Biobehavioral Survey Among People Who Inject Drugs in Selected Towns in Zambia 2021

Zambia PWID BBS 2021

Zambia National HIV/AIDS/STI/TB Council (NAC)

Zambia Ministry of Health (MoH)

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ZAMBIA PWID BBS 2021 COLLABORATING INSTITUTIONS

Zambia National HIV/AIDS/STI/TB Council (NAC
Zambia Ministry of Health (MoH
The United States (US President's Emergency Plan for AIDS Relief (PEPFAR
The US Centers for Disease Control and Prevention (CDC
ICAP at Columbia University
Tropical Diseases Research Centre (TDRC

DONOR SUPPORT AND DISCLAIMER

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GLOSSARY OF TERMS

95-95-95: Treatment targets proposed by the Joint United Nations Programme on HIV and AIDS (UNAIDS) to help end the AIDS epidemic. The targets for 2025 are that 95% of all people living with HIV should know their HIV status; 95% of all people with diagnosed HIV should receive sustained antiretroviral therapy (ART); and 95% of all people receiving ART should achieve viral load suppression (VLS).

Acquired Immunodeficiency Syndrome (AIDS): AIDS is a disease that can develop after HIV causes severe damage to the immune system, leaving the body vulnerable to life-threatening conditions, such as infections and cancers.

Antiretroviral (ARV): A type of medication that inhibits the ability of HIV to multiply in the body.

Antiretroviral Therapy (ART): Treatment with a combination of ARV medications that reduces the amount of HIV in the body (viral load), leading to improved health and survival in a person living with HIV.

CD4+ T Cells: CD4+ T-cells (CD4) are white blood cells that are an essential part of the human immune system. These cells are often referred to as T-helper cells. HIV attacks and kills CD4 cells, leaving the body vulnerable to a wide range of infections. The CD4 count is used to determine the degree of weakness of the immune system from HIV infection.

Coronavirus disease 2019 (COVID-19): An illness caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), a virus that can be spread from person-to-person.

Human Immunodeficiency Virus (HIV): HIV is the virus that causes AIDS. The virus is passed from person-to-person through blood, semen, vaginal fluids, and breast milk. HIV attacks CD4 cells in the body, leaving a person living with HIV vulnerable to illnesses that a healthy immune system would eliminate.

HIV Incidence: A measure of the frequency with which new cases of HIV occur in a population over a period. The denominator is the population at risk; the numerator is the number of new cases that occur during a given time.

HIV Prevalence: The proportion of persons in a population who are living with HIV at a specific point in time.

HIV Viral Load: The concentration of HIV RNA in the blood, usually expressed as copies per milliliter (mL).

HIV Viral Load Suppression (VLS): An HIV RNA measurement of less than 1,000 copies per mL.

Informed Consent: Informed consent is a legal condition whereby a person can give consent based upon a clear understanding of the facts, implications, and future consequences of an action. To give informed consent, the individual concerned must have adequate reasoning faculties and be in possession of all relevant facts at the time he or she gives consent.

Pre-Exposure Prophylaxis (PrEP): PrEP is the use of ARVs by people at risk for HIV to prevent HIV acquisition.

Tuberculosis: Tuberculosis (TB) is a bacterial disease that most often affects the lungs but can also affect other parts of the body. When a person with active TB coughs, sneezes, sings, or talks, the bacteria that causes TB can spread through the air and may remain airborne in an enclosed area for hours. TB is the leading cause of death among people living with HIV.

LIST OF ABBREVIATIONS AND ACRONYMS

AIDS	Acquired Immunodeficiency Syndrome
ART	Antiretroviral Therapy
ARV	Antiretroviral Drug
BBS	Biobehavioral Survey
CDC	US Centers for Disease Control and Prevention
CD4	CD4+ T Cell
CI	Confidence Interval
CUMC	Columbia University Medical Centre
DEC	Drug Enforcement Commission
FGD	Focus Group Discussion
HBV	Hepatitis B Virus
HBsAg	Hepatitis B Surface Antigen
HCV	Hepatitis C Virus
HIV	Human Immunodeficiency Virus
ID	Identification Number
IDI	In-depth Interview
IRB	Institutional Review Board
KP	Key Population
mL	Milliliter
MoH	Ministry of Health
NAC	National HIV/AIDS/STI/TB Council
NHRA	National Health Research Authority
PEPFAR	US President's Emergency Plan for AIDS Relief
PrEP	Pre-Exposure Prophylaxis
PSE	Population Size Estimation
PWID	People Who Inject Drugs
RDS	Respondent Driven Sampling
RDS-A	Respondent Driven Sampling Analyst
RDSCM	Respondent Driven Sampling Coupon Management Template
SAG	Survey Advisory Group
SID	Survey ID
STI	Sexually Transmitted Infection
TB	Tuberculosis
TDRC	Tropical Diseases Research Centre
UNAIDS	Joint United Nations Programme on HIV and AIDS
UPC	Unique Participant Code
VLS	Viral Load Suppression
WHO	World Health Organization
Zambia PWID BBS 2021	Biobehavioral Survey Among People Who Inject Drugs in Selected Towns in Zambia 2021
ZAMPHIA	Zambia Population–based HIV Impact Assessment

PREFACE

Zambia is making progress towards attaining Vision 2030, which is an initiative of the Zambian Government to provide a high quality of life to all its citizens by leaving no one behind. However, Zambia is still experiencing a generalized HIV epidemic, with a national HIV prevalence of 11.0% and an annual HIV incidence of 0.31% among adults aged 15-59 years (ZAMPHIA 2021).

People who inject drugs (PWID) are a key population that is disproportionately affected by HIV/AIDS. This is due to the practice of injecting drugs, which can lead to the sharing of needles and other injection equipment. As a result, PWID have a much higher HIV prevalence than the general population.

To reach the goal of achieving 95-95-95 by 2025, it is essential to address the HIV prevention, care, and treatment needs of PWID. This report highlights the findings of the 2021 Zambia PWID Biobehavioral Survey (BBS), which was conducted to provide data on HIV, hepatitis B virus (HBV), hepatitis C virus (HCV), and syphilis infection among PWID in three surveyed towns (Livingstone, Lusaka, and Ndola).

The survey found that the prevalence of HIV among PWID in the three surveyed towns (Livingstone, Lusaka, and Ndola) was 12.3%, 7.3% and 21.3%, respectively, which is higher than the national HIV prevalence of 11.0%. The survey also found that PWID are at high risk for hepatitis B, hepatitis C, and syphilis. The survey also found that PWID face several challenges in accessing HIV prevention, care, and treatment services. These challenges include stigma and discrimination, lack of access to health insurance, and lack of knowledge about HIV and other blood-borne infections. The findings of this report highlight the need for increased investment in HIV prevention, care, and treatment services for PWID in Zambia. These services should be tailored to the specific needs of PWID and should address the challenges that they face in accessing care.

On behalf of NAC, I would like to thank the U.S. Centers for Disease Control and Prevention (CDC), the technical assistance of ICAP at Columbia University, Tropical Diseases Research Centre (TDRC), Key Populations Consortium, and participants who were integral to the success of the 2021 Zambia PWID Biobehavioral Survey.

I would also like to thank all the stakeholders who have worked together in the national AIDS response to this point. I look forward to continuing our partnership as we get closer to achieving the goal of ending the HIV epidemic in Zambia.

National HIV/AIDS/STI/TB Council

EXECUTIVE SUMMARY

BACKGROUND

Zambia has a generalized HIV epidemic with a national HIV prevalence of 11.0% among adults aged 15 years and older and an annual incidence of 0.31%. However, substantial progress has been made toward reaching the 95-95-95 goals.[*] To achieve the Joint United Nations Programme on HIV and AIDS (UNAIDS) 95-95-95 targets by 2025, addressing the HIV prevention, care, and treatment needs of key populations (KP) disproportionately affected by HIV, including people who inject drugs (PWID), is essential. In other settings, HIV prevalence is generally higher among PWID in comparison with the general population. In addition, experiences of homelessness, arrest, imprisonment, and sex work may increase exposure of PWID to HIV, HCV, and HBV, and increase risks of health harm. Age, gender, and the type of drug injected affect risk of exposure to blood-borne viruses and likely require differentiated treatment and harm reduction responses.

"Experiences of homelessness, arrest, imprisonment, and sex work may increase exposure of people who inject drugs (PWID) to HIV, hepatitis C virus, and hepatitis B virus"

There have been no biobehavioral survey (BBS) data nor previous population size estimates (PSE) for PWID in Zambia. Quantification of the size of the PWID population, assessment of their demographic characteristics, prevalence of risk behaviors, service uptake, and HIV among this KP is essential to enable effective health policy planning. To respond to this gap, the Biobehavioral Survey among PWID in Selected Towns in Zambia 2021 (Zambia PWID BBS 2021) was conducted from May to November 2021 to measure the prevalence of HIV and sexually transmitted infections (STIs) and risk behaviors among PWID in three cities in Zambia: Livingstone, Lusaka, and Ndola.

Zambia PWID BBS 2021 was led by the Zambian Ministry of Health (MoH) and the Zambia National HIV/AIDS/STI Council (NAC), in collaboration with the Tropical Diseases Research Centre (TDRC) and ICAP at Columbia University. The BBS was conducted with funding from the United States (US) President's Emergency Plan for AIDS Relief (PEPFAR) and through technical assistance and partnership with the US Centers for Disease Control and Prevention (CDC). Zambia PWID BBS 2021 was implemented by ICAP at Columbia University in collaboration with the government of Zambia through the MoH and NAC. Local civil society organizations, and international development partners participated in the survey advisory group (SAG) facilitated by NAC during survey implementation.

METHODS

To standardize methods for KP HIV surveillance, a protocol was adapted from the 2017 WHO Biobehavioural Survey Guidelines for Populations at Risk for HIV (The Blue Book).[†] A formative assessment was conducted with PWID (individuals aged 16 years and older who reported drug injection for non-medical purposes in the past 3 months) to inform the design and implementation of the BBS. In each survey site, 3 focus group discussions (FGDs) with 6-8 PWID, 5 in-depth interviews (IDIs) with health service providers, and 15 IDIs with PWID were conducted. Across all survey sites, 15 health service providers and 45 individuals participated in IDIs and a maximum of 72 individuals participated in FGDs.

Following the formative assessment, a cross-sectional BBS was conducted using respondent-driven sampling (RDS) to recruit participants. Population size estimation

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[*] Zambia Ministry of Health (ZMoH) and the Zambia Statistics Agency (ZamStats). *Zambia Population-based HIV/Impact Assessment (ZAMPHIA 2021)*. Lusaka: ZMoH/ZamStats; 2022.

[†] World Health Organization (WHO). *Biobehavioral survey guidelines for Populations at Risk for HIV*. Geneva: World Health Organization; 2017.

utilized the service multiplier, 3-source capture-recapture, and successive sampling-PSE methods.

Verbal informed consent was obtained by interviewers trained in human participant protection and good clinical practice. A standardized questionnaire was adapted from the Blue Book, programmed with SurveyCTO for electronic data collection, and administered by trained interviewers. After completing the questionnaire, consenting participants received rapid testing for HIV, HBV, HCV, and active syphilis.*

Participants who tested positive for HIV received testing for HIV viral load and HIV recency per the recent infection testing algorithm (RITA) at the TDRC laboratory. Participants were given their test results for HIV, HBV, HCV, and viral load; referrals for care were provided to those testing positive or who reported symptoms of STIs. HIV recency results were not returned to participants. HIV-negative individuals were referred to KP-friendly clinics for HIV pre-exposure prophylaxis (PrEP) services.

HIV prevalence testing was conducted using a serological rapid diagnostic testing algorithm based on Zambia's national guidelines, with laboratory confirmation of seropositive samples using a supplemental assay. For confirmed HIV-positive samples, laboratory-based testing was conducted for quantitative evaluation of viral load. A laboratory-based RITA using a recency test with correction for viral load was used to distinguish recent (within the last 180 days) from long-term infection. Survey weights were utilized for all estimates.

"HIV prevalence among PWID was 7.3% in Lusaka, 10.2% in Livingstone, and 21.3% in Ndola, but varied by sex in Livingstone and Lusaka"

KEY FINDINGS

- The survey enrolled 235 participants among the PWID communities in Livingstone, 349 in Lusaka, and 259 in Ndola, all of whom underwent biomarker testing.

- Consensus estimates by site found that in the 6 months before the survey, PWID accounted for 0.24%-0.93% of the population of each of the survey districts. The number of PWID (1,500-7,500) was greatest in Lusaka and represented about 0.24% of the district population. In Livingstone, the PSE was between 900-1,900 people, which represented 0.93% of the district population. In Ndola, the PSE was between 1,600-2,900 people, representing 0.56% of the district population (Key Findings Table, Table 2.11).†

- HIV prevalence among PWID was 7.3% in Lusaka, 10.2% in Livingstone, and 21.3% in Ndola. HIV prevalence varied by sex in Livingstone, where it was 42.4% among women compared with 6.0% among men; and in Lusaka, where HIV prevalence was 48.6% among women compared with 5.7% among men. In Ndola, HIV prevalence was 28.8% among women and 15.2% among men (Key Findings Table, Table 3.2.1).‡

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* A reactive result for *Treponema pallidum* antibodies on a rapid test for syphilis indicates an individual has been previously infected with syphilis as the antibodies to the bacterium can persist despite cure, while a reactive result for both treponemal and nontreponemal antibodies (biomarkers released during cellular damage caused by the treponemal spirochetes) indicates a person has a syphilis infection that is currently active and in need of treatment.

† The survey PSEs reflect PWID population sizes for the survey catchment areas. However, the populations of the survey catchment areas were difficult to measure; thus, district population was used.

‡ It should be noted that the proportion of men and women varied by site, with women comprising approximately 15% of the PWID population in Livingstone, less than 4% of the in Lusaka and almost 30% in Ndola.

"Viral load suppression (VLS) among PWID living with HIV ranged across the sites from 39.6% in Lusaka, to 55.3% in Ndola, and to 73.5% in Livingstone"

- Viral load suppression (VLS) among PWID living with HIV ranged across the sites from 39.6% in Lusaka, to 55.3% in Ndola, and to 73.5% in Livingstone (Key Findings Table, Table 3.2.1).
- Prevalence of acute or chronic HBV infection among PWID ranged from 1.9%-4.5% across sites (Key Findings Table, Table 3.4).
- There were no HCV infections found among men who inject drugs in Livingstone and Ndola, nor among women who inject drugs in Lusaka. HCV was detected among women who inject drugs in Livingstone (3.4%) and Ndola (0.9%) and among men who inject drugs in Lusaka (1.0%; Table 3.4).
- Prevalence of active syphilis among PWID was similar in Livingstone and Lusaka (3.7% and 4.2%, respectively) but was more than twice as high in Ndola (10.8%; Key Findings Table, Table 3.4).
- HBV, HCV and/or active syphilis coinfection among PWID living with HIV across all sites ranged from 2.1%-6.1% (Key Findings Table, Table 3.4).

PROGRESS TO THE 95-95-95 TARGETS

UNAIDS set the 95-95-95 targets with the aim that by 2025, 95% of all people living with HIV would know their HIV-positive status, 95% of those who were diagnosed would be on antiretroviral therapy (ART), and 95% of those who were on ART would achieve VLS.

95-95-95 achievements among PWID, based on self-report and adjusted for viral load below 200 copies per mL,* by site

For the conditional 95-95-95, the denominators for the second and third 95 are the values of the preceding 95 (Key Findings Table, Table 3.3.1):

- ***In Livingstone,*** 72.9% of PWID living with HIV were aware of their HIV-positive status, 100.0% of those who were aware of their HIV-positive status were on ART, and 100.0% of those on ART had VLS.
- ***In Lusaka,*** 66.0% of PWID living with HIV were aware of their HIV-positive status, 82.0% of those who were aware of their HIV-positive status were on ART, and 73.3% of those on ART had VLS.
- ***In Ndola,*** 61.9% of PWID living with HIV were aware of their HIV-positive status, 100.0% of those who were aware of their HIV-positive status were on ART, and 83.7% of those on ART had VLS.

*Young PW, Zielinski-Gutierrez E, Wamicwe J, et al. Use of viral load to improve survey estimates of known HIV-positive status and antiretroviral treatment coverage. *AIDS*. 2020;34(4):631-636. doi:10.1097/QAD.0000000000002453

Key Findings Table

Key findings among people who inject drugs (PWID), by sex, Zambia PWID BBS 2021			
	Livingstone		
Indicators	Male, n = 199	Female, n = 36	Overall, n = 235
Consensus population size estimate			1,200 (900 - 1,900)
HIV prevalence	6.0 (3.0 - 9.0)	42.4 (25.8 - 59.4)	12.2 (8.3 - 16.3)
Prevalence of viral load suppression (VLS)	77.3 (60.8 - 94.9)	69.4 (49.3 - 89.3)	73.5 (60.3 - 87.1)
Progress toward 95-95-95[1]			
People living with HIV aware of HIV status	77.2 (61.3 - 93.7)	70.4 (53.7 - 88.1)	72.9 (60.3 - 87.0)
People living with HIV aware of HIV status receiving ART	100.0 (-)	100.0 (-)	100.0 (-)
People living with HIV receiving ART with VLS	100.0 (-)	100.0 (-)	100.0 (-)
Recent HIV infection	0.0 (-)	0.0 (-)	0.0 (-)
HBsAg prevalence	2.3 (0.5 - 4.2)	0.0 (-)	1.9 (0.4 - 3.5)
Active syphilis prevalence	3.5 (1.1 - 5.9)	5.0 (0.0 - 11.7)	3.7 (1.3 - 6.2)
HIV and other coinfection prevalence	1.9 (0.0 - 4.0)	3.4 (0.0 - 9.6)	2.2 (0.2 - 4.1)
	Lusaka		
	Male, n = 335	Female, n = 13	Overall, n = 349
Consensus population size estimate			3,700 (1,500 - 7,500)
HIV prevalence	5.7 (3.1 - 8.4)	48.6 (30.9 - 66.3)	7.3 (4.5 - 10.2)
Prevalence of viral load suppression (VLS)	38.1 (14.9 - 61.2)	50.0 (4.0 - 96.0)	39.6 (18.6 - 60.1)
Progress toward 95-95-95[1]			
People living with HIV aware of HIV status	58.7 (34.8 - 82.3)	87.0 (42.2 - 100.0)	66.0 (45.7 - 85.6)
People living with HIV aware of HIV status receiving ART	80.1 (51.7 - 100.0)	84.5 (66.4 - 100.0)	82.0 (62.1 - 100.0)
People living with HIV receiving ART with VLS	81.4 (44.4 - 100.0)	66.6 (27.8 - 100.0)	73.3 (52.1 - 95.4)
Recent HIV infection	0.0 (-)	0.0 (-)	0.0 (-)
HBsAg prevalence	4.4 (1.7 - 7.1)	8.2 (0.0 - 28.3)	4.5 (1.9 - 7.1)
Active syphilis prevalence	3.3 (1.4 - 5.1)	31.8 (0.0 - 65.2)	4.2 (2.1 - 6.2)
HIV and other coinfection prevalence	1.5 (0.3 - 2.8)	18.6 (4.0 - 32.4)	2.1 (0.8 - 3.5)
	Ndola		
	Male, n = 173	Female, n = 77	Overall, n = 259
Consensus population size estimate			2,200 (1,600 - 2,900)
HIV prevalence	15.2 (8.1 - 22.1)	28.8 (17.5 - 40.3)	21.3 (15.2 - 27.4)
Prevalence of viral load suppression (VLS)	54.2 (30.5 - 78.2)	45.2 (26.2 - 64.3)	55.3 (39.4 - 71.3)
Progress toward 95-95-95[1]			
People living with HIV aware of HIV status	55.5 (32.2 - 79.0)	65.3 (48.8 - 81.7)	61.9 (47.8 - 76.1)
People living with HIV aware of HIV status receiving ART	100.0 (-)	100.0 (-)	100.0 (-)
People living with HIV receiving ART with VLS	93.8 (83.1 - 100.0)	68.8 (46.9 - 89.9)	83.7 (73.0 - 95.1)
Recent HIV infection	3.5 (0.0 - 9.7)	0.0 (-)	3.3 (0.0 - 8.1)
HBsAg prevalence	1.4 (0.3 - 2.5)	5.8 (1.6 - 10.0)	2.6 (1.2 - 4.1)
Active syphilis prevalence	9.0 (3.8 - 14.3)	15.1 (6.0 - 24.2)	10.8 (6.3 - 15.3)
HIV and other coinfection prevalence	4.8 (1.0 - 8.5)	8.8 (2.6 - 15.0)	6.1 (2.8 - 9.4)

[1] In the viral load-adjusted 95-95-95, individuals are considered aware of their HIV-positive status and on ART if their viral load is < 200 copies per mL.
Abbreviations: ART, antiretroviral therapy; HBsAg, hepatitis B surface antigen.
Definitions: Viral load suppression is defined as HIV RNA < 1,000 copies/mL among individuals living with HIV. Other coinfections include hepatitis B, hepatitis C, and active syphilis.

OTHER SELECTED KEY FINDINGS

Demographics

"Full-time employment among PWID was uncommon regardless of sex, ranging from 0.0%-5.6% across the sites; and most PWID were unmarried"

- The median age among men and women who inject drugs was 22 years and 29 years, respectively, in Livingstone and 25 years among the men and 22 years among the women in Lusaka. The median ages in Ndola were 27 years among the men and 29 years among the women (Table 3.1).
- More than half of PWID were unemployed in Livingstone (53.7% of men, 78.3% of women) and Lusaka (77.9% of men, 60.7% of women), while in Ndola 41.5% of men and 49.0% of women who inject drugs were unemployed. Full-time employment was uncommon regardless of sex, ranging from 0.0%-5.6% across the sites (Table 3.1).
- Most PWID were not married. Only 6.9% of the men and 3.9% of the women in Livingstone, 8.4% of the men and 14.0% of the women in Lusaka, and 18.6% of the men and 13.3% of the women in Ndola were married (Table 3.1).

TB services among PWID living with HIV

- Among PWID living with HIV, 66.6%-81.9% across the sites were screened for tuberculosis (TB) symptoms in the past 12 months. Among those screened, 28.2% in Livingstone, 63.8% in Lusaka, and 35.1% in Ndola had experienced TB symptoms in the 12 months before the survey. Among those who had TB symptoms, the percentage who had a chest x-ray or sputum test for TB ranged from 56.0% in Livingstone to 78.1% in Ndola (Table 3.3.4).

Sexually transmitted infections

"Across sites, approximately 60%-75% of PWID said they were less likely to use condoms with a regular partner"

- In Lusaka and Ndola, higher proportions of PWID had one or more STI symptoms in the 12 months before the survey compared to the proportion of PWID in Livingstone (19.7% and 27.6% vs. 8.7%, respectively; Table 3.5).
- Many PWID who had one or more STI symptoms did not seek out healthcare for the symptoms (range: 57.2%-67.7%), but among those who were diagnosed with an STI (range: 5.5%-12.0%), most received treatment (range: 89.8%-100.0%; Table 3.5).
- Among PWID who had one or more symptoms of STIs, 87.5% in Livingstone, 93.6% in Lusaka and 38.2% in Ndola said that they did not abstain from sex or always use condoms while having STI symptoms (Table 3.5).

Sexual behavior

- Among PWID, condom use at last sex with their most recent partner varied among men (range: 34.3%-60.6%) and women (range: 18.3%-36.8%). Across sites, a similar proportion of both men and women said that they were less likely to use condoms with a regular partner (range: 60.5%-74.6%; Table 3.6.2).
- Between 8.4%-15.3% of PWID across the sites had ever had anal sex, except for women from Lusaka who had never had anal sex. In Livingstone, all the men who had engaged in anal sex had done so with another man compared with 11.9% in Lusaka and 35.3% in Ndola (Table 3.6.1).

Drug and alcohol use

- Hazardous drinking* among PWID ranged from 17.8% in Lusaka to 49.7% in Ndola. Prevalence of alcohol dependency in Ndola was 25.7%, versus 4.3% in Lusaka and 4.4% in Livingstone (Table 3.7.1).
- In the 6 months before the survey, 93.9% of PWID in Livingstone and 95.9% in Lusaka most often injected Tie White (heroin) compared with Ndola, where Artane (68.0%) and Blue Marsh (promethazine; 59.9%) were the drugs most injected (Table 3.7.4).
- A higher proportion of PWID in Livingstone (62.9%) and Lusaka (75.9%) were detained for or imprisoned for drug use than in Ndola (32.9%; Table 3.7.3).
- The prevalence of PWID using a syringe/needle previously used by someone else in the six months before the survey ranged from 29.1% in Lusaka to 67.2% in Ndola. Expense was a primary reason for not using a new needle/syringe (71.5% in Lusaka, 64.1% in Livingstone, and 43.8% in Ndola), although difficulty finding a clean needle/syringe was noted by more than a third (37.7%) of PWID in Ndola (Table 3.7.5).
- Other unsafe injecting practices among PWID in the six months before the survey were common, including:
    - Sharing other previously used injection works (cookers, cottons, tourniquets, or water) which occurred among 64.9% in Livingstone, 35.7% in Lusaka, and 43.7% in Ndola;
    - Not cleaning previously used needles/syringes, which occurred among 26.8% in Livingstone, 76.6% in Lusaka, and 74.3% in Ndola; and
    - Using syringes that were front- or back-loaded (use of one injector's syringe to mix drugs, which is then divided into one or more syringes for injection), which occurred among 46.4% in Livingstone, 23.2% in Lusaka, and 44.0% in Ndola (Table 3.7.5).
- In Livingstone, HIV prevalence by duration of injection drug use ranged from 9.8% among those who had injected for 2 to 6 years, up to 28.0% among those who had injected for 10 or more years. In Lusaka and Ndola, there was a similar pattern of higher HIV prevalence with longer duration of injection drug use, 6.1% up to 11.9%, and 9.1% up to 28.2%, respectively (Table 3.7.6).
- Awareness of programs to modify, reduce, or stop drug use was low across all sites, although PWID in Lusaka were more likely to be aware of such a program than PWID in Livingstone or Ndola (41.7% vs. 15.8% and 20.1%, respectively). Among PWID who were aware of these programs, 22.9%-30.8% had ever received any services. Among the 8.7%-11.8% of PWID who had received any services from these programs in the six months before the survey, the majority had been placed into detox programs or received counseling. Uptake of methadone replacement therapy was only reported in Lusaka; of the 9.4% of PWID in Lusaka who had received services in the six months before the survey, about half (50.1%) received methadone replacement therapy (Table 3.7.8).

"PWID in Livingstone and Lusaka most often injected Tie White (heroin); in Ndola, Artane and Blue Marsh (promethazine) were most commonly injected"

"The prevalence of using a syringe/needle previously used by someone else in the six months before the survey ranged from 29% in Lusaka to 67% in Ndola"

* Alcohol Use Disorders Identification Test (AUDIT) questions were included in the survey questionnaire and scored. According to World Health Organization (WHO) guidelines, scores from 8 to 14 suggest hazardous or harmful alcohol consumption and a score of 15 or more indicates the likelihood of alcohol dependence (moderate-severe alcohol use disorder). https://auditscreen.org/about/scoring-audit.

"Many PWID experienced physical, sexual, or verbal abuse for injecting drugs"

"A substantial proportion of PWID avoided seeking healthcare services for fear of being identified as a person who injects drugs"

HIV knowledge, prevention, outreach

- Comprehensive knowledge of HIV* was generally low among PWID (range: 7.1%-18.7%; Table 3.8.1).
- Most PWID were aware that a person can get HIV by injecting with a needle that has been used by someone else (range: 94.2%-97.4%). More PWID in Lusaka and Ndola were aware that they can protect themselves from HIV by switching to drugs that are swallowed, sniffed, or inhaled compared with PWID in Livingstone (63.6% and 59.8% vs. 45.0%, respectively; Table 3.8.1).

Utilization of HIV prevention services

- Among PWID who tested negative at the first survey visit, the majority had previously had an HIV test (range: 79.8%-90.8%). While slightly over half in Livingstone and Ndola (54.8% and 51.1%, respectively) had tested in the six months before the survey, about one-third (34.3%) tested in the 6 months before the survey in Lusaka. Very few had conducted a self-test for HIV (range: 0.2%-1.5%; Table 3.9.1, Table 3.9.2).
- Among HIV-negative PWID, 68.0% in Livingstone and 56.8% in Ndola had ever heard of PrEP, compared with 18.1% in Lusaka. Of those who had heard of PrEP, 16.2% in Livingstone, 11.9% in Lusaka, and 22.7% in Ndola had ever taken PrEP. Among PWID who had ever taken PrEP, 45.2%-78.8% had taken it in the 6 months before the survey. Among HIV-negative PWID who were aware of but had not taken PrEP, 62.4% to 94.7% were willing to take it (Table 3.9.4).

Social cohesion and stigma

- PWID experienced family rejection for injecting drugs in Lusaka (68.1%), Livingstone (53.1%) and Ndola (32.7%). Many PWID experienced physical, sexual, or verbal abuse for injecting drugs (range: 42.8%-66.4%). For those who had experienced abuse, the abuse was perpetrated by friends or other people they knew (range: 60.7%-87.9%; Table 3.10.1).
- At each site, a substantial proportion of PWID avoided seeking healthcare services for fear of being identified as a person who injects drugs (range: 32.2%-54.2%). Many PWID experienced mental health issues including depression (range: 32.4%-47.5%; Table 3.10.1).

COVID-19

- The COVID-19 pandemic was associated with a decrease in sexual risk among PWID: 33.5% to 50.6% of PWID experienced a decrease in opportunities to have sex. However, there were variable effects on injecting drug use behaviors and opportunities. While 51.1% of PWID in Livingstone and 45.8% of PWID in Lusaka did not change their frequency of injecting (with little net change overall), 60.9% of the PWID in Ndola injected less frequently. However, use of clean needles when injecting decreased among 24.5% of the PWID in Livingstone, 22.9% in Lusaka, and 48.2% in Ndola (Table 3.11.1).

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* According to the UNAIDS definition, see: https://dhsprogram.com/data/Guide-to-DHS-Statistics/Comprehensive_Knowledge_about_HIV_Total_and_Youth.htm.

- Most of the PWID who were on ART did not experience disruptions in HIV care and treatment because of COVID-19. However, 19.4% in Lusaka and 14.5% in Ndola had trouble getting HIV medications due to COVID-19. Some, 19.3% in Livingstone and 7.7% in Ndola, also had trouble getting viral load tests and other lab work done due to COVID-19 (Table 3.11.3).

1. INTRODUCTION

1.1 BACKGROUND

HIV epidemic in Zambia

Zambia has a generalized HIV epidemic, with a national HIV prevalence of 11.0% among adults aged 15 years and older and an annual incidence of 0.31%.[1] High HIV incidence in Zambia is attributed to several factors, including multiple and concurrent sexual partnerships and inconsistent use of condoms; low uptake of voluntary medical male circumcision; migration and mobility; the presence of marginalized and underserved populations; and high prevalence of other sexually transmitted infections (STIs).[2]

Recent data highlight Zambia's progress toward reaching the 95-95-95 goals set the by Joint United Nations Programme on HIV and AIDS (UNAIDS). Among adults, 89% of individuals living with HIV knew their status, 98% of individuals aware of their status were on antiretroviral therapy (ART), and 96% of individuals on ART achieved viral load suppression (VLS, defined as HIV RNA <1,000 copies per mL).[1] Many countries are approaching or reaching UNAIDS 95-95-95 targets, but addressing the HIV prevention, care, and treatment needs of underserved key populations (KP) disproportionately affected by HIV, including people who inject drugs (PWID), will be necessary to meet the UNAIDS and Sustainable Development Goal 3 targets of ending the global AIDS epidemic as a public health threat by 2030.

