



Makerere University
College of Health Sciences
SCHOOL OF PUBLIC HEALTH

Bio- Behavioral Survey among Female Sex Workers in 12 districts in Uganda

2021 – 2023

Geofrey Musinguzi
Co-Principal Investigator and CoAg Director



CoAg Program Areas

1. Sentinel Biological and Behavioral Surveillance (BBS)
2. Electronic Health Screening Services by ACASI (EHSS-ACASI)
3. Key Population Friendly Services Training (GSD)
4. Legal Environmental Assessment (LEA)
5. Stigma and Discrimination Too Kit (S&D)
6. Teenage Pregnancy Evaluation (TP)
7. Uganda General Population Survey (UPHIA2024)



*KPSCO Coag team

- Principal Investigator – Prof Rhoda Wanyenze
- Program Director – Dr. Geofrey Musinguzi
- Manager M&E – Dr. George Tumusinze
- Business Official – Ms. Susan Mawemuko
- BBS (total staff = 74)– Lead Mr.Moses Ogwal
- EHSS-ACASI (4) – Lead Mr. Derrick Twikirize
- LEA (1) – Lead Ms. Florence Obua
- UPHIA (10) – Lead Prof Fred Makumbi & Dr. Sam Biraro- PHIA Director
- GSD (2) – Lead Gloria Natwijuka
- TP study (2) – Ms Rebecca Nuwamatsiko
- **Total staff = 97 in the coag**



BBS Investigators

MakSPH – G Musinguzi, M Ogwal, G Tumusinze and R Wanyenze

CDC Atlanta – W Hladik

CDC Uganda – G Aluzimbi, H Kiyingi, A Awor, C Ajulong, P Nasirumbi, and R Bbosa

MoH – W Kirungi, P Kyambadde and G Pande



Collaborating Institutions

Uganda Ministry of Health (STI/ AIDS Control Programme)

Makerere University School of Public Health

KP stakeholders

Regional PEPFAR implementing mechanisms

CDC Uganda/Atlanta and PEPFAR USG agencies



Key Implementing partners

PEPFAR Comprehensive partner (CDC/USAID/DOD)	Supported Districts
Baylor Uganda (Bunyoro region)	Hoima & Bulisa
Baylor Uganda (Rwenzori region)	Fort Portal
DOD - Makerere University Walter Reed project	Buvuma
IDI - West Nile region	Arua
Infectious Disease Institute (IDI)	Masaka
USAID LPHS - MJAP	Jinja & Busia
USAID LPHS - TASO Mbarara	Mbarara
USAID LPHS - JCRC-Kigezi	Kabale
USAID LPHS ACHOLI - TASO	Gulu
USAID LPHS East -Baylor Uganda	Mbale & Tororo
USAID LPHS LANGO - JCRC	Lira



Acknowledgement

Crane Survey Staff

FSW CSOs/CBOs and Study Participants

District and regional referral labs and hospitals

Central Public Health Laboratory

Peers and mobilisers



MakSPH Crane Survey BBS project Background

- PEPFAR-funded collaborative activity (MakSPH, MoH, CDC, USAID & DoD)
- Crane 1 round: 2008 – 2010 – Chicken House, Old Kampala
- Crane 2 round: 2011 - 2015 – Wandegeya, Kampala
- Crane 3 round: 2021 – 2023 - 12 districts
- Crane 4 round: Start 2024, ongoing: 15 districts, continuous sentinel surveillance



Goals & Objectives

IBBS Surveillance

Project goals

1. Establish routine surveillance system for KP
2. Estimate burden of HIV and STIs
3. Estimate prevention and treatment service uptake, risk and co-infections factors

Specific primary objectives:

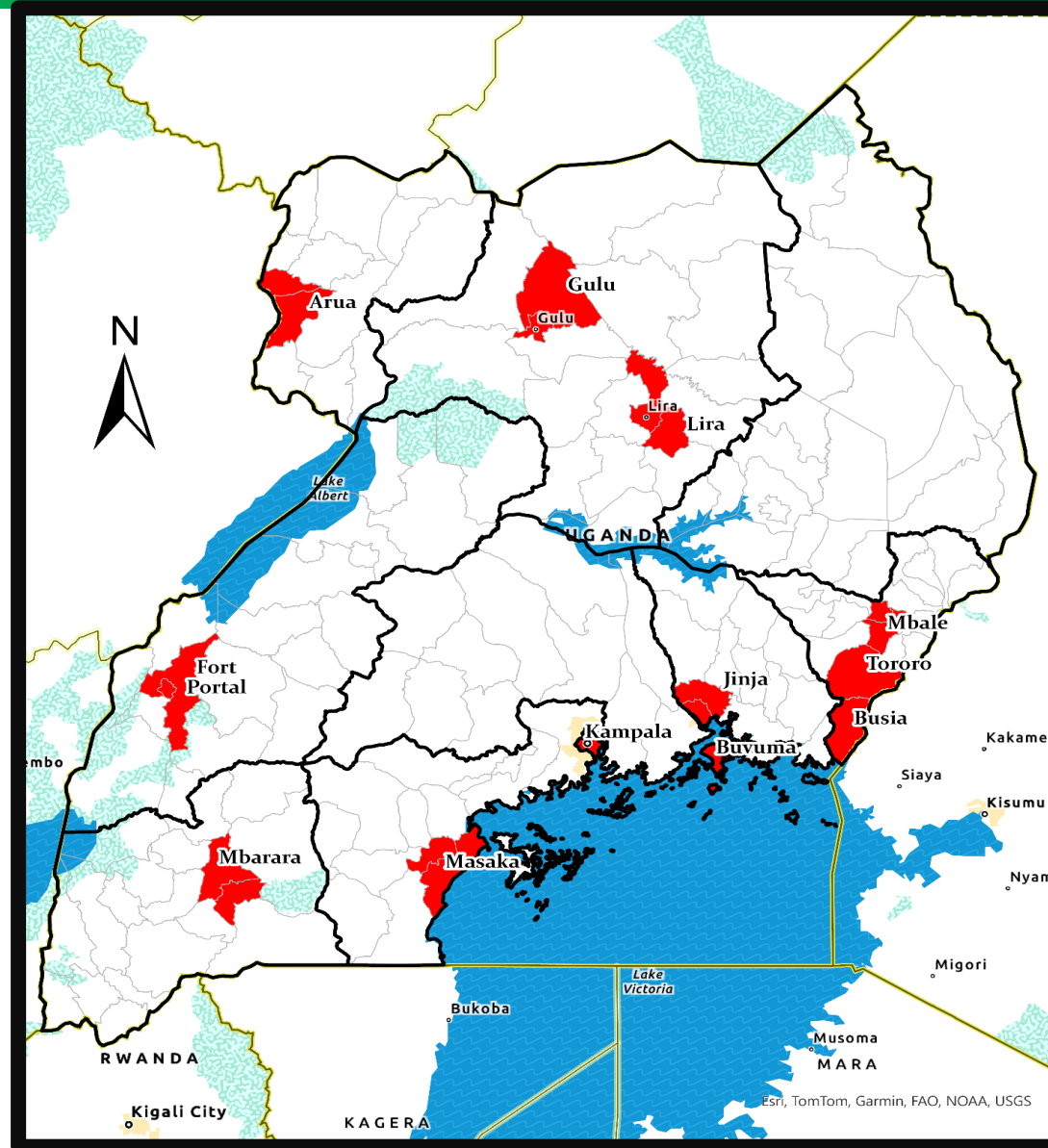
- To estimate HIV prevalence and VL suppression among those living with HIV.

Secondary objectives:

- Inform population-level prevention and treatment cascades;
- Estimate prevalence of select STI
- Estimate population sizes
- Build local capacity for HIV surveys and surveillance among KP and other populations at risk for HIV.



Map showing studied districts in Uganda



12 Districts
Sampled

MakSPH Crane survey focuses on urban concentrations (towns)



Methods

- Sampling: Respondent-driven sampling (RDS)
- Data collection: Audio computer self-assisted interviews (ACASI)
- Biomarkers: HIV, CD4, viral load, syphilis, HPV
- Mapping: virtual, venue-based mapping (GIS map generation)
- Population size estimation: Robust three-source capture-recapture method (3S-CRC)
- 12 locations
- **Sampling period:** 2021-2023
- **Sample size calculations:** VL suppression
- **Data analysis:** Pooled, weighted



Eligibility criteria



**Age greater than or equal to 18 years [FSW: ≥ 15 years]
SEC**



Resident in study district



Able to understand one of the interview languages offered



Having received a coupon from a peer they personally know [except for *seeds]



Survey Findings

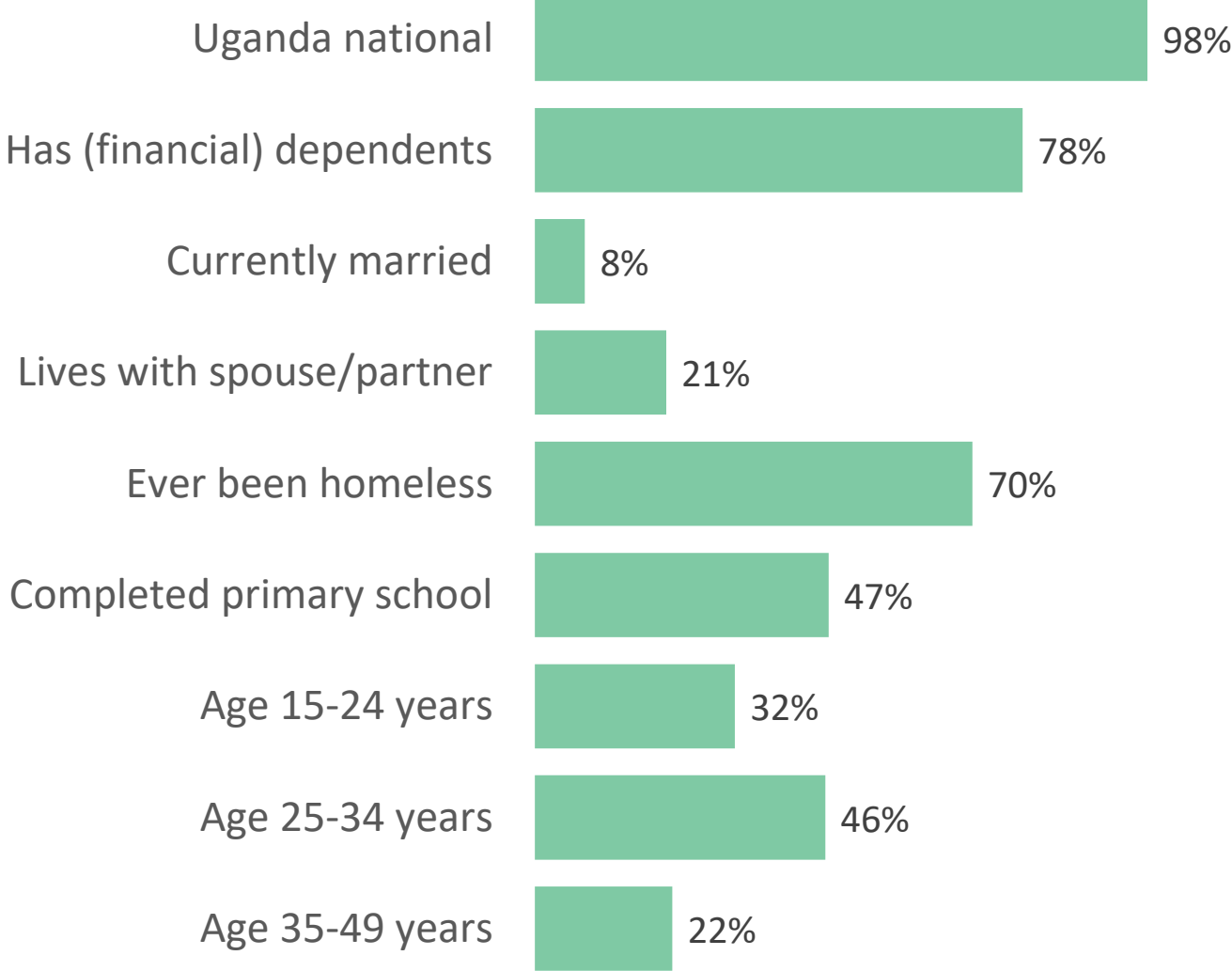
Sample Size and Population Size Estimates (PSEs)

Location	Sample Size	Population Size Estimates	PSE 95% CI	PSE %
Arua	651	1400	1100 - 2800	1.7%
Busia	759	2700	1900 - 3500	1.6%
Buvuma	482	1100	710 - 1900	3.2%
Fort Portal	463	1500	1000 - 2100	4.7%
Gulu	615	5300	4700 - 6000	4.6%
Jinja	607	2200	1100 - 4100	3.5%
Kampala	1589	4400	3900 - 5000	1.2%
Lira	429	760	720 - 870	1.1%
Masaka	445	1200	850 - 1700	1.2%
Mbale	759	1200	1000 - 1400	1.1%
Mbarara	415	2600	770 - 11870	2.5%
Tororo	675	3200	1400 - 4600	2.3%
Total	7947	27560	---	---



Population size estimation (PSE, 3-source capture recapture): 1.1%-4.7% of women ages 15-49 years

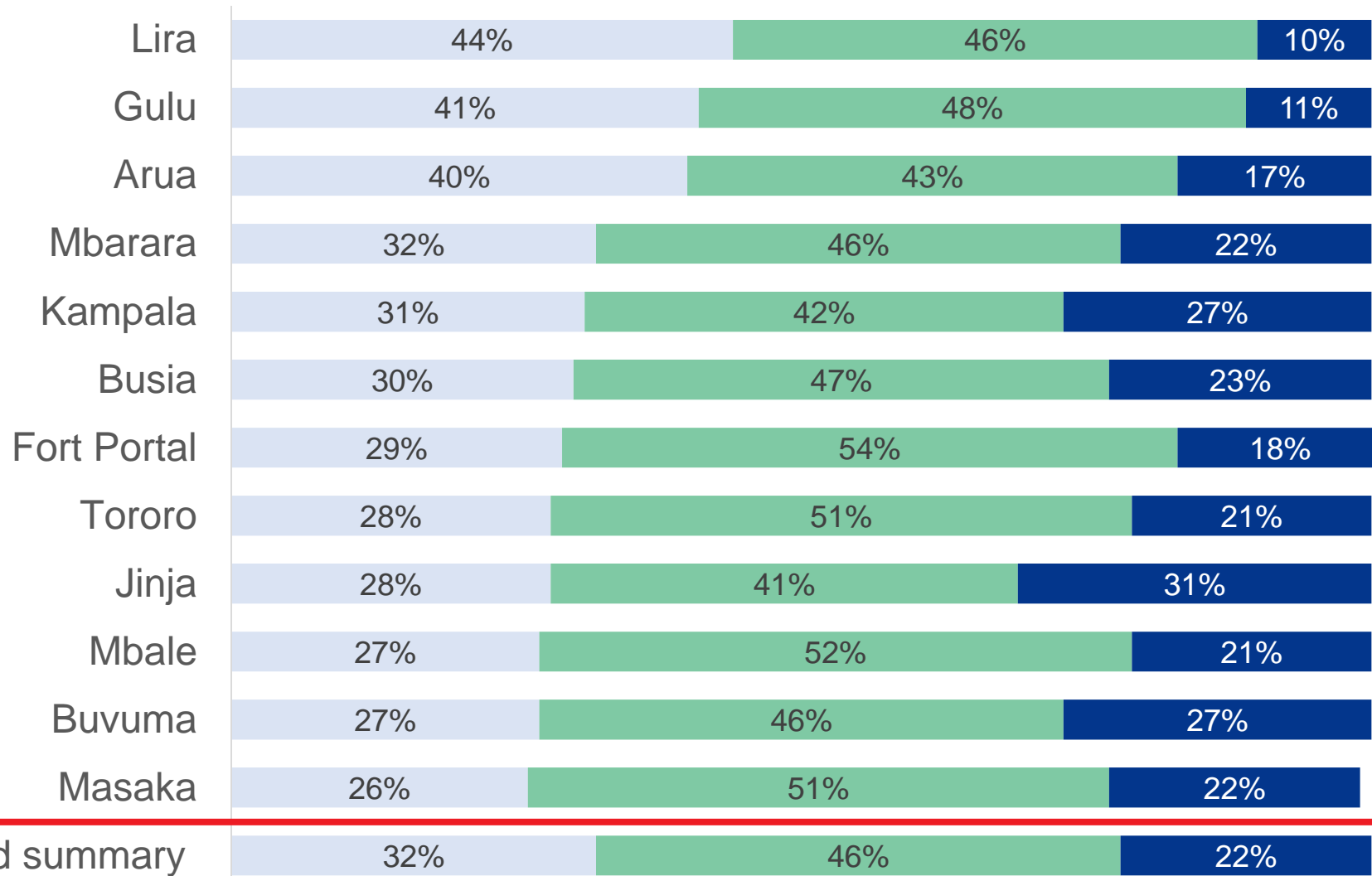
FSW demographics



FSW demographics

Age Distribution By Location

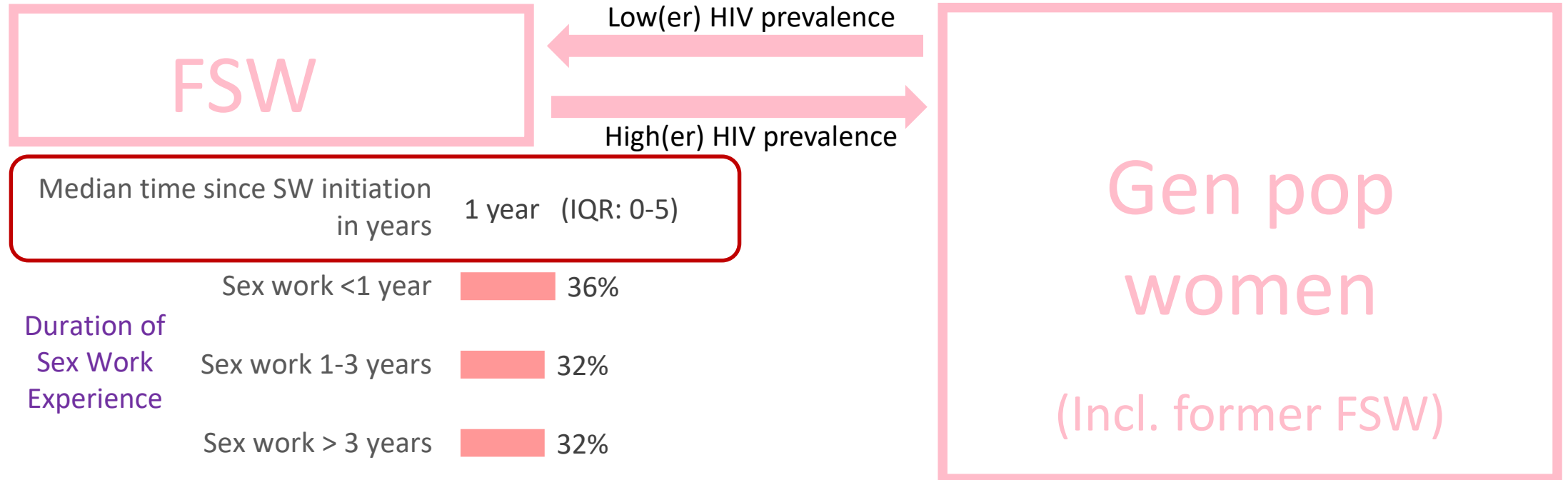
Median age:
28 years
IQR: **23-34 years**



