



GFEMS KENYA RESEARCH PROGRAM

COMMERCIAL SEXUAL EXPLOITATION OF CHILDREN (CSEC) - PREVALENCE ESTIMATION REPORT

November 2021

This publication was produced with funding from the Global Fund to End Modern Slavery (GFEMS). It was prepared independently by NORC at the University of Chicago through Erika Keaveney, Kyle Vincent, Sarah Lord, and Kareem Kysia with support from Charles Munene.



This research study was commissioned by the Global Fund to End Modern Slavery, in partnership with NORC. A gift of the United States Government.

This research was funded by a grant from the United States Department of State. The opinions, findings, and conclusions stated herein are those of the authors and do not necessarily reflect those of the United States Department of State or GFEMS.

Revised November 23rd, 2021

Prepared under Contract No.: 8744.02.01

Submitted to:

Global Fund to End Modern Slavery (GFEMS)

Submitted by:

Erika Keaveney
Kyle Vincent
Sarah Lord
Kareem Kysia

Contractor:

NORC at the University of Chicago
1155 East 60th Street, 2nd Floor
Chicago, IL 60637

Attention: Kareem Kysia
Tel: 301-634-9470; E-mail: Kysia-Kareem@norc.org

CONTENTS

TABLE OF TABLES	6
TABLE OF FIGURES	7
ACRONYMS	8
EXECUTIVE SUMMARY	9
RESEARCH BACKGROUND AND METHODOLOGY	9
SAMPLING AND MEASUREMENT APPROACH	9
KEY FINDINGS	10
RECOMMENDATIONS	11
1. INTRODUCTION	13
BACKGROUND AND CONTEXT	13
STUDY PURPOSE AND OBJECTIVES	13
RESEARCH QUESTIONS	14
2. RESEARCH METHODS	15
PREVALENCE ESTIMATION METHODOLOGY	15
SAMPLING	18
SAMPLE SIZE CALCULATIONS	18
SAMPLING DESIGN	20
LINK-TRACING USING REFERRAL AND REDEMPTIONS DATA	21
LINK-TRACING USING NOMINATIONS DATA	21
TARGET VERSUS ACTUAL SAMPLE	23
DATA COLLECTION PREPARATION AND MANAGEMENT	24
FORMATIVE ASSESSMENT	24
INTERVIEWER TRAINING AND PILOTING	25
DATA MANAGEMENT	25
DATA QUALITY ASSURANCE	26
RESEARCH ETHICS AND STUDY AUTHORIZATION	26
3. FINDINGS	28
RESPONDENT DEMOGRAPHIC CHARACTERISTICS	28
ENGAGEMENT IN COMMERCIAL SEX TRADE	29
PREVALENCE ESTIMATION	39
SAMPLE NETWORK PLOTS	39
DATA ANALYSIS	42
LIMITATIONS	44
6. CONCLUSIONS AND RECOMMENDATIONS	46
CONCLUSIONS	46
RECOMMENDATIONS	46
7. ANNEXES	48
ANNEX I. FORMATIVE ANALYSIS	48

CSEC PRE-TEST OUTCOME	48
CSEC FIELDWORK APPROACH	48
CSEC OBSERVATIONS AND CHALLENGES	48
CSEC RECOMMENDATIONS	52
ANNEX II. DATA QUALITY REVIEWS	53
ANNEX III. CSEC DEFINITION CROSSWALK	55
ANNEX IV. TABLES	56
ANNEX V. DATA COLLECTION TOOLS	63
NORC AT THE UNIVERSITY OF CHICAGO: CSEC LINK TRACING SURVEY	63
ANNEX VI. REFERENCES	98

TABLE OF TABLES

Table 1: CSEC Prevalence Estimation for Each Study Region	10
Table 2: Estimated Performance of the Network Sampling Strategy, Disaggregated Results	20
Table 3: Estimated Performance of the Network Sampling Strategy, Aggregated Results	20
Table 4: Sample Distribution by Wave for Study Regions	21
Table 5: Target Sample Size versus Final Sample Size.....	23
Table 6: Respondent Demographic Characteristics, by County	28
Table 7: CSEC Victim Definitions	30
Table 8: Characteristics of First Engagement in Commercial Sex Act(s) Among Respondents.....	31
Table 9: Third Party Knowledge and Facilitation of CSEC Transactions	35
Table 10: Current and Future Engagement in Sexual Activities and Sex Trade.....	37
Table 11: Population Size Estimation for Each Study Region	42
Table 12: CSEC Prevalence Estimation for Each Study Region.....	43
Table 14: Summary of CSEC Sampling Criteria	48
Table 15: Overall Target and Achievements	48
Table 16: CSEC Enumerator comments on observations.....	50
Table 17: DQR	53
Table 18: Issue Log	54
Table 19: CSEC Crosswalk	55
Table 20: Religion, Ethnicity, and Highest Level of Schooling Completed	56
Table 21: Sex Acts.....	58
Table 22: Sex Work First	59
Table 23: Sex Work Clients.....	61
Table 24: PTSD Questions	62

TABLE OF FIGURES

Figure 1: Number of PTSD Indicators per Respondent	11
Figure 2: Population Graph Example.....	16
Figure 3: Initial Sample Example.....	16
Figure 4: Final Sample Example	18
Figure 5: Respondent Religion, Ethnicity, and Highest Level of Schooling Completed	29
Figure 6: Who First Introduced Respondent to the Sex Trade.....	32
Figure 7: Reasons Respondents First Entered the Sex Trade (Self-Reported)	33
Figure 8: What Would Have Happened to Respondents that Faced Pressure or Intimidation to First Engage in CSEC Had They Refused	34
Figure 9: Reasons Exchanged Sex for Goods or Money Recently	34
Figure 10: Where Respondent Normally Find Buyers.....	36
Figure 11: Number of Paying Partners for Sexual Activities	37
Figure 12: Number of PTSD Indicators per Respondent.....	38
Figure 13: Kilifi Network Plot of Seeds and First Wave	39
Figure 14: Kilifi Network Plot of Full Sample	40
Figure 15: Kwale Network Plot of Seeds and First Wave.....	40
Figure 16: Kwale Network Plot of Full Sample	41
Figure 17: Mombasa Network Plot of Seeds and First Wave.....	41
Figure 18: Mombasa Network Plot of Full Sample	42
Figure 19: Sample Weights for Kilifi Respondents Based on Resampling Procedure.....	43
Figure 20: Sample Weights for Kwale Respondents Based on Resampling Procedure	44
Figure 21: Sample Weights for Mombasa Respondents Based on Resampling Procedure.....	44

ACRONYMS

ANPPCAN	African Network for the Prevention and Protection against Child Abuse and Neglect
COSWA	Coast Commercial Sex Workers Association
CITI	Collaborative Institutional Training Initiative
CSEC	Commercial Sexual Exploitation of Children
DQA	Data Quality Assurance
DQR	Data Quality Review
FGD	Focus Group Discussions
GFEMSGlobal	Global Fund to End Modern Slavery
IJM	International Justice Mission
ILO	International Labour Organization
IRB	Institutional Review Board
KAP	Knowledge, Attitudes, and Practices
KII	Key informant interviews
NACOSTI	National Commission for Science, Technology and Innovation
NIH	National Institutes of Health
NSUM	Network Scale-Up Method
ODK	Open Data Kit
PTSD	Post-Traumatic Stress Disorder
RDS	Respondent Driven Sampling
TdH	Terre des Hommes
TIP	Trafficking in Persons
UNICEF	United Nations Children’s Fund

EXECUTIVE SUMMARY

RESEARCH BACKGROUND AND METHODOLOGY

As a part of its partnership with the U.S. Department of State's Office to Monitor and Combat Trafficking in Persons (TIP Office), the Global Fund to End Modern Slavery (GFEMS) is launching a series of projects to combat commercial sexual exploitation of children (CSEC) in coastal Kenya. NORC at the University of Chicago was contracted by GFEMS to lead an independent research study to obtain pre- and post-intervention point estimates of the count of CSEC victims/survivors in Mombasa, Kilifi, and Kwale counties of Kenya.

Our primary methodological approach for obtaining CSEC point estimates is link-tracing, a variation of two common approaches used to measure hidden and hard-to-reach populations, including respondent driven sampling (RDS) and mark-recapture (or "capture-recapture"). RDS provides a way for researchers to quickly recruit members of a hidden population even when there is no readily available sampling frame, however it is designed to estimate the average value of traits or outcomes in the population rather than provide point estimates. RDS-based inference also typically relies on unverifiable assumptions that imposes heterophily constraints on the network structure, as well as the fact that the population is well-networked enough to obtain a census with enough sample waves. Mark-recapture is designed to provide point estimates, however it typically relies on self-selection of individuals and assumes that a mathematical model can be fitted to the pattern of captures to extrapolate an estimate of the population size.

Link-tracing combines the strengths of RDS and mark-recapture to provide an efficient way to estimate the size and characteristics of a hidden population of interest. In summary, (1) link-tracing occurs in the same fashion as RDS but does not place any sampling constraints on the individuals and therefore the network sample is not restricted to forming a tree-like structure; (2) the designs allow for "overlaps" between networks to be observed, through multiple observations (i.e., redemption of more than one referral coupon) of individuals, giving rise to a more comprehensive and accurate representation of the population network; and (3) overlaps in networks can be exploited in a mark-recapture fashion for population size estimation. As such, link-tracing can produce hidden population counts cost-effectively and on a relatively broad scale.

SAMPLING AND MEASUREMENT APPROACH

The total target sample for the CSEC link-tracing study was 1,500 children (500 per county) who self-reported having exchanged sex for money or things worth money (like a place to stay, food, or gifts) in the past 12 months. All study participants were provided with a referral coupon they received from either a partner NGO (the "seeds") or from another study participant (the "waves"). This referral coupon contained a unique identification number that allowed for tracking of network relations between study participants. All respondents (both seeds and waves) were required to have met the following eligibility criteria to participate: (1) be 13-17 years of age¹ at the time of scheduling the interview, (2) lived and/or worked in the target county in the past 12 months, (3) done sexual things for money or things worth money like a place to stay, food, or gifts at least once in the past 12 months, and (4) in possession of a valid referral coupon. At the end of the interview, referral procedures and eligibility criteria were explained to the respondent and s/he was asked to refer up to three other children who met the eligibility criteria. Sample recruitment continued for as many waves as was required in order to reach the desired sample size. Respondents were also asked to nominate up to five individuals in their personal network who

¹ Survey respondents were included if they had already reached their 13th birthday, but not yet reached their 18th birthday for an effective age range of five years.

intersected with the study population and corresponding region. Their nominees' covariate/demographic information was recorded to facilitate post data collection sample linking.

Data collection activities included a CSEC victim/survivor survey administered in three counties of coastal Kenya (Mombasa, Kilifi, and Kwale). Supporting activities included a phone screener to determine potential respondents' eligibility to participate in the study (i.e., whether they fit the inclusion criteria). Data collection instruments for the CSEC victim/survivor survey were structured around CSEC statistical definitions used by the TIP Office, International Labour Organization (ILO), and Government of Kenya, and were refined in consultation with GFEMS and through a formative assessment period.

KEY FINDINGS

- **An estimated 6,356 children in Kilifi, Kwale, and Mombasa are currently engaged in CSEC**, accounting for 1.6 percent of the total population of 13-17 year olds across the three counties, including 2.4 percent of female 13-17 year olds and 0.7 percent of male 13-17 year olds. However, this is likely underestimated relative to pre-pandemic times, as respondents reported a precipitous drop in demand for CSEC since 2020.

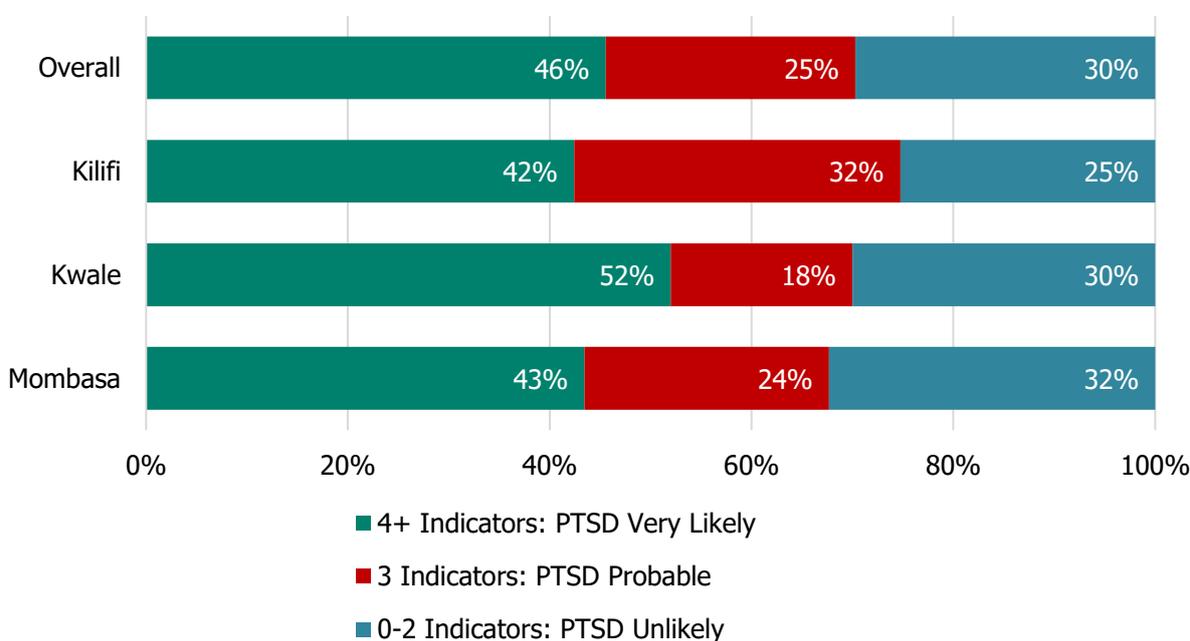
Table 1: CSEC Prevalence Estimation for Each Study Region

Study Region	Point Estimate	Total Population Size	Prevalence Rate
Kilifi			
Total	3,328	189,359	1.76%
Female	2,614	94,129	2.78%
Male	714	95,230	0.75%
Kwale			
Total	1,808	110,367	1.64%
Female	1,389	54,127	2.57%
Male	417	56,240	0.74%
Mombasa			
Total	1,220	102,887	1.19%
Female	872	52,884	1.65%
Male	348	50,003	0.70%
Overall			
Total	6,356	402,613	1.58%
Female	4,875	201,140	2.42%
Male	1,479	201,473	0.73%

- **According to respondents, parents of victims/survivors are largely unaware of their child's involvement in the sex trade.** Overall, 83 percent of respondents said that their parent(s) were unaware of their involvement in CSEC even though three-quarters were living at home when they first engaged in commercial sex acts. Further, only five percent said they were introduced to the sex trade by an immediate family member (parent or sibling).

- Most victims/survivors are out of school.** Slightly less than half of respondents were enrolled in school at the time of the survey, ranging from 42 percent in Mombasa to 52 percent in Kilifi. Fifty-eight percent of respondents had primary school as the highest level of schooling completed, however this varied somewhat by county (48 percent in Kwale compared to 66 percent in Mombasa). Education levels in Mombasa were lower on average than in Kilifi and Kwale, with only five percent of respondents advancing beyond primary school compared to 17 and 18 percent in Kilifi and Kwale, respectively.
- Over 70 percent of CSEC victims are likely suffering from Post-Traumatic Stress Disorder (PTSD).** The highest share was in Kilifi where approximately three-quarters of respondents reported at least three (of five) PTSD indicators, and the lowest in Mombasa at 67 percent. Additionally, 46 percent of respondents overall reported at least four indicators of PTSD and are thus “very likely” to have PTSD. Kwale had the highest percentage of such cases at 52 percent and Mombasa the lowest at 43 percent.

Figure 1: Number of PTSD Indicators per Respondent



- CSEC victims/survivors regularly recruit other children into CSEC and financially profit from their involvement.** Thirty-seven percent of respondents said the person who first introduced them to the sex trade was another minor. Furthermore, of the 35 percent of respondents who said someone else helps them find clients, nearly 20 percent of such facilitators are other children (and 78 percent are female). One-third of respondents also reported financially benefiting from arranging transactions/clients for other children in the sex trade.

RECOMMENDATIONS

- Sensitize families to CSEC risk factors and the importance of monitoring vulnerability among children in the household.** Low awareness among parents that their child is involved in CSEC suggests a strong need for community sensitization on the physical, social, and behavioral risk factors associated with CSEC as well as the importance of monitoring children’s vulnerability in the household. Program implementers should therefore

seek opportunities to integrate direct advocacy with parents/guardians into their existing programming. This might include door-to-door information campaigns, hosting community- and school-based parent meetings, or collaboration with religious leaders/institutions to disseminate messages to their congregations.

- **Help community members see CSEC victims/survivors as children needing care and protection rather than criminals.** Data from this study including on PTSD rates among victims/survivors and the age of entry into the sex trade (13.6 for the average respondent in the study) could be disseminated to the public alongside information on the negative psychosocial effects CSEC. Furthermore, educating the public on PTSD may help community members and policymakers become more sensitized towards victims, and therefore more proactive agents of change.
- **Enhance the provision of trauma-informed mental health services to CSEC victims/survivors.** The high rates of probable PTSD among respondents suggest a strong need for high-quality mental health services to supplement other basic services for survivors. While there are governmental and non-governmental organizations offering psychosocial support services locally, the extent to which they are able to provide evidence-based screening, treatment, and aftercare to survivors of PTSD is unclear. In addition, service providers should educate caregivers of reintegrated survivors on recognizing and coping with the aftereffects of trauma.
- **Educate community members on CSEC reporting channels other than police and local authorities.** Of particular note, only three percent of respondents in the KAP study knew of Childline Kenya (116).² Childline offers an anonymous reporting pathway which may make community members less fearful of retaliation, particularly from local authorities. In addition, helping community members understand the laws and penalties associated with CSEC may encourage reporting and discourage the sexual exploitation of children.
- **Enhance peer-to-peer education for CSEC victims and other at-risk children.** Implement community- and school-based prevention programming with current CSEC victims/survivors to help them understand the harmful effects of CSEC to enable them to protect themselves and others. Helping children understand the harmful effects of CSEC may also discourage them from recruiting, and financially benefiting from, other child victims.
- **Provide alternative livelihoods for CSEC victims/survivors, particularly those who are unable to return to formal schooling.** Fifty-five percent of respondents said they continue to engage in commercial sex acts because they have no other way to earn a living. In addition, nearly 30 percent of respondents dropped out before finishing primary school, and are thus unlikely to return to formal schooling. Offering these children an alternative way to make a consistent, living wage may give them the opportunity to leave the sex trade for good.

² NORC at the University of Chicago (2021). GFEMS Kenya CSEC KAP Survey. Unpublished raw data.

1. INTRODUCTION

BACKGROUND AND CONTEXT

Kenya is a source, transit, and destination country for the commercial sexual exploitation of children (CSEC). Despite continued efforts on the part of the Kenyan government to eliminate CSEC and other forms of trafficking in persons, the country remains on the U.S. Department of State's Tier 2 list due to uneven prosecution of perpetrators and inadequate social protections for survivors.³ Kenya criminalizes CSEC through the Counter Trafficking in Persons Act (2012) and the Sexual Offenses Act (2005), and the government adopted the National Plan of Action Against Sexual Exploitation of Children in 2013. However, identification and prosecution of offenders remains challenging due to under-resourced law enforcement.

A review of existing literature highlights some factors that cause children to be more vulnerable to CSEC, including the cyclical forces of demand and supply from various geographic hotspots. The supply chain of sex trafficking in Kenya is interlinked, with inland trafficking responding to high demands created by the child sex tourism industry on the coast. Additionally, recent studies find that while CSEC remains pervasive, it has been gradually shifting from more traditional venues such as brothels and bars to private establishments and online. Child sex tourism is widespread along the Kenyan coastline in areas such as Mombasa, Malindi, and Kilifi. The supply chain of sex trafficking in Kenya is interlinked, with inland trafficking responding to high demand created by the child sex tourism industry on the coast.⁴ Victims are trafficked by intermediaries such as recruitment agents and taxi drivers, or by people known to them including their own families.⁵

Prior to this study, the number of CSEC victims in Coastal Kenya was unknown. However it was widely acknowledged that CSEC is very common in the coastal areas, with UNICEF reporting in 2006 that up to 30 percent of all 12-18 year-old girls in the coastal areas of Malindi, Mombasa, Kilifi and Diani had been involved in the sex trade at some point.⁶ These reports are corroborated by more recent data from NORC's 2021 CSEC Knowledge, Attitudes, and Practices (KAP) survey in Kilifi and Kwale, in which 90 percent of respondents said that CSEC is common in their county with 23 percent knowing of actual CSEC cases that occurred in their sub-county in the past year.⁷

STUDY PURPOSE AND OBJECTIVES

The Global Fund to End Modern Slavery (GFEMS) aims to end modern slavery by making it economically unprofitable. GFEMS identifies, invests in, and collaborates with on-the-ground partners who implement interventions, experimental innovations, or a combination of both, to combat modern slavery. Given their strong commitment to evidence-informed practice, GFEMS aims to understand the scope of modern slavery in specific geographical locations where they work. Such prevalence estimates can help stakeholders establish benchmarks, allocate resources,

³ 2020 Trafficking in Persons Report: Costa Rica. (2020). USDOS. Online.

⁴ Hope, Kempe. (2013). Sex Tourism in Kenya: An Analytical Review. *Tourism Analysis*. 18. 533-542; Kibicho, W. (2016). *Sex tourism in Africa: Kenya's booming industry*. Routledge.

⁵ US Department of State (2012). CTIP report: June 2012. Washington, DC.

⁶ ECPAT (2007). Global monitoring report on the status of action against commercial sexual exploitation of children in Kenya.

⁷ NORC at the University of Chicago (2021). GFEMS Kenya CSEC KAP Survey. Unpublished raw data.

and measure the effectiveness of public policies and anti-slavery programs by providing estimates of the extent of victimization, identifying hotspots, and following trends over time.

As a part of its partnership with the U.S. Department of State's Office to Monitor and Combat Trafficking in Persons (TIP Office), GFEMS is launching a series of projects to combat CSEC in coastal Kenya. NORC at the University of Chicago was contracted by GFEMS to lead an independent research study to obtain pre- and post-intervention point estimates of the count of CSEC victims/survivors in Mombasa, Kilifi, and Kwale counties of Kenya.