People who inject drugs (PWID)

PWID are disproportionately affected by HIV, yet information on HIV prevalence and behavioral risk factors among PWID is limited and very little has been published on injection drug use for non-medical purposes in sub-Saharan Africa, where HIV continues to be a leading cause of morbidity, disability, and death. Although 1.02 million people have been estimated to inject drugs in the region, numbers may be as high as 6.24 million.[2] The few surveys carried out among PWID in the region point to a high burden of disease in this population. HIV prevalence estimates among PWID obtained through respondent-driven sampling (RDS) surveys vary by country and range from 0.9% in Lagos, Nigeria to 47.4% in the Republic of Mauritius.[3,4] Other estimates published in the region were obtained using convenience sampling or program data, and therefore may not reflect the true prevalence of HIV in those populations.

Studies suggest that in addition to injection behaviors, experiences of homelessness, arrest, imprisonment, and sex work can increase exposure of PWID to HIV, hepatitis C virus (HCV), and hepatitis B virus (HBV), and increase risks of health harm.[5] Age, gender, and the type of drug injected affect risk of exposure to blood-borne viruses and require differentiated treatment and harm reduction responses.[5] While a formative qualitative assessment with people who use drugs (PWUD) was conducted in three locations in Zambia between 2013 and 2015, there have been no biobehavioral survey (BBS) data nor population size estimates (PSE) for PWID in the country.[6]

Key populations surveillance and epidemic control

Implementation of strategies to address the biological and behavioral risks have important implications for public health. In the past decade, surveillance capacity, including KP surveillance, has been enhanced across many low- and middle-income countries. Targets for reductions in HIV in KP have been developed, making data on KP crucially important.

The review and understanding of sociodemographic characteristics, behavioral risk factors, HIV burden, recent HIV infection and VLS among KP, and subsequent initiation of appropriate public health interventions, are key to HIV epidemic control in Zambia and may contribute toward the goal of zero HIV transmissions by 2030. However, available data on HIV prevalence and incidence in PWID in Zambia remain incomplete. Quantification of the population size of PWID through improved PSE methods, as well as their demographic characteristics and prevalence of risk behavior and prevention and treatment service uptake, is essential to enable effective health policy planning.

1.2 ZAMBIA BIOBEHAVIORAL SURVEY AMONG PWID (ZAMBIA PWID BBS 2021)

The HIV and STI Biological and Behavioral Survey Among People Who Inject Drugs in Selected Towns in Zambia 2021 (Zambia PWID BBS 2021) was conducted from November 2021 to February 2022 to measure the prevalence of HIV and STIs and risk behaviors among PWID in three cities in Zambia: Lusaka, Livingstone, and Ndola, to estimate their population size in the survey sites, and gauge progress toward reaching the UNAIDS 95-95-95 targets.

Zambia PWID BBS 2021 was led by the Zambian Ministry of Health (MoH) and the Zambia National HIV/AIDS/STI Council (NAC), in collaboration with Tropical Diseases Research Centre (TDRC) and ICAP at Columbia University. The BBS was conducted with funding from the United States (US) President's Emergency Plan for AIDS Relief (PEPFAR) and through technical assistance and partnership with the US Centers for Disease Control and Prevention (CDC). Zambia PWID BBS 2021 was implemented by ICAP at Columbia University in collaboration with the Government of Zambia through MoH and NAC. Local civil society organizations and international development partners participated in the survey advisory group (SAG) facilitated by NAC during survey implementation.

The specific objectives of the survey were:

- To estimate the HIV care cascade (95-95-95) for PWID living with HIV, including proportion aware of their status, proportion on treatment and the proportion with VLS
- To measure the prevalence of HIV, active syphilis, HBV, and HCV, as well as the prevalence of coinfection with HIV and these infections among PWID at survey sites
- To assess sexual risk behaviors and access to HIV prevention and care services among PWID
- To estimate the proportion of PWID living with HIV with recent HIV infection
- To assess drug use behavior and access to drug dependency health and care programs among PWID
- To estimate the population size of PWID in survey sites

The secondary objectives included:

- To link participants living with HIV to care and treatment for HIV
- To link participants who test negative for HIV to pre-exposure prophylaxis (PrEP) services and prevention programs
- To link those testing positive for active syphilis or with STI symptoms to STI treatment
- To link participants testing positive for HBV to care and treatment and participants testing positive for HCV to care

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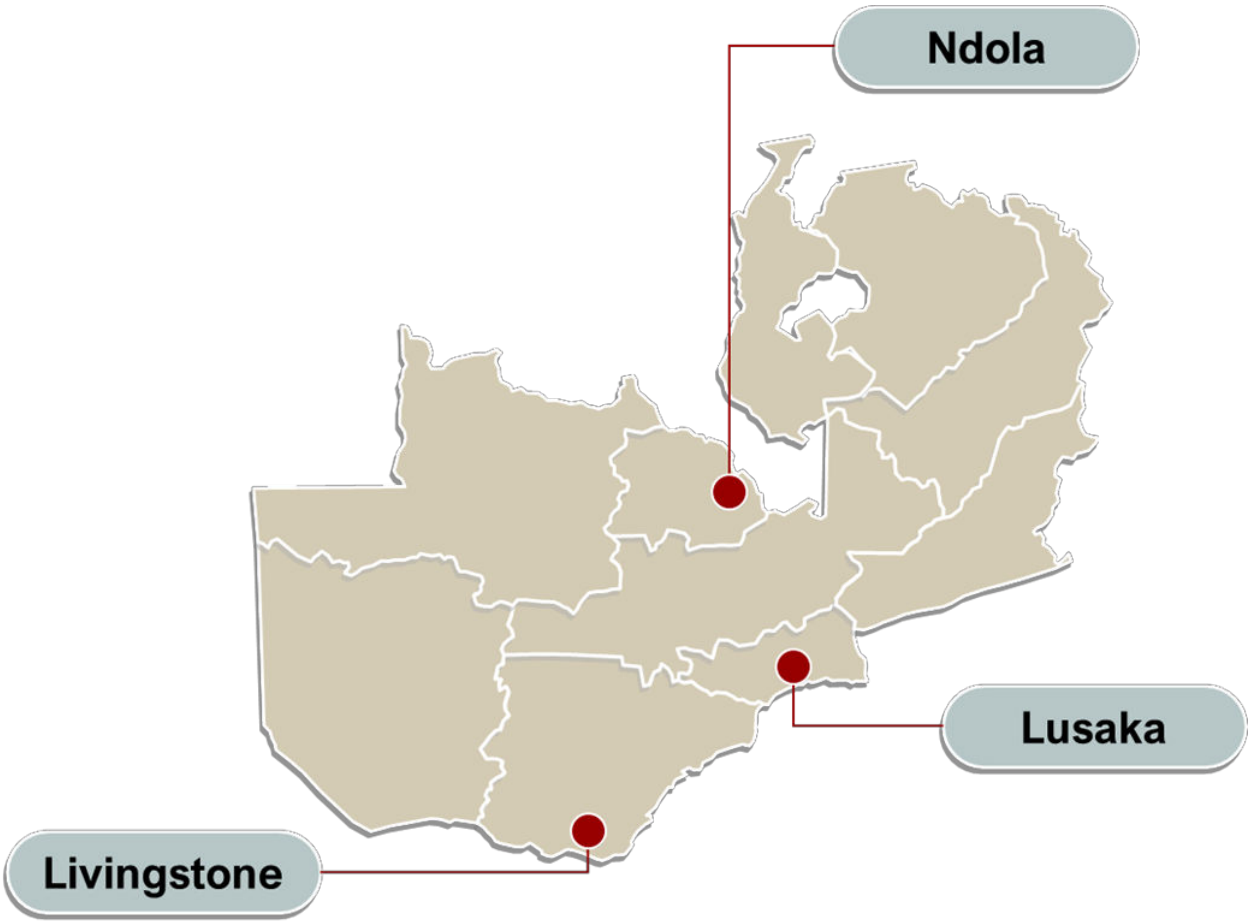
2. SURVEY METHODS

2.1 SURVEY DESIGN

Zambia PWID BBS 2021 adapted a protocol from the 2017 WHO Biobehavioral Survey Guidelines for Populations at Risk for HIV to use standardized methods for KP surveillance.[1] Data collection was implemented in two sequential phases in three Zambian cities. The formative assessment (phase 1) utilized qualitative methods to identify perceptions, experiences, and contextual factors unique to PWID in Zambia and informed the design and implementation of the descriptive cross-sectional BBS (phase 2).

Three cities (Lusaka, Livingstone, and Ndola) were included as survey sites based on a previous formative assessment of PWUD.[2] Survey sites and the precise geographic boundaries for the survey areas were determined prior to survey implementation based on information from the BBS's formative assessment.

Figure 2.1: Survey sites, Zambia PWID BBS 2021



The sample size for the formative assessment was not set in advance but was determined once the survey population reached data saturation—the point at which further inquiry was not expected to yield any additional information. For the biobehavioral component of the survey, the Blue Book sample size calculator for survey based VLS was used for sample size calculation using the formula below:

$$n_a = \frac{DEFF \times n_u}{1-NR}$$

n_a = minimum adjusted target sample size for all respondents, regardless of HIV status
n_u = minimum unadjusted target sample size for all respondents, regardless of HIV status, above

DEFF = design effect (the BBS used 2)
NR = nonresponse rate (the BBS used 5%)

Among people living with HIV aged 15-59 years in Zambia, the prevalence of VLS (defined as an HIV RNA of less than 1,000 copies/mL) was 59.2% in 2016-2017.[3] Assuming a design effect of 2 and a nonresponse rate of 5%, a sample size of 195 HIV-positive participants was calculated to produce a two-sided 95% confidence interval (CI) ranging from 50.0% to 70.0% when the proportion of HIV-positive people with VLS is 60.0%. To achieve a sample size of 195 HIV-positive PWID participants per survey site, assuming an HIV prevalence of 25%, a sample size of 780 PWID participants per survey site was needed.

After consultation with stakeholders supporting PWID in Zambia, it was determined that the target sample size of 780 PWID would not be achievable at the site level. As such, the sample size was divided between the three sites based on the size of the population of PWUD in each site: Lusaka (n=350), Livingstone (n=215) and Ndola (n=215).

2.2 FORMATIVE ASSESSMENT

Formative assessment procedures

The formative assessment phase allowed investigators to understand the networks, practices, availability of healthcare and other services, and service-seeking behaviors of PWID. The formative assessment was also performed to identify the operational and logistical needs of conducting the BBS, including information on:

- Identifying and selecting seeds (individuals from PWID networks who helped start the recruitment of other network members to participate in the survey)
- Survey sites to conduct survey operations and distribution locations for dissemination of unique objects
- Appropriate type and value of incentive for survey participation
- Areas of the survey instrument requiring fine tuning or revisions
- Appropriate unique objects to be distributed
- Potential barriers and facilitators of the survey
- Inventory of existing health and social welfare services and identification of gaps
- Providers/clinics interested in being trained to provide appropriate services and existing KP-friendly health referral services

Focus group discussions

The survey used purposeful sampling techniques to recruit participants. The composition of each focus group was stratified by age (16-19, 20-24, 25-29, and 30 years and older) to encourage individuals to freely share their ideas and perceptions.

A standardized focus group discussion (FGD) guide was used. During the FGDs, the interviewer took notes and highlighted key points as the discussion unfolded to help formulate follow-up questions and probes. At the end of each session, the interviewers analyzed the responses and recorded their impressions about the session. Participants were reimbursed K240 (US $13) to cover transportation costs and time.

In-depth interviews

In-depth interviews (IDIs) were conducted with PWID and service providers providing healthcare and other services to KP groups in the proposed survey sites. Trained staff (a notetaker and interviewer) performed all IDIs using interview guides: one for service providers and one for PWID. Participants were reimbursed K240 (US $13) to cover transportation costs and time.

2.3 SURVEY POPULATION

Eligibility criteria for the Zambia PWID BBS 2021 included:

- Self-reported drug injection for non-medical purposes in the past 3 months
- Aged 16 years or older
- Lived in surveyed city for the past 3 months
- Speaks English or other designated local language
- Capable and willing to provide verbal informed consent
- In possession of valid survey coupon

2.4 SELECTION OF SEEDS AND RDS RECRUITMENT

Participants at the survey sites were recruited through RDS. RDS is a type of chain referral method or link-tracing/adaptive sampling design used to access hard-to-reach populations. The method is based on the principle that members of the target population refer other members of the same population to participate so that the sample is established by successive "generations" of recruitment referrals. The survey used RDS to recruit participants in two ways: a) the survey team selected "seeds" to start the recruitment waves; and b) previously enrolled survey participants used individually coded coupons to refer their peers.

During the formative assessment phase, the survey team identified up to six eligible seeds who could start the chains of recruitment among their social networks. Seeds were selected to represent the diverse range of ages, languages spoken, gender identities and sociodemographic characteristics of the network at each survey site. Additional seeds were added when recruitment speed was slower than anticipated, chains discontinued, or elements of populations were missing from the sample.

Coupon management

Paper-based coupons were designed in consultation with community representatives to appeal to the population while omitting information that could reveal the PWID focus of the survey. The coupons contained the survey name and a unique coupon code in a sequence linked to the recruiter.

Issuance and receipt of coupons was monitored electronically using an RDS Coupon Management (RDSCM) spreadsheet. Recruitment monitoring of relevant variables, including HIV/HBV/HCV/active syphilis prevalence, VLS, socio-economic status, and other demographic information occurred weekly until sample size and convergence was reached. Coupon distribution was discontinued when 95% of the sample size was reached, while recruitment was discontinued one week after the sample size was reached.

2.5 SURVEY IMPLEMENTATION

Staffing and staff training

All staff participated in a multi-day training. The curriculum included topics related to HIV among PWID, protocol design and implementation, data collection tools, laboratory procedures, staff roles and responsibilities, coupon management, safety, and ethics. Interviewers and counselors were also trained in open and nonjudgmental interviewing techniques and accurate recording practices. Laboratory technicians and HIV counselors participated in laboratory-related sessions that included practical sessions and competency assessments for all point-of-care (POC) rapid tests. Interviewers received additional training on the administration of the behavioral questionnaires. Skip patterns were programmed into the questionnaire to ensure appropriate questions were asked of participants.

The survey team included a site coordinator, receptionist, coupon manager, interviewers, an HIV counselor/nurse, laboratory technician, and support staff (driver, cleaner, peer educator, and guard). The site coordinator provided

leadership and managed data collection. The receptionist managed participant flow, participant checklists, and appointments. The coupon manager verified coupons, managed the RDSCM, and screened for eligibility. Interviewers administered informed consent and questionnaires. The HIV counselor/nurse provided pre- and post-test counseling. The laboratory technician conducted venous blood draws, administered rapid tests for HIV, HBV, HCV, and active syphilis, and entered the rapid test results into a tablet. Support staff transported samples, escorted participants to referral facilities, and cleaned the site.

Screening

The coupon manager examined the coupon presented by the recruit for validity and a unique code demonstrating that they had not previously enrolled. A screening form with eligibility criteria was then used to confirm the participants' eligibility. If doubts remained, staff posed additional questions to confirm eligibility.

Informed consent

Verbal informed consent was solicited and obtained from all participants. Informed consent covered all procedures, potential risks, benefits, and how to report complaints or concerns. Consent was obtained for each survey component, including completion of the questionnaire (required for inclusion); testing for HIV, STI, HBV, HCV, and VLS; testing for recency; and collection and storage of blood specimens for possible future testing. Verbal informed consent was electronically documented by the interviewer on their tablet.

Interview administration

Standardized instruments were used for quantitative data collection.[1] The data included indicators needed to track the HIV epidemic and the national response for PWID, compared to international standards (eg, local key performance indicators), national program needs, and comparability with similar surveys in the region. The first visit questionnaire collected data on demographics and injection drug and sexual risk behaviors, as well as on HIV-related knowledge, attitudes, practices, stigma, discrimination, and risk perceptions.

2.6 BIOMARKER TESTING

Pre-test counseling for biomarker testing

Upon completion of the questionnaire, participants who consented to testing received pre-test/risk reduction counseling for HIV and other tests that followed national guidelines. While participants were free to opt out of HIV and other biomarker testing, they were appropriately counseled on the benefits of knowing their health status as well as the importance of testing for the purposes of the survey, if previously diagnosed with HIV. The importance of early HIV diagnosis and treatment for participants who tested positive, and the maintenance of an HIV-negative status through prevention interventions such as PrEP for those who tested negative, was also emphasized.

Blood collection, storage, transport, and processing

Venous blood samples were collected from the arm of consenting participants for HIV, HIV recency, HIV viral load, active syphilis, HBV, and HCV testing by a trained laboratory technician. Each day, the blood specimens were centrifuged to separate the plasma. The plasma was stored at -20°C at the survey site until shipment to the TDRC lab. Plasma was shipped on a weekly basis to TDRC for additional testing (viral load, recency, and HCV diagnostic testing), quality control purposes, and for potential future testing (eg, HIV genotyping).

HIV testing

HIV rapid testing was conducted at the survey site after completion of pre-test counseling. Individuals with a nonreactive result on the screening test (Determine™ HIV-1/2 [Abbott Molecular Inc., Des Plaines, Illinois, United States]) were reported as HIV negative. Individuals with a reactive screening test result underwent confirmatory testing using SD BIOLINE HIV-1/2 (Abbott Molecular Inc., Des Plaines, Illinois, United States). Those with a reactive result on both screening and confirmatory tests were classified as HIV positive. Individuals with a reactive screening test result followed by a nonreactive confirmatory test result were immediately retested (re-bled by finger stick and

retested sequentially with Determine and Bioline in accordance with HTS guidelines). Individuals with discordant results on retest were tested again during their second visit.

Post-test counseling

Counseling of HIV-positive participants included an assessment of psychosocial needs, a discussion of how to live positively with HIV, HIV treatment, HIV care (viral load, U=U, etc.), and issues related to stigma and discrimination. HIV transmission to partners and strategies for behavioral change were addressed. Condoms and lubricants were made available to all participants free of charge. Counseling of HIV-negative participants included discussions around maintaining a negative status, strategies for behavioral risk reduction, and other risk reduction methods like PrEP. All HIV un-infected participants were referred for PrEP services at KP-friendly clinics previously identified.

HIV viral load testing

HIV-1 viral load (HIV RNA copies per mL) of confirmed HIV-positive participants was measured on the Roche COBAS AmpliPrep Instrument using the COBAS AmpliPrep/COBAS TaqMan HIV-1 Test, v2.0 (Roche Molecular Diagnostics). On a weekly basis, TDRC produced a copy of the viral load results for all participants to date, entered it in the survey dataset and shared it with the site supervisor. Viral load results were provided to the participants during the second visit. Participants were counseled appropriately and instructed to take the results to their treatment clinic.

Viral load testing results were also used in a recent infection testing algorithm (RITA) to identify any long-term infections potentially misclassified as recent infections due to being on ART or elite controllers (a very small percentage of people living with HIV whose immune systems are able to maintain VLS without treatment).

In addition, viral load results <200 copies/mL were used to adjust survey estimates of awareness of HIV status and ART coverage status. Self-reported awareness of HIV status or treatment status can be subject to negative or positive bias due to HIV related stigma, or due to poor understanding of biomedical terminology.[4] Use of a very low (<200 copies/mL or undetectable) viral load has been shown to be a biometric to indicate a participant's awareness of HIV-positive status at the time of blood collection, since individuals living with HIV are unlikely to achieve a viral load below 200 copies per mL if they are not on an effective ART regimen.[5]

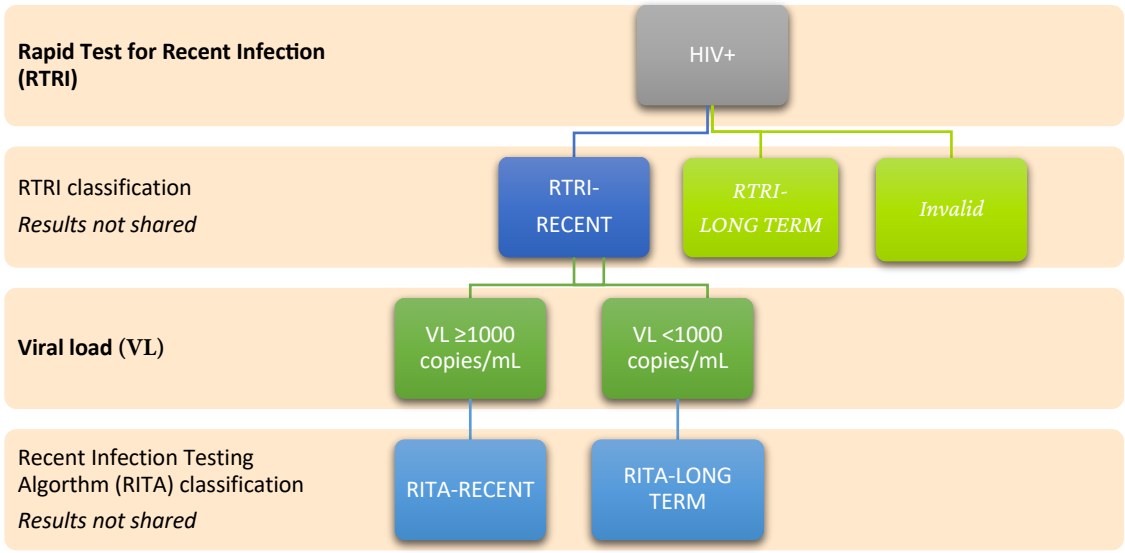
HIV recency testing

HIV recency is used to track the recent spread of HIV and identify geographic areas or populations with increased risk of HIV acquisition.[6] For this reason, all HIV-positive plasma specimens were subjected to the Asanté HIV-1 Rapid Recency™ Assay (Sedia Biosciences Corporation, Portland, Oregon, United States), a POC rapid test used to differentiate recent from long-term HIV-1 infections in combination with viral load testing as part of a RITA (Figure 2.3).

HIV recent infection testing algorithm

Participants were classified as having a recent infection if the HIV-1 rapid test for recent infection (RTRI) result indicated recent infection (within the previous 12 months) and they had a viral load ≥ 1000 copies/mL. Those identified by the RTRI as recent infection but with a viral load <1000 copies/mL may represent elite controllers or individuals on ART. These were classified as long-term infections (longer than 12 months). Since the RTRI was still under evaluation and not yet pre-qualified by the World Health Organization, the results obtained were used for surveillance purposes only, and not returned to participants as they did not affect clients' HIV diagnosis and clinical care.

Figure 2.6: HIV-1 recent infection testing algorithm, Zambia PWID BBS 2021



Active syphilis testing

Active syphilis testing was conducted using the DPP Syphilis Screen and Confirm Assay (Chembio, Medford, NY) for the simultaneous detection of antibodies against nontreponemal and *Treponema pallidum* antigens, with confirmatory testing using the SD BIOLINE Syphilis 3.0 (Abbott Molecular Inc., Chicago, Illinois, United States). SD BIOLINE is approved by the Zambian Government and the result was returned to the participant according to the standard of care.

HBV and HCV testing

The Determine HBsAg (Abbott Molecular Inc., Chicago, Illinois, United States, formerly Alere) was used to test for HBV, which indicates acute or chronic HBV infection. SD BIOLINE HCV (Abbott Molecular Inc., Chicago, Illinois, United States, formerly Alere) was used to test for HCV antibodies. Since a reactive test result for HCV cannot distinguish between current or resolved infections, all HCV rapid test reactive specimens were tested for HCV RNA by PCR to confirm current HCV at the TDRC laboratory.

Return of results

The HIV nurse counselor provided participants with test results for HIV, active syphilis, HBV, HCV, and viral load. Post-test counseling messages were tailored to participants' test results and risk profiles and included goals, means, and strategies for behavioral risk reduction, maintenance of risk reduction, and explanation of risk reduction methods (such as condom use). Participants who tested HIV positive received their HIV viral load results during their second visit.

Linkages to care

At all PWID BBS locations conducting biomarker testing, collaborations were developed between the survey team and local clinics and NGOs that can provide HIV, active syphilis, HBV, and HCV services and linkage to care. Referrals were conducted as follows:

- Participants testing positive for HIV, active syphilis, HBV, or HCV were offered a referral or escort by a peer educator for relevant care and/or treatment at collaborating clinics providing KP-friendly health services.

- Participants reporting symptoms of STIs (eg, urethral discharge, genital ulcer, anal sores, and warts) were referred to collaborating clinics for treatment.
- HIV-negative individuals were referred to KP-friendly clinics to initiate PrEP.
- Participants were offered active linkage via a peer educator to access referrals. Participants were referred to healthcare facilities where healthcare personnel had been sensitized about KP and the importance of providing friendly and non-discriminatory services to this population. At the time of the survey, harm reduction service interventions such as methadone maintenance treatment were not available.

2.7 SECOND VISIT

All participants were asked to return to the survey site to provide information about the number and characteristics of peers they approached. The second visit was scheduled when referral coupons had already been collected, typically two weeks after the initial visit. Participants were allowed to attend the second visit before the scheduled appointment date; however, reimbursement for transportation was only given once. The interviewer used the second visit form to ask the participant how many eligible recruits he or she approached, how many referral coupons he or she handed out, as well as some basic information about those they approached who had refused to accept the coupon, and why they thought these potential survey participants had refused the coupon.

2.8 PARTICIPANT COMPENSATION

Survey participants received K240 (US $13) in cash for their time and for transportation costs. The participant also received K55 (US $3) for each referred peer who completed a survey, as well as K92 (US $5) for transportation for returning for their secondary visit. The maximum compensation for the second visit was therefore K257 (US $14). The combined maximum value of primary and secondary compensation including transportation was K497 (USD $27) per RDS participant.

2.9 DATA MANAGEMENT AND ANALYSIS

Population size estimates

All paper-based distributor's logs were kept in a secure locked cabinet in a locked office at the survey site and brought to the central survey office at the end of each capture. Data from each log were entered into Excel databases stored on password protected computers.

Biological behavioral survey

Survey data were directly entered by the interviewer into password protected tablets programmed in Open Data Kit language (SurveyCTO). To ensure quality of data, built in checks were programmed into SurveyCTO and verification of completeness and internal consistency was performed.

No participant identifying information was documented on survey tools; participants were only identified by the survey ID (SID) and unique participant code (UPC). All completed paper screening forms, consent forms, coupons and survey logs were kept in secure locked files during data collection at the survey sites. The team used the RDSCM for data management and to link the UPC and SID, and to track recruitment processing and coupons.

Merging of data sources (biometric results and questionnaire responses) was conducted by ICAP analysts using SAS or Stata. All databases were password protected and data were encrypted before transmission over public networks.

Specialized analyses were conducted to produce population prevalence estimates and CIs of variables adjusting for unequal probabilities of inclusion due to varying social network sizes and similarities in characteristics of persons within their social networks. The analysis of RDS data required adjustment for social network size and homophily (a diagnostic statistic that describes the mixing patterns in networks and is calculated by RDS software) within networks. RDS Analyst (RDS-A) was used to produce population point prevalence estimates and 95% CIs for key

indicator variables. The data (along with the individual survey weights) were exported into SAS or Stata for more complex analyses not possible with RDS-A.

2.10 ETHICAL CONSIDERATIONS

Enrollment of minors

In Zambia, the legal age of consent is 16 years. The inclusion of minors aged 16-17 years in the formative assessment and BBS was a priority for NAC given the high incidence of HIV in this age group and little available data. Therefore, they were included in these activities. All participation was confidential, with referrals to local resources provided to all emancipated minor participants who reported sex work or trafficking. Note that for reporting purposes in this document, when aggregated with adults, older adolescents will be referred to as men or women, depending on their assigned sex at birth.

Potential risks

There was a slight risk of loss of privacy for participants. Disclosure of information may have subjected persons to discrimination and potential harm. To minimize this, all survey staff were trained in Good Clinical Practices and signed a confidentiality agreement. Additionally, survey locations were selected so that confidentiality was maintained. Participants could refuse to answer any questions and discontinue participation at any time.

During the formative phase, investigators took all necessary precautions to protect IDI and FGD participants and avoid putting them in danger of harassment or arrest. Thus, letters of permission and support from Ministry of Home Affairs (police) and Drug Enforcement Commission (DEC) were obtained for assurance to not prosecute researchers and PWID participants during the survey period. Prior to initiating the survey, a community sensitization event was held whereby key members of the community, including law enforcement, were informed of the survey.

Diagnosis of HIV infection may also subject participants to psychological and emotional stress and self-stigma. To minimize these harms, the investigators provided trained counselors to offer consenting participants with pre- and post-test counseling. Participants who tested HIV positive and received their result or who needed active syphilis treatment were linked to care at a health facility appropriate for PWID. The survey engaged and worked in collaboration with the health facilities to meet the increased demands of health services created by the survey.

Potential benefits

The primary benefits of the survey were to produce reliable data on the HIV epidemic and social welfare needs of the PWID community in Zambia and to inform program and policy managers. While HIV counseling and testing are available to all persons free of charge in Zambia, survey participants still gained individual benefits including the provision of counseling and testing for HIV, active syphilis, HBV, and HCV at the survey site, as well as linkage to further care and treatment for participants with these conditions. Free condoms, lubricants, health information, and referral services (ie, PrEP referrals for HIV-negative participants) were also provided. Participants may have benefited from meaningfully contributing to survey efforts and gaining knowledge on how to improve HIV prevention, health services and social protections for their communities. Lastly, those with drug withdrawal syndromes or victims of abuse were linked to appropriate services.

Approvals and administrative support

This protocol was submitted for administrative and ethical approvals to the CDC Global Health Center Associate Director for Science, Columbia University Medical Center (CUMC) Institutional Review Board (IRB), TDRC, and the Zambia MoH National Health Research Authority (NHRA). Permission and administrative approval from the Zambia MoH and NHRA were obtained prior to data collection. Letters of support from the Ministry of Home Affairs (Police) and DEC was obtained to ensure that researchers and PWID participants were not prosecuted during the survey period.

2.11 POPULATION SIZE ESTIMATIONS

Three methods were used to estimate the size of the population based on the responses obtained during the survey. Since there is no gold standard method for PSE, multiple methods were employed to strengthen confidence in the estimates and provide upper and lower plausibility bounds, and to reduce the likelihood that biases of any single method would substantially alter results. The following PSE methods were used: service multiplier, 3-source capture-recapture, and successive sampling.

Service multipliers

The survey allowed for the integration of service multipliers, which entailed determining the overlap in two independent data sources with the following steps:

1. Adding questions to the PWID survey instrument asking about the use of specific services or facilities or membership in a group.

2. Obtaining the unduplicated counts of the PWID using the above services or facilities, membership lists, or participating in a research project.

Using these two data sources, the multiplier method provides a population size estimate by the formula:

$$N = n / p$$

Here, N represents the specific KP population size estimate, n represents the number of PWID using a particular prevention or healthcare service in a specified time-period and p represents the proportion of PWID survey participants reporting using the service during the same specified time-period. To prevent overestimation of population size, service providers must be able to validate that individuals belong to the population of interest and produce unduplicated counts of individuals. Data on the number of PWID who used two health providers for HIV-related services were identified as sources of multipliers during the formative assessment.