Age 15-24 years
Age 25-34 years
Age 35-49 years



Under-appreciated epidemiology: High turnover between FSW and general population women



Global literature suggests poverty as key driver for engaging in sex work



Sex work frequency and condom use – Pooled analysis

1

On average,
per day:

- 8 commercial sex acts
- 4 clients

2

Self-reported condom use: high but not fully consistent

3

One quarter
also engaged in
anal sex

- Much higher HIV acquisition risk
- Lower condom use

Average clients per day 4 (IQR: 3-5)

Average sex acts per client 2 (IQR: 2-3)

No condom use 18%

Inconsistent condom use 16%

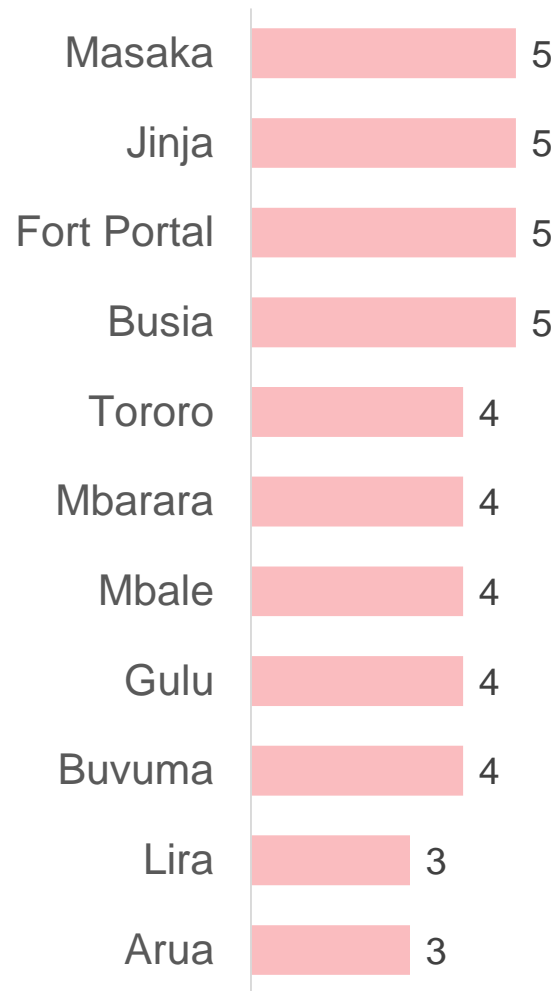
Consistent condom use 84%

Had anal sex 24%

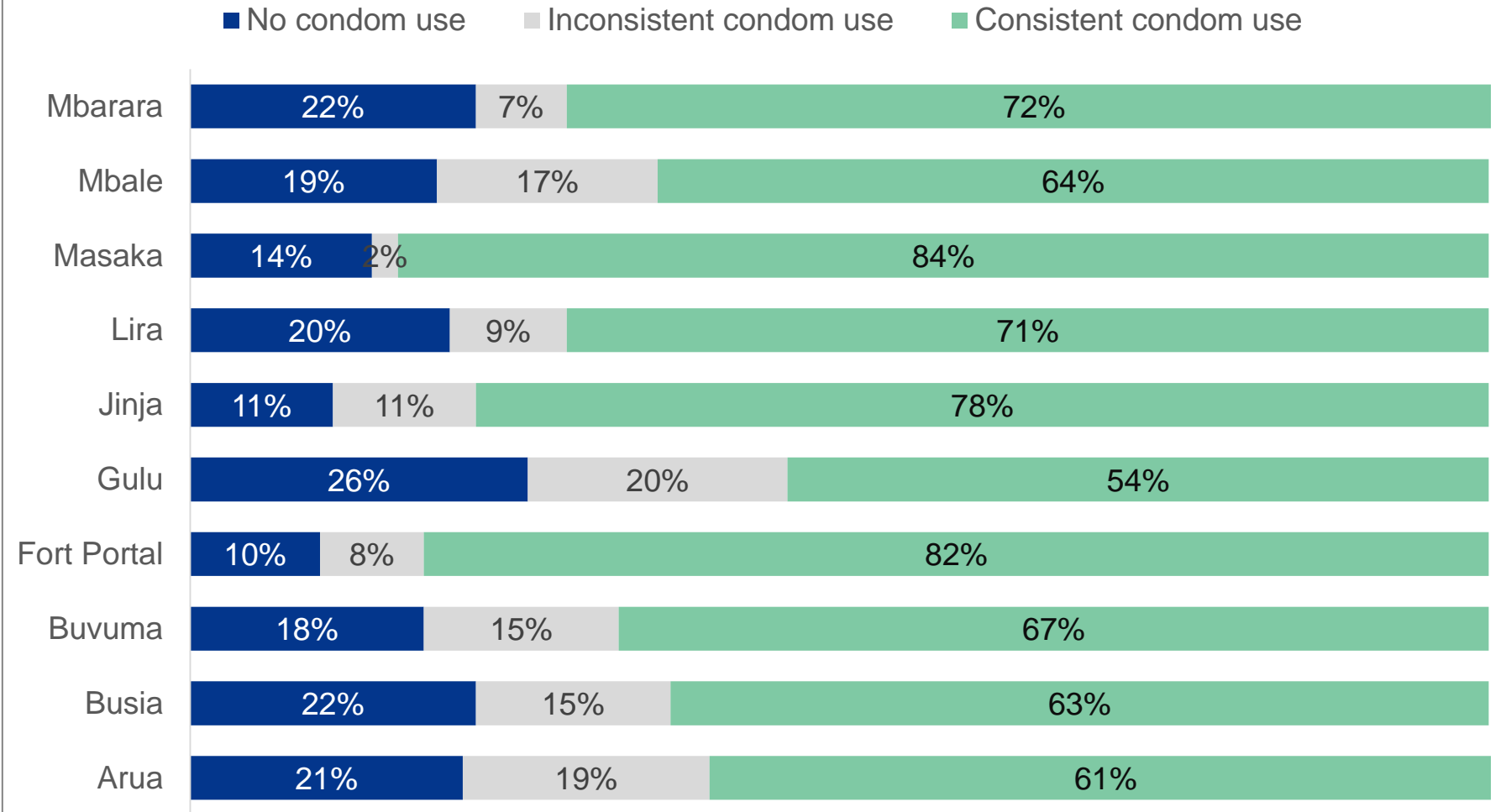
Condom at last anal sex 65%

Sex work frequency and condom use – Disaggregated analysis by districts

Average clients per day



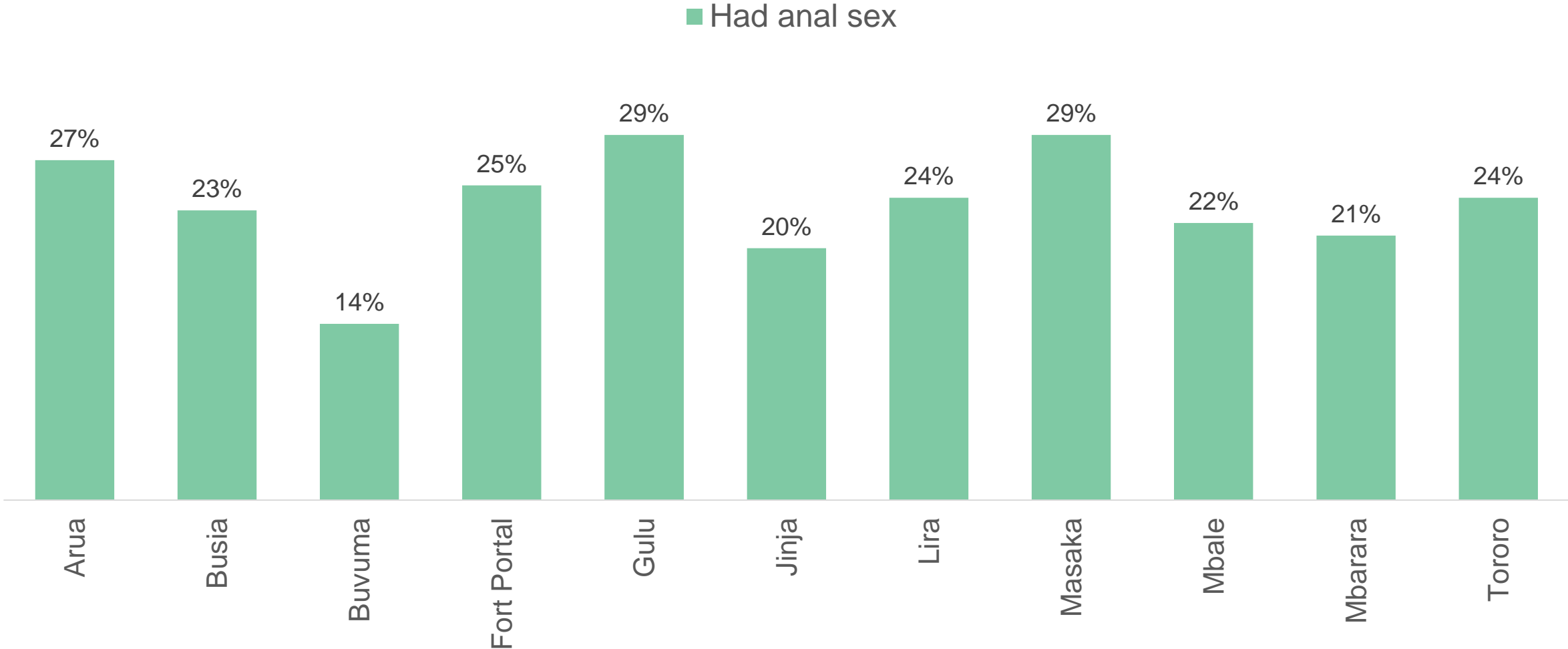
Condom Use



We Never collected data on Condom use in Kampala

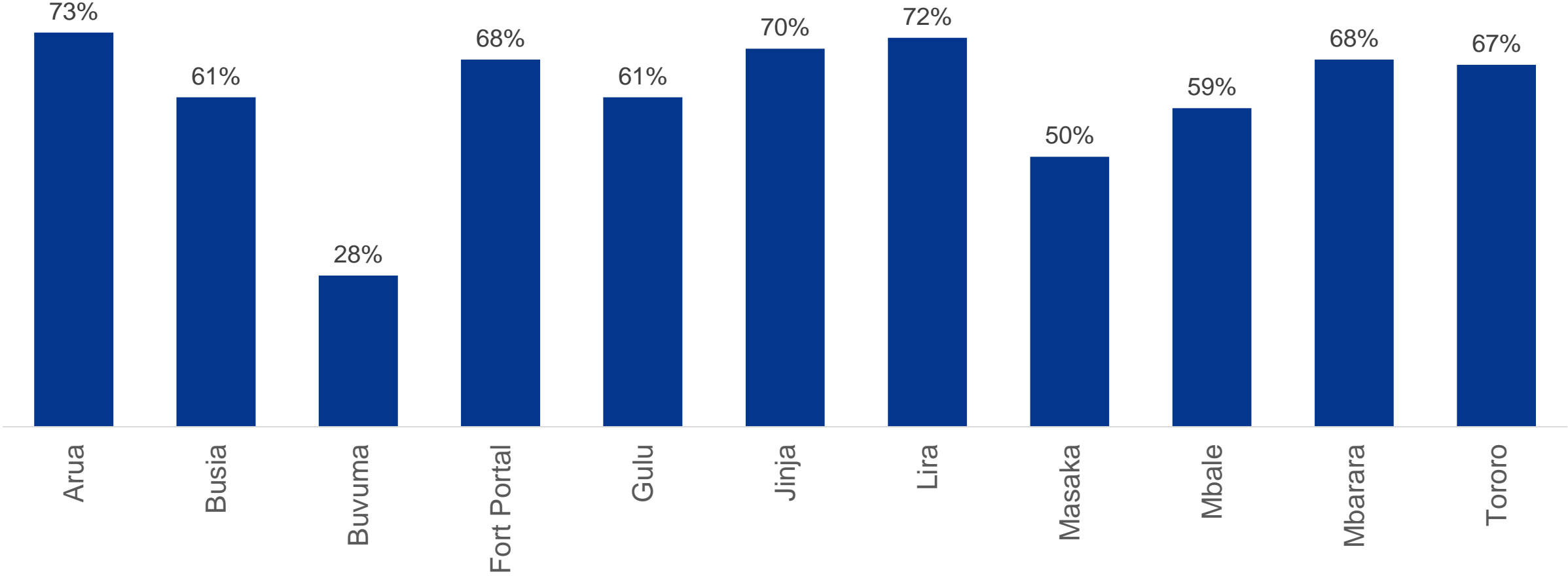


Anal Sex – Disaggregated analysis by districts



Condom Use at Last Anal Sex – Disaggregated analysis by districts

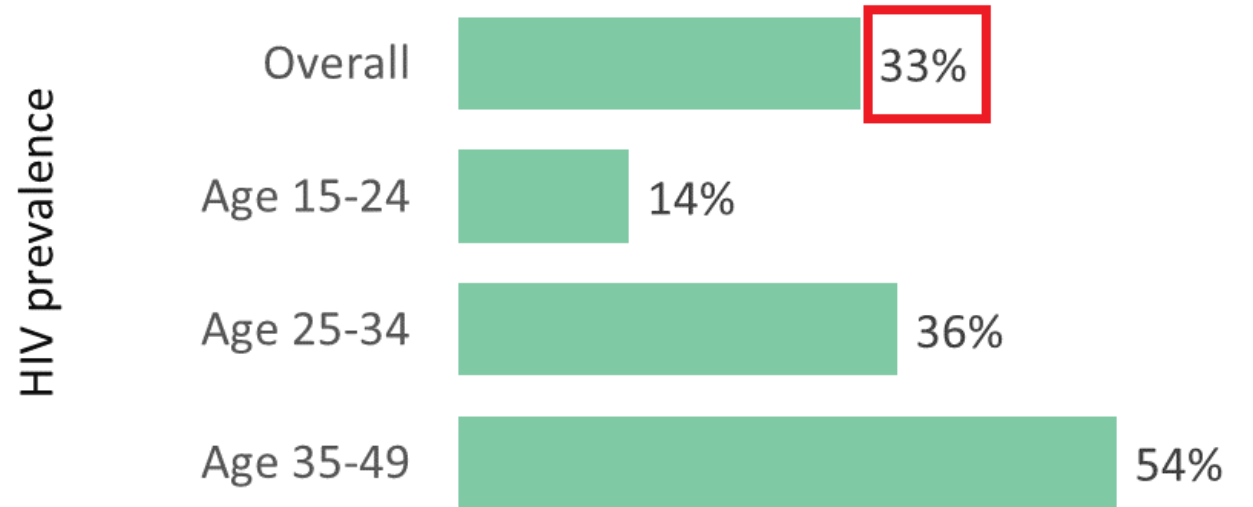
■ Condom at last anal sex



HIV Prevalence – pooled analysis

Age Distribution

- One in three FSW are living with HIV
- HIV prevalence rises sharply with age
- UPHIA 2020/1, gen pop women:
 - 15-49 yrs: 7.1%
 - 15-24 yrs: 2.9%



