

Female Sex Workers Population Size Estimation (FSWs-PSE) Using three-source, capture-recapture method (3SCRC), Rwanda, 2018

FACTSHEET

Objectives

The Rwanda FSW-PSE 2018 aims at estimating the population size of FSW nationally in Rwanda to report on important monitoring indicators and to inform programmatic resource allocation and policy decision-making.

Partners

- **In-Country Partners:** Rwanda Biomedical Center (RBC) and United States Centers for Disease Control and Prevention (CDC-Rwanda).
- **International:** Key Population Surveillance Team, Epidemiology and Surveillance Branch, Division for Global HIV/AIDS and TB, US Centers for Disease Control and Prevention, Atlanta.

Ethical Considerations and Process

Rwanda FSW-PSE 2018 Development & Implementation

- The Rwanda National Ethical Committee (RNEC) and CDC's Institutional Review Board independently reviewed and approved the Female Sex Workers size estimation in Rwanda using three-source, capture-recapture, following the 2018 protocol.
- RBC implemented the FSW-PSE 2018 protocol. CDC provided technical support in implementing the estimation project, conducting data analysis and review of the study findings.

Study that informed the 2018 Rwanda FSW-PSE 3SCRC Sampling:

- FSWs Hotspot Mapping exercise, Rwanda 2017

Time period of implementation for 3 captures:

- First capture: **August 1-8, 2018**
- Second capture: **August 9-15, 2018**
- Third capture: **August 16-22, 2018**

Location

National: 5 provinces (East, South, West, North and Kigali city) and 30 Districts.

Target Population

Self-reported FSWs, estimated age ≥ 15 years of age; present at the selected hotspots and identified by a key informant.

Data Analysis & Dissemination: RBC worked together with CDC in the quality control of data collection, data cleaning, statistical testing of hypothesis and analyses. Both agencies collaborated to develop a comprehensive final report. The report is planned for release by end-2019, followed by the official launch of the report. The data dissemination and scientific product development action plan are also underway.

Methodology

- **Sampling:** Based on 2017 FSW mapping results, FSW population size was estimated to be 13,000 based on Rwanda's FSW Hotspot mapping conducted in 2017. With a sample size of 1,000, the number of unique objects to be distributed was 1,157 per capture. Taking into account the potential loss of objects, the final number of unique objects was rounded up to 1,200. Unique object allocation was done using probability proportional to each sector's size of total FSWs from the 2017 FSW mapping exercise. Unique object distribution within a hotspot used systematic sampling with sampling interval of 11.
- **Field Implementation:** The 2018 Rwanda FSW-PSE used a national cross-sectional three-source, capture-recapture method (3SCRC) to estimate the population size of FSW in Rwanda. 3SCRC started with a capture stage (capture 1), where sampled FSWs in hotspots were captured and tagged (marked) by providing a unique object (a key holder with a pre-printed unique message: "**Rinda Ubuzima**", which means "**Protect your life**" in English). After a one-week period, a second capture began, with sampled FSWs being captured independently and tagged with a different unique object (a bracelet with a pre-printed unique message: "**♥ Ubuzima**", which means "**Love your life**" in English). After one week, the third capture began, with randomly sampled FSWs being approached and asked whether they had received unique gift(s) in the last 2 weeks. To observe the mobility of FSWs, each of the five provinces had been given one of five different colored unique objects to be distributed.