3-source capture-recapture

Capture-recapture involves iteratively capturing population members and identifying how many were recaptured in each successive capture. There are four main assumptions that must hold for this method to produce accurate results: individual captures are independent from one another, the population is closed (ie, no in- or out- migration), homogeneity in capture probabilities, and accurate capture history of each population member. The first assumption, independence of captures, can be relaxed when three or more sources are used, as interaction can be addressed during analysis.

A fixed number of two different unique objects was distributed to PWID at each survey location. The goal was to distribute twice as many of each unique object as the sample size in each location. Appropriate unique objects, distributors, locations, and times were determined during the formative assessment and through discussions with stakeholders. Potential objects were deemed to be acceptable among the KP and have intrinsic value.

Investigators identified 10-30 PWID in each survey location to serve as volunteer object distributors. Distributors were different for each capture to facilitate independence between captures. All distributors participated in a half-day training where they were trained on assessment of eligibility prior to giving out unique objects, guidance on offering unique objects to PWID, maintaining anonymity, confidentiality, and safety in the field, and instructions on completing the distributor's log. Distributors for each distribution were split into at least two training groups to limit their interaction.

Each distributor was assigned a time and location where they distributed unique objects while wearing a memorable article of clothing. Distributors approached population members they believed met the eligibility criteria. For each capture round, distributors offered only one object per person and recorded the number of people approached, and, of those, the number who accepted or refused the unique object, and the number of objects distributed in a log.

To facilitate the assumption of a closed population the second capture was conducted 1 week after the completion of the first capture. During the second capture, in addition to distributing the second unique object, distributors asked individuals approached if they received a unique object from a person wearing a similar article of clothing as them. Individuals were asked whether they received any gift/unique object in the past 1 week. If yes, then they were asked to produce the object or describe it. To confirm, they were shown a sheet with pictures of different unique objects, one of which was distributed, and asked if they received any of these objects from someone wearing a similar article of clothing as them. Responses were recorded in the unique object distribution log for the second capture.

The final capture was the RDS survey. Questions regarding the unique objects in both captures were included in the survey to determine whether participants received either, both, or none of the unique objects distributed.

Sequential sampling PSE

The survey produced a PSE through a method called sequential sampling PSE (SS-PSE), which models the total number of persons in the population using RDS data. The method used responses to a survey question which asked participants the total number of peers in their network that they could recruit into the survey and applied a Bayesian approach to estimate the probable size of the target population.

Population size estimation analyses

Using the statistical software R (version 4.0.5), three independent methods were used to estimate the population size of PWID in the six months leading up to the survey at each site. Three-source capture-recapture (3-SCR) estimates were based on two sampling events approximately one week apart at community sites combined with data from the survey participants. Estimates and 95% CIs were calculated with Bayesian nonparametric latent-class models in the R shinyrecap package.[7] SS-PSE figures were computed from the RDS recruitment and personal network size information using the sspse package (version 0.6) in R. Imputed visibility was used to help account for measurement errors in self-reported network size. Finally, service multiplier estimates were computed using data from two health providers on the number of people who used them for HIV-related services, combined with data from the RDS about how many participants had used those services. Bootstrapped 95% CIs were computed for the service multiplier estimates.[3]

- Consensus estimates of PWID population size in the six months before the survey accounted for 0.24%-0.93% of the population of each of the survey districts. Among the three sites, the eligible survey population was largest in Lusaka, with an estimated population size between 1,500-7,500 people, representing 0.24% of the district population. In Livingstone, the estimated population size was between 900-1,900 people, representing 0.93% of the district population. In Ndola, the estimated population size was between 1,600-2,900 people, representing 0.56% of the district population (Table 2.11).

Table 2.11: Population size estimation by site

Population size estimates of people who have injected drugs (PWID) in the 6 months before the survey at three sites in Zambia, by site, Zambia PWID BBS 2021

	Consensus Estimate				3-SCR		SS-PSE	
Site	Estimate (median)	95% credible interval	% of district population†	% of male population in district†	Estimate (median)	95% credible interval	Estimate (median)	95% credible interval
Livingstone	1,200	900-1,900	0.93%	1.84%	2,600	1,500-4,700	400	300-500
Lusaka	3,700	1,500-7,500	0.24%	0.47%	2,300	1,700-10,700	2,000	700-30,400
Ndola	2,200	1,600-2,900	0.56%	1.12%	3,300	2,800-3,900	800	400-3,100

Methods and Abbreviations:
PWID, people who inject drugs.
Consensus estimate: Calculated using a Bayesian Consensus Estimator from the results of the other estimation methods.
3-SCR: Three-Source Capture-Recapture using two capture events and the RDS survey population.
SS-PSE: Sequential Sampling Population Size Estimation using the RDS survey data and recruitment records.
† Based upon comparison with government of Zambia district population projections. Source: ZamStat 2021 Adjusted District Population Estimates (December 2021).

2.12 SAMPLE AND NETWORK CHARACTERISTICS

- Overall, six to eight seeds were used to recruit the full sample. The average number of recruits per seed ranged from 38.2 in Livingstone to 57.0 in Lusaka. The mean number of waves ranged from 3.9 in Lusaka to 4.8 in Livingstone. The coupon return rate was similar across sites, ranging from 48.2%-53.8% (Table 2.12.1).
- The percent eligible among all screened participants ranged from 72.9% eligible in Lusaka, 85.5% in Ndola, to 94.4% in Livingstone. Eligible participants were enrolled and tested for biomarkers at all sites. The proportion of participants who returned for a second visit was similar across sites (71.0%-74.9%; Table 2.12.2).

Table 2.12.1: Recruitment statistics by site

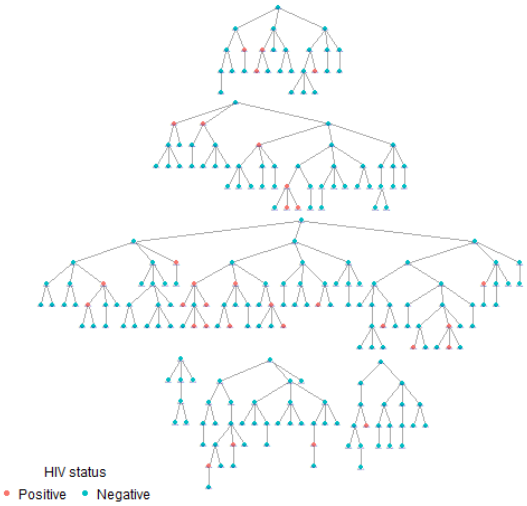
Recruitment statistics among people who inject drugs (PWID) by site Zambia PWID BBS 2021					
Site	Number of seeds	Mean (median) number of recruits by seed	Mean number of waves	Longest wave	Coupon return rate (%)
Livingstone	6	38.2 (28.5)	4.8	6	48.2
Lusaka	8	57.0 (4.5)	3.9	18	51.5
Ndola	6	42.2 (32.0)	4.5	8	53.8
Coupon return rate: proportion of coupons distributed which were returned to survey sites by potential participants					

Table 2.12.2: Screening, enrollment, and testing statistics by site

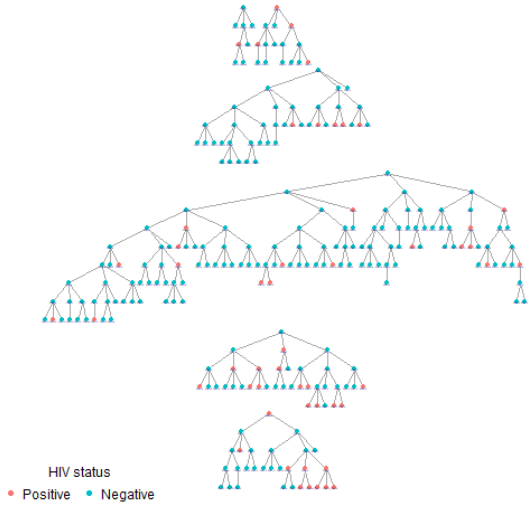
Screening, enrollment, and testing statistics among people who inject drugs (PWID) by site, Zambia PWID BBS 2021									
	Screened	Eligible		Enrolled		Tested for biomarkers		Returned for second visit	
Site	n	n	% of those screened	n	% of those eligible	n	% of those enrolled	n	% of those enrolled
Livingstone	249	235	94.4%	235	100.0%	235	100.0%	176	74.9%
Lusaka	479	349	72.9%	349	100.0%	349	100.0%	253	72.5%
Ndola	303	259	85.5%	259	100.0%	259	100.0%	184	71.0%

Figure 2.12.1 Recruitment trees by site and HIV status, Zambia PWID BBS 2021

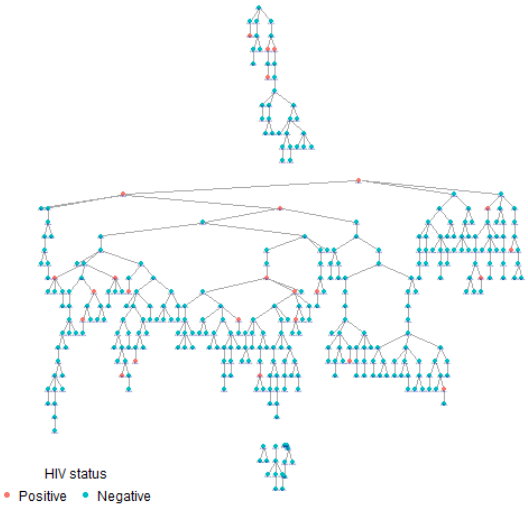
Livingstone



Ndola



Lusaka



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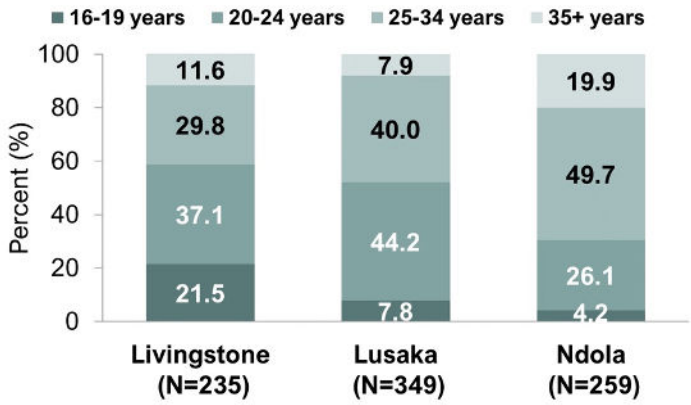
3. RESULTS

3.1 DEMOGRAPHIC CHARACTERISTICS

Key findings

- The median age of PWID ranged from 22 years for men to 29 for women in Livingstone; 25 years for men to 22 for women in Lusaka; and 27 years for men and 29 for women in Ndola (Table 3.1 and Figure 3.1.).
- Across the sites, more than half of the PWID had completed secondary school (range: 52.9%-82.6%), except for the women in Livingstone, where 35.8% had completed secondary school, though it should be noted more than a third of the female population was still quite young, aged 16-19 years (Table 3.1.).
- More than half of PWID were unemployed in Livingstone (53.7% of men, 78.3% of women) and Lusaka (77.9% of men, 69.7% of women), while in Ndola, 41.5% of men and 49.0% of women, respectively, were unemployed. Full-time employment was uncommon regardless of sex or site, ranging from 0.0%-5.6% (Table 3.1).

Figure 3.1: Age group distribution among PWID by site, Zambia PWID BBS 2021



- Across all sites, a large proportion of PWID were single and had never married, ranging from 51.7% of women in Ndola to 79.6% of men in Livingstone, while divorce was common (13.5% of men and 19.6% of women in Livingstone; 21.0% of men and 1.7% of women in Lusaka; and 17.7% of men and 30.6% of women in Ndola were divorced). Being married was less common among PWID across the sites; 6.9% of the men and 3.9% of the women in Livingstone, 8.4% of the men and 14.0% of the women in Lusaka, and 18.6% of the men and 13.3% of the women in Ndola were married (Table 3.1).
- Most PWID have a regular place to sleep at night, ranging from 75.7% of women in Lusaka to 100.0% of men in Ndola. In the six months leading up to the survey, sleeping away from home was common in Livingstone and Lusaka; 18.0% of men and 41.7% of women in Livingstone and 20.5% of men and 44.3% of women in Lusaka spent more than 90 nights away from home. This was not as common in Ndola, where 12.6% of men and 7.4% of women spent more than 90 nights away from home in the prior 6 months (Table 3.1).

Table 3.1: Demographic and other characteristics among people who inject drugs, by sex and site

Demographic characteristics among people who inject drugs (PWID) by sex and by site, Zambia PWID BBS 2021												
	Livingstone				Lusaka				Ndola			
	Male (N=199)		Female (N=36)		Male (N=335)		Female (N=13)		Male (N=173)		Female (N=77)	
Characteristic	%	n	%	n	%	n	%	n	%	n	%	n
Age in years												
16-19	19.4	42	34.1	*	7.7	26	13.5	*	2.2	7	9.4	*
20-24	42.8	82	8.2	*	43.3	135	72.5	9	26.5	49	19.1	15
25-29	16.0	31	18.0	8	28.3	103	0.0	0	31.3	51	31.8	25
30-34	12.3	25	18.6	8	12.6	44	10.8	*	20.2	33	18.7	*
35 or older	9.5	19	21.4	9	8.1	27	3.2	*	19.9	33	20.6	20
Age in years												
Median age (IQR)	22 (20-28)		29 (23-34)		25 (22-29)		22 (21-24)		27 (23-32)		29 (24-35)	

Table 3.1: Demographic and other characteristics among people who inject drugs, by sex and site (continued)

Demographic characteristics among people who inject drugs (PWID) by sex and by site, Zambia PWID BBS 2021												
	Livingstone				Lusaka				Ndola			
	Male (N=199)		Female (N=36)		Male (N=335)		Female (N=13)		Male (N=173)		Female (N=77)	
Characteristic	%	n	%	n	%	n	%	n	%	n	%	n
Highest level of education completed												
No formal education	6.2	11	11.8	*	6.8	24	1.7	*	0.0	0	0.0	0
Primary	34.2	73	47.8	18	30.9	97	45.4	*	12.4	19	13.6	*
Secondary	53.5	102	35.8	15	56.5	195	52.9	6	73.5	131	82.6	61
Tertiary	4.7	*	3.4	*	5.3	*	0.0	0	10.2	*	0.0	0
Vocational†	1.6	*	0.0	0	0.5	*	0.0	0	3.9	*	3.9	*
Lozi	28.3	60	24.1	8	6.0	16	0.0	0	3.9	6	3.9	*
Tonga	13.8	25	8.5	*	8.5	29	19.4	*	4.7	9	9.4	6
Nsenga/Ngoni	13.8	28	15.0	5	23.1	81	6.5	*	17.1	31	13.8	10
Bemba	15.0	30	24.7	8	28.9	95	11.9	*	42.8	67	49.6	37
Lala	1.2	*	0.0	0	1.2	*	0.0	0	5.7	10	5.4	*
Lamba	0.3	*	2.1	*	0.7	*	0.0	0	3.4	9	4.4	*
Kaonde	0.7	*	0.0	0	1.8	8	0.0	0	3.8	7	1.4	*
Other	27.3	51	25.8	10	29.8	99	62.2	7	18.7	34	12.2	12
Country of origin												
Zambia	100.0	199	100.0	36	99.7	*	100.0	13	99.1	*	99.4	*
Other African country	0.0	0	0.0	0	0.3	*	0.0	0	0.9	*	0.6	*
Employment status												
Permanent job	5.6	11	0.4	*	1.5	*	0.0	0	5.5	16	0.9	*
Temporary job	10.8	19	2.0	*	8.6	27	1.7	*	14.0	25	18.0	8
Full-time pupil/student	5.1	8	6.1	*	0.8	*	0.0	0	6.5	8	1.8	*
Retired	0.0	0	0.7	*	0.0	0	0.0	0	0.0	0	0.0	0
Unemployed	53.7	105	78.3	25	77.9	263	69.7	8	41.5	64	49.0	40
Other	24.9	56	12.5	*	11.2	36	28.6	*	32.6	60	30.6	26
Income earned last month, Kwacha‡												
0-500	60.7	123	62.8	21	39.0	114	44.0	5	31.2	55	39.5	32
501-1000	24.8	48	19.0	8	23.5	86	33.8	*	32.4	54	31.6	24
1001-1500	8.8	15	11.2	*	12.4	49	15.4	*	17.9	36	22.5	13
1501+	5.7	13	6.8	*	25.1	82	6.9	*	18.5	26	6.6	6
Marital status												
Single, never married	79.6	158	67.7	20	70.4	231	69.7	8	61.5	109	51.7	36
Married	6.9	*	3.9	*	8.4	31	14.0	*	18.6	33	13.3	*
Separated/divorced	13.2	22	19.6	10	21.0	72	1.7	*	17.7	*	30.6	26
Widowed	0.3	*	8.9	*	0.2	*	14.6	*	2.2	*	4.4	*
How many living children at time of survey?												
No children	63.5	124	33.2	8	53.1	159	42.7	5	46.3	81	21.8	*
1 child	24.4	49	27.0	11	31.2	120	46.5	*	27.3	50	38.0	29
2 children	7.5	15	26.9	12	10.1	33	10.8	*	12.9	22	23.6	20
3 to 5 children	4.7	11	8.9	*	5.3	*	0.0	0	11.5	*	15.8	14
More than 5 children	0.0	0	3.5	*	0.4	*	0.0	0	2.0	*	0.7	*
Median (IQR)	0 (0-1)		1 (1-2)		1 (0-1)		1 (0-1)		1 (0-1)		1 (1-2)	
Religion												
Christianity	92.6	183	94.4	*	90.0	297	73.0	10	94.7	159	96.1	73
Islam	2.3	*	5.5	*	4.2	*	10.8	*	0.7	*	0.0	0
Traditional and other	1.0	*	0.0	0	0.7	*	0.0	0	2.6	*	0.9	*
None	4.2	8	0.0	0	5.2	19	16.2	*	2.1	6	3.0	*

Table 3.1: Demographic and other characteristics among people who inject drugs, by sex and site (continued)

Demographic characteristics among people who inject drugs (PWID) by sex and by site, Zambia PWID BBS 2021												
	Livingstone				Lusaka				Ndola			
	Male (N=199)		Female (N=36)		Male (N=335)		Female (N=13)		Male (N=173)		Female (N=77)	
Characteristic	%	n	%	n	%	n	%	n	%	n	%	n
Regular place to sleep at night												
Yes	92.9	186	94.3	*	87.0	293	75.7	*	100.0	173	98.2	*
No	7.1	13	5.6	*	13.0	42	24.3	*	0.0	0	1.8	*
Shelter type												
House	91.9	184	90.9	33	47.9	149	55.2	7	80.8	143	90.4	69
Apartment	0.7	*	3.5	*	25.2	88	11.3	*	3.8	6	0.0	0
Dormitory	0.0	0	0.0	0	9.4	35	17.3	*	15.4	24	7.8	*
Community center	0.0	0	0.0	0	1.9	11	0.0	0	0.0	0	0.0	0
Street/homeless	3.3	8	0.0	0	11.8	39	5.4	*	0.0	0	1.8	*
Other	4.1	*	5.9	*	3.8	13	10.8	*	0.0	0	0.0	0
Number of times away from home for at least one night in the six months before the survey												
0	31.7	60	22.5	9	25.4	92	19.0	*	19.8	31	20.2	17
1-14	27.3	54	27.1	9	32.9	96	15.1	*	41.5	72	55.1	38
15-44	14.3	27	6.2	*	15.4	46	16.2	*	19.8	32	7.9	8
45-89	8.7	17	3.0	*	5.7	21	5.4	*	6.3	18	9.6	8
More than 90	18.0	41	41.7	13	20.5	78	44.3	5	12.6	20	7.4	5

*To protect the identity of survey respondents, numerators greater than 0 but less than 5 are suppressed with an asterisk. In addition, in categories where a numerator that was greater than 0 but less than 5 could be guessed, the next lowest numerator is also suppressed with an asterisk.
†Vocational training refers to skills training qualifications mainly in construction such as carpentry, plumbing, brick laying, and tailoring.
‡Retired or unemployed participants were not asked this question.
Note that the denominator for a characteristic may differ from the site total due to nonresponse or missing data. Also, due to rounding, estimated total sums may not equal 100.0%.

3.2 HIV PREVALENCE

Key findings

- HIV prevalence varied among men and women who inject drugs across sites. In Livingstone, HIV prevalence was over seven times higher among women (42.4%) compared to men (6.0%), and a similar pattern emerged among PWID in Lusaka, with an HIV prevalence over eight times higher among women (48.6%) compared with men (5.7%). However, in Ndola, HIV prevalence was 28.8% among women and 15.2% men (Table 3.2.1).
- HIV prevalence was generally higher among older PWID—among men in Livingstone (35.9% of men aged 35 years and older vs 4.3% of men aged 25-29 years) and in Ndola (36.3% of men aged 35 years and older vs 2.0% of those aged 20-24 years). Among women aged 35 years and older, HIV prevalence was 52.4% in Ndola, 85.0% in Livingstone, and 100% in Lusaka, although the numbers were small (Table 3.2.1).
- The proportion of PWID living with HIV achieving VLS ranged from 38.1% of men in Lusaka to 77.3% of men in Livingstone, and from 45.2% of women in Ndola to 69.4% of women in Livingstone (Table 3.2.1).
- Based on the RITA (see section 2.6), there were no recent infections among PWID who tested positive in Livingstone or Lusaka, but 3.3% of those who tested positive in Ndola had been recently infected. Most of those who tested positive in the survey had long-term HIV infections (Table 3.2.2).

- Only 27.6%, 38.5%, and 60.7% of PWID in Livingstone, Ndola, and Lusaka, respectively, who tested positive in the survey said they were aware of their HIV-positive status. However, based on viral load-adjustment (having a viral load < 200 copies/mL, see section 2.4) actual awareness of HIV-positive status was 61.9% in Ndola, and even higher in Livingstone (73.7%). In Lusaka, 65.6% were aware based on viral load-adjustment, which was closer to the proportion that voluntarily disclosed their status (60.7%; Table 3.2.3).

Table 3.2.1: HIV prevalence and viral load suppression among people who inject drugs by sex and site

HIV prevalence among people who inject drugs (PWID) and viral load suppression (VLS) among PWID who are living with HIV by age (years) and site, Zambia PWID BBS 2021

	Livingstone (N=235)						Lusaka (N=348)						Ndola (N=250)					
	Male (N=199)			Female (N=36)			Male (N=335)			Female (N=13)			Male (N=173)			Female (N=77)		
	%	95% CI	n	%	95% CI	n	%	95% CI	n	%	95% CI	n	%	95% CI	n	%	95% CI	n
HIV prevalence																		
16-19	3.1	0.0-7.1	*	10.3	0.0-30.6	*	-	-	0	60.0	0.0-100.0	*	-	-	0	-	-	0
20-24	2.6	0.0-7.1	*	51.1	0.0-100.0	*	3.2	0.0-6.5	*	51.4	15.5-87.3	*	2.0	0.0-5.4	*	18.4	0.0-38.6	*
25-29	4.3	0.0-11.5	*	39.8	5.8-73.9	*	3.8	0.0-7.6	*	-	-	0	14.2	0.7-27.8	6	16.6	0.5-32.9	*
30-34	-	-	0	50.0	9.6-90.4	*	21.1	7.2-34.8	8	-	-	0	15.4	0.7-30.3	*	46.6	11.8-82.2	8
35 or older	35.9	12.8-58.6	9	85.0	60.3-100.0	7	7.8	0.0-18.3	*	100.0	-	*	36.3	18.6-54.2	8	52.4	30.7-74.3	11
Total	6.0	3.0-9.0	14	42.4	25.8-59.4	18	5.7	3.1-8.4	19	48.6	30.9-66.3	6	15.2	8.1-22.1	19	28.8	17.5-40.3	28
VLS prevalence																		
16-19	-	-	0	100.0	-	*	-	-	0	100.0	-	*	-	-	0	-	-	0
20-24	100.0	-	*	50.0	0.0-100.0	*	53.2	0.3-100.0	*	43.5	0.0-100.0	*	-	-	0	30.8	0.0-77.7	*
25-29	100.0	-	*	33.8	0.0-84.7	*	16.5	0.0-47.3	*	-	-	0	24.0	0.0-58.8	*	-	-	0
30-34	-	-	0	100.0	-	*	39.3	1.9-76.7	*	-	-	0	75.4	31.7-100.0	*	59.1	21.3-98.5	*
35 or older	81.0	56.8-100.0	7	67.5	25.1-100.0	5	35.7	17.6-53.8	*	0.0	-	0	67.5	30.5-100.0	6	60.3	26.8-93.0	7
Total	77.3	60.8-94.9	10	69.4	49.3-89.3	13	38.1	14.9-61.2	7	50.0	4.0-96.0	*	54.2	30.5-78.2	10	45.2	26.2-64.3	15

*To protect the identity of survey respondents, numerators greater than 0 but less than 5 are suppressed with an asterisk. In addition, in categories where a numerator that was greater than 0 but less than 5 could be guessed, the next lowest numerator is also suppressed with an asterisk.
Note that the denominator for a characteristic may differ from the site total due to nonresponse or missing data. Also, due to rounding, estimated total sums may not equal 100.0%.

Table 3.2.2: HIV biomarkers by site

Recent HIV infection and viral load distribution among all people who inject drugs (PWID) living with HIV by site, Zambia PWID BBS 2021

	Livingstone (N = 32)			Lusaka (N = 26)			Ndola (N = 52)		
	%	95% CI	n	%	95% CI	n	%	95% CI	n
Recent infection testing algorithm (RITA)									
Recent infection	0.0	-	0	0.0	-	0	3.3	0.0-8.1	*
Long-term infection	100.0	-	31	100.0	-	26	96.7	92.4-100.0	*
Viral load result									
<1000 copies/mL	73.8	57.7-89.0	23	39.7	18.2-61.3	9	55.3	38.2-72.4	29
≥1000 copies/mL	26.7	11.0-41.0	9	60.3	38.4-82.2	17	44.8	26.8-62.3	23

*To protect the identity of survey respondents, numerators greater than 0 but less than 5 are suppressed with an asterisk. In addition, in categories where a numerator that was greater than 0 but less than 5 could be guessed, the next lowest numerator is also suppressed with an asterisk.
Note that the denominator for a characteristic may differ from the site total due to nonresponse or missing data. Also, due to rounding, estimated total sums may not equal 100.0%.

Table 3.2.3: HIV testing history, risk perception, and awareness of HIV-positive status, by HIV test result during the first survey visit and site

HIV testing history, perceived risk of having HIV, and awareness of HIV-positive status among people who inject drugs (PWID) who received an HIV-positive result during the first survey visit, by site, Zambia PWID BBS 2021									
	Livingstone (N = 32)			Lusaka (N = 26)			Ndola (N = 52)		
	%	95% CI	n	%	95% CI	n	%	95% CI	n
Ever tested for HIV									
Yes	85.0	70.9 - 98.8	*	77.2	58.9 - 95.5	21	83.5	70.8 - 96.0	45
No	15.2	1.0 - 29.5	*	22.8	4.0 - 41.5	5	16.5	4.1 - 29.3	7
Among those ever tested, timing of last HIV test									
In the six months before the survey	45.3	28.0 - 62.7	13	33.8	13.3 - 54.3	*	40.0	25.1 - 54.7	*
6-12 months before the survey	20.3	3.8 - 36.8	5	17.6	0.0 - 36.2	*	7.7	0.0 - 18.2	*
More than 12 months before the survey	34.4	15.9 - 53.2	10	48.6	21.8 - 75.4	10	52.5	37.2 - 67.9	25
Thought it was possible that they might have HIV at the time of the first survey visit									
Yes	45.6	21.0 - 70.8	7	20.0	0.0 - 71.5	*	69.7	48.9 - 91.7	11
No	54.4	29.4 - 78.8	10	80.0	28.5 - 100.0	*	30.3	8.4 - 50.8	7
Aware of HIV-positive status†									
Yes	27.6	12.5 - 42.3	10	60.7	40.5 - 80.8	17	38.5	23.5 - 53.5	22
No	72.5	58.3 - 86.7	22	39.3	18.2 - 60.5	9	61.6	47.9 - 76.1	30
Viral load-adjusted awareness of HIV-positive status‡									
Yes	73.7	59.2 - 88.4	23	65.6	44.4 - 86.9	18	61.9	47.3 - 76.4	32
No	26.4	10.4 - 41.1	9	34.4	14.1 - 54.7	8	38.0	22.8 - 53.3	20

*To protect the identity of survey respondents, numerators greater than 0 but less than 5 are suppressed with an asterisk. In addition, in categories where a numerator that was greater than 0 but less than 5 could be guessed, the next lowest numerator is also suppressed with an asterisk.
†Awareness of HIV-positive status based upon self-report during survey interview.
‡Viral load-adjusted awareness of HIV-positive status was based upon self-report and/or having a viral load < 200 copies/mL.
Note that the denominator for a characteristic may differ from the site total due to nonresponse or missing data. Also, due to rounding, estimated total sums may not equal 100.0%.

3.3 HIV CARE, ART USE, VIRAL LOAD SUPPRESSION AND TB SERVICES

UNAIDS set the 95-95-95 targets with the aim that by 2025, 95% of all people living with HIV would know their status, 95% of those who were diagnosed would be on ART, and 95% of those who were on ART would have VLS.

Key findings

For the conditional 95-95-95, the denominator for the second and third 95 is the value of the preceding 95. The estimates for awareness of HIV-positive status and being on ART are based on self-report and adjusted for viral load below 200 copies per mL,* by site (Table 3.3.1.)

- *In Livingstone*, 72.9% of PWID living with HIV were aware of their HIV-positive status, 100.0% those who were aware of their HIV-positive status were on ART, and 100.0% of those on ART had VLS.

*Young PW, Zielinski-Gutierrez E, Wamicwe J, et al. Use of viral load to improve survey estimates of known HIV-positive status and antiretroviral treatment coverage. *AIDS*. 2020;34(4):631-636. doi:10.1097/QAD.0000000000002453

- *In Lusaka*, 66.0% of PWID living with HIV were aware of their HIV-positive status, 82.0% those who were aware of their HIV-positive status were on ART, and 73.3% of those on ART had VLS.
- *In Ndola*, 61.9% of PWID living with HIV were aware of their HIV-positive status, 100.0% those who were aware of their HIV-positive status were on ART, and 83.7% of those on ART had VLS.

For the overall 95-95-95, the denominator for the second and third 95 is all the PWID living with HIV at each site. The overall 95-95-95 target of VLS among all the PWID living with HIV (the product of 95% of those living with HIV diagnosed, 95% of those diagnosed on treatment, and 95% of those on treatment achieving VLS [95x95x95]) is 85.7% or greater. The estimates for awareness of HIV-positive status and being on ART are based on self-report and adjusted for viral load below 200 copies per mL,[*] by site (Table 3.3.2).