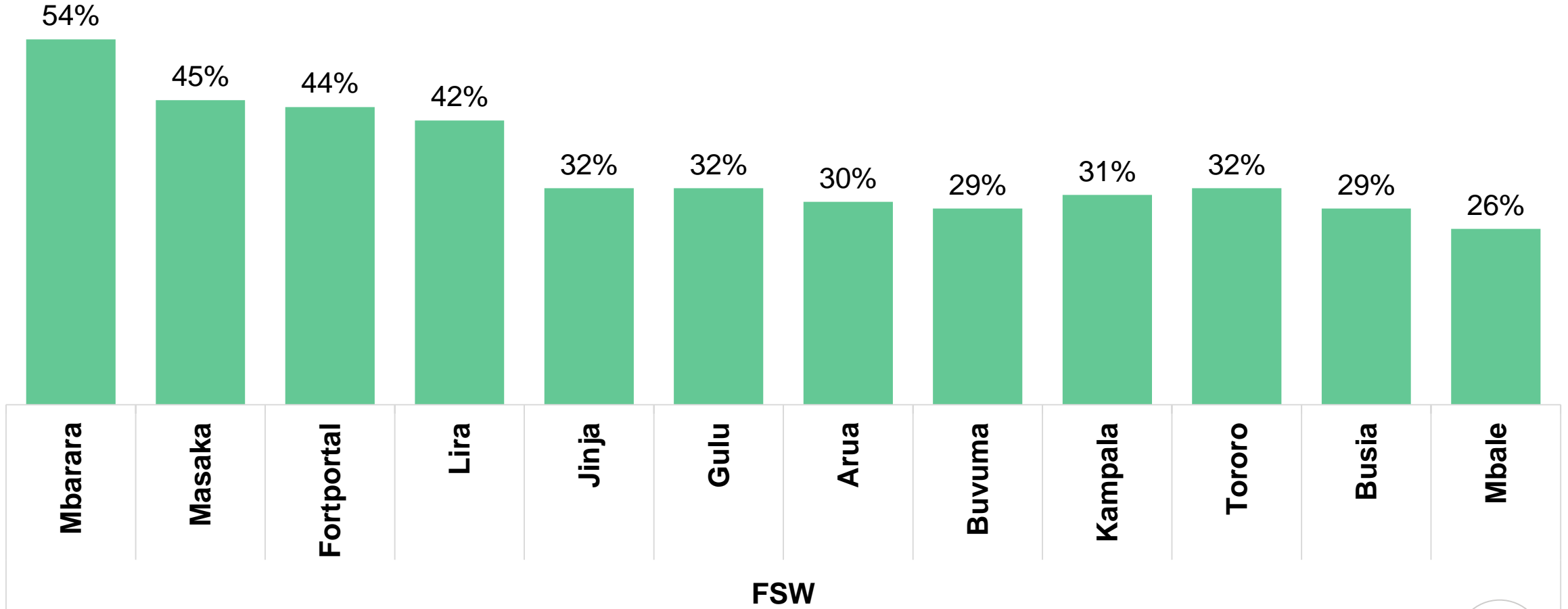
33%

HIV
Prevalence
among FSW

HIV Prevalence - Disaggregated

District Distribution

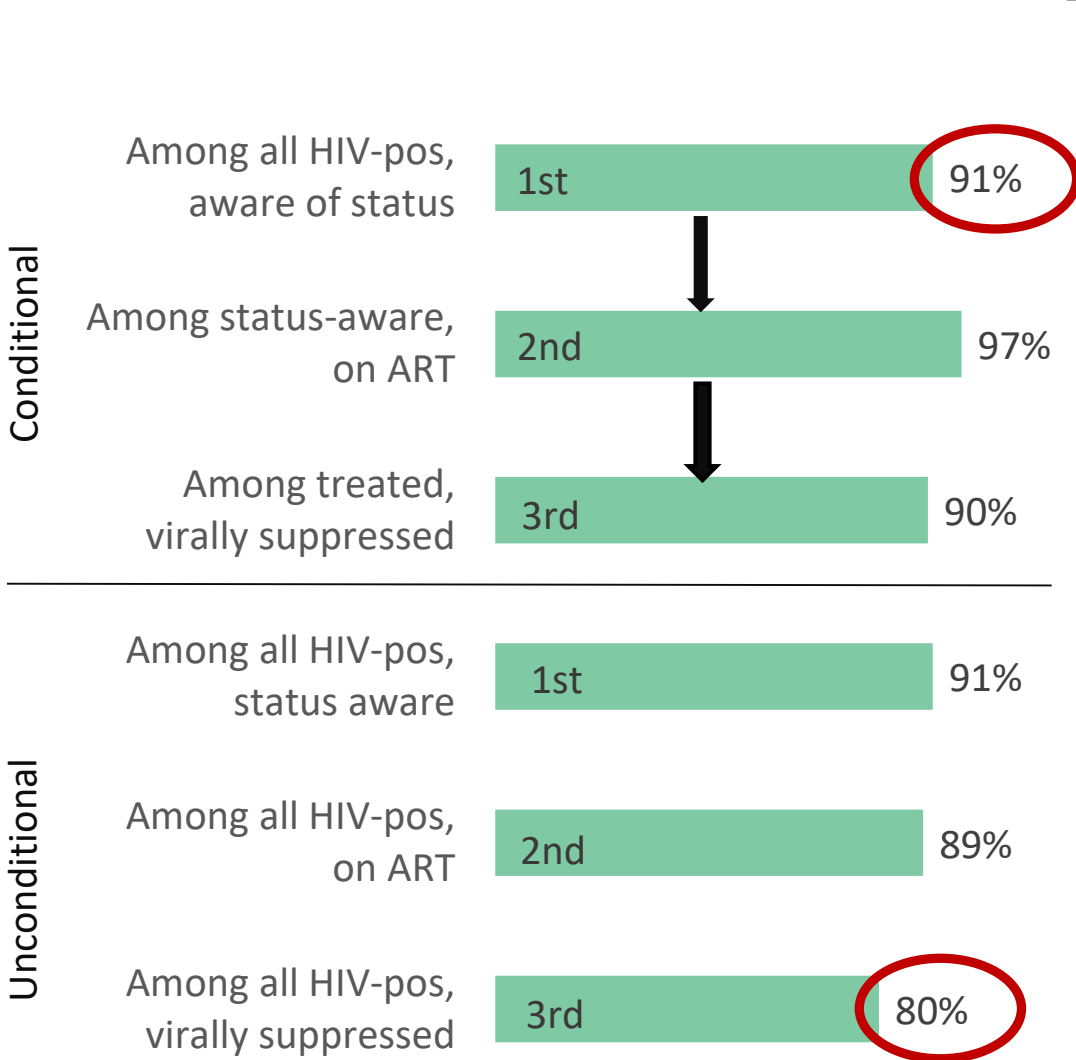
HIV prevalence Overall



FSW



Treatment cascade – pooled data

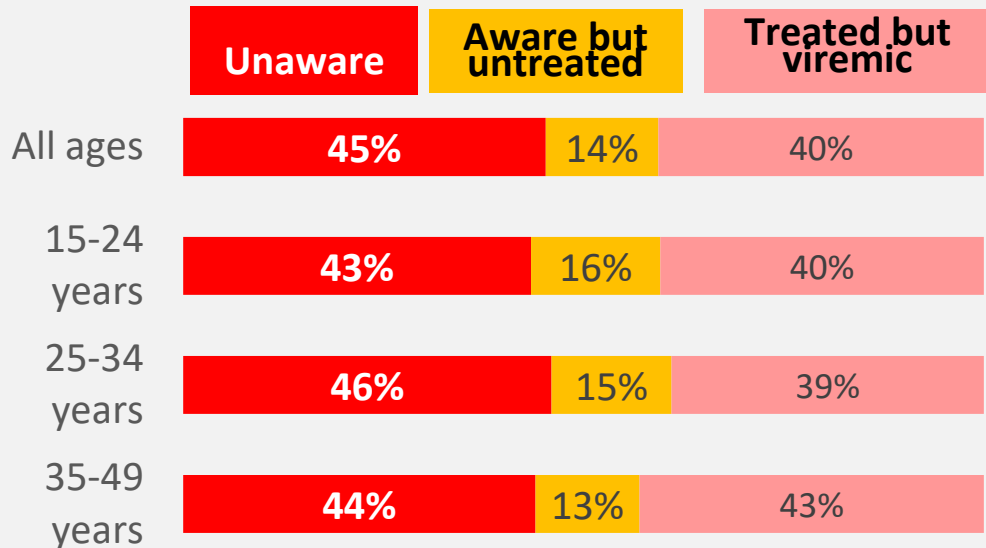


9 of 10 FSW living with HIV are status aware

4 of 5 FSW living with HIV are virally suppressed

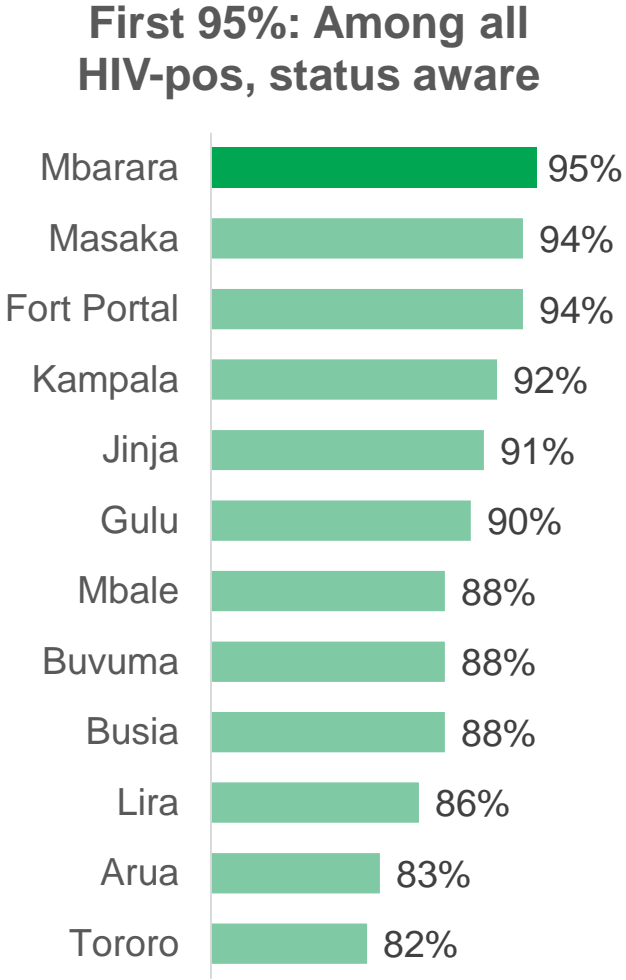
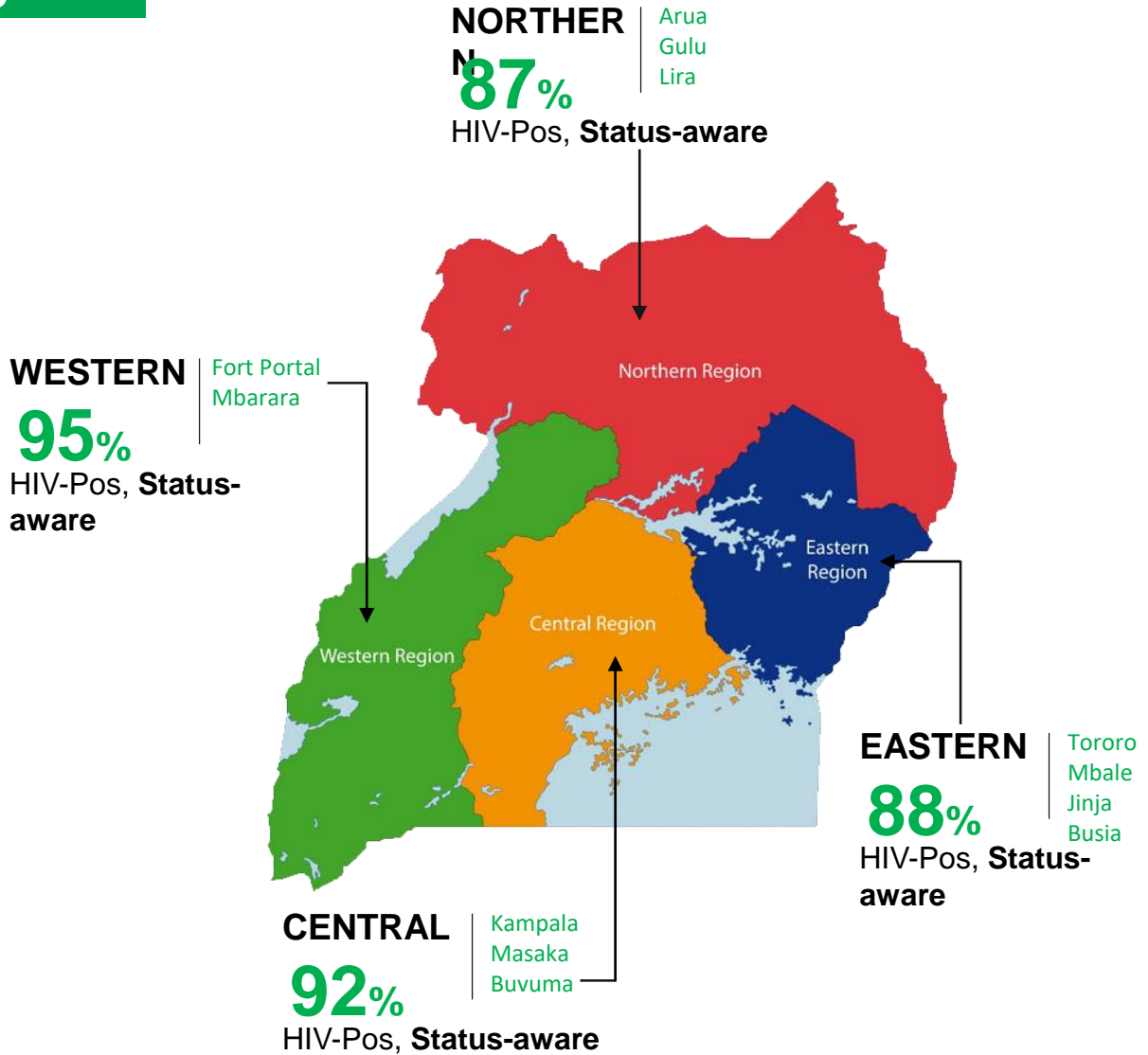
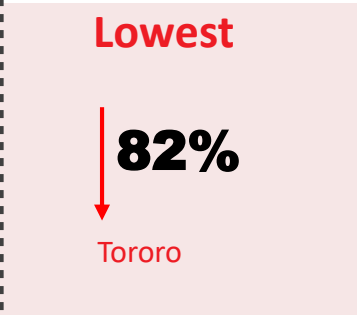
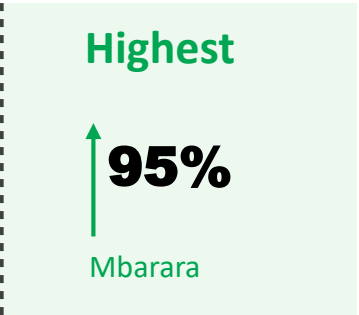
Biggest challenges: 1st and 3rd 95

Distribution of Viremic PLHIV by Awareness and Treatment Status



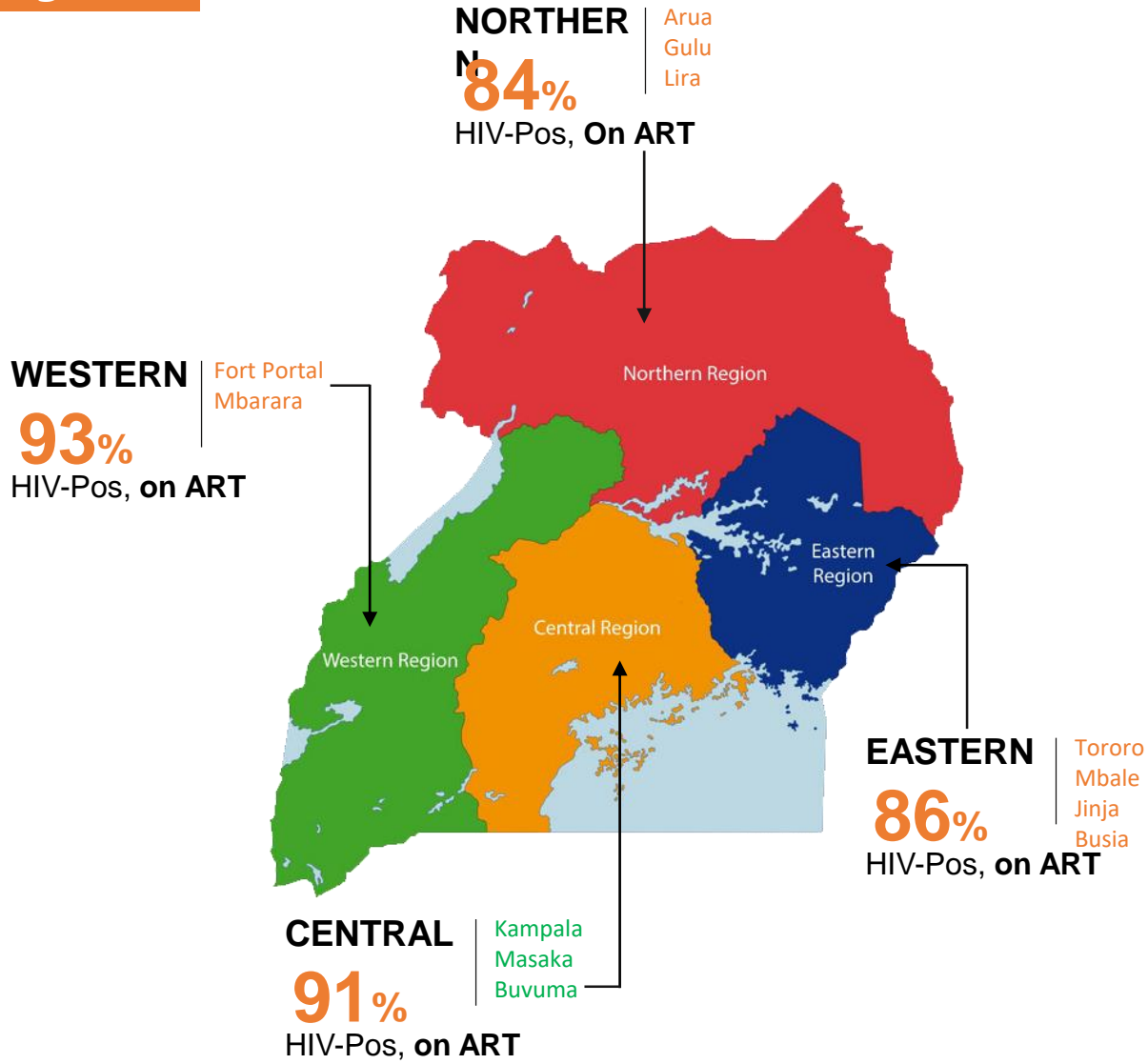
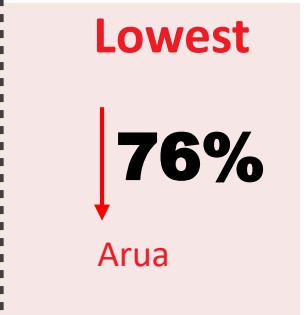
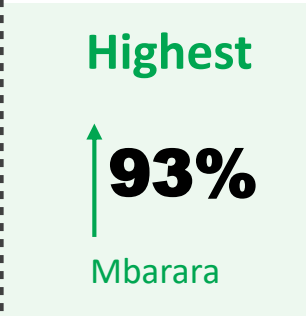
Cascade among FSW: First 95% - regional comparison