RESEARCH QUESTIONS

The primary research question for the CSEC prevalence study is as follows:

- What is the current count of CSEC victims/survivors in Mombasa, Kilifi, and Kwale counties of Kenya?

Secondary research questions—developed based on consultations with GFEMS and its subrecipients—include:

- What are the demographic characteristics of current CSEC victims/survivors in coastal Kenya?
- To what extent do formal definitions of CSEC correlate with respondents' own self-identification as a victim/survivor?
- What were the conditions and circumstances driving victims/survivors to engage in CSEC for the first time?
- To what extent are third parties financially benefiting from CSEC?
- What is the rate of likely PTSD among current CSEC victims/survivors?

2. RESEARCH METHODS

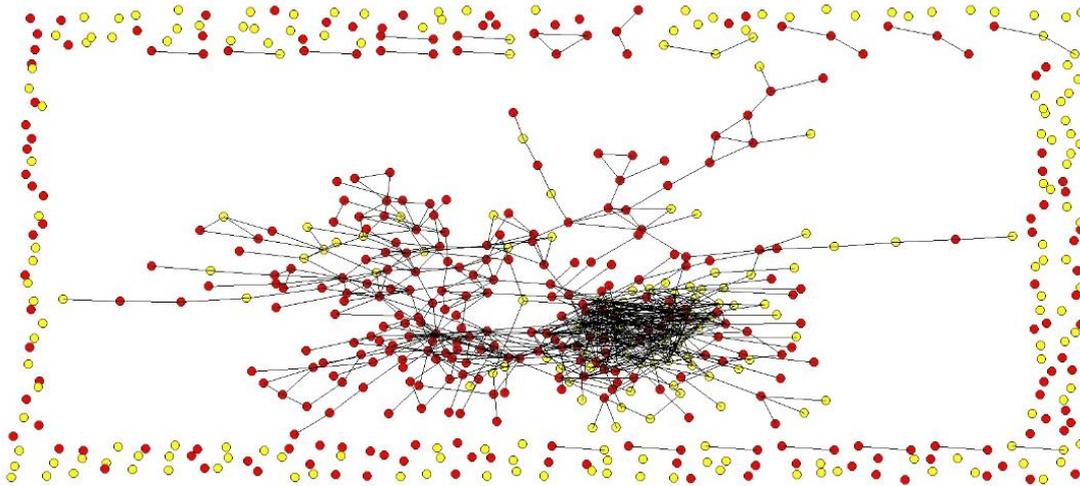
PREVALENCE ESTIMATION METHODOLOGY

Our primary methodological approach for obtaining CSEC point estimates is based on a link-tracing sampling design and inference procedures developed for such designs. The rationale for applying this method is that CSEC victims are often hidden in pockets of society thus making probability-based sampling strategies ineffective or difficult to implement. In other words, CSEC victims may be concentrated in certain geographic locations or venue types which may not be visible to the research team *ex ante* and/or would be costly to map on a sufficient scale. As such, few sampling frames are adequate for conventional probability-based sampling, even if one intends to sample from a population that encompasses the hidden population being measured. Since studies employing probability-based sampling will likely miss hidden individuals in the population, such methods risk producing estimates of trafficking that are far below what would be expected with network-based sampling strategies including those based on link-tracing, respondent driven sampling (RDS), the network scale-up method (NSUM), or non-network-based strategies such as mark-recapture.

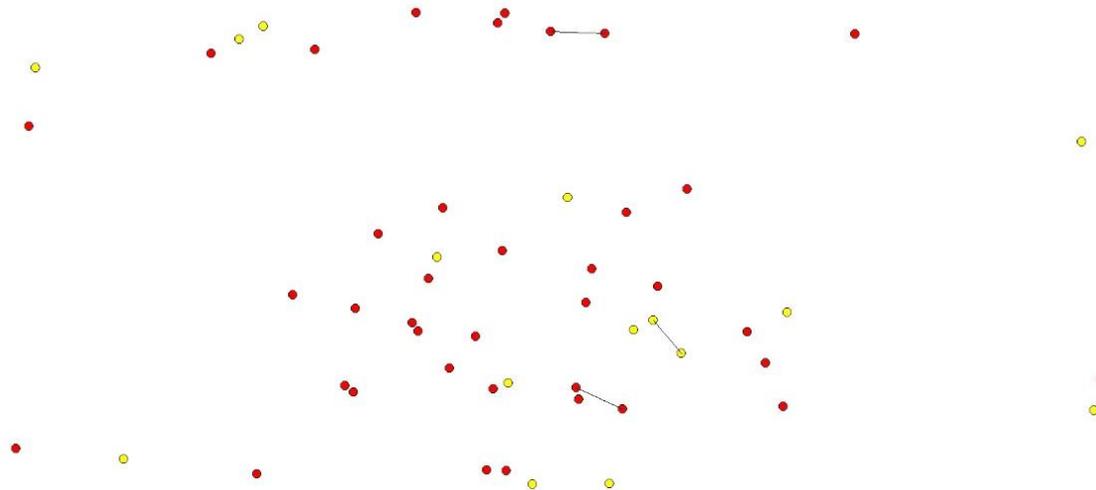
When recruiting subjects that are hidden or irregularly distributed, two sampling strategies are frequently used to produce prevalence estimates—RDS and mark-recapture (also known as capture-recapture). Both strategies have been widely used in diverse contexts, yet both have inherent problems when applied to hidden populations. For example, RDS-based inference typically relies on unverifiable assumptions that impose heterophily constraints on the network structure, as well as the assumption that the population is well-networked enough to obtain a census with enough sample waves. Mark-recapture methods typically rely on self-selection of individuals and assumes that a mathematical model can be fitted to the pattern across lists/samples of captured individuals to safely extrapolate and arrive at an estimate of the population size. The assumptions of the mathematical model may well not be even approximately satisfied in practice.

Link-tracing combines the strengths of RDS and mark-recapture methods to provide an efficient way to estimate the size of the hidden population. In summary: 1) link-tracing occurs in the same fashion as RDS but does not place any sampling constraints on the individuals and therefore the network sample is not restricted to forming a tree-like structure; 2) the designs allow for “overlaps” between networks to be observed, through multiple observations (i.e. redemption of more than one referral coupon) of individuals, giving rise to a more comprehensive and accurate representation of the population network; and 3) overlaps in networks can be exploited in a mark-recapture fashion for population size estimation. As such, link-tracing can produce estimates of high-risk populations both cost-effectively and on a broad scale.

Link-tracing first entails selecting a moderately sized initial sample, also known as the seeds of the sample, whose composition is well-dispersed among the population in terms of key demographics and geographic location. Observations corresponding to the initial sample requires a comprehensive set of information pertaining to the selected individuals’ personal network; typically, the size of each selected individual’s personal network and identifying covariate information to those who they are most strongly linked are required in order to map nominations/referrals within the initial sample, along with the number of links which stretch out of the initial sample. The figures below exemplify such data requirements. The illustration in Figure 1 is based on a longitudinal study of an HIV/AIDS at-risk drug-using population situated in the Colorado Springs area (Klovdahl et al. 1994). The size of the population is 595. The nodes represent the individuals in the population and links between pairs of nodes indicate the existence of a predefined social relationship.

Figure 2: Population Graph Example*Full population network graph of a drug-using population of size 595 in the Colorado Springs area (Klov Dahl et al., 1994).*

The illustration in Figure 3 depicts 53 individuals selected completely at random for the initial sample. Several links within the initial sample are observed based on the referral information.

Figure 3: Initial Sample Example*A hypothetical initial sample of size 53 from of the drug-using population. The figure shows that several links are observed between individuals selected for the initial sample which illustrates the data observation requirements for a link-tracing design.*

The data collection procedure discussed thus far permits for preliminary estimation of the population size and characteristics based on simple, yet statistically efficient, mark-recapture types of design-based estimators derived by Frank and Snijders (1994); a design-based approach is preferred for populations that are suspected to have high levels of clustering since elaborate network models do not have to be posited and tested for fit to the sample data. Define the size of the initial sample to be n_0 , number of links within the initial sample to be r , and number of links stretching out of the initial sample to be l . An estimate for the population size is $\hat{N} = n_0 \times \frac{(l+r)}{r}$.

This estimator depends on the network/link information emanating from the initial sample and is asymptotically consistent estimator for the population size N (see Frank and Snijders, 1994). This

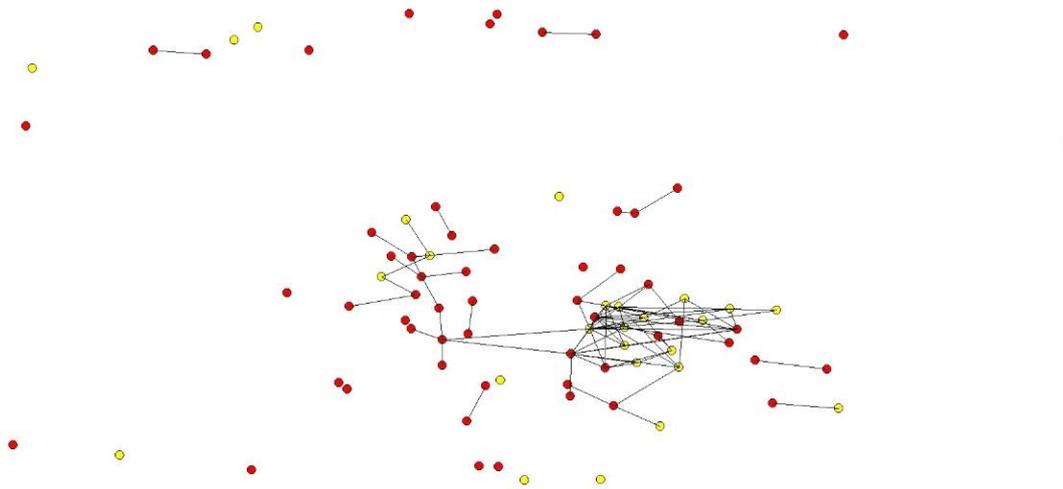
estimator is akin to the two-sample mark-recapture estimator (Chapman, 1951) where n_0 is the size of the first sample, $l + r$ is the size of the second sample, and r is the number of recaptures in the second sample. Notice that the smaller the number of links within the initial sample (recaptures), the larger the estimate for the size of the population.

Based on the theoretical results presented in Vincent and Thompson (2017), Vincent (2019), and Thompson (2020), recently introduced inference procedures can allow for the addition of individuals to the sample through link-tracing to be permitted to proceed in any pattern. For example, the versatility of this approach can allow for individuals to be added either via 1) tracing a random number of links from any set of previously selected individuals, 2) tracing a predetermined number of links only from individuals of high-interest (such as those at higher risk for trafficking), or 3) tracing a subset of links from the more well-connected individuals. Similar to the data collection requirements corresponding to the initial sample, observation for the final sample typically requires the size and identifying covariate information of those in each selected individual's personal network in order to map nominations/referrals within the final sample.

To exemplify such data requirements, Figure 4 depicts the final sample selected via tracing a randomly selected set of links from the initial sample. The final sample size is 85. Notice that all links within the final sample are mapped, primarily for inferential purposes.

Point and variance estimation of population quantities rely on sampling weights generated by an innovative and newly developed procedure introduced by Thompson (2020). The procedure is design-based and therefore does not rely on a network model for inference or classic RDS assumptions and corresponding diagnostic checks. The procedure entails selecting subsamples of the observed network sample based on a relatively small amount of reseeding and tracing links/branches to reach a predetermined subsample size of observed individuals. A sampled individual's sampling weight is inversely proportional to the number of times they are resampled through the algorithm. This resampling procedure has been shown to address and mitigate the bias in point estimators commonly encountered with RDS and other network sampling designs.

Population size estimation was conducted using the R programming language (R Core Team, 2016). This includes sample size calculations and calculations of sample weights. All summary statistical tables were created in STATA using the R-generated sample weights.

Figure 4: Final Sample Example

Final sample of size 85 selected from the drug-using population. All links within the final sample, along with each sampled individual's network size, are observed to allow for recently developed inference procedures to be applied to the sample data set.

SAMPLING

SAMPLE SIZE CALCULATIONS

The inference procedure described in Vincent and Thompson (2017) ensures an increase in precision with the Rao-Blackwellized estimators relative to their preliminary counterparts; a simulation study of a hard-to-reach Colorado Springs-based drug-using population has demonstrated that immense gains in precision may be expected even with a relatively small amount of adaptive link-tracing sampling. The preliminary version of these estimators bears a strong resemblance to the Lincoln-Petersen estimator (Chapman, 1951), and the two estimators are similar in terms of statistical properties and asymptotic characteristics. We evaluate the sample size required to reach a desired level of precision for this study based on the Lincoln-Petersen estimator (Chapman, 1951). In particular, we make use of the expressions and calculations outlined in Robson and Regier (1964). In order to derive the necessary sample size, we require 1) a value of α that reflects the precision of the estimator,⁸ 2) a value of p to denote the level of accuracy, and 3) an initial, crude guess/estimate for the population size N .

Calculations are based on the two-sample mark-recapture estimator published results presented in Robson and Regier (1964) and are used to inform a suitable sample size. For these calculations, we set the precision and accuracy parameters to conservative values since the aforementioned Rao-Blackwell inference procedure will result in estimators whose accuracy will exceed thresholds based on conventionally accepted values for the parameters. We note here that sample size calculations based on the improved/Rao-Blackwellized versions are difficult to evaluate for a study such as ours since the resulting improved estimators strongly depend on the target population's network topology (that is, the behavior/pattern of referrals from individuals) as well as how sampling effort may be steered at each wave of recruitment. However, for projections on the expected increase in precision, see Vincent and Thompson (2017) and Vincent (2019).

We will set a precision of $\alpha = 0.10$ and an accuracy level of $p = 0.4$. We assume the total population size of the at-risk CSEC population in the study region of Kenya to be not more than

⁸ $(1 - \alpha)$ is the probability that the population estimate will be within 100p percent of the true population size.

30,000 as this is taken to be a conservative upper bound on the population size based on the formative assessment. Our inference procedure requires a subset of referrals within the sample to be recruited and hence we will base numbers for recruitments on stringent criteria. Therefore, we will make the assumption that the average number of traceable nominations per individual is at a low value of two⁹. Following the setup outlined in Robson and Regier (1964), let M be the size of the initial sample (which is analogous to first sample captures). The sampling strategy will give rise to an expected number of $C = (2 \times M) + 2 \times (2 \times M)$ traced referrals (which is analogous to second sample captures); the bulk of data collection will be carried out over two waves. Based on these sampling parameters the Lincoln-Petersen-type estimator for the population size is defined to be $\hat{N} = \frac{MC}{R} = \frac{3M^2}{R}$ where R is the number of referrals located in the initial sample (recaptures). We seek an initial sample size that satisfies:

$$1 - \alpha \leq P\left(-p < \frac{\hat{N}-N}{N} < p\right). \quad (1)$$

Or, after rearranging:

$$1 - \alpha \leq P\left(\frac{3M^2}{(1+p)N} < R < \frac{3M^2}{(1-p)N}\right). \quad (2)$$

The random variable R follows a hyper-geometric distribution, and hence one can rely on the normal approximation to the hyper-geometric distribution through setting $\mu = \frac{MC}{N} = \frac{3M^2}{N}$ and $\sigma^2 = \frac{M(N-M)C(N-C)}{N^2(N-1)} = \frac{3M^2(N-M)(N-4M)}{N^2(N-1)}$ (see Seber, 1970 for details regarding the moments of the distribution of the Lincoln-Petersen estimator). With an initial sample size of $M = 225$ (and with an expected number of second sample captures in the form of interviewed referrals, and referrals of referrals to allow two additional waves of data collection, $C = 225 \times 2 + 450 \times 2 = 1,350$), allocated through strategically assigning approximately 75 seeds to each of the three counties based on the anticipated demographic distribution of the study population, the calculations show that the preliminary estimator based on this final sample size is close to meeting the above threshold. Hence, an appropriate final sample size is $M + C = 1,575$.

As the population size estimator may result in conservative estimates with small sample sizes, a simulation-based approach is used to reinforce the claim of precision on the sample size calculations. Recall that we are considering three identified counties with a high concentration of CSEC victims, and estimators based on a stratified setup, where strata are based on county and other combinations of factors of importance (such as gender and age), will be used. The proposed network sampling-based estimator bears a strong resemblance to the two-sample, bias adjusted mark-recapture Lincoln-Petersen estimator (Chapman, 1951). Hence, this estimator is used to give crude approximations to the performance of the preliminary versions of these estimators since their sampling distribution is likely to be a function of the actual network structure. The corresponding variance estimator is that presented in Seber (1970), on which the margin-of-error is directly based. It is noted here with importance that, as shown in Vincent (2019) and Vincent and Thompson (2017): 1) with the stratified setup one can expect efficiency gains of at least 25 percent over the margin-of-error based on these crude approximations, and 2) the Rao-Blackwellized versions of these estimators are likely to give rise to substantial gains in

⁹ Calculations are based on pretest observations that indicate approximately two referrals can successfully be made from each respondent.

improvement in terms of the margin-of-error, and the magnitude of improvement is likely to be in the vicinity of one-half.

Table 2 presents disaggregated performance scores that can be expected for each of the counties to be studied. The corresponding initial sample size is 75 and final sample size is 500. The table presents the corresponding approximated mean of the estimate of the population size, standard deviation, and margin-of-error of the estimators when our proposed network sampling strategy is applied to areas of interest for varying population sizes. The quantity of interest (values in the right-most column) gives a conservative estimate of the margin-of-error for the network sampling strategy. The margin-of-error is approximately twice the standard deviation, to correspond with the expected half-length of the confidence interval based on 95 percent nominal levels and the central limit theorem.

Table 2: Estimated Performance of the Network Sampling Strategy, Disaggregated Results

Population Size	Mean	Standard Deviation	Margin-of-Error	Anticipated Upper Bound Margin-of-Error of Network Sampling Estimator
2,500	2,498	615	1,204	452
5,000	5,026	1,835	3,596	1,349
10,000	9,692	4,807	9,422	3,533

Simulation results for determining an appropriate sample size for the study. An array of simulation parameters is considered in order to assess a suitable sample size.

Table 2 presents aggregated performance scores that can be expected for the full study region based on all three counties. The corresponding sample sizes are summed over all three counties to give an initial sample size of 225 and final sample size is 1500.

Table 3: Estimated Performance of the Network Sampling Strategy, Aggregated Results

Population Size	Mean	Standard Deviation	Margin-of-Error	Anticipated Upper Bound Margin-of-Error of Network Sampling Estimator
5,000	5,008	555	1,088	408
15,000	15,048	3,241	6,351	2,382
30,000	30,030	9,315	18,257	6,846

Aggregated results based on simulation study to determine a suitable sample size for the study. Results are intended to be applied to the full study region.

SAMPLING DESIGN

As per the sample size calculations, the targeted initial sample size was 75 and final sample size was 500 for each of the three study regions of Kilifi, Kwale, and Mombasa. Two local NGOs in coastal Kenya—Trace Kenya and Okoa Sasa—recruited seed respondents from their database of victims/survivors with whom they have previously worked. They recruited 75 respondents in each county as described in Table 3 below. At the end of the interview, seeds were given up to three referral coupons to distribute to other eligible respondents. Referral chains then continued until the target sample of 500 interviews per county (1,500 total) was achieved.

Within each county, Kantar was given a breakdown of demographic characteristics to target among seeds in order to avoid clustering effects that could result from link-tracing the more

conspicuous individuals in the population. Specifically, 80 percent were to be girls and 20 percent boys. Within each gender strata, half were to be pimp/boss-controlled, and the other half were to be freelance or home-based. To further diversify the sample, it was also required that pimp/boss-controlled seeds could not work under the same boss or be in the same gang as another seed. Finally, the strata were broken up by age group such that 50 percent were 16-17, 40 percent were 14-15, and 10 percent were 13 years of age. Targeting a higher proportion of older children was done based on learnings from the formative assessment, which suggested older respondents could effectively recruit from all age ranges whereas younger respondents were unlikely to be able to recruit older children.

Table 4: Sample Distribution by Wave for Study Regions

Study Region	Initial Sample	First Wave	After First Wave	Final Sample Size
Kilifi	75	154	270	499
Kwale	72	122	294	488
Mombasa	73	141	275	489

Sample distribution by initial sample (seeds), first wave, and all succeeding waves for each of the three study regions.

Respondents were asked to nominate up to five individuals in their personal network and which intersected with the study population and corresponding region. Their nominees' covariate/demographic information was recorded to facilitate post data collection sample linking. Respondents were then given a set of coupons to pass to up to three of their nominations. Respondents received 1,200 KSH (approximately 11 USD) for completing the survey, as well as an additional 500 KSH (approximate 4.5 USD) for each eligible person they recruited who completed the survey. Sample recruitment continued for as many waves as was required in order to reach the desired sample size.

LINK-TRACING USING REFERRAL AND REDEMPTIONS DATA

Links between respondents were fully observed and traced via redemption of the referral coupons. Each respondent received up to three coupons with a unique coupon code, which were recorded in the survey platform/software. The respondent was then instructed to pass each physical coupon to another child involved in the sex trade. Once these coupons were redeemed by another respondent there was a clear linkage between the respondent who was given the referral coupon and the individual that redeemed the coupon. This is believed to be a "strong linkage" because the respondents would have known each other well enough for them to give the other respondent the physical coupon in person, and to describe the study in sufficient detail for invitation purposes.

LINK-TRACING USING NOMINATIONS DATA

Link-tracing/observation via the nominations data was a trickier process because there were no unique codes passed between respondents. Instead, only nomination data in the form of covariate/demographic information could be used for matching purposes. All matching was performed using STATA. Recall that each respondent was asked to nominate up to five other children involved in CSEC and to give basic demographic information on each person they nominated. This information was then matched to the demographic information on the respondent that was collected in the survey. The information used for matching nominees to respondents selected for the final sample were name (first name, last initial), sex, age, county, sub-county, ethnicity, marital status, and number of children.

The demographic information was broken into three different categories for matching:

1. A “fuzzy” match was used to match different elements that are approximately similar, but not an exact match:
 - a. Name was matched using a fuzzy matching program in STATA called *matchit* with a threshold of a 60 percent name match.¹⁰
 - b. Age was considered to be a match if the nominee’s age was within one year of the respondent’s age.
2. An exact match was used for elements that should have been exactly the same:
 - a. Sex was required to be an exact match for all cases.
3. A “soft” match was used to match different elements that have match, but not necessarily all, of their characteristics:
 - a. The respondent and nominee needed to match on four out of five for county, sub-county, ethnicity, marital status, and number of children.