- *In Livingstone*, 72.9% of all the PWID living with HIV were aware of their HIV-positive status; 72.9% were on ART, and 72.9% were on treatment with VLS.
- *In Lusaka*, 66.0% of all the PWID living with HIV were aware of their HIV-positive status; 54.1% were on ART, and 39.6% were on treatment with VLS.
- *In Ndola*, 61.9% of all the PWID living with HIV were aware of their HIV-positive status; 61.7% were on ART, and 51.7% were on treatment with VLS.
- Almost all PWID living with HIV had seen a provider about HIV (95.2% in Lusaka, 96.1% in Ndola, and 100% in Livingstone). While most PWID living with HIV were still in HIV care, a small proportion in Livingstone (8.8%) and Lusaka (19.3%) were no longer in care. All PWID living with HIV said they had been on ART at some time, and all were still on ART in Livingstone and Ndola, whereas in Lusaka 19.2% were not currently on ART (Table 3.3.3).
- Among PWID living with HIV, 66.6%, 69.7%, and 81.9% were screened for TB in the past 12 months in Lusaka, Ndola, and Livingstone, respectively. Among those screened, 28.2% in Livingstone, 63.8% in Lusaka, and 35.1% in Ndola had TB symptoms in the 12 months preceding the survey (Table 3.3.4).

Table 3.3.1: 95-95-95 targets (conditional) by site

Conditional achievements toward the 95-95-95 targets (viral load-adjusted)† among people who use drugs (PWID) living with HIV by site, Zambia PWID BBS 2021

	Livingstone (N = 32)			Lusaka (N = 26)			Ndola (N = 52)		
	Diagnosed†								
Age in years	% aware of HIV status	95% CI	n	% aware of HIV status	95% CI	n	% aware of HIV status	95% CI	n
16-19	51.0	21.2-80.8	*	100.0	-	*	0.0	-	0
20-24	77.5	26.5-100.0	*	76.9	33.0-100.0	6	62.9	0.0-100.0	*
25-29	56.6	21.8-91.4	*	46.8	0.0-100.0	*	30.8	7.5-53.9	*
30-34	100.0	-	*	62.9	39.8-86.0	5	73.1	50.2-97.8	8
35 or older	73.8	52.1-96.4	12	51.7	11.5-91.9	*	71.7	49.1-93.8	16
Total	72.9	60.3-87.0	23	66.0	45.7-85.6	18	61.9	47.8-76.1	32
	Livingstone (N = 23)			Lusaka (N = 18)			Ndola (N = 32)		
	On Treatment Among Those Diagnosed†								
Age in years	% on ART	95% CI	n	% on ART	95% CI	n	% on ART	95% CI	n
16-19	100.0	-	*	100.0	-	*	0.0	-	0
20-24	100.0	-	*	88.6	72.7-100.0	5	100.0	-	*
25-29	100.0	-	*	100.0	-	*	100.0	-	*
30-34	100.0	-	*	63.2	42.5-83.8	*	100.0	-	8
35 or older	100.0	-	12	89.6	48.0-100.0	*	100.0	-	16
Total	100.0	-	23	82.0	62.1-100.0	14	100.0	-	32

[†]Young PW, Zielinski-Gutierrez E, Wamicwe J, et al. Use of viral load to improve survey estimates of known HIV-positive status and antiretroviral treatment coverage. AIDS. 2020;34(4):631-636. doi:10.1097/QAD.0000000000002453

Table 3.3.1: 95-95-95 targets (conditional) by site (continued)

Conditional achievements toward the 95-95-95 targets (viral load-adjusted)† among people who use drugs (PWID) living with HIV by site, Zambia PWID BBS 2021

	Livingstone (N = 23)			Lusaka (N = 14)			Ndola (N = 32)		
	Viral Load Suppression (VLS) Among Those on Treatment								
	% with VLS	95% CI	n	% with VLS	95% CI	n	% with VLS	95% CI	n
16-19	100.0	-	*	100.0	-	*	0.0	-	0
20-24	100.0	-	*	70.3	11.8-100.0	*	100.0	-	*
25-29	100.0	-	*	30.6	4.9-56.4	*	35.1	0.0-88.1	*
30-34	100.0	-	*	100.0	-	*	84.0	75.5-92.6	7
35 or older	100.0	-	12	65.5	65.5-65.5	*	87.8	71.7-100.0	14
Total	100.0	-	23	73.3	52.1-95.4	9	83.7	73.0-95.1	26

*To protect the identity of survey respondents, numerators greater than 0 but less than 5 are suppressed with an asterisk. In addition, in categories where a numerator that was greater than 0 but less than 5 could be guessed, the next lowest numerator is also suppressed with an asterisk.
†Both awareness of HIV-positive status and on treatment status were based upon self-report or having a viral load < 200 copies/mL.
Note that the denominator for a characteristic may differ from the site total due to nonresponse or missing data. Also, due to rounding, estimated total sums may not equal 100.0%.

Table 3.3.2: 95-95-95 targets (overall) by site

Overall achievements toward the 95-95-95 targets (viral load-adjusted)† among people who use drugs (PWID) living with HIV by site, Zambia PWID BBS 2021

	Livingstone (N = 32)			Lusaka (N = 26)			Ndola (N = 52)		
	Diagnosed†								
Age in years	% aware of HIV status	95% CI	n	% aware of HIV status	95% CI	n	% aware of HIV status	95% CI	n
16-19	51.0	21.2-80.8	*	100.0	-	*	0.0	-	0
20-24	77.5	26.5-100.0	*	76.9	33.0-100.0	6	62.9	0.0-100.0	*
25-29	56.6	21.8-91.4	*	46.8	0.0-100.0	*	30.8	7.5-53.9	*
30-34	100.0	-	*	62.9	39.8-86.0	5	73.1	50.2-97.8	8
35 or older	73.8	52.1-96.4	12	51.7	11.5-91.9	*	71.7	49.1-93.8	16
Total	72.9	60.3-87.0	23	66.0	45.7-85.6	18	61.9	47.8-76.1	32
	On Treatment Among Those Diagnosed†								
	% on ART	95% CI	n	% on ART	95% CI	n	% on ART	95% CI	n
16-19	52.0	23.9-80.0	*	100.0	-	*	0.0	-	0
20-24	78.5	28.1-100.0	*	69.2	25.5-100.0	5	61.5	0.0-100.0	*
25-29	56.6	22.2-90.9	*	49.3	0.0-100.0	*	30.3	8.0-53.7	*
30-34	100.0	-	*	39.6	0.0-81.8	*	73.8	49.7-97.7	8
35 or older	74.3	52.1-96.2	12	45.6	26.2-65.0	*	72.0	50.2-93.5	16
Total	72.9	60.0-86.8	23	54.1	34.5-73.4	14	61.7	47.8-76.1	32
	Viral Load Suppression (VLS) Among Those on Treatment								
Age in years	% with VLS	95% CI	n	% with VLS	95% CI	n	% with VLS	95% CI	n
16-19	50.6	20.0-81.2	*	100.0	-	*	0.0	-	0
20-24	77.8	26.9-100.0	*	47.5	0.0-98.0	*	62.9	0.0-100.0	*
25-29	57.5	23.0-92.1	*	15.0	0.0-31.7	*	11.4	0.0-29.7	*
30-34	100.0	-	*	38.6	0.0-80.9	*	63.4	34.6-90.8	7
35 or older	74.0	52.7-95.8	12	31.0	9.1-52.9	*	63.1	41.2-85.0	14
Total	72.9	59.1-87.5	23	39.6	18.9-60.4	9	51.7	35.5-68.3	26

*To protect the identity of survey respondents, numerators greater than 0 but less than 5 are suppressed with an asterisk. In addition, in categories where a numerator that was greater than 0 but less than 5 could be guessed, the next lowest numerator is also suppressed with an asterisk.
†Both awareness of HIV-positive status and on treatment status were based upon self-report or having a viral load < 200 copies/mL.
Note that the denominator for a characteristic may differ from the site total due to nonresponse or missing data. Also, due to rounding, estimated total sums may not equal 100.0%.

Table 3.3.3: HIV care and treatment and HIV disclosure by site

HIV care and treatment and disclosure among people who inject drugs (PWID) living with HIV,† by site, Zambia PWID BBS 2021									
	Livingstone (N = 10)			Lusaka (N = 18)			Ndola (N = 24)		
	%	95% CI	n	%	95% CI	n	%	95% CI	n
Have seen a provider related to HIV									
Yes	100.0	-	10	95.2	86.0-100.0	*	96.1	89.6-100.0	*
No	0.0	-	0	4.8	0.0-14.0	*	3.9	0.0-10.4	*
If no, reason why they have never received HIV medical care from a health provide									
Feel healthy	0.0	-	0	100.0	-	*	0.0	-	0
Stigma, don't want others to know	0.0	-	0	0.0	-	0	0.0	-	0
Cost/distance to clinic	0.0	-	0	0.0	-	0	0.0	-	0
Poor attitude of health care workers	0.0	-	0	0.0	-	0	0.0	-	0
Waiting time or clinic hours not good	0.0	-	0	0.0	-	0	0.0	-	0
Other	0.0	-	0	0.0	-	0	100.0	-	*
Among those who've seen a provider for HIV care:									
In care for HIV at time of survey									
Yes	91.2	77.3-100.0	*	80.7	59.9-100.0	*	100.0	-	23
No, had stopped receiving care/going to checkups at time of survey	8.8	0.0-22.7	*	19.3	0.0-40.1	*	0.0	-	0
Among those in care, their current HIV care provider knows that they inject drugs									
Yes	17.8	4.1-31.4	*	30.9	6.6-56.4	5	37.3	15.2-57.4	6
No	82.2	68.6-95.9	*	69.1	43.6-93.4	8	62.7	42.6-84.8	17
Have had a viral load test									
Yes	89.8	81.9-97.7	*	64.7	41.8-87.9	10	100.0	-	23
No	10.2	2.3-18.1	*	35.3	12.1-58.2	7	0.0	-	0
Among those who had a viral load test, timing of last viral load test									
In the last 12 months	86.4	69.2-100.0	*	46.9	13.8-80.3	*	92.7	84.1-100.0	*
More than 12 months ago	13.6	0.0-30.8	*	53.1	19.7-86.2	*	7.3	0.0-15.9	*
Ever been on ART									
Yes	100.0	-	10	100.0	-	17	100.0	-	23
No	0.0	-	0	0.0	-	0	0.0	-	0
Among those currently in care, currently on ART									
Yes	100.0	-	10	80.8	58.9-100.0	*	100.0	-	23
No	0.0	-	0	19.2	0.0-41.1	*	0.0	-	0

Table 3.3.3: HIV care and treatment and HIV disclosure by site (continued)

HIV care and treatment and disclosure among people who inject drugs (PWID) living with HIV,† by site, Zambia PWID BBS 2021									
	Livingstone (N = 10)			Lusaka (N = 18)			Ndola (N = 24)		
	%	95% CI	n	%	95% CI	n	%	95% CI	n
While taking ART, do they use any of the following services‡									
Mobile phone text reminders	0.0	-	0	20.2	0.0-41.9	*	66.5	46.3-85.0	15
Treatment support group	0.0	-	0	24.5	1.0-49.7	*	13.5	0.7-26.3	*
Food or money support	0.0	-	0	0.0	-	0	0.0	-	0
Outreach worker or peer educator	0.0	-	0	25.0	0.9-49.5	*	6.3	0.0-13.7	*
Social support services	0.0	-	0	0.0	-	0	0.0	-	0
None of these	100.0	-	10	59.6	31.5-87.6	12	33.6	14.7-53.5	8

*To protect the identity of survey respondents, numerators greater than 0 but less than 5 are suppressed with an asterisk. In addition, in categories where a numerator that was greater than 0 but less than 5 could be guessed, the next lowest numerator is also suppressed with an asterisk.
†The number of PWID living with HIV was based upon self-report during the survey interview.
‡Responses not mutually exclusive.
Note that the denominator for a characteristic may differ from the site total due to nonresponse or missing data. Also, due to rounding, estimated total sums may not equal 100.0%.

Table 3.3.4: TB services among those living with HIV by site

Among people who inject drugs (PWID) living with HIV,† percentage screened for tuberculosis (TB) symptoms in the 12 months before the survey, percentage with TB symptoms in the 12 months before the survey, and among those with TB symptoms, percentage who received diagnostic services, by site, Zambia PWID BBS 2021									
	Livingstone (N = 10)			Lusaka (N = 18)			Ndola (N = 24)		
	%	95% CI	n	%	95% CI	n	%	95% CI	n
Screened for TB symptoms in the 12 months before the survey									
Yes	81.9	62.5-100.0	*	66.6	42.8-90.9	13	69.7	50.7-90.7	18
No	18.1	0.0-37.5	*	33.4	9.1-57.2	5	30.3	9.3-49.3	6
Experienced TB symptoms (night sweats, cough, fever, or weight loss) in the 12 months before survey									
Yes	28.2	1.3-56.5	*	63.8	39.1-88.5	13	35.1	16.4-55.1	8
No	71.8	43.5-98.7	*	36.2	11.5-60.9	5	64.9	44.9-83.6	16
Among those with TB symptoms, percentage who received a sputum test or chest x-ray in the 12 months before the survey									
Yes	56.0	56.0-56.0	*	60.6	29.1-92.3	*	78.1	41.1-100.0	*
No	44.0	44.0-44.0	*	39.4	7.7-70.9	*	21.9	0.0-58.9	*

*To protect the identity of survey respondents, numerators greater than 0 but less than 5 are suppressed with an asterisk. In addition, in categories where a numerator that was greater than 0 but less than 5 could be guessed, the next lowest numerator is also suppressed with an asterisk.
†The number of PWID living with HIV was based upon self-report during the survey interview.
Note that the denominator for a characteristic may differ from the site total due to nonresponse or missing data. Also, due to rounding, estimated total sums may not equal 100.0%.

3.4 HEPATITIS, ACTIVE SYPHILIS, AND COINFECTIONS

Key findings

- Among men who inject drugs, HBV prevalence was 2.3% in Livingstone, 4.4% in Lusaka, and 1.4% in Ndola. HBV prevalence among women who inject drugs was 8.2% in Lusaka and 5.8% in Ndola, while those in Livingstone had no HBV infections (Table 3.4).
- No HCV infection was found among men who inject drugs in Livingstone or Ndola, nor among women who inject drugs in Lusaka. HCV infection was present in 3.4% of the women who inject drugs in Livingstone and 0.9% of the women who inject drugs in Ndola, and 1.0% of the men who inject drugs in Lusaka (Table 3.4).
- Active syphilis was prevalent among PWID at all sites. Among men who inject drugs the prevalence of active syphilis was 3.5%, 3.3%, and 9.0% in Livingstone, Lusaka, and Ndola, respectively. The prevalence of active syphilis among women who inject drugs was higher compared to men: 5.0%, 31.8%, and 15.1% in Livingstone, Lusaka, and Ndola, respectively (Table 3.4).
- Among men who inject drugs living with HIV, 0.7% in Livingstone and 0.2% in Lusaka were coinfected with HBV. Among women who inject drugs living with HIV, 7.7% in Lusaka and 2.8% in Ndola were coinfected with HBV (Table 3.4).
- HIV and HCV coinfection among men who inject drugs was 0.8% in Lusaka, while coinfection among women who inject drugs was 3.4% in Livingstone and 0.9% in Ndola (Table 3.4).
- HIV and active syphilis coinfection among men who inject drugs was 1.3%, 0.5%, and 4.8% in Livingstone, Lusaka, and Ndola, respectively. HIV and active syphilis coinfection in women who inject drugs was 9.8% in Lusaka and 7.1% in Ndola (Table 3.4).
- The proportion of HIV-positive PWID who were co-infected with HBV, HCV and/or active syphilis, ranged from 1.5% of men who inject drugs in Lusaka to 18.6% of women who inject drugs in Lusaka (Table 3.4).

Table 3.4: Hepatitis B, hepatitis C, active syphilis, and HIV coinfections by site

Prevalence of hepatitis B virus (HBV), hepatitis C virus (HCV), active syphilis, and HIV coinfections among people who inject drugs (PWID) by site, Zambia PWID BBS 2021

	Livingstone						Lusaka						Ndola					
	Male (N = 199)			Female (N = 36)			Male (N = 335)			Female (N = 13)			Male (N = 173)			Female (N = 77)		
	%	95% CI	n	%	95% CI	n	%	95% CI	n	%	95% CI	n	%	95% CI	n	%	95% CI	n
HBV																		
Positive	2.3	0.5-4.2	5	0.0	-	0	4.4	1.7-7.1	15	8.2	0.0-28.3	*	1.4	0.3-2.5	*	5.8	1.6-10.0	6
Negative	97.7	95.8-99.5	194	100.0	-	36	95.6	92.9-98.3	320	91.8	71.7-100.0	*	98.6	97.5-99.7	*	94.2	90.0-98.4	71
HCV																		
Positive	0.0	-	0	3.4	0.0-9.0	*	1.0	0.0-2.2	*	0.0	-	0	0.0	-	0	0.9	0.0-2.3	*
Negative	100.0	-	199	96.6	91.0-100.0	*	99.0	97.8-100.0	*	100.0	-	13	100.0	-	173	99.1	97.7-100.0	*
Active syphilis																		
Yes	3.5	1.1-5.9	8	5.0	0.0-11.7	*	3.3	1.4-5.1	12	31.8	0.0-65.2	*	9.0	3.8-14.3	11	15.1	6.0-24.2	14
No	96.5	94.1-98.9	191	95.0	88.3-100.0	*	96.7	94.9-98.6	321	68.2	34.8-100.0	*	91.0	85.7-96.2	162	84.9	75.8-94.0	63
HIV/HBV co-infection	0.7	0.0-1.9	*	0.0	-	0	0.2	0.0-0.6	*	7.7	0.0-26.3	*	0.0	-	0	2.8	0.0-5.9	*
HIV/HCV co-infection	0.0	-	0	3.4	0.0-9.5	*	0.8	0.1-1.4	*	0.0	-	0	0.0	-	0	0.9	0.0-2.4	*
HIV/active syphilis co-infection	1.3	0.0-2.5	*	0.0	-	0	0.5	0.0-1.2	*	9.8	0.0-22.0	*	4.8	1.1-8.4	6	7.1	1.4-13.0	8

Table 3.4: Hepatitis B, hepatitis C, active syphilis, and HIV coinfections by site (continued)

Prevalence of hepatitis B virus (HBV), hepatitis C virus (HCV), active syphilis, and HIV coinfections among people who inject drugs (PWID) by site, Zambia PWID BBS 2021

	Livingstone						Lusaka						Ndola					
	Male (N = 199)			Female (N = 36)			Male (N = 335)			Female (N = 13)			Male (N = 173)			Female (N = 77)		
	%	95% CI	n	%	95% CI	n	%	95% CI	n	%	95% CI	n	%	95% CI	n	%	95% CI	n
HIV coinfection with HBV, HCV and/or active syphilis	1.9	0.0-4.0	*	3.4	0.0-9.6	*	1.5	0.3-2.8	6	18.6	4.0-32.4	*	4.8	1.0-8.5	6	8.8	2.6-15.0	10

*To protect the identity of survey respondents, numerators greater than 0 but less than 5 are suppressed with an asterisk. In addition, in categories where a numerator that was greater than 0 but less than 5 could be guessed, the next lowest numerator is also suppressed with an asterisk.
Note that the denominator for a characteristic may differ from the site total due to nonresponse or missing data. Also, due to rounding, estimated total sums may not equal 100.0%.

3.5 SEXUALLY TRANSMITTED INFECTIONS

Key findings

- In Lusaka and Ndola, a higher proportion of PWID had one or more STI symptoms in the 12 months before the survey compared with PWID in Livingstone (19.7% and 27.6% vs. 8.7%, respectively; Table 3.5).
- Across Livingstone, Lusaka, and Ndola, many PWID did not seek healthcare for their STI symptoms (range: 32.3-43.2%), but among those diagnosed with an STI (range: 5.5%-12.0%), most received treatment for their STI symptoms (89.8%-100.0%). Most PWID received treatment at a public hospital or clinic (84.7%-94.2%; Table 3.5).
- Among PWID who had one or more symptoms of STIs, 87.5% in Livingstone, 93.6% in Lusaka and 38.2% in Ndola did not abstain from sex or always use condoms while having STI symptoms (Table 3.5).

Table 3.5: Sexually transmitted infections by site

Sexually transmitted infections (STI) symptoms and diagnoses in the 12 months before the survey among people who inject drugs (PWID) by site, Zambia PWID BBS 2021

	Livingstone (N = 235)			Lusaka (N = 349)			Ndola (N = 259)		
	%	95% CI	n	%	95% CI	n	%	95% CI	n
Abnormal discharge from vagina/penis or experienced pelvic pain									
Yes	4.8	2.4-7.2	12	10.9	6.8-14.9	38	20.4	14.5-26.3	43
No	95.2	92.7-97.7	223	89.1	84.7-93.5	311	79.6	73.7-85.4	216
Had an ulcer or sore on or near your vagina/penis									
Yes	3.8	1.3-6.3	10	10.8	6.5-15.1	33	9.4	5.0-13.9	22
No	96.2	93.7-98.7	225	89.2	85.0-93.4	316	90.6	85.9-95.3	236
Had warts on genitals									
Yes	1.2	0.0-2.4	*	2.8	0.9-4.7	9	6.5	2.1-10.8	13
No	98.8	97.6-100.0	*	97.2	95.4-99.0	340	93.5	89.2-97.8	245
Had one or more STI symptoms									
Yes	8.7	5.2-12.2	22	19.7	14.2-25.3	62	27.6	21.4-33.8	61
No	91.2	87.7-94.9	213	80.3	74.8-85.7	287	72.4	65.9-78.8	196

Table 3.5: Sexually transmitted infections by site (continued)

Sexually transmitted infections (STI) symptoms and diagnoses in the 12 months before the survey among people who inject drugs (PWID) by site, Zambia PWID BBS 2021	Livingstone (N = 235)			Lusaka (N = 349)			Ndola (N = 259)		
	%	95% CI	n	%	95% CI	n	%	95% CI	n
Sought healthcare for symptoms listed above									
Yes	61.4	40.3-82.9	14	57.2	42.6-72.3	37	67.7	54.8-80.5	43
No	38.7	16.9-59.5	8	43.2	28.4-57.7	25	32.3	19.0-45.8	18
Diagnosed with STI									
Yes	5.5	2.8-8.2	14	10.9	7.4-14.5	35	12.0	7.9-16.0	36
No	94.5	91.9-97.1	221	89.1	85.6-92.6	313	88.1	84.0-92.0	223
Received treatment for diagnosed STI									
Yes	89.8	77.7-100.0	*	100.0	0.0-0.0	35	100.0	0.0-0.0	36
No	10.5	0.0-22.8	*	0.0	0.0-0.0	0	0.0	0.0-0.0	0
Among those who had sought treatment, location where treatment was sought									
Public clinic/hospital	94.2	91.2-97.2	*	84.7	72.3-97.4	30	85.9	74.3-97.6	31
NGO clinic/hospital	0.0	0.0-0.0	0	0.0	0.0-0.0	0	2.3	0.0-5.7	*
Private clinic/hospital	5.6	1.7-10.1	*	12.2	0.0-24.8	*	10.1	0.0-20.6	*
Pharmacy	0.0	0.0-0.0	0	0.0	0.0-0.0	0	1.7	0.0-3.9	*
Other	0.0	0.0-0.0	0	3.3	0.0-9.5	*	0.0	0.0-0.0	0
Abstained from sex or always used condoms during symptoms above									
Yes	13.3	0.0-30.6	*	6.5	0.0-20.0	*	62.5	23.2-100.0	*
No	87.5	68.0-100.0	*	93.6	79.6-100.0	*	38.2	0.0-77.8	*

*To protect the identity of survey respondents, numerators greater than 0 but less than 5 are suppressed with an asterisk. In addition, in categories where a numerator that was greater than 0 but less than 5 could be guessed, the next lowest numerator is also suppressed with an asterisk.
Note that the denominator for a characteristic may differ from the site total due to nonresponse or missing data. Also, due to rounding, estimated total sums may not equal 100.0%.

3.6 SEXUAL BEHAVIOR

Key findings

- The median age at first sex ranged from 15-18 years across sites. For most men at the three sites, their first sexual partner was about their own age at the time of the encounter (range: 71.8%-89.8%). In contrast, for women, the age of their first sexual partner was either with someone their own age or someone 5-10 years older at the time of the encounter. The median number of lifetime partners among PWID who had sex with a member of the opposite sex was 4, except for women in Ndola, where the median number of lifetime partners was 3 (Table 3.6.1).
- Across the three sites, a proportion (range: 8.4%-15.3%) of the PWID had experienced anal sex, with the exception of women in Lusaka, who indicated they had never had anal sex. All the men who inject drugs in Livingstone who had ever had anal sex had engaged in anal sex with another man, compared with 11.9% in Lusaka and 35.3% in Ndola (Table 3.6.1).
- For a similar proportion of PWID across sites, their most recent sexual partner was typically their main partner, (range: 53.4%-70.8%). An exception was noted among women in Lusaka, all of whom indicated that their most recent sexual partner was their main partner. In other instances, the most recent sexual partner was either a casual partner or commercial sex partner. The last sexual partner for most PWID was a member of the opposite sex (range: 94.6%-100.0%; Table 3.6.2).

- Condom use at last sex varied among men who inject drugs (range: 34.3%-60.6%) and women who inject drugs (range: 18.3%-36.8%). Consistent condom use with non-transactional sex partners in the past six months was low among all PWID (range: 11.7%-30.2%; Table 3.6.2).
- Over 75% of women and men who inject drugs had not paid any partners of the opposite sex for sex in the past 6 months (range: 75.4%-100.0%), except for men in Ndola, where 26.2% said they paid 1-2 women, and 22.7% paid more than two women for sex (Table 3.6.2).
- Most men had not been paid for sex by a partner of the opposite sex in the past 6 months (range: 86.3%-98.6%), similar to most of the women in Lusaka (87.5%). However, more than half of the women in Livingstone and Ndola said that male partners had paid them for sex in the past 6 months. In Livingstone, 11.9% of women had been paid by 1-2 partners and 44.6% had been paid by more than 2 partners, while in Ndola, 12.0% were paid by 1-2 partners and 42.3% had been paid by more than 2 partners (Table 3.6.2).
- Consistent condom use with transactional sex partners varied. Among men who inject drugs, condom use during transactional sex ranged from 46.9% to 62.3%, while condom use among women who inject drugs ranged from 13.6% to 31.3% (Table 3.6.2).

Table 3.6.1: Sexual history by sex and site

Sexual history among people who inject drugs (PWID) by sex and site, Zambia PWID BBS 2021

	Livingstone						Lusaka						Ndola					
	Male (N = 199)			Female (N = 36)			Male (N = 335)			Female (N = 13)			Male (N = 173)			Female (N = 77)		
	%	95% CI	n	%	95% CI	n	%	95% CI	n	%	95% CI	n	%	95% CI	n	%	95% CI	n
Had ever had vaginal sex	97.6	95.9-99.2	193	96.6	92.0-100.0	35	97.3	95.4-99.1	326	94.5	84.1-100.0	12	100.0	-	173	100.0	-	77
Had ever had anal sex	14.7	9.3-20.2	29	12.9	3.0-23.0	*	8.4	4.6-12.1	26	0.0	-	0	12.1	6.1-18.2	24	15.3	6.1-24.4	11
Among men who had anal sex, had ever had anal sex with a man	100.0	-	29	0.0	-	0	11.9	0.0-25.5	*	0.0	-	0	35.3	15.4-56.4	9	0.0	-	0
Age (years) at first sex																		
<15	43.5	36.3-50.8	92	39.0	19.9-58.3	10	17.8	13.0-22.6	70	28.2	10.7-45.0	5	21.7	14.3-29.2	33	12.1	5.2-19.2	*
15-19	49.0	41.5-56.5	92	54.7	35.6-73.8	23	68.8	63.0-74.5	228	63.8	46.5-82.1	*	57.6	49.0-66.1	106	65.7	54.0-77.4	49
20-24	6.9	3.6-10.1	*	5.2	0.0-11.2	*	11.0	7.0-15.0	30	8.0	0.0-20.7	*	14.2	7.6-20.8	26	17.5	8.5-26.3	14
≥25	0.6	0.0-1.3	*	1.1	0.0-2.2	*	2.4	0.7-4.2	7	0.0	-	0	6.5	1.7-11.3	8	4.7	0.0-11.2	*
Median age (IQR)	15	13-17	199	16	14-17	36	17	15-18	335	17	0.0-0.0	13	17	15-19	173	18	0.0-0.0	77
Age of sexual partner at first sex																		
More than 10 years younger than me	0.0	-	0	0.0	-	0	0.3	0.0-0.8	*	0.0	-	0	0.0	-	0	4.1	0.0-8.4	*
5-10 years younger than me	5.4	2.5-8.4	*	1.0	0.1-2.1	*	4.4	2.2-6.6	16	17.4	0.0-36.4	*	14.3	8.0-20.7	20	1.2	0.0-3.9	*
About the same age	89.8	85.9-93.7	170	48.3	24.3-72.2	13	83.2	78.9-87.4	262	23.9	0.0-48.8	*	71.8	62.9-80.6	126	33.8	21.9-45.6	28
5-10 years older than me	4.1	1.7-6.5	10	40.7	21.1-60.4	16	11.3	7.7-14.9	37	45.5	12.7-78.6	5	13.9	6.9-20.9	24	59.6	46.8-72.5	44
More than 10 years older than me	0.7	0.0-1.9	*	9.9	0.9-19.0	*	0.8	0.0-2.0	*	13.2	0.0-33.9	*	0.0	-	0	1.2	0.0-3.8	*

Table 3.6.1: Sexual history by sex and site (continued)

Sexual history among people who inject drugs (PWID) by sex and site, Zambia PWID BBS 2021

	Livingstone						Lusaka						Ndola					
	Male (N = 199)			Female (N = 36)			Male (N = 335)			Female (N = 13)			Male (N = 173)			Female (N = 77)		
	%	95% CI	n	%	95% CI	n	%	95% CI	n	%	95% CI	n	%	95% CI	n	%	95% CI	n
Among those who have had sex with a member of the opposite sex, lifetime number of sexual partners																		
1	4.2	1.4-7.0	9	0.0	-	0	6.5	3.4-9.6	18	9.1	0.0-25.9	*	1.1	0.0-2.2	*	2.8	0.0-5.8	*
2	6.6	3.3-9.9	15	10.7	0.0-21.7	*	9.3	4.8-13.9	26	11.5	0.0-32.0	*	5.5	0.9-10.2	*	13.8	4.2-23.5	*
3-5	30.3	23.4-37.2	58	15.3	2.4-28.3	*	35.3	29.3-41.5	117	20.3	0.0-42.1	*	20.6	13.9-27.2	38	37.5	24.5-50.2	30
6+	58.9	51.4-66.4	108	74.0	58.3-89.4	25	48.8	42.3-55.3	165	59.0	29.4-88.6	6	72.9	65.1-80.7	127	45.9	32.7-59.1	36
Median sexual partners (IQR)	4	3-4	190	4	3-4	35	4	3-4	326	4	3-4	11	4	3-4	173	3	3-4	76
Among those who have had sex with a member of the opposite sex, the proportion for whom first sex was transactional†	5.7	2.7-8.7	11	33.7	17.4-50.1	11	21.3	15.9-26.6	61	42.4	18.9-66.5	5	17.6	9.0-26.3	29	31.5	19.3-43.8	23

*To protect the identity of survey respondents, numerators greater than 0 but less than 5 are suppressed with an asterisk. In addition, in categories where a numerator that was greater than 0 but less than 5 could be guessed, the next lowest numerator is also suppressed with an asterisk.
†Participant reported receiving money or goods from first sexual partner.
Note that the denominator for a characteristic may differ from the site total due to nonresponse or missing data. Also, due to rounding, estimated total sums may not equal 100.0%.