UNAIDS 95-95-95 Targets

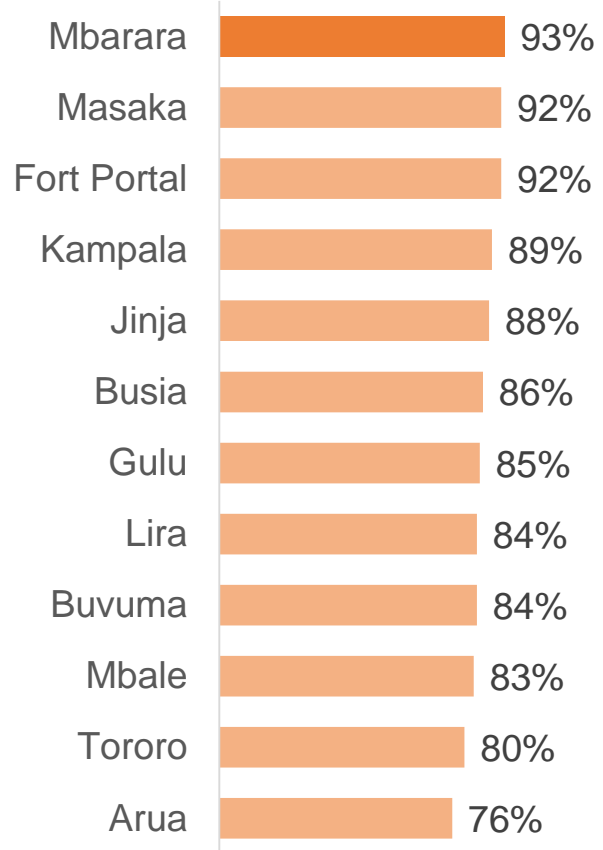


cascade among FSW : Second 95% - regional comparison

UNAIDS 95-95-95 Targets

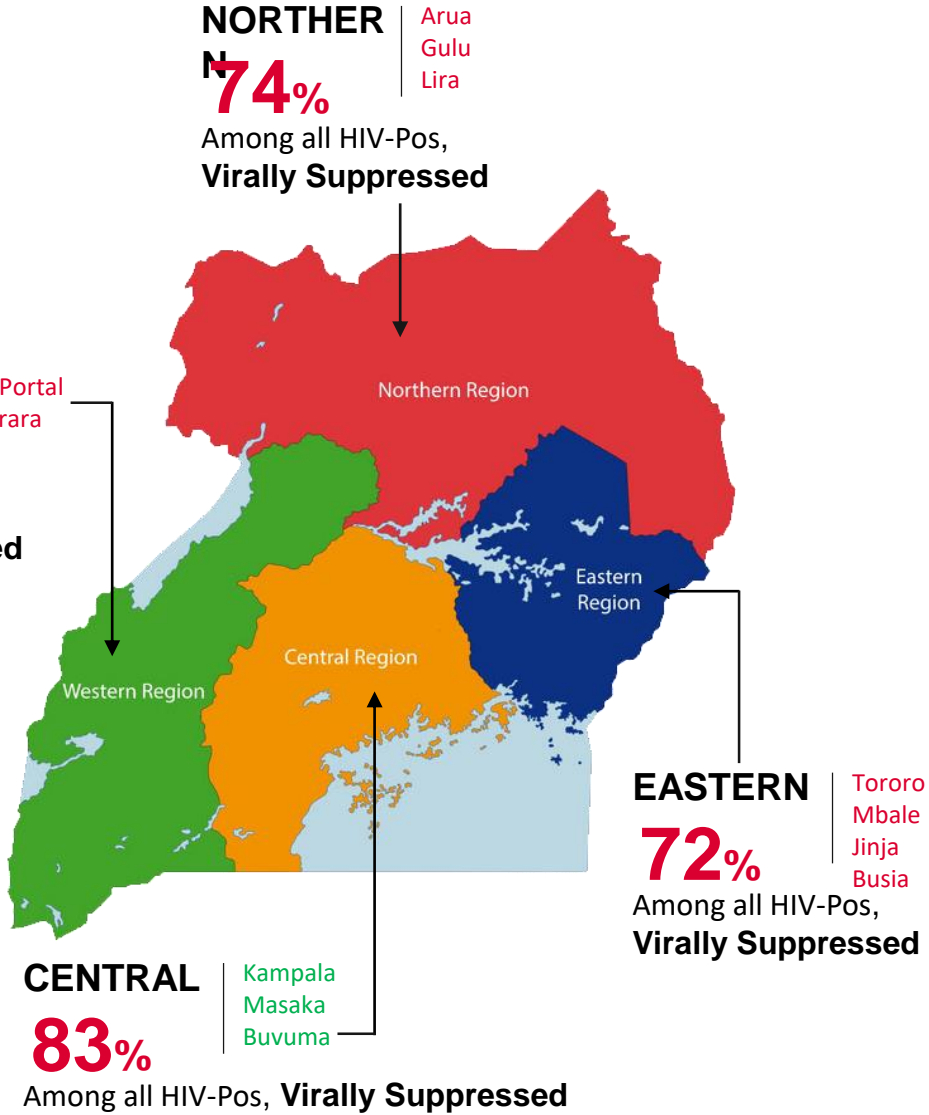
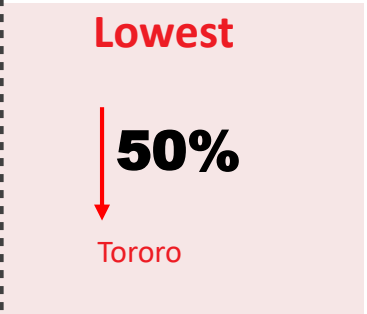
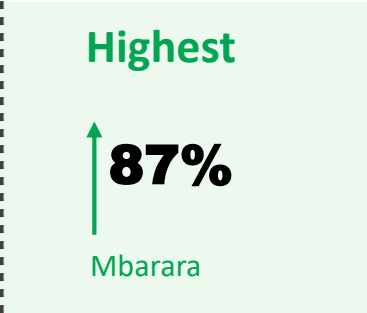


Second 95%: Among all HIV-pos, on ART

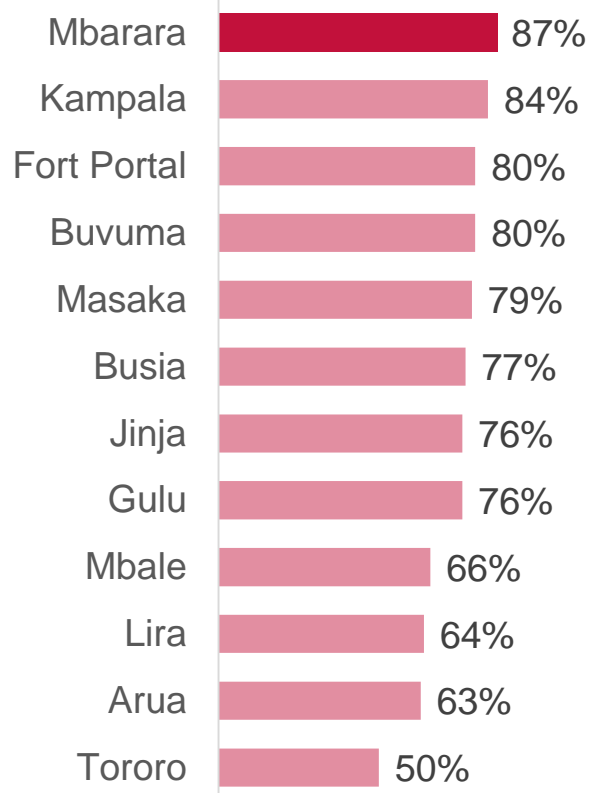


Cascade among FSW : Third 95% - regional comparison

UNAIDS 95-95-95 Targets



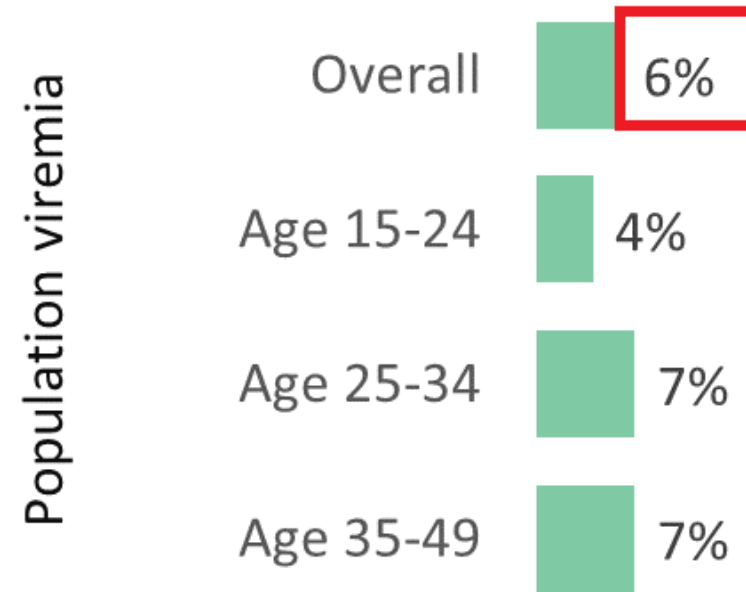
Third 95%: Among all HIV-pos, virally suppressed



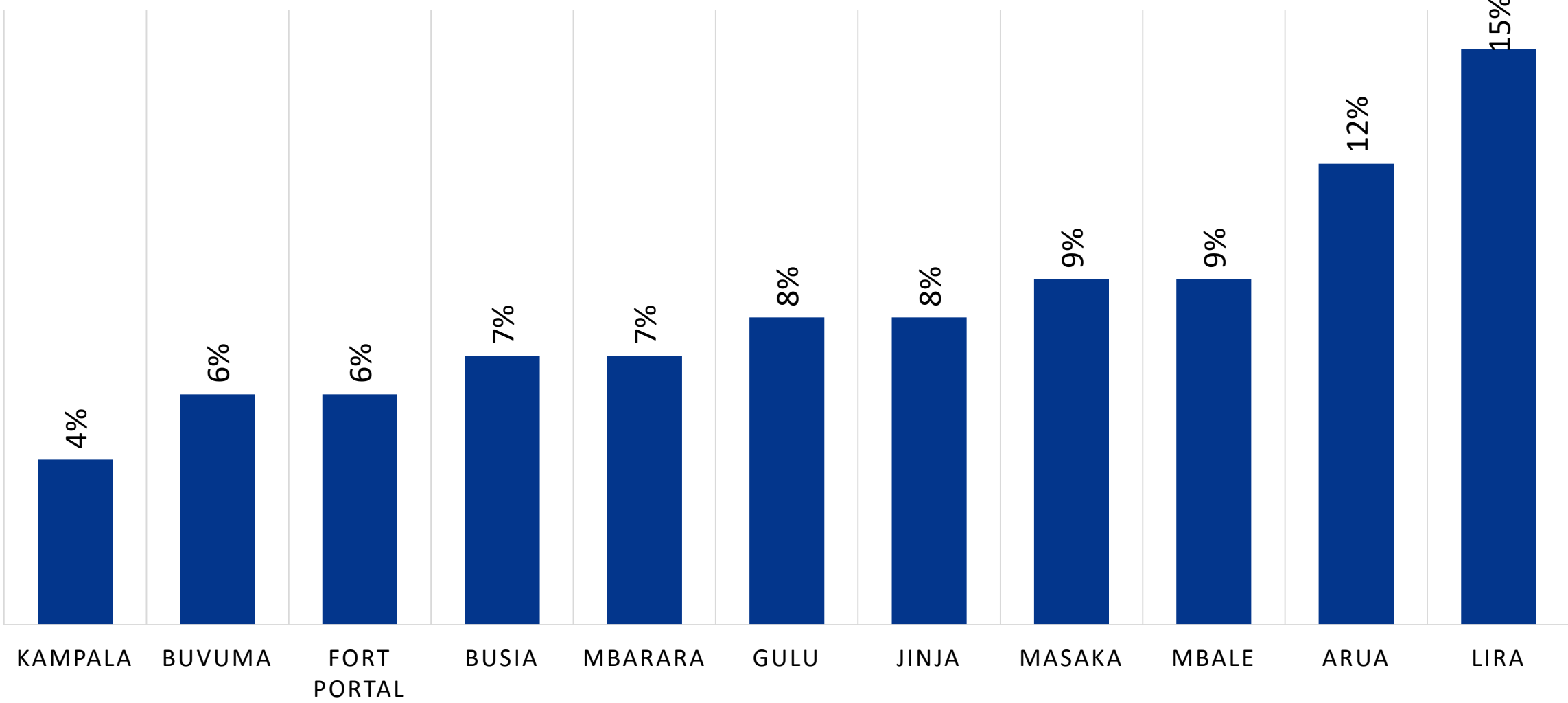
Population viremia: Estimating the population level potential for HIV transmission and mortality – pooled data

Population viremia: The proportion of all FSW (HIV-neg and pos) with unsuppressed HIV ($\geq 1,000$ copies/ml).

Due to high ART uptake (VLS), population viremia is much lower than HIV prevalence (6% vs. 33%)



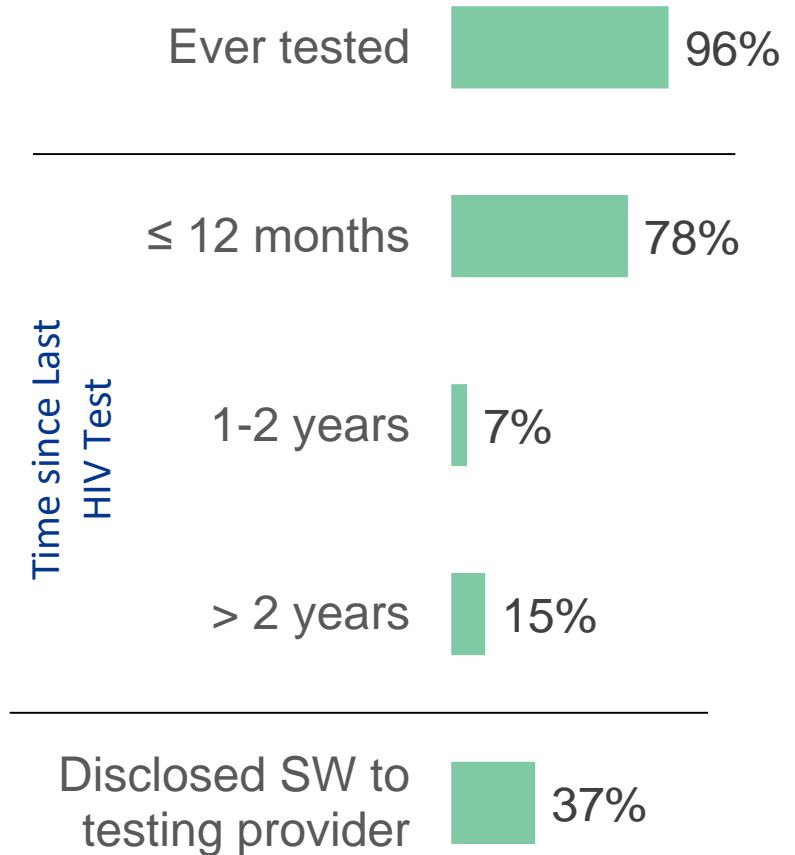
Population viremia by District



HIV testing: Reasonably good uptake – pooled data

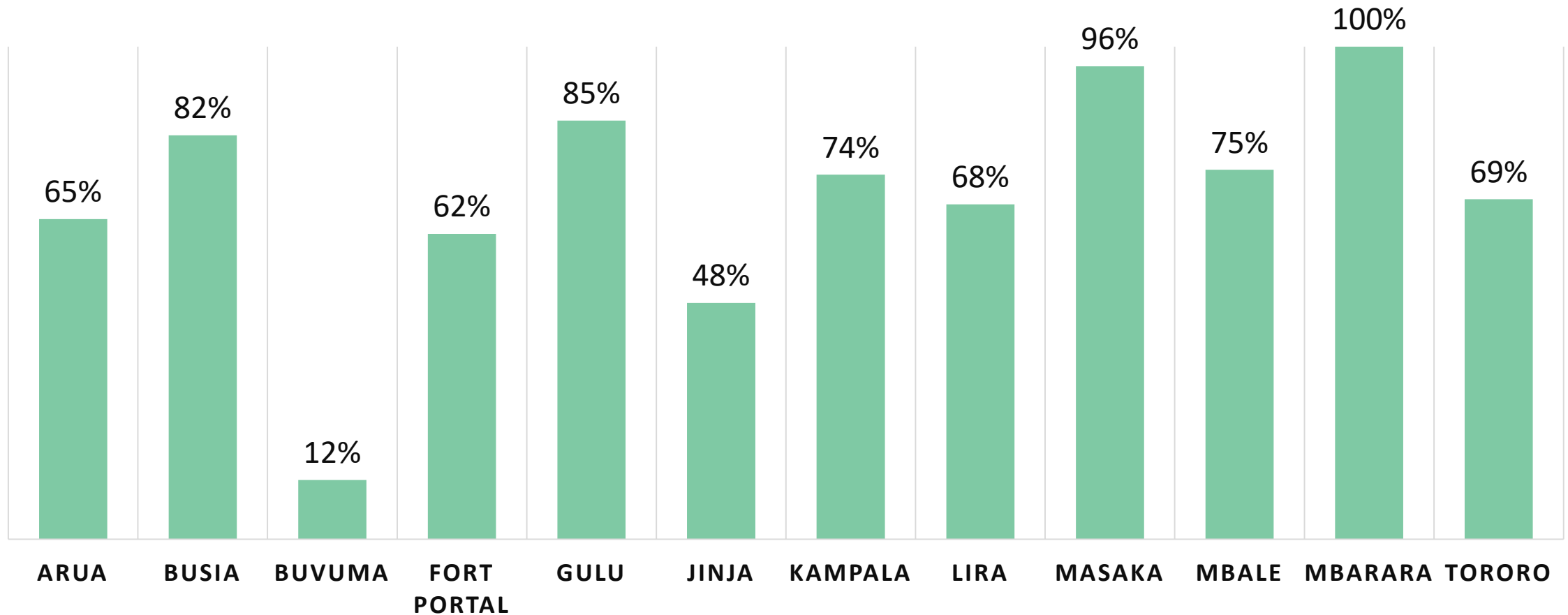
- Almost **4 in 5** FSWs tested in the last 12 months
- The **lower testing uptake 1+ years** ago likely also reflects the short time since sex work initiation
- Fewer than **2 in 5** FSWs disclosed their work to the testing provider