The name variable was matched using a fuzzy matching criteria because people may not know the exact spelling of another person’s name, in particular if they only communicate verbally with this person. Additionally, the enumerator was the one who entered the names into the tablet and they would not be expected to know the exact spelling of names for each nominee. It is important to have the names match to some extent to ensure with a level of confidence that the respondent and nominee do in fact know each other.

The variable for sex was set to be an exact match since the sex of another individual would typically be known and clear to the respondent nominating this individual.¹¹ The age range was set to plus or minus one year because exact ages of friends and colleagues are not always known, but in most cases the respondent would be expected to know an approximate age.

The remaining five variables for county, sub-county, ethnicity, marital status, and number of children are not always known exactly by the respondent depending on the relationship between the respondent and nominee. A threshold of four out of five matching criteria gave information that we believe to be the most credible and consistent after also considering network plots based on criteria of three out of five for matching purposes.¹²

¹⁰ The 60 percent threshold for the *matchit* command will pick up names that are similar but have some small differences. For example, a respondent with the name “John Doe” would be matched with a nominee if the nominee’s name was “Jahn Doe” or “John Dee.”

¹¹ This is not true for all cases, and we do recognize that sex and gender are not always binary or the same as how someone may present themselves to the world. However, for the purposes of matching respondents and nominees for this study we needed to make a set of assumptions to be able to create network linkages.

¹² The number of network linkages when using three out of five for the soft matching technique provided a number of linkages much higher than the number of people nominated and referred by a single respondent. This should not be possible because we believe that the respondents are each unique individuals so there should be no more than five linkages.

TARGET VERSUS ACTUAL SAMPLE

The target sample for each county was 500 respondents. Table 5 shows that the field team was able to conduct 500 interviews in Kilifi and Kwale, and 501 interviews in Mombasa. In preparing the final sample for matching there were determined to be 12 respondents that were interviewed twice in Kwale, 11 in Mombasa, and one in Kilifi.

Table 5: Target Sample Size versus Final Sample Size

Respondents	County			Overall
	Kilifi	Kwale	Mombasa	
Target	500	500	500	1,500
Total Surveys	500	500	501	1,501
Unique Respondents	499	488	489	1,476

The target sample and total sample size per study region, with the total number of unique respondents per study region after accounting for duplicated entries from multiple redemption of coupons.

Respondents were determined to have redeemed more than one coupon if either of the following criteria was met:

1. Exact and fuzzy matching
 - a. Name, county, sub-county, sex, marital status, number of children, and ethnicity as matching exactly and with the age fuzzy match of one year.
2. Matching used for nominees and respondents indicating they redeemed more than one coupon.
 - a. Fuzzy match on name and age.
 - b. Exact match on sex.
 - c. Soft match on county, sub-county, marital status, number of children, and ethnicity.
 - d. Respondent indicated that they were previously interviewed.

The main difference in the matching criteria is that the fuzzy and soft match was only used in cases where the respondent indicated that they had been previously interviewed. In cases where neither respondent indicated that they had been interviewed the match was only made if all information matched exactly except for an age range of one year.¹³ The matching criteria was stricter for identifying duplicate respondents than for identifying network linkages between respondents because the respondent would be expected to give more accurate and consistent information on themselves than they would for others.

¹³ The age range of one year was still used for respondents even though they should know their own age to account for the fact that they may have had a birthday in between interviews.

DATA COLLECTION PREPARATION AND MANAGEMENT

FORMATIVE ASSESSMENT

Formative assessment is developmental research conducted in preparation for a study employing novel methods and/or relying on untested functional and analytical assumptions. The purpose of formative assessment is to validate a proposed research design as well as gather key inputs required for survey logistics and planning. Because the link-tracing estimation strategies proposed under the GFEMS Kenya Research Program have not been previously conducted with the target populations and respondents, a formative assessment was conducted in September - November 2020 to test several critical assumptions that surfaced during the research design stage.

Planning for the formative assessment took place in June - August 2020. Formative assessment activities were informed by the research design report, a desk review, and consultative meetings/discussions with GFEMS, J/TIP, local partners, and the local firm subcontracted by NORC to support in-country activities (Kantar Public). Field activities were structured around a formative assessment objectives document, which outlined key items and parameters from the research design document that required further investigation (see ANNEX I. FORMATIVE ANALYSIS). Broadly speaking, these objectives included assessing:

- The extent to which target respondents were able and willing to speak with the research team; provide accurate data on themselves; and refer persons known to them to participate in the study;
- Ability of network-based referral chains to branch out to especially hidden or hard-to-reach respondents;
- Sample size calculation inputs including expected referral counts and participation rates;
- Logistical assumptions related to data collection including modalities, sampling, and budgetary inputs; and
- Quality of the draft survey instruments including content clarity, structure, and language; contextual appropriateness; and need for further clarification or enumerator guidance.

Methods for addressing the above included:

- Focus group discussions (FGDs) and semi-structured interviews with target population respondents;
- Field-testing of quantitative survey instruments with target population respondents; and
- Key informant interviews (KIIs) with stakeholders, including sector experts and NGOs.

The study team worked closely with local partners ANPPCAN, CHTRUST, and Okoa Sasa to recruit participants for three FGDs. The study had the following inclusion criterion for recruitment: respondents must be currently in the sex trade; be aged less than 18 years; and consist of both males and females. Respondents were drawn from four coastal counties, namely Kilifi, Kwale, Taita-Taveta¹⁴, and Mombasa. The first Female FGD consisted of 11 participants while the second consisted of 12 participants. The male FGD consisted of six participants. KIIs were conducted over

¹⁴ Some members of the focus group listed their residence as Taita-Taveta, but all recruitment was performed in the other three counties that are used in the quantitative findings.

the phone with representatives from African Network for the Prevention and Protection against Child Abuse and Neglect (ANPPCAN), Candle of Hope Foundation, International Justice Mission (IJM), Okoa Sasa, Terre des Hommes (TdH), Trace Kenya, United Nations Children's Fund (UNICEF), and Wangu Kanja.

Findings from the formative assessment informed the final research methodology, sampling strategy, and instrument design, and are featured in ANNEX I. FORMATIVE ANALYSIS.

INTERVIEWER TRAINING AND PILOTING

NORC and Kantar co-facilitated a nine-day interviewer training and pilot exercise which took place from February 9-26, 2021. The training was focused on orienting participants to the study, data collection procedures, sampling, logistics, respondent screening, survey administration, and trauma-informed research practices. In addition, the training included a "lab review" and a field pilot of the survey instrument. The purpose of the lab review was to draw on the participants' extensive research experience in Kenya to improve comprehension and contextual appropriateness of the survey questions; ensure response options were clear, exhaustive, and mutually exclusive; and identify additional guidance that interviewers might need to help them clarify or probe respondents in cases where a question was unclear.

The survey instruments were updated based on the lab review, and field piloted with 14 CSEC victims/survivors in the target communities. The purpose of the field test was to assess whether respondents struggled with understanding, comprehension, or recall; identify which tools/approaches were helpful in improving comprehension and recall; determine if any questions were subject to response bias or perceived as overly sensitive by respondents; and identify any other unforeseen issues or challenges. Following the field test, NORC and Kantar conducted extended debrief sessions with the trainees to identify any necessary final adjustments to the instruments prior to the main training.

Following the main training, 15 interviewers (five per county) were selected to participate in field work. Four enumerators dropped after training, and the final list of enumerators included ten women and one man¹⁵. Selection was made based on training attendance and participation, pilot performance, and written exams. Selected teams then travelled to their respective counties to commence data collection, which took place from March 3 to June 6. The interviews were primarily conducted in Kiswahili (93%) and all interviews were conducted in person. Additional information on interview protocols can be found in RESEARCH ETHICS AND STUDY AUTHORIZATION.

DATA MANAGEMENT

For data collection, NORC subcontracted with Kantar Public (formerly TNS), an international data collection, research, and consultancy firm with headquarters in Nairobi and two additional regional offices in Kenya. Kantar was selected based on their experience managing logistically complex data collection activities in Kenya; ability to rapidly mobilize to recruit a large pool of experienced and qualified supervisors and enumerators; demonstrated expertise managing methodologically demanding mixed-methods research; experience using tablets for data collection; past performance conducting exercises of similar scope and scale; and value for money. Kantar also

¹⁵ More male enumerators were originally recruited, but they dropped after training. While recruitment matched the anticipated gender composition of the sample, there was no specific requirement to match enumerator and respondent gender.

has established relationships with Kenyan government agencies, NGOs, and the local academic and research community.

DATA QUALITY ASSURANCE

Data collection was tablet-based, utilizing SurveyCTO/Open Data Kit (ODK). Survey programming was conducted in-house by NORC and data collection platforms/servers were centrally managed by the research team. All tablets and servers were encrypted to ensure maximum data security. Data uploads were completed on a daily basis (connectivity permitting) to allow for real-time data quality reviews. A data quality assurance (DQA) protocol was established to set forth data quality standards/requirements and team member responsibilities in ensuring high quality data during field work. The data quality review (DQR) procedures can be found in ANNEX II. DATA QUALITY REVIEWS.

RESEARCH ETHICS AND STUDY AUTHORIZATION

This study was conducted in line with human subjects research guidelines both in the United States and Kenya. NORC follows established protocols for gathering informed consent, protecting anonymity and identifying information, and ensuring ethical data collection—including from children and other vulnerable populations. To ensure compliance with our high ethical standards, all research involving vulnerable populations must pass through formal Institutional Review Board (IRB) review prior to data collection and all research staff must complete a certified course in Protecting Human Research Participants through the National Institutes of Health (NIH) or Collaborative Institutional Training Initiative (CITI).

Field teams were extensively trained on research ethics, including confidentiality and informed consent procedures. Consent/assent was verbally attained from study participants, and all respondents were offered the option to obtain parental consent if they deemed it appropriate. NORC also provided interviewers with contextually-grounded training on child protection, psychological first aid, and trauma-informed research. The comfort and privacy of the respondents was a key aspect of all interviews. The interviews were held at a neutral location chosen by the interviewee, without employer knowledge whenever possible, and personal information of respondents was protected by keeping appointment scheduling sheets out of sight. Additionally, enumerators were extensively trained on trauma-informed research and psychological first aid to enable them to support respondents that became distressed during the interview.

Enumerators were trained on protocols for reporting abuse to law enforcement or social services, as well as offering referrals resources. If the respondent reported illegal abuse and directly asked for law enforcement intervention, then the enumerator was trained to submit a safety assessment to their supervisor and the supervisor would refer the case to law enforcement within 24 hours. If the respondent directly requested social services other than law enforcement intervention, the enumerator would submit a safety assessment to their supervisor and the supervisor would refer the case to social services within 72 hours. All respondents were also offered referral resources after the interview was completed.

NORC sought and received approval from its internal IRB, which follows a formal process for ensuring all research projects are conducted in accordance with the U.S. Federal Policy for the Protection of Human Subjects. NORC's IRB is registered with the U.S. Department of Health and Human Services Office of Human Research Protection and has a Federal-wide assurance (Federal-Wide Assurance FWA 00000142). The IRB takes an active role in helping guide protocols to meet the highest standards for human subject protections. NORC's IRB requires that research protocols provide sufficient detail to ensure that (1) the selection of subjects is equitable, subjects' privacy is

protected, and data confidentiality is maintained; (2) informed consent is written in language that study participants can understand and is obtained without coercion or undue influence; and (3) appropriate safeguards to protect the rights and welfare of vulnerable subjects. NORC also obtained IRB approval from AMREF, a local IRB accredited by Kenya's National Commission for Science, Technology and Innovation (NACOSTI).

COVID-19 protocols were put into effect for the safety of respondents and enumerators during data collection. The protocols included the requirement to always wear a face mask and the requirement to socially distance by at least 1-2 meters during the interview.

3. FINDINGS

In this section, we first present summary statistics on the study population including demographic characteristics of victims/survivors, the extent to which formal definitions of CSEC correlate with respondents' own self-identification as a victim/survivor, conditions and circumstances driving respondents to initially fall into the sex trade, whether and to what extent third parties financially benefit from respondents, and the prevalence of probable post-traumatic stress disorder (PTSD) among the study population. Thereafter, we present results for the study's primary research question—i.e., the current count of CSEC victims/survivors in Mombasa, Kilifi, and Kwale counties—followed by a discussion of the methodological limitations of the estimation approach. All summary statistics presented in this section are weighted averages using the sample weights described in PREVALENCE ESTIMATION METHODOLOGY.

RESPONDENT DEMOGRAPHIC CHARACTERISTICS

Table 6: Respondent Demographic Characteristics, by County

Variable	County			
	Kilifi	Kwale	Mombasa	Overall
Age	15.74	15.71	15.95	15.80
Number of children	0.15	0.13	0.14	0.14
Currently enrolled in school	52%	50%	42%	48%
Sex				
Male	21%	23%	28%	24%
Female	79%	77%	72%	76%
Country of Birth				
Kenya	100%	100%	99%	100%
Another Country	0%	0%	1%	0%
Marital Status				
Never married	98%	99%	99%	99%
Ever married	2%	1%	1%	1%
Primary Language Spoken				
Kiswahili	94%	93%	92%	93%
English	1%	0%	4%	2%
Other	5%	7%	3%	5%

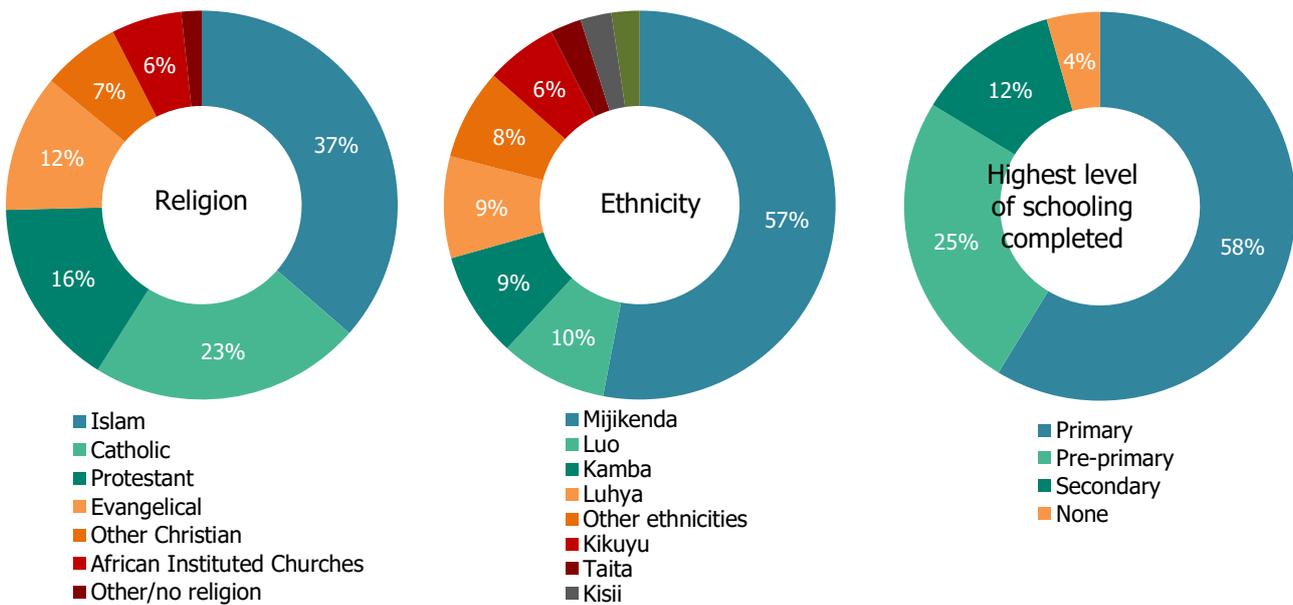
Additional countries of birth, marital statuses, and languages were included in the survey instrument, but no other categories reached greater than one percent of respondents and were thus excluded from the tables above.

Table 6 below shows that the average age of respondents was just under 16 years in all counties, which is slightly above the median age (15) of the study's target population (13-17 year-olds). In line with the seed selection protocol, girls comprised 76 percent of the study population with boys making up the remaining 24 percent. At the time of the survey, the great majority of respondents were unmarried (99 percent) and childless (0.1 children on average).

Slightly less than half of respondents were enrolled in school at the time of the survey, ranging from 42 percent in Mombasa to 52 percent in Kilifi. As shown in Figure 5, 58 percent of respondents had primary school as the highest level of schooling completed, however this varied somewhat by county (48 percent in Kwale compared to 66 percent in Mombasa). Education levels in Mombasa were lower on average than in Kilifi and Kwale, with only five percent of respondents advancing beyond primary school compared to 17 and 18 percent in Kilifi and Kwale, respectively. The percentage of respondents with less than primary school education was fairly consistent across counties at approximately one in four. For a complete breakdown of schooling by county, see Table 19 in ANNEX IV. TABLES.

The vast majority of study participants were born in Kenya, and the most common language spoken is Kiswahili at 93 percent, followed by English at two percent.

Figure 5: Respondent Religion, Ethnicity, and Highest Level of Schooling Completed



Categories were only included if they were reported by at least 2 percent of respondents, all other categories were then combined into other.

Figure 5 shows that Christian religions including Catholicism, Protestantism, and Evangelicalism were the most commonly cited religious affiliations overall at 23, 16, and 12 percent, respectively. Islam was the next most common religion overall at 37 percent of respondents, but the proportion of respondents identifying as Muslim varied significantly across counties (19 percent in Kilifi compared to 60 percent in Kwale). The most common ethnicity among respondents was Mijikenda at 57 percent, but this varied a good deal across counties (74 percent in Kilifi compared to 30 percent in Mombasa). No other ethnicity represented more than ten percent of respondents, but Luo (20 percent), Luhya (15 percent), and Kamba (13 percent) each accounted for over ten percent of respondents in Mombasa. See Table 19 in ANNEX IV. TABLES ANNEX IV. TABLES for complete breakdowns of religion and ethnicity by county.

ENGAGEMENT IN COMMERCIAL SEX TRADE

Respondents were eligible to participate in the study if they self-reported having done sexual things for money or things worth money like a place to stay, food, or gifts at least once in the past 12 months. However, what qualifies as a commercial “sex act” varies somewhat across governmental and intergovernmental agencies. For example, the U.S. State Department definition

states that “sex includes genital or anal contact or penetration of a person, regardless of whether such contact or penetration is genital, oral, or manual...and can include virtual situations, such as when a trafficker pays to watch a trafficking victim engaging in a sex act, including self-masturbation.” The Government of Kenya includes “indecent exhibition or show”—regardless of genital contact or penetration—among its definition while the ILO includes any media of a sexual nature (See ANNEX III. CSEC DEFINITION CROSSWALK for complete definitions and variable mapping by source).

Given the sensitive and intrusive nature of questions on specific sex acts, the research team included a randomized response module at the end of the survey to elicit accurate information on respondents’ engagement in qualifying sex acts while preserving their anonymity. For the randomized response module, respondents were given a die and instructed to roll it before answering a question about a specific sex act (the interviewer could not see what number was rolled). If they rolled a one they were instructed to answer yes to the statement even if it was untrue; if they rolled a six, they were instructed to answer no even if the statement was true; and if they rolled a two, three, four, or five, they were instructed to give a truthful response. Responses were tallied in accordance with the definitional criteria provided in Annex III and data were transformed to back out the forced responses, thus yielding accurate aggregate summary statistics the results of which are presented below.¹⁶

Table 7: CSEC Victim Definitions

Variable	County			Overall
	Kilifi	Kwale	Mombasa	
Respondent self identifies as CSEC victim	100%	100%	100%	100%
U.S. State Department CSEC victim definition	100%	96%	97%	97%
Government of Kenya Sexual Offences Act CSEC victim definition	100%	96%	97%	98%
ILO CSEC victim definition	100%	96%	98%	98%
Sugar daddy/mommy only CSEC victim definition	0%	1%	0%	0%

Table 7 indicates that overall the vast majority of respondents met the criteria for every definition of CSEC. Ninety-eight percent of respondents met the ILO criteria (ranging from 96 percent in Kwale to 100 percent in Kilifi). In general, Kilifi saw the highest rate of correlation between self-reporting and the various formal definitions/criteria for what constitutes a sex act.

The team also explored the special case of “sugar daddy” or “sugar mommy” relationships whereby the child is engaged in a more long-term sexual relationship that involves material benefits but may not be considered purely transactional in nature. No respondents in Kilifi or Mombasa and only one percent of respondent in Kwale were in a sugar daddy/mommy relationship while not engaging in any other type of commercial sex acts. To summarize, self-reporting using a general/simplified definition was well-aligned to more formal definitions, thus obviating the need to probe on specific sex acts in future studies.

¹⁶ Means were calculated using Stata’s user written *rrreg* command (see Fox, James Alan, and Paul E. Tracy. 1986. *Randomized response: A method for sensitive surveys*. London: Sage). Probabilities of forced yes or forced no responses were calculated using joint probabilities that varied depending on the number of yes responses provided by a given respondent to a given block of questions.

