.6–27.5
More than 2 years					120/209	57.4	57.8	40.3–66.4
Reason for leaving birthplace								
To find work	10/28	35.7	-	-	177/201	88.1	86.0	80.7–91.3
To go to school	0/28	0.0	-	-	0/201	0.0	-	-
For marriage	1/28	3.6	-	-	1/201	0.5	1.3	0.6–1.9
To escape insecurity/war	2/28	7.1	-	-	10/201	5.0	6.5	2.3–10.7
I left to visit family and I never returned	8/28	28.6	-	-	N/A	NA	-	-
I was forced to leave	1/28	3.6	-	-	2/201	1.0	1.8	0.0–4.5
I was kidnapped (abducted)	2/28	7.1	-	-	2/201	1.0	0.7	0.0–1.7
Other	4/28	14.3	-	-	7/201	3.5	3.0	1.1–4.9
Don't remember	-	-			2/201	1.0	0.7	0.0–1.5
When forced to leave, engaged in								
Sex work	2/3	66.7	-	-	N/A			
Domestic work	1/3	33.3	-	-	N/A			
Other	0/3	0.0	-	-	N/A			
Belong to tribal community (clan)								
Darod	17/93	18.3	23.8	0.8–39.2	28/219	12.8	11.7	6.7–16.7
Dir	4/93	4.3	2.7	0.0–5.8	8/219	3.7	3.0	1.0–5.0
Hawiye	7/93	7.5	10.1	0.0–20.8	14/219	6.4	8.0	3.6–12.4
Isak	41/93	44.1	37.7	25.0–50.2	33/219	15.1	15.8	5.9–25.7
Rahanweyn	0/93	0.0	-	-	0/219	0.0	-	-
Oromo	2/93	2.2	2.1	0.0–0.6	95/219	43.4	42.9	31.9–54.1
Other	22/93	23.7	23.5	14.6–32.3	41/219	18.7	18.5	12.5–24.5
Religion								
Christianity	0/93	0.0	-	-	2/219	0.9	0.6	0.0–1.7
Islam	93/93	100.0	-	-	217/219	99.1	99.3	98.3 –
Other	0/93	0.0	-	-	0/219	0.0	-	100.0
Not religious	0/93	0.0	-	-	0/219	0.0	-	-

Characteristic	2014				2008			
	Sample proportions		Population estimates		Sample proportions		Population estimates	
	n/N	%	%	95% confidence interval (CI)	n/N	%	%	95% CI
Marital status								
Single	33/93	35.5	29.9	21.8–38.0	170/219	77.6	76.6	70.3–82.9
Married	0/93	0.0	0.0	-	1/219	0.5	0.4	0.0–1.2
Separated	1/93	1.1	0.3	0.0–0.8	9/219	4.1	3.5	1.5–5.6
Divorced	45/93	48.4	49.3	31.4–68.4	27/219	12.3	13.6	8.4–18.8
Widowed	6/93	6.5	11.3	0.0–28.5	12/219	5.5	5.9	1.8–9.9
Other	8/93	8.6	8.7	2.8–14.6	0/219	0.0	-	-
Age when married								
<16	19/51	37.3	32.6	17.4–47.7	20/49	40.8	41.6	27.4–55.9
16–20	22/51	43.1	41.8	23.3–60.2	23/49	46.90	46.0	31.5–60.5
>20	10/51	19.6	25.6	6.1–45.1	6/49	12.2	12.4	0.0–26.7
Current spouse/partner has other wives	14/60	23.3	29.8	13.1–46.5	3/33	9.1	9.3	1.9–16.7
Currently living with sexual partner								
Married, living with spouse	2/93	2.2	2.2	0.0–4.8	0/219	0.0	-	-
Married, living with other sex partner	12/93	12.9	13.9	4.0–23.8	5/219	2.3	2.2	0.4–4.0
Currently married, not living with spouse or any other sexual partner	0/93	0.0	-	-	3/219	1.4	0.9	0.1 – 1.6
Not married, living with sexual partner	20/93	21.5	24.5	13.0–36.0	37/219	16.9	15.6	10.5–20.8
Not married, not living with sexual partner	28/93	30.1	26.7	18.9 – 35.1	147/219	67.1	69.3	62.7–75.8
Living in a brothel with sexual partner	14/93	15.1	16.9	5.3–28.5	17/219	7.8	7.5	3.9–11.1
Living in a brothel without sexual partner	13/93	14.0	12.9	4.8–20.9	9/219	4.1	4.2	1.2–7.2
Other	4/93	4.3	2.9	0.0–8.8	1/219	0.5	0.4	0.0–1.1
Living children								
0	37/95	38.9	36.2	24.2–48.2	N/A	N/A	N/A	N/A
1–3	36/95	37.9	37.2	24.3–50.1	N/A	N/A	N/A	N/A
4+	22/95	23.2	26.6	15.0–38.2	N/A	N/A	N/A	N/A
Earning money doing non-sex-work	1/93	1.1	2.0	0.0–5.8	9/219	4.1	4.4	1.4–7.5
Supporting anybody else (children, parents, etc.)	54/92	58.7	63.5	55.0–72.0	146/219	66.7	67.7	61.3–74.1
Number of people supporting								
1	9/54	16.7	18.2	5.4–31.0	47/145	32.4	33.0	21.7–44.3
2–3	24/54	44.4	39.6	22.7–56.6	54/145	37.2	36.9	28.7–45.2
4+	21/54	38.9	42.2	25.8–58.6	44/145	30.3	30.1	21.2–38.9
People who they are supporting								
Husband	0/54	0.0	-	-	0/146	0.0	-	-
Children	52/54	96.3	96.1	88.9–100.0	135/146	92.5	93.2	88.2–98.1
Sexual Partner but not husband	0/54	0.0	-	-	0/146	0.0	-	-
Parent(s)	1/54	1.9	1.6	0.0–7.8	10/146	6.8	5.8	0.0–11.5
Sibling(s)	1/54	1.9	2.3	0.0–6.2	13/146	8.9	9.3	2.8–15.8
Other relative(s)	0/54	0.0	-	-	0/146	0.0	-	-
Other	0/54	0.0	-	-	0/146	0.0	-	-
Circumcised	92/93	98.9	99.7	99.6–99.8	199/219	90.9	91.3	86.9–95.8
Age of circumcision								
<8	28/92	30.4	30.3	20.2–40.3	23/193	11.9	13.3	7.5–19.1
8–10	53/92	57.6	59.6	48.4–70.7	148/193	76.7	75.2	67.7–82.6
11+	11/92	12.0	10.2	4.3–16.1	22/193	11.4	11.5	6.6–16.4
Locations outside Hargeisa where engaged in high-risk sex in the past 12 months								
Berbera	0/95	0.0	-	-	N/A	N/A	N/A	N/A
Burao	2/95	2.1	2.0	0.0–5.3	N/A	N/A	N/A	N/A
Toogwajale	2/95	2.1	2.5	0.0–6.6	N/A	N/A	N/A	N/A
Las Anod	1/95	1.1	1.9	0.0–5.6	N/A	N/A	N/A	N/A
Other	1/95	1.1	1.4	0.0–4.0	N/A	N/A	N/A	N/A

The difference in place of birth is large and should be noted as it could limit the comparison between the two survey rounds. The comparison of population homophily (Table 8) shows differences in 2014 and 2008. While in 2014, Ethiopian women were half as likely to recruit Ethiopian women; in 2008 they were 2.25 times more likely to recruit the same. This change in homophily is striking and could be affected by the number of Ethiopian women in Hargeisa. The RDS analysis takes into account differences in recruitment patterns; however, it is advised that all key variables are stratified by place of birth to control for this sociodemographic difference before making conclusions. This stratification will be limited by small size of groups (i.e., in 2014, there were only 7 Ethiopian women, and in 2008, there were only 42 Somaliland women in the recruited sample.).

Several potential reasons for the difference have been noted as follows:

(a) Misclassification of women's place of birth caused by women falsely self-reporting their place of birth. Perhaps because of the political situation in the country, and social desirability bias, women self-reported as Somalilander, rather than as Ethiopian, in 2014;

(b) Changes in the economic situation motivated another subgroup of women into engaging in high-risk sex, in this case more Somaliland women;

(c) Geographic migration of women (e.g. Ethiopian women returned to Ethiopia);

(d) Difference in data collection methods across the two surveys; and

(e) Inefficient recruitment in some subpopulations (e.g. in Ethiopian women).

Interval variables for sociodemographic characteristics, such as average age, time lived in Hargeisa, age when married, number of living children, number of people supporting, and age of circumcision, can be found in the data tables in the annex (Table A.1).

Table 8: Place of birth – Population homophily

	2014	2008
Place of birth – Population homophily*		
Djibouti	1.33	0.82
Ethiopia	0.43	2.25
Puntland	1.92	0.8
Somaliland	1.19	1.75
South Central Somalia	1.48	0.76
Other	-	1.02

7.3. HIV and STI prevalence

The HIV and syphilis epidemic among vulnerable women in Hargeisa is stable based on the two available rounds of IBBS data (Table 9). Even though there is a slight decrease in HIV and syphilis prevalence, this change is not significant as confidence intervals overlap. It is worth mentioning that 95 per cent confidence intervals for HIV include ranges above 5 per cent, showing some evidence for a concentrated epidemic among vulnerable women in Hargeisa. However, most importantly, in order to identify a trend, three data points are needed. For the first time, estimates of chlamydia and gonorrhoea in vulnerable women in Somaliland are available at 0.7 per cent and 0.4 per cent, respectively.

Table 9: HIV and STI prevalence

Characteristic	2014				2008			
	Sample proportions		Population estimates		Sample proportions		Population estimates	
	n/N	%	%	95% CI	n/N	%	%	95% CI
HIV	5/96	5.2	4.8	0.2–9.3	13/237	5.5	5.1	2.1–8.1
Syphilis	2/96	2.1	2.4	0.0–5.6	8/237	3.4	3.4	1.1–5.7
Chlamydia	2/90	2.2	0.7	0.1–1.3	N/A	N/A	N/A	N/A
Gonorrhoea	1/91	1.1	0.4	0.1–0.7	N/A	N/A	N/A	N/A

7.4. Sexual history

The average age of first vaginal sex is consistently low, with most vulnerable women reporting below 18 years across both survey rounds (66.9% in 2014 and 85.3%) (Table 10). More vulnerable women in 2008 had reported ever having anal sex and giving oral sex to men, compared with in 2014. There is a significant difference in the distribution in number of paying clients between 2008 and 2014; further, the mean difference is 0.96 more paying clients in 2014. Analysis shows moderately strong evidence of a difference ($t = 2.539$, $p = 0.0116$). The t-test also shows evidence of a difference between the total number of sexual partners ($t = 3.015$, $p = 0.003$). Forced sexual intercourse in the past 12 months remains at nearly a fifth of all vulnerable women (18.3% in 2014, 23.7% in 2008).