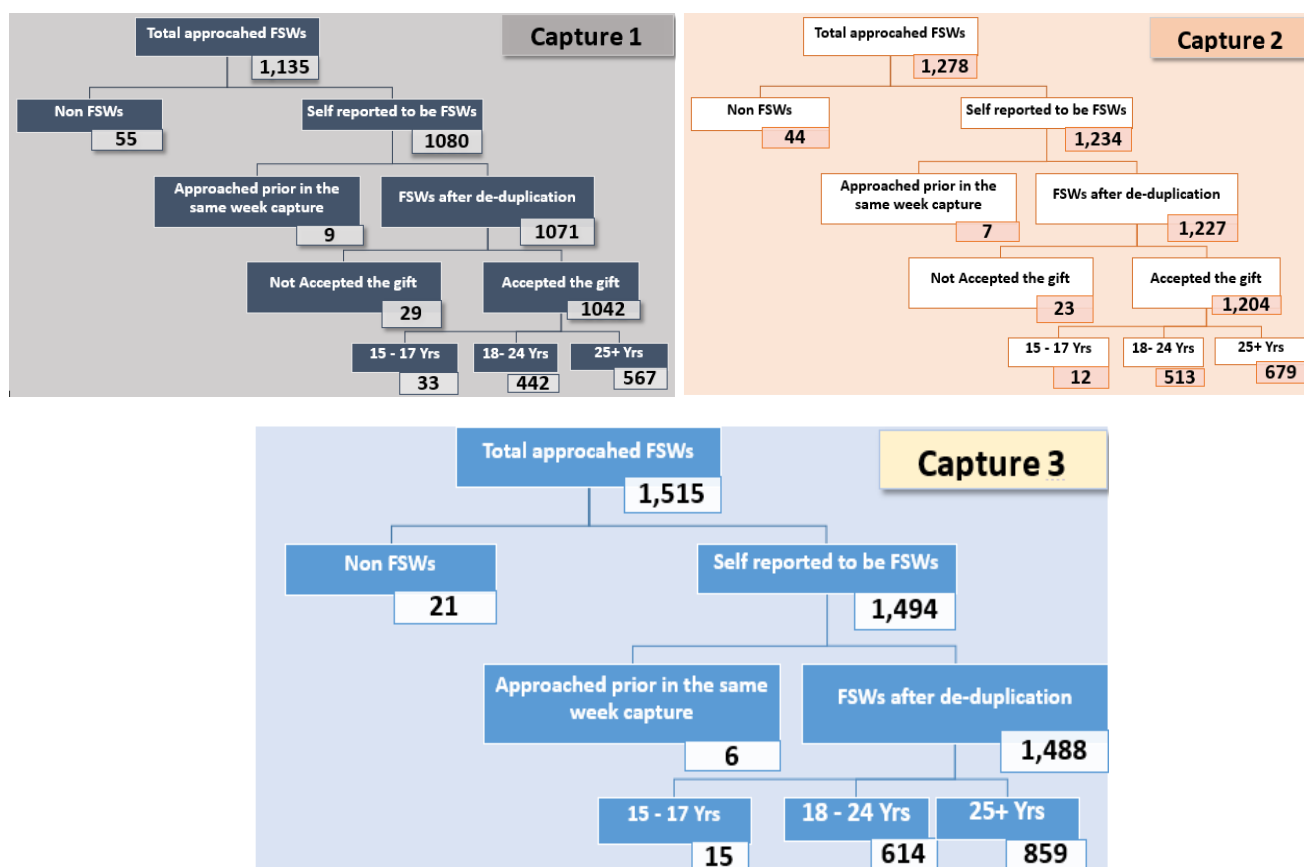
Funding agency

All findings presented here are preliminary results, which are subject to further revision. This estimation project was supported by the President's Emergency Plan for AIDS Relief (PEPFAR) under grant number GH001612

Data quality /control and Data analysis

- *Data quality monitoring:* Each completed form was saved on tablets and simultaneously sent to an external online server managed by RBC. All forms received by the server were downloaded multiple times daily for data quality checks. In case of any error, the data collector was contacted immediately, so the issue was addressed. The data collected at the end of each capture were imported to a statistical analysis software package for further analysis.
- Individuals appeared in multiple captures if 1) they were able to produce the gift from captures 1 and/or 2. Heterogeneity exploration between captures was done. The 3SCRC using Bayesian nonparametric latent-class models with Jeffrey's hyper prior was fitted to estimate the population size of female sex workers in Rwanda. The final estimate was adjusted to account for FSW guides used for data collection. Additionally, we calculated three 2SCRC estimates to compare to the 3SCRC estimate. All 2SCRC estimates were calculated using the Exact Hypergeometric method. SAS and STATA were used for sampling and data cleaning and RStudio 3.5.1 was used for log linear and Bayesian Latent Class modelling to produce final estimates.

Flow charts for the final captured FSWs in each capture

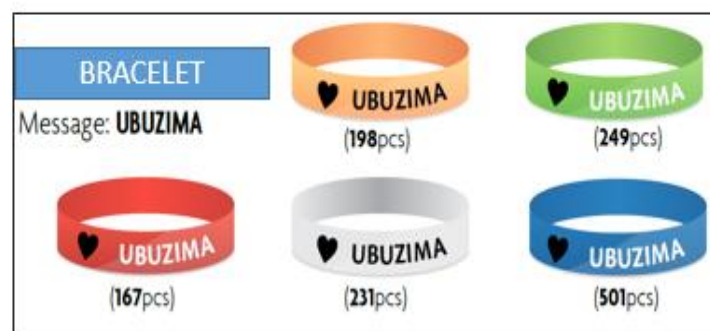


The charts above have a typo for “approached”