i.e., HIV testing program data only partially capture FSW testing behaviour



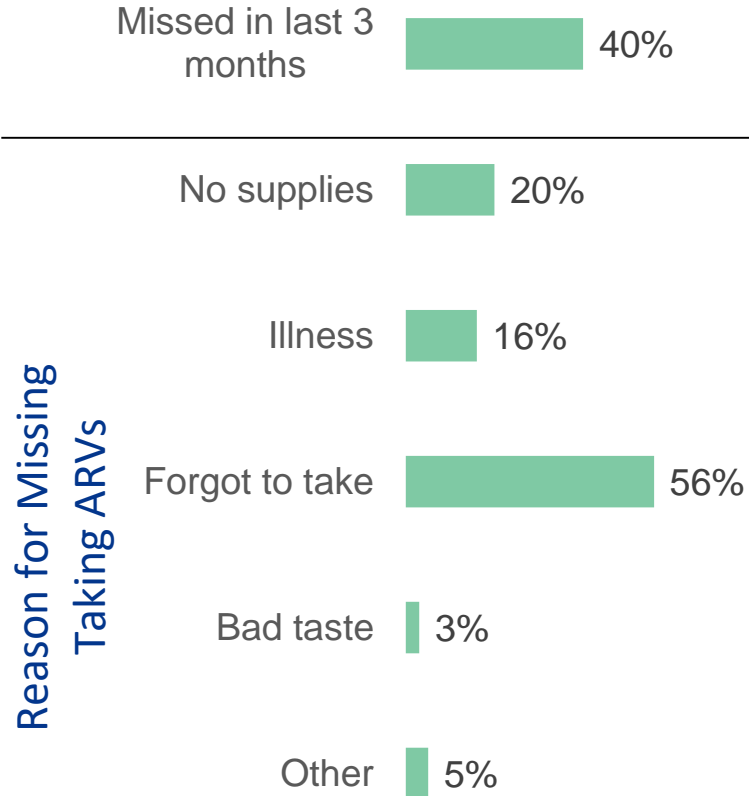
HIV testing: FSWs Tested in the Last 12 Months

District Distribution

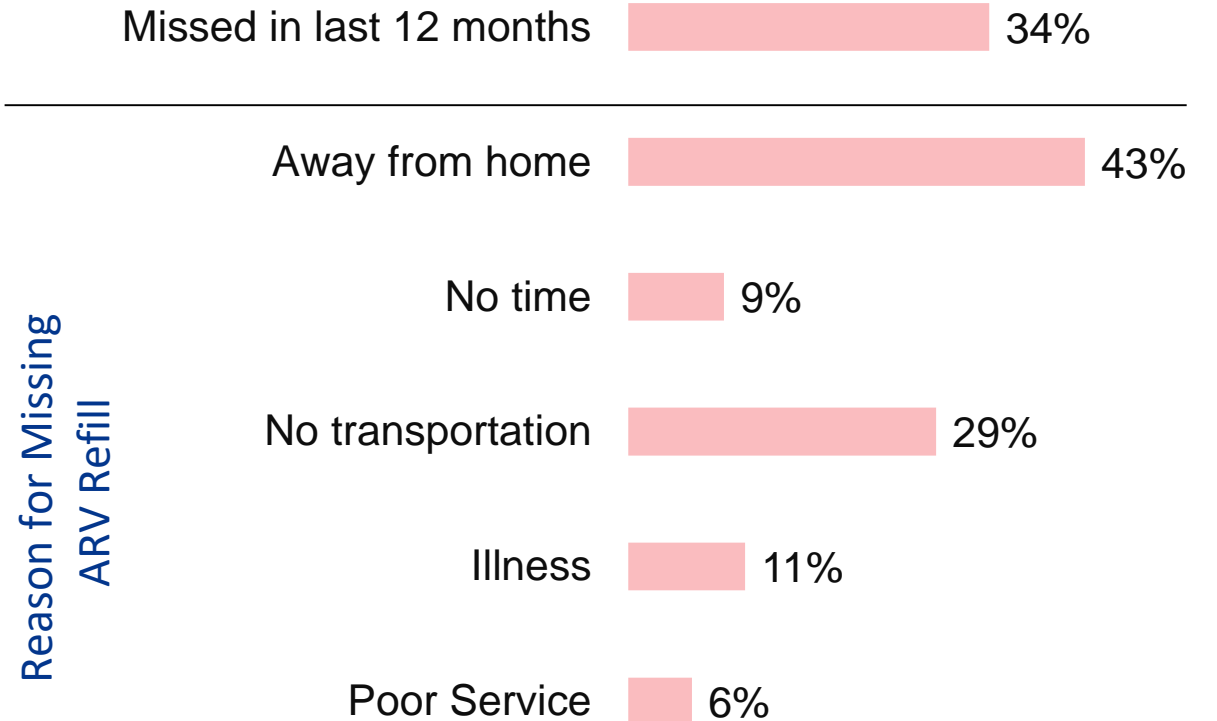


ARVs Dosage and refills

Missed ARV Dose(s)



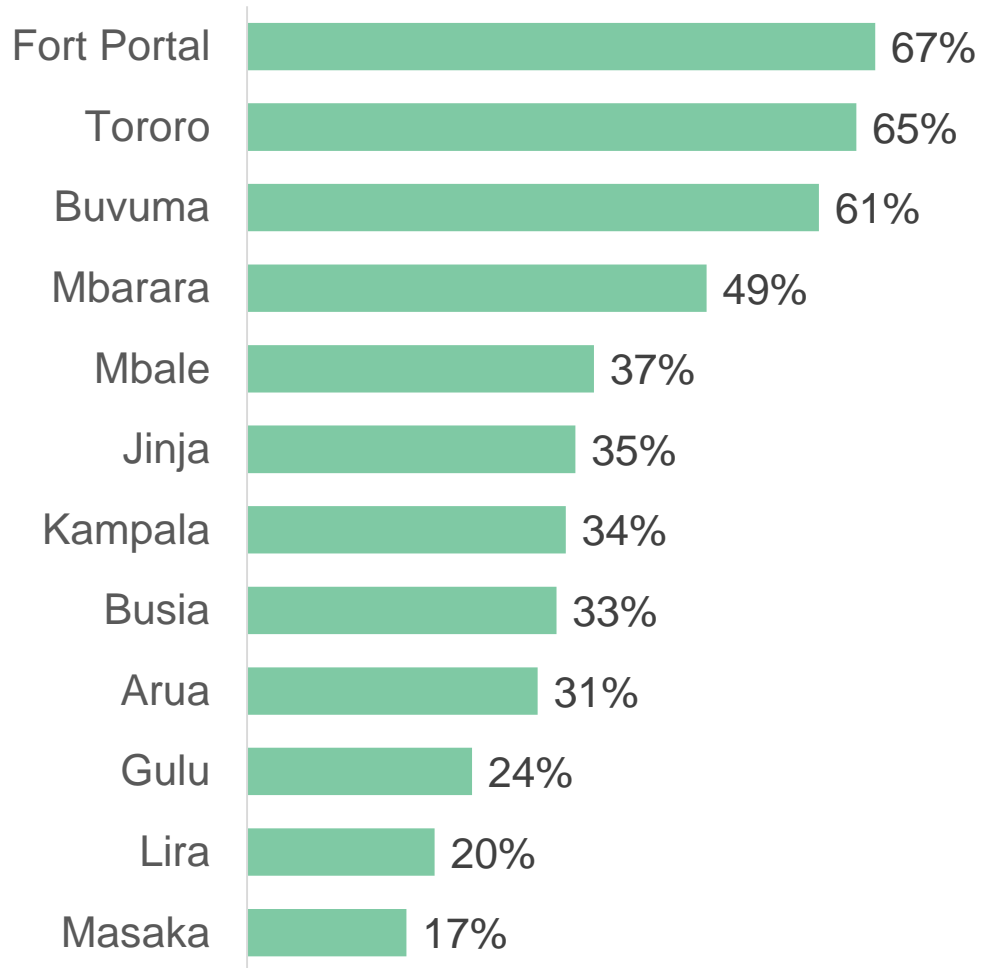
Missed ARV Refill



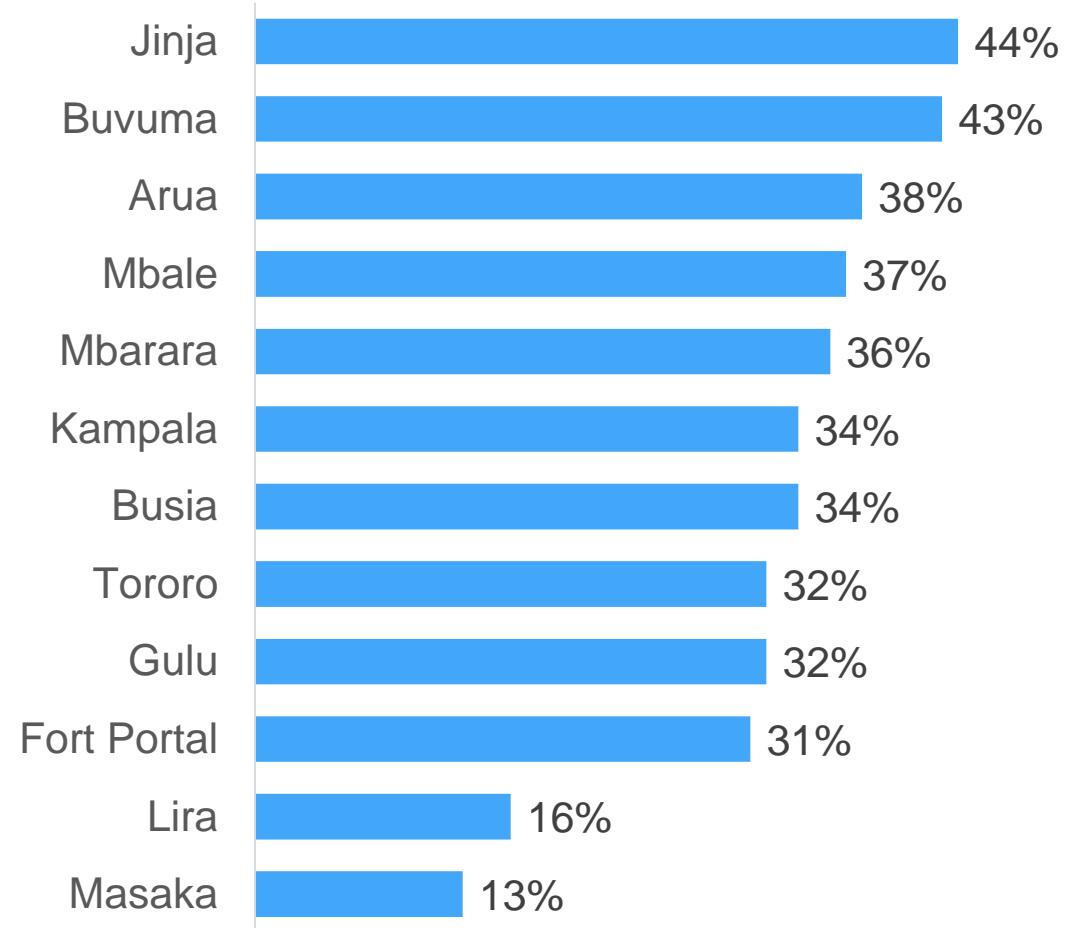
ARVs Dosage and refills-

Disaggregated

Missed ARV Dose in last 3 months



Missed ARV refills in last 12 months



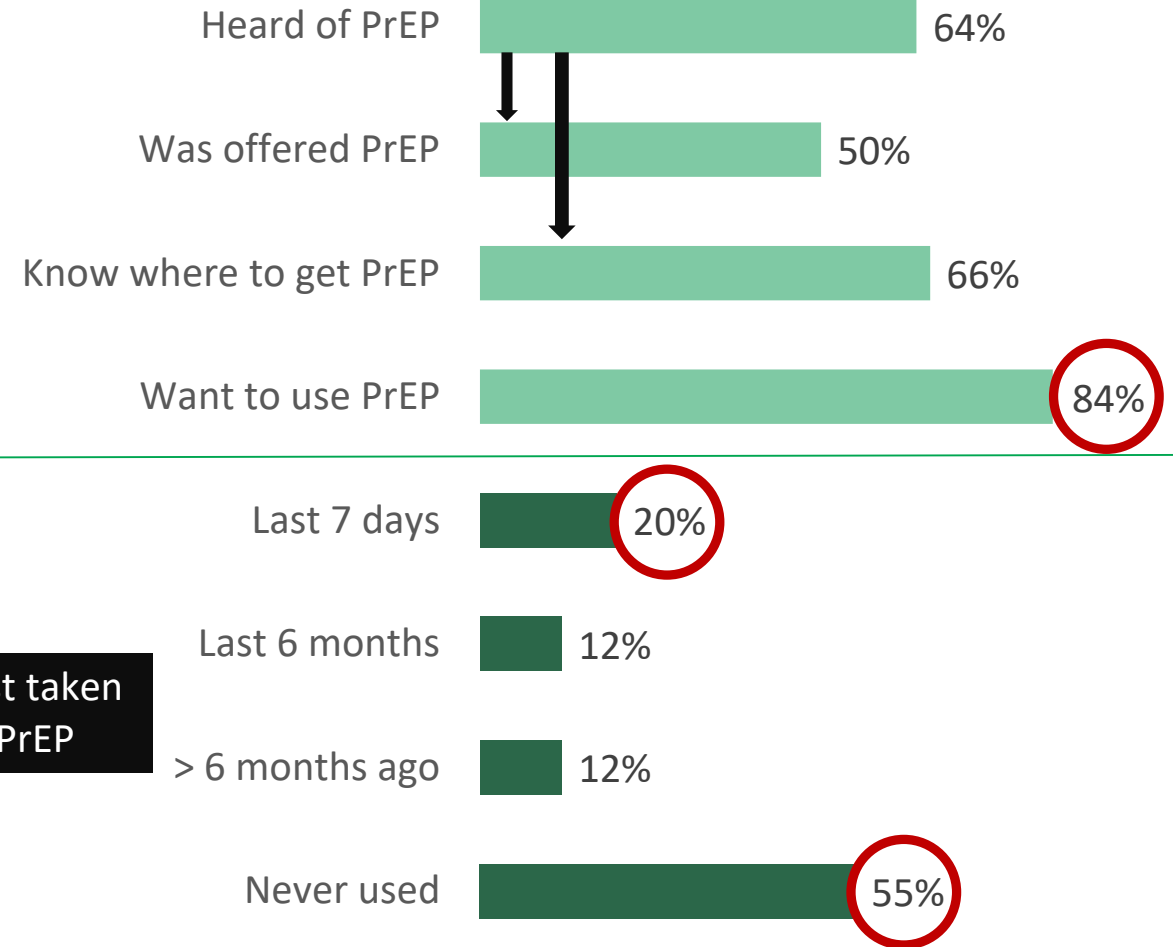
PrEP: Large untapped program potential – pooled data

84% want to use PrEP

Only **20%** used PrEP in last 7 days

More than half never used PrEP

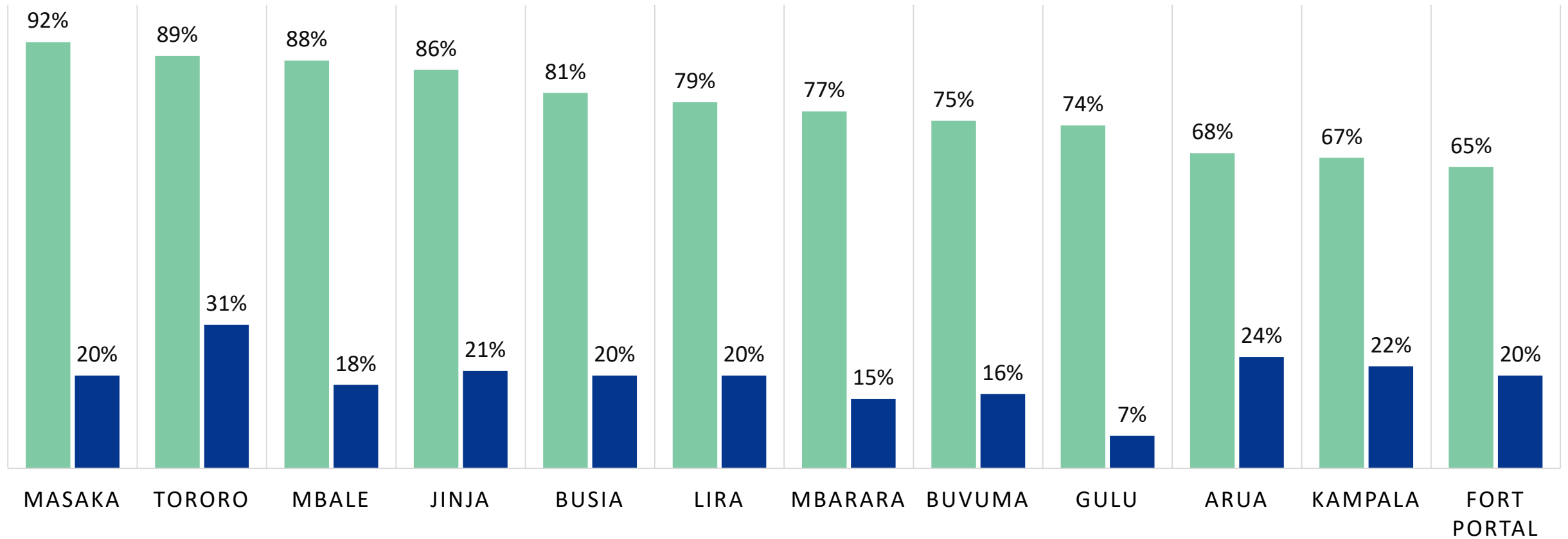
May part of the challenge be the frequent non-disclosure of SW to HIV testing providers?