Table 8: Characteristics of First Engagement in Commercial Sex Act(s) Among Respondents

Variable	County			Overall
	Kilifi	Kwale	Mombasa	
Age first engaged in any sexual activity	12.58	13.06	13.13	12.92
Age first engaged in sexual activity in exchange for goods/money	13.53	13.71	13.69	13.64
Living arrangement when you first engaged in sexual activity for goods/money				
With a parent/guardian	66%	87%	78%	77%
In hometown/village	64%	84%	52%	67%
Person who first introduced you to the sex trade				
Adult	71%	63%	56%	63%
Male	23%	28%	28%	26%
Forced, pressured, coerced you into entering the sex trade	21%	30%	12%	21%

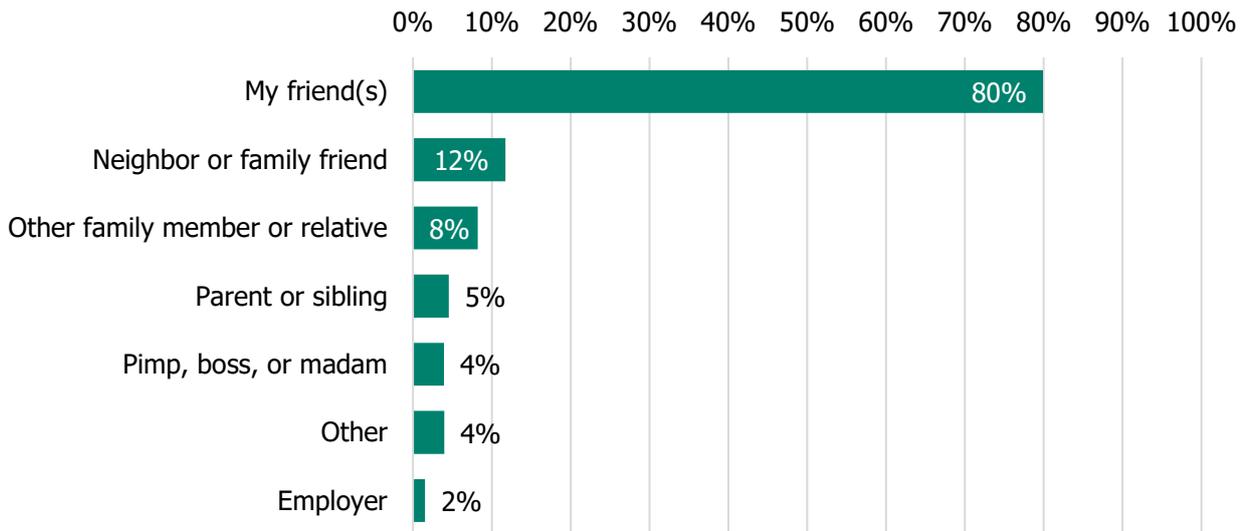
Table 8 above shows summary statistics on respondents' circumstances when they first engaged in commercial sex act(s). The average age that respondents first engaged in any sexual activity was just under 13 years old overall, which was fairly consistent across counties. The average age that respondents first engaged in sexual activity in exchange for goods and money was slightly higher at around 13.6 years overall¹⁷.

Approximately three-quarters of respondents were living with a parent or guardian when they first engaged in commercial sex act(s), which varied across counties from 66 percent in Kilifi to 87 percent in Kwale. About two-thirds of respondents were living in their hometown or village when they first engaged in commercial sex act(s), however this similarly varied across counties from 52 percent in Mombasa to 84 percent in Kwale.

Figure 6 shows that overall four out of five respondents said that a friend first introduced them to the sex trade, which was the most common response by far and very consistent across the three counties. The next most common response was a neighbor or family friend, which was selected by 12 percent of respondents. No other type of person was indicated by more than ten percent of respondents overall or within any given county.

¹⁷Note that the sample was only for children aged 13-17, so children that entered sex work below the age of 13 and have not turned 13 yet would not be included and this may bias the estimate.

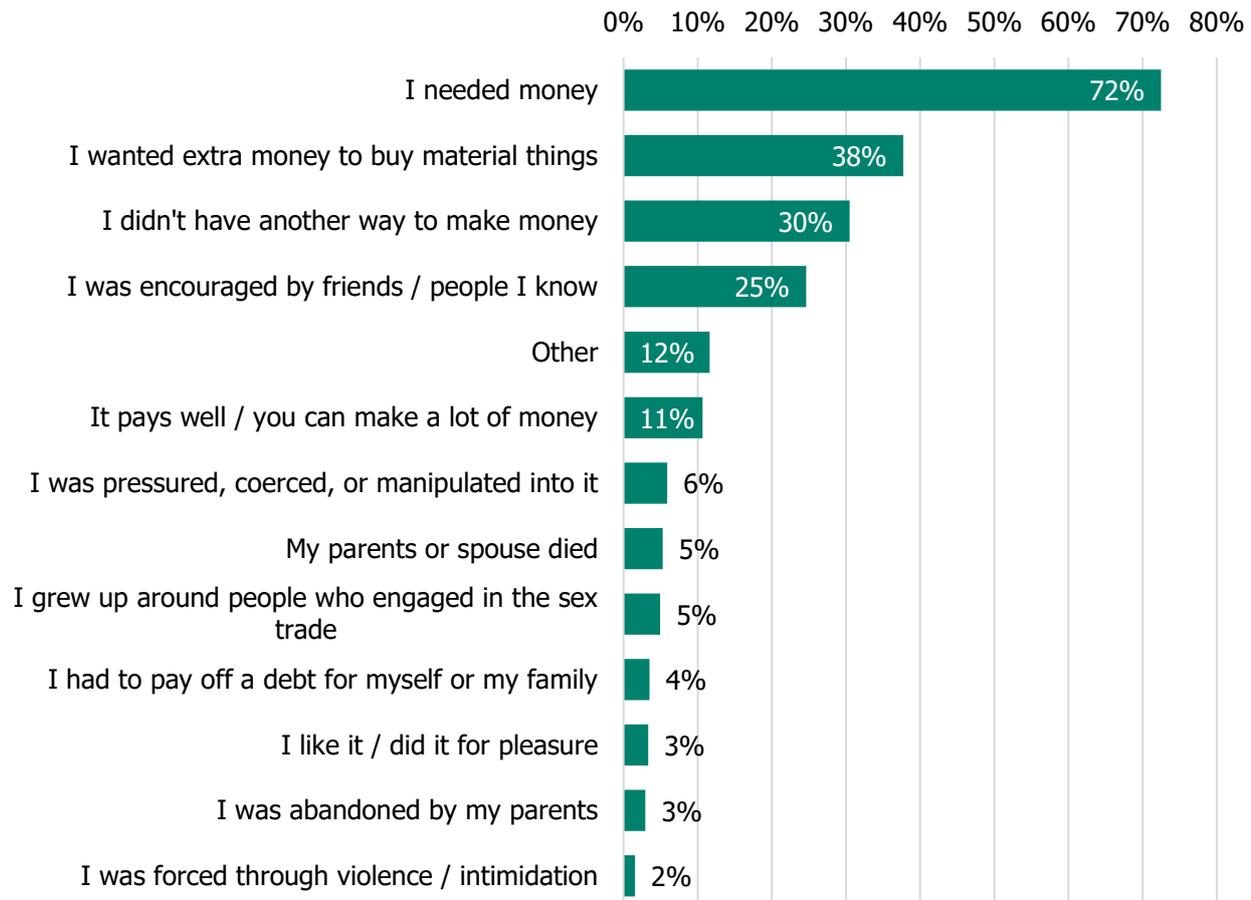
Figure 6: Who First Introduced Respondent to the Sex Trade



Categories were only included if they were reported by at least 2 percent of respondents, all other categories were then combined into other. The responses are multi-select, so response options will not necessarily add up to 100 percent.

Figure 7 shows the reasons that first led respondents to enter the sex trade. Four out of the top five reasons (excluding the “other” category) were of a financial nature: needing money (72 percent), wanting extra money to buy material things (38 percent), not having any other way to make money (30 percent), and that the sex trade pays well (11 percent). The only reason in the top five that was not directly related to money was being encouraged by friends at 25 percent. Respondents in Kwale were the most likely to mention each of the top five reasons related to money, and respondents in Kilifi were the least likely to mention any of these responses, which suggests that motivations for joining the sex trade in Kwale may be more driven by peer influence and cultural norms than in the other two counties. See Table 21 in ANNEX IV. TABLES for complete breakdowns of who first introduced respondents to the sex trade and the reasons respondents first entered the sex trade by county.

Figure 7: Reasons Respondents First Entered the Sex Trade (Self-Reported)

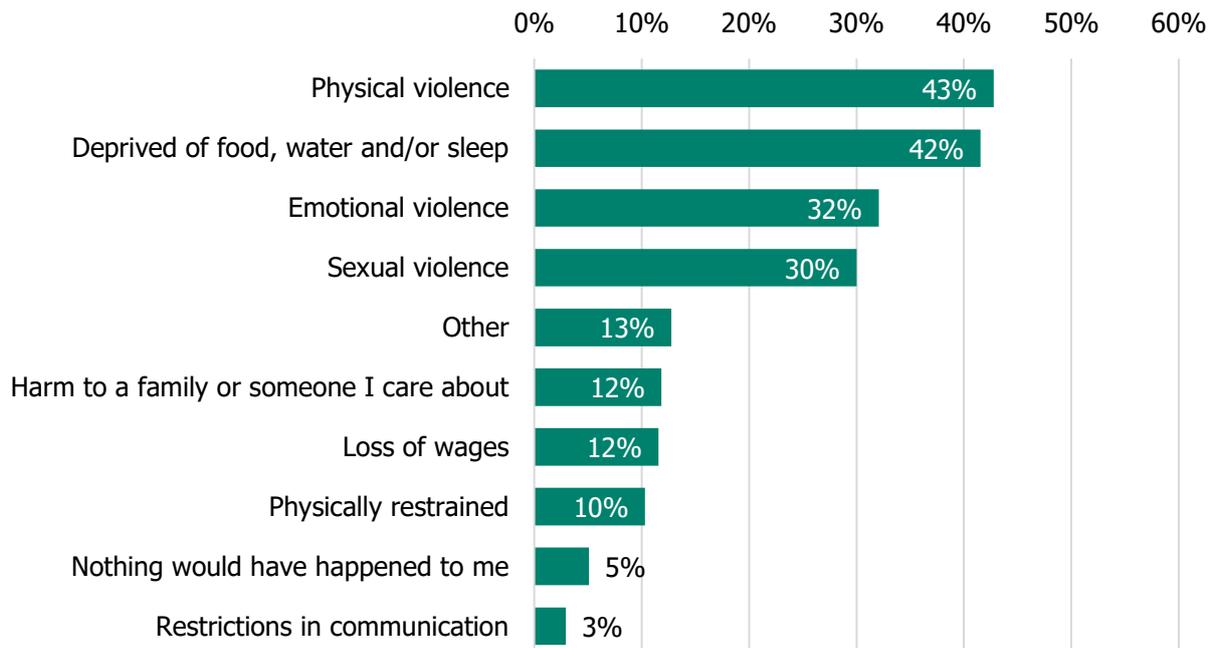


Categories were only included if they were reported by at least two percent of respondents, all other categories were then combined into other. The responses are multi-select, so response options will not necessarily add up to 100 percent.

Respondents who reported first engaging in commercial sex acts due to pressure/coercion/manipulation (6 percent) or violence/intimidation (2 percent) were asked a follow-up question on what they believe would have happened if they had refused that first time. Approximately one in three of these respondents asked the follow-up question said they would have been subjected to some type of violence had they refused (physical violence 43 percent, emotional violence 32 percent, and sexual violence 30 percent). The next most common response was that they would have been deprived of basic needs such as food, water, and/or sleep (42 percent). Compared to Mombasa and Kilifi, respondents in Kwale were more likely to report physical, sexual, or emotional violence; harm to family members; and deprivation of food, water, or sleep as consequences for refusing.

See Table 21 in ANNEX IV. TABLES for the complete breakdowns of what these 8 percent of respondents believe would have happened if they refused to join the sex trade by county.

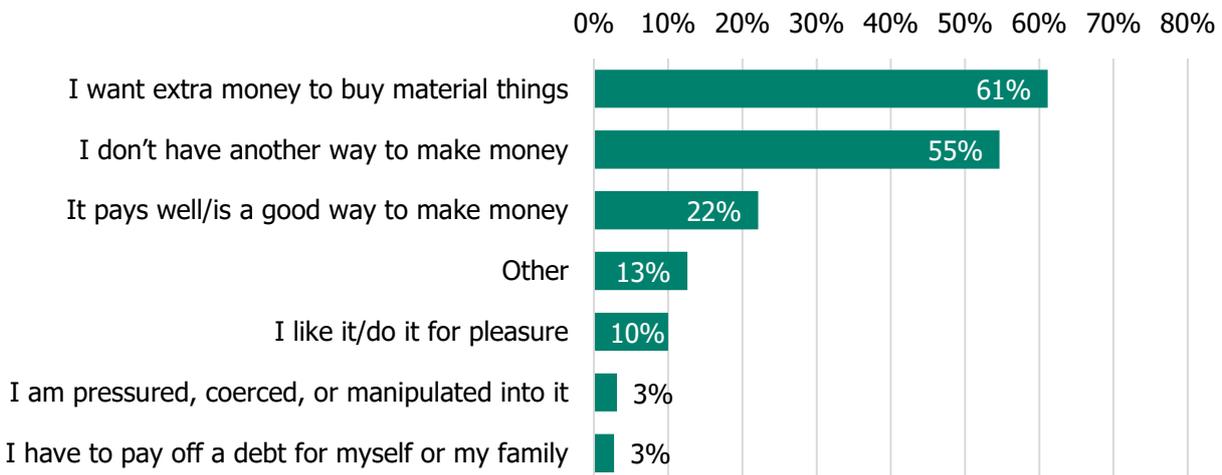
Figure 8: What Would Have Happened to Respondents that Faced Pressure or Intimidation to First Engage in CSEC Had They Refused



Categories were only included if they were reported by at least two percent of respondents, all other categories were then combined into other. The responses are multi-select, so response options will not necessarily add up to 100 percent.

Figure 8 shows the reasons why respondents exchanged sex for goods or money more recently, which were similar to the reasons why respondents first entered the sex trade. The three main reasons why they exchanged sex for money or goods recently also center on money: wanting extra money to buy material things was the most common answer (61 percent) followed by not having another way to earn money (55 percent).

Figure 9: Reasons Exchanged Sex for Goods or Money Recently



Categories were only included if they were reported by at least 2 percent of respondents, all other categories were then combined into other. The responses are multi-select, so response options will not necessarily add up to 100 percent.

Figure 9 shows that 17 percent of respondents indicated that their parents or guardians were aware of their involvement in the sex trade. This varied by county from 12 percent in Kwale to 24 percent in Kilifi. Around 35 percent of respondents had someone else help them find clients,

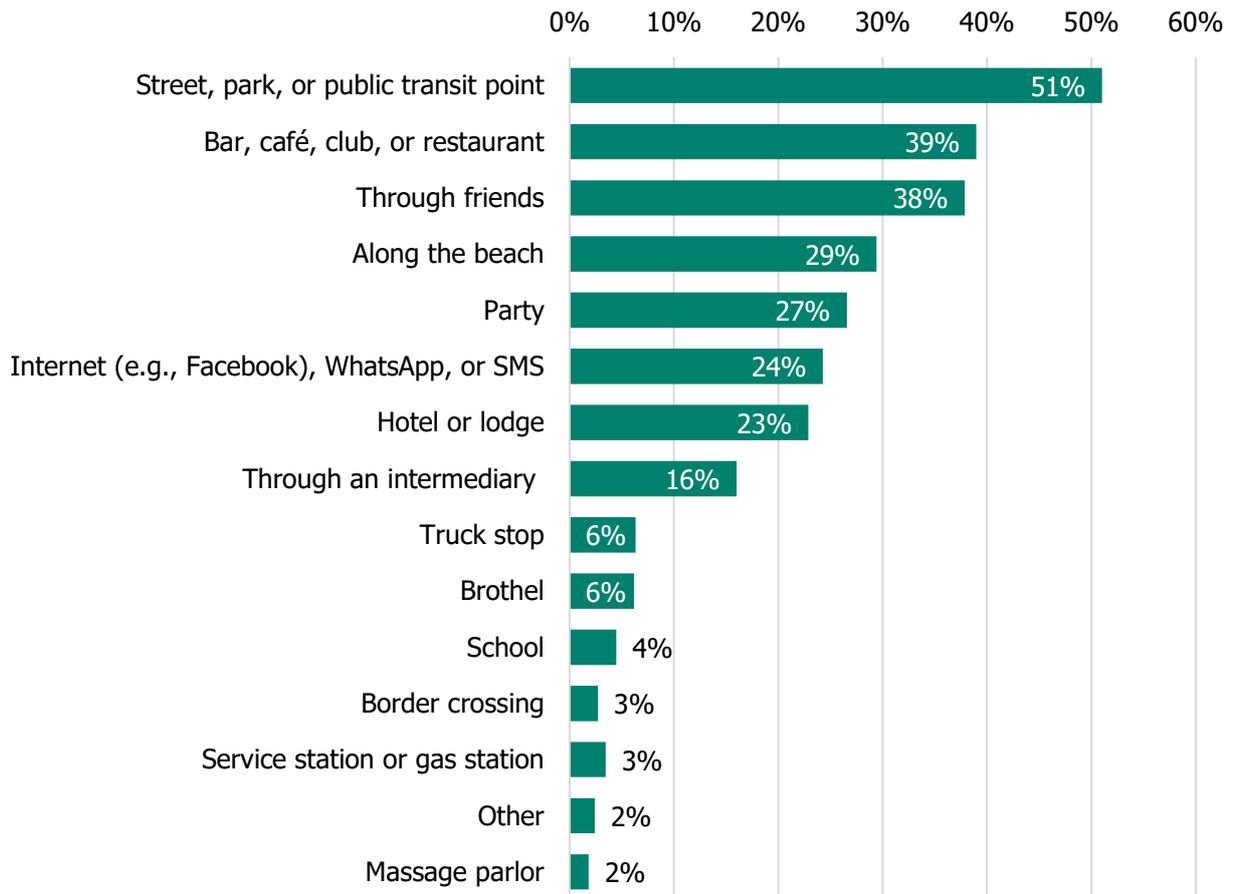
arrange their transactions, or manage their involvement in the sex trade, and the average number of such people was 1.6 overall. The person who arranged their engagement in the sex industry was typically an adult (82 percent overall) and female (78 percent overall). Kilifi had the largest percentage of adult facilitators at 91 percent and the lowest percentage of male facilitators at 10 percent. It is noteworthy that in both Mombasa and Kwale, over 20 percent of third-party facilitators were other children.

Table 9: Third Party Knowledge and Facilitation of CSEC Transactions

Variable	County			
	Kilifi	Kwale	Mombasa	Overall
Parents/guardians aware of involvement in the sex trade	24%	12%	15%	17%
Earn money by finding clients/arranging transactions for other children in the sex trade	35%	28%	35%	33%
Someone else helps find clients/arrange transactions/manage involvement in the sex trade	33%	37%	34%	35%
For those who have someone else helps find clients/arrange transactions/manage involvement in the sex trade				
Number of people who help find clients/arrange transactions/manage	1.57	1.63	1.53	1.58
Person who arranges transactions is an adult	91%	79%	77%	82%
Person who arranges transactions is a female	90%	77%	68%	78%
Person charges a fee to arrange transactions	72%	87%	73%	78%
For those who have a facilitator (pimp, boss, or madam) that helps find clients/arrange transactions/manage involvement in the sex trade				
Money paid for sexual services kept by a facilitator to cover basic needs (housing/food)	30%	36%	10%	30%
Money paid for your sexual services kept by a facilitator to pay off a debt	22%	7%	5%	13%

Overall, approximately three in four third party facilitators charged a fee to arrange the respondent's sexual transactions. Of those respondents who reported that their facilitator collected a fee, 30 percent said the fee was kept to cover their basic needs like housing and food, and 13 percent said the fee was kept to pay off a debt. Kwale had the highest percentages of fees used for basic needs (36 percent) and Kilifi had the highest percentage of fees used for paying off debt (22 percent); Mombasa had the lowest percentages for each at 10 and 5 percent, respectively. Finally, around one in three respondents indicated that they earned money by finding clients and arranging sex work for other children, which was fairly consistent across counties.

Figure 10: Where Respondent Normally Find Buyers



The responses are multi-select, so response options will not necessarily add up to 100 percent.

Figure 10 illustrates where respondents typically find their clients. The majority of respondents said that they normally found clients in a public place; 51 percent on a street/park/public transportation, 39 percent at a bar/café/club/restaurant, 29 percent along the beach, 27 percent at a party, and 23 percent at a hotel/lodge. More than one in three respondents said that they found clients through a friend and one in six through an intermediary. Additionally, about one in four respondents found their clients online. In Kwale respondents were much less likely to find their clients in a bar/café/club/restaurant (23 percent) than in the other two counties, but much more likely to find their clients at a party (47 percent) or through an intermediary (25 percent). In Kilifi more than one in three respondents found their clients online or at a hotel/lodge. See ANNEX IV. TABLES for the complete breakdowns of where respondents find clients by county.

Figure 11: Number of Paying Partners¹⁸ for Sexual Activities

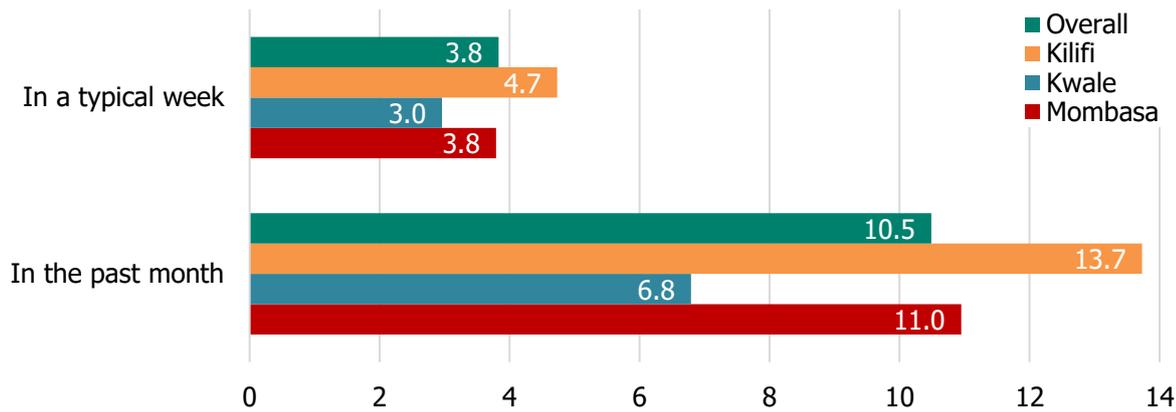


Figure 11 shows that the average number of paying partners with whom respondents engaged in sexual activities in a typical week was almost four and varied from three in Kwale to about five in Kilifi. The average number of paying partners over the past month was 10.5. This was also the highest in Kilifi at 14 and the lowest in Kwale at seven.

Table 10: Current and Future Engagement in Sexual Activities and Sex Trade

Variable	County			
	Kilifi	Kwale	Mombasa	Overall
Had unprotected sex with a client in the past year	58%	49%	39%	49%
Feel you can stop engaging in the sex trade anytime if you want	77%	83%	87%	82%
COVID-19 has changed about how you support yourself	27%	22%	39%	30%

As shown in Table 10 almost half of all respondents reported that they had had unprotected sex with a buyer in the past year, which ranged from 39 percent in Mombasa to 58 percent in Kilifi. Despite the fact that 55 percent of respondents saying they do not have another way to earn money, the great majority—82 percent overall—felt that they could stop engaging in the sex trade anytime if they wanted to.