Table 3.6.2: Sexual behaviors by site

Sexual behaviors among people who inject drugs (PWID) by site, Zambia PWID BBS 2021

	Livingstone								
	Male			Female			Total		
	%	95% CI	n	%	95% CI	n	%	95% CI	n
Timing of most recent sexual intercourse									
In the 7 days before the survey	26.8	20.5 - 33.1	56	64.4	46.0 - 82.7	22	32.8	27.1 - 38.8	26.8
More than 7 days ago but within 1 month of the survey	19.7	13.8 - 25.6	40	19.3	4.7 - 33.4	6	19.6	14.4 - 24.9	19.7
More than 1 month but within 3 months before the survey	20.6	14.3 - 26.9	34	8.5	0.2 - 16.6	*	18.5	13.2 - 23.8	20.6
More than 3 months before the survey	32.9	26.0 - 39.8	67	7.9	0.0 - 16.6	*	28.9	23.5 - 34.5	32.9
Gender of most recent sexual partner									
Man	4.6	1.7 - 7.5	9	99.2	97.9 - 100.0	*	19.9	12.9 - 26.9	4.6
Woman	95.4	92.3 - 98.4	188	0.7	0.0 - 2.1	*	80.1	73.3 - 86.9	95.4
Transgender person	0.0	0.0 - 0.0	0	0.0	0.0 - 0.0	0	0.0	-	0.0

Table 3.6.2: Sexual behaviors by site (continued)

Sexual behaviors among people who inject drugs (PWID) by site, Zambia PWID BBS 2021									
	Livingstone								
	Male			Female			Total		
	%	95% CI	n	%	95% CI	n	%	95% CI	n
Relationship status with most recent sexual partner									
Main sex partner	63.0	55.7 - 70.2	123	53.4	29.3 - 77.8	20	61.5	54.9 - 68.1	63.0
Casual sex partner	21.3	15.1 - 27.4	43	13.1	0.0 - 30.5	*	20.0	14.3 - 25.6	21.3
Transactional partner who was paid money, drugs, or goods for sex	14.9	9.1 - 20.7	*	0.0	0.0 - 0.0	0	12.5	7.8 - 17.3	14.9
Transactional partner who paid money, drugs, or goods for sex	0.8	0.1 - 1.6	*	33.6	19.1 - 47.6	*	6.1	3.2 - 8.9	0.8
Used condom at last sex									
Yes	60.6	54.1 - 67.2	111	36.8	18.4 - 55.9	14	56.7	50.5 - 62.9	60.6
No	39.3	32.7 - 46.1	86	63.2	43.5 - 82.4	21	43.3	37.0 - 49.6	39.3
Circumstances where condoms were not used									
When drunk or high	36.2	28.8 - 43.3	74	26.8	14.7 - 39.5	12	34.7	28.6 - 41.0	36.2
When afraid to ask partner to use a condom or they refuse	2.0	0.5 - 3.5	*	16.8	5.4 - 28.0	*	4.4	1.8 - 7.0	2.0
When having sex with a regular partner	69.7	62.9 - 76.5	145	69.4	52.9 - 86.0	24	69.7	63.9 - 75.5	69.7
When having sex with a non-regular partner	16.2	10.6 - 21.9	33	50.8	28.1 - 73.8	17	21.9	16.1 - 27.6	16.2
When participant does not ejaculate inside me	0.0	0.0 - 0.0	0	5.7	0.0 - 14.1	*	0.9	0.0 - 2.0	0.0
Other	14.1	9.5 - 18.8	*	41.8	26.9 - 56.2	15	18.6	13.9 - 23.4	14.1
Number of non-transactional sexual partners in the 6 months before the survey									
0	22.4	16.3 - 28.5	48	9.0	1.9 - 16.4	5	20.4	15.1 - 25.7	22.4
1-2	51.7	44.7 - 58.5	93	41.4	21.8 - 59.7	17	49.9	43.5 - 56.4	51.7
2+	25.9	20.0 - 31.8	58	49.5	31.5 - 67.8	14	29.7	23.8 - 35.5	25.9
Median (IQR)	1	1 - 3	199	1	1 - 4	36	1	1 - 3	1
Consistent condom use with nontransactional sex partners in the 6 months before the survey									
Yes	30.2	22.3 - 38.2	38	14.3	0.0 - 28.9	5	27.0	20.1 - 34.0	30.2
No	69.7	61.6 - 77.8	105	85.7	72.2 - 99.8	26	73.0	66.0 - 80.0	69.7
Number of partners of opposite sex who were paid for sex in the 6 months before the survey									
0	75.4	68.8 - 82.1	148	100.0	0.0 - 0.0	36	79.6	74.2 - 85.1	75.4
1-2	18.6	12.4 - 24.7	33	0.0	0.0 - 0.0	0	15.4	10.6 - 20.1	18.6
3+	6.0	2.8 - 9.3	12	0.0	0.0 - 0.0	0	5.0	2.5 - 7.6	6.0
Median (IQR)	0	0 - 0	193	0	0 - 0	36	0	0 - 0	0

Table 3.6.2: Sexual behaviors by site (continued)

Sexual behaviors among people who inject drugs (PWID) by site, Zambia PWID BBS 2021									
	Livingstone								
	Male			Female			Total		
	%	95% CI	n	%	95% CI	n	%	95% CI	n
Number of partners of opposite sex who paid you for sex in the 6 months before the survey									
0	98.6	97.2 - 100.0	195	43.5	23.9 - 62.8	16	89.5	85.4 - 93.6	98.6
1-2	1.3	0.0 - 2.7	*	11.9	0.0 - 24.0	*	3.0	0.9 - 5.1	1.3
3+	0.2	0.0 - 0.3	*	44.6	20.0 - 68.3	*	7.5	3.1 - 11.9	0.2
Median (IQR)	0	0 - 0	199	2	0 - 22	36	0	0 - 0	0
Consistent condom use with transactional sex partners of the opposite sex in the 6 months before the survey									
Yes	59.9	46.4 - 73.2	28	27.2	7.8 - 46.7	5	49.8	38.2 - 61.1	59.9
No	40.2	26.8 - 53.6	20	72.8	52.3 - 93.4	15	50.4	38.6 - 62.1	40.2

	Lusaka								
	Male			Female			Total		
	%	95% CI	n	%	95% CI	n	%	95% CI	n
Timing of most recent sexual intercourse									
In the 7 days before the survey	15.0	10.5 - 19.4	56	47.5	13.9 - 81.0	7	16.1	11.6 - 20.6	63
More than 7 days ago but within 1 month of the survey	14.0	9.7 - 18.3	47	24.0	0.0 - 51.7	*	14.3	9.9 - 18.7	49
More than 1 month but within 3 months before the survey	13.3	9.1 - 17.4	49	0.0	0.0 - 0.0	0	12.9	8.7 - 17.0	49
More than 3 months before the survey	57.8	51.1 - 64.4	174	28.5	0.5 - 56.6	*	56.8	50.5 - 63.2	177
Gender of most recent sexual partner									
Man	0.2	0.0 - 0.5	*	100.0	0.0 - 0.0	12	3.5	1.5 - 5.4	13
Woman	99.8	99.5 - 100.0	*	0.0	0.0 - 0.0	0	96.6	94.7 - 98.4	325
Transgender person	0.0	0.0 - 0.0	0	0.0	0.0 - 0.0	0	0.0	-	0
Relationship status with most recent sexual partner									
Main sex partner	66.1	59.7 - 72.5	223	100.0	0.0 - 0.0	11	67.2	60.9 - 73.5	234
Casual sex partner	19.3	14.1 - 24.5	56	0.0	0.0 - 0.0	0	18.7	13.8 - 23.7	56
Transactional partner who was paid money, drugs, or goods for sex	13.3	8.7 - 17.8	42	0.0	0.0 - 0.0	0	12.9	8.3 - 17.5	42
Transactional partner who paid money, drugs, or goods for sex	1.3	0.0 - 2.5	5	0.0	0.0 - 0.0	0	1.2	0.0 - 2.4	5
Used condom at last sex									
Yes	52.5	46.3 - 58.7	160	18.3	0.0 - 41.6	*	51.3	45.3 - 57.4	162
No	47.5	41.4 - 53.7	166	81.7	59.2 - 100.0	*	48.6	42.6 - 54.6	176

Table 3.6.2: Sexual behaviors by site (continued)

Sexual behaviors among people who inject drugs (PWID) by site, Zambia PWID BBS 2021									
	Lusaka								
	Male			Female			Total		
	%	95% CI	n	%	95% CI	n	%	95% CI	n
Circumstances where condoms were not used									
When drunk or high	26.6	20.9 - 32.3	87	10.8	0.0 - 27.6	*	26.1	20.3 - 31.8	88
When afraid to ask partner to use a condom or they refuse	9.3	5.1 - 13.3	29	12.5	0.0 - 29.6	*	9.3	5.3 - 13.4	31
When having sex with a regular partner	72.0	66.6 - 77.4	244	74.6	49.6 - 99.6	10	72.1	66.4 - 77.7	254
When having sex with a non-regular partner	1.5	0.4 - 2.6	7	0.0	0.0 - 0.0	0	1.4	0.4 - 2.5	7
When participant does not ejaculate inside me	0.0	0.0 - 0.0	0	0.0	0.0 - 0.0	0	0.0	-	0
Other	20.7	15.3 - 26.1	65	25.4	1.1 - 49.6	*	20.9	15.6 - 26.1	68
Number of non-transactional sexual partners in the 6 months before the survey									
0	56.5	49.4 - 63.6	181	28.1	0.0 - 62.0	*	55.5	48.8 - 62.3	185
1-2	32.9	26.5 - 39.1	117	64.8	29.9 - 99.7	7	33.9	27.8 - 40.0	124
2+	10.7	6.8 - 14.5	37	7.1	0.0 - 15.8	*	10.6	7.0 - 14.1	39
Median (IQR)	0	0 - 1	335	1	0 - 1	13	0	0 - 1	348
Consistent condom use with nontransactional sex partners in the 6 months before the survey									
Yes	14.9	7.6 - 22.4	21	24.0	0.0 - 53.2	*	15.5	8.9 - 22.2	23
No	85.0	77.8 - 92.2	126	76.0	46.0 - 100.0	*	84.5	77.5 - 91.5	133
Number of partners of opposite sex who were paid for sex in the 6 months before the survey									
0	83.8	78.4 - 89.2	280	100.0	0.0 - 0.0	13	84.4	79.3 - 89.5	293
1-2	13.4	8.2 - 18.5	35	0.0	0.0 - 0.0	0	12.9	8.1 - 17.9	35
3+	2.8	0.9 - 4.6	11	0.0	0.0 - 0.0	0	2.7	0.9 - 4.4	11
Median (IQR)	0	0 - 0	326	0	0 - 0	13	0	0 - 0	339
Number of partners of opposite sex who paid you for sex in the 6 months before the survey									
0	98.1	96.7 - 99.5	327	87.5	71.5 - 100.0	*	97.8	96.2 - 99.3	338
1-2	1.7	0.2 - 3.1	*	12.5	0.0 - 29.1	*	2.0	0.6 - 3.5	9
3+	0.2	0.0 - 0.6	*	0.0	0.0 - 0.0	0	0.2	0.0 - 0.6	*
Median (IQR)	0	0 - 0	335	0	0 - 0	13	0	0 - 0	348
Consistent condom use with transactional sex partners of the opposite sex in the 6 months before the survey									
Yes	62.3	46.5 - 77.9	31	13.6	13.6 - 13.6	*	61.2	45.5 - 77.6	32
No	37.6	21.5 - 53.2	19	86.4	86.4 - 86.4	*	38.9	23.1 - 54.6	20

Table 3.6.2: Sexual behaviors by site (continued)

Sexual behaviors among people who inject drugs (PWID) by site, Zambia PWID BBS 2021									
	Ndola								
	Male			Female			Total		
	%	95% CI	n	%	95% CI	n	%	95% CI	n
Timing of most recent sexual intercourse									
In the 7 days before the survey	49.6	40.6 - 58.8	85	65.6	52.6 - 78.5	50	54.5	46.8 - 62.1	135
More than 7 days ago but within 1 month of the survey	24.7	18.2 - 31.0	53	22.0	9.9 - 34.1	18	24.1	18.2 - 29.8	71
More than 1 month but within 3 months before the survey	9.8	4.8 - 14.9	17	6.8	0.3 - 13.5	*	8.9	4.9 - 12.9	21
More than 3 months before the survey	15.8	9.0 - 22.7	18	5.5	0.8 - 10.3	*	12.6	7.1 - 18.1	23
Gender of most recent sexual partner									
Man	0.8	0.0 - 1.8	*	94.6	90.3 - 98.9	*	29.3	20.7 - 37.8	74
Woman	99.2	98.1 - 100.0	*	5.4	1.1 - 9.7	*	70.8	62.1 - 79.4	175
Transgender person	0.0	0.0 - 0.0	0	0.0	0.0 - 0.0	0	0.0	-	0
Relationship status with most recent sexual partner									
Main sex partner	70.2	61.4 - 79.1	118	70.8	58.5 - 83.0	53	70.3	63.5 - 77.1	171
Casual sex partner	13.3	7.7 - 19.1	27	9.7	0.0 - 19.2	5	12.2	7.6 - 16.8	32
Transactional partner who was paid money, drugs, or goods for sex	16.5	10.0 - 22.9	28	6.0	0.2 - 12.0	6	13.3	8.5 - 18.2	34
Transactional partner who paid money, drugs, or goods for sex	0.0	0.0 - 0.0	0	13.6	6.3 - 21.0	13	4.2	1.5 - 6.9	13
Used condom at last sex									
Yes	34.3	25.3 - 43.1	56	33.7	22.3 - 45.2	27	34.0	26.9 - 41.2	83
No	65.8	56.4 - 75.2	117	66.2	55.1 - 77.5	50	66.0	59.1 - 72.9	167
Circumstances where condoms were not used									
When drunk or high	52.2	42.4 - 62.1	89	58.7	44.7 - 72.5	46	54.2	46.6 - 61.8	135
When afraid to ask partner to use a condom or they refuse	23.6	16.3 - 31.0	40	32.1	19.5 - 44.7	23	26.2	20.0 - 32.2	63
When having sex with a regular partner	60.5	52.0 - 68.9	98	61.0	49.2 - 72.9	48	60.6	53.8 - 67.4	146
When having sex with a non-regular partner	8.7	4.7 - 12.8	21	16.4	6.2 - 26.5	11	11.1	7.0 - 15.2	32
When participant does not ejaculate inside me	6.1	2.1 - 10.1	12	26.0	15.0 - 37.0	19	12.1	7.6 - 16.7	31
Other	9.5	5.2 - 14.0	21	14.7	3.7 - 25.6	10	11.2	6.7 - 15.6	31
Number of non-transactional sexual partners in the 6 months before the survey									
0	16.0	8.9 - 23.1	20	23.0	11.9 - 34.1	19	18.0	12.5 - 23.5	39
1-2	30.4	21.6 - 39.1	51	41.0	29.3 - 53.0	29	33.5	26.8 - 40.3	80
2+	53.6	44.0 - 63.3	102	36.1	23.4 - 48.7	29	48.5	41.1 - 56.0	131
Median (IQR)	3	1 - 5	173	2	1 - 4	77	3	1 - 5	250

Table 3.6.2: Sexual behaviors by site (continued)

Sexual behaviors among people who inject drugs (PWID) by site, Zambia PWID BBS 2021									
	Ndola								
	Male			Female			Total		
	%	95% CI	n	%	95% CI	n	%	95% CI	n
Consistent condom use with nontransactional sex partners in the 6 months before the survey									
Yes	11.7	5.1 - 18.3	16	17.7	5.2 - 30.3	7	13.3	7.4 - 19.1	23
No	88.3	81.7 - 94.9	133	82.3	69.4 - 95.0	51	86.7	81.2 - 92.3	184
Number of partners of opposite sex who were paid for sex in the 6 months before the survey									
0	51.0	41.5 - 60.4	78	94.3	88.2 - 100.0	*	64.0	56.7 - 71.4	152
1-2	26.2	19.0 - 33.5	48	5.7	0.0 - 11.8	*	20.0	14.6 - 25.4	51
3+	22.7	15.6 - 29.8	46	0.0	0.0 - 0.0	0	16.0	11.0 - 21.0	46
Median (IQR)	1	0 - 3	172	0	0 - 0	77	0	0 - 2	249
Number of partners of opposite sex who paid you for sex in the 6 months before the survey									
0	86.3	80.1 - 92.5	141	45.8	31.8 - 59.6	34	73.8	66.9 - 80.7	175
1-2	10.0	4.9 - 15.1	21	12.0	2.5 - 21.5	10	10.7	6.4 - 15.1	31
3+	3.7	0.9 - 6.4	10	42.3	29.6 - 54.8	33	15.5	10.2 - 20.7	43
Median (IQR)	0	0 - 0	172	2	0 - 4	77	0	0 - 1	249
Consistent condom use with transactional sex partners of the opposite sex in the 6 months before the survey									
Yes	46.9	35.1 - 58.5	45	31.3	15.0 - 47.5	13	41.7	33.0 - 50.5	58
No	53.2	41.2 - 65.2	57	68.7	52.1 - 85.4	31	58.2	48.8 - 67.7	88

*To protect the identity of survey respondents, numerators greater than 0 but less than 5 are suppressed with an asterisk. In addition, in categories where a numerator that was greater than 0 but less than 5 could be guessed, the next lowest numerator is also suppressed with an asterisk.
†Participant reported receiving money or goods from first sexual partner.
Note that the denominator for a characteristic may differ from the site total due to nonresponse or missing data. Also, due to rounding, estimated total sums may not equal 100.0%.

3.7 ALCOHOL AND DRUG USE

Key findings

- Hazardous drinking[11] among PWID ranged from 17.8% in Lusaka to 49.7% in Ndola. Ndola had higher rates of alcohol dependency (25.7%), compared to Lusaka (4.3%) and Livingstone (4.4%; Table 3.7.1).
- Across all sites, a high proportion of PWID had also used non-injection drugs other than those prescribed (range: 85.2%-95.8%). Aside from tobacco, 63.8%-75.3% of PWID used other drugs, most commonly marijuana (range: 45.1%-77.8%) and heroin (31.1%-55.7%). Cocaine, Unga (rock cocaine), and Blue Mash were used by around a quarter or more PWID at one or more sites (Table 3.7.2).
- The median age for initiating injection drug use ranged from 23-28 years old across the three sites. Tie White (heroin) was most often the first drug tried in Livingstone (86.5%) and Lusaka (73.1%), while in Ndola 73.9%

[11] Moderate-severe alcohol use disorder as defined by the World Health Organization (WHO) screening algorithm: https://auditscreen.org/about/scoring-audit.

injected "other" drugs first. The median years of injection drug use ranged from 4-6 years across all sites (Table 3.7.3).

- Among PWID, sharing a needle the first time they ever injected drugs was more common in Ndola (51.3%) and Livingstone (44.1%), compared with Lusaka (21.1%; Table 3.7.3).
- A higher proportion of PWID in Livingstone (76.4%) had ever experienced an overdose compared with Lusaka (47.3%) and Ndola (51.3%). Among those PWID who had experienced overdose, the majority overdosed more than once but less than 5 times (range: 73.7%-89.5%). Among those with a history of overdose, a majority had experienced an overdose in the 12 months preceding the survey (range: 78.7%-86.0%; Table 3.7.3).
- A higher proportion of PWID in Livingstone (62.9%) and Lusaka (75.9%) were detained or imprisoned for drug use than in Ndola (32.9%; Table 3.7.3).
- Almost half of PWID in Livingstone (49.1%) and Lusaka (47.8%) had last injected drugs on the day of or day before the survey, compared with 16.6% in Ndola (Table 3.7.4).
- The type of injection drug used by PWID in the 6 months before the survey varied across sites; 93.9% in Livingstone and 95.9% in Lusaka injected Tie White (Heroin) most often, compared with Ndola where Artane (68.0%) and Blue Marsh (promethazine; 59.9%) were the most injected drugs (Table 3.7.4).
- PWID in Ndola more commonly sold sex for drugs in the 6 months preceding the survey (19.0%) compared to those in Livingstone (7.5%) and Lusaka (6.4%; Table 3.7.4).
- Approximately half of PWID in Lusaka (52.2%) always used a new needle when injecting drugs in the 6 months before the survey, compared with 32.4% in Livingstone and 28.9% in Ndola. In the 6 months before the survey, 70.9% of the PWID in Lusaka never injected drugs with a syringe/needle previously used by someone else compared with 42.7% in Livingstone and 32.8% in Ndola. Reasons given for not using a new needle varied. The expense of clean needles was a driving factor for not using a new needle across all sites (71.5% in Lusaka, 61.4% in Livingstone, and 43.8% in Ndola; Table 3.7.5).
- The practice of bluetooth, injecting oneself with blood drawn from a person who recently injected drugs, was not common among PWID across the sites: 20.9% in Livingstone, 11.8% in Ndola, and 5.9% in Lusaka (Table 3.7.5).
- In Livingstone, HIV prevalence by duration of injection drug use ranged from 9.8% among those who had injected for at least 2 years but less than 6 years, to 28.0% among PWID who had injected for 10 or more years. HIV prevalence among PWID in Lusaka and Ndola showed similar trends, 6.1% to 11.9%, and 9.1% to 28.2%, respectively. In Lusaka, those who injected one to four times a month had a lower HIV prevalence (3.7%) than those who inject five or more times a day (35.9%), but similar trends were not observed at the other sites. In Livingstone, those who sold sex for drugs in the 6 months before the survey had a higher HIV prevalence than those who did not sell sex (39.9% vs. 10.0%, respectively; Table 3.7.6).
- Awareness of drug treatment programs was low across all sites, although PWID in Lusaka were more likely to be aware of available drug treatment programs intended to modify, reduce, or stop drug use than PWID in Livingstone or Ndola (41.7% vs. 15.8% and 20.1%, respectively). Among those PWID who were aware of drug treatment programs, 22.9%-30.8% had ever received drug treatment. Among those who had received drug treatment, the majority had been placed into detox programs or received counseling. In Lusaka, 50.1% of the few PWID who received treatment received methadone replacement therapy; however, no PWID in Livingstone or Ndola received methadone (Table 3.7.7).

Table 3.7.1: Alcohol dependence and hazardous drinking by site and sex

Alcohol dependence and hazardous drinking among people who inject drugs (PWID) by site, Zambia PWID BBS 2021						
	Alcohol dependence†			Hazardous Drinking‡		
	%	95% CI	n	%	95% CI	n
Livingstone	4.4	0.3-8.6	*	35.0	23.9-45.8	28
Male	6.1	0.3-11.9	*	33.9	21.1-46.8	20
Female	0.0	-	0	37.8	18.4-56.8	8
Lusaka	4.3	0.4-8.3	6	17.8	8.7-27.0	18
Male	4.3	0.4-8.3	6	16.3	7.5-25.2	*
Female	0.0	-	0	100.0	-	*
Ndola	25.7	18.6-32.8	53	49.7	42.2-57.3	98
Male	26.3	17.9-34.8	36	49.7	39.8-59.7	66
Female	24.5	11.7-37.2	17	50.4	37.0-63.7	32

*To protect the identity of survey respondents, numerators greater than 0 but less than 5 are suppressed with an asterisk. In addition, in categories where a numerator that was greater than 0 but less than 5 could be guessed, the next lowest numerator is also suppressed with an asterisk.
†Alcohol Use Disorders Identification Test (AUDIT) score of ≥15.
‡Alcohol Use Disorders Identification Test (AUDIT) score ≥ 8 ≤14.
Based on scores on the Alcohol Use Disorders Identification Test (AUDIT) scores. The range of possible scores is from 0 to 40 where 0 indicates an abstainer who has never had any problems from alcohol. A score of 1 to 7 suggests low-risk consumption according to World Health Organization (WHO) guidelines. Scores from 8 to 14 suggest hazardous or harmful alcohol consumption and a score of 15 or more indicates the likelihood of alcohol dependence (moderate-severe alcohol use disorder). https://auditscreen.org/about/scoring-audit.
Note that the denominator for a characteristic may differ from the site total due to nonresponse or missing data. Also, due to rounding, estimated total sums may not equal 100.0%.

Table 3.7.2: Non-injection and injection drug use by site

Non-injection drug use among people who inject drugs (PWID) by site, Zambia PWID BBS 2021									
	Livingstone (N = 235)			Lusaka (N = 349)			Ndola (N = 259)		
	%	95% CI	n	%	95% CI	n	%	95% CI	n
Have ever used non-injection drugs other than those prescribed									
Yes	95.8	92.7-99.0	225	87.6	84.0-91.3	303	85.2	79.8-90.4	217
No	4.2	1.0-7.3	10	12.4	8.7-16.0	46	14.8	9.6-20.2	42
Among those who have used non-injection drugs, age (years) at first use									
<15	26.4	21.1-31.8	63	18.5	13.1-23.9	55	11.8	6.8-16.9	23
15-19	52.0	45.6-58.2	113	58.9	51.8-65.9	176	46.5	39.4-53.6	98
20-24	12.9	8.2-17.8	28	16.5	11.8-21.2	52	23.1	16.9-29.3	54
≥25	8.6	5.1-12.2	21	6.1	3.5-8.8	20	18.6	12.4-24.7	41
Median age (IQR)	16	14-18	225	16	15-19	303	18	16-21	216
Among those who have used non-injection drugs, used in the 6 months before survey									
Yes	83.6	78.7-88.4	190	93.5	90.2-96.9	283	84.8	79.4-90.2	184
Reported using non-injection drugs other than tobacco	63.8	57.8-69.9	138	67.2	60.6-73.9	197	75.3	68.9-81.7	164
Reported only tobacco use	36.2	30.1-42.2	87	32.8	26.1-39.4	106	24.7	18.3-31.1	53
No	16.4	11.6-21.3	35	6.5	3.1-9.8	20	15.2	9.8-20.6	33

Table 3.7.2: Non-injection and injection drug use by site (continued)

Non-injection drug use among people who inject drugs (PWID) by site, Zambia PWID BBS 2021									
	Livingstone (N = 235)			Lusaka (N = 349)			Ndola (N = 259)		
	%	95% CI	n	%	95% CI	n	%	95% CI	n
Type of drugs used†									
Glue (sniffing)	1.1	0.0-2.5	*	5.1	1.7-8.4	14	13.8	7.8-19.7	28
Tobacco	56.0	48.6-63.4	110	96.1	93.9-98.4	270	77.1	70.3-84.0	141
Petrol (sniffing)	0.3	0.0-0.6	*	2.5	0.5-4.6	*	11.7	5.8-17.7	21
Marijuana (daga)	57.3	50.1-65.0	103	45.1	38.1-52.1	117	77.8	70.1-85.5	144
Heroin (nono)	33.9	25.9-41.8	66	55.7	48.6-62.8	154	31.1	21.3-40.9	60
Cocaine	4.4	1.1-7.8	7	38.0	30.7-45.3	110	23.2	15.5-31.2	38
Amphetamine	0.0	0.0-0.0	0	4.2	1.2-7.2	12	8.9	4.8-12.6	22
Mandrax	0.0	0.0-0.0	0	0.4	0.0-0.9	*	11.0	5.1-16.9	16
Unga (rock cocaine)	4.5	1.6-7.3	8	29.8	22.7-36.9	80	2.5	0.3-4.6	5
Blue Mash	10.0	5.7-14.3	18	23.8	17.6-29.8	67	2.6	0.6-4.5	7
Artane	2.3	0.0-4.7	*	19.1	13.7-24.4	52	4.4	1.0-7.8	9
Other	1.9	0.0-4.3	*	16.7	11.5-21.9	43	6.0	1.8-10.2	10

*To protect the identity of survey respondents, numerators greater than 0 but less than 5 are suppressed with an asterisk. In addition, in categories where a numerator that was greater than 0 but less than 5 could be guessed, the next lowest numerator is also suppressed with an asterisk.
† Responses not mutually exclusive.
Note that the denominator for a characteristic may differ from the site total due to nonresponse or missing data. Also, due to rounding, estimated total sums may not equal 100.0%.

Table 3.7.3. Injection drug use history by site

Injection drug use history among people who inject drugs (PWID) by site, Zambia PWID BBS 2021									
	Livingstone (N = 235)			Lusaka (N = 348)			Ndola (N = 259)		
	%	95% CI	n	%	95% CI	n	%	95% CI	n
Age (years) when first injected drugs									
< 15	7.2	4.2-10.2	19	2.8	1.2-4.4	12	2.3	0.8-3.7	7
15-19	49.5	41.9-57.0	116	51.0	44.2-57.9	172	38.1	31.2-45.0	101
20-24	24.8	18.5-31.0	52	27.5	22.1-32.9	104	32.4	26.5-38.2	82
≥25	18.5	13.5-23.6	48	18.7	13.1-24.2	60	27.3	20.9-33.6	69
Median age (IQR)	23	20-30	235	25	22-29	348	28	23-33	259
Duration of injection drug use									
<2 years	16.2	11.3-21.0	35	9.0	5.9-12.2	33	10.7	6.4-15.0	27
≥2–<6 years	53.9	47.7-60.1	126	56.8	50.4-63.1	183	36.9	30.3-43.7	96
≥6–<10 years	15.1	11.2-19.1	39	22.4	17.4-27.5	85	26.2	20.3-32.1	66
≥10 years	14.8	10.6-19.1	35	11.8	7.6-15.9	47	26.2	19.8-32.5	70
Median years (IQR)	4	2-6	235	5	3-7	348	6	3-10	259
Type of drug first injected									
Tie White (Heroin)	86.5	82.2-91.0	202	73.1	67.4-78.8	252	20.8	14.7-26.9	50
Mandrax	0.0	0.0-0.0	0	0.0	0.0-0.0	0	0.0	0.0-0.0	0
Dirty Drug (Heroin)	0.4	0.0-0.8	*	42.6	36.5-48.6	153	5.1	2.0-8.1	13
Ashtone powder /mixed cocaine (dirty, little if any cocaine)	2.1	0.4-3.9	6	2.0	0.2-3.8	*	5.6	2.7-8.5	16
Unga (rock cocaine)	0.8	0.0-1.8	*	0.0	0.0-0.0	0	1.5	0.0-3.1	*
Opium	0.0	0.0-0.0	0	1.1	0.0-2.6	*	0.5	0.0-1.3	*
Other	11.0	6.6-15.5	25	2.1	0.2-4.0	6	73.9	67.6-80.2	188
Relationship with person who first injected them									
Injected by themselves	6.2	3.6-8.7	19	35.0	29.3-40.8	115	13.7	8.3-19.1	35
A person they had sex with	5.7	2.2-9.1	12	1.5	0.2-2.8	6	2.0	0.0-4.2	*
A relative	6.2	3.2-9.1	14	3.9	1.5-6.3	11	5.6	2.7-8.6	*
A friend	44.3	36.4-52.1	102	44.3	38.5-50.1	161	71.8	65.5-78.1	187
A dealer/other user	37.8	29.9-45.6	88	15.2	11.0-19.4	56	6.9	3.4-10.3	18

Table 3.7.3. Injection drug use history by site (continued)

Injection drug use history among people who inject drugs (PWID) by site, Zambia PWID BBS 2021									
	Livingstone (N = 235)			Lusaka (N = 348)			Ndola (N = 259)		
	%	95% CI	n	%	95% CI	n	%	95% CI	n
Shared needle or a syringe the first time ever injected drugs									
Yes	44.1	37.3-51.0	104	21.1	15.5-26.6	63	54.8	47.2-62.4	147
No	55.9	49.0-62.7	129	78.9	73.4-84.5	285	45.2	37.6-52.8	112
Had ever overdosed									
Yes	76.4	70.7-82.2	181	47.3	40.7-53.9	159	51.3	44.5-58.1	138
No	23.6	17.8-29.3	54	52.7	46.1-59.3	190	48.7	41.9-55.5	121
Among those who overdosed, how many times ever overdosed?									
More than 1 less than 5 times	75.6	70.1-81.6	129	73.7	67.6-79.9	109	89.5	83.5-95.6	123
At least 5 but less than 10 times	9.6	5.9-13.2	19	12.4	7.1-17.6	23	8.5	2.7-14.5	10
10 or more	14.8	9.8-19.4	33	13.9	9.1-18.6	27	2.0	0.0-3.9	5
Among those with history of overdose, the last time overdosed?									
Within the 12 months before the survey	86.0	80.3-91.8	155	83.7	76.7-90.7	132	78.7	71.2-86.4	109
12 or more months before the survey	14.0	8.2-19.7	26	16.3	9.3-23.3	27	21.3	13.6-28.8	29
Ever been detained or imprisoned for drug use									
Yes	62.9	55.9-69.9	150	75.9	70.5-81.4	272	32.9	26.5-39.2	77
No	37.1	30.1-44.1	85	24.1	18.6-29.5	77	67.1	60.8-73.5	181

*To protect the identity of survey respondents, numerators greater than 0 but less than 5 are suppressed with an asterisk. In addition, in categories where a numerator that was greater than 0 but less than 5 could be guessed, the next lowest numerator is also suppressed with an asterisk.
Note that the denominator for a characteristic may differ from the site total due to nonresponse or missing data. Also, due to rounding, estimated total sums may not equal 100.0%.