PrEP: Want to Use Prep Vs Used Prep in Last 7 days

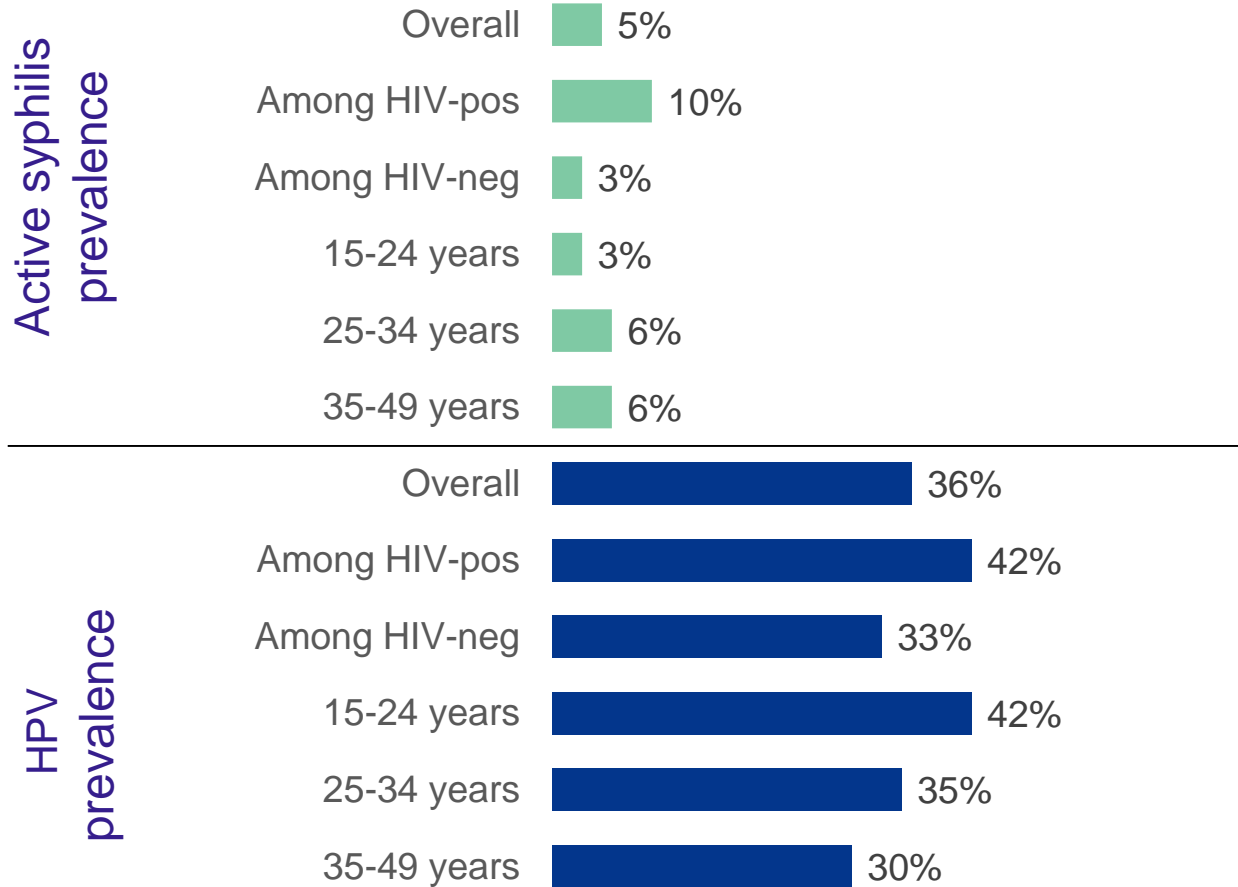
District Distribution

■ Want to use PrEP ■ Used PrEP:Last 7 days



Active Syphilis & HPV Prevalence

Active Syphilis & HPV Prevalence



One in 20 FSW/SEC tested positive for active syphilis, and more often among FSW/SEC living with HIV.

More than one in three were infected with a high-risk strain of human papilloma virus (**HPV**), putting them at risk for cervical cancer, with little change by age or HIV status



HPV Prevalence

District Distribution

Prevalence of High-risk HPV was generally more than twice as high as that of the general population

36%

Overall HPV Prevalence

Highest

41%

Arua

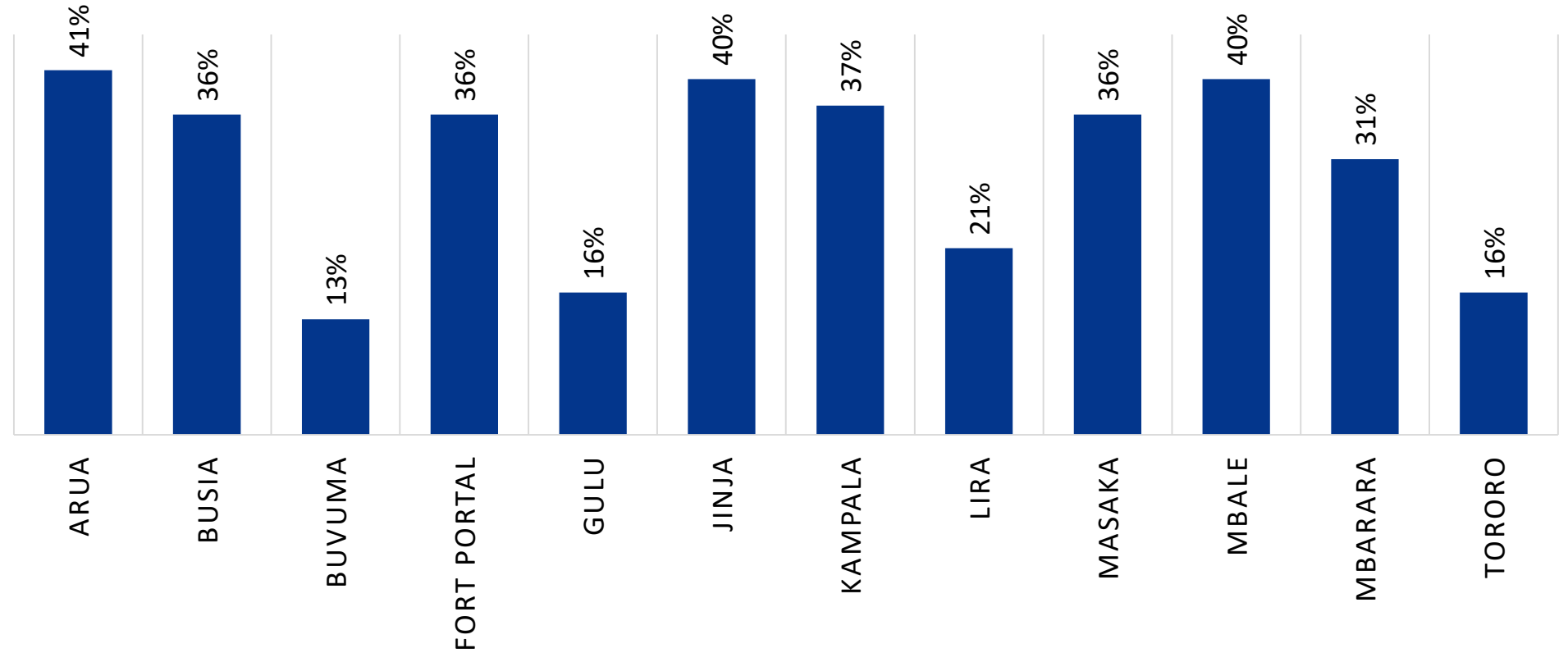
Lowest

13%

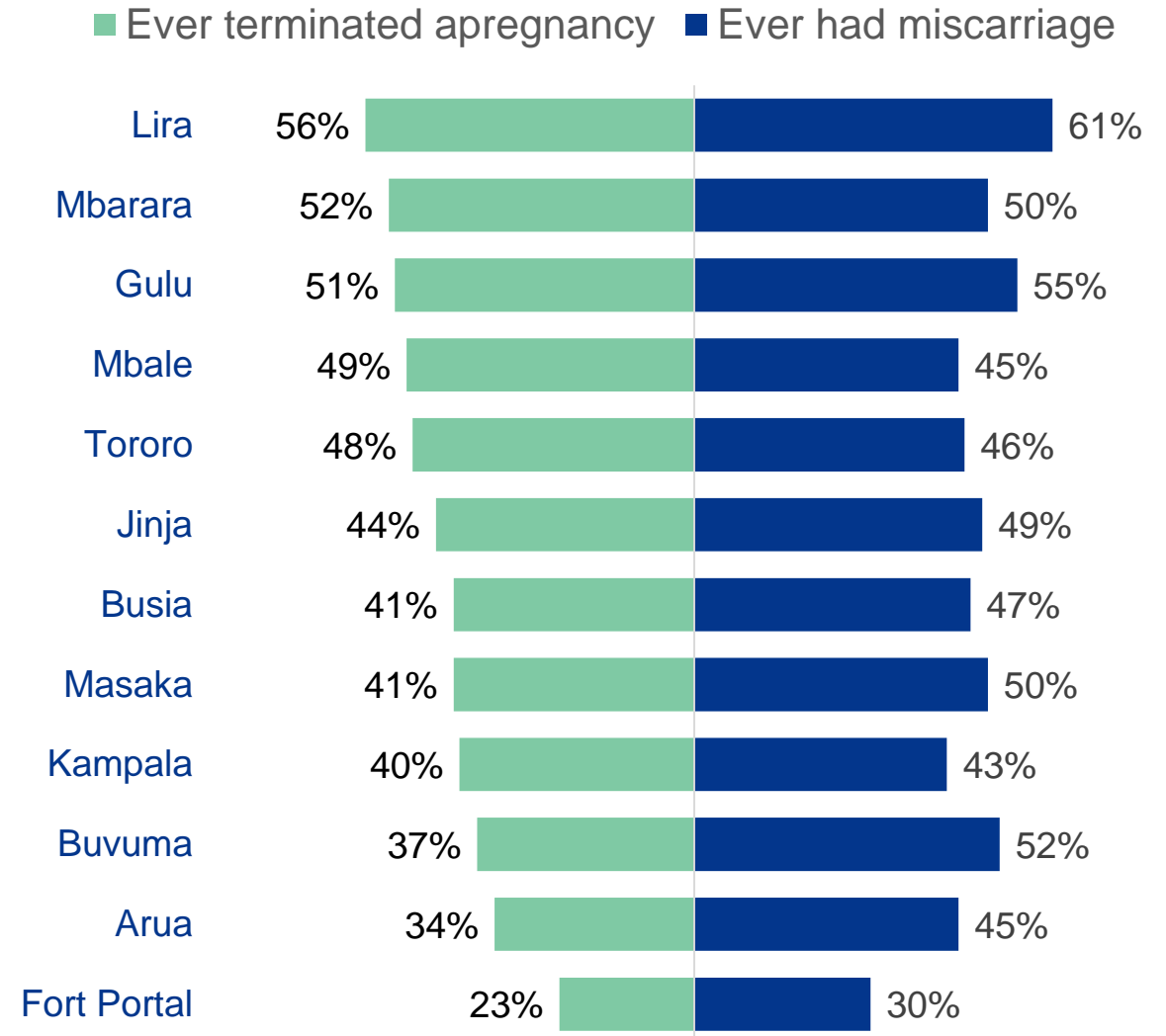
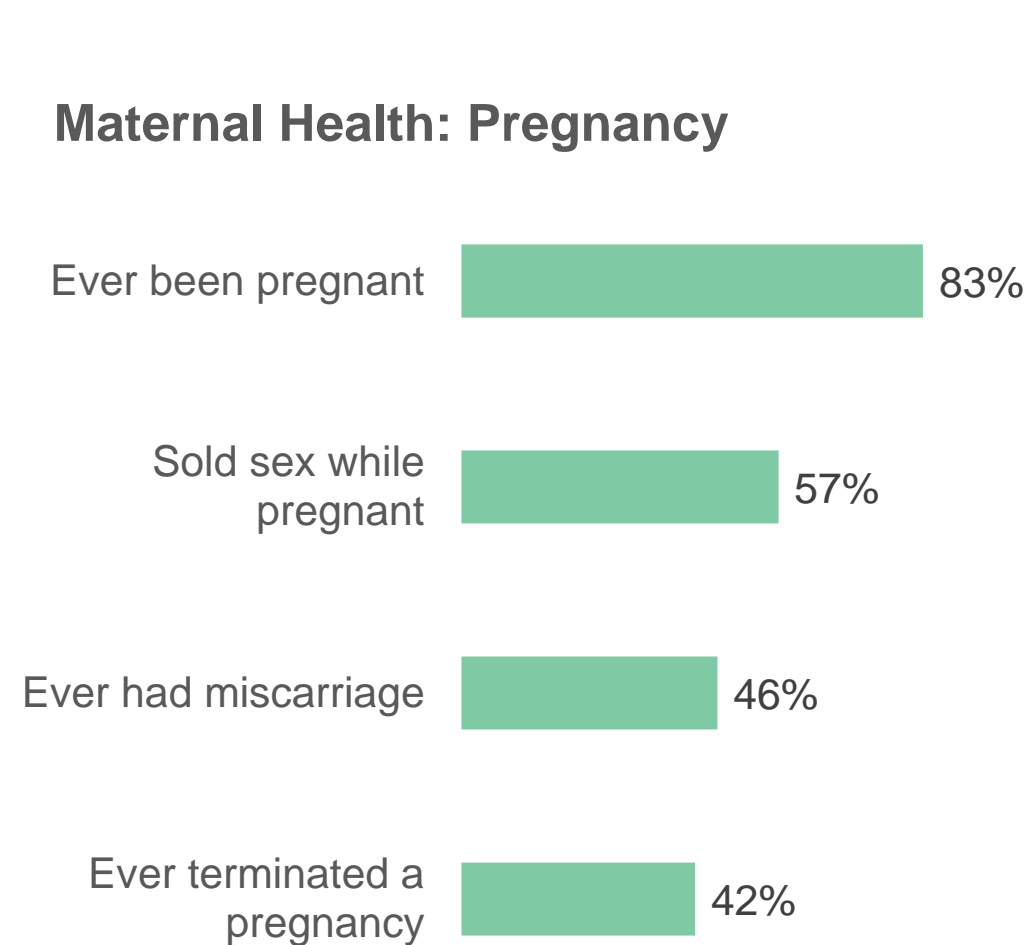
Buvuma

HPV PREVALENCE

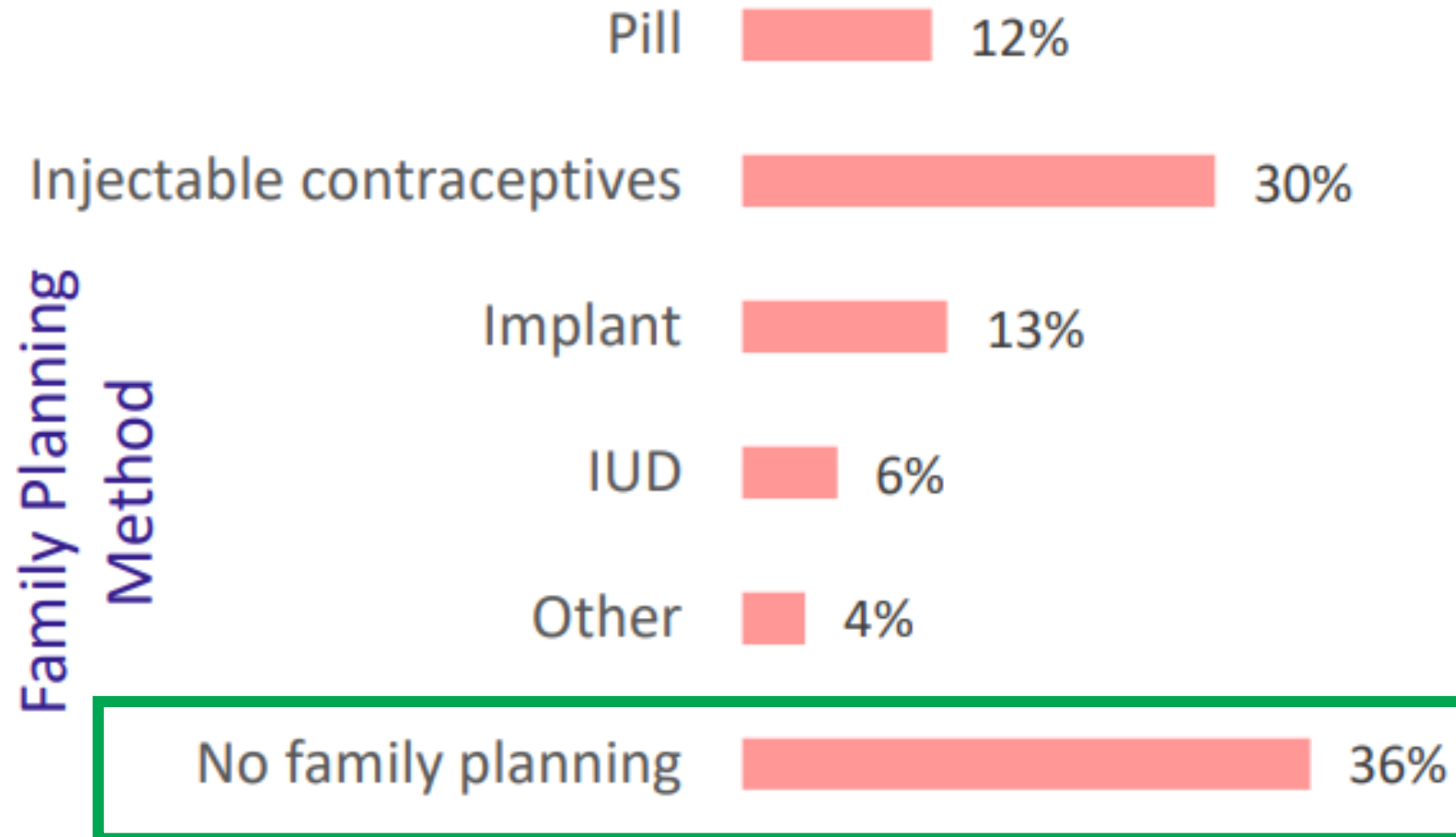
High risk - HPV prevalence (Gen pop 16%)