Thirty percent of respondents indicated that since COVID-19 the way they supported themselves had changed. Most respondents note a significant drop in earnings due to both short-term measures (such as the imposition of lockdowns and curfews and shuttering of bars and clubs) as well as potentially long-term disruptions to the tourism industry and the resulting exodus of migrant workers. According to open-ended feedback from respondents, the profile of the typical buyer has also changed from tourists and workers in the hospitality sector to locals, who are reportedly paying substantially less and, in some instances, not paying at all. Likewise, middlemen and third parties such as hoteliers and taxi drivers may play a less pronounced role in brokering CSEC since the pandemic began.

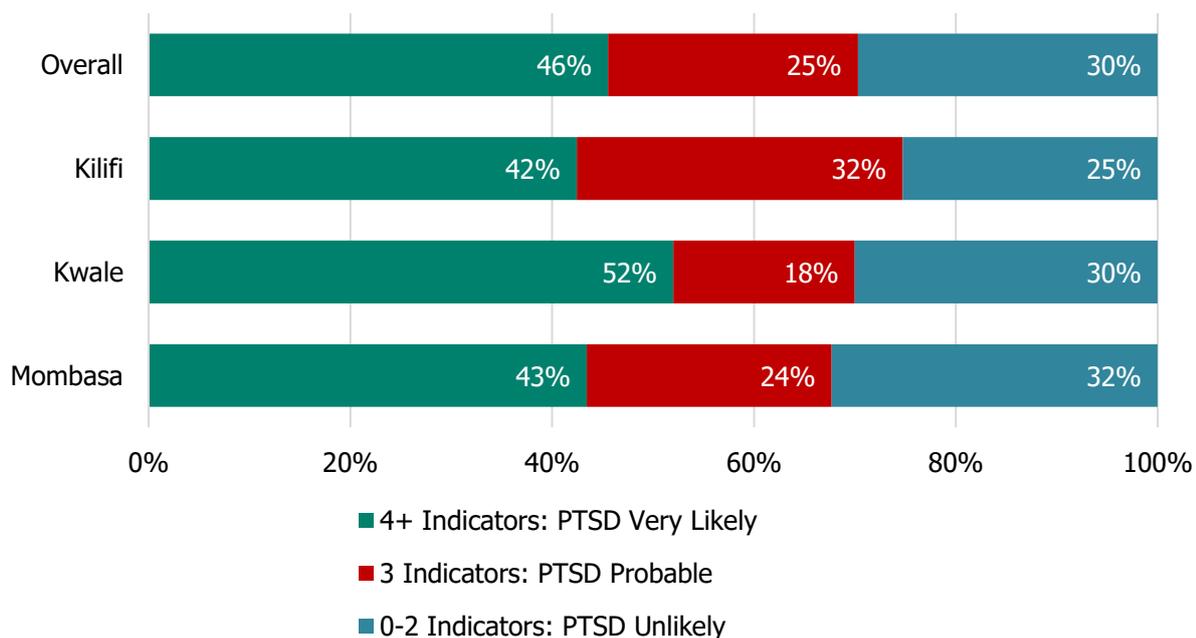
¹⁸Note that this figure is the number of paying partners and not the number of sexual transactions, therefore if one partner paid for sex multiple times they would still be counted once. This distinction is why the number of paying partners in the past week is not four times as large as the number of paying partners in the past month.

Respondents were asked a series of five questions to quickly and reliably assess the likelihood that they have Post-Traumatic Stress Disorder (PTSD).¹⁹ Specifically, they were asked if they had experienced any of the following over the past month:

1. Had nightmares about traumatic event(s) or thought about traumatic event(s) when you did not want to?
2. Tried hard not to think about traumatic event(s) or went out of your way to avoid situations that reminded you of traumatic event(s)?
3. Felt guilty or unable to stop blaming yourself or others for traumatic event(s) or any problems those event(s) may have caused?
4. Been overly alert or easily startled?
5. Felt numb or detached from people, activities, or your surroundings?

If the respondent answered yes to at least three questions then this is optimally sensitive to screening for probable PTSD, meaning that it minimizes false negative screen results. If the respondent answered yes to four or more questions, then this is optimally efficient to screening for PTSD meaning that this balances the false positive and false negative results (the percentage of respondents that answered yes to each question can be found in ANNEX IV. TABLES in Table 23).

Figure 12: Number of PTSD Indicators per Respondent



As shown in Figure 12 over 70 percent of respondents reported at least three indicators and are thus probable PTSD sufferers. The highest share was in Kilifi where approximately three-quarters of respondents reported at least three PTSD indicators, and the lowest in Mombasa at 67 percent. Additionally, 46 percent of respondents overall reported at least four indicators of PTSD and are

¹⁹ For additional resources on how the PTSD screener is used the reader can reference the Primary Care PTSD Screen: <https://www.ptsd.va.gov/professional/assessment/documents/pc-ptsd5-screen.pdf>

thus very likely to have PTSD. Kwale had the highest percentages at 52 percent and Mombasa had the lowest at 43 percent.

PREVALENCE ESTIMATION

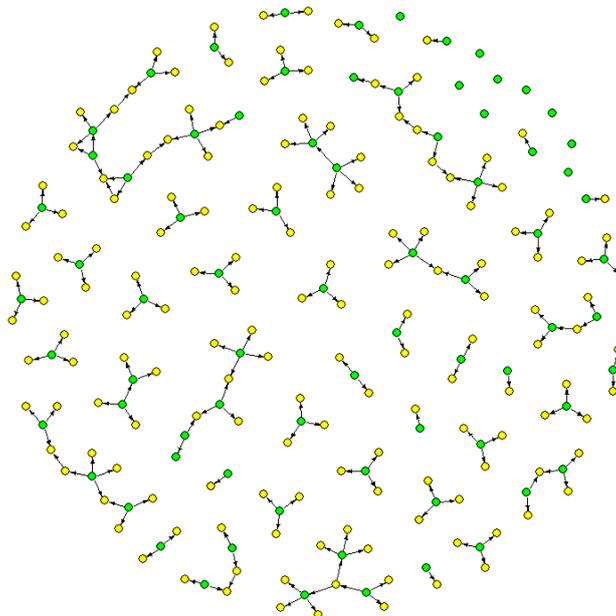
SAMPLE NETWORK PLOTS

Network plots of the sample networks for each county are included below to illustrate the results of the coupon redemption/link-tracing and matching process. The green nodes represent the initial sample (seeds) and the yellow nodes represent individuals that were selected after the initial sample. Edges between nodes indicate a referral with the arrow indicating its direction. Each county corresponds to two plots:

1. Plots of the initial sample and first wave, where it can be seen that the majority of the arrows emanate from the seed respondents.
2. Plots of the fully observed network sample, where it can be seen that arrows stretch over waves and in both directions so as to capture observations/nominations from any one individual to another in the final sample.

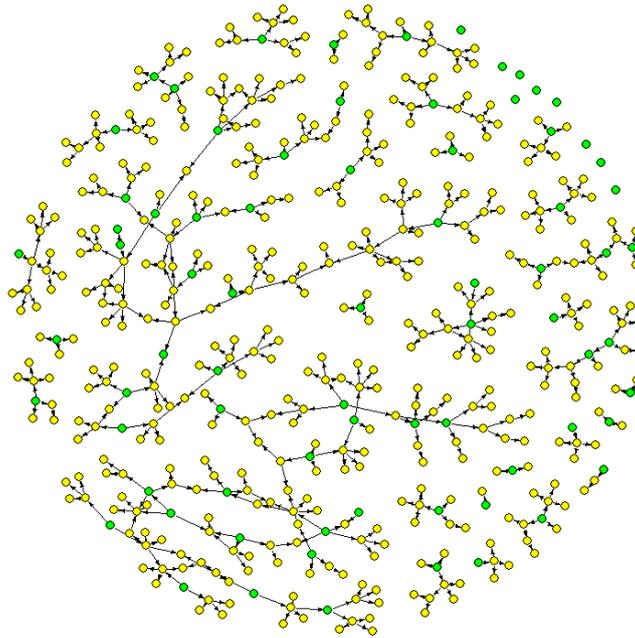
The illustrations show that Mombasa was the densest sample in terms of network links, while Kilifi was the least dense of the three. Interestingly, all three initial samples gave rise to a first wave of similar magnitude (see Figure 13). Such characteristics have implications for population size estimation since in this case the more well-connected the initial sample size, the smaller the estimate for the population size (see Figure 14). Clustering tendencies among the observed individuals are especially evident in the Kwale and Mombasa sample networks, which reflect the sampling design's ability to capture information that accurately reflects the network topology of the parent populations.

Figure 13: Kilifi Network Plot of Seeds and First Wave



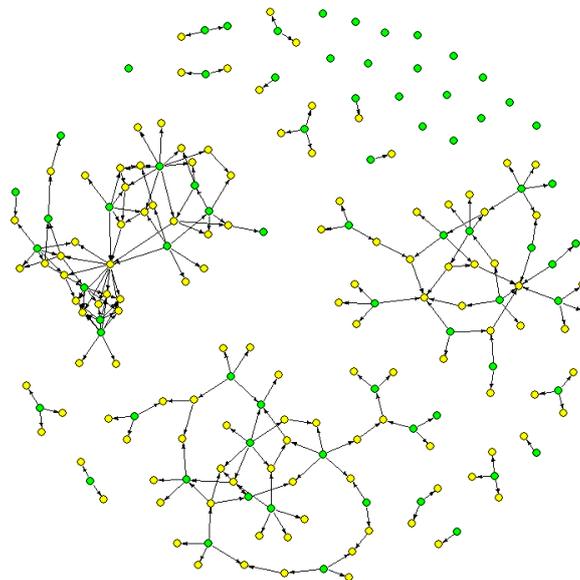
The Kilifi sample network plot of initial sample and first wave. Yellow nodes represent those selected for the initial sample and green nodes represent those selected after the initial sample. The directed edges indicate a nomination/referral.

Figure 14: Kilifi Network Plot of Full Sample



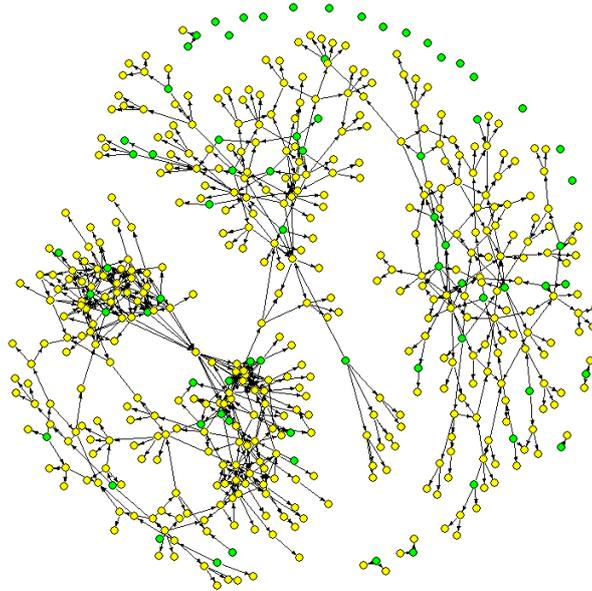
The Kilifi sample network plot of the full sample. Yellow nodes represent those selected for the initial sample and green nodes represent those selected after the initial sample. The directed edges indicate a nomination/referral.

Figure 15: Kwale Network Plot of Seeds and First Wave



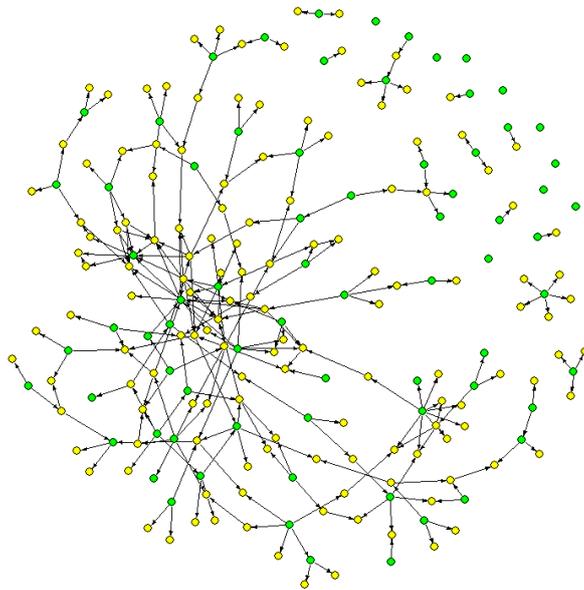
The Kwale sample network plot of initial sample and first wave. Yellow nodes represent those selected for the initial sample and green nodes represent those selected after the initial sample. The directed edges indicate a nomination/referral.

Figure 16: Kwale Network Plot of Full Sample



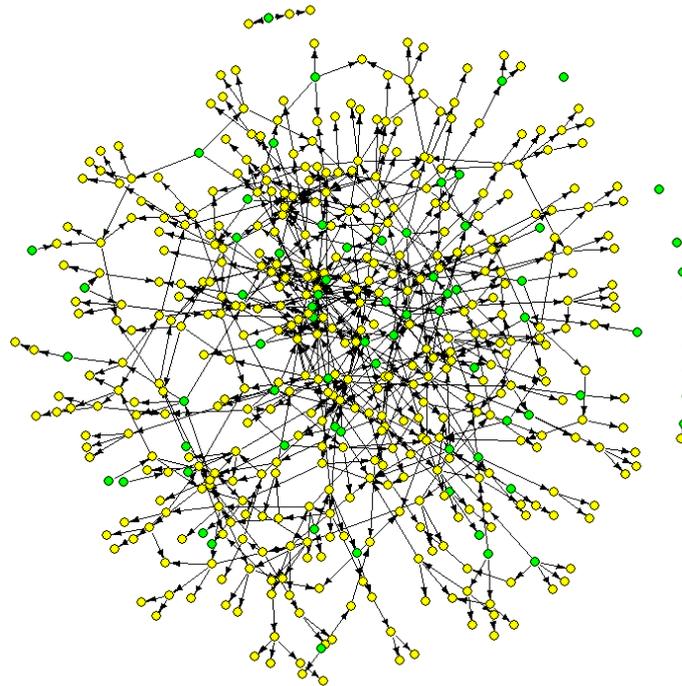
The Kwale sample network plot of full sample. Yellow nodes represent those selected for the initial sample and green nodes represent those selected after the initial sample. The directed edges indicate a nomination/referral.

Figure 17: Mombasa Network Plot of Seeds and First Wave



The Mombasa sample network plot of initial sample and first wave. Yellow nodes represent those selected for the initial sample and green nodes represent those selected after the initial sample. The directed edges indicate a nomination/referral.

Figure 18: Mombasa Network Plot of Full Sample



The Mombasa sample network plot of full sample. Yellow nodes represent those selected for the initial sample and green nodes represent those selected after the initial sample. The directed edges indicate a nomination/referral.

DATA ANALYSIS

Estimation of the full study population size is based on the approach outlined in Frank and Snijders (1994). Table 11 gives the point estimates, standard errors, and confidence intervals corresponding to each of the three counties. The $1 - \alpha = 95\%$ confidence intervals are based on a log-transformation procedure. Comments which tie observations of the structure of the sample network plots to the population size estimates is summarized in RESEARCH METHODS.

Table 11: Population Size Estimation for Each Study Region

Study Region	Point Estimate	Standard Error	95% Confidence Interval
Kilifi	3,328	1,458	(1,481; 7,600)
Kwale	1,808	636	(938; 3,553)
Mombasa	1,220	329	(734; 2,064)
Overall	6,356	1,624	(3,173; 9,539)

Population size estimates with corresponding standard errors and confidence intervals for each study region. The estimation procedure is based on the design-based approach detailed in Frank and Snijders (1994).

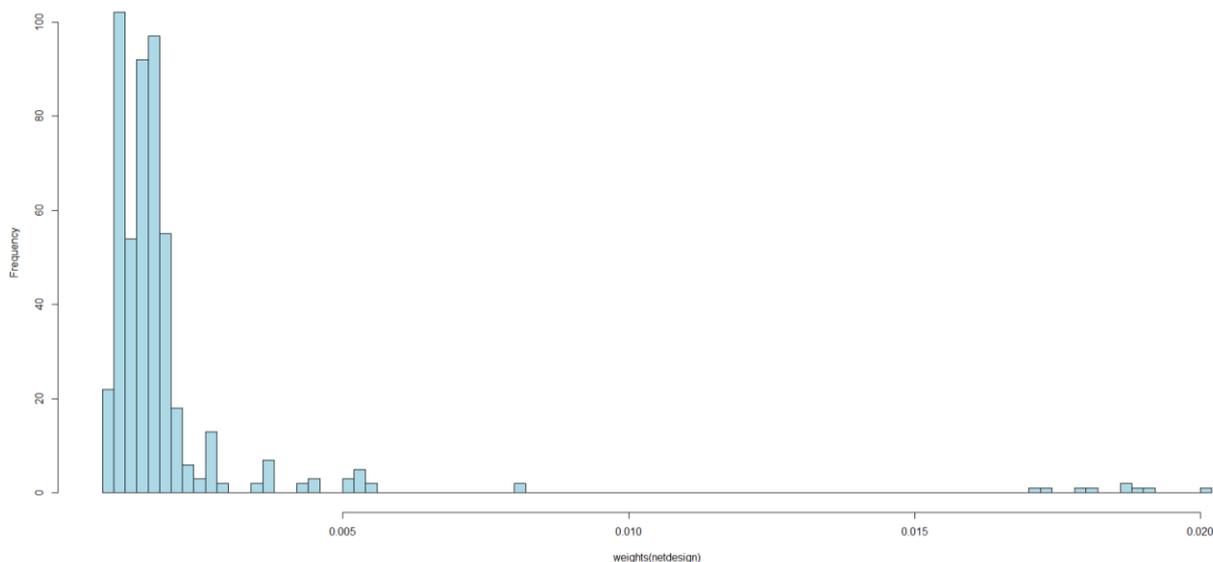
Table 12 below combines county- and age-disaggregated population size data from the 2019 census with the aforementioned point estimates to obtain an estimated prevalence rate of CSEC among the general population of 13-17 year-olds in the respective counties. Overall, we estimate that one to two percent of all 13-17 year olds in the three coastal counties were engaged in CSEC at some point in the preceding 12 months. This is likely underestimated relative to pre-pandemic times, as respondents widely reported a precipitous drop in demand for CSEC since 2020.

Table 12: CSEC Prevalence Estimation for Each Study Region

Study Region	Point Estimate	Total Population Size ²⁰	Prevalence Rate
Kilifi			
Total	3,328	189,359	1.76%
Female	2,614	94,129	2.78%
Male	714	95,230	0.75%
Kwale			
Total	1,808	110,367	1.64%
Female	1,389	54,127	2.57%
Male	417	56,240	0.74%
Mombasa			
Total	1,220	102,887	1.19%
Female	872	52,884	1.65%
Male	348	50,003	0.70%
Overall			
Total	6,356	402,613	1.58%
Female	4,875	201,140	2.42%
Male	1,479	201,473	0.73%

Figure 19, Figure 20, and Figure 21 give histograms of the scaled sample weights for each study region. Recall that the recently introduced resampling procedure that is detailed in Thompson (2020) was used to calculate the sample weights. The algorithm tends to assign larger weights to the more isolated individuals and smaller weights to the more well-networked individuals. We find that the weights for the Kilifi sample have the least amount of deviance, which is to be expected considering that the corresponding sample network has the least amount of heterogeneity in terms of individual degree (i.e., number of links stretching to and from the individual).

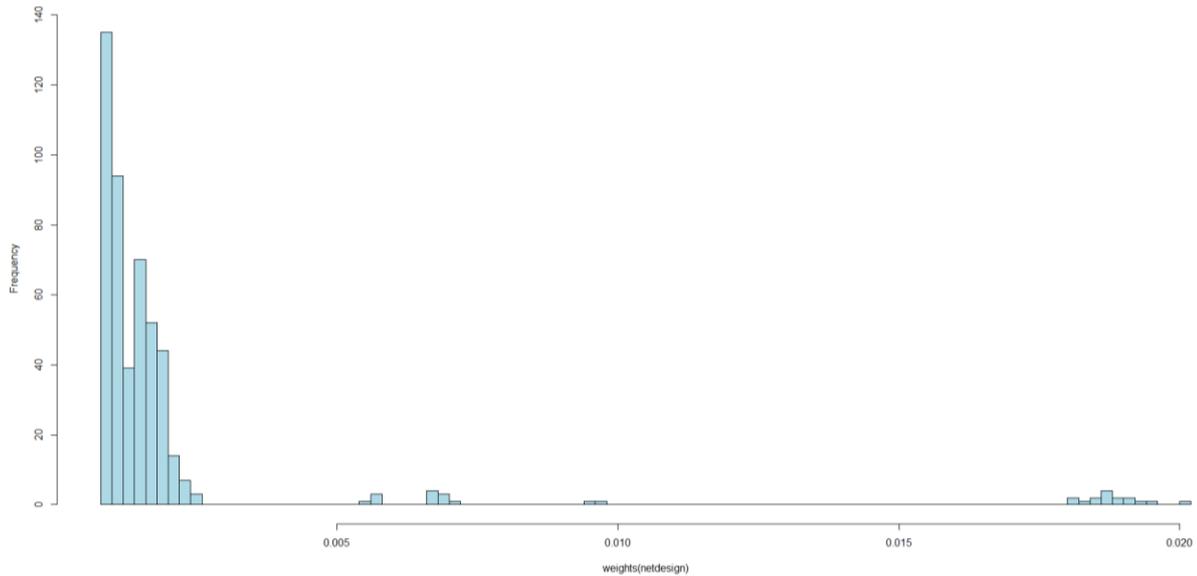
Figure 19: Sample Weights for Kilifi Respondents Based on Resampling Procedure



Scaled sample weights for Kilifi respondents based on Thompson’s (2020) resampling procedure.