Table 3.7.4: Recent injection drug use behavior by site

Recent injection drug use behavior among people who inject drugs (PWID) by site, Zambia PWID BBS 2021									
	Livingstone (N = 235)			Lusaka (N = 349)			Ndola (N = 258)		
	%	95% CI	n	%	95% CI	n	%	95% CI	n
Last time injected drugs									
Today/yesterday	49.1	42.6-55.7	122	47.8	40.7-54.9	184	16.6	11.8-21.4	47
More than a couple days before the survey, less than one week	40.8	34.6-47.1	92	45.7	38.7-52.8	142	47.5	39.8-55.2	125
More than a week, but with a month of the survey	9.1	5.3-12.8	*	5.3	2.3-8.3	*	17.3	11.9-22.6	43
More than a month, but within the three months before the survey	1.0	0.0-2.2	*	1.1	0.0-2.9	*	18.6	12.6-24.7	43
Injected drugs how often in the six months before the survey									
Less than once a month	0.9	0.0-1.8	*	2.5	0.0-5.2	*	12.8	7.2-18.5	24
One to four times a month	13.8	8.7-18.9	28	29.0	22.7-35.2	87	61.7	54.6-68.9	152
Two to seven times a week/once a day	52.9	46.4-59.5	126	37.0	31.1-43.0	135	19.0	14.3-23.7	62
Two to three times a day	31.2	24.8-37.5	75	30.8	24.6-36.9	117	3.1	1.5-4.7	13
Five or more times a day	1.2	0.2-2.2	*	0.7	0.0-1.6	*	3.4	0.8-6.0	8

Table 3.7.4: Recent injection drug use behavior by site (continued)

Recent injection drug use behavior among people who inject drugs (PWID) by site, Zambia PWID BBS 2021									
	Livingstone (N = 235)			Lusaka (N = 349)			Ndola (N = 258)		
	%	95% CI	n	%	95% CI	n	%	95% CI	n
Types of drugs injected in the six months before the survey†									
Tie White (Heroin)	93.9	90.0-97.8	222	95.9	93.8-97.9	333	28.8	21.7-35.8	75
Artane	4.5	2.0-7.1	10	5.4	2.4-8.4	18	68.0	60.9-75.1	177
Blue Marsh (Promethazine)	7.3	3.5-11.2	15	6.0	2.9-9.1	20	59.9	52.6-67.2	160
Mandrax	0.0	-	0	1.5	0.1-2.9	*	5.2	2.1-8.4	14
Dirty Drug/Voloo (Mixed Heroin)	0.4	0.1-0.7	*	75.5	69.6-81.4	263	6.4	3.4-9.4	19
Ashtone powder (Cocaine)	0.4	0.0-0.9	*	19.8	14.4-25.1	64	11.6	7.2-16.0	29
Mixed cocaine	0.8	0.0-1.8	*	12.0	7.6-16.3	39	6.0	2.1-9.8	12
Bendeka (Diazepam)	3.2	0.5-5.9	*	4.4	2.0-6.8	16	13.3	8.4-18.3	35
Unga (Cocaine)	0.8	0.0-1.8	*	5.0	2.5-7.5	19	2.4	0.0-5.3	*
Opium	0.0	-	0	7.3	4.0-10.6	26	2.4	0.0-5.1	*
Nyerere (Benylin/Codeine)	2.9	0.9-5.0	7	5.6	2.8-8.4	22	38.1	30.7-45.5	92
Other	2.2	0.9-3.5	8	1.8	0.0-3.8	*	3.7	1.1-6.4	9
Sold sex for drugs in the six months before the survey	7.5	3.9-11.1	16	6.4	3.2-9.7	19	19.0	13.3-24.6	55

*To protect the identity of survey respondents, numerators greater than 0 but less than 5 are suppressed with an asterisk. In addition, in categories where a numerator that was greater than 0 but less than 5 could be guessed, the next lowest numerator is also suppressed with an asterisk.
† Responses not mutually exclusive.
Note that the denominator for a characteristic may differ from the site total due to nonresponse or missing data. Also, due to rounding, estimated total sums may not equal 100.0%.

Table 3.7.5: Needle, syringe, and cooker practices by site

Needle, syringe, and cooker practices among people who inject drugs (PWID) by site, Zambia PWID BBS 2021									
	Livingstone (N = 235)			Lusaka (N = 349)			Ndola (N = 258)		
	%	95% CI	n	%	95% CI	n	%	95% CI	n
How often was a new, sterile needle used for injecting drugs in the six months before the survey									
Never	1.4	0.4-2.3	5	2.7	0.8-4.5	9	9.1	5.2-13.0	24
Rarely	29.8	24.0-35.7	72	15.4	11.1-19.8	55	29.4	23.1-35.8	68
Sometimes	36.4	30.2-42.5	90	29.7	24.1-35.3	106	32.7	26.4-38.9	86
Always	32.4	26.3-38.5	68	52.2	46.1-58.3	179	28.9	22.4-35.2	78
In the six months before the survey, how often were drugs injected with a syringe/needle previously used by someone									
Never	42.7	34.8-50.2	73	70.9	63.0-78.8	122	32.8	24.6-41.4	54
Rarely	22.8	15.6-29.6	41	9.8	5.1-14.3	*	21.5	14.5-28.9	33
Sometimes	31.4	23.4-40.4	48	17.3	9.8-25.0	27	38.9	30.1-47.2	79
Always	3.0	0.5-5.5	5	2.0	0.0-4.3	*	6.7	2.9-10.5	14
Reason why a new needle/syringe not always used									
Not available	15.1	8.7-22.0	23	14.7	9.0-20.4	27	10.7	5.3-15.9	22
Difficult to find	17.5	11.7-23.6	27	4.7	1.6-7.6	11	37.7	29.7-45.6	69
Expensive	61.4	52.7-69.1	111	71.5	64.1-79.2	123	43.8	34.6-53.1	74
Other	6.0	0.9-11.3	6	9.1	4.1-14.1	8	7.9	3.6-12.1	15

Table 3.7.5: Needle, syringe, and cooker practices by site (continued)

Needle, syringe, and cooker practices among people who inject drugs (PWID) by site, Zambia PWID BBS 2021									
	Livingstone (N = 235)			Lusaka (N = 349)			Ndola (N = 258)		
	%	95% CI	n	%	95% CI	n	%	95% CI	n
In the three months before the survey, how many sterile needles would have been needed for personal use that were not received from pharmacies, NGO, etc.									
0	3.0	1.1-4.9	8	8.9	4.7-13.0	26	41.4	34.5-48.2	99
1 to 10	14.9	9.6-20.3	31	29.9	24.1-35.6	88	53.2	46.4-60.0	142
11 to 40	46.9	40.4-53.4	105	33.6	27.8-39.4	117	5.1	2.6-7.7	*
> 40	35.2	29.0-41.4	91	27.7	22.0-33.4	104	0.3	0.0-0.7	*
In the six months before the survey, how often injected drugs using cookers, cottons, tourniquets, or water previously used by someone									
Never	35.1	29.2-41.1	77	64.3	58.9-69.7	228	56.3	48.8-63.9	141
Rarely	29.9	24.2-35.5	78	12.6	8.5-16.8	36	18.9	13.2-24.6	45
Sometimes	30.6	24.4-36.7	68	20.5	15.8-25.3	72	16.6	11.8-21.3	50
Always	4.4	2.1-6.8	12	2.6	1.0-4.1	11	8.3	4.6-11.9	23
In the six months before the survey, how often were previously used syringes cleaned before reuse									
Never	7.0	3.5-10.5	15	61.3	54.9-67.6	207	30.6	23.0-38.1	78
Occasionally	8.5	4.8-12.1	20	2.8	1.0-4.6	10	13.0	7.9-18.0	33
Sometimes	11.3	7.9-14.6	34	12.5	8.6-16.5	44	30.8	24.4-37.1	84
Always	73.2	67.2-79.4	166	23.4	17.5-29.4	87	25.7	19.3-32.1	64
In the six months before the survey, how often were syringes used that had been back- or front-loaded									
Never	53.6	47.2-60.0	131	76.8	71.0-82.6	271	56.0	48.7-63.2	136
Rarely	22.3	17.0-27.5	53	12.6	8.0-17.2	40	15.7	10.9-20.6	43
Sometimes	12.7	8.7-16.6	29	8.9	5.5-12.3	31	24.0	17.9-30.2	68
Always	11.5	6.9-16.2	22	1.7	0.0-3.8	6	4.3	1.5-7.1	12
Ever engaged in 'bluetooth"†	20.9	15.5-26.4	48	5.9	2.6-9.1	17	11.8	7.4-16.1	32
Among those who have engaged in bluetooth, how often was bluetooth performed in the six months before the survey?									
Never	50.3	35.6-66.7	22	79.2	69.3-89.6	12	15.6	5.6-27.4	*
Rarely	38.8	23.1-53.3	20	10.1	0.0-24.5	*	7.1	3.7-7.8	*
Sometimes	10.8	3.7-17.7	6	10.7	0.0-26.4	*	77.4	66.1-89.4	24
Always	0.0	0.0-0.0	0	0.0	0.0-0.0	0	0.0	0.0-0.0	0

*To protect the identity of survey respondents, numerators greater than 0 but less than 5 are suppressed with an asterisk. In addition, in categories where a numerator that was greater than 0 but less than 5 could be guessed, the next lowest numerator is also suppressed with an asterisk.
†Bluetooth means injecting oneself with blood drawn from someone else who has recently injected drugs.
Note that the denominator for a characteristic may differ from the site total due to nonresponse or missing data. Also, due to rounding, estimated total sums may not equal 100.0%.

Table 3.7.6: HIV prevalence by drug injection practices and history by site

HIV prevalence among people who inject drugs (PWID) by self-reported drug injection practices and history, by site, Zambia PWID BBS 2021

	Livingstone (N = 235)				Lusaka (N = 349)				Ndola (N = 259)			
	%	95% CI	n	N	%	95% CI	n	N	%	95% CI	n	N
Age (years) when first injected drugs												
< 15	19.6	5.0 - 34.5	*	19	2.5	0.0 - 6.8	*	12	31.0	0.0 - 68.9	*	7
15-19	5.8	2.2 - 9.5	7	116	5.7	2.1 - 9.4	9	172	12.5	2.9 - 22.1	11	101
20-24	8.9	1.2 - 16.6	5	52	10.1	3.7 - 16.6	10	104	20.6	10.9 - 30.2	15	82
≥25	31.2	17.8 - 44.1	16	48	8.3	1.9 - 14.9	6	60	33.5	21.3 - 46.1	24	69
Duration of injection drug use												
<2 years	0.0	-	0	35	0.0	-	0	33	9.1	0.0 - 20.4	*	27
≥2–<6 years	9.8	5.2 - 14.5	13	126	6.1	2.7 - 9.6	11	183	15.8	6.6 - 24.8	16	96
≥6–<10 years	18.7	6.5 - 30.9	7	39	10.9	3.3 - 18.5	9	85	26.9	13.0 - 40.9	15	66
≥10 years	28.0	15.4 - 41.2	12	35	11.9	1.6 - 22.3	6	47	28.2	18.0 - 38.5	18	70
Shared needle or a syringe the first time ever injected drugs												
Yes	13.9	6.8 - 20.9	15	104	3.8	0.0 - 7.9	*	63	16.9	9.2 - 24.6	22	147
No	11.1	6.3 - 15.8	17	129	8.3	4.9 - 11.6	23	285	26.5	18.0 - 35.1	30	112
Ever been detained or imprisoned for drug use												
Yes	10.6	5.7 - 15.4	18	150	6.8	3.7 - 9.9	18	272	24.9	12.9 - 36.7	16	77
No	15.1	7.1 - 22.8	14	85	9.0	2.1 - 15.7	8	77	19.6	13.0 - 26.2	36	181
Frequency of injection in the six months before the survey												
Less than once a month	0.0	-	0	*	0.0	-	0	7	27.4	8.2 - 46.4	6	24
One to four times a month	22.2	8.5 - 36.2	7	28	3.7	0.0 - 7.9	*	87	23.4	15.6 - 31.1	34	152
Two to seven times a week/once a day	12.2	6.4 - 18.1	17	126	6.3	2.1 - 10.5	9	135	12.6	3.7 - 21.2	9	62
Two to three times a day	8.7	2.8 - 14.6	8	75	11.9	5.0 - 18.9	13	117	20.1	0.0 - 42.2	*	13
Five or more times a day	0.0	-	0	*	35.9	18.0 - 53.8	*	*	10.7	0.0 - 32.3	*	8
Sold sex for drugs in the six months before the survey												
Yes	39.9	16.5 - 63.6	6	16	12.4	0.0 - 29.5	*	19	12.7	2.3 - 23.2	8	55
No	10.0	6.4 - 13.7	26	219	7.0	4.1 - 9.9	24	330	23.3	16.1 - 30.6	44	204
In the six months before the survey, how often were drugs injected with a syringe/needle previously used by someone												
Never	14.5	7.6 - 21.5	13	73	7.4	2.2 - 12.6	10	122	23.6	10.0 - 37.3	12	54
Rarely	11.6	2.0 - 21.0	*	41	0.0	-	0	18	23.0	8.6 - 37.6	9	33
Sometimes	11.8	3.9 - 19.4	6	48	5.8	0.0 - 13.9	*	27	16.3	4.8 - 27.6	12	79
Always	0.0	-	0	5	0.0	-	0	*	3.2	0.0 - 8.6	*	14
In the six months before the survey, how often injected drugs using cookers, cottons, tourniquets, or water previously used by someone												
Never	11.8	5.8 - 17.9	12	77	9.0	5.0 - 13.0	21	228	27.7	18.6 - 36.7	37	141
Rarely	13.1	6.0 - 20.2	10	78	0.0	-	0	36	14.3	3.3 - 25.2	6	45
Sometimes	11.8	3.8 - 19.7	9	68	5.3	0.0 - 10.9	*	72	9.7	2.4 - 16.9	5	50
Always	12.3	0.0 - 31.0	*	12	14.1	0.0 - 37.7	*	11	16.9	2.4 - 31.2	*	23

Table 3.7.6: HIV prevalence by drug injection practices and history by site (continued)

HIV prevalence among people who inject drugs (PWID) by self-reported drug injection practices and history, by site, Zambia PWID BBS 2021

	Livingstone (N = 235)				Lusaka (N = 349)				Ndola (N = 259)			
	%	95% CI	n	N	%	95% CI	n	N	%	95% CI	n	N
In the six months before the survey, how often were syringes used that had been back- or front-loaded												
Never	11.4	5.5 - 17.2	18	131	8.3	4.8 - 11.7	23	271	27.4	18.9 - 36.0	35	136
Rarely	7.1	0.6 - 13.7	*	53	6.4	0.0 - 14.8	*	40	12.3	0.9 - 23.7	5	43
Sometimes	17.8	4.8 - 30.9	5	29	2.2	0.0 - 5.6	*	31	14.2	4.0 - 24.3	9	68
Always	20.3	5.5 - 35.4	5	22	0.0	-	0	6	14.0	0.0 - 29.4	*	12
Have engaged in 'bluetooth'†?												
Yes	6.1	1.7 - 10.7	5	48	4.6	0.0 - 13.5	*	17	6.4	0.0 - 13.7	*	32
No	13.8	8.6 - 19.1	27	187	7.5	4.5 - 10.5	25	332	23.3	16.6 - 30.0	49	227
Total	12.2	8.2 - 16.3	32	235	7.3	4.5 - 10.2	26	349	21.3	15.2 - 27.4	52	259

*To protect the identity of survey respondents, numerators greater than 0 but less than 5 are suppressed with an asterisk. In addition, in categories where a numerator that was greater than 0 but less than 5 could be guessed, the next lowest numerator is also suppressed with an asterisk.
†Bluetooth means injecting oneself with blood drawn from someone else who has recently injected drugs.
Note that the denominator for a characteristic may differ from the site total due to nonresponse or missing data. Also, due to rounding, estimated total sums may not equal 100.0%.

Table 3.7.7: Drug treatment programs by site

Drug treatment programs among people who inject drugs (PWID), by site, Zambia PWID BBS 2021

	Livingstone (N = 235)			Lusaka (N = 349)			Ndola (N = 258)		
	%	95% CI	n	%	95% CI	n	%	95% CI	n
Percentage aware of any drug treatment available intended to modify, reduce, or stop drug use	15.8	11.5-20.3	42	41.7	35.8-47.6	145	20.1	14.6-25.5	51
Among those aware of treatment programs, percentage who had ever received any professional drug treatment	27.9	13.1-42.8	12	22.9	15.6-30.1	33	30.8	17.3-44.4	13
Among those who had received treatment, percentage who had been in a drug treatment program in the six months before the survey	8.7	0.0-19.1	*	9.4	4.4-14.3	13	11.8	2.1-21.5	5
The kind of treatment received†									
Inpatient counseling	58.7	38.4-79.1	*	80.0	56.6-100.0	10	0.0	0.0-0.0	0
Outpatient counseling	0.0	0.0-0.0	0	28.4	0.4-55.7	*	37.2	0.0-75.2	*
Peer/community counseling	0.0	0.0-0.0	0	9.2	0.0-25.9	*	21.7	0.0-75.1	*
Maintenance with methadone	0.0	0.0-0.0	0	50.1	21.8-78.5	6	0.0	0.0-0.0	0
Detoxification with other drugs	100.0	0.0-0.0	*	93.0	79.9-100.0	12	40.9	18.9-63.0	*
Other	0.0	0.0-0.0	0	7.1	0.0-20.1	*	0.0	0.0-0.0	0

*To protect the identity of survey respondents, numerators greater than 0 but less than 5 are suppressed with an asterisk. In addition, in categories where a numerator that was greater than 0 but less than 5 could be guessed, the next lowest numerator is also suppressed with an asterisk.
† Responses not mutually exclusive.
Note that the denominator for a characteristic may differ from the site total due to nonresponse or missing data. Also, due to rounding, estimated total sums may not equal 100.0%.

3.8 HIV KNOWLEDGE, PREVENTION, AND OUTREACH

Key findings

- Comprehensive knowledge of HIV (defined by answers to 5 basic questions)[1] was low among both PWID under age 25 years (range: 6.1%-17.1%) and PWID aged 25 years and older (range: 1.7%-19.2%). When asked about the HIV risk of different sexual activities, including anal sex, the highest proportion of PWID across all sites thought vaginal sex put one at the highest risk for HIV if a condom was not used (range: 68.4%-90.1%; Table 3.8.1).
- A high percentage of PWID were aware that a person can get HIV by injecting with a needle that was used by someone else (range: 94.2%-97.4%). More PWID in Lusaka and Ndola were aware that they could protect themselves from HIV by switching to drugs that are swallowed, sniffed, or inhaled compared with PWID in Livingstone (63.6% and 59.8% vs. 45.0%, respectively; Table 3.8.1).
- Across the three sites, a consistent proportion of PWID had ever received HIV messaging from a peer educator/outreach worker (range: 58.1%-60.8%). Among those who had received HIV messaging from a peer educator/outreach worker, 9.4%-20.1% received messaging in the 30 days before the survey. Male condoms were the most received item for those who met with a peer educator/outreach worker (range: 47.9%-84.8%). HIV testing and counseling on risk were the most common services PWID received when they met with a peer educator/outreach worker (range: 40.8%-75.8% and 33.0%-56.3%, respectively; Table 3.8.2).

Table 3.8.1: Knowledge, opinions, and attitudes toward HIV/AIDS by site

HIV knowledge, opinions, and attitudes toward HIV/AIDS among people who inject drugs (PWID) by site, Zambia PWID BBS 2021									
	Livingstone (N = 234)			Lusaka (N = 348)			Ndola (N = 259)		
Characteristics	%	95% CI	n	%	95% CI	n	%	95% CI	n
Correctly responded to: Can the risk of HIV transmission be reduced by having sex with only one uninfected sex partner who has no other partners?	19.1	14.4-23.8	48	12.8	8.4-17.3	43	28.1	21.9-34.1	80
Correctly responded to: Can a person reduce the risk of getting HIV by using a condom every time they have sex?	86.0	81.3-90.7	202	90.1	86.1-94.0	312	95.2	92.7-97.7	246
Correctly responded to: Can a healthy-looking person have HIV or AIDS?	82.4	77.1-87.6	197	91.0	87.1-94.9	320	94.4	91.2-97.5	242
Correctly responded to: Can a person get HIV from mosquito bites?	77.9	72.7-82.8	181	62.2	56.0-68.3	206	76.8	71.0-82.4	195
Correctly responded to: Can a person get HIV by sharing food with someone who is infected?	97.1	95.0-99.3	228	87.5	83.4-91.5	306	95.2	92.9-97.5	242
Proportion with comprehensive HIV knowledge†	7.1	4.3 - 9.9	20	4.0	1.8 - 6.2	14	18.7	13.9 - 23.5	54
Among those aged < 25 years	6.2	2.7-9.8	12	6.1	2.0-10.1	9	17.1	7.0-27.3	15
Among those aged 25 years or older	8.0	2.4-13.6	8	1.7	0.0-3.4	5	19.2	12.7-25.7	39
What kind of sex puts one at highest risk for HIV if a condom is not used									
Oral sex	2.8	0.7-5.0	7	4.2	1.6-6.7	*	6.5	2.5-10.4	*
Vaginal sex	90.1	86.6-93.6	209	68.4	61.7-75.1	239	86.2	81.5-90.8	217

Table 3.8.1: Knowledge, opinions, and attitudes toward HIV/AIDS by site (continued)

HIV knowledge, opinions, and attitudes toward HIV/AIDS among people who inject drugs (PWID) by site, Zambia PWID BBS 2021									
	Livingstone (N = 234)			Lusaka (N = 348)			Ndola (N = 259)		
Characteristics	%	95% CI	n	%	95% CI	n	%	95% CI	n
What kind of sex puts one at highest risk for HIV if a condom is not used (cont.)									
Anal sex	7.1	4.1-10.1	17	27.3	21.3-33.3	89	6.7	3.5-9.7	18
Fingering/hand job	0.0	0.0-0.0	0	0.1	0.0-0.2	*	0.7	0.0-1.5	*
Aware that a person can get HIV by injecting with a needle already used by someone else	94.2	90.9-97.5	219	94.4	91.4-97.3	332	97.4	95.6-99.2	250
Aware that PWID can protect themselves from HIV by switching to drugs that are swallowed, sniffed, or inhaled	45.0	38.4-51.5	111	63.6	57.4-69.8	218	59.8	53.2-66.5	161

* To protect the identity of survey respondents, numerators greater than 0 but less than 5 are suppressed with an asterisk. In addition, in categories where a numerator that was greater than 0 but less than 5 could be guessed, the next lowest numerator is also suppressed with an asterisk.

†According to the UNAIDS definition, see https://dhsprogram.com/data/Guide-to-DHS-Statistics/Comprehensive_Knowledge_about_HIV_Total_and_Youth.htm.

Note that the denominator for a characteristic may differ from the site total due to nonresponse or missing data. Also, due to rounding, estimated total sums may not equal 100.0%.

Table 3.8.2: Outreach services and HIV information by site

Outreach services and HIV information accessed by people who inject drugs (PWID) by site, Zambia PWID BBS 2021									
	Livingstone (N = 235)			Lusaka (N = 349)			Ndola (N = 258)		
Characteristics	%	95% CI	n	%	95% CI	n	%	95% CI	n
Ever received HIV messaging from peer educator/outreach worker									
Yes	60.8	53.7-67.9	147	58.1	51.9-64.3	196	58.3	51.9-64.7	152
No	39.2	32.3-46.1	88	41.9	35.8-48.0	153	41.7	35.2-48.2	106
Among those who received HIV messaging from peer educator /outreach worker, time of most recent message									
Within 30 days of the survey	13.6	7.9-19.3	18	9.4	5.2-13.6	21	20.1	12.6-27.6	29
More than 30 days but within 3 months before the survey	37.2	27.9-46.5	48	17.4	11.1-23.8	37	46.0	37.0-54.9	73
More than 3 months but within 1 year before survey	32.9	24.3-41.5	52	32.6	25.3-40.0	68	12.1	6.6-17.5	18
More than a year before the survey	16.4	10.9-21.8	29	40.5	32.4-48.6	70	21.9	15.0-28.7	32
Among those who received HIV messaging, items received from peer educator/outreach worker at last encounter†									
Nothing	9.6	4.7-14.5	16	23.3	16.5-30.1	45	30.4	20.8-40.0	44
Male condoms	84.8	79.3-90.3	120	72.7	65.7-79.7	143	47.9	37.8-58.1	77
Female condoms	2.7	0.5-4.9	*	4.1	0.5-7.7	*	3.9	1.1-6.6	7
Lubricants	6.9	2.8-11.1	12	0.7	0.0-1.7	*	2.0	0.2-3.8	*
Pamphlet or brochure	24.2	16.5-31.8	39	29.6	21.7-37.4	56	11.0	5.6-16.4	15
Medicines	0.9	0.0-2.0	*	2.3	0.0-4.5	5	10.2	4.9-15.4	14
HIV self-test	1.0	0.0-2.2	*	6.8	2.2-11.2	12	7.5	3.4-11.7	14
Voucher for HIV self-test	1.0	0.0-2.2	*	4.1	1.0-7.2	8	2.6	0.0-6.1	*
Offer to escort to a health facility	1.5	0.0-3.5	*	3.8	1.1-6.7	7	0.0	0.0-0.0	0

Table 3.8.2: Outreach services and HIV information by site (continued)

Outreach services and HIV information accessed by people who inject drugs (PWID) by site, Zambia PWID BBS 2021									
	Livingstone (N = 235)			Lusaka (N = 349)			Ndola (N = 258)		
Characteristics	%	95% CI	n	%	95% CI	n	%	95% CI	n
Among those who had received HIV messaging, items received from peer educator/outreach worker at last encounter† (cont.)									
Offer of clean needles/syringes	2.0	0.4-3.6	5	0.0	0.0-0.0	0	1.7	0.0-5.2	*
Other	0.0	0.0-0.0	0	3.4	0.7-6.0	7	3.8	0.0-8.3	5
Among those who received HIV messaging, services received from peer educator/outreach worker at last encounter†									
Nothing	16.8	10.3-23.4	21	15.1	8.8-21.4	25	26.6	18.9-34.3	41
HIV testing	75.8	69.0-82.7	114	55.8	48.0-63.5	119	40.8	31.6-50.1	69
STI testing	12.8	6.4-19.2	17	5.6	2.3-8.8	*	6.0	0.9-11.1	7
STI screening	9.8	3.8-15.9	12	7.6	3.5-11.7	15	5.7	0.0-11.5	7
TB screening	11.6	4.6-18.5	16	12.0	6.0-17.9	20	5.4	0.9-9.8	6
Referral	0.0	0.0-0.0	0	2.4	0.0-4.8	*	0.9	0.0-1.9	*
Training on condom use	13.5	8.0-18.8	22	39.4	30.9-48.0	80	26.7	18.6-35.0	41
Counseling on risk	56.3	47.4-65.0	88	53.5	45.1-61.7	110	33.0	24.2-41.6	48
Other	0.0	0.0-0.0	0	0.0	0.0-0.0	0	0.9	0.0-2.4	*
Preferred source(s) to receive HIV information†									
Radio	2.9	0.8-5.1	6	54.2	47.9-60.6	188	6.5	3.3-9.8	18
Television	9.3	5.5-13.2	27	34.3	28.1-40.3	118	5.3	3.1-7.6	19
Newspaper	1.0	0.1-2.0	*	5.7	2.6-8.7	22	0.2	0.0-0.4	*
Internet	10.4	6.6-14.3	24	10.2	6.2-14.2	32	6.0	2.1-9.8	13
Mobile Apps	8.5	4.6-12.2	18	3.8	0.7-6.9	9	3.8	1.7-6.0	10
Telephone/SMS/WhatsApp	1.8	0.5-3.1	*	1.6	0.0-3.2	*	0.3	0.0-0.7	*
Brochure	8.5	4.9-12.2	17	15.7	11.7-19.7	63	1.1	0.1-2.1	*
Friends	36.9	30.5-43.2	75	32.4	26.5-38.3	118	13.1	8.3-17.8	30
Family	1.9	0.7-3.1	7	21.1	15.9-26.3	77	4.8	1.6-8.1	10
Sex partners	4.1	1.6-6.5	9	4.7	1.8-7.6	16	1.4	0.3-2.6	5
Health care providers	80.6	75.1-86.0	188	87.7	84.1-91.3	297	83.7	79.1-88.3	214
Peer educator/outreach worker	45.0	38.9-51.2	101	46.5	40.1-52.9	162	30.7	23.9-37.4	76
Religious leader	0.4	0.0-1.0	*	0.7	0.0-1.4	*	0.6	0.0-1.3	*
Other	11.6	6.9-16.2	27	4.4	1.7-7.2	16	2.2	0.6-3.8	7
What HIV-related topics do you want to learn more about?†									
How HIV is transmitted	32.2	26.0-38.5	73	56.5	50.4-62.6	200	48.3	41.0-55.5	123
How to prevent HIV	57.6	50.9-64.2	121	53.4	46.7-60.0	186	59.8	53.2-66.5	158
How to treat HIV	56.9	49.7-64.1	123	30.6	25.0-36.2	108	31.1	24.9-37.3	79
How to use a condom	22.8	16.9-28.7	49	10.7	7.3-14.0	39	5.8	3.1-8.4	18
Talking to partner about condom use	14.3	9.5-19.2	28	12.3	8.0-16.8	37	4.1	1.2-7.0	11
Abstinence	12.1	6.9-17.3	25	9.1	4.8-13.7	25	2.7	0.4-5.0	*
Monogamy	0.6	0.0-1.3	*	2.2	0.5-3.9	9	1.6	0.0-3.8	*
PrEP	57.1	50.3-64.2	128	55.6	49.4-61.7	186	22.7	16.5-29.2	52
PEP	5.6	2.7-8.5	*	13.7	9.2-18.0	43	13.0	7.5-18.4	26
Treatment	22.9	17.6-28.3	52	34.3	28.6-40.0	126	11.0	6.9-15.2	28
Other	7.7	4.8-10.7	23	15.0	10.7-19.4	50	3.7	0.8-6.6	10
None	26.6	21.1-32.1	73	29.0	23.5-34.6	94	17.9	11.5-24.4	40

* To protect the identity of survey respondents, numerators greater than 0 but less than 5 are suppressed with an asterisk. In addition, in categories where a numerator that was greater than 0 but less than 5 could be guessed, the next lowest numerator is also suppressed with an asterisk.
† Responses not mutually exclusive.
Note that the denominator for a characteristic may differ from the site total due to nonresponse or missing data. Also, due to rounding, estimated total sums may not equal 100.0%.