Maternal Health: Pregnancy

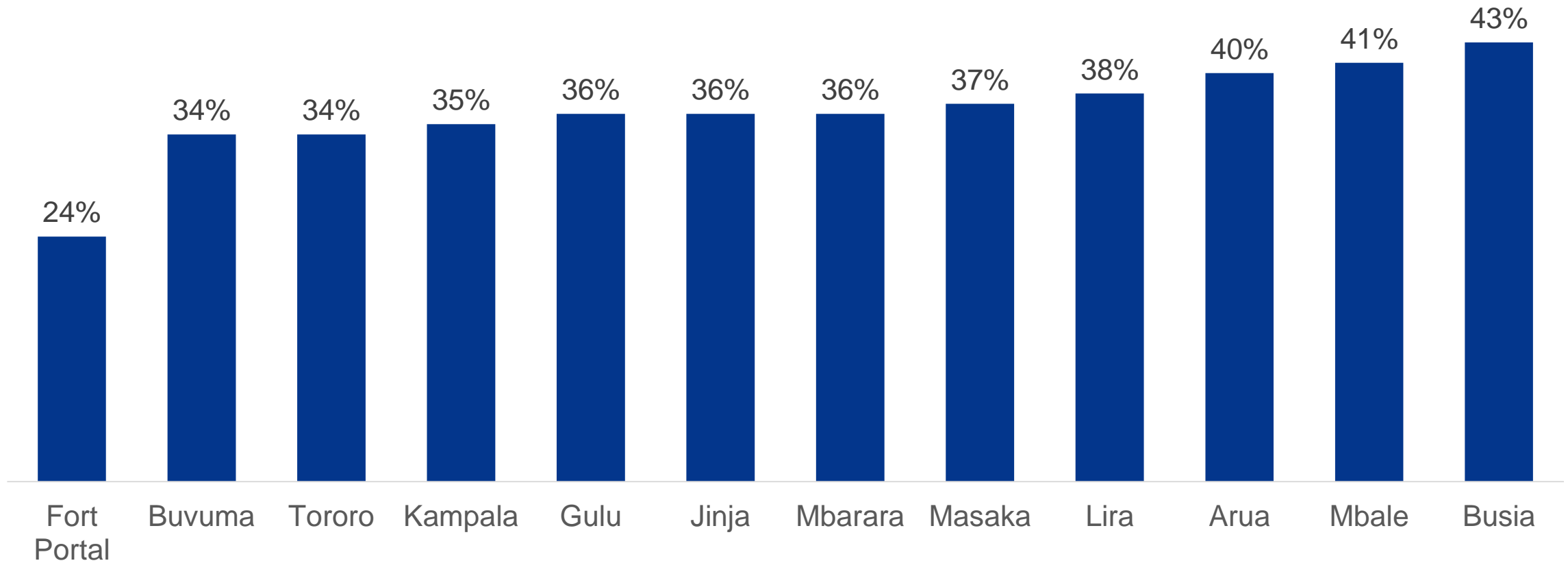


Family Planning



Family Planning (Non-Use)- Disaggregated by district

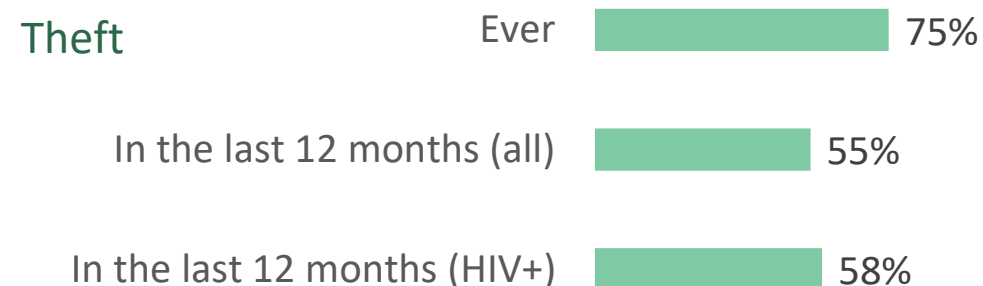
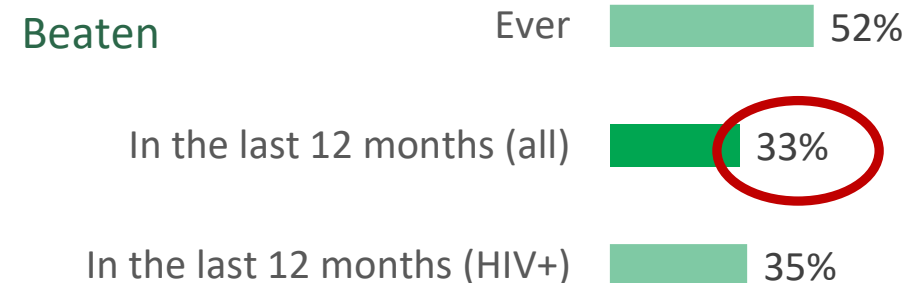
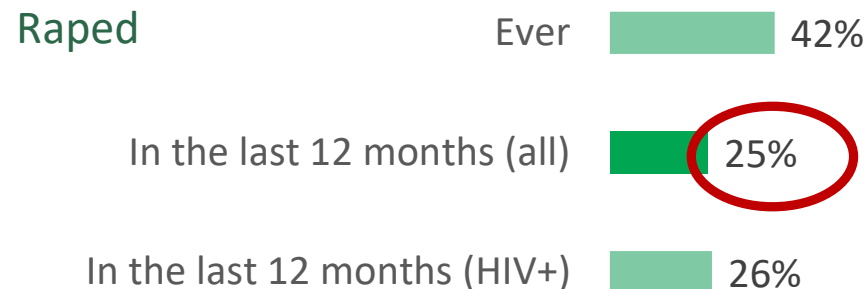
No Family planning use



Violence Frequent



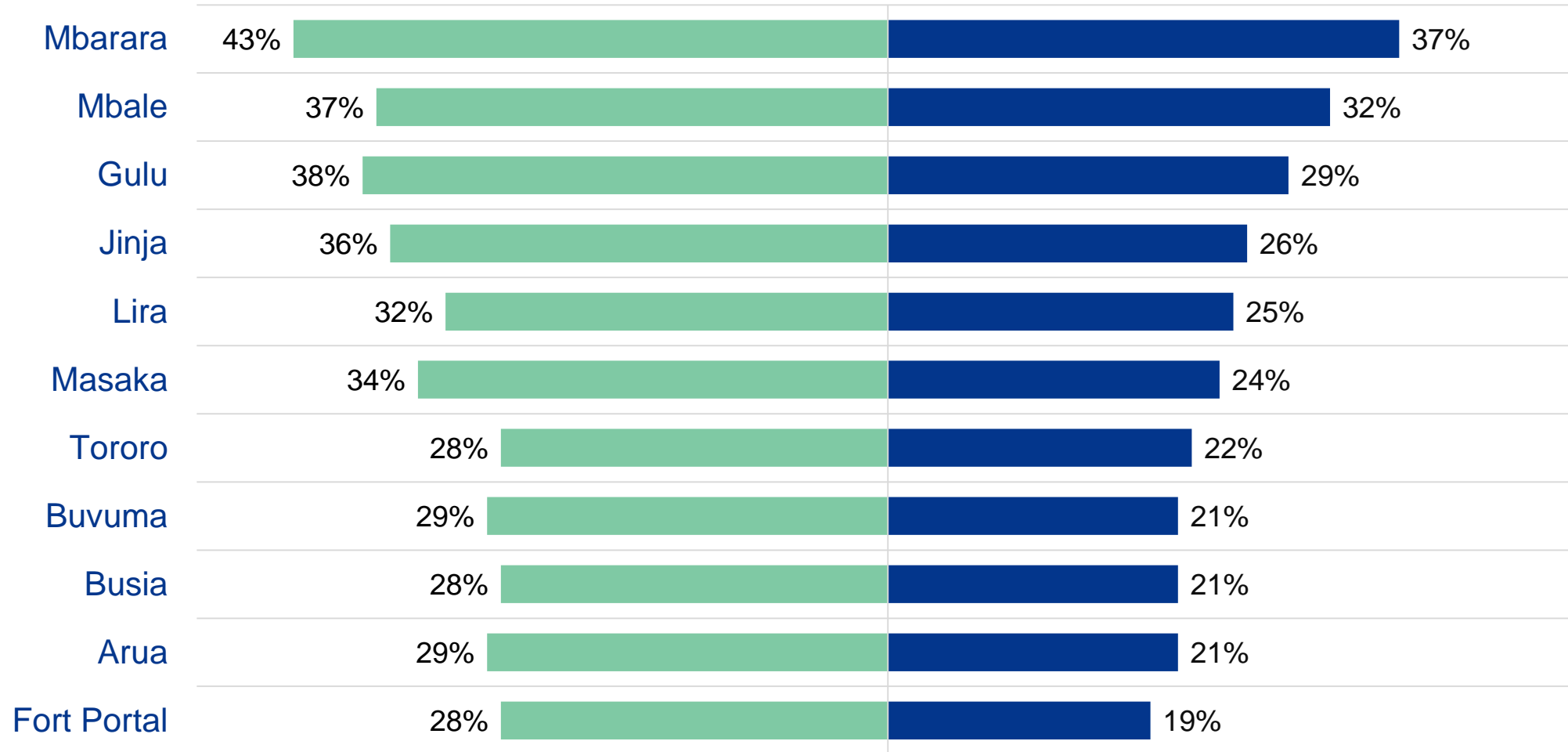
- 1 in 4 reported having been **raped** within the last year
- 1 in 3 were reported being **beaten** in the last year



Violence-Disaggregate



■ Beaten In the last 12 months (all) ■ Raped In the last 12 months (all)



Mortality

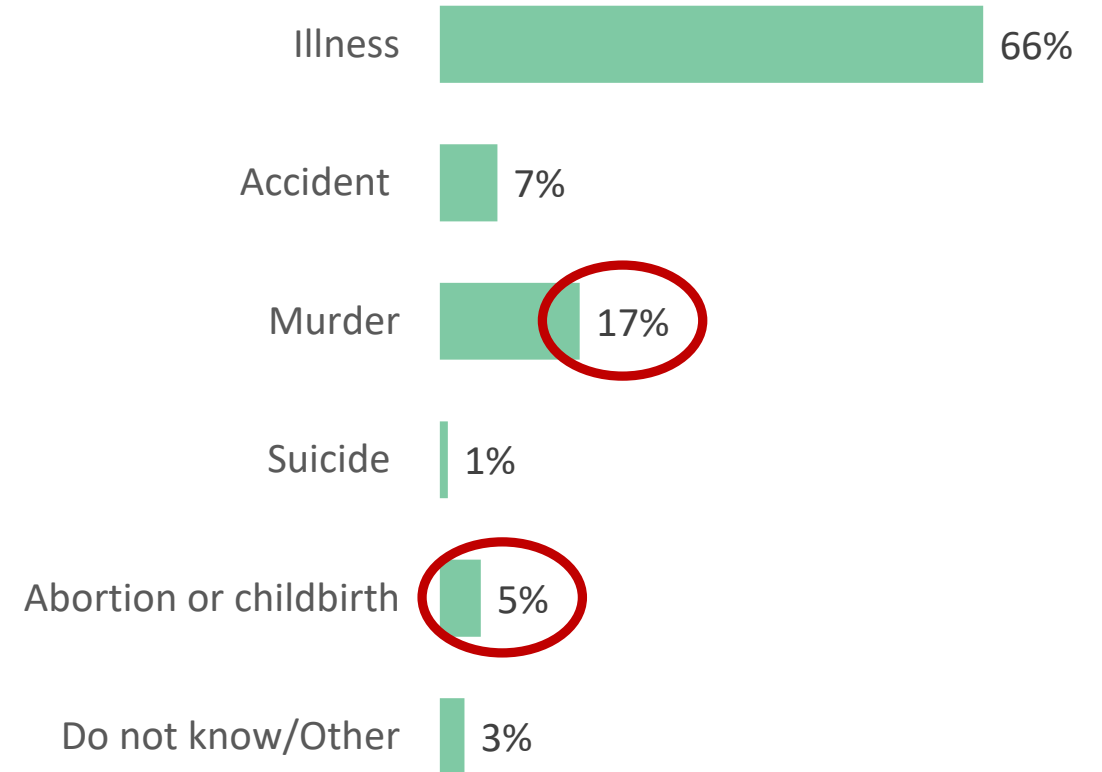
Survey asked about the deaths among known peers in last 12 months

One-third (**34%**) of participants reported the death of a peer in the last 12 months

“Murder” accounted for 1 in 6 deaths

“Abortion” or **“childbirth”** complications accounted for **1 in 20 deaths**

Cause of death among deceased peers



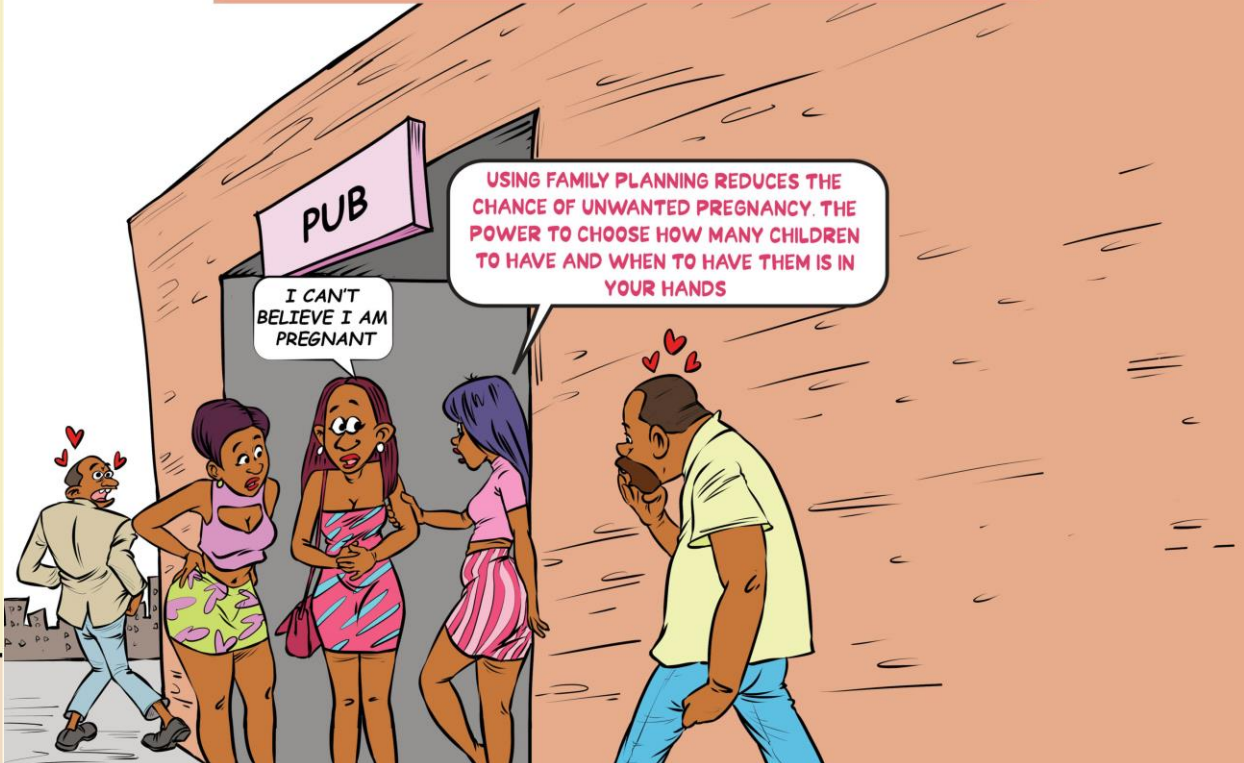
KP Specific Tailored Behavioral Change Materials

Development of FSW dissemination messages

3 IN EVERY 10 FEMALE SEX WORKERS IN KAMPALA WERE FOUND TO HAVE HIV.



1 OUT OF 3 FEMALE SEX WORKERS IN KAMPALA ARE NOT USING ANY FAMILY PLANNING METHOD



The Crane Survey is a collaboration of Makerere University/School of Public Health, Centers For Disease Control and Prevention (CDC), and Ministry of Health.

Finding: This survey has been supported by the President's Emergency Plan for Aids Relief (PEPFAR) through the CDC under the terms of #GH002127.