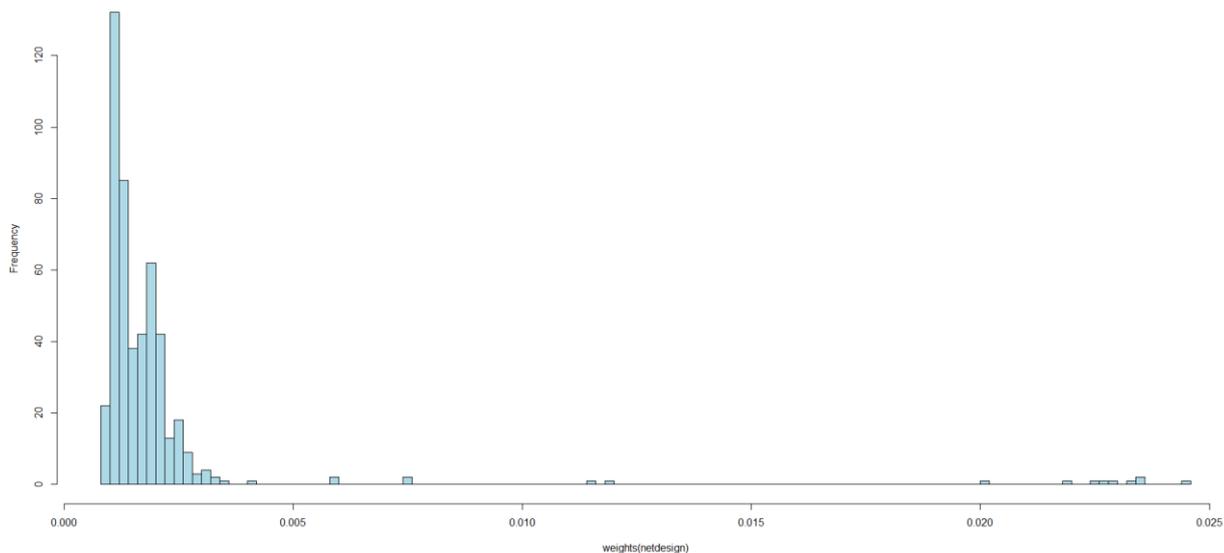
²⁰ Total estimated population of 13-17 year olds in the county, per the 2019 census.

Figure 20: Sample Weights for Kwale Respondents Based on Resampling Procedure



Scaled sample weights for Kwale respondents based on Thompson’s (2020) resampling procedure.

Figure 21: Sample Weights for Mombasa Respondents Based on Resampling Procedure



Scaled sample weights for Mombasa respondents based on Thompson’s (2020) resampling procedure.

LIMITATIONS

As noted earlier, the sampling and inference strategies possess both advantages and disadvantages relative to contemporary network-based approaches. The strategies have been primarily developed to enable efficient estimation of the study population and subpopulation sizes, which are typically the most sought-after quantities in studies on hard-to-reach populations. Other strategies are either limited or require unreasonable and possibly unverifiable assumptions for population size estimation, oftentimes when the population network is assumed to be generated for an elaborate model. The strategy also gives rise to a much richer data set since it encourages observations/records of nominations across sampled networks and repeat interviews (cf. the “network trees” which are obtained with applications of an RDS design), which can allow for sophisticated network-modeling procedures to be applied to infer on network parameters that govern attributes such as the cohesiveness and rate of transmission within the population.

The primary limitations of link-tracing are outlined as follows. First, since the initial sample forms the basis for both the design and inference components of this strategy, a moderately sized and representative initial sample is critical for efficient inference for population level quantities. Obtaining such a sample can be challenging for especially rare or elusive populations. Second, social links are almost always automatically mapped in network sampling designs when these are used as sampling paths for recruitment (i.e., through redemption of coupons). In this strategy, any untraced links within the final sample must be observed for the corresponding inference procedure to be applied. This has required post-data collection mapping based on covariate information, as was successfully applied in Vincent, Dank, and Zhang (2019). Such matching exercises will always be subjected to a degree of error, and the corresponding lessons learned will be applied to the analysis for this study to ensure such mapping exercises are as efficient as possible.

This study has exploited the nomination and identifying information within the initial sample and across to the first wave to obtain a population size estimate and corresponding confidence interval. Further, the full sample link structure was completely observed to most efficiently apply the innovative network analysis procedure, governed by the algorithm detailed in Thompson (2020), to mitigate limitations commonly encountered with studies based on network-based approaches.

6. CONCLUSIONS AND RECOMMENDATIONS

CONCLUSIONS

- **An estimated 6,356 children in Kilifi, Kwale, and Mombasa are currently engaged in CSEC**, accounting for 1.6 percent of the total population of 13-17 year olds across the three counties, including 2.4 percent of female 13-17 year olds and 0.7 percent of male 13-17 year olds. However, this is likely underestimated relative to pre-pandemic times, as respondents reported a precipitous drop in demand for CSEC since 2020.
- **According to respondents, parents of victims/survivors are largely unaware of their child's involvement in the sex trade.** Overall, 83 percent of respondents said that their parent(s) were unaware of their involvement in CSEC even though three-quarters were living at home when they first engaged in commercial sex acts. Further, only five percent said they were introduced to the sex trade by an immediate family member (parent or sibling).
- **Most victims/survivors are out of school.** Slightly less than half of respondents were enrolled in school at the time of the survey, ranging from 42 percent in Mombasa to 52 percent in Kilifi. Fifty-eight percent of respondents had primary school as the highest level of schooling completed, however this varied somewhat by county (48 percent in Kwale compared to 66 percent in Mombasa). Education levels in Mombasa were lower on average than in Kilifi and Kwale, with only five percent of respondents advancing beyond primary school compared to 17 and 18 percent in Kilifi and Kwale, respectively.
- **Over 70 percent of CSEC victims are likely suffering from Post-Traumatic Stress Disorder (PTSD).** The highest share was in Kilifi where approximately three-quarters of respondents reported at least three (of five) PTSD indicators, and the lowest in Mombasa at 67 percent. Additionally, 46 percent of respondents overall reported at least four indicators of PTSD and are thus "very likely" to have PTSD. Kwale had the highest percentage of such cases at 52 percent and Mombasa the lowest at 43 percent.
- **CSEC victims/survivors regularly recruit other children into CSEC and financially profit from their involvement.** Thirty-seven percent of respondents said the person who first introduced them to the sex trade was another minor. Furthermore, of the 35 percent of respondents who said someone else helps them find clients, nearly 20 percent of such facilitators are other children (and 78 percent are female). One-third of respondents also reported financially benefiting from arranging transactions/clients for other children in the sex trade.

RECOMMENDATIONS

- **Sensitize families to CSEC risk factors and the importance of monitoring vulnerability among children in the household.** Low awareness among parents that their child is involved in CSEC suggests a strong need for community sensitization on the physical, social, and behavioral risk factors associated with CSEC as well as the importance of monitoring children's vulnerability in the household. Program implementers should therefore seek opportunities to integrate direct advocacy with parents/guardians into their existing programming. This might include door-to-door information campaigns, hosting community- and school-based parent meetings, or collaborating with religious leaders/institutions to disseminate messages to their congregations.

- **Help community members see CSEC victims/survivors as children needing care and protection rather than criminals.** Data from this study including on PTSD rates among victims/survivors and the age of entry into the sex trade (13.6 for the average respondent in the sample) could be disseminated to the public alongside information on the negative psychosocial effects CSEC. Furthermore, educating the public on PTSD may help community members and policymakers become more sensitized towards victims, and therefore more proactive agents of change.
- **Enhance the provision of trauma-informed mental health services to CSEC victims/survivors.** The high rates of probable PTSD among respondents suggest a strong need for high-quality mental health services to supplement other basic services for survivors. While there are governmental and non-governmental organizations offering psychosocial support services locally, the extent to which they are able to provide evidence-based screening, treatment, and aftercare to survivors of PTSD is unclear. In addition, service providers should educate caregivers of reintegrated survivors on recognizing and coping with the aftereffects of trauma.
- **Educate community members on CSEC reporting channels other than police and local authorities.** Of particular note, only three percent of respondents in the KAP study knew of Childline Kenya (116).²¹ Childline offers an anonymous reporting pathway which may make community members less fearful of retaliation, particularly from local authorities. In addition, helping community members understand the laws and penalties associated with CSEC may encourage reporting and discourage the sexual exploitation of children.
- **Enhance peer-to-peer education for CSEC victims and other at-risk children.** Implement community- and school-based prevention programming with current CSEC victims/survivors to help them understand the harmful effects of CSEC to enable them to protect themselves and others. Helping children understand the harmful effects of CSEC may also discourage them from recruiting, and financially benefiting from, other child victims.
- **Provide alternative livelihoods for CSEC victims/survivors, particularly those who are unable to return to formal schooling.** Fifty-five percent of respondents said they continue to engage in commercial sex acts because they have no other way to earn a living. In addition, nearly 30 percent of respondents dropped out before finishing primary school, and are thus unlikely to return to formal schooling. Offering these children an alternative way to make a consistent, living wage may give them the opportunity to leave the sex trade for good.

²¹ NORC at the University of Chicago (2021). GFEMS Kenya CSEC KAP Survey. Unpublished raw data.

7. ANNEXES

ANNEX I. FORMATIVE ANALYSIS

Data collection was conducted from 20th November 2020 to 22nd November 2020, for a period of 3 days. The team took 3 days to complete the allocated sample of 15 respondents.

CSEC PRE-TEST OUTCOME

Table 13: Summary of CSEC Sampling Criteria

	Criteria
Target complete	15 respondents (respondents should not know each other)
Respondent diversity	<ol style="list-style-type: none"> 1. Distributed across all ages from 13-17 2. Distributed across Ukunda and Mtwapa 3. A mix of venue-based on freelance/non venue-based 4. 1-2 of the interviews should be with boys
Target area	Ukunda and Mtwapa
Other parameters	SES, ethnic, linguistic, and religious backgrounds should reflect variation in the population

CSEC FIELDWORK APPROACH

The main approach was team to strike a rapport with some of the known approachable contacts working with gender-based organizations like ICRH who also have good network of CSEC vulnerable persons dotted along the Coast region. Coast Commercial Sex Workers Association (COSWA) and OKOA SASA were approached for this purpose.

Table 14: Overall Target and Achievements

County	Sub County	Sample	Day 1	Day 2	Day 3	Total Achieved
Kwale	Ukunda	6	0	1	5	6
Kilifi	Mtwapa	9	8	1	0	9
Total		15	8	2	5	15

CSEC OBSERVATIONS AND CHALLENGES

1. *sex_work*: Most of the respondents took a lot of time to answer this question. Other appeared very uncomfortable while others said "no" but after probing they changed their responses to "yes". More training is needed on this question since it`s the backbone of the whole study and if it is not well administered, we might find so many non-participants.
2. *ppi_towels*: respondents asked type of towels we meant and why and we had to keep informing them that we meant any kind of towel.
3. *ppi_educ_fam*: the term primary household at: ppi_educ_fam, ppi_walls, ppi_floors, ppi_floors, ppi_towels and ppi_thermos and the term current residence at ppi_bread, ppi_fish and ppi_bananas and also the term hometown or village at sw_hometown seems to confuse some of the respondents on the home that we mean. Several respondents kept asking on the residence we were talking about in each question. An instruction on what we mean after every name would be better so that it`s simply and clearly understood by each respondent.

4. *sw_alone*: we observed that it was hard to achieve a sample of those sex workers who work under pimps/madams.
5. The male sample was also hard to achieve since most of them do not like people knowing what they do.
6. *sw_clients_type*: This question seemed hard to most of the respondents and most of them said that their clients are not always ready to reveal what they do. Others mentioned that they are only interested with what their clients pay, and they do not care on the type of client that they find provided they pay.
7. *sw_quit*: We found a male respondent who mentioned that he is his own boss in this business and even if he wanted to quit, he would never quit because his body pushes him to.
8. *sex_work_when*: Apart from the ones involved in sex trade within the last few days, most of the respondents could only remember the number of years and months and not the number of days since the last had a sex trade.
9. *religion*: Most Christians took time to define the type of Christian they are since most of them know that they are just Christians.
10. *sw_reason_now*: If a person mentions rent here, it will be better if it is coded as "I have to pay off a debt for myself or my family" so that we can be able to ask on the amount he/she is trying to settle on question *sw_debt_amt*
11. The wordings on *ptsd_startled* and *ptsd_num* are too hard for the respondents to understand. The words on guard, or easily startled and numb or detached should be rephrased with some other easier words for the respondents to understand.

Some of the suggestions are:

- Cautious, alert or careful, for the word 'on guard', or easily startled
 - Disconnected, parted for detached
12. *sw_partner_week*: There are some respondents who could not even give a range of the number of paying customers they engage in sexual activities in a typical week since they said that they go with a very high number on a single day and could only approximate the number on this specific question.
 13. *country, country_moth and country_fath*: Democratic Republic of Congo is on the list of responses as the response number 8 but there is no number 8 on the answer codes.
 14. *sw_first_reason*: Option "Family issues" should be added on the list of responses.

Table 15: CSEC Enumerator comments on observations

Qsn number/ section/page	Issue	Observation on int	Observation on respondents	Field comment
sex_work	Most of the respondents took a lot of time to answer this question. Other appeared very uncomfortable while others said "no" but after probing they changed their responses to "yes".	Made sure they prepared respondents accordingly prior to starting the interview. To make sure they will not shy off with such questions.	Respondents seemed to have been shy and uncomfortable to give feedback on this question.	Emphasis on how to administer this question should of much importance during training. More training is needed on this question since it`s the backbone of the whole study and if it is not well administered, we might find so many non-participants.
ppi_towels	Respondents asked type of towels we meant and why and we had to keep informing them that we meant any kind of towel.	Interviewer took time to make explicit explanations to get the point at home.	Respondents seemed to have been uncertain on the kind of towels being asked.	More explanations and descriptions on the exact type of towel to be added on the questionnaire.
ppi_educ_fam	The term <u>primary household</u> at: ppi_educ_fam, ppi_walls, ppi_floors, ppi_floors, ppi_towels and ppi_thermos and the term <u>current residence</u> at ppi_bread, ppi_fish and ppi_bananas and also the term <u>hometown or village</u> at sw_hometown seems to confuse some of the respondents on the home that we mean.	Interviewer took time to make explicit explanations to get the point at home.	Several respondents kept asking on the residence we were talking about in each question.	An instruction on what we mean after every name would be better so that it`s simply and clearly understood by each respondent.
sw_alone	Team observed that it was hard to achieve a sample of those sex workers who work under pimps/madams. The male sample was also hard to achieve since most of them do not like people knowing what they do.	This did not affect interviewers as such as team had a recruiter.	It was noted that most respondents are under freelance.	Sample on this category to be minimized during the main study.
sw_clients_type	This question seemed hard to most of the respondents and most of them said that their clients are not always ready to reveal what they do. Others mentioned that they are only interested with what their clients pay, and they do not care on the type of client that they	Interviewers kept probing for information.	Most respondents confirmed that they are not aware of what their clients do professionally.	The question to be rephrased for better understanding by the respondents.

Qsn number/ section/page	Issue	Observation on int	Observation on respondents	Field comment
	find provided they pay. Most of them do not ask and they only know about their main clients.			
sex_work_when	Apart from the ones involved in sex trade within the last few days, most of the respondents could only remember the number of years and months and not the number of days since the last had a sex trade.	Interviewers kept probing for more exact information.	Most respondents struggled to remember. They however remembered after probing.	Training on probing techniques to be focused on during the main training.
religion	Most Christians took time to define the type of Christian they are since most of them know that they are just Christians.	Interviewers kept probing for more exact information.	Most respondents could only tell their religion in general.	Question to be rephrased for denominations.
ptsd_startled and ptsd_num	The wordings on ptsd_startled and ptsd_num are too hard for the respondents to understand.	Interviewer took time to make explicit explanations to get the point at home.	Most respondents took time to comprehend.	The words on guard, or easily startled and numb or detached should be rephrased with some other easier words for the respondents to understand.
sw_partner_week	There are some respondents who could not even give a range of the number of paying customers they engage in sexual activities in a typical week since they said that they go with a very high number on a single day and could only approximate the number on this specific question.	Interviewers kept probing for more exact information on numbers.	Most respondents struggled to remember the exact numbers and approximate.	Probing techniques to be emphasized during training.
country, country_moth and country_fath	Democratic Republic of Congo is on the list of responses as the response number 8 but there is no number 8 on the answer codes.	Interviewers wrote manually on the questionnaire.	This did not affect respondents.	The issue on numbering to be rectified on questionnaire

CSEC RECOMMENDATIONS

1. Most of the respondents mentioned that not many are always willing to share their names or contact details. With this, it will be good to try not to take any identifiable data from the participants to ensure that their confidentiality is kept.
2. It will also be important to ensure that the participants are interviewed at a very private place where no one else can hear any part of the interview apart from the study team members.
3. One of the participants mentioned that it would be better if the participants are facilitated to the selected venue and mentioned that an incentive for participation will be a good thing to attract more participants to the survey.
4. Sex_work_when: Choices only provides *days, weeks and months*. Options for hours should be added as one respondent said 5 hours and we had to code manually

ANNEX II. DATA QUALITY REVIEWS

Data quality reviews (DQRs) were conducted by NORC’s data management team at regular intervals throughout the course of data collection. The purpose of a DQR is to proactively identify and remedy issues related to survey programming, question clarity, and enumerator error/performance. Specific issues that were checked during DQRs are summarized below:

Table 16: DQR

Data Quality Review Type	Description
Date/time verification	This check ensures that the start and end times of the surveys are logical (i.e., sequential and within the field period) and that the survey duration is not abnormally short or long.
Form completeness	This check determines whether any required variables in the form are missing.
ID verification	This check flags any unresolved duplicate IDs as well as cross-verifies components of manually entered IDs.
Speed violations	This check flags longer/more complex questions for which enumerators advance in the survey form more quickly than would be expected.
Soft check suppressions	An alternative to programming constraints, “soft checks” serve to alert enumerators to potential errors in either data entry or question interpretation (either by the enumerator or the respondent). Soft checks consist of a simple “select one” question immediately following the question of concern, where the enumerator is alerted to a possible error (using relevancy rules) and required to either go back in the form and edit the entry or select “continue” to advance in the form. This check summarizes all soft check suppressions alongside the recorded values.
“Don’t know / no response” frequencies	This check flags variables for which the don’t know/no response rate is five percent or more as well as cases where a given enumerator has at least five don’t know/refused responses.
Open-ended response review	This check involves reviewing all open-ended responses (including “other: specify” entries and enumerator notes).
Outlier review	This check flags continuous numerical variables that are more than two standard deviations from the mean value.

Following each round of DQR, the assessment team flagged areas of concern to Kantar in a cloud-based DQR log. Each issue was flagged based on urgency; a summary of urgency levels, illustrative issues, and required response times is below:

Table 17: Issue Log

Urgency level	Examples of issues	Response time
Most Urgent	Suspected data falsification, using incorrect versions of tools	<24 hours
High	Missing form submissions, excessive speed violations, excess replacements	48 hours
Medium	Confirming outliers	2-3 days
Low	Simple cleaning tasks that don't require enumerator recall	1 week

Issues flagged in the DQR log as “most urgent” (e.g., possible data falsification) were expected to be resolved in less than 24 hours whereas issues with less urgency (e.g., basic cleaning tasks that don't require enumerator recall) could be resolved within a few days. Over the course of data collection, NORC flagged 26 DQR items to Kantar's management team—the majority of which were related to ID discrepancies, variable outliers, and high frequency of “don't know” responses for certain enumerators and questions—all of which were addressed to NORC's satisfaction by the conclusion of field work.

ANNEX III. CSEC DEFINITION CROSSWALK*Table 18: CSEC Crosswalk*

Source	Definition	Variables
Self-identification	In the past 12 months, child engaged in any kind of sex work, whether voluntary or involuntary.	sex_work is indicated as yes
U.S. State Department ²²	Sex includes genital or anal contact or penetration of a person, regardless of whether such contact or penetration is genital, oral, or manual. Sex trafficking can include virtual situations, such as when a trafficker pays to watch a trafficking victim engaging in a sex act, including self-masturbation.	Any of the following is indicated as yes: <ul style="list-style-type: none"> ● sa_oral ● sa_anal ● sa_pen ● sa_gen
Government of Kenya Sexual Offences Act	Child prostitution: monetary consideration, goods, other benefits or any other form of inducement to a child or his parents with intent to procure the child for sexual intercourse or any form of sexual abuse or indecent exhibition or show.	Any of the following is indicated as yes: <ul style="list-style-type: none"> ● sa_oral ● sa_anal ● sa_pen ● sa_gen ● sa_strip
ILO	Commercial sexual exploitation of children includes: <ul style="list-style-type: none"> ● the use of girls and boys in sexual activities remunerated in cash/in kind; ● trafficking of girls and boys and adolescents for the sex trade; ● child sex tourism; ● the production, promotion and distribution of pornography involving children; and, ● the use of children in sex shows (public or private). 	Any of the following is indicated as yes: <ul style="list-style-type: none"> ● sa_oral ● sa_anal ● sa_pen ● sa_gen ● sa_strip ● sa_photo
Sugar daddy or momma only	Child has sugar daddy/mama relationship(s) but is not otherwise defined as a CSEC victim using aforementioned definitions	sa_sugard is indicated as yes AND <u>all</u> of the following are indicated as no: <ul style="list-style-type: none"> ● sa_intim ● sa_oral ● sa_anal ● sa_pen ● sa_gen ● sa_strip

²² <https://www.aha.org/system/files/media/file/2020/08/PRIF-Statistical-Definitions-Document-8-3.pdf>

ANNEX IV. TABLES*Table 19: Religion, Ethnicity, and Highest Level of Schooling Completed*

	County			Overall
	Kilifi	Kwale	Mombasa	
Religion				
Catholic	30%	12%	27%	23%
Protestant	16%	7%	24%	16%
Evangelical	23%	5%	7%	12%
African Instituted Churches	10%	7%	2%	6%
Orthodox	0%	0%	0%	0%
Other Christian	3%	10%	7%	7%
Islam	19%	60%	33%	37%
Hindu	0%	0%	0%	0%
Traditionalist	0%	1%	0%	0%
Other religion	0%	0%	0%	0%
No religion	2%	1%	1%	1%
Ethnicity				
Kikuyu	5%	6%	8%	6%
Luhya	3%	9%	15%	9%
Kalenjin	1%	0%	1%	1%
Luo	4%	5%	20%	10%
Kamba	6%	9%	13%	9%
Somali	2%	0%	0%	1%
Kisii	1%	3%	4%	3%
Mijikenda	74%	67%	30%	57%
Meru	1%	1%	2%	1%
Maasai	0%	1%	0%	0%
Turkana	0%	0%	0%	0%
Swahili	4%	3%	1%	3%
Bajun	1%	2%	1%	1%
Taita	1%	2%	6%	3%
Other (specify)	0%	5%	7%	4%

	County			Overall
	Kilifi	Kwale	Mombasa	
	Highest Level of Schooling Completed			
None	4%	7%	2%	4%
Pre-primary	19%	27%	28%	25%
Primary	60%	48%	66%	58%
Secondary	17%	14%	4%	12%
Vocational school	0%	4%	1%	1%

Ethnicity was a multi-select question, so the categories will not necessarily sum to 100%.