3.9 UTILIZATION OF HIV PREVENTION SERVICES

Key findings

- Most PWID across all three sites had been tested for HIV in their lifetime. Among PWID in Livingstone, Ndola, and Lusaka, 90.2%, 87.1%, and 79.7%, respectively, had ever been tested for HIV. Among those who tested, most traveled to the site where they received their last test (range: 67.5%-92.3%). The most common reason for not getting an HIV test was "no time to get tested" (range: 34.9%-35.4%) and "fear of getting a positive result" (range: 23.3%-34.5%). HIV self-tests were not commonly used (range: 0.3%-1.5%; Table 3.9.1).
- Among PWID who tested negative at the first survey visit, the majority had previously had an HIV test (range: 79.8%-90.8%). Over half of PWID in Livingstone and Ndola (56.1% and 51.1%, respectively) had tested for HIV in the six months preceding the survey compared to 34.3% of PWID in Lusaka (Table 3.9.2).
- PWID at all three sites were aware of numerous places (eg, clinics or hospitals, pharmacies, friends or peers, NGOs, etc.) to get condoms. In Livingstone and Ndola, PWID were more likely to have received free condoms in the year before the survey compared to those in Lusaka (77.7% and 73.6% vs. 35.7%, respectively; Table 3.9.3).
- Among HIV-negative PWID, more PWID in Livingstone and Ndola had ever heard of PrEP than those in Lusaka (68.0% and 56.8% vs. 18.1%, respectively). Few HIV-negative PWID who had heard of PrEP had ever used PrEP (16.2% in Livingstone, 11.9% in Lusaka, 22.7% in Ndola). Among PWID who had ever taken PrEP, 45.2%-78.8% took it in the 6 months prior to the survey. Among PWID who were aware of but had not yet taken PrEP, many were willing to take it (range: 62.4%-94.7%; Table 3.9.4).
- Awareness of post-exposure prophylaxis (PEP) was low among PWID across all sites (range: 7.2%-21.3%). Among PWID who heard of PEP, a small proportion had ever received PEP services (range: 4.4%-14.7%; Table 3.9.5).

Table 3.9.1: HIV testing by site

HIV testing experiences and preferences among people who inject drugs (PWID) by site, Zambia PWID BBS 2021									
	Livingstone (N = 235)			Lusaka (N = 349)			Ndola (N = 259)		
	%	95% CI	n	%	95% CI	n	%	95% CI	n
Ever tested for HIV									
Yes	90.2	85.6-94.8	215	79.7	74.5-84.8	282	87.1	82.3-91.9	228
No	9.8	5.2-14.4	20	20.3	15.2-25.5	67	12.9	8.1-17.7	31
Among those never tested, reason for not testing									
Did not feel at risk for HIV	5.7	5.6-5.6	*	23.3	4.3-42.4	16	33.4	9.1-58.8	10
Fear of positive result	34.5	36.8-37.1	*	23.3	8.4-38.5	14	29.2	10.5-48.1	*
No money to get tested	0.0	-	0	0.0	-	0	0.0	-	0
No time to get tested	35.1	13.8-52.6	9	35.4	7.7-62.6	28	34.9	14.8-55.2	10
Concerns about confidentiality	0.0	-	0	0.0	-	0	0.0	-	0
Stigma by healthcare workers	0.0	-	0	2.6	0.0-30.3	*	0.0	-	0
Other	24.7	4.8-43.6	5	15.3	0.0-39.4	*	2.4	1.8-1.8	*
How last HIV test was accessed by those who tested,									
Traveled to testing site	67.5	61.5-73.6	145	79.8	74.6-85.0	217	92.3	88.7-95.9	208
The testing services traveled to them	31.9	26.0-37.7	*	19.9	14.8-25.0	*	6.2	2.8-9.7	15
Conducted a self-test	0.6	0.0-1.6	*	0.3	0.0-0.9	*	1.5	0.3-2.6	5
Among those who tested, location of last test									
Testing and counseling center	0.0	-	0	2.5	0.6-4.3	8	8.6	4.7-12.6	19
Health clinic, hospital or similar	46.4	40.0-53.2	101	63.1	56.8-69.4	172	82.2	77.1-87.4	185
Outreach/mobile testing	39.3	32.6-45.7	80	29.7	23.7-35.7	87	6.2	2.5-9.8	14

Table 3.9.1: HIV testing by site (continued)

HIV testing experiences and preferences among people who inject drugs (PWID) by site, Zambia PWID BBS 2021	Livingstone (N = 235)			Lusaka (N = 349)			Ndola (N = 259)		
	%	95% CI	n	%	95% CI	n	%	95% CI	n
How last HIV test was accessed by those who tested, (cont.)									
In my home	0.3	0.1-0.5	*	0.7	0.0-1.6	*	2.0	0.7-3.2	7
At work	0.0	-	0	1.3	0.0-3.4	*	0.0	-	0
Where I socialize	2.6	1.1-4.2	8	2.7	0.9-4.5	11	0.3	0.2-0.4	*
Other	0.0	-	0	0.0	-	0	0.0	-	0
Among those who have tested, time of last HIV test									
In the 6 months before the survey	54.8	48.3-61.4	111	34.2	28.0-40.5	108	48.7	41.5-56.0	105
Between 7-12 months before the survey	15.5	10.9-20.3	32	19.9	14.0-25.9	49	12.2	7.6-16.5	35
More than 12 months before the survey	29.6	24.1-35.0	72	45.8	39.2-52.5	124	39.1	32.4-46.0	87
Reason for last HIV test†									
Health care/outreach worker offered test	31.8	25.5-38.2	66	19.1	12.5-25.6	51	11.0	6.6-15.3	25
They just wanted to know	54.5	47.5-61.2	117	56.7	50.2-63.2	158	72.0	65.3-78.5	168
Someone they had sex with was recently diagnosed	0.0	-	0	4.4	1.3-7.6	13	3.5	0.7-6.4	7
Someone they share needles/syringes with was recently diagnosed	0.0	-	0	0.0	-	0	0.3	0.0-0.6	*
Felt at risk	3.1	1.3-5.0	8	16.2	11.2-21.3	45	14.6	9.1-20.4	27
Felt sick	13.8	9.7-17.9	33	28.9	22.4-35.1	82	30.1	22.9-37.4	60
Got a new partner	0.0	-	0	1.7	0.2-3.1	5	0.7	0.0-2.1	*
Child diagnosed	0.0	-	0	0.3	0.0-1.0	*	2.1	0.5-3.6	6
Employer asked me to test	0.0	-	0	0.0	-	0	1.2	0.0-2.7	*
Pre-marital testing	0.0	-	0	0.0	-	0	0.4	0.0-1.0	*
Partner asked me to test	1.2	0.1-2.2	*	2.9	0.0-6.1	*	3.6	0.8-6.4	8
Other	4.0	1.8-6.1	*	12.8	8.8-16.8	41	1.6	0.2-2.9	5
Did the person who tested them do any of the following?									
Nothing	10.7	7.0-14.3	24	19.0	13.6-24.5	51	15.7	10.5-21.0	34
Counsel them on HIV care	89.3	85.5-93.2	190	80.7	74.6-86.7	229	84.2	79.1-89.3	188
Refer them to a care service	5.0	2.5-7.5	12	3.6	1.3-5.9	*	12.3	7.8-16.9	30
Accompany them to a care service	0.0	-	0	1.0	0.0-2.6	*	10.0	5.9-14.1	22
In their experience, the HIV test counseling received was:									
Respectful, caring, understanding	95.3	93.0-97.7	202	72.0	65.1-78.8	210	89.7	84.9-94.4	202
Disrespectful, uncaring, stigmatizing, uncomfortable	0.5	0.0-1.1	*	2.1	0.1-4.0	5	1.6	0.0-3.2	*
Neither respectful nor disrespectful	4.2	1.9-6.4	*	26.0	19.3-32.7	65	8.7	4.3-13.3	*
Received an HIV test in the last 12 months and know the results									
Yes	70.3	65.0-75.8	143	54.2	47.5-60.7	157	60.8	54.1-67.5	140
No	29.7	24.2-35.0	72	45.8	39.3-52.5	124	39.2	32.5-45.9	87

* To protect the identity of survey respondents, numerators greater than 0 but less than 5 are suppressed with an asterisk. In addition, in categories where a numerator that was greater than 0 but less than 5 could be guessed, the next lowest numerator is also suppressed with an asterisk.
† Responses not mutually exclusive.
Note that the denominator for a characteristic may differ from the site total due to nonresponse or missing data. Also, due to rounding, estimated total sums may not equal 100.0%.

Table 3.9.2: HIV testing history and perceptions of risk among those who tested HIV negative during the survey, by site

HIV testing history and self-perceived risk of HIV acquisition among people who inject drugs (PWID) who tested negative during the survey, by site, Zambia PWID BBS 2021	Livingstone (N = 203)			Lusaka (N = 323)			Ndola (N = 207)		
	%	95% CI	n	%	95% CI	n	%	95% CI	n
Ever tested for HIV									
Yes	90.8	85.3 - 96.4	187	79.8	74.6 - 85.0	261	88.0	82.8 - 93.2	183
No	9.2	3.6 - 14.7	16	20.2	14.9 - 25.5	62	12.0	6.9 - 17.1	24
Among those ever tested, timing of last HIV test									
In the six months before the survey	56.1	49.0 - 63.1	98	34.3	27.8 - 40.6	101	51.1	41.7 - 60.6	87
6-12 months before the survey	15.0	10.0 - 20.0	27	20.1	14.0 - 26.2	45	13.2	8.0 - 18.4	33
More than 12 months before the survey	28.9	22.8 - 35.0	62	45.6	38.8 - 52.4	114	35.7	27.8 - 43.6	62
Thought it was possible that they might have HIV at the time of the first survey visit									
Yes	14.3	8.8 - 19.9	25	6.3	2.6 - 10.0	15	20.1	11.4 - 28.8	28
No	85.6	79.8 - 91.5	163	93.7	90.0 - 97.5	267	79.9	71.2 - 88.6	130

*To protect the identity of survey respondents, numerators greater than 0 but less than 5 are suppressed with an asterisk. In addition, in categories where a numerator that was greater than 0 but less than 5 could be guessed, the next lowest numerator is also suppressed with an asterisk.
Note that the denominator for a characteristic may differ from the site total due to nonresponse or missing data. Also, due to rounding, estimated total sums may not equal 100.0%.

Table 3.9.3 Condom access by site

Condom access among people who inject drugs (PWID) by site, Zambia PWID BBS 2021	Livingstone (N = 235)			Lusaka (N = 349)			Ndola (N = 259)		
	%	95% CI	n	%	95% CI	n	%	95% CI	n
Where can a person access condoms†									
Clinic/hospital	92.7	89.3 - 96.1	217	84.8	79.9 - 89.7	306	89.6	85.3 - 94.0	233
Drug store/Pharmacy/Chemist	57.0	50.5 - 63.8	135	76.1	70.7 - 81.5	266	57.1	50.7 - 63.5	147
Kiosk/Shop	45.6	39.5 - 51.8	103	84.1	80.0 - 88.1	296	56.3	50.0 - 62.6	144
Local free dispenser	6.7	2.7 - 10.8	15	12.0	7.8 - 16.3	39	2.6	0.9 - 4.4	9
Friends/peers	47.1	40.7 - 53.3	97	5.0	2.9 - 7.1	23	5.4	2.3 - 8.5	15
Sexual partner	24.0	18.4 - 29.7	50	4.6	2.2 - 7.0	13	4.0	1.6 - 6.3	13
NGOs	37.3	31.0 - 43.7	84	21.9	17.2 - 26.6	80	1.9	0.3 - 3.6	5
Bar/Nightclub/Tavern	16.8	12.6 - 20.9	45	8.3	5.1 - 11.6	30	15.4	10.3 - 20.5	37
Other	5.1	3.0 - 7.3	15	3.2	0.7 - 5.8	9	1.9	0.0 - 3.8	5
Preferred condom brand†									
Maximum	47.1	40.4 - 54.0	108	60.8	54.7 - 66.9	215	57.7	51.2 - 64.1	157
Rough rider	4.4	1.9 - 6.9	10	13.1	8.4 - 17.8	41	19.9	14.8 - 25.0	57
Moods	10.3	6.7 - 13.9	27	4.5	2.0 - 7.0	16	10.7	6.6 - 14.8	27
Love condoms	5.5	2.6 - 8.4	13	8.4	5.0 - 11.9	29	15.7	10.4 - 20.9	44
Bare back	0.0	-	0	0.0	-	0	3.4	0.4 - 6.4	6
Durex	0.7	0.0 - 1.7	*	7.5	3.8 - 11.1	25	8.2	3.6 - 12.9	20
Lovers plus	1.3	0.0 - 2.8	*	0.9	0.0 - 2.1	*	2.3	0.1 - 4.5	7
Trust	0.0	-	0	0.2	0.0 - 0.6	*	0.4	0.0 - 0.7	*
Choice	0.0	-	0	0.5	0.0 - 1.2	*	0.6	0.0 - 1.4	*
Saxos	0.0	-	0	0.0	-	0	0.5	0.0 - 1.0	*
Protector	0.4	0.0 - 1.0	*	0.7	0.0 - 1.7	*	2.3	0.0 - 5.1	7
Other	48.1	41.0 - 55.1	111	21.2	15.9 - 26.4	66	20.7	14.5 - 27.0	47
N/A: do not use condoms	5.5	3.0 - 7.9	16	8.1	5.0 - 11.3	30	6.2	2.8 - 9.6	15

Table 3.9.3 Condom access by site (continued)

Condom access among people who inject drugs (PWID) by site, Zambia PWID BBS 2021									
	Livingstone (N = 235)			Lusaka (N = 349)			Ndola (N = 259)		
	%	95% CI	n	%	95% CI	n	%	95% CI	n
Received free condoms in the year before the survey									
Yes	77.7	72.3 - 83.2	179	35.7	29.6 - 42.0	130	73.6	67.6 - 79.5	192
No	22.3	16.8 - 27.7	56	64.3	58.0 - 70.4	219	26.4	20.5 - 32.4	67
Among those who received free condoms, preferred free or branded condoms									
Free	42.8	35.9 - 49.8	92	20.2	15.3 - 25.2	70	38.1	31.6 - 44.7	105
Branded	23.6	17.8 - 29.4	57	39.0	33.1 - 44.9	134	26.6	20.6 - 32.6	66
No preference	33.6	27.7 - 39.4	86	40.7	35.1 - 46.4	145	35.3	28.7 - 41.9	88
Reasons accessing condoms in the year before the survey was difficult†									
Can always get condoms	63.2	56.6 - 69.8	143	52.1	45.7 - 58.4	187	36.4	29.6 - 43.2	88
Costs too much	2.5	0.9 - 4.0	*	6.2	3.6 - 8.9	23	2.2	0.9 - 3.5	*
Not convenient	14.9	10.8 - 19.2	38	25.2	19.5 - 30.8	81	37.1	30.5 - 43.5	102
Clinic does not provide them	0.4	0.0 - 0.9	*	1.2	0.2 - 2.1	*	7.1	3.4 - 10.8	18
Embarrassed to get condoms	4.1	0.5 - 7.6	8	4.9	2.0 - 7.9	17	13.4	8.7 - 18.1	34
Do not know where to get condoms	0.0	-	0	1.5	0.1 - 2.9	*	1.7	0.1 - 3.3	*
Condoms not available	13.9	9.8 - 18.1	35	18.4	13.8 - 23.0	64	16.4	11.7 - 21.2	45
Other	3.7	1.6 - 5.9	11	5.9	3.4 - 8.3	22	8.6	4.4 - 12.7	19
Received information on condom use and safe sex in with the year before the survey									
Yes	52.9	46.1 - 59.7	118	31.3	26.1 - 36.7	123	59.0	52.3 - 65.7	151
No	47.1	40.3 - 53.9	117	68.7	63.3 - 73.9	226	41.0	34.3 - 47.7	108

* To protect the identity of survey respondents, numerators greater than 0 but less than 5 are suppressed with an asterisk. In addition, in categories where a numerator that was greater than 0 but less than 5 could be guessed, the next lowest numerator is also suppressed with an asterisk.
†Responses not mutually exclusive.
Note that the denominator for a characteristic may differ from the site total due to nonresponse or missing data. Also, due to rounding, estimated total sums may not equal 100.0%.

Table 3.9.4: Pre-exposure prophylaxis (PrEP) use and access by site

Pre-exposure prophylaxis (PrEP) use and access among HIV-negative people who inject drugs (PWID)† at last test by site, Zambia PWID BBS 2021									
	Livingstone (N = 200)			Lusaka (N = 258)			Ndola (N = 201)		
	%	95% CI	n	%	95% CI	n	%	95% CI	n
Thought it was possible that they were HIV positive									
Yes	13.8	8.3 - 19.2	24	4.6	0.8 - 8.4	8	19.6	12.2 - 27.0	34
No	80.8	74.9 - 86.7	160	84.2	78.9 - 89.4	221	55.8	47.1 - 64.5	119
Don't know	5.4	3.1 - 7.7	16	11.2	7.3 - 15.2	29	24.6	17.1 - 32.1	48
Ever heard of PrEP									
Yes	68.0	60.3 - 75.8	139	18.1	12.7 - 23.5	51	56.8	47.6 - 65.8	103
No	32.0	24.2 - 39.7	61	81.9	76.5 - 87.3	207	43.2	34.2 - 52.4	98
Among those who had heard of PrEP, proportion that had ever taken it									
Yes	16.2	10.0 - 22.2	23	11.9	4.3 - 19.4	7	22.7	10.5 - 34.5	27
No	83.8	77.8 - 90.0	116	88.1	80.6 - 95.7	44	77.3	65.5 - 89.5	76

Table 3.9.4: Pre-exposure prophylaxis (PrEP) use and access by site (continued)

Pre-exposure prophylaxis (PrEP) use and access among HIV-negative people who inject drugs (PWID)† at last test by site, Zambia PWID BBS 2021									
	Livingstone (N = 200)			Lusaka (N = 258)			Ndola (N = 201)		
	%	95% CI	n	%	95% CI	n	%	95% CI	n
Among those who had taken PrEP, proportion that took it in the 6 months before the survey									
Yes	45.2	28.0 - 61.4	11	78.8	48.2 - 100.0	*	71.1	50.6 - 90.3	21
No	54.8	38.6 - 72.0	12	21.2	0.0 - 51.8	*	28.9	9.7 - 49.4	6
Among those currently taking PrEP, last time used PrEP									
Yesterday or today	13.2	0.0 - 33.4	*	17.6	0.0 - 71.9	*	28.0	0.0 - 57.5	7
2-3 days ago	8.6	0.0 - 21.5	*	0.0	-	0	18.9	0.0 - 44.5	*
4-7 days ago	0.0	-	0	0.0	-	0	6.6	2.5 - 9.8	*
1-2 weeks	0.0	-	0	0.0	-	0	3.9	0.6 - 7.3	*
More than 2 weeks ago	78.2	52.7 - 100.0	9	82.4	28.1 - 100.0	*	42.5	10.5 - 74.5	9
Among those aware of, but not taking PrEP, proportion willing to take PrEP									
Yes	62.4	51.8 - 72.3	76	81.5	64.5 - 98.6	33	94.7	90.7 - 98.9	71
No	37.6	27.7 - 48.2	40	18.5	1.4 - 35.5	11	5.3	1.1 - 9.3	5
Among those aware of, but not taking PrEP, reason for never taking PrEP									
Embarrassed to talk about it with doctor/nurse	0.0	-	0	1.9	0.0 - 4.5	*	0.0	-	0
Don't feel at risk for HIV	38.8	28.5 - 48.7	45	21.5	9.4 - 33.0	13	29.9	16.9 - 42.6	24
Not available where I live	3.9	0.0 - 8.2	*	5.0	1.2 - 8.4	*	9.3	1.0 - 17.0	9
Don't know where to get it	13.9	6.0 - 21.7	16	18.8	5.0 - 32.8	8	33.8	21.5 - 46.4	24
Don't want it	26.1	16.6 - 36.6	27	12.9	0.5 - 25.3	6	6.0	0.0 - 13.1	*
Afraid of side effects	5.6	2.1 - 9.2	*	2.3	0.0 - 6.0	*	13.3	5.4 - 21.3	9
Don't want others to know	0.0	-	0	0.0	-	0	0.0	-	0
Do not have enough information about PrEP	6.9	2.2 - 11.3	9	17.0	5.4 - 28.9	6	3.5	1.4 - 5.5	*
Other	4.8	1.1 - 8.1	9	20.6	3.5 - 38.0	5	4.2	0.0 - 13.5	*
Of those who stopped PrEP, reason for stopping									
I trust my partners	12.0	0.0 - 44.8	*	0.0	-	0	72.6	38.8 - 100.0	6
Can't get PrEP anymore	12.0	5.1 - 18.8	*	0.0	-	0	0.0	-	0
Had side effects	15.6	0.0 - 41.4	*	14.2	0.0 - 81.8	*	3.8	0.0 - 9.9	*
Other	60.5	25.1 - 95.9	7	85.8	18.2 - 100.0	*	23.7	0.0 - 53.5	*

*To protect the identity of survey respondents, numerators greater than 0 but less than 5 are suppressed with an asterisk. In addition, in categories where a numerator that was greater than 0 but less than 5 could be guessed, the next lowest numerator is also suppressed with an asterisk.
†HIV-negative status was based upon self-report during the survey and was not adjusted by survey test result.
Note that the denominator for a characteristic may differ from the site total due to nonresponse or missing data. Also, due to rounding, estimated total sums may not equal 100.0%.

Table 3.9.5: Post-exposure prophylaxis (PEP) use and access by site

Post-exposure prophylaxis (PEP) use among people who inject drugs (PWID) by site, Zambia PWID BBS 2021									
	Livingstone (N = 225)			Lusaka (N = 331)			Ndola (N = 235)		
	%	95% CI	n	%	95% CI	n	%	95% CI	n
Ever heard of PEP									
Yes	15.4	10.7 - 20.0	39	7.2	4.0 - 10.5	27	21.3	13.6 - 29.0	47
No	84.6	80.0 - 89.3	186	92.8	89.5 - 96.0	304	78.7	71.0 - 86.4	188

Table 3.9.5: Post-exposure prophylaxis (PEP) use and access by site (continued)

Post-exposure prophylaxis (PEP) use among people who inject drugs (PWID) by site, Zambia PWID BBS 2021									
	Livingstone (N = 225)			Lusaka (N = 331)			Ndola (N = 235)		
	%	95% CI	n	%	95% CI	n	%	95% CI	n
Among those who had ever heard of PEP, the proportion that had ever taken PEP									
Yes	4.4	0.0 - 8.7	*	4.4	4.2 - 4.2	*	14.7	2.8 - 26.3	7
No	95.6	91.3 - 1.0	*	95.6	95.8 - 95.8	*	85.3	73.7 - 97.2	40

*To protect the identity of survey respondents, numerators greater than 0 but less than 5 are suppressed with an asterisk. In addition, in categories where a numerator that was greater than 0 but less than 5 could be guessed, the next lowest numerator is also suppressed with an asterisk.
Note that the denominator for a characteristic may differ from the site total due to nonresponse or missing data. Also, due to rounding, estimated total sums may not equal 100.0%.

3.10 SOCIAL COHESION AND STIGMA

Key findings

- In Lusaka, 38.0% of PWID had been arrested for injecting drugs at some point in their lives, while 12.6% of PWID in Livingstone and 12.3% of PWID in Ndola had a history of arrest (Table 3.10.1).
- Experience with family rejection for injecting drug use varied across sites; 68.1% of PWID in Lusaka experienced family rejection, followed by 53.1% in Livingstone and 32.7% in Ndola. Many experienced job losses due to being a PWID (range: 16.1%-26.1%). High proportions of PWID experienced physical, sexual, and/or verbal abuse for injecting drugs (range: 42.8%-66.4%). Among PWID who experienced abuse, perpetrators of the abuse were friends or people they knew (range: 60.7%-87.9%; Table 3.10.1).
- Fear of being identified as a PWID was a driving factor for avoiding seeking healthcare services (32.2% in Livingstone, 43.1% in Lusaka, and 54.2% in Ndola; Table 3.10.1).
- Many PWID screened positive for likely depression[12] (range: 32.4%-47.5%; Table 3.10.1).

Table 3.10.1: Stigma, violence, and mental health by site

Stigma, violence, and mental health among people who inject drugs (PWID) by site, Zambia PWID BBS 2021									
	Livingstone (N = 235)			Lusaka (N = 349)			Ndola (N = 259)		
	%	95% CI	n	%	95% CI	n	%	95% CI	n
Ever arrested because they inject drugs									
Yes	12.6	8.2 - 17.0	28	38.0	32.1 - 44.0	133	12.3	7.5 - 17.1	28
In the last 6 months	4.7	1.3 - 8.0	9	11.2	7.7 - 14.6	42	3.2	0.9 - 5.5	8
Not in the last 6 months	8.0	4.5 - 11.5	19	26.8	21.4 - 32.2	91	9.1	4.4 - 13.6	20
No	87.4	83.1 - 91.7	207	62.0	56.3 - 67.6	216	87.7	82.9 - 92.5	231
Ever rejected by family for being a person who injects drugs									
Yes	53.1	46.5 - 59.5	138	68.1	62.5 - 73.7	234	32.7	25.9 - 39.4	78
In the last 6 months	26.9	21.0 - 32.9	75	27.1	21.7 - 32.5	87	14.0	9.3 - 18.6	36
Not in the last 6 months	26.1	20.8 - 31.4	63	41.1	35.5 - 46.6	147	18.6	12.9 - 24.5	42
No	46.9	40.4 - 53.4	97	31.9	26.2 - 37.5	115	67.3	60.7 - 74.0	181

[12] Based on an accepted mental health screening tool from the University of Washington (https://www.hiv.uw.edu/page/mental-health-screening/phq-2).