Makerere University
College of Health Sciences
SCHOOL OF PUBLIC HEALTH



THE REPUBLIC OF UGANDA
MINISTRY OF HEALTH



PEPFAR



CDC
CENTERS FOR DISEASE CONTROL AND PREVENTION

The Crane Survey is a collaboration of Makerere University/School of Public Health, Centers For Disease Control and Prevention (CDC), and Ministry of Health.

Finding: This survey has been supported by the President's Emergency Plan for Aids Relief (PEPFAR) through the CDC under the terms of #GH002127.



Makerere University
College of Health Sciences
SCHOOL OF PUBLIC HEALTH



THE REPUBLIC OF UGANDA
MINISTRY OF HEALTH



PEPFAR

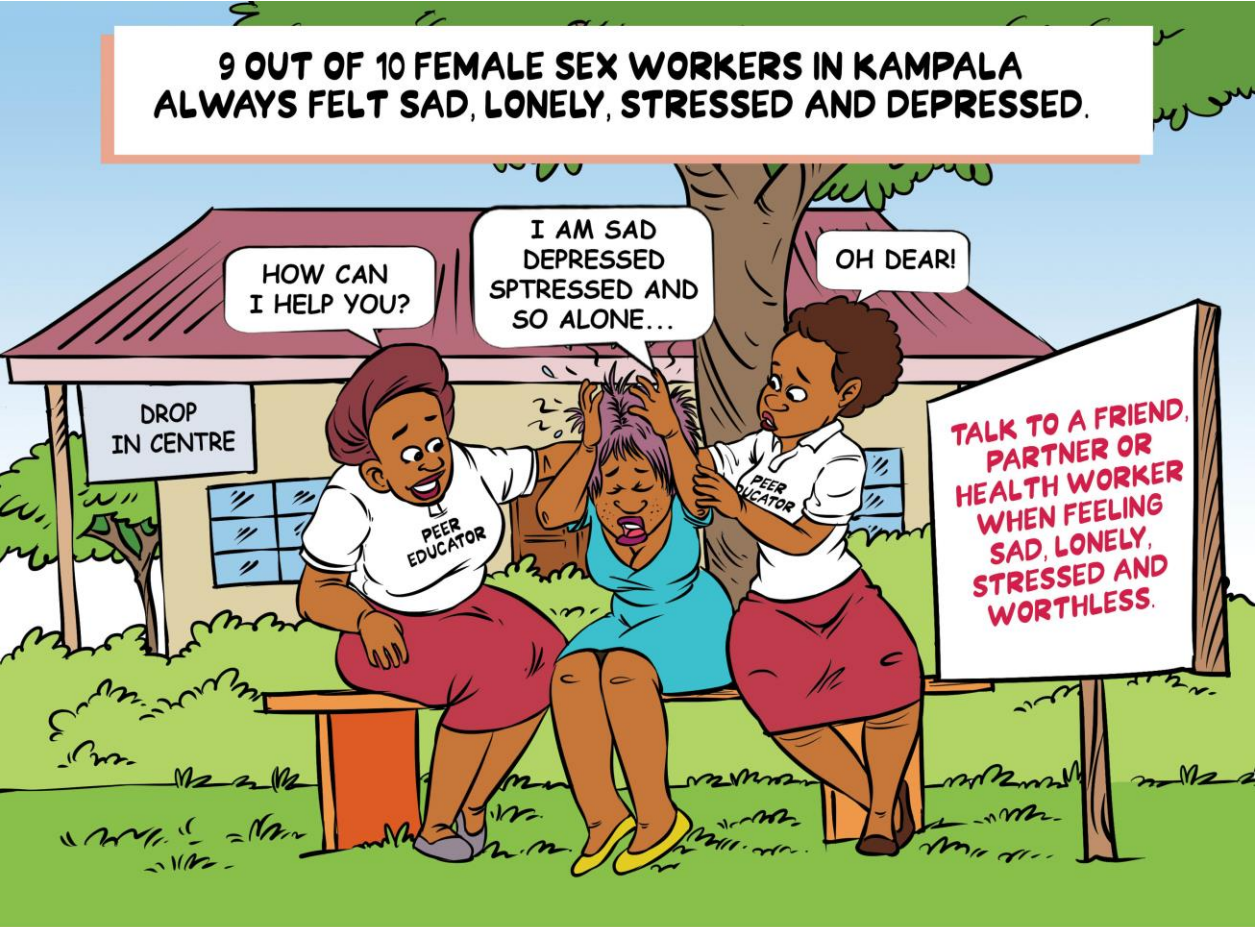


CDC
CENTERS FOR DISEASE CONTROL AND PREVENTION



Development of FSW dissemination messages

9 OUT OF 10 FEMALE SEX WORKERS IN KAMPALA ALWAYS FELT SAD, LONELY, STRESSED AND DEPRESSED.



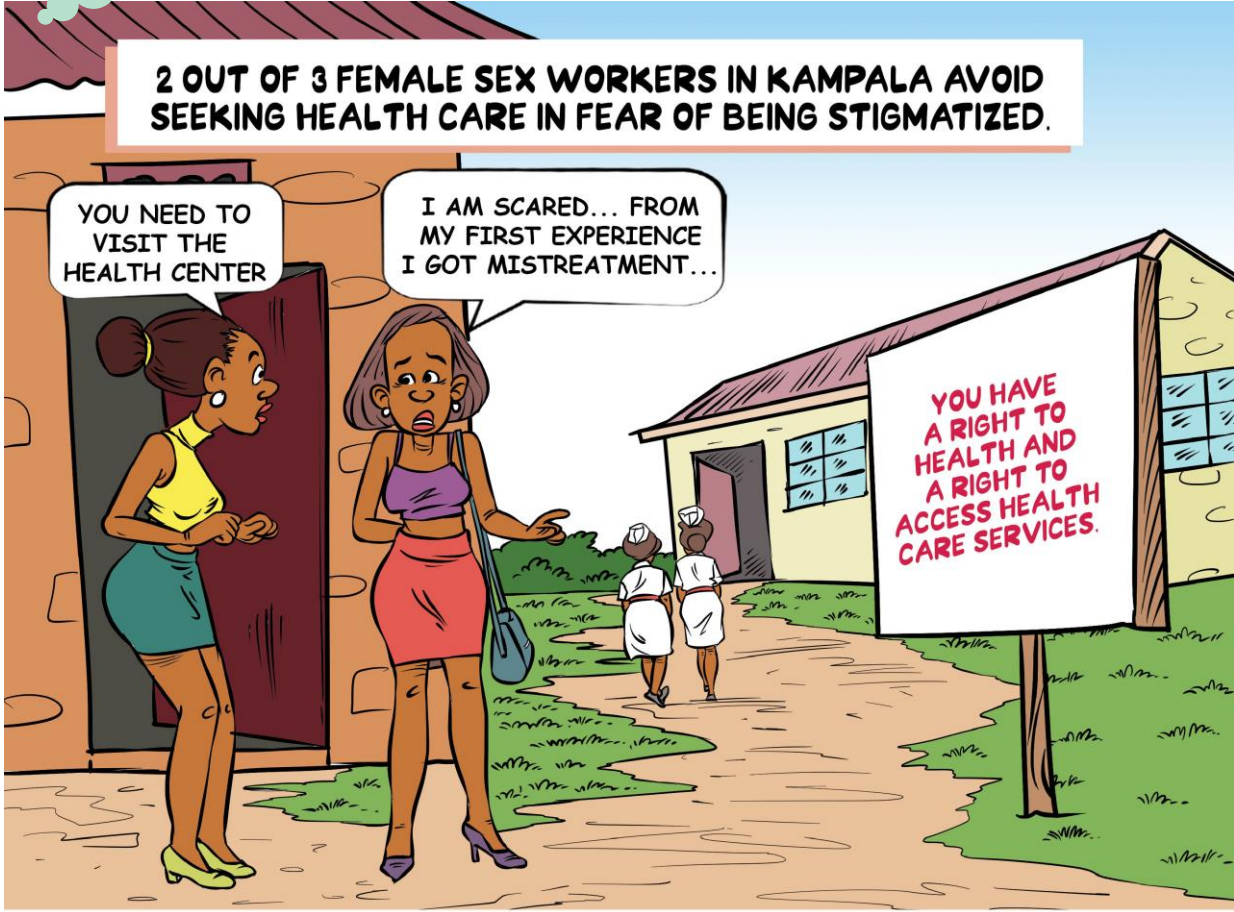
HOW CAN I HELP YOU?

I AM SAD DEPRESSED STRESSED AND SO ALONE...

OH DEAR!

TALK TO A FRIEND, PARTNER OR HEALTH WORKER WHEN FEELING SAD, LONELY, STRESSED AND WORTHLESS.

2 OUT OF 3 FEMALE SEX WORKERS IN KAMPALA AVOID SEEKING HEALTH CARE IN FEAR OF BEING STIGMATIZED.



YOU NEED TO VISIT THE HEALTH CENTER

I AM SCARED... FROM MY FIRST EXPERIENCE I GOT MISTREATMENT...

YOU HAVE A RIGHT TO HEALTH AND A RIGHT TO ACCESS HEALTH CARE SERVICES.

The Crane Survey is a collaboration of Makerere University/School of Public Health, Centers For Disease Control and Prevention (CDC), and Ministry of Health.

Finding: This survey has been supported by the President's Emergency Plan for Aids Relief (PEPFAR) through the CDC under the terms of #GH002127.



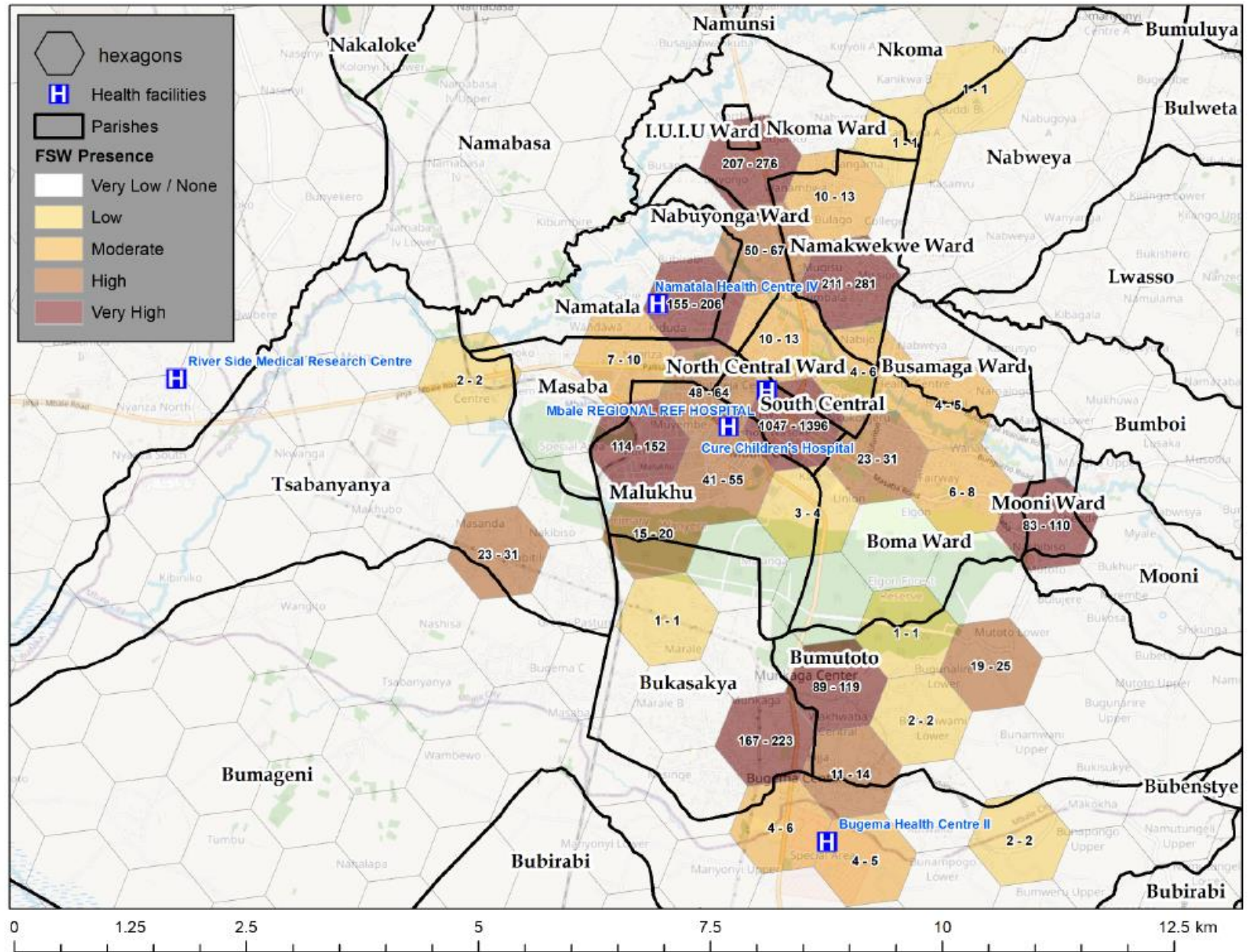
The Crane Survey is a collaboration of Makerere University/School of Public Health, Centers For Disease Control and Prevention (CDC), and Ministry of Health.

Finding: This survey has been supported by the President's Emergency Plan for Aids Relief (PEPFAR) through the CDC under the terms of #GH002127.



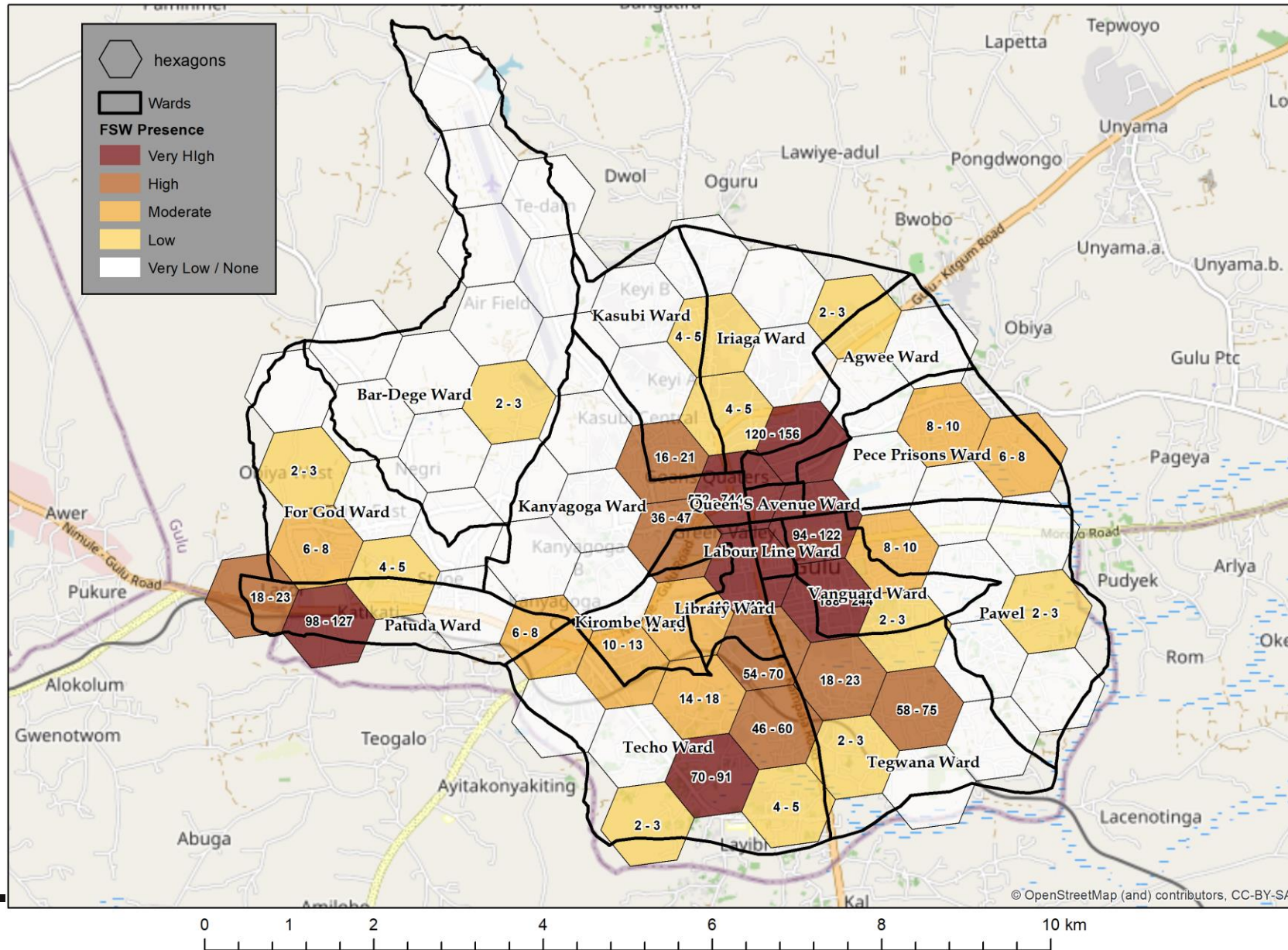
Figure 1. Distribution of sex work in Mbale, 2022.

Virtual mapping



Distribution of FSW in Gulu

Virtual mapping



Summary

High turnover (short duration of SW): FSW ↔ Gen pop women

HIV prevalence among FSW in Kampala unchanged since first Crane survey in 2008/9: ~33% Very likely high HIV incidence

Encouraging: High HIV testing uptake, relatively high VL suppression

(Much) Room for improvement: PrEP

Frequent non-disclosure of SW to healthcare providers

Substantial exposure to violence





**Makerere University College of Health Sciences
School of Public Health**

P.O.Box 7072 Kampala, Uganda

Tel: 256-414-543872

Email: dean@musph.ac.ug



@MakSPH



@MakSPH



MakSPH videos



<https://sph.mak.ac.ug/>