Table 20: Sex Acts

	County			
	Kilifi	Kwale	Mombasa	Overall
In the past 12 months, have you				
Engaged in kissing, cuddling, or intimate touching for goods or money? (sa_intim)	87%	81%	81%	83%
Ever engaged in oral sex in exchange for goods or money? (sa_oral)	80%	66%	59%	68%
Ever engaged in anal or vaginal sex in exchange for goods or money? (sa_anal)	74%	68%	48%	63%
Engaged in vaginal or anal penetration using other means like fingers, objects, etc. in exchange for goods or money? (sa_pen)	60%	57%	50%	56%
Had direct contact with someone else's genitals or has someone had direct contact with your genitals, in exchange for goods or money? (sa_gen)	73%	72%	70%	71%
Done any nude posing, undressing, or performing in a sexual way in exchange for goods or money? (sa_strip)	64%	34%	47%	49%
Any sexually explicit photographs or videos been taken of you? (sa_photo)	57%	23%	35%	38%
Engaged in any kind of sex trade with a member of your same sex? (sa_gender)	61%	36%	48%	48%
Been arrested for engaging in the sex trade? (sa_arrest)	50%	33%	44%	42%
Entered into a sexual relationship with someone mainly in order to get things that you need, money, gifts, or other things that are important to you? (sa_sugard)	86%	83%	82%	84%
Someone provided you with drugs or alcohol in order to exercise some control over you? (sa_drugs)	51%	41%	51%	48%

Variable names can be found in parentheses and can be mapped to the sex work crosswalk in ANNEX III. CSEC DEFINITION CROSSWALK.

Table 21: Sex Work First

	County			
	Kilifi	Kwale	Mombasa	Overall
Who first introduced you to the sex trade				
Partner or spouse	0%	1%	0%	0%
Parent or sibling	4%	6%	3%	5%
Other family member or relative	9%	9%	7%	8%
Neighbor or family friend	15%	12%	9%	12%
My friend(s)	78%	80%	81%	80%
Pimp, boss, or madam	4%	7%	1%	4%
Employer	1%	3%	0%	2%
Co-worker(s)	1%	3%	0%	1%
Other	1%	3%	3%	2%
Reasons that led you to exchange sex for goods or money the first time				
I needed money	58%	85%	75%	72%
I had to pay off a debt for myself or my family	4%	6%	0%	4%
I didn't have another way to make money	17%	59%	15%	30%
I grew up around people who engaged in the sex trade	12%	2%	1%	5%
I was forced through physical violence/intimidation	2%	3%	0%	2%
I was pressured, coerced, or manipulated into it	3%	14%	1%	6%
I like it/did it for pleasure	4%	3%	3%	3%
I was encouraged by friends/people I know	31%	31%	13%	25%
It pays well/you can make a lot of money	8%	19%	5%	11%
I was abandoned by my parents	1%	7%	1%	3%
I was abandoned by my spouse	2%	0%	0%	1%
I wanted extra money to buy material things	13%	63%	37%	38%
My parents or spouse died	3%	11%	2%	5%
Other	4%	9%	20%	11%
What would have happened to you if you had refused that first time				
Physical violence	19%	52%	36%	43%
Physically restrained	32%	3%	0%	10%

	County			Overall
	Kilifi	Kwale	Mombasa	
Deprived of food, water and/or sleep	33%	47%	0%	42%
Sexual violence	25%	33%	14%	30%
Emotional violence	2%	43%	26%	32%
Harm to a family member(s) or someone I care about	4%	15%	0%	12%
Legal action	0%	0%	0%	0%
Withholding of identity/citizenship documents	0%	0%	0%	0%
Loss of wages	0%	16%	0%	12%
Confiscation of savings or other valuables	0%	0%	0%	0%
Kept drunk/drugged	0%	1%	0%	1%
Restrictions in communication	0%	4%	0%	3%
Nothing would have happened to me	6%	3%	38%	5%
Other	0%	17%	0%	12%

All three indicators are multi-select question, so the categories will not necessarily sum to 100 percent.

Table 22: Sex Work Clients

	County			
	Kilifi	Kwale	Mombasa	Overall
Reasons exchanged sex for goods or money recently				
I don't have another way to make money	40%	70%	54%	55%
I am forced through physical violence/intimidation	1%	2%	0%	1%
I am pressured, coerced, or manipulated into it	2%	7%	1%	3%
I like it/do it for pleasure	11%	13%	6%	10%
It pays well/is a good way to make money	22%	37%	8%	22%
I want extra money to buy material things	55%	73%	55%	61%
I have to pay off a debt for myself or my family	2%	5%	1%	3%
I have been shunned by my community for engaging in the sex trade	0%	0%	0%	0%
Other	8%	8%	19%	11%
Where normally find clients				
Brothel	13%	3%	2%	6%
Bar, café, club, or restaurant	46%	23%	48%	39%
Hotel or lodge	34%	18%	16%	23%
Along the beach	28%	27%	33%	29%
Street, park, or public transit point	37%	60%	56%	51%
Through friends	36%	42%	36%	38%
Internet (e.g., Facebook), WhatsApp, or SMS	37%	20%	17%	24%
School	7%	5%	2%	4%
Party	16%	47%	16%	27%
Service station or gas station	5%	5%	0%	3%
Through an intermediary	11%	25%	13%	16%
Truck stop	4%	14%	1%	6%
Border crossing	0%	8%	0%	3%
Massage parlor	3%	1%	1%	2%
Other	1%	1%	6%	2%

Both indicators are multi-select question, so the categories will not necessarily sum to 100 percent.

Table 23: PTSD Questions

	County			
	Kilifi	Kwale	Mombasa	Overall
In the past month, have you...				
Had nightmares about traumatic event(s) or thought about traumatic event(s) when you did not want to?	77%	60%	66%	68%
Tried hard not to think about traumatic event(s) or went out of your way to avoid situations that reminded you of traumatic event(s)?	69%	71%	65%	68%
Felt guilty or unable to stop blaming yourself or others for traumatic event(s) or any problems those event(s) may have caused?	61%	80%	59%	67%
Been overly alert or easily startled?	55%	59%	52%	55%
Felt numb or detached from people, activities, or your surroundings?	64%	63%	67%	65%

ANNEX V. DATA COLLECTION TOOLS**NORC AT THE UNIVERSITY OF CHICAGO: CSEC LINK TRACING SURVEY**

Hello, and thank you for taking the time to speak with me today. My name is [Interviewer Name], and I work with Kantar, a local Kenyan organization that conducts research on social issues. You have been referred by [an NGO/someone you know] to participate in this study. I am going to read to you some information about the study, including what you will be asked to do, and then you can decide if you want to participate or not.

Kantar is working with NORC at the University of Chicago on a research study about 13-17 year olds involved in Kenya's sex industry. In this interview, I will ask you questions about your experiences with and knowledge of the sex industry in your community. This will include questions about your own involvement in the sex trade, whether voluntary or involuntary, as well as some questions about your life and background. This interview is expected to last about 60 minutes. Please be sure to let me know if any question I ask is unclear or you are not sure how to answer.

The risk of doing this interview is that some of our questions are very personal, and might bring up painful memories including possible past abuse or sexual abuse. You also might get tired of answering questions or they might feel hard to answer. If you do not want to be interviewed, you do not have to be. If you do not want to answer a question, say so, and I will move on to the next question. Your emotional well-being is very important to us and if you are feeling distressed at any time, please let me know so we can pause or stop the interview. We also have telephone counselors you can talk to if needed. You may stop the interview at any time for any reason. Deciding not to answer a question or to stop the interview won't have any impact on our relationship or on getting any referrals or services.

Besides telephone counseling, this study has identified local organizations that may be able to support study recruits who seek help or protection. If you would like me to put you in contact with these organizations, please ask me at any time. We can't guarantee that they will give you what you need, but we can tell you what they say they might be able to do for you. We are happy to give you as much information about the services that are out there as you want or need. We can give you this information even if you decide not to take part in this research.

It is important that you know that we will take all steps to protect your privacy. Only the research team will know your individual answers and we will not share any information that can be used to identify you. No answers will be able to be traced back to you and the research team will not tell anyone that you participated in this interview. We won't tell anyone about your participation in the study or what you say, but we cannot guarantee your privacy since the study is based on network referrals. If you have any questions at a later time, you may contact: [Insert Name and Contact Information of Senior Manager at Data Collection Firm].

There is no direct benefit to you for participating in this study. However in the future, this study may help social services organizations design projects that better meet the needs of 13-17 year olds affected by Kenya's sex industry.

- Do you have any questions?
- Do you agree to participate?

With your permission, we would like to audio record this interview so we can listen to it later. The recording will not be shared with anyone outside the research team. If you do not wish to be audio recorded, that is okay.

- Will you allow us to audio record this interview?

0. Field control			Enumerator notes
<i>county_0</i>	Select county		
	1. Kilifi	1	
	2. Kwale	2	
	3. Mombasa	3	
	4. Nairobi	4	
<i>sub_county</i>	Select sub-county where interview is taking place		
<i>division</i>	Select division		
<i>location</i>	Select location		
<i>sub_location</i>	Select sub-location		

0. Field control			Enumerator notes
<i>supervisor</i>	Select supervisor name		
<i>interviewer</i>	Select interviewer name		
<i>start_date</i>	Confirm the date of interview (DD-MM-YY)	_ _ - _ _ - _ _	
<i>start_time</i>	Confirm start time (HH:MM)	_ _ : _ _	
<i>GPS</i>	Allow automatic recording of GPS coordinates		
<i>consent</i>	Has the respondent agreed to be interviewed today? 0. No 1. Yes	0 1	<i>Enumerator, by selecting yes, you certify that the nature and purpose, the potential benefits, and possible risks associated with participating in this research have been explained to the respondent and he/she has verbally consented to participate.</i>
<i>consent_specify1</i>	[If <i>consent</i> =0] Why didn't the respondent agree to be interviewed? 1. Refused 2. Temporarily unavailable 3. Other (specify)	1 2 3	→ If 1 or 2, skip to end of survey
<i>consent_specify2</i>	[If <i>consent_specify1</i> =3] Specify other:		→ Skip to end of survey

1. Basic eligibility screener			Enumerator notes
<i>language</i>	Which language would you prefer to be interviewed in?	1 2 3	

1. Basic eligibility screener			Enumerator notes
	1. Kiswahili 2. English 3. Kikuyu 4. Luo 5. Akamba 6. Maa	4 5 6	
Age	How old are you?	_ _	→ If >17 or <13, skip to end of survey Should be age s/he turned on his/her last birthday.
residency	Are you currently living in [sub_county]? 0. No 1. Yes	0 1	
res_length	[If residency=1] About how long have you lived in [sub_county]?	_ _ Years _ _ Months	
work_location	Are you currently working in [sub_county]? 0. No 1. Yes	0 1	
work_length	[If work_location=1] About how long have you worked in [sub_county]?	_ _ Years _ _ Months	
sex_work	In the past 12 months, have you engaged in any kind of sex trade, whether voluntary or involuntary? By "sex trade" I mean doing sexual things in exchange for money or things worth money, like a place to stay, food, or gifts,		→ If 0, skip to end of survey The money or in-kind goods/services can be received by the respondent or by a third party. Definition of sex does not need to be provided at this stage. Child should use his/her own

1. Basic eligibility screener			Enumerator notes
	0. No 1. Yes	0 1	<i>definition. However if they ask for clarity on what is meant by "sex", note that it includes genital or anal contact or penetration of another person, regardless of whether such contact or penetration is genital, oral, or manual.</i>
<i>sex_work_when</i>	About how long has it been since you last did any kind of sex trade, whether voluntary or involuntary?	__ __ Days __ __ Weeks __ __ Months	<i>Use any fields as appropriate to enter the TOTAL amount of time since the last transaction. Do not enter duplicate values (e.g., do not enter both 2 weeks and 14 days).</i>
<i>mobile</i>	For tracking purposes, can you please provide me with your mobile phone number?	__ __ __ __ __ __ __ __ __ __ __ __ __ __ __ __	

A. Demographic information			Enumerator notes
	In what country were you born?		<i>Do not read list.</i>
<i>country</i>	1. Kenya 2. Uganda 3. Somalia 4. Tanzania 5. S. Sudan 6. Ethiopia 7. Rwanda 8. Democratic Republic of Congo 9. Other (specify) 998. Refused 999. Don't know	1 2 3 4 5 6 7 8 9 998 999	
<i>country_other</i>	[If <i>country</i> =7] Specify other:		

A. Demographic information			Enumerator notes
<i>country_moth</i>	In what country was your mother born?		<i>Do not read list.</i>
	1. Kenya	1	
	2. Uganda	2	
	3. Somalia	3	
	4. Tanzania	4	
	5. S. Sudan	5	
	6. Ethiopia	6	
	7. Rwanda	7	
	8. Democratic Republic of Congo	8	
	9. Other	9	
998. Refused	998		
999. Don't know	999		
<i>country_fath</i>	In what country was your father born?		<i>Do not read list.</i>
	1. Kenya	1	
	2. Uganda	2	
	3. Somalia	3	
	4. Tanzania	4	
	5. S. Sudan	5	
	6. Ethiopia	6	
	7. Rwanda	7	
	8. Democratic Republic of Congo	8	
	9. Other	9	
998. Refused	998		
999. Don't know	999		
<i>sex</i>	What is your gender?		
	1. Male	1	

A. Demographic information			Enumerator notes
	2. Female	2	
	3. Other	3	
<i>ethnic</i>	What is your ethnicity?		<i>Do not read list. Select all that apply.</i>
	1. Kikuyu	1	
	2. Luhya	2	
	3. Kalenjin	3	
	4. Luo	4	
	5. Kamba	5	
	6. Somali	6	
	7. Kisii	7	
	8. Mijikenda	8	
	9. Meru	9	
	10. Maasai	10	
	11. Turkana	11	
	12. Other	12	
	998. Refused	998	
	999. Don't know	999	
<i>lang</i>	What is the primary language you speak?		<i>Do not read list.</i>
	1. Kiswahili	1	
	2. English	2	
	3. Kikuyu	3	
	4. Luo	4	
	5. Akamba	5	
	6. Maa	6	
	7. Other	7	

A. Demographic information			Enumerator notes
<i>lang_mother</i>	What is the primary language that you used with your parents or guardian when you were a child?		<i>Do not read list.</i>
	1. Kiswahili	1	
	2. English	2	
	3. Kikuyu	3	
	4. Luo	4	
	5. Akamba	5	
	6. Maa	6	
	7. Other	7	
<i>religion</i>	What is your religion?		
	1. Catholic	1	
	2. Protestant	2	
	3. Evangelical	3	
	4. African Instituted Churches	4	
	5. Orthodox	5	
	6. Other Christian	6	
	7. Islam	7	
	8. Hindu	8	
	9. Traditionalist	9	
	10. Other religion	10	
11. No religion	11		
998. Refused	998		
999. Don't know	999		

A. Demographic information			Enumerator notes
<i>maritst</i>	What is your marital status?		
	1. Never married	1	
	2. Married – monogamous	2	
	3. Married – polygamous	3	
	4. Divorced	4	
	5. Widowed	5	
	6. Separated	6	
	998. Refused	998	
999. Don't know	999		
<i>num_child</i>	How many children do you have?	_ _	
<i>educ</i>	What is the highest level of schooling you have completed?		
	1. Pre-primary, none, or other	1	
	2. Primary	2	
	3. Secondary or post-primary, vocational	3	
	4. College level or higher	4	
	998. Refused	998	
999. Don't know	999		
<i>educ_curr</i>	Are you currently enrolled in school?		
	0. No	0	
	1. Yes	1	

A. Demographic information		<i>Enumerator notes</i>	
<i>educ_noreas</i>	<p>[If <i>educ_curr</i>=0] Why aren't you currently enrolled in school?</p> <ol style="list-style-type: none"> 1. I have completed my compulsory schooling 2. I am too old for school 3. I stopped going due to illness or injury 4. I stopped going due to pregnancy 5. The school is too far 6. I cannot afford schooling 7. My family does not allow me to go/made me stop 8. I am not very good in my studies 9. I am not interested in school / education is not valuable to me 10. My school is not safe 11. I wanted to learn a job / skill instead 12. I wanted to make money 13. I have to help at home with household chores 14. I have to care for other household members 15. Other (specify) <p>998. Refused 999. Don't know</p>	<p style="text-align: center;">1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 998 999</p>	<p><i>Do not read list. Select all that apply.</i></p>
<i>educ_nooth</i>	[If <i>educ_noreas</i> =15] Specify other:		
<i>educ_grade</i>	[If <i>educ_curr</i> =1] What grade are you currently in?		

A. Demographic information			<i>Enumerator notes</i>
<i>educ_abs</i>	[If <i>educ_curr</i> =1] How often are you absent from school?		
	1. Rarely or never miss school	1	
	2. Sometimes miss school (but the days I attend are more than the days I miss)	2	
	3. Regularly miss school (and the days I miss are more than the days I attend)	3	
	4. I rarely go to school	4	
	998. Refused	998	
	999. Don't know	999	

A. Demographic information		Enumerator notes
<i>educ_abs_r</i>	<p>[If <i>educ_abs</i>=2, 3, or 4] What are the main reasons that you miss school?</p> <ol style="list-style-type: none"> 1. Illness or injury 2. I am too tired 3. I can't pay the school fees 4. School is too far away 5. No transportation or money for transportation 6. To engage in the sex trade 7. To do other work 8. To help with household chores 9. To care for other household members 10. I don't like school 11. I struggle to do well at school 12. Kids tease or bully me 13. Other (specify) 998. Refused 999. Don't know 	<p>1</p> <p>2</p> <p>3</p> <p>4</p> <p>5</p> <p>6</p> <p>7</p> <p>8</p> <p>9</p> <p>10</p> <p>11</p> <p>12</p> <p>13</p> <p>998</p> <p>999</p>
<i>educ_abs_oth</i>	[If <i>educ_abs_r</i> =12] Specify other:	
<i>ppi_prim_res</i>	In which county is your <u>primary household</u> located? By primary household I mean the place that you consider to be your permanent home.	<i>A household is defined as a person or a group of people living in the same compound (fenced or unfenced); answerable to the same head and sharing a common source of food and/or income as a single unit in the sense that they have common housekeeping arrangements.</i>

A. Demographic information			<i>Enumerator notes</i>
			<i>Primary household</i> refers to the household which the respondent considers to be his/her permanent residence, regardless of how long s/he is away. It may or may not be where s/he is living and working at the time of the interview.
<i>ppi_educ_fa</i> <i>m</i>	<p>I will now ask you some questions about your <u>primary household</u> in [<i>ppi_prim_res</i>] county.</p> <p>What is the highest level of schooling anyone in your <u>primary household</u> has completed?</p> <ol style="list-style-type: none"> 1. Pre-primary, none, or other 2. Primary 3. Secondary or post-primary, vocational 4. College level or higher <p>998. Refused 999. Don't know</p>	<p style="text-align: center;">1 2 3 4 998 999</p>	<i>Includes all members of the permanent household, even if they are temporarily away.</i>
<i>ppi_walls</i>	<p>What are the walls made out of for the main dwelling unit [for your <u>primary household</u>]?</p> <ol style="list-style-type: none"> 1. Finished walls (cement, stone with lime/cement, bricks, cement blocks, covered adobe, or wood planks/shingles) 2. Uncovered adobe, plywood, cardboard, reused wood, or corrugated iron sheets 3. Natural walls (cane/palm/trunks, grass/reeds, or mud/cow dung), no walls, 	<p style="text-align: center;">1 2 3</p>	

A. Demographic information			Enumerator notes
	bamboo with mud, stone with mud, or other 998. Refused 999. Don't know	998 999	
<i>ppi_floors</i>	What is the floor made out of for the main dwelling unit [for your <u>primary household</u>]? 1. Natural floor (earth/sand or dung) or palm/bamboo 2. Other (including wood planks/shingles, parquet or polished wood, vinyl or asphalt strips, ceramic tiles, cement, or carpet) 998. Refused 999. Don't know	1 2 998 999	<i>Decorative materials such as carpets should not be considered as floor finish material unless it covers from wall to wall and it's not temporary. For cases where a mixture of floor finish is applied, code the one that covers the greatest floor surface.</i>
<i>ppi_towels</i>	Does your <u>primary household</u> own any towels? 0. No 1. Yes 998. Refused 999. Don't know	0 1 998 999	
<i>ppi_thermos</i>	Does your <u>primary household</u> own any thermos flasks? 0. No 1. Yes 998. Refused 999. Don't know	0 1 998 999	

A. Demographic information			Enumerator notes
<i>ppi_bread</i>	I will now ask some questions about where you are staying now.		<i>Current residence refers to current household to which s/he is attached at the time of the interview. It may or may not be the same as the primary household.</i>
	Over the past 7 days, did anyone in your <u>current residence</u> purchase, consume, or acquire any bread?		
	0. No	0	
	1. Yes	1	
	998. Refused	998	
999. Don't know	999		
<i>ppi_fish</i>	Over the past 7 days, did anyone in your <u>current residence</u> either purchase, consume, or acquire any meat or fish?		<i>Meat includes beef, minced meat, pork, mutton/goat, camel, chicken, rabbit, tinned/packeted soups (meat), offals, sausages/smokies/hot dogs, brawn, canned meat, meat paste, and other meat products. Fish includes fresh, frozen, dried/smoked, omena, prawns, tinned, and other fish.</i>
	0. No	0	
	1. Yes	1	
	998. Refused	998	
	999. Don't know	999	
<i>ppi_bananas</i>	Over the past 7 days, did anyone in your <u>current residence</u> either purchase, consume, or acquire any ripe bananas?		
	0. No	0	
	1. Yes	1	
	998. Refused	998	
	999. Don't know	999	