Table 10: Sexual history

Characteristic	2014				2008			
	Sample proportions		Population estimates		Sample proportions		Population estimates	
	n/N	%	%	95% CI	n/N	%	%	95% CI
Age of first vaginal sex								
<16	39/92	42.4	36.4	23.5–49.2	109/219	49.8	47.5	40.2–54.8
16–18	27/92	29.3	30.5	17.3–43.7	80/219	36.5	37.8	31.0–33.5
>18	26/92	28.3	33.2	19.9–46.5	30/219	13.7	14.7	9.7–19.7
Ever had anal sex	4/92	4.3	2.3	0.0–5.0	64/219	29.2	30.0	24.0–36.0
Ever gave oral sex to a man	7/92	7.6	4.4	0.0–12.1	45/219	20.5	20.2	14.4–26.0
Ever receive oral sex	5/92	5.4	3.2	0.0–7.4	6/219	2.7	2.9	1.9–3.9
Number of paying clients in the past 7 days								
None	3/92	3.3	2.9	0.0–6.4	10/216	4.6	5.6	1.5–9.6
1	23/92	25.0	33.1	17.4–48.8	27/216	12.5	13.7	8.5–18.8
2–4	39/92	42.4	33.4	21.6–45.1	146/216	67.6	66.7	59.8–73.5
>4	27/92	29.3	30.6	16.0–45.3	33/216	15.3	14.1	9.2–19.0
Number of non-paying partners in the past 7 days								
None	46/92	50.0	51.5	37.7–65.4	N/A	N/A	N/A	N/A
1	8/92	8.7	5.9	1.3–10.4	N/A	N/A	N/A	N/A
2–4	29/92	31.5	34.7	19.9–49.5	N/A	N/A	N/A	N/A
>4	9/92	9.8	7.9	1.5–14.4	N/A	N/A	N/A	N/A
Number of total sexual partners in the past 7 days								
None	5/92	5.4	6.4	0.8–11.8	11/218	5.0	5.6	2.1–9.1
1	18/92	19.6	23.1	10.6–35.6	19/218	8.7	11.1	5.8–16.5
2–4	23/92	25.0	25.6	14.1–37.2	104/218	47.7	44.7	38.2–51.3
>4	46/92	50.0	44.9	31.4–58.4	84/218	38.5	38.4	31.4–45.5

Characteristic	2014				2008			
	Sample proportions		Population estimates		Sample proportions		Population estimates	
	n/N	%	%	95% CI	n/N	%	%	95% CI
Consistent number of total partners (sum of non-paying and paying equals total in the past 7 days)	85/92	92.4	-	-	N/A	N/A	N/A	N/A
Number of total sexual partners in the past 30 days								
None	2/92	2.2	1.8	0.0–4.0	10/209	4.8	4.9	1.9–7.9
1	19/92	20.7	26.0	10.6–39.4	16/209	7.7	8.9	4.4–13.4
2–4	10/92	10.9	12.5	4.6–20.4	34/209	16.3	17.0	11.9–22.1
>4	61/92	66.3	60.7	45.9–75.6	149/209	71.3	69.1	62.4–75.8
Had forced sexual intercourse in the previous 12 months	23/92	25.0	23.7	11.5–36.0	40/219	18.3	16.8	10.9–22.6
Person who forced sexual intercourse last time								
Husband	0/23	0.0	-	-	0/40	0.0	-	-
Other relative	0/23	0.0	-	-	0/40	0.0	-	-
Neighbour	1/23	4.3	4.3	0.0–27.1	0/40	0.0	-	-
Stranger	4/23	17.4	32.1	0.0–64.1	24/40	60.0	54.9	37.9–72.0
Regular client	18/23	78.3	63.6	42.7–84.6	16/40	40.0	45.1	28.1–62.1
Other	0/23	0.0	-	-	0/40	0.0	-	-

Interval variable for sexual history such as average age of first vaginal, anal and oral sex, and number of partners in the past seven days, can be found in the annex (Table A.2).

Table 11 displays the results for sexual history among paying clients specifically. The age of first paid sex appears to be older in 2014 (53.8% >18) than in 2008 (37.9% >18), showing statistical significance. More women in 2014 meet clients by the roadside (36.7% in 2014, 13.4% in 2008), fewer in a home shared with family (1.4% in 2014, 10.5% in 2008), and in a home shared with vulnerable women (17.2% in 2014, 42.9% in 2008). Similarly, more women in 2014 engage in sex in a home living alone, compared with a home they share with family or with other vulnerable women. The GARPR indicator for "condom usage at last sex" has increased slightly (25.6% in 2008 and 31.5% in 2014); however, this difference is not statistically significant, and this variable did not reach equilibrium, as outlined in the previous section. A striking finding when asked about non-condom use at last sex is the increase in number of vulnerable women that "didn't think of it" (34.5% in 2014, compared with only 2.2% in 2008). Fewer vulnerable women indicated that clients objected in 2014 (11%) than in 2008 (39.7%), possibly indicating differences in behaviour among clients across the two surveys.

In questions about most common client occupation and clients from the diaspora, significant differences occurred because of different proportions of "Do not know" answers, a likely result of different interviewing techniques in 2014 and 2008. The difference disappears when "Do not know" is removed from the denominator. The most common occupations of clients are khat seller (24.3%), businessmen (23.7%) and truckers (25.7%). The same trend was found in 2008.

Table 11: Sexual history – Paying clients

Characteristic	2014				2008			
	Sample proportions		Population estimates		Sample proportions		Population estimates	
	n/N	%	%	95% CI	n/N	%	%	95% CI
Age when the first time they paid for sex								
<16	24/91	26.4	21.4	8.7–34.1	22/218	10.1	7.3	4.8–9.7
16–18	18/91	19.8	15.5	7.9–23.1	113/218	51.8	54.8	48.0–61.7
>18	49/91	53.8	63.0	47.5–78.6	83/218	38.1	37.9	31.1–44.6
Place where they meet new clients								
Roadside	29/90	32.2	36.7	25.1–48.4	32/219	14.6	13.4	9.5–17.4
They call me	8/90	8.9	5.7	2.3–9.1	23/219	10.5	9.4	6.1–12.7
Home shared with family	2/90	2.2	1.4	0.0–3.3	25/219	11.4	10.5	6.2–14.8
Home shared with vulnerable women	20/90	22.2	17.2	7.7–26.7	85/219	38.8	42.9	36.2–49.6
Home living alone	13/90	14.4	12.5	5.0–19.9	46/219	21.0	20.7	15.0–26.5
Tea shop	2/90	2.2	3.0	0.0–11.4	0/219	0.0	-	-
Khat shop	2/90	2.2	7.6	0.0–20.7	0/219	0.0	-	-
Hotel	3/90	3.3	2.3	0.0–5.5	1/219	0.5	0.3	0.2–0.4
Broker	5/90	5.6	7.2	0.1–13.7	0/219	0.0	-	-
Other	6/90	6.7	6.3	0.0–12.5	7/219	3.2	2.6	0.9–4.3
Place where most often engaged in transactional sex								
Home living alone	39/91	41.1	43.4	30.3–56.5	44/219	20.1	20.4	14.4–26.4
Home shared with family	1/91	1.1	0.3	0.0–0.9	22/219	10.0	9.0	5.4–12.7
Home shared with vulnerable women	9/91	9.9	8.3	2.9–13.7	77/219	35.2	40.4	33.6–47.1
Client's house	30/91	33.0	33.9	21.7–46.1	73/219	33.3	29.1	23.7–34.5
Car/vehicle	3/91	3.3	3.3	0.0–7.4	1/219	0.5	0.4	0.0–1.0
Tea shop	0/91	0.0	0.0	-	1/219	0.5	0.3	0.0–0.8
Khat shop	0/91	0.0	0.0	-	0/219	0.0	-	-
Hotel	4/91	4.4	4.6	0.1–9.0	1/219	0.5	0.3	0.1–0.5
Other	5/91	5.5	6.1	0.5–11.6	0/219	0.0	-	-
Used condom during last intercourse with a client	31/92	33.7	31.5	19.6–43.3	63/219	28.8	25.6	19.2–32.0
Type of a condom used								
Male condom	30/31	96.8	98.1	93.6–100.0	63/63	100.0	-	-
Female condom	1/30	3.2	1.9	0.0–6.3	0/63	0.0	-	-
Person suggested condom use								
Women	14/31	45.2	52.6	31.1–74.1	15/62	24.2	18.4	9.8–27.0
Client	17/31	54.8	47.4	25.6–68.9	47/62	75.8	81.6	73.0–90.2
Joint decision	0/31	0.0	-	-	-	-	-	-
Reason for not using a condom *(Multiple choice)*								
We did not have one with us	4/61	6.6	3.4	0.0–7.7	4/146	2.7	1.9	0.2–3.6
They are too expensive	0/61	0.0	-	-	0/146	0.0	-	-
Do not know where to buy one	0/61	0.0	-	-	56/146	38.4	35.1	27.4–42.7
Client objected	6/61	9.8	11.0	1.5–20.4	52/146	35.6	39.7	31.1–48.3
I do not like them	5/61	8.2	8.2	0.0–17.6	10/146	6.8	6.9	3.0–10.7
Used other contraceptive	0/61	0.0	-	-	0/146	0.0	-	-
Did not think it was necessary	2/61	3.3	3.1	0.0–7.4	16/146	11.0	12.5	5.4–19.5
Condoms transmit HIV	5/61	8.2	7.1	0.6–13.5	0/146	0.0	-	-
Did not think of it	22/61	36.1	34.5	21.4–47.6	4/146	2.7	2.2	0.4–4.0
Other	16/61	26.2	31.9	15.9–48.0	1/146	0.7	-	-

Characteristic	2014				2008			
	Sample proportions		Population estimates		Sample proportions		Population estimates	
	n/N	%	%	95% CI	n/N	%	%	95% CI
"Other" reasons for not using a condom								
Scared it will get lost/slip inside	9/16							
Does not know what a condom is	2/16							
"Afraid of it"	1/16							
"It will rip"	1/16							
I do not know	3/16							
Kind of contraceptive used with clients								
Pill	2/16	12.5	12.0	0.0–27.6	N/A	N/A	N/A	N/A
Injection	0/16	0.0	-	-	N/A	N/A	N/A	N/A
IUD	0/16	0.0	-	-	N/A	N/A	N/A	N/A
Withdrawal	0/16	0.0	-	-	N/A	N/A	N/A	N/A
Calendar method	0/16	0.0	-	-	N/A	N/A	N/A	N/A
Other	14/16	87.5	88.0	72.4–100.0	N/A	N/A	N/A	N/A
Frequency of condom use with clients during last 30 days								
Every time	14/89	15.7	13.4	4.2–22.6	14/219	6.4	5.6	2.2–9.0
Almost every time	6/89	6.7	4.1	0.0–8.3	2/219	0.9	0.4	0.0–0.7
Sometimes	14/89	15.7	18.3	4.5–32.2	50/219	22.8	19.9	14.6–25.3
Never	50/89	56.2	59.4	46.8–72.0	148/219	67.6	71.1	64.1–78.0
Do not know	5/89	5.6	4.8	0.2–9.3	5/219	2.3	3.0	0.5–5.5
Number of clients on the last day worked								
0	1/92	1.1	0.5	0.0–1.3	0/215	0.0	-	-
1	35/92	38.0	51.0	36.6–65.4	53/215	24.7	26.9	20.3–35.5
2	24/92	26.1	23.1	12.8–33.5	117/215	54.4	53.3	46.6–60.0
>2	32/92	34.8	25.4	15.7–35.1	45/215	20.9	19.8	14.4–25.2
Amount received for last intercourse (USD)								
<USD 2	5/92	5.4	13.3	1.8–24.7	81/215	37.7	40.3	32.8–47.8
USD 2–USD 5	31/92	33.7	33.1	21.6–44.7	133/215	61.9	59.3	51.8–66.7
>USD 5	56/92	60.9	53.6	41.4–65.9	1/215	0.5	0.4	0.0–1.2
Forced to share profits of the last transaction	3/92	3.3	3.1	0.0–8.2	12/217	5.5	5.4	2.2–8.6
Shared profits with:								
Pimp/Broker (Dilal)	1/3	33.3	-	-	2/11	18.2	-	-
Female head of house	1/3	33.3	-	-	3/11	27.3	-	-
Male head of house	0/3	0.0	-	-	2/11	18.2	-	-
Other	1/3	33.3	-	-	4/11	36.4	-	-
Typical client's occupation* (Multiple choice)								
Khat seller	28/92	30.4	24.3	13.5–35.1	22/93	23.7	21.9	13.0–30.7
Businessman	26/92	28.3	23.7	12.7–34.8	32/93	34.4	32.2	20.7–43.7
Truck driver	25/92	27.2	25.7	15.0–36.4	16/93	17.2	19.6	7.6–31.5
Police	3/92	3.3	2.7	0.0–7.7	2/93	2.2	3.8	0.0–9.8
Army	0/92	0.0	-	-	0/93	0.0	-	-
Government worker	11/92	12.0	10.6	0.0–22.0	7/93	7.5	8.9	0.8–17.0
Humanitarian aid worker	6/92	6.5	8.8	0.0–19.7	6/93	6.5	4.6	1.2–7.9
Unemployed	5/92	5.4	13.5	5.4–21.6	14/93	15.1	14.9	4.9–24.9
Other	19/92	20.7	18.0	7.1–28.8	12/93	12.9	-	-

*In 2008, many participants said they don't know how to lower the denominator.