Funding agency

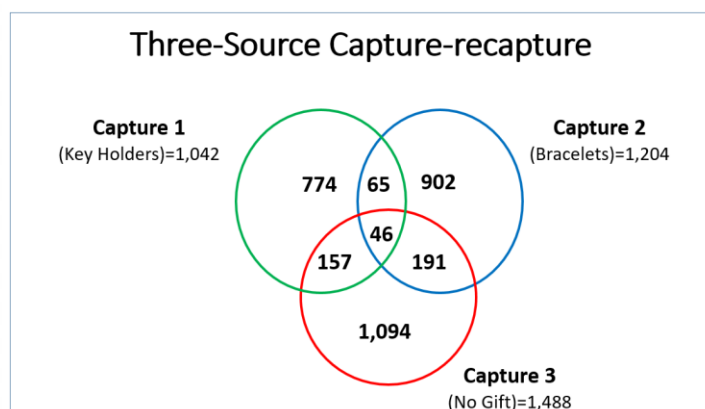
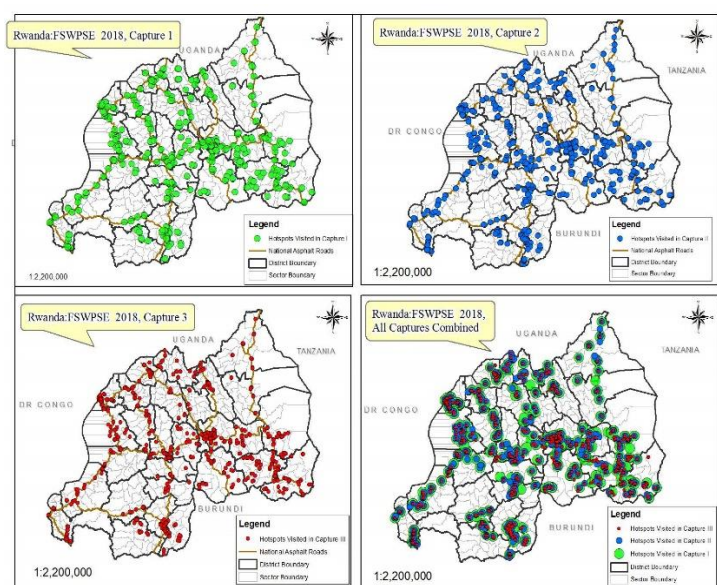
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Image and Design of Unique Objects/Gifts used in Capture 1 and Capture 2 phases



Rinda UBUZIMA= Protect your life

UBUZIMA= Love your life



		Unadjusted Median (Credible Set)	Adjusted Median (+ 576 FSWs Informants) (Credible Set)	Method/Models
2-SCRC	Capture 1 & 2:	9,167 [7,675 – 10,659]	9,743 [8,251 - 11,235]	Exact Hypergeometric
	Capture 1 & 3:	5,893 [5,241 – 6,545]	6,469 [5,817 – 7,121]	
	Capture 2 & 3:	5,926 [5,327 – 6,525]	6,502 [5,903 – 7,101]	
3-SCRC	Capture 1,2 & 3:	13,138 [8,277 - 22,919]	13,714 [8,853 - 23,495]	Bayesian LCA PSE

Limitations

The estimates in this report may have underestimated the FSW population size in Rwanda, because:

- The estimates are limited to FSWs who congregate at hotspots or who operate on the streets (i.e., street and venue-based FSW). FSWs who do not congregate at hotspot venues, such as home-based FSWs, are not included in this PSE estimate.
- During the 3 weeks of capture-recapture activities, a low attendance rate in the venues and streets was identified in the Western province, mostly in Rubavu and Nyabihu Districts, which could have affected the final estimates.

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Conclusion

- The population size of street- and venue-based FSWs in Rwanda is estimated to be in the credible set of 8,853 - 23,495 with a corresponding median of 13,714. The credible set median is very similar to the 2017 hotspot mapping finding (13,569 for home, street and venue based). Further studies are warranted to estimate the number of FSW not visible at hotspots to obtain a full picture for programmatic decision-making and reporting.

Technical Notes to reader

- **Adjustment for FSWs Guides:**
 - To understand the full picture of the size of venue-and street-based FSWs operating in Rwanda, the number of FSWs Guides who facilitated the data collection was known and fixed to 576 without any error around it. Therefore, this number was added to the base estimate from the 3SCRC FSW_PSE 2018 and produced an adjusted credible set of **[8,853 – 23,495]** with Median of **13,714**.

Additional information about the Female Sex Workers size estimation in Rwanda using three-source capture-recapture, 2018 (FSW-PSE 2018) can be obtained from the Rwanda Biomedical Center; Institute of HIV/AIDS, Disease Prevention and Control Department (RBC/IHDPC), P. O. Box 7162, Kigali, Rwanda; Telephone: +250 788 418 769; Internet: www.rbc.gov.rw

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