B. Engagement in sex trade			<i>Enumerator notes</i>
<i>sw_age_any</i>	<p>These next questions are going to focus on sexual activity and engagement in the sex trade. Remember you don't have to answer any question if you don't want to, and all of your responses are confidential.</p> <p>At what age did you first engage in <u>any</u> sexual activity?</p>	_ _ _	<p><i>Definition of sex does not need to be provided at this stage. Child should use his/her own definition. However if they <u>ask</u> for clarity on what is meant by "sex", note that it includes genital or anal contact or penetration of another person, regardless of whether such contact or penetration is genital, oral, or manual.</i></p> <p><i>If respondent answers "Refused", record the answer as "998".</i></p> <p><i>If respondent answers "Don't know", record the answer as "999".</i></p>
<i>sw_age</i>	<p>At what age did you first engage in sexual activity in exchange for goods or money?</p>	_ _ _	<p><i>Definition of sex does not need to be provided at this stage. Child should use his/her own definition. However if they <u>ask</u> for clarity on what is meant by "sex", note that it includes genital or anal contact or penetration of another person, regardless of whether such contact or penetration is genital, oral, or manual. Persons who engage in the sex trade exchange sex acts for something of value including cash or material items that would otherwise not be extended to them by their sex partners.</i></p> <p><i>If respondent answers "Refused", record the answer as "998".</i></p>

B. Engagement in sex trade			<i>Enumerator notes</i>
			<i>If respondent answers "Don't know", record the answer as "999".</i>
<i>sw_parent</i>	When you first engaged in sexual activity for goods or money, were you living with either a parent or guardian? 0. No 1. Yes 998. Refused 999. Don't know	0 1 998 999	
<i>sw_hometown</i>	When you first engaged in sexual activity for goods or money, were you living in either your hometown or village? 0. No 1. Yes 998. Refused 999. Don't know	0 1 998 999	
<i>sw_first_reason</i>	What were the reasons that led you to exchange sex for goods or money <u>the first time</u> ? 1. I needed money 2. I had to pay off a debt for myself or my family 3. I didn't have another way to make money 4. I grew up around people who engaged in the sex trade	1 2 3 4 5	<i>Do not read list. Select all that apply.</i>

B. Engagement in sex trade			<i>Enumerator notes</i>	
	5. I was forced to do so through physical violence or intimidation	6		
	6. I was pressured, coerced, or manipulated into it	7 8		
	7. I like it / did it for pleasure	9		
	8. I was encouraged by friends / people I know	10 11		
	9. It pays well / you can make a lot of money	12 13		
	10. I was abandoned by my parents	14		
	11. I was abandoned by my spouse	998		
	12. I wanted extra money to buy material things	999		
	13. My parents or spouse died			
	14. Other (specify)			
	998. Refused			
	999. Don't know			
<i>sw_first_reason_oth</i>	[If <i>sw_first_reason</i> =14] Specify other:			
<i>sw_first_penalty</i>	[If <i>sw_first_reason</i> =5 or 6] What do you think would have happened to you if you had refused that first time?			<i>Do not read list. Select all that apply.</i>
	1. Physical violence (including being punched, kicked, dragged, beaten up, threatened with a gun, knife or other weapons)	1 2		
	2. Physically restrained (including being tied up or locked in a room)	3		

B. Engagement in sex trade			<i>Enumerator notes</i>
	3. Deprived of food, water and/or sleep	4	
	4. Sexual violence (an act that is sexual in nature, including physical contact, being photographed or forced to watch other sexual acts)	5	
	5. Emotional violence (including belittling or ostracizing a person in front of peers/verbal abuse)	6	
	6. Harm to a family member(s) or someone I care about	7	
	7. Legal action (including being arrested)	8	
	8. Withholding of ID cards/citizenship	9	
	9. Loss of wages	10	
	10. Confiscation of savings or other valuables	11	
	11. Kept drunk/drugged	12	
	12. Restrictions in communication	13	
	13. Nothing would have happened to me	14	
	14. Other (specify)	998	
	998. Refused	999	
	999. Don't know		
<i>sw_first_penalty_oth</i>	[If <i>sw_first_penalty</i> =14] Specify other:		
<i>sw_reason_now</i>	What are the reasons that you have exchanged sex for goods or money more recently?		<i>Do not read list. Select all that apply.</i>
	1. I don't have another way to make money	1	
	2. I am forced to do so through physical violence or intimidation	2	
		3	

B. Engagement in sex trade			<i>Enumerator notes</i>
	3. I am pressured, coerced, or manipulated into it 4. I like it / do it for pleasure 5. It pays well / is a good way to make money 6. I want extra money to buy material things 7. I have to pay off a debt for myself or my family 8. I have been shunned by my community for engaging in the sex trade 9. Other (specify) 998. Refused 999. Don't know	4 5 6 7 8 9 998 999	
<i>sw_reason_now_oth</i>	[If <i>sw_reason_now</i> =9] Specify other:		
<i>sw_debt_amt</i>	[If <i>sw_reason_now</i> =7] What is the approximate value of the outstanding debt you are trying to pay off?	_ _ _ _ _ _ _	<p><i>Please record the monetary unit along with the number.</i></p> <p><i>If respondent answers "Refused", record the answer as "998".</i></p> <p><i>If respondent answers "Don't know", record the answer as "999".</i></p> <p><i>If respondent cannot give a single number answer, use the blank space to record what they say.</i></p>
<i>sw_forcer</i>	Who first introduced or pressured you into engaging in the sex trade?		<i>Do not read list. Select all that apply.</i>

B. Engagement in sex trade			<i>Enumerator notes</i>
	1. Partner or spouse 2. Parent or sibling 3. Other family member or relative 4. Neighbor or family friend 5. My friend(s) 6. Pimp or madam 7. Employer 8. Co-workers 9. Other (specify) 998. Refused 999. Don't know	1 2 3 4 5 6 7 8 9 998 999	
<i>sw_forcer_oth</i>	[If <i>sw_forcer</i> =9] Specify other:		
<i>sw_alone</i>	Do you work alone (freelance) or under a pimp or madam? 1. I work alone 2. Work for a pimp or madam 3. Sometimes I work alone, sometimes I work for a pimp or madam 998. Refused 999. Don't know	1 2 3 998 999	<i>If sw_alone=1, skip to sw_clients.</i>
<i>sw_money_keep</i>	[If <i>sw_alone</i> =2 or 3] How much of the money that is paid for your sexual services do you get to keep? 1. All of it 2. Most of it	1 2	

B. Engagement in sex trade			<i>Enumerator notes</i>
	3. More than half 4. Exactly half 5. Less than half 6. None 998. Refused 999. Don't know	3 4 5 6 998 999	
<i>sw_basic_needs</i>	[If <i>sw_money_keep</i> ≠1] Is any of the money paid for your sexual services kept by your pimp or madam to cover your basic needs, like housing and food? 0. No 1. Yes 998. Refused 999. Don't know	0 1 998 999	
<i>sw_debt</i>	[If <i>sw_money_keep</i> ≠1] Is any of the money paid for your sexual services kept by your pimp or madam to pay off a debt (whether yours or someone else's)? 0. No 1. Yes 998. Refused 999. Don't know	0 1 998 999	
<i>sw_clients</i>	Where do you normally find clients? 1. Brothel 2. Bar, café, club, or restaurant	1 2	<i>Do not read list. Select all that apply.</i>

B. Engagement in sex trade			<i>Enumerator notes</i>
	3. Hotel or lodge	3	
	4. Along the beach	4	
	5. Street, park, or public transit point	5	
	6. Through friends	6	
	7. Internet (e.g. Facebook), WhatsApp, or SMS	7	
		8	
	8. School	9	
	9. Party	10	
	10. Service station		
	11. Through an intermediary (pimp, bartender, taxi driver)	11	
		12	
	12. Truck stop	13	
	13. Border crossing	14	
	14. Massage parlor	15	
	15. Other (specify)	998	
	998. Refused	999	
	999. Don't know		
<i>sw_clients_oth</i>	[If <i>sw_clients</i> =14] Specify other:		
	What types of occupations do you think your clients have?		<i>Do not read list. Select all that apply.</i>
<i>sw_clients_type</i>	1. Workers (includes mining workers and lumberjacks)	1	
	2. Foreign nationals or tourists	2	
	3. Gang members	3	
	4. Military	4	
	5. Police officers	5	
	6. Other (specify)	6	

B. Engagement in sex trade			<i>Enumerator notes</i>
	998. Refused 999. Don't know	998 999	
<i>sw_clients_type_oth</i>	[If <i>sw_clients_type</i> =6] Specify other:		
<i>sw_partner_week</i>	In a typical week, about how many paying partners do you engage in sexual activities with?	_ _ _	<p><i>If respondent answers "Refused", record the answer as "998".</i></p> <p><i>If respondent answers "Don't know", record the answer as "999".</i></p> <p><i>If respondent cannot give a single number answer, use the blank space to record what they say.</i></p>
<i>sw_partner_count_m</i>	In the past month, about how many paying partners have you engaged in sexual activities with?	_ _ _	<p><i>If respondent answers "Refused", record the answer as "998".</i></p> <p><i>If respondent answers "Don't know", record the answer as "999".</i></p> <p><i>If respondent cannot give a single number answer, use the blank space to record what they say.</i></p>
<i>sw_risk</i>	In the past year, have you ever had unprotected sex with a client? 0. No 1. Yes 998. Refused 999. Don't know	0 1 998 999	

B. Engagement in sex trade		Enumerator notes	
<i>sw_preg</i>	<p>[If <i>sex</i>=female] What protection methods, if any, have you used with clients to prevent pregnancy?</p> <ol style="list-style-type: none"> 1. Use condoms 2. Use other barrier methods 3. Use hormonal birth control 4. Intrauterine device (IUD) 5. Do not engage in vaginal sex 6. Spacing method / periodic abstinence 7. Withdrawal method 8. Other (specify) 9. Nothing <p>998. Refused 999. Don't know</p>	<p>1 2 3 4 5 6 7 8 998 999</p>	<p><i>Ask only to female respondents.</i></p> <p><i>Do not read list. Select all that apply.</i></p>
<i>sw_preg_oth</i> <i>er</i>	[If <i>sw_preg</i> =8] Specify other:		
<i>sw_sti</i>	<p>What protection methods, if any, have you used with clients to lower your risk of sexually transmitted infections (STIs)?</p> <ol style="list-style-type: none"> 1. Use condoms 2. Use other barrier methods 3. Avoid vaginal sex 4. Avoid anal sex 5. Avoid oral sex 6. Withdrawal method 7. Other (specify) 8. Nothing 	<p>1 2 3 4 5 6 7 8 998</p>	<p><i>Do not read list. Select all that apply.</i></p>

B. Engagement in sex trade			<i>Enumerator notes</i>
	998. Refused 999. Don't know	999	
<i>sw_sti_oth</i>	[If <i>sw_sti</i> =7] Specify other:		
<i>sw_quit</i>	Do you feel that you can stop engaging in the sex trade anytime, if you wanted to? 0. No 1. Yes 998. Refused 999. Don't know	0 1 998 999	
<i>covid</i>	Since COVID-19, what, if anything, has changed about how you support yourself?		

In this next section, I want to learn about specific activities related to your engagement in the sex trade. I understand that these questions are very sensitive and that you might not feel comfortable telling me whether or not you have taken part in any of these activities. To ensure that neither myself nor anyone else involved in this study knows how you answered, we will use a die to make your responses secret.

For each statement, I will ask you to roll the die and keep the result hidden from me behind this card.

- If you roll a 1, you have to answer "YES" – even if that statement is not true
- If you roll a 6, you have to answer "NO" – even if the statement is true
- For all numbers between 2 and 5, you have to tell me the TRUTH

At no point will I know what number you rolled. Because of this, it is impossible to know whether the answer you provided was the truth or was forced by the rules of the game (1 or 6). Do you understand? Do you have any questions before we practice?

Let us practice. I will now ask you a sample question and you will roll the die behind the card. If you roll a 1, answer "YES". If you roll a 6, answer "NO". If you roll between 2-5, tell me the TRUTH. Remember, don't show me the die and don't tell me what number you roll. Are you ready?

- Do you like very spicy foods?

Are the steps clear? Do you have any questions before we begin the activity?

C. Sex acts (anonymized)			<i>Enumerator notes</i>
<i>sa_intim</i>	In the past 12 months, have you engaged in kissing, cuddling, or intimate touching for goods or money? 0. No 1. Yes 998. Refused 999. Don't know	0 1 998 999	
<i>sa_oral</i>	In the past 12 months, have you ever engaged in oral sex in exchange for goods or money? This includes giving or receiving oral sex. 0. No 1. Yes 998. Refused 999. Don't know	0 1 998 999	
<i>sa_anal</i>	In the past 12 months, have you ever engaged in anal or vaginal sex in exchange for goods or money? This includes giving or receiving anal or vaginal sex.	0	

C. Sex acts (anonymized)			<i>Enumerator notes</i>
	0. No 1. Yes 998. Refused 999. Don't know	1 998 999	
<i>sa_pen</i>	In the past 12 months, have you engaged in vaginal or anal penetration using other means like fingers, objects, etc. in exchange for goods or money? This includes giving or receiving. 0. No 1. Yes 998. Refused 999. Don't know	0 1 998 999	
<i>sa_gen</i>	In the past 12 months, have you had direct contact with someone else's genitals or has someone had direct contact with your genitals, in exchange for goods or money? 0. No 1. Yes 998. Refused 999. Don't know	0 1 998 999	
<i>sa_strip</i>	In the past 12 months, have you done any nude posing, undressing, or performing in a sexual way in exchange for goods or money?		

C. Sex acts (anonymized)			<i>Enumerator notes</i>
	0. No 1. Yes 998. Refused 999. Don't know	0 1 998 999	
<i>sa_photo</i>	In the past 12 months, have any sexually explicit photographs or videos been taken of you? 0. No 1. Yes 998. Refused 999. Don't know	0 1 998 999	
<i>sa_arrest</i>	In the past 12 months, have you been arrested for engaging in the sex trade? 0. No 1. Yes 998. Refused 999. Don't know	0 1 998 999	
<i>sa_sugard</i>	In the past 12 months, have you entered into a sexual relationship with someone mainly in order to get things that you need, money, gifts, or other things that are important to you? 0. No	0 1 998 999	

C. Sex acts (anonymized)			Enumerator notes
	1. Yes 998. Refused 999. Don't know		
<i>sa_drugs</i>	In the past 12 months, has someone provided you with drugs or alcohol in order to exercise some control over you? 0. No 1. Yes 998. Refused 999. Don't know	0 1 998 999	

Okay, now you can stop rolling the die to determine your answer. From now on, please go back to providing true answers to the questions.

In this next section, we want to understand how any traumatic events you may have experienced impact your day-to-day life. Examples of traumatic events may include a serious accident or natural disaster, a physical or sexual assault, seeing a loved one die, or anything else that was unusually or especially frightening, horrible, or traumatic for you.

For the next few questions, think about any traumatic events you have experienced in your life. You do not have to tell me what the traumatic events are.

D. PTSD Screener			Enumerator notes
<i>ptsd_night</i>	In the past month, have you had nightmares about the traumatic event(s) or thought about those event(s) when you did not want to? 0. No	0 1 998	"Past month" refers to past ~30 days. E.g., if today is November 15, we are asking about the period from October 15 to now.

D. PTSD Screener			<i>Enumerator notes</i>
	1. Yes 998. Refused 999. Don't know	999	
<i>ptsd_avoid</i>	In the past month, have you tried hard not to think about the traumatic event(s) or went out of your way to avoid situations that reminded you of those event(s)? 0. No 1. Yes 998. Refused 999. Don't know	0 1 998 999	
<i>ptsd_guilt</i>	In the past month, have you felt guilty or unable to stop blaming yourself or others for the traumatic event(s) or any problems those event(s) may have caused? 0. No 1. Yes 998. Refused 999. Don't know	0 1 998 999	
<i>ptsd_startled</i>	In the past month, have you been constantly on guard, watchful, or easily startled? 0. No 1. Yes 998. Refused 999. Don't know	0 1 998 999	

D. PTSD Screener			Enumerator notes
<i>ptsd_numb</i>	In the past month, have you felt numb or detached from people, activities, or your surroundings? 0. No 1. Yes 998. Refused 999. Don't know	0 1 998 999	

E. Network information			Enumerator notes
<i>net_count</i>	About how many 13-17 year olds do you personally know by name/alias who have engaged in the sex trade in the last 12 months?	_ _ _	<i>If respondent answers "Refused", record the answer as "998".</i> <i>If respondent answers "Don't know", record the answer as "999".</i>
<i>net_isolated</i>	Do you know of any 13-17 year olds who are kept by their facilitators/employers and never hang out with other teenagers in the sex industry? You don't need to know them by name, just know of them. 0. No 1. Yes 998. Refused 999. Don't know	0 1 998 999	
<i>net_isolated_count</i>	[If <i>net_isolated</i> =1] About how many such 13-17 year olds do you know of?	_ _ _	<i>If respondent answers "Refused", record the answer as "998".</i>

E. Network information			Enumerator notes
			If respondent answers "Don't know", record the answer as "999".

F. Open-ended questions			Enumerator notes
<p>In the future, we plan to ask 13-17 year olds like yourself to help us invite more study participants. We will be doing this by giving participants coupons to distribute to other 13-17 year olds engaged in the sex trade in this area. These coupons will provide important information about the study, including how to participate.</p> <p>Please take a look at these example coupons [<i>show respondent the two coupons</i>].</p>			
<p>1. What are some of the ways these coupons are helpful in presenting important information about the study? [<i>Probe on whether the right social media applications are relevant, the graphics, the text</i>]</p>			
<p>2. What are some of the ways they are not helpful? What are some of the ways to address these? [<i>Probe on whether it needs more graphics, the information is not clear</i>]</p>			
<p>3. Imagine we asked you to give coupons like this to five 13-17 year-olds that you know in this area who have engaged in the sex trade in the past year. Would be you able and willing to invite people in this manner? Why or why not?</p> <p style="padding-left: 20px;">a. [<i>If yes</i>] If you gave out 5 coupons to 5 13-17 year olds involved in the sex trade, how many of them do you think would actually call to enroll in the study?</p> <p>[<i>If less than 5</i>] What could be done to increase the number that would call to enroll in the study?</p>			
<p>4. If I asked you to give us the names and phone numbers of the people that you plan to share these coupons with, would you do so? Note that this would be for tracking purposes only and we would NOT contact them directly. Why or why not?</p>			

F. Open-ended questions		<i>Enumerator notes</i>
5.	<p>Now imagine 13-17 year olds in the sex trade were given an incentive for taking the survey and were also given an incentive for each 13-17 year old engaging in the sex trade they invited to do the survey. What kinds of incentives (type/amount) would make this invitation exercise more successful?</p> <p>a. For the 13-17 year old engaging in the sex trade completing the survey? For each 13-17 year old engaging in the sex trade they successfully invite?</p>	
6.	<p>Do you think most young adults (say 18-20 year olds) engaging in the sex trade started before they turned 18?</p> <p>a. Out of 5 young adults engaging in the sex trade, about how many would you think started engaging in the sex trade before they turned 18? Out of 5 young adults engaging in the sex trade, about how many would you think started engaging in the sex trade before they turned 13?</p>	
7.	<p>Beyond what has been discussed, are there any other important things we should consider before doing research on 13-17 year olds involved in the sex trade?</p>	

Thank you for taking the time to speak with me, I've learned a lot from our conversation. [*Enumerator instruction: Offer the respondent the list of referrals to service, say goodbye, and then complete the rest of the questionnaire*].

G. Metadata		<i>Enumerator notes</i>
<i>result</i>	<p>Record result of interview:</p> <ol style="list-style-type: none"> 1. Completed 1 2. Partially completed; will not be completed at a later date 2 3. Partially completed; will be completed at a later date 3 	

G. Metadata			<i>Enumerator notes</i>
	4. Other (specify)	4	
<i>result_specify</i>	[If <i>result</i> =4] Specify other:		
<i>cooperation</i>	In your opinion, how cooperative was the respondent? 1. Cooperative 2. In-between 3. Uncooperative	1 2 3	
<i>honesty</i>	In your opinion, how honest was the respondent when answering? 1. Honest 2. In-between 3. Misleading 999. Don't know	1 2 3 999	
<i>endnote</i>	Record any other notes about this interview:		
<i>end_time</i>	Confirm end time (HH:MM)	_ _ : _ _	

ANNEX VI. REFERENCES

- Chapman, D. (1951). Some Properties of the Hypergeometric Distribution with Applications to Zoological Sample Census. *University of California Publications in Statistics*. 1, 131-160.
- Frank, O. and Snijders, T. (1994). Estimating the Size of Hidden Populations Using Snowball Sampling. *Journal of Official Statistics*, 10, 53-67.
- Klov Dahl, A.; Potterat, J.; Woodhouse, D.; Muth, J.; Muth, S. & Darrow, W. (1994). Social networks and infectious disease: The Colorado Springs Study. *Social Science & Medicine*, 38, 79-88.
- R Core Team (2016). *R: A Language and Environment for Statistical Computing*. R Foundation for Statistical Computing, Vienna, Austria.
- Robson, D. and Regier, H. A. (1964). Sample Size in Petersen Mark-Recapture Experiments. *Transactions of the American Fisheries Society*. 93, 215-226.
- Seber, G. A. F. (1970). The Effects of Trap Response on Tag Recapture Estimates. *Biometrics, International Biometric Society*, 26, 13-22.
- Thompson, S. (2020). New estimates for network sampling. *arXiv preprint: 2002.01350*.
- Vincent, K., Zhang, S., and Dank, M. Searching for Sex-Trafficking Victims: Using a Novel Link-Tracing Method among Commercial Sex-Workers in Muzzafarpur, India. *Crime & Delinquency*. 0011128719890265.
- Vincent, K. and Thompson, S. (2021). Estimating the Size and Distribution of Networked Populations with Snowball Sampling. *Journal of Survey Statistics and Methodology*. (To appear).
- Vincent, K. and Thompson, S. (2017). Estimating Population Size with Link-Tracing Sampling. *Journal of the American Statistical Association*. 112, 1286-1295.
- Vincent, K. (2019). Recent Advances on Estimating Population Size with Link-Tracing Sampling. *arXiv preprint: 1709.07556*.