Characteristic	2014				2008			
	Sample proportions		Population estimates		Sample proportions		Population estimates	
	n/N	%	%	95% CI	n/N	%	%	95% CI
Most common client's occupation								
Khat seller	18/91	19.8	16.1	7.6–24.7	17/219	7.8	6.9	3.4–10.4
Businessman	21/91	23.1	18.6	8.8–28.4	27/219	12.3	11.7	6.6–16.8
Truck driver	12/91	13.2	14.3	8.3–20.2	11/219	5.0	6.6	1.6–11.7
Police	2/01	2.2	2.1	0.0–8.5	1/219	0.5	1.2	0.0–3.6
Army	0/91	0.0	0.0	-	0/219	0.0	-	-
Government worker	3/91	3.3	2.8	0.5–5.0	5/219	2.3	3.8	0.0–7.8
NGO worker	0/91	0.0	0.0	-	0/219	0.0	-	-
Humanitarian aid worker	3/91	3.3	3.9	0.0–12.2	3/219	1.4	1.1	0.0–2.3
Unemployed	4/91	4.4	13.8	0.0–29.5	9/219	4.1	3.8	1.2–6.3
Other	18/91	19.8	18.8	12.3–25.3	17/219	7.8	7.3	2.8–12.0
Don't know	10/91	11.0	9.5	2.4–16.6	129/219	58.9	57.5	48.1–66.9
Most common clients' occupation (Without "Don't know")								
Khat seller	18/81	22.2	18.0	9.0–27.0	17/90	18.9	16.4	6.3–26.4
Businessman	21/81	25.9	20.8	10.3–31.4	27/90	30.0	27.6	15.3–39.9
Truck driver	12/81	14.8	15.7	8.9–22.5	11/90	12.2	15.5	0.0–33.5
Police	2/81	2.5	2.4	0.0–8.6	1/90	1.1	2.8	0.0–10.3
Army	0/81	0.0	-	-	0/90	0.0	-	-
Government worker	3/81	3.7	3.1	0.6–5.5	5/90	5.6	8.8	0.0–19.4
NGO worker	0/81	0.0	-	-	0/90	0.0	-	-
Humanitarian aid worker	3/81	3.7	4.3	0.0–10.7	3/90	3.3	2.6	0.2–5.1
Unemployed	4/81	4.9	14.7	0.0–30.9	9/90	10.0	8.9	3.3–14.5
Other	18/81	22.2	20.9	11.8–30.1	17/90	18.9	17.3	0.0–34.8
Frequency of clients from Somali diaspora in the last month								
All of them	0/91	0.0	-	-	0/219	0.0	-	-
Most of them	0/91	0.0	-	-	0/219	0.0	-	-
Some of them	11/91	12.1	7.1	0.0–16.0	7/219	3.2	2.3	0.9–37.9
None	76/91	83.5	87.8	77.8–97.9	93/219	45.5	40.5	33.5–47.5
Do not know	4/91	4.4	5.1	0.0–10.7	119/219	54.3	57.6	50.0–64.3
Frequency of clients from Somali diaspora in the last month (Without "Don't know")								
All of them	0/91	0.0	-	-	0/100	0.0	-	-
Most of them	0/91	0.0	-	-	0/100	0.0	-	-
Some of them	11/91	12.6	7.5	0.0–16.8	7/100	7.0	5.5	1.6–9.4
None	76/91	87.4	92.5	83.2–100.0	93/100	93.0	94.5	90.6–98.5
Operate through pimp/dials	22/90	24.4	18.5	6.5–30.5	N/A	N/A	N/A	N/A

The most striking difference between 2014 and 2008 is in the amount received for last intercourse in USD (Table 12). The difference is not explained when stratified by place of birth or place where new clients are met (Table 13). The possibility of error is noted, that the interviewers potentially may have made an error in converting amounts to USD. However, given the increases in cost of living, it is also possible that the cost per sexual act has simply risen from USD 2–5 to more than USD 5.

Table 12: Amount received at last sex act by place and where vulnerable women meets clients

Characteristic	2014			2008		
	Roadside	Home shared with vulnerable women	Home living alone	Roadside	Home shared with vulnerable women	Home living alone
Amount received for last intercourse (USD)						
N	29	20	13	31	83	46
Median	8	8	9	2	2	2
Mean	17.59	14	17.15	2.09	1.81	1.76
Standard deviation	21.96	14.68	23.22	0.81	0.85	0.71
Range	0–100	2–50	0–80	1–4	1–5	1–4

Table 13: Amount received at last sex act by country of birth

Characteristic	2014		2008	
	Somaliland	Ethiopia	Somaliland	Ethiopia
Amount received for last intercourse (USD)				
N	76.0	9.0	41.0	154.0
Median	8.5	5.0	2.0	2.0
Mean	17.7	18.56	2.07	1.78
SD	22.72	19.78	0.96	0.92
Range	0–100	2–50	1–5	06

In Table 14, the difference in number of sexual intercourses (higher in 2008) has likely occurred because the number of missing data was much higher in 2008 (and therefore a smaller sample size for this indicator). Regardless, it appears that in 2014, more than half of vulnerable women do not have any non-paying sexual partners. Across both surveys, condom usage with non-paying partners remains low (18.8% in 2014 and 4.9% in 2008).

Table 14: Sexual history – Non-paying sexual partners

Characteristic	2014				2008			
	Sample proportions		Population estimates		Sample proportions		Population estimates	
	n/N	%	%	95% CI	n/N	%	%	95% CI
Number of sexual intercourses with a non-paying partner in the last seven days								
None	46/92	50.0	51.3	37.7–64.9	4/41	9.8	8.6	2.1–15.2
One	8/92	8.7	5.9	1.3–10.4	17/41	41.5	43.8	21.3–66.4
2–4	29/92	31.5	34.9	20.2–49.6	14/41	34.1	29.3	8.0–50.6
5+	9/92	9.8	7.9	1.4–14.5	6/41	14.6	18.2	8.5–27.9
Number of sexual intercourses with a non-paying partner in the last 30 days								
None	55/92	59.8	5.8	45.5–71.0	3/43	7.0	7.0	3.7–10.3
One	7/92	7.6	6.1	0.5–11.7	13/43	30.2	34.8	16.9–52.7
2–4	9/92	9.8	14.7	3.7–25.7	9/43	20.9	19.8	0.0–45.0
5+	21/92	22.8	21.0	10.1–31.9	18/43	41.9	38.3	20.0–56.7
Used condom during last sexual intercourse with non-paying partner	16/85	18.8	18.8	4.5–32.9	7/104	6.7	4.9	1.2–8.6

Characteristic	2014				2008			
	Sample proportions		Population estimates		Sample proportions		Population estimates	
	n/N	%	%	95% CI	n/N	%	%	95% CI
Type of a condom used								
Male condom	15/16	93.8	96.4	94.3–98.6	7/7	100.0	-	-
Female condom	1/16	6.2	3.6	1.4–5.7	0/7	0.0	-	-
Person who suggested condom use								
Women	7/15	46.7	24.5	1.0–48.2	4/7	57.1	40.0	9.3–70.5
Client	8/15	53.3	75.3	51.8–99.0	3/7	42.9	60.0	29.5–90.7
Joint decision	0/15	0.0	-	-	0/7	0.0	-	-
Reason for no condom use								
Did not have one with us	1/69	1.4	0.4	0.0–1.2	2/52	3.8	3.0	0.0–7.6
Too expensive	0/69	0.0	-	-	1/52	1.9	0.8	0.0–1.9
Do not know where to buy	0/69	0.0	-	-	34/52	65.4	64.7	51.2–78.2
Partner objected	3/69	4.3	6.4	0.0–13.6	8/52	15.4	19.5	7.1–31.9
Do not like them	5/69	7.2	6.3	0.0–13.1	4/52	7.7	8.0	0.2–15.9
Used other contraceptive	0/69	0.0	-	-	0/52	0.0	-	-
Did not think it was necessary	2/69	2.9	2.8	0.0–6.1	1/52	1.9	1.9	0.0–4.9
Condoms transmit HIV	9/69	13.0	9.9	3.2–16.5	0/52	0.0	-	-
Did not think of it	0/69	0.0	-	-	0/52	0.0	-	-
Other	27/69	39.1	43.9	28.8–59.1	0/52	0.0	-	-
Do not know	22/69	31.9	30.3	18.0–42.6	0/52	0.0	-	-
Frequency of condom use with non-paying partner in the last 12 months								
Every time with every partner	13/87	14.9	12.8	5.3–20.2	5/58	8.6	8.3	3.8–12.7
Almost every time with every partner	6/87	6.9	5.9	8.2–11.0	0/58	0.0	-	-
Sometimes with some partners	12/87	13.8	13.9	0.0–27.9	10/58	17.2	18.5	5.6–31.4
Never with any partners	56/87	64.4	67.4	54.4–80.4	43/58	74.1	73.2	60.4–86.1

7.5. Male condoms

Across both surveys, the majority of vulnerable women had heard of male condoms, and there is a significant difference in ever having used a male condom, and being familiar with places where condoms can be obtained, seen below in Table 15. Nearly two-thirds (60.1%) of vulnerable women have ever used a condom in 2014, compared with only a quarter in 2008 (25%). There is also a significant difference in time required to obtain a male condom. However, this difference has most likely happened because of difference in categorizing time. If groups “less than 5 minutes” and “5-10 minutes” were grouped, this difference would disappear. The proportion of vulnerable women who have been given condoms in the last 12 months remains low across both surveys (3.8% in 2014, and 0.7% in 2008). Pharmacies (58.1%) were the most commonly mentioned location as to where vulnerable women would like to obtain condoms.

Table 15: Knowledge and use of male condoms

Characteristic	2014				2008			
	Sample proportions		Population estimates		Sample proportions		Population estimates	
	n/N	%	%	95% CI	n/N	%	%	95% CI
Ever heard of male condom before today	60/90	66.7	60.8	44.9–76.8	154/212	72.6	72.8	67.0–78.6
Ever used a male condom	35/60	58.3	60.1	44.2–75.9	58/212	27.4	25.0	17.0–32.1
Knows a place where to obtain male condoms	24/58	41.4	32.3	17.6–46.9	21/219	9.6	7.7	4.3–11.0
Known places or persons to obtain male condoms								
Shop	1/24	4.2	4.7	0.0–14.3	1/21	4.8	3.9	0.0–9.6
Pharmacy	22/24	91.7	89.1	75.4–100.0	15/21	71.4	76.7	61.5–91.9
Market	0/24	0.0	-	-	0/21	0.0	-	-
Clinic	0/24	0.0	-	-	0/21	0.0	-	-
Hospital	0/24	0.0	-	-	0/21	0.0	-	-
Maternal and child health clinic	0/24	0.0	-	-	0/21	0.0	-	-
Hotel	0/24	0.0	-	-	0/21	0.0	-	-
Friend	1/24	4.2	6.2	0.0–16.2	2/21	9.5	8.9	0.0–19.3
Family member	0/24	0.0	-	-	0/21	0.0	-	-
Other vulnerable women	0/24	0.0	-	-	1/21	4.8	3.7	0.0–9.6
Client(s)	0/24	0.0	-	-	2/21	9.5	7.6	0.0–17.1
Other	0/24	0.0	-	-	0/21	0.0	-	-
Time required to obtain a male condom from the place of residence								
Under 5 minutes	2/17	11.8	22.6	7.6–37.1	1/18	5.6	2.1	0.3–3.9
5–10 minutes	1/17	5.9	3.0	0.0–8.6	4/18	22.2	15.7	2.2–29.1
10–30 minutes	6/17	35.3	26.9	2.9–50.9	3/18	16.7	21.8	0.7–42.9
30–60 minutes	6/17	35.3	35.1	11.8–58.5	10/18	55.6	60.4	36.2–84.6
1 hour–1 day	2/17	11.8	12.6	0.0–38.7	0/18	0.0	-	-
Time required to obtain a male condom from the place of work								
Under 5 minutes	11/17	11.8	22.3	8.3–36.3	1/18	5.6	2.1	2.8–3.8
5–10 minutes	1/17	5.9	3.1	0.0–8.5	4/18	22.2	15.4	1.7–29.1
10–30 minutes	6/17	35.3	27.1	3.2–51.0	3/18	16.7	21.4	1.2–41.5
30–60 minutes	6/17	35.3	34.8	10.9–58.8	10/18	55.6	61.2	37.3–85.0
1 hour–1 day	2/17	11.8	12.7	13.5–38.8	0/18	0.0	-	-
Given condoms in the last 12 months	3/60	5.0	3.8	0.0–12.5	1/200	0.5	0.7	0.0–1.0
Place where one would ideally like to obtain condoms								
Shop	0/60	0.0	-	-	N/A	N/A	N/A	N/A
Pharmacy	41/60	68.3	58.1	43.1–73.2	N/A	N/A	N/A	N/A
Market	2/60	3.3	1.9	0.0–4.9	N/A	N/A	N/A	N/A
Clinic	3/60	5.0	4.0	0.0–10.0	N/A	N/A	N/A	N/A
Hospital	0/60	0.0	-	-	N/A	N/A	N/A	N/A
Maternal and child health clinic	1/60	1.7	2.4	0.0–6.3	N/A	N/A	N/A	N/A
Hotel	0/60	0.0	-	-	N/A	N/A	N/A	N/A
Friend	2/60	3.3	3.1	0.0–7.3	N/A	N/A	N/A	N/A
Family member	0/60	0.0	-	-	N/A	N/A	N/A	N/A
Other vulnerable women	0/60	0.0	-	-	N/A	N/A	N/A	N/A
Client(s)	7/60	11.7	20.2	3.6–36.8	N/A	N/A	N/A	N/A
Other	8/60	13.3	13.2	5.6–20.8	N/A	N/A	N/A	N/A

7.6. Female condoms

The proportion of women who have heard about the female condom has increased, but it is not significantly different (Table 16). Usage of female condom is at similar levels in 2008 and 2014. In 2008, questions related to usage of female condoms were minimal, but at the request of the United Nations Population Fund, additional questions were added in 2014, hence the unavailability of comparable data across both surveys. Similar to male condoms, pharmacies (38.6%) are the most commonly cited place where vulnerable women would like to obtain condoms, followed by friends (23.9%) and the market (10.8%).

Table 16: Knowledge and use of female condoms

Characteristic	2014				2008			
	Sample proportions		Population estimates		Sample proportions		Population estimates	
	n/N	%	%	95% CI	n/N	%	%	95% CI
Ever heard of a female condom	14/92	15.2	11.1	0.2–22.0	8/219	3.7	2.9	1.1–4.6
Ever used a female condom	2/14	14.3	8.8	0.0–38.2	1/8	12.5	9.1	0.0–22.4
Knows any place to obtain female condoms	2/14	14.3	18.5	0.0–38.2	2/8	25.0	-	-
Known places where female condoms can be obtained								
Shop	0/2	0.0	-	-	N/A	N/A	N/A	N/A
Pharmacy	1/2	50.0	-	-	N/A	N/A	N/A	N/A
Market	0/2	0.0	-	-	N/A	N/A	N/A	N/A
Clinic	0/2	0.0	-	-	N/A	N/A	N/A	N/A
Hospital	0/2	0.0	-	-	N/A	N/A	N/A	N/A
Maternal and child health centre	0/2	0.0	-	-	N/A	N/A	N/A	N/A
Hotel	0/2	0.0	-	-	N/A	N/A	N/A	N/A
Friend	1/2	50.0	-	-	N/A	N/A	N/A	N/A
Family member	0/2	0.0	-	-	N/A	N/A	N/A	N/A
Other vulnerable women	0/2	0.0	-	-	N/A	N/A	N/A	N/A
Client(s)	0/2	0.0	-	-	N/A	N/A	N/A	N/A
Preferred places to obtain female condoms								
Shop	0/14	0.0	-	-	N/A	N/A	N/A	N/A
Pharmacy	8/14	57.1	38.6	17.5–59.7	N/A	N/A	N/A	N/A
Market	2/14	14.3	10.8	0.0–25.2	N/A	N/A	N/A	N/A
Clinic	0/14	0.0	-	-	N/A	N/A	N/A	N/A
Hospital	0/14	0.0	-	-	N/A	N/A	N/A	N/A
Maternal and child health centre	0/14	0.0	-	-	N/A	N/A	N/A	N/A
Hotel	0/14	0.0	-	-	N/A	N/A	N/A	N/A
Friend	2/14	14.3	23.9	0.0–51.1	N/A	N/A	N/A	N/A
Family member	0/14	0.0	-	-	N/A	N/A	N/A	N/A
Other vulnerable women	1/14	7.1	10.2	0.0–27.4	N/A	N/A	N/A	N/A
Client(s)	1/14	7.1	8.9	0.0–24.8	N/A	N/A	N/A	N/A
Other	2/14	14.3	21.1	0.0–49.0	N/A	N/A	N/A	N/A

7.7. STI symptoms and STI treatment-seeking behaviour

Fewer women heard about STI in 2014 than in 2008, but the difference is not significant (Table 17). The familiarity with STI symptoms was different: fewer women recognized abdominal pain and genital discharge as symptoms in 2014 than in 2008. Herpes was an STI with which participants were significantly more familiar in 2014 than in 2008. Less than a tenth of the sample, across both surveys, cited having genital discharge of an ulcer or sore in the last 12 months. Of those who did, more women sought treatment from a hospital in 2014, compared with in 2008 when more women sought treatment from a traditional healer, although this difference is not significant.

Table 17: STI symptoms and STI treatment-seeking behaviour

Characteristic	2014				2008			
	Sample proportions		Population estimates		Sample proportions		Population estimates	
	n/N	%	%	95% CI	n/N	%	%	95% CI
Ever heard of STI	32/92	34.8	31.5	19.2–43.8	101/218	46.3	43.0	35.9–50.2
STI symptoms described in women *(Multiple choice)*								
Abdominal pain	1/32	3.1	1.1	0.0–2.9	24/60*	40.0	43.9	30.6–57.2
Genital discharge	3/32	9.4	4.7	0.0–10.2	29/60	48.3	42.5	27.1–57.8
Foul-smelling discharge	0/32	0.0	-	-	4/60	6.7	5.1	0.4–9.6
Burning pain on urination	1/32	3.1	3.2	0.0 – 8.7	3/60	5.0	8.6	0.0–18.3
Genital ulcers/sores	0/32	0.0	-	-	0/60	0.0	-	-
Swelling in groin area	0/32	0.0	-	-	0/60	0.0	-	-
Itching	9/32	28.1	16.7	6.5–32.9	0/60	0.0	-	-
Other	1/32	3.1	4.6	0.0–14.4	0/60	0.0	-	-
*In 2008, N is smaller because many answered “do not know”.								
STI symptoms described in men *(Multiple choice)*								
Abdominal pain	2/32	6.2	4.9	0.0–11.6	-	-	-	-
Genital discharge	3/32	9.4	3.5	0.0–7.2	5/25	20.0	-	-
Foul-smelling discharge	0/32	0.0	-	-	-	-	-	-
Burning pain on urination	1/32	3.1	2.7	0.0–7.3	6/25	24.0	-	-
Genital ulcers/sores	0/32	0.0	-	-	11/25	44.0	-	-
Swelling in groin area	0/32	0.0	-	-	3/25	12.0	-	-
Itching	1/32	3.1	1.3	0.0–3.7	-	-	-	-
Other	3/32	9.4	3.3	0.0–6.6	-	-	-	-
Heard of STI *(Multiple choice)*								
HIV	30/32	93.8	94.2	84.2–100.0	100/100	100.0	-	-
Chlamydia	0/32	0.0	-	-	1/100	1.0	0.4	0.0–1.0
Gonorrhoea	N/A	N/A	N/A	N/A	41/100	41.0	38.1	24.4–52.4
Herpes	20/32	62.5	62.4	39.3–85.6	3/100	3.0	2.2	0.0–5.2
Genital warts	1/32	3.1	0.9	0.0–23.9	1/100	1.0	1.0	0.0–3.1
Syphilis	3/32	9.4	8.4	0.0–18.0	9/100	9.0	6.8	0.0–17.4
Had genital discharge during the last 12 months	2/90	2.2	3.0	0.0–8.1	18/219	8.2	8.4	4.6–12.2
Had a genital ulcer/sores in the last 12 months	5/91	5.5	6.6	0.0–18.2	10/219	4.6	4.5	1.6–7.4

Characteristic	2014				2008			
	Sample proportions		Population estimates		Sample proportions		Population estimates	
	n/N	%	%	95% CI	n/N	%	%	95% CI
Last time they had genital discharge or genital ulcers/sores, they: *(Multiple choice)*								
(a) Sought advice/medicine from a general hospital?	3/5	40.0	-	-	1/16	6.3	-	-
(b) Sought advice/medicine from a private clinic or hospital?	0/5	0.0	-	-	1/16	6.3	-	-
(c) Sought advice/medicine from a maternal and child health clinic?	0/5	0.0	-	-	2/16	0.9	-	-
(d) Sought advice/medicine from a private pharmacy?	1/5	20.0	-	-	9/16	56.3	-	-
(e) Sought advice/medicine from a traditional healer?	0/5	0.0	-	-	0/16	0.0	-	-
(f) Took medicine you had at home?	0/5	0.0	-	-	3/16	18.9	-	-
(g) Told your sexual partner about the discharge/ulcer?	0/5	0.0	....	...	....	....	....	....
(h) Stopped having sexual intercourse when you had the symptoms?	1/5	20.0	-	-	0/16	0.0	-	-
(i) Used a condom when having sexual intercourse during the time you had the symptoms?	0/5	0.0	-	-	0/16	0.0	-	-
Action taken the last time she had genital discharge or ulcer/sore:								
(a) Sought advice/medicine from a general hospital?	3/5	60.0	-	-	1/16	6.3	-	-
(b) Sought advice/medicine from a private clinic or hospital?	1/5	20.0	-	-	1/16	6.3	-	-
(c) Sought advice/medicine from a maternal and child health clinic?	0/5	0.0	-	-	2/16	12.5	-	-
(d) Sought advice/medicine from a private pharmacy?	0/5	0.0	-	-	9/16	56.3	-	-
(e) Sought advice/medicine from a traditional healer?	0/5	0.0	-	-	0/16	0.0	-	-
(f) Took medicine you had at home?	0/5	0.0	-	-	3/16	18.8	-	-
(g) Other	1/5	20.0	-	-	0/16	0.0	-	-
If they took medicine, where did they obtain the medicine:								
Health worker in general hospital	2/5	40.0	-	-	13/14	92.9	-	-
Health worker in private clinic/ hospital	1/5	20.0	-	-	1/14	7.1	-	-
Maternal and child health clinic	0/5	0.0	-	-	0/14	0.0	-	-
Pharmacy	1/5	20.0	-	-	0/14	0.0	-	-
Traditional healer	0/5	0.0	-	-	0/14	0.0	-	-
Friend or relative	0/5	0.0	-	-	0/14	0.0	-	-
Other vulnerable women	0/5	0.0	-	-	0/14	0.0	-	-
Took medicine I had at home	0/5	0.0	-	-	0/14	0.0	-	-
Did not take any medicine	1/5	20.0	-	-	0/14	0.0	-	-

Characteristic	2014				2008			
	Sample proportions		Population estimates		Sample proportions		Population estimates	
	n/N	%	%	95% CI	n/N	%	%	95% CI
Amount paid for the medicine								
<USD 1	2/5	40.0	-	-	3/12	25.0	-	-
USD 1 to USD 5	2/5	40.0	-	-	6/12	50.0	-	-
USD 6 to USD 10	0/5	0.0	-	-	1/12	8.3	-	-
USD 11 to USD 20	0/5	0.0	-	-	1/12	8.3	-	-
USD 21 to USD 50	1/5	20.0	-	-	1/12	8.3	-	-
> USD 50	0/5	0.0	-	-	0/12	0.0	-	-
Received prescription for medicine from a doctor	4/5	80.0	-	-	13/14	92.9	-	-
Obtained medicine prescribed by the doctor	4/4	100.0	-	-	11/13	84.6	-	-
Took the medicine prescribed	4/4	100.0	-	-	N/A	N/A	N/A	N/A

7.8. Knowledge, opinions and attitudes

Across both surveys, the majority (97.3% in 2014, 96.2% in 2008) of vulnerable women have heard of HIV or AIDS (Table 18). There is a significant change in proportion of vulnerable women who know a person living with HIV, from 16.5 per cent in 2008 to 38.4 per cent in 2014. Additionally, there is a significant change in two questions about knowledge. Understanding that a healthy-looking person has HIV has increased from 33.5 per cent in 2008 to 80.3 per cent in 2014; and knowledge that mosquitoes do not transmit HIV has decreased from 68.5 per cent in 2008 to 35.6 per cent in 2014. This change, namely the decrease in knowledge, is unusual, and therefore the coding of the questions was double-checked and is in order. Overall, the composite GARPR indicator for knowledge – which is a composite variable of five questions – shows that knowledge overall has remained the same (10.4% in 2014 and 6.3% in 2008).

Table 18: Knowledge, opinions and attitudes

Characteristic	2014				2008			
	Sample proportions		Population estimates		Sample proportions		Population estimates	
	n/N	%	%	95% CI	n/N	%	%	95% CI
Ever heard of HIV or AIDS	85/89	95.5	97.3	90.9–100.0	211/219	96.3	96.2	93.4–98.9
Knows anyone infected with HIV or died of AIDS-related illness	29/84	34.5	38.4	26.2–50.6	38/219	17.4	16.5	11.5–21.5
Close relationship with that person								
Close relative	3/29	10.3	9.0	5.1–13.0	N/A	N/A	N/A	N/A
Close friend	22/29	75.9	58.9	40.9–76.8	N/A	N/A	N/A	N/A
Not close	4/29	13.8	32.1	13.8–50.5	N/A	N/A	N/A	N/A
Type of relationship with that person								
Husband	0/29	0.0	-	-	0/38	0.0	...	...
Child	0/29	0.0	-	-	0/38	0.0		
Sibling	3/29	10.3	9.2	0.0–19.4	0/38	0.0		
Parent	0/29	0.0	-	-	0/38	0.0		
Sexual partner (not husband)	0/29	0.0	-	-	0/38	0.0		
Client	0/29	0.0	-	-	0/38	0.0		
Friend	23/29	79.3	58.1	29.7–86.6	23/38	60.5		
Other	4/29	13.8	36.1	6.3–65.9	15/38	39.5		

Characteristic	2014				2008			
	Sample proportions		Population estimates		Sample proportions		Population estimates	
	n/N	%	%	95% CI	n/N	%	%	95% CI
"Other" type of relationship Neighbour Someone I know	N/A N/A N/A	N/A N/A N/A			10/15 5/15	…	…	…
***Can having sex with only one faithful, uninfected partner reduce the risk of HIV transmission? =**Yes	66/86	76.7	78.9	66.7–91.0	191/216	87.2	88.8	85.1–92.6
***Can using condoms reduce the risk of HIV transmission?** =Yes	46/89	52.9	51.6	37.6–65.6	151/219	68.9	70.6	64.6–76.7
***Can a healthy-looking person have HIV?** =Yes	71/88	80.7	80.3	67.2–93.5	77/219	35.2	33.5	27.0–40.0
***Can a person get HIV from mosquito bites?** =No	25/88	28.4	35.6	22.3–48.8	143/219	65.3	68.5	62.4–74.6
***Can a person get HIV by sharing a meal with someone who is infected?** =No	66/87	75.9	76.0	65.0–87.0	120/219	54.8	54.9	47.4–62.4
Can people protect themselves from HIV by abstaining from sexual intercourse? =Yes	77/86	89.5	89.6	78.0–100.0	166/219	75.8	76.6	70.4–82.7
Can a person get HIV by getting injections with a needle that was already used by someone else? =Yes	84/86	97.7	99.5	98.9–100.0	210/219	95.9	95.8	92.9–98.6
Can a pregnant woman infected with HIV or AIDS transmit the virus to her unborn child? =Yes	61/86	70.9	75.5	64.2–86.7	142/219	64.8	64.1	56.8–71.4
What can a pregnant woman do to reduce the risk of transmission of HIV to her unborn child? *(Multiple choice)* Take ARV Childbirth practices Breastfeeding/formula practices I do not know Other (all other said: abstain from sex)	 37/92 4/92 4/92 32/92 9/92	 40.2 4.3 4.3 34.8 9.8	 40.1 8.7 2.4 35.5 7.8	 28.8–51.3 0.0–20.3 0.0–5.3 24.5–46.6 0.0–18.5	 7/219 21/219 56/219 140/219 0/219	 3.2 9.6 25.6 63.9 0.0	 4.7 7.8 25.5 65.0 -	 0.8–8.5 4.1–11.4 18.7–32.2 56.6–73.4 -
Can a woman with HIV or AIDS transmit the virus to her child through breastfeeding? =Yes	69/85	81.2	83.6	71.9–95.2	191/219	87.2	88.8	84.5–93.1
Correctly identified ways of preventing transmissions and rejected major misconceptions (GARPR composite indicator)	6/89	6.7	10.4	0.0–26.1	13/219	5.9	6.3	1.0–11.5

Note: *Included in the GARPR indicator.

7.9. HIV testing

Across both surveys, very few vulnerable women know where to obtain an HIV test (3.5% in 2014, and 3.6% in 2008) (Table 19). However, there is a significant difference in HIV testing rates, including ever having had an HIV test (up to 29% in 2014, from 5% in 2008), and being tested in the last 12 months and receiving the test results (21.3% in 2014, and 2.4% in 2008). In 2014, more participants said they were required to have HIV test, and reasons for this change should be explored.

Table 19: HIV testing

Characteristic	2014				2008			
	Sample proportions		Population estimates		Sample proportions		Population estimates	
	n/N	%	%	95% CI	n/N	%	n/N	%
Know where to receive confidential HIV test	5/85	5.9	3.5	0.0–12.0	10/219	4.6	3.6	1.8–5.4
Ever had HIV test	24/85	28.2	29.6	18.3–40.9	13/214	6.0	5.0	2.6–7.4
Most recent HIV test								
Less than 1 month	0/24	0.0	-	-	1/13	7.7	4.3	0.0–10.2
1–3 months	6/24	25.0	27.5	9.7–45.3	3/13	23.0	24.7	3.1–46.4
3–6 months	4/24	16.7	21.5	3.7–39.4	2/13	15.4	13.7	0.0–29.8
6–12 months	8/24	33.3	28.2	8.6–47.7	1/13	7.7	5.0	0.0–12.2
More than 12 months	5/24	20.8	18.5	4.4–32.7	6/13	46.2	52.3	28.0–76.7
Do not remember	1/24	4.2	4.3	0.0–11.6	0/13	0.0	-	-
Knows result of the last test	21/24	87.5	86.7	73.6–99.8	13/13	100.0	-	-
Required to have the test?								
Voluntary	16/24	66.7	70.8	50.7–90.9	13/13	100.0	-	-
Required	7/24	29.2	24.9	5.3–44.5	0/13	0.0	-	-
Other	1/24	4.2	4.3	0.0–11.5	0/13	0.0	-	-
Told provider they were vulnerable women during the most recent HIV test	5/24	20.8	18.8	3.0–34.5	N/A	N/A	N/A	N/A
GARPR: Tested in the last 12 months and knows the result	17/85	20.0	21.3	10.7–31.9	7/219	3.2	2.4	1.7–3.0

7.10. Substance use

Vulnerable women in 2014 have used khat, shisha and cigarettes more frequently than in 2008, and these differences are significant. Daily khat chewing is up to 72.4 per cent in 2014, compared with 29.8 per cent in 2008. Daily shisha smoking is up to 65.1 per cent, compared with 36.2 per cent in 2008; and daily cigarette smoking is up to 42.7 per cent in 2014, compared with 12.6 per cent in 2008. Few vulnerable women engage in drinking across both surveys. One survey participant in 2014 has ever injected drugs, but they did not share injecting equipment.

Table 20: Substance use among vulnerable women

Characteristic	2014				2008			
	Sample proportions		Population estimates		Sample proportions		Population estimates	
	n/N	%	%	95% CI	n/N	%	%	95% CI
Frequency of chewing khat during the last month								
Every day	68/91	74.7	72.4	61.3–83.5	67/219	30.6	29.8	22.6–37.1
At least once a week	12/91	13.2	11.8	4.5–19.1	18/219	8.2	6.9	3.7–10.1
Less than once a week	2/91	2.2	1.0	0.0–2.1	6/219	2.7	2.6	0.3–5.0
Never	9/91	9.9	14.8	5.0–24.7	128/219	58.4	60.6	52.2–69.0
Frequency of smoking marijuana/hashish during the last month								
Every day	0/91	0.0	-	-	1/218	0.5	0.6	0.0–1.5
At least once a week	1/91	1.1	0.3	0.0–0.9	0/218	0.0	-	-
Less than once a week	6/91	6.6	4.4	0.0–11.9	0/218	0.0	-	-
Never	84/91	92.3	95.3	87.6–100.0	217/218	99.5	99.4	98.5–100.0
Frequency of inhaling glue during the last month								
Every day	1/91	1.1	0.3	0.0–0.7	1/218	0.5	0.4	0.0–1.2
At least once a week	2/91	2.2	1.2	0.0–3.9	2/218	0.9	0.9	0.0–2.0
Less than once a week	6/91	6.6	6.4	0.0–15.5	0/218	0.0	-	-
Never	82/91	90.1	92.1	82.9–100.0	215/218	98.6	98.7	97.4–100.0
Frequency of smoking shisha during the last month								
Every day	64/92	69.6	65.1	53.6–76.5	84/219	38.4	36.2	28.0–44.4
At least once a week	0/92	0.0	-	-	8/219	3.7	2.9	0.6–5.2
Less than once a week	1/92	1.1	0.3	0.0–0.7	5/219	2.3	3.3	0.7–5.9
Never	27/92	29.3	34.6	23.2–46.1	122/219	55.7	57.6	48.6–66.6
Frequency of smoking cigarettes during the last month								
Every day	38/92	41.8	42.7	29.8–55.6	27/219	12.3	12.6	7.1–18.1
At least once a week	5/92	5.5	4.6	0.0–9.7	0/219	0.0	-	-
Less than once a week	4/92	4.4	2.5	0.0–5.4	0/219	0.0	-	-
Never	44/92	48.4	50.2	38.8–61.6	192/219	87.7	87.4	87.4–81.9
Frequency of having drinks containing alcohol during the last month								
Every day	0/92	0.0	-	-	3/219	1.4	1.8	0.0–3.7
At least once a week	10/92	10.9	5.7	0.2–11.2	1/219	0.5	0.2	0.0–0.3
Less than once a week	7/92	7.6	6.0	0.0–13.8	2/219	0.9	1.0	0.0–2.1
Never	75/92	81.5	88.4	79.2–97.5	213/219	97.3	97.0	94.8–99.2
Frequency of taking sleeping pills during the last month								
Every day	1/91	1.1	0.9	0.0–3.6	1/219	0.5	4.4	0.0–1.2
At least once a week	4/91	4.4	0.5	0.0–1.0	2/219	0.9	0.7	0.0–1.4
Less than once a week	2/91	2.2	0.5	0.0–1.0	2/219	0.9	1.1	0.0–2.3
Never	84/91	92.3	95.0	88.1–100.0	214/219	97.7	97.8	96.2–99.4
Injected drugs in the last 12 months	1/91	1.1	0.6	0.0–2.9	0/219	0.0	-	-
Ever shared injecting equipment	0/1	0.0	-	-	0/0	0.0	-	-

Note:

7.11. Media and HIV intervention exposure and planning

Vulnerable women in 2014 listened to the radio less than in 2008, and this difference is significant; however, many more participants answered "do not know" in 2014, questioning the reliability of the comparison (Table 29). Exposure to television remains low across both surveys as approximately only one quarter of all vulnerable women watch TV every day or at least once a week in both 2014 (27.5%) and in 2008 (16.1%). In 2014, no vulnerable women indicated exposure to any sources of HIV information, including friends, posters, leaflets, billboards, and others, whereas this was indicated in 2008. There may have been a problem with interpretation/explanation of this question to vulnerable women in the 2014 survey. Furthermore, the preferred source of information has shifted: in 2008, vulnerable women's preferred persons for HIV and AIDS information were older women (61.6%), which then decreased (19.7%) in 2014. In terms of planning future interventions, nearly all vulnerable women indicated they would be willing to regularly attend a health centre, group learning activities or a drop-in centre. These questions were newly added in 2014.

Table 21: Media and HIV intervention exposure

Characteristic	2014				2008			
	Sample proportions		Population estimates		Sample proportions		Population estimates	
	n/N	%	%	95% CI	n/N	%	%	95% CI
Frequency of listening to the radio in the last month								
Every day	10/91	11.0	10.2	1.8–18.6	83/219	37.9	37.9	30.7–45.1
At least once a week	5/91	5.5	3.1	0.0–7.1	25/219	11.4	9.9	6.5–13.3
Less than once a week	2/91	2.2	1.5	0.0–3.7	6/219	2.7	3.0	0.5–5.5
Not in the past 4 weeks	24/91	26.4	30.1	17.7–42.5	67/219	30.6	30.4	23.9–36.9
Do not know (*possible interpretation: seldom to none*)	50/91	54.9	55.1	41.7–68.4	38/219	17.4	18.8	12.8–24.8
Radio station listened to most often								
BBC	1/17	5.9	7.9	1.3–14.4	17/113	15.0	14.5	7.1–21.8
Somali radio	16/17	94.1	92.1	85.6–98.7	83/113	73.5	75.4	67.6–83.2
Ethiopian radio	N/A	N/A	N/A	N/A	12/113	10.6	9.8	5.1–14.5
Oroma radio	N/A	N/A	N/A	N/A	1/113	0.9	0.4	0.0–0.8
Frequency of watching television in the last month								
Every day	19/91	20.9	17.0	8.2–25.9	7/93	7.5	7.5	1.2–13.7
At least once a week	8/91	8.8	10.5	2.6–18.5	10/93	10.8	8.6	2.6–14.6
Less than once a week	0/91	0.0	0.0	-	2/93	2.2	3.7	0.0–10.7
Not in the past four weeks	17/91	18.7	23.9	11.2–36.6	74/93	79.6	80.2	0.0–10.7
Do not know (*possible interpretation: seldom to none*)	47/91	51.6	48.6	34.2–63.0	0/93	0.0	-	-
Television station watched most often								
BBC	0/27	0.0	-	-	N/A	N/A	N/A	N/A
Somaliland national TV	8/27	29.6	34.2	17.3–51.0	N/A	N/A	N/A	N/A
Somaliland space channel	0/27	0.0	-	-	N/A	N/A	N/A	N/A
Borama TV	0/27	0.0	-	-	N/A	N/A	N/A	N/A
Horn cable TV	19/27	29.6	65.9	49.0–82.7	N/A	N/A	N/A	N/A
Other	0/27	0.0	-	-	N/A	N/A	N/A	N/A

Characteristic	2014				2008			
	Sample proportions		Population estimates		Sample proportions		Population estimates	
	n/N	%	%	95% CI	n/N	%	%	95% CI
Sources of HIV and AIDS information in the last 12 months (Multiple choice)								
Friend – vulnerable women	0/92	0.0	-	-	6/77	7.8	5.6	8.6–10.3
Friend – NOT vulnerable women	0/92	0.0	-	-	2/77	2.6	2.5	0.0–6.3
Leaflet or poster	0/92	0.0	-	-	1/77	1.3	1.0	0.0–2.4
Newspaper – Somaliland	0/92	0.0	-	-	0/77	0.0	-	-
Newspaper – Not Somaliland	0/92	0.0	-	-	0/77	0.0	-	-
TV – Somaliland	0/92	0.0	-	-	13/77	16.9	16.6	5.9–27.3
TV – Not Somaliland	0/92	0.0	-	-	2/77	2.6	2.5	1.3–3.8
Radio – Somaliland	0/92	0.0	-	-	29/77	37.7	36.8	25.1–48.4
Radio – Not Somaliland	0/92	0.0	-	-	24/77	31.2	36.8	15.9–57.8
Awareness-raising by NGO	0/92	0.0	-	-	0/77	0.0	-	-
From doctor or nurse	0/92	0.0	-	-	0/77	0.0	-	-
Counselling during HIV/STI test	0/92	0.0	-	-	0/77	0.0	-	-
Other	0/92	0.0	-	-	0/77	0.0	-	-
Preferred person as source of HIV/STI information								
Female, same age	33/72	45.8	48.2	33.7–63.4	72/219	32.9	32.2	25.8–38.6
Female, older	15/72	20.8	19.7	6.9–32.4	135/219	61.6	63.0	56.6–69.4
Male, same age	0/72	0.0	-	-	3/219	1.4	1.0	1.0–2.0
Male, older	11/72	15.3	14.9	6.3–23.6	5/219	2.3	2.0	0.5–3.5
Other	2/72	2.8	2.3	0.0–7.8	4/219	1.8	1.7	2.2–3.3
Preferred place as source of HIV/STI information								
Health clinics	44/86	51.2	48.0	34.8–60.6	20/184	10.9	10.3	5.3–15.3
Hospital	9/86	10.5	8.2	2.8–13.6	7/184	3.8	3.1	0.9–5.2
Community health workers	11/86	12.8	17.4	5.4–29.4	143/184	77.7	79.2	71.6–86.8
Radio	10/86	11.6	15.5	4.6–26.3	13/184	7.1	7.0	2.4–11.7
TV	12/86	14.0	11.2	4.0–18.4	13/184	0.5	0.4	0.0–1.0
Willingness to regularly visit health centre, if provided	91/91	100.0	-	-	N/A	N/A	N/A	N/A
Willingness to visit "drop-in" centre, if provided	80/91	82.90	87.6	75.5–99.8	N/A	N/A	N/A	N/A
Willingness to attend group learning activity	88/89	98.9	99.3	97.5–100.0	N/A	N/A	N/A	N/A

Another newly added question in the 2014 survey was around priorities for vulnerable women around health and social support (Table 22). These questions were completely open ended and asked without probing. The most common priorities for vulnerable women included improving health (43.4%), increasing income and financial stability (32.2%), and quitting high-risk sex for money/finding a better job (32.2%).

Table 22: Priorities for vulnerable women

Characteristic	2014 Sample proportions	
Top three priorities in terms of health and social support (*thematic analysis of an open-ended question*)		
(a) Improve health (get health advice, services, medication)	39/90	43.3%
(b) Increase income/financial stability	29/90	32.2%
(c) Quit high-risk sex/get better job	29/90	32.2%
(d) Get assistance	17/90	18.9%
(e) Improve living conditions (new home, clothing, food)	16/90	17.8%
(f) Get education	16/90	17.8%
(g) Get tested / learn current health status	15/90	16.7%
(h) Improve children's life	10/19	11.1%

7.12. Stigma and discrimination

Of the six stigma and discrimination indicators, four out of six showed a significant change across the two surveys; unfortunately, three of these four reflected higher levels of discrimination (Table 23). For example, in 2008, 90.4 per cent of vulnerable women believed a student should be allowed to go to school if they have HIV, whereas this same indicator is only 55.6 per cent in 2014. A similar trend is found across the two other indicators as well, "should a teacher with HIV be allowed to go to school" (88.2% in 2008 and 38.9% in 2014), and "would you buy food from a shopkeeper or food seller with HIV" (62.4% in 2008, 39.3% in 2014). However, the indicator "would you want to keep it a secret if a family member became ill with HIV" showed some improvement at 92.5 per cent in 2008, and 25.7 per cent in 2014.

Table 23: Stigma and discrimination

Characteristic	2014				2008			
	Sample proportions		Population estimates		Sample proportions		Population estimates	
	n/N	%	%	95% CI	n/N	%	%	95% CI
Willing to share cutlery, plates and/or glasses with a person known to have HIV or AIDS = Yes	26/80	29.2	35.3	24.6–46.1	60/209	28.7	27.8	21.5–34.0
Willing to care for a male or female relative with HIV = Yes	69/90	76.7	78.3	68.4–88.2	178/218	81.7	81.5	76.4–86.6
Should a student with HIV, who is not sick, be allowed to go to school = Yes	43/87	49.4	55.6	44.1–67.0	194/217	89.4	90.4	86.6–94.3
Should a teacher with HIV, who is not sick, be allowed to go to school = Yes	32/87	36.8	38.9	27.8–50.0	192/219	87.7	88.2	84.0–92.4
Would you buy from a shopkeeper or food seller who has HIV = Yes	29/88	33.0	39.3	28.8–49.8	136/219	62.1	62.4	55.8–69.0
Would want to keep a secret if family member became ill with HIV = Yes	22/88	25.0	25.7	14.0–37.3	202/219	92.2	92.5	89.0–96.1

7.13. Networks and support

This section was newly added to the 2014 questionnaire; hence no data is available for 2008. Less than half (40.2%) of vulnerable women belong to a vulnerable women group, and those who do mostly say the group is for leisure and social activities (64.6%). Just over half of vulnerable women (52.5%) discuss their problems with other vulnerable women, illustrating the potential

for peer interventions. Few (18.5%) vulnerable women own a mobile phone, illustrating m-health innovations would be premature in Somaliland for this population; however, those who do have a phone would be interested in receiving information about health and HIV. When asked about the most needed interventions, health took priority, mentioned by 45.9 per cent of vulnerable women.

Table 24: Networks and support

Characteristic	Sample proportions		Population estimates	
	n/N	%	%	95% CI
Member of a vulnerable women group	38/88	43.2	40.2	28.3–52.1
This group is mainly involved in:				
Leisure and social activities	24/38	63.2	64.6	45.8–83.3
Vulnerable women issues advocacy/promotion	2/38	5.3	3.4	0.0–8.5
Health advice and support	0/38	0.0	-	-
Community support and welfare	0/38	0.0	-	-
Other	12/38	31.6	32.0	12.8–51.2
Discusses general problems with other vulnerable women	44/89	49.4	52.5	42.1–62.9
Plans to continue with high-risk sex in the future	11/89	12.4	11.2	0.0–22.7
Owns a mobile phone	20/88	22.7	18.5	7.6–29.5
Uses a mobile phone to communicate with other vulnerable women or clients	16/20	80.0	77.0	56.2–97.8
Interested in receiving text messages about health and HIV	19/20	95.0	96.2	79.6–100.0
Use the Internet to communicate with vulnerable women or to obtain health information	0/88	0.0	-	-
Most needed interventions				
Health	47/88	53.4	45.9	34.0–57.7
Legal	4/88	4.5	5.3	0.0–10.6
Education	9/88	10.2	9.2	3.0–15.4
Support groups	28/88	31.8	39.6	26.7–52.5
Other	0/88	0.0	-	-

A further open-ended, qualitative question was asked about plans for the future (Table 25). Most (61.9%) vulnerable women indicate they would like to quit high-risk sex for money, repent to Allah (10.7%), followed by the desire to “get a better life” (8.3%), and get a job (8.3%). Less than 10 percent (8.3%) of vulnerable women indicated their plans include to continue high-risk sex for money.

Table 25: Plans for the future

Characteristic	Sample proportions	
	n/N	%
Plans for the future (thematic analysis of an open-ended question)		
(a) Quit high-risk sex for money	52/84	61.9%
(b) Repent to Allah	8/84	10.7%
(c) Get better life	7/84	8.3%
(d) Get a job	7/84	8.3%
(e) Continue high-risk sex for money	7/84	8.3%
(f) Get married	5/84	6.0%
(g) Get education	2/84	2.4%
(h) Other	3/84	3.6%

7.14. Bivariate analysis

Given the small sample size, any further subgroup analysis is challenging; however, some key indicators were reviewed, mainly by age and nationality. These data are presented in Table 26. None of the subgroup analysis by age is statistically significant.

Table 26: Bivariate analysis by age

	<25			25+		
	n/N	% (Unadjusted)	% (RDS adjusted)	n/N	% (Unadjusted)	% (RDS adjusted)
HIV infected	2/32	6.3	4.1	3/63	4.8	5.2
Condom use at last sex with client (GARPR)	8/32	25.0	20.6	23/60	38.3	36.3
Condom used consistently with clients in past month	4/30	13.3	13.3	10/59	17.0	13.6
Ever heard of male condom	17/30	56.7	48.9	43/60	66.7	66.0
More than four clients in the last seven days	11/32	34.4	32.1	16/60	26.7	30.0
% of vulnerable women who had HIV test in past 12 months and knew result (GARPR)	5/27	18.6	21.0	12/58	20.7	21.3
Ever had HIV test	7/27	26.0	31.5	17/58	29.3	28.5
% of vulnerable women who correctly identified ways of preventing transmissions and rejected major misconceptions (GARPR)	1/29	3.5	3.8	5/60	8.3	12.7

The second attempt at bivariate analysis stratified respondents by nationality, mainly Somaliland and Ethiopia (Table 27). Three indicators are statistically different by place of birth; these include "condom used at last sex with client", "condoms used consistently over the past month" and "ever had an HIV test". Both chi square[6] and Fisher's exact test[7] were performed for these indicators. The Fisher's test is more appropriate with smaller sample sizes and should be reported. Both tests are displayed for convenience. As the sample size is small and place of birth subgroups are very small, it is possible these differences have occurred due to self-selection or another bias, and therefore interpretation is limited.

[6] A chi-squared test is any statistical hypothesis test in which the sampling distribution of the test statistic is a chi-squared distribution when the null hypothesis is true. The chi-square test is used to determine whether there is a significant difference between the expected frequencies and the observed frequencies in one or more categories.

[7] Fisher's exact test is a statistical significance test used in the analysis of contingency tables, typically used with small sample sizes.

Table 27: Bivariate analysis by origin

	Somaliland			Ethiopia			Other		
	n/N	% (Unadjusted)	% (RDS adjusted)	n/N	% (Unadjusted)	% (RDS adjusted)	n/N	% (Unadjusted)	% (RDS Adjusted)
HIV infected	5/78	6.4	5.8	0/10	0.0	-	0/10	0.0	-
Condom use at last sex with client (1)	19/76	25.0	25.3	8/9	88.9	79.6	4/7	57.1	40.0
Condom used consistently with clients in past month (2)	9/73	12.3	9.5	2/9	22.2	30.9	3/7	42.9	37.5
Ever heard of male condom	48/75	64.0	60.2	8/9	88.9	79.3	4/6	66.7	43.4
More than four clients in the last 7 days	19/76	25.0	24.6	5/9	55.6	62.9	3/7	42.9	59.8
% of vulnerable women who had HIV test in past 12 months and knew result (UNGASS)	11/69	15.9	15.8	3/9	33.3	43.3	3/7	42.9	52.5
Ever had HIV test (3)	15/69	21.7	22.1	5/9	55.6	66.2	4/7	57.1	59.3
% of vulnerable women who correctly identified ways of preventing transmissions and rejected major misconceptions (GARPR)	5/73	6.9	10.4	0/9	0.0	-	1/7	0.0	-

(1) $p < 0.001$ (Chi squared and Fisher's exact test)

(2) $p = 0.019$ (Chi squared) and $p = 0.012$ (Fisher's exact)

(3) $p = 0.022$ (Chi squared) and $p = 0.016$ (Fisher's exact)

8. Limitations

First and foremost, security challenges significantly hampered progress of the research, and thus the initial target sample size was not reached. It is highly recommended that measures be taken in advance of the next IBBS survey to ensure extensive government and local community support for UN partnered and endorsed interventions. The data analysis would have benefited from a larger sample size, as with the current data, there are significant challenges in disaggregating indicators by subgroups, and some indicators did not reach convergence. The most noteworthy example is regarding nationality, as the sample is heavily weighted to Somaliland-born respondents, while the previous surveillance was predominantly Ethiopian-born respondents. In theory, RDS corrects for this by long-chain referrals reaching across networks, by achieving convergence with the target population and through statistical adjustment for recruitment biases; unfortunately, convergence was only reached on some variables in this study.

Future IBBS surveys would benefit from inclusion of questions to estimate the size of key populations (a PSE technique).[8] A question that could, at a later date, be triangulated with another independent reference point can be included, to estimate the population size of vulnerable women using the multiplier method. Although currently there are no second independent data points to allow triangulation (e.g. police records, intervention programme data, etc.), this hopefully will be the case in the near future. Also, a question asking whether respondents had participated in a survey such as this before (e.g. the previous IBBS) was omitted, and in the future, should be included in the questionnaire.

Finally, as with many RDS studies, ensuring respondents are true members of the target population can be a challenge. Given RDS works based on incentives, if the incentive amount is too high, it can erroneously encourage illegitimate members of the population, or imposters, simply to collect the incentive. To minimize compromising the validity of the sample, a vulnerable woman was included as part of the study team, to assist in screening vulnerable women. Furthermore, the modest incentive amount was considered by partners not to have been incentive enough for women to pretend to be a member of the target population.

[8] Population size estimates allow stakeholders to develop models to estimate and project HIV prevalence. PSE techniques include capture–recapture, multiplier method and network scale-up, to name a few.

9. Review of recommendations from previous surveillance

Before embarking on a summary of the conclusions and recommendations from this round of surveillance, it is important to review progress against recommendations from the last survey. Table 28 presents a summary of these recommendations, and a brief update as to whether these recommendations from the previous IBBS survey have been accomplished by the National Response, and all HIV stakeholders in Somaliland.[9] The legend of colours displayed those recommendations achieved and ongoing in green, those not achieved in red, and those where measurement of milestones and progress is unavailable in yellow. In summary, it is clear that while strides have been made to implement interventions with vulnerable women for the first time in Somaliland, little progress has been made around condom promotion and interventions. Furthermore, while religious leaders and community members may have been trained, the follow-up, monitoring and longer-term impact of this awareness-raising and behaviour change often goes unmeasured and unquantified. Relevant questions pertain to, for example, how many of those religious leaders and peer educators are still working within these programmes 6 and 12 months later, and how many people have they reached, and with what quality of information.

Table 28: Summary of recommendations from 2008 IBBS survey

	Recommendation from 2008 IBBS Survey	Status as of July 2014
1	Initiate networking with vulnerable women to establish an entry point for engagement, service signposting/provision and interventions. Initially, points of contact would ideally be made through local NGOs and community organizations, in coordination with SOLNAC. It is essential that staff engaging with vulnerable women be trained, discreet and sensitive.	Completed and ongoing, with select NGOs working with vulnerable women
2	Develop interventions specifically among vulnerable women to increase knowledge and behaviour change interventions, primarily to increase condom use with clients. Interpersonal engagement, including peer education, is recommended due to the fact that vulnerable women often have low educational attainment, which results in most women being illiterate. It is also an important factor to ensure that confidentiality is maintained. The majority of vulnerable women expressed preference for an older woman as a source of HIV and AIDS information. Using both Somali- and Amharic-speaking staff will ensure the majority of vulnerable women are engaged in their native language, which is of particular importance among vulnerable undocumented migrants who have limited or no Somali language skills.	Completed and ongoing
3	Improve vulnerable women's access to health services, including HIV and STI testing, treatment, care, referral for social support and condom provision. Services provided should be through the existing health-care infrastructure, including maternal and child health centres, with specific provision for vulnerable women to ensure confidentiality and good uptake of services among vulnerable women. Training and sensitization of staff where vulnerable women health services will be integrated is essential.	Completed and ongoing

[9] These recommendations can be found in full on pages 25–26 of the IBBS Survey report by IOM and SOLNAC; the full reference can be found in the reference list.

	Recommendation from 2008 IBBS Survey	Status as of July 2014
4	Ensure vulnerable women attending voluntary counselling and testing (VCT) take rapid tests to ensure knowledge of HIV/STI status, and are signposted to treatment pathway where necessary. Among the few vulnerable women that had taken an HIV test, none knew their result. In contrast, all vulnerable women who participated in the research waited for their rapid HIV and syphilis test results.	Ongoing
5	Develop interventions specifically among male populations to promote positive attitudes to and use of condoms.	Not completed
6	Engage religious leaders in training, education, awareness and sensitization opportunities.	Completed and ongoing
7	Promote a condom distribution strategy. Implement a comprehensive condom distribution strategy engaging UN agencies, NGOs and the private sector through social marketing, with the assistance of SOLNAC. Currently, vulnerable women do not know where to find condoms; therefore, the strategy must include public awareness campaigns, sensitization and education for the community including men and women.	Not completed
8	Ensure sexual and reproductive health rights principles are mainstreamed into interventions and service provision among vulnerable women.	Completed and ongoing
9	Complete baseline surveillance among vulnerable women in Berbera and other sites in Somaliland. Since results from interrupted data during this study indicated HIV prevalence could be significantly higher among vulnerable women than in Hargeisa, this requires further investigation through surveillance. In addition, the epidemiology of HIV and syphilis infections and related behaviours need to be established throughout Somaliland.	Not completed
10	Conduct a second round of surveillance among vulnerable women and expand number of sites. Repeated rounds of surveillance every three years will monitor the impact of the response in terms of changes in HIV prevalence, provision and use of condoms, uptake of VCT, and exposure to interventions among vulnerable women.	Completed and ongoing
11	Develop a comprehensive surveillance system in Somaliland including other most at-risk populations, particularly clients such as truck drivers and uniformed services.	Not completed
12	Explore the value and feasibility of testing for other STI, in addition to HIV and syphilis, in future rounds of surveillance.	Completed
13	Develop and expand future questionnaires to explore: (a) Improving classification of client occupation groups both for research/ surveillance and targeting of programmes; and (b) Exploring personal HIV risk perception among respondents.	Completed

10. Conclusions and recommendations

Overall, this second round of IBBS survey with vulnerable women has collected a large amount of information, and has now established a second data point with one key population of interest in Somaliland. This data will lead to evidence-informed interventions, as well as guide future surveillance and research activities. Detailed conclusions and recommendations are outlined below. These recommendations align with the newly launched National Strategic Plan (NSP) for the Somali HIV and AIDS response 2015–2019.

10.1. Evidence-informed interventions

In order for stakeholders to succeed in stopping and reversing the spread of HIV in Somalia, the following areas should be prioritized, in terms of planning evidence-informed interventions.

10.1.1. Increase condom awareness and usage

The majority of vulnerable women have heard of male condoms, and there is a noticeable increase in ever having used a male condom (60.1%) and being familiar with places where condoms can be obtained (32.3%). However, while more vulnerable women in 2014 have ever used a condom, compared with in 2008 (25%), this indicator is still low considering that nearly three quarters (70.5%) of vulnerable women have had two or more partners in the past seven days, showing a high prevalence of concurrent and multiple partnerships, of particular concern for HIV transmission. Most importantly, less than a third (31.5%) of vulnerable women used a condom at last sex with a client.

***Recommendations**: In alignment with the new NSP for the Somali HIV and AIDS Response 2015–2019, conduct condom promotion and distribution through the public sector and social marketing among vulnerable women. Conduct operational research to explore and document community perceptions, identify gaps in knowledge, attitudes and skills, and develop strategies to increase the correct and consistent use of condoms (section 3.1.3). While this recommendation applies to all young men and women, mobile and cross-border populations, as well as key affected populations, in the context of this research, it is equally applied to vulnerable women specifically, particularly as a cross-over population with each of these aforementioned groups.*

10.1.2. Increase HIV testing

While strides have been made in HIV testing across the two surveys in terms of ever having had an HIV test (29.6% in 2014; 5% in 2008), coverage of HIV testing and counselling (HTC) among vulnerable women remains low. Furthermore, the GARPR indicator for having had an HIV test in the last 12 months and received the result remains at less than a quarter of all vulnerable women (21.3%).

***Recommendations**: A two-step approach to increase HIV testing among vulnerable women is needed. Firstly, as part of a social and behaviour change communication (SBCC) intervention targeting vulnerable women specifically, peer educators should be trained to encourage and raise awareness of the importance of HIV testing, and mobilize vulnerable women to attend HTC centres. These interventions need to be sustainable, and continuous, and not solely dependent upon Global Fund resources, as currently. Secondly, as part of routine HTC, and general health practice including provider-initiated testing and counselling, health service providers should be trained to ask questions regarding high risk sexual behaviour. If and when patients disclose to high-risk sexual activity, targeted messaging, including information on the importance of correct*

and consistent condom usage and the need for routine HIV testing, should be conveyed. The new NSP proposes actions to strengthen Somali community service organization (CSO) capacity for the delivery of HTC services, this should include CSO working with vulnerable women.

10.1.3. Increase knowledge around HIV

While efforts have been made to increase the knowledge and awareness around HIV and AIDS among vulnerable women, few vulnerable women (10.1%) can correctly identify ways of preventing HIV transmission and correctly identify myths. This indicator has only minimally changed since the last survey in 2008 (6.3%). Current SBCC interventions have targeted the general population in Somaliland, and some targeted interventions among vulnerable women exist; however, these must be scaled up as part of a comprehensive and sustainable set of interventions.

***Recommendations**: Documented approaches for vulnerable women engagement should be explored and piloted in the Somali context, including vulnerable women-led outreach, development of vulnerable women collectives, strengthening community systems and comprehensively evaluating these approaches to document successes and continual gaps.*[10]

10.1.4. Reduce stigma around HIV

Significant levels of stigma and discrimination still exist among vulnerable women. While over three quarters of vulnerable women (78.3%) would take care of a relative with HIV, only just over half (55.6%) believe a child with HIV should be able to go to school, only just over a third (39.3%) would buy food from a shopkeeper with HIV, and a quarter of vulnerable women (25.7%) would still keep it a secret if a member had HIV. This high prevalence of stigma certainly affects access to HIV testing and treatment, and likely even more so for vulnerable women as a stigmatized group.

***Recommendations**: Social, institutional and personal stigma related to HIV needs to be addressed through the aforementioned SBCC interventions, utilizing vulnerable women via a peer approach. The NSP outlines general strategies to improve the enabling environment for the delivery of HIV and AIDS services in Somaliland, including sensitization of religious, political, community leaders and the media to address HIV-related stigma and discrimination. The strategies also include supporting the development and adoption of policies that improve equitable and affordable access to prevention, treatment, care and support services and mainstreaming HIV into other sectoral strategies; these strategies will affect the environment for vulnerable women as well. It is unlikely that Somaliland is ready now for general vulnerable women's hard-reduction sensitizations given cultural and religious barriers, and therefore in its place, general HIV sensitization relating to "high-risk behaviours: should be the focus. The use of appropriate and non-discriminatory, context-appropriate language is key (e.g. "high-risk women", rather than "vulnerable women").*

10.1.5. Innovate with HIV interventions

Given the minimal work with vulnerable women to date, nearly any intervention would be considered "innovation" in Somaliland, particularly given that mostly general population interventions have been the focus of the national response to date. However, some additional information from this research gives weight to new ideas. Surprisingly, more vulnerable women watch TV than listen to the radio, 27.5 per cent every day or at least once a week, compared

[10] These vulnerable women suggested interventions are documented across varying contexts, and should be adapted to the context in Somaliland, where appropriate. (World Health Organization, United Nations Population Fund, Joint United Nations Programme on HIV/AIDS, Global Network of Sex Work Projects, The World Bank, Implementing comprehensive HIV/STI programmes with sex workers: Practical approaches from collaborative interventions (World Health Organization, Geneva, 2013).

with 13.3 per cent, respectively. While one cannot identify a trend with only two data points, it appears fewer vulnerable women listen to the radio in 2014 (down from 47.8% in 2008) and more vulnerable women watch TV (up from 16.1% in 2008). While less than a quarter (18.5%) of vulnerable women own a mobile phone, more than three quarters of those (77%) would be interested in receiving information around health and HIV on their mobile phone. The survey has shown that vulnerable women do not access the Internet (0%); however, with an average network size of almost 10 (mean = 9.8), outreach would be a viable option to access vulnerable women. The existence of pimps in Hargeisa has been documented for the second time,[11] with nearly a fifth (18.5%) of vulnerable women respondents indicating they operate through a pimp.

***Recommendations**: Comprehensive programming for vulnerable women should explore the inclusion of TV programmes, as to date HIV programming in Somaliland has only utilized radio. While Somaliland may not yet be ready for m-health or Internet-based interventions with vulnerable women, these should continually be explored in repeated surveillance, in the event access to mobile phones and Internet becomes more widespread, and new interventions could be conceptualized. Stakeholders should consider inclusion of pimps in programmatic interventions and prevention and awareness activities going forward. To date, there is limited or no reference to inclusion of pimps in programmatic interventions in Somaliland, and limited inclusion in any of the national response documents – strategic framework, monitoring and evaluation (M&E) plan and others.*

10.2. Additional research and M&E

10.2.1. Population size estimations

The average network size of vulnerable women is nearly 10 (mean = 9.8), and the formative assessment provided imprecise estimations that the overall population size of vulnerable women is larger than 500.

***Recommendations**: Stakeholders should come together to identify the most appropriate PSE technique(s) in the Somaliland context for vulnerable women, and plan for this exercise in 2014, under the guidance of the national strategic framework. Such an exercise would require collaborative planning to obtain the multiple data points often needed for such an exercise, technical expertise in this field and financial resources. This was also a recommendation from the formative assessment, and since has been included in the new HIV National Strategic Plan for Somalia. Given that two independent data points are not available to allow for a multiplier PSE calculation, another option would be to conduct an observations mapping exercise, in collaboration with "wisdom of the crowd" method or "modified Delphi". Participants of the mapping would be asked their best estimate of the number of key population members like them in their locations. This method assumes that members of the population have specialized information on the population, and that personal opinion formulated in private will not be influenced by others' responses. The estimate will be examined as the median, mode and mean responses and compared to the other size estimation methods (e.g. mapping and observation). The wisdom of the crowd method has been used in IBBS surveys in other contexts such as Ghana, South Africa and Kenya; however, those contexts have less restrictive environments, and as such, the feasibility of this method would need to be reviewed and assessed by all stakeholders involved in the national response.*

10.2.2. Routine surveillance

IBBS surveys with vulnerable women in Hargeisa can be undertaken despite the sensitive nature of the work. Lessons learned for creating an enabling environment, and increasing chances of

[11] First-time existence of pimps was documented in the formative assessment undertaken for this IBBS, in 2013.

success of any future surveys, are now documented. Surveillance activities should be repeated with the same groups, in the same geographic locations, to allow for comparability of data and the possibility of documenting trends, while the surveillance should also be expanded to additional groups and locations to provide further data points.

***Recommendations**: A follow-up IBBS survey should be conducted in two to four years. This would provide a third data point, which would for the first time provide a trend for vulnerable women surveillance in Somaliland. Funding should be secured, and the activity appropriately planned, using the same research protocol and data collection tools, to allow comparability of the data. Lessons learned from this IBBS should be utilized to ensure the success of the survey, most notably survey continuation to reach the desired sample size.*

10.3. Enabling environment for future IBBS surveys

There are many documented lessons learned from this IBBS survey with vulnerable women, most notably that creating an enabling environment to work with key populations in Somaliland is pertinent to the success of any research or intervention activities.

***Recommendations**: Before conducting any future surveillance with vulnerable women, the following should be reviewed and applied in advance, and during, both research and implementation of interventions.*

- Study "shield" – Through alliances with relevant authorities including religious and community leaders, the police and key government stakeholders, a "shield" can be formed to protect the study from misconceptions and myths, and prevent rumours from spreading. This type of shield can protect the study and its objectives from being divulged in the media, and from the study site and its activities being disrupted by inquiring individuals and groups. To develop this "protection", relationships must be fostered and trust built with each of these key stakeholders.
- Awareness-raising activities – Through the assistance of key stakeholders, awareness-raising activities to inform the general community about the planned activities is recommended. The extent to which precise information on the key population involved in the study should be carefully considered, in order to protect both the survey staff and the research respondents.
- Support from relevant government counterparts – For the success of these activities, it is crucial that relevant government counterparts show support for UN endorsed and partnered interventions, such as IBBS surveys. They are collaborative efforts, and as such all participating and supporting agencies should support in all stages of development, and in the event of criticism from the community.
- Government roles and responsibilities – Clarity in communication between the Ministry of Health and the AIDS Commission, and the roles and responsibilities of each entity, would benefit both future IBBS surveys, and also the greater HIV national response.
- IBBS survey site – In future surveys, investigators should look into incorporating the research site into existing health facility (e.g. IOM clinic, maternal and child health centres). Alternatively, if the site remains separate, the location should be marketed as a women's health group or community establishment, to avert unwanted attention when activities commence.
- Review use of language – The term "sex worker" in Somaliland is controversial, and therefore the national response has used alternative language – "vulnerable women". This practice should continually be reviewed with national stakeholders.

Annexes

A.1. Sociodemographic characteristics – Interval variables

Table A.1. Sociodemographic characteristics – Interval variables

	2014		2008	
	Sample	Population estimate	Sample	Population estimate
Age (crude t-test = 0.9986, p = 0.32)				
N	95	-	219	-
Median	28	30.0	28	28.0
Mean	30.4	32.2	29.4	29.6
Standard deviation (SD)	8.58	-	8.08	-
Range	17–52	-	13–60	-
Months lived in Hargeisa				
N	31	-	N/A	N/A
Median	24.0	24.0	N/A	N/A
Mean	46.3	47.2	N/A	N/A
Range	2–168	-	N/A	N/A
Age when married				
N	51	-	49	-
Median	17.0	17.0	17.0	17.0
Mean	17.63	18.2	17.29	17.02
Range	12–28	-	12–35	-
Living children				
N	95	-	N/A	N/A
Median	2.0	2.0	N/A	N/A
Mean	1.98	2.26	N/A	N/A
Range	0–8	-	N/A	N/A
Number of people being supported				
N	54	-	145	-
Median	3.0	3.0	2.0	2.0
Mean	3.28	3.5	2.83	2.80
Range	1–8	-	1-10	-
Age of circumcision				
N	92	-	193	-
Median	8.0	8.0	9.0	9.0
Mean	8.45	8.47	9.18	9.12
Range	4–14	-	2–15	-

A.2. Sexual history – Interval variables

Table A.2. Sexual history – Interval variables

Characteristic	2014		2008	
	Sample	Population estimate	Sample	Population estimate
Age of first vaginal sex				
N	92	-	219	-
Median	16.0	16.5	16.0	16.0
Mean	17.35	17.77	16.16	16.22
Range	9–35	-	10–25	-
Age of first anal sex				
N	4	-	64	-
Median	20.0	21.0	17.0	17.0
Mean	19.00	19.63	16.02	16.75
Range	14–22	-	11–37	-
Age of first oral sex to a man				
N	7	-	45	-
Median	20.0	20.0	17.0	17.0
Mean	18.57	18.62	17.44	17.08
Range	12–25	-	11–26	-
Age of first receiving oral sex				
N	5	-	6	-
Median	20.0	20.0	17.5	17.5
Mean	18.40	18.51	18.3	18.04
Range	12–25	-	14–26	-
Number of paying clients in the last 7 days				
N	92	-	216	-
Median	3.0	3.0	3.0	3.0
Mean	3.87	3.24	2.91	2.89
SD	4.76	-	1.88	-
Range	0–40	-	0–18	-
Number of non-paying partners in the last 7 days				
N	92	-	N/A	N/A
Median	0.5	0	N/A	N/A
Mean	1.64	1.52	N/A	N/A
Range	0–14	-	N/A	N/A
Number of total sexual partners in the last 7 days				
N	92	-	218	-
Median	4.5	4	4.0	4.0
Mean	5.67	4.84	4.02	3.85
SD	6.62	-	3.02	-
Range	0–50	-	0–33	-
Number of total sexual partners in the last 30 days				
N	92	-	209	-
Median	8.0	5	8.0	8.0
Mean	11.9	9.64	7.89	7.59
Range	0–70	-	0–30	-

A.3. Sexual history – Paying clients: Interval variables

Table A.3. Sexual history - Paying clients: Interval variables

Characteristic	2014		2008	
	Sample	Population estimate	Sample	Population estimate
Age first time paid for sex				
N	91	-	218	-
Median	20	20	18.0	18.0
Mean	21.21	24.2	19.24	19.22
SD	7.93	-	4.84	-
Range	10–61	-	9–39	-
Number of clients on the last working day				
N	92	-	215	-
Median	2.0	1.5	2.0	2.0
Mean	2.74	2.34	2.16	2.11
SD	3.13	-	2.16	-
Range	0–26	-	1–33	-
Amount received for last intercourse (USD)				
N	92	-	215	-
Median	8.0	7.0	2.0	2.0
Mean	17.83	15.64	1.83	1.8
SD	22.2	-	0.9	-
Range	0–100	-	0–6	-

A.4. Sexual history – Non-paying sexual partners: Interval variables

Table A.4. Sexual history – Non-paying sexual partners: Interval variables

Characteristic	2014		2008	
	Sample	Population estimate	Sample	Population estimate
Number of sexual intercourses with a non-paying partner in the last seven days				
N	92	-	41	-
Median	0.5	0.0	1.0	1.0
Mean	1.64	1.04	2.34	2.88
SD	2.37	-	2.33	-
Range	0-14	-	0–11	-
Number of sexual intercourses with a non-paying partner in the last 30 days				
N	92	-	43	-
Median	0.0	0.0	3.0	3.0
Mean	2.76	2.59	6.86	6.59
SD	5.68	-	8.55	-
Range	0–35	-	0–30	-

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