Table 3.10.1: Stigma, violence, and mental health by site (continued)

Stigma, violence, and mental health among people who inject drugs (PWID) by site, Zambia PWID BBS 2021									
	Livingstone (N = 235)			Lusaka (N = 349)			Ndola (N = 259)		
	%	95% CI	n	%	95% CI	n	%	95% CI	n
Ever terminated from a job for being a person who injects drugs									
Yes	18.4	13.2 - 23.7	44	26.1	20.3 - 31.9	84	16.1	11.3 - 21.0	36
In the last 6 months	6.4	2.8 - 10.2	14	8.7	4.8 - 12.6	25	7.2	3.3 - 11.2	13
Not in the last 6 months	12.0	8.0 - 16.1	30	17.4	12.1 - 22.7	59	8.9	5.3 - 12.5	23
No	81.6	76.6 - 86.4	191	73.9	67.9 - 79.9	265	83.9	78.9 - 88.9	223
Ever denied a job for being a person who injects drugs									
Yes	17.7	13.3 - 21.9	45	23.8	18.0 - 29.7	77	18.3	12.0 - 24.4	35
In the last 6 months	10.5	6.8 - 14.2	27	13.7	8.8 - 18.5	40	11.9	6.5 - 17.4	21
Not in the last 6 months	7.2	4.3 - 10.0	18	10.2	6.6 - 13.7	37	6.3	2.8 - 9.8	14
No	82.4	77.8 - 86.9	190	76.2	70.5 - 81.9	272	81.8	75.8 - 87.7	224
Ever blackmailed for being a person who injects drugs									
Yes	25.7	20.4 - 30.9	73	21.5	16.1 - 26.8	67	26.3	20.4 - 32.2	69
In the last 6 months	18.3	13.9 - 22.7	50	9.0	5.5 - 12.5	28	16.4	11.5 - 21.2	43
Not in the last 6 months	7.3	4.7 - 9.9	23	12.5	8.3 - 16.7	39	10.0	5.7 - 14.2	26
No	74.5	69.2 - 79.5	162	78.5	73.3 - 83.8	282	73.4	67.4 - 79.3	189
Ever treated unfairly/denied healthcare for being a person who injects drugs									
Yes	7.8	4.7 - 11.0	19	20.1	15.2 - 25.0	67	19.1	13.6 - 24.5	43
In the last 6 months	5.0	2.3 - 7.7	11	9.3	5.6 - 12.9	28	13.3	7.7 - 18.9	27
Not in the last 6 months	2.8	1.1 - 4.6	8	10.9	7.3 - 14.5	39	5.7	3.0 - 8.5	16
No	92.2	88.7 - 95.7	216	79.9	74.9 - 84.8	282	80.9	75.4 - 86.5	216
Ever avoided seeking healthcare services for fear of being identified as a person who injects drugs									
Yes	32.2	26.3 - 38.2	80	43.1	37.2 - 49.3	159	54.2	47.4 - 61.0	137
In the last 6 months	27.5	21.6 - 33.4	67	24.0	19.1 - 28.9	82	40.4	34.0 - 46.8	97
Not in the last 6 months	4.7	2.5 - 6.9	13	19.2	14.6 - 23.7	77	13.8	9.4 - 18.2	40
No	67.8	61.9 - 73.6	155	56.9	50.6 - 63.0	190	45.8	39.1 - 52.4	122
Ever physically/sexually/verbally abused for injecting drugs									
Yes	66.4	60.1 - 72.8	157	55.3	49.2 - 61.4	200	42.8	36.2 - 49.4	116
In the last 6 months	44.2	38.2 - 50.2	105	44.1	38.4 - 49.7	158	28.9	23.1 - 34.7	78
Not in the last 6 months	22.2	17.2 - 27.1	52	11.2	7.4 - 15.1	42	13.9	9.6 - 18.3	38
No	33.5	26.9 - 40.2	78	44.7	38.5 - 50.8	149	57.2	50.7 - 63.6	143
Physically/sexually/verbally abused for injecting by†									
Family member	47.6	39.9 - 55.2	77	59.9	51.7 - 68.2	109	32.9	23.8 - 41.9	36
Sexual partner	13.9	8.3 - 19.6	21	19.4	12.6 - 26.4	42	27.6	18.9 - 36.1	34
Friends or other people they know	78.0	71.9 - 84.2	121	87.9	83.2 - 92.6	174	60.7	49.8 - 71.8	74
Authority figure‡	10.2	5.2 - 15.1	17	25.1	17.1 - 32.9	47	7.6	2.5 - 12.7	8
Healthcare worker	3.9	1.4 - 6.5	7	19.3	11.9 - 26.8	30	2.5	0.0 - 5.1	*
Stranger	37.9	29.9 - 45.8	55	75.3	68.4 - 82.1	147	33.9	24.3 - 43.7	39
Prison inmate	2.0	0.4 - 3.6	*	1.9	0.6 - 3.3	*	1.2	0.0 - 3.4	*
Uniformed services personnel	0.0	0.0 - 0.0	0	11.2	6.4 - 16.1	21	4.1	1.2 - 7.1	7
Other	3.0	0.4 - 5.7	*	2.9	0.0 - 5.8	*	0.0	0.0 - 0.0	0

Table 3.10.1: Stigma, violence, and mental health by site (continued)

Stigma, violence, and mental health among people who inject drugs (PWID) by site, Zambia PWID BBS 2021									
	Livingstone (N = 235)			Lusaka (N = 349)			Ndola (N = 259)		
	%	95% CI	n	%	95% CI	n	%	95% CI	n
Ever forced to have sex									
Yes	14.8	10.0 - 19.7	37	8.6	5.3 - 12.0	32	36.2	29.2 - 43.2	96
In the last 6 months	8.8	5.3 - 12.2	22	3.9	1.9 - 5.8	17	17.8	13.1 - 22.6	54
Not in the last 6 months	6.1	2.7 - 9.5	15	4.8	2.0 - 7.6	15	18.4	12.8 - 24.0	42
No	85.1	80.4 - 89.9	198	91.3	88.0 - 94.7	317	63.8	57.2 - 70.4	163
Forced to have sex by†									
Family member	0.0	0.0 - 0.0	0	7.2	0.0 - 17.2	*	14.4	3.7 - 25.2	9
Sexual partner	8.7	1.4 - 16.3	*	32.5	16.2 - 49.1	11	50.2	40.0 - 60.4	46
Friends	63.5	46.7 - 79.6	20	51.9	32.5 - 71.3	16	48.0	36.0 - 60.0	49
Authority figure‡	0.0	0.0 - 0.0	0	0.0	0.0 - 0.0	0	6.1	0.0 - 12.2	*
Healthcare worker	0.0	0.0 - 0.0	0	0.0	0.0 - 0.0	0	0.0	0.0 - 0.0	0
Stranger	14.1	3.9 - 24.3	7	13.9	2.1 - 25.2	6	21.9	12.3 - 31.3	22
Prison inmate	10.2	2.9 - 17.3	5	0.0	0.0 - 0.0	0	0.3	0.0 - 0.6	*
Uniformed service personnel	0.0	0.0 - 0.0	0	0.0	0.0 - 0.0	0	1.6	0.0 - 3.4	*
Other	6.3	0.0 - 13.1	*	10.0	0.0 - 22.1	*	0.6	0.0 - 1.2	*
Little interest or pleasure in activities									
Not at all	49.9	42.8 - 57.0	118	39.3	33.2 - 45.4	141	43.8	37.1 - 50.5	120
Several days	35.1	28.9 - 41.2	83	34.0	28.3 - 39.7	118	31.0	24.7 - 37.3	79
More than half the days	10.9	7.1 - 14.7	24	11.3	7.8 - 14.8	38	19.3	13.9 - 24.5	47
Nearly every day	4.2	1.8 - 6.6	10	15.3	10.1 - 20.6	52	5.9	2.7 - 9.2	13
Refuse to answer	0.0	0.0 - 0.0	0	0.0	0.0 - 0.0	0	0.0	0.0 - 0.0	0
Feeling low/sad, depressed, or hopeless									
Not at all	14.6	9.9 - 19.3	37	36.3	30.7 - 41.8	127	32.0	26.2 - 37.9	92
Several days	37.3	30.5 - 43.8	91	34.1	28.7 - 39.4	126	38.0	31.6 - 44.4	97
More than half the days	20.7	15.3 - 25.9	48	13.5	9.3 - 17.8	44	20.7	15.4 - 26.0	49
Nearly every day	27.5	22.0 - 33.1	59	16.0	11.4 - 20.6	52	9.3	5.0 - 13.6	21
Refuse to answer	0.0	0.0 - 0.0	0	0.0	0.0 - 0.0	0	0.0	0.0 - 0.0	0
Screened positive for likely depression§									
Yes	47.5	40.9 - 54.1	106	34.7	28.7 - 40.8	116	32.4	26.0 - 38.7	73
No	52.7	46.0 - 59.4	129	65.2	59.0 - 71.5	233	67.6	61.4 - 73.7	186

*To protect the identity of survey respondents, numerators greater than 0 but less than 5 are suppressed with an asterisk. In addition, in categories where a numerator that was greater than 0 but less than 5 could be guessed, the next lowest numerator is also suppressed with an asterisk.
† Responses not mutually exclusive.
‡ Authority figures include government official, religious leader, teacher, employer, military, police, prison guard.
§ Screened likely for depression based on a PHQ-2 score of 3 or greater (https://www.hiv.uw.edu/page/mental-health-screening/phq-2).
Note that the denominator for a characteristic may differ from the site total due to nonresponse or missing data. Also, due to rounding, estimated total sums may not equal 100.0%.

Table 3.10.2: HIV test result at first visit by stigma, violence, and mental health by site

HIV prevalence by stigma, violence, and mental health among people who inject drugs (PWID) by site, Zambia PWID BBS 2021									
	Livingstone (N = 138)			Lusaka (N = 234)			Ndola (N = 78)		
	%	95% CI	n	%	95% CI	n	%	95% CI	n
Had ever been arrested because they inject drugs	8.3	0.0 - 18.9	*	9.9	4.3 - 15.6	13	11.2	0.0 - 29.1	*
Had ever been rejected by family for being a person who injects drugs	11.5	5.5 - 17.5	18	7.6	3.9 - 11.4	17	8.3	1.0 - 15.7	7

Table 3.10.2: HIV test result at first visit by stigma, violence, and mental health by site (continued)

HIV prevalence by stigma, violence, and mental health among people who inject drugs (PWID) by site, Zambia PWID BBS 2021									
	Livingstone (N = 138)			Lusaka (N = 234)			Ndola (N = 78)		
	%	95% CI	n	%	95% CI	n	%	95% CI	n
Had ever been terminated from a job for being a person who injects drugs	12.0	1.8 - 22.7	5	4.7	0.3 - 8.9	*	31.3	12.8 - 49.8	9
Had ever been denied a job for being a person who injects drugs	4.0	0.0 - 9.9	*	6.0	0.9 - 11.1	5	31.5	12.6 - 50.3	9
Had ever been blackmailed for being a person who injects drugs	24.5	13.4 - 35.7	18	4.6	0.0 - 10.1	*	17.4	7.4 - 27.3	11
Had ever been treated unfairly/denied healthcare for being a person who injects drugs	0.0	0.0 - 0.0	0	6.0	1.0 - 11.0	5	8.0	0.0 - 16.5	*
Had ever avoided seeking healthcare services for fear of being identified as a person who injects drugs	11.9	4.8 - 19.2	9	5.5	1.5 - 9.4	9	17.5	10.4 - 24.7	20
Had ever been physically/sexually/verbally abused for injecting drugs	11.1	6.3 - 15.8	19	8.4	4.1 - 12.8	17	18.0	9.6 - 26.4	22

*To protect the identity of survey respondents, numerators greater than 0 but less than 5 are suppressed with an asterisk. In addition, in categories where a numerator that was greater than 0 but less than 5 could be guessed, the next lowest numerator is also suppressed with an asterisk.
Note that the denominator for a characteristic may differ from the site total due to nonresponse or missing data. Also, due to rounding, estimated total sums may not equal 100.0%.

3.11 COVID-19

Key findings

- At all three sites, COVID-19 resulted in a decrease in the number of sex partners among PWID and a decrease in the number of opportunities to have sex; however, the degree of the impact varied. Over half of PWID in Ndola (58.1%) had a decrease in the number of sex partners, followed by Lusaka (37.6%) and Livingstone (36.3%). Half of PWID in Ndola (50.6%) experienced a decrease in opportunities to have sex, compared to Livingstone (35.1%) and Lusaka (33.5%; Table 3.11.1).
- The COVID-19 pandemic was associated with variable effects on injection drug use behaviors and opportunities. The frequency of injecting did not change due to COVID-19 for 51.1% of PWID in Livingstone and 45.8% of PWID in Lusaka (while the proportions who increased or decreased injecting at those sites were similar). In Ndola, however, 60.9% injected less frequently. More than half of PWID in Ndola (51.5%) experienced a decreased supply of injectable drugs, while the supply was mostly unchanged in Livingstone (72.3%) and Lusaka (67.0%). While COVID-19 did not affect clean needles/sterile injection equipment use among most PWID in Livingstone (70.1%) and in Lusaka (60.0%), use of clean needles decreased among others (24.5%, 22.9%, and 48.2% in Livingstone, Lusaka, and Ndola, respectively). There was also an increase in the use of used cooking equipment (45.6% in Livingstone, 31.7% in Lusaka, and 35.8% in Ndola) and other unsafe injecting behaviors (Table 3.11.1).
- Some PWID experienced an increase in physical, sexual, or verbal harassment or abuse following the institution of government plans to manage COVID-19 (range: 16.0%-21.2%; Table 3.11.1).

- A proportion of PWID at each site experienced a decrease in availability of condoms due to COVID-19 (range: 21.8%-28.5%). In Livingstone, 55.2% had decreased access to STI testing, which was not as common in Ndola (25.2%) or Lusaka (5.9%). Decreased access to HIV testing was observed among PWID in Livingstone (31.5%) and Ndola (20.6%). PWID at all sites experienced a decrease in the availability of PrEP due to COVID-19 (range: 13.6%-48.3%; Table 3.11.2).
- Among PWID who acknowledged their HIV-positive status and were on treatment, the majority did not experience an impact on access to HIV care and treatment due to COVID-19. Nevertheless, some PWID in Lusaka (19.4%) and Ndola (14.5%) had difficulty getting HIV medications. Among PWID who were living with HIV and receiving care, 19.3% in Livingstone and 7.7% in Ndola had difficulty getting viral load or other labs done at the clinic due to COVID-19 (Table 3.11.3).
- Almost all PWID knew the COVID-19 virus could spread when an infected person touches someone's hand or face, kisses them, or sneezes or coughs near them (range: 95.9%-98.2%); that washing hands helps prevent infection (range: 94.8%-98.3%); and that avoiding touching your eyes, nose, and mouth with unwashed hands helps prevent infection (range: 87.4%-89.1%; Table 3.11.4).

Table 3.11.1: Impacts of COVID-19 on risk behavior and experiences of violence by site

Impacts of COVID-19 on risk behaviors and experiences of violence among people who inject drugs (PWID) by site, Zambia PWID BBS 2021

	Livingstone (N = 235)			Lusaka (N = 345)			Ndola (N = 259)		
	%	95% CI	n	%	95% CI	n	%	95% CI	n
COVID-19 impacts on the number of sex partners									
Fewer partners	36.3	30.2 - 42.6	78	37.6	31.6 - 43.5	126	58.1	51.2 - 65.0	139
Same number	52.2	45.8 - 58.5	127	53.4	47.0 - 59.7	191	29.9	24.3 - 35.5	91
More partners	11.5	7.7 - 15.3	30	9.1	5.0 - 13.2	28	12.0	6.8 - 17.2	29
COVID-19 impacts on opportunities to have sex									
Fewer opportunities	35.1	29.1 - 41.0	78	33.5	27.4 - 39.6	114	50.6	43.9 - 57.2	127
Same amount	46.9	40.7 - 53.2	115	50.0	43.7 - 56.4	178	32.3	26.3 - 38.2	91
More opportunities	18.0	12.7 - 23.3	42	16.5	11.6 - 21.2	55	17.1	11.6 - 22.7	41
COVID-19 impacts on alcohol consumption									
Decreased	52.7	46.1 - 59.3	114	8.3	5.0 - 11.5	*	53.5	45.7 - 61.3	134
Unchanged	42.9	36.5 - 49.3	113	91.1	87.9 - 94.4	309	27.9	21.3 - 34.4	73
Increased	4.4	0.9 - 7.9	8	0.6	0.0 - 1.3	*	18.6	13.3 - 24.0	47
Never drank alcohol	0.0	0.0 - 0.0	0	0.0	0.0 - 0.0	0	0.0	0.0 - 0.0	0
COVID-19 impact on desire to inject									
Less frequent	20.3	15.7 - 24.9	48	24.3	19.0 - 29.7	80	59.8	53.4 - 66.0	147
Not changed or changed other reasons	47.6	41.5 - 53.7	113	33.9	27.9 - 40.0	122	25.0	19.6 - 30.5	67
More frequent	32.1	26.2 - 38.0	74	41.8	35.6 - 47.9	147	15.2	10.8 - 19.7	45
COVID-19 impact on injection frequency									
Less frequent	26.5	21.2 - 31.7	60	26.0	21.0 - 30.9	93	60.9	54.5 - 67.3	157
Not changed or changed other reasons	51.1	44.8 - 57.5	123	45.8	39.8 - 51.8	152	24.5	19.0 - 30.1	59
More frequent	22.4	16.8 - 27.9	52	28.2	23.2 - 33.3	104	14.5	10.1 - 19.0	43
COVID-19 impact on access to injection substances									
Decreased	15.8	11.4 - 20.2	39	13.4	9.7 - 17.2	51	51.5	44.3 - 58.8	136
Unchanged	72.3	66.5 - 78.0	167	67.0	61.5 - 72.5	228	36.8	29.9 - 43.7	94
Increased	12.0	8.3 - 15.7	29	19.6	15.0 - 24.1	70	11.6	7.2 - 16.2	29

Table 3.11.1: Impacts of COVID-19 on risk behavior and experiences of violence by site (continued)

Impacts of COVID-19 on risk behaviors and experiences of violence among people who inject drugs (PWID) by site, Zambia PWID BBS 2021	Livingstone (N = 235)			Lusaka (N = 345)			Ndola (N = 259)		
	%	95% CI	n	%	95% CI	n	%	95% CI	n
COVID-19 impact on cost of injection substances									
Decreased	22.1	16.7 - 27.5	47	0.4	0.0 - 1.0	*	13.3	8.4 - 18.2	28
Unchanged	20.2	15.9 - 24.8	55	80.4	75.4 - 85.4	280	21.1	15.7 - 26.4	53
Increased	57.7	51.4 - 63.8	133	19.2	14.3 - 24.1	*	65.6	59.5 - 71.8	177
COVID-19 impact on injection with clean needles/sterile injection equipment									
Less frequent	24.5	19.3 - 29.8	54	22.9	17.8 - 28.1	81	48.2	41.3 - 55.0	116
Not changed or changed for other reasons	70.1	64.6 - 75.5	167	60.0	53.7 - 66.4	211	32.4	26.2 - 38.6	88
More frequent	5.4	3.0 - 7.8	14	17.0	12.2 - 21.9	57	19.4	14.1 - 24.7	53
Because of COVID-19, using previously used cooker equipment	45.6	39.3 - 51.8	117	31.7	26.1 - 37.3	108	35.8	28.8 - 42.8	97
Because of COVID-19, backloading (piggy-back) to share injection drugs	28.3	22.5 - 34.0	60	14.8	9.6 - 20.0	44	35.5	28.0 - 43.0	93
Because of COVID-19, inject drugs with people that one would not normally inject with	32.7	26.4 - 38.8	78	38.6	32.6 - 44.7	136	36.0	28.6 - 43.4	98
Suffered an increase in physical, sexual, or verbal harassment or abuse since government plans to manage COVID-19 were instituted									
Yes	16.0	11.4 - 20.6	34	21.2	16.2 - 26.3	74	19.4	14.1 - 24.7	46
No	84.0	79.4 - 88.6	201	78.8	73.7 - 83.8	275	80.6	75.3 - 85.9	213
Suffered an increase in physical/sexual/verbal abuse by†									
Family member	100.0	0.0 - 0.0	*	100.0	100.0 - 100.0	*	0.0	0.0 - 0.0	0
Sexual partner	26.0	16.0 - 35.3	10	14.0	10.4 - 18.0	8	23.3	0.0 - 66.7	*
Friends	83.1	74.9 - 92.0	28	74.6	63.1 - 85.8	60	68.0	27.9 - 1.0	31
Authority figure‡	3.5	3.6 - 3.6	*	11.1	1.9 - 20.2	7	6.7	0.1 - 12.9	*
Healthcare worker	3.7	3.3 - 3.3	*	7.6	0.0 - 15.6	*	0.0	0.0 - 0.0	0
Stranger	77.2	48.5 - 1.0	26	63.5	50.0 - 76.9	47	46.5	24.5 - 68.0	20
Prison inmate	0.0	0.0 - 0.0	0	1.6	0.0 - 4.5	*	0.0	0.0 - 0.0	0
Uniformed services personnel	0.0	0.0 - 0.0	0	5.2	0.9 - 9.5	*	24.2	8.4 - 39.6	13
Other	5.8	5.7 - 5.7	*	0.4	0.0 - 1.3	*	0.0	0.0 - 0.0	0

*To protect the identity of survey respondents, numerators greater than 0 but less than 5 are suppressed with an asterisk. In addition, in categories where a numerator that was greater than 0 but less than 5 could be guessed, the next lowest numerator is also suppressed with an asterisk.
†Responses not mutually exclusive.
‡Authority figures include government official, religious leader, teacher, employer, military, police, prison guard.
Note that the denominator for a characteristic may differ from the site total due to nonresponse or missing data. Also, due to rounding, estimated total sums may not equal 100.0%.

Table 3.11.2: Impacts of COVID-19 on access to and use of HIV prevention services by site

Impacts of COVID-19 on access to and use of HIV prevention services among people who inject drugs (PWID) by site, Zambia PWID BBS 2021

	Livingstone (N = 235)			Lusaka (N = 347)			Ndola (N = 255)		
	%	95% CI	n	%	95% CI	n	%	95% CI	n
COVID-19 impacts on access to condoms									
Decreased	28.1	22.2 - 33.9	65	21.8	16.5 - 27.1	66	28.5	22.6 - 34.4	74
Unchanged	63.0	56.9 - 69.2	148	63.8	58.1 - 69.6	232	59.5	52.8 - 66.2	147
Increased	8.9	5.7 - 12.1	22	14.4	10.3 - 18.5	49	12.0	7.4 - 16.6	34
COVID-19 impacts on use of condoms									
Decreased	16.2	4.1 - 26.3	*	36.2	18.4 - 53.9	*	28.8	0.0 - 71.5	*
Unchanged	79.3	66.7 - 93.4	22	63.8	46.1 - 81.6	*	50.8	13.8 - 87.7	5
Increased	4.5	0.0 - 15.3	*	0.0	0.0 - 0.0	0	20.4	3.9 - 36.9	*
COVID-19 impacts on access to lubricants									
Decreased	55.0	48.1 - 62.0	*	3.5	1.2 - 5.8	*	9.9	5.7 - 13.7	26
Unchanged	44.5	37.6 - 51.4	113	96.4	94.1 - 98.7	330	87.3	82.5 - 92.6	147
Increased	0.5	0.0 - 0.9	*	0.1	0.0 - 0.3	*	2.8	0.5 - 5.1	6
COVID-19 impacts on access to STI testing or treatment									
Decreased	55.2	47.8 - 62.2	*	5.9	2.5 - 9.2	17	25.2	19.0 - 31.5	57
Unchanged	44.6	37.5 - 52.0	118	89.8	85.7 - 93.9	319	64.3	57.5 - 71.0	159
Increased	0.3	0.0 - 0.6	*	4.3	1.9 - 6.8	13	10.5	6.3 - 14.7	26
COVID-19 impacts on access to HIV testing									
Decreased	31.5	24.9 - 38.0	69	0.6	0.0 - 1.4	*	20.6	14.7 - 26.4	53
Unchanged	65.3	58.7 - 71.9	149	92.9	89.3 - 96.4	312	71.0	64.6 - 77.4	159
Increased	3.2	1.0 - 5.4	7	6.6	3.1 - 10.1	*	8.4	4.6 - 12.3	19
COVID-19 impacts on testing for HIV									
Tested less than usual	34.5	28.8 - 40.5	78	4.7	1.4 - 8.0	11	65.5	58.1 - 73.0	158
Tested same as usual	56.6	50.3 - 62.5	122	85.0	80.2 - 90.0	290	31.2	24.2 - 38.3	66
Tested more than usual	8.9	5.6 - 12.3	25	10.3	6.0 - 14.4	30	3.2	0.8 - 5.7	8
Difficulty getting HIV test due to COVID-19									
Yes	2.3	0.6 - 4.1	6	1.1	0.1 - 2.0	5	14.3	9.2 - 19.4	32
No	77.6	71.7 - 83.6	175	52.2	45.5 - 58.9	172	49.7	42.3 - 57.2	116
Have not tried to get a test since COVID-19	20.1	14.3 - 25.8	44	46.7	40.1 - 53.4	154	36.0	28.8 - 43.1	87
COVID-19 impacts on access to PrEP‡									
Decreased	48.3	48.8 - 48.8	5	22.7	0.0 - 63.7	*	13.6	0.0 - 29.7	*
Unchanged	51.7	51.2 - 51.2	6	63.6	5.7 - 1.0	*	69.2	42.2 - 95.2	16
Increased	0.0	0.0 - 0.0	0	13.7	0.0 - 56.2	*	17.2	0.0 - 36.6	*
Difficulty taking PrEP daily due to COVID-19‡									
Yes	0.0	0.0 - 0.0	0	8.7	0.0 - 20.9	*	29.7	9.5 - 50.0	6
No	100.0	100.0 - 100.0	10	91.3	79.1 - 1.0	*	70.3	50.0 - 90.5	16

*To protect the identity of survey respondents, numerators greater than 0 but less than 5 are suppressed with an asterisk. In addition, in categories where a numerator that was greater than 0 but less than 5 could be guessed, the next lowest numerator is also suppressed with an asterisk.
†Among those who had taken PrEP in the 6 months before the survey.
Note that the denominator for a characteristic may differ from the site total due to nonresponse or missing data. Also, due to rounding, estimated total sums may not equal 100.0%.

Table 3.11.3: Impacts of COVID-19 on access to and use of HIV care services among those living with HIV by site

Impacts of COVID-19 on access to and use of HIV care services among people who inject drugs (PWID) living with HIV, by site,† Zambia 2021	Livingstone (N = 10)			Lusaka (N = 18)			Ndola (N = 24)		
	%	95% CI	n	%	95% CI	n	%	95% CI	n
HIV care experiences in response to COVID-19 or government plans to manage COVID-19†									
Been unable to get medicine I need because of COVID-19	0.0	0.0 - 0.0	0	5.8	0.0 - 16.3	*	8.1	0.0 - 19.5	*
I cancelled a clinic or doctor's appointment to avoid being around others	0.0	0.0 - 0.0	0	3.3	0.0 - 9.4	*	15.6	0.0 - 32.3	*
A clinic or doctor closed or cancelled my appointment because of COVID-19	0.0	0.0 - 0.0	0	0.0	0.0 - 0.0	0	6.5	0.0 - 16.6	*
None	100.0	100.0 - 100.0	10	90.8	78.7 - 1.0	16	80.4	62.6 - 98.5	19
Among those on treatment, difficulty getting HIV medications due to COVID-19									
Yes	0.0	0.0 - 0.0	0	19.4	2.2 - 36.7	*	14.5	0.0 - 29.6	*
No	100.0	100.0 - 100.0	10	80.6	63.3 - 97.8	*	85.5	70.4 - 1.0	*
Among those on treatment, difficulty taking HIV medications daily due to COVID-19‡									
Yes	0.0	0.0 - 0.0	0	7.3	0.0 - 16.9	*	7.4	0.0 - 16.6	*
No	100.0	100.0 - 100.0	10	92.7	83.1 - 1.0	*	92.6	83.4 - 1.0	*
Among those receiving HIV care, difficulty getting to a clinic appointment due to COVID-19									
Yes	0.0	0.0 - 0.0	0	26.7	0.0 - 58.7	*	13.5	0.2 - 27.0	*
No	100.0	100.0 - 100.0	9	73.3	41.3 - 1.0	*	86.5	73.0 - 99.8	*
Among those receiving HIV care, difficulty getting viral load or other labs done while at the clinic due to COVID-19									
Yes	19.3	0.4 - 38.3	*	0.0	0.0 - 0.0	0	7.7	0.0 - 16.7	*
No	80.7	61.7 - 99.6	*	100.0	100.0 - 100.0	6	92.3	83.3 - 1.0	*

*To protect the identity of survey respondents, numerators greater than 0 but less than 5 are suppressed with an asterisk. In addition, in categories where a numerator that was greater than 0 but less than 5 could be guessed, the next lowest numerator is also suppressed with an asterisk.
†The number of PWID living with HIV was based upon self-report during the survey interview.
Note that the denominator for a characteristic may differ from the site total due to nonresponse or missing data. Also, due to rounding, estimated total sums may not equal 100.0%.

Table 3.11.4: Knowledge and Risk Perceptions of COVID-19 by site

Knowledge and risk perceptions of COVID-19 among people who inject drugs (PWID) by site, Zambia PWID BBS 2021									
	Livingstone (N = 229)			Lusaka (N = 306)			Ndola (N = 246)		
	%	95% CI	n	%	95% CI	n	%	95% CI	n
Infected people may not show symptoms for 3-14 days									
True	37.2	30.5 - 44.0	82	59.4	53.3 - 65.7	176	43.8	36.8 - 50.6	116
False	62.8	56.0 - 69.5	147	40.6	34.3 - 46.7	130	56.2	49.4 - 63.2	130
Virus can spread when an infected person touches someone's hand/face, kisses them, or sneezes/coughs near them									
True	98.2	96.8 - 99.6	230	95.9	92.5 - 99.3	337	97.4	95.9 - 98.9	248
False	1.8	0.4 - 3.2	5	4.1	0.7 - 7.5	9	2.6	1.1 - 4.1	9
Washing hands helps prevent infection									
True	94.8	92.1 - 97.5	224	98.3	97.0 - 99.7	342	98.0	96.1 - 100.0	253
False	5.2	2.5 - 7.9	11	1.7	0.3 - 3.0	7	2.0	0.0 - 3.9	6
Avoiding touching your eyes, nose, and mouth with unwashed hands helps prevent infection									
True	87.4	83.5 - 91.4	203	89.1	85.1 - 93.2	312	88.0	83.7 - 92.4	225
False	12.6	8.6 - 16.5	32	10.9	6.8 - 14.9	36	12.0	7.6 - 16.3	34
Perceived risk of infection									
Very low	4.4	2.1 - 6.7	13	6.0	3.5 - 8.6	25	7.0	3.6 - 10.3	19
Low	25.0	19.5 - 30.4	60	20.2	14.7 - 25.7	66	21.4	16.1 - 26.9	60
Medium	16.5	12.0 - 21.1	43	30.4	24.7 - 36.2	102	35.8	29.3 - 42.3	86
High	19.2	13.6 - 25.0	42	30.1	24.7 - 35.6	111	28.6	22.5 - 34.6	72
Very high	34.8	28.4 - 41.4	76	13.2	8.7 - 17.6	42	7.2	3.7 - 10.7	18

*To protect the identity of survey respondents, numerators greater than 0 but less than 5 are suppressed with an asterisk. In addition, in categories where a numerator that was greater than 0 but less than 5 could be guessed, the next lowest numerator is also suppressed with an asterisk.
Note that the denominator for a characteristic may differ from the site total due to nonresponse or missing data. Also, due to rounding, estimated total sums may not equal 100.0%.

4. DISCUSSION

4.1 PWID POPULATION SIZE ESTIMATES AND DEMOGRAPHICS

Accounting for 0.24%-0.93% of the population of each of the three survey locations, the population of PWID is small, but presents unique challenges in terms of HIV epidemic control. The population skewed younger—like the population of Zambia in general[1]—than the median age of PWID populations described in studies in Kenya and Tanzania, although the methodology of those was very different.[2] In another PWID BBS in Mozambique, the median age was 33 years in Maputo, but was similar (at 28 years) in Nampula/Nacala.[3]

The very high rate of unemployment, low frequency of marriage, and substantial frequency of time spent away from home found in this survey indicate challenges to stability in the lives of PWID—many of which may be related to stigma, discrimination, and criminalization.

4.2 BURDEN OF HIV AND OTHER INFECTIONS AMONG PWID

PWID from these three towns in Zambia were highly impacted by HIV, with a substantial proportion of the PWID population living with HIV at the three survey sites. Overall, HIV prevalence in Livingstone and Lusaka was similar to what was recently reported among adults aged 15-49 years in the general population (9.9%) through the 2021 Zambia Population-based HIV Impact Assessment (ZAMPHIA). However, overall prevalence in Ndola was somewhat higher.[4] Though the numbers are small, HIV prevalence among women who inject drugs was higher than that of the general population.[1,4] Women who inject may be a particularly vulnerable population facing the same HIV risks as women in the general population, combined with intersectional risks from injecting drugs and other illicit drug use.

Prevalence of active HBV infection was comparable to HBV prevalence found in other surveys,[1] but HCV burden was low, reflecting few HCV infections and limited transmission in the PWID population in the three survey locations. However, the levels of drug injection risk factors found in this survey establish a substantial risk of HBV and HCV outbreaks if introduced into local networks.[2,5,6] In addition, while overall prevalence of active syphilis among PWID in Livingstone and Lusaka was comparable to prevalence among the general population, prevalence appeared to be higher in Ndola among both men and women who inject drugs.[1] The prevalence of active syphilis was also relatively high among women who inject drugs in Lusaka, although the numbers were small and should be interpreted with caution. Overall, prevalence of STI symptoms were relatively high in Lusaka and Ndola in comparison to what was reported among the general population.[1] The fact that some PWID were engaged in transactional sex in Ndola could be associated with a higher risk of syphilis and other STIs.

The prevalence of TB diagnoses among PWID was not assessed in the survey. PWID that acknowledged their HIV-positive status were asked about their experience with TB screening, and among those who had TB symptoms in the 12 months before the survey, 56.0%-78.1% underwent diagnostic procedures. However, in other studies in the region, the burden of TB among people who use drugs has been reported to be as much as 12 times greater than that of the general population.[7] In addition, tobacco and marijuana smoking and incarceration, which were all common in the survey, have been associated with a higher risk of TB.[8] Future BBS should direct questions about TB to both HIV-positive and HIV-negative PWID.

4.3 CARE AND TREATMENT ACCESS AND VIRAL LOAD SUPPRESSION AMONG PWID LIVING WITH HIV

The survey findings indicate that many PWID were reluctant to seek out health services because of their identity as a PWID. More than a half of PWID did not seek out healthcare even when they had one or more symptoms of STIs. Depending on the site, one third to over half of PWID avoided healthcare services due to fear of being recognized as a PWID. Many PWID seemed to conceal their injection drug use when accessing healthcare: Among those acknowledging awareness of their HIV-positive status and being in HIV care, few were seeing healthcare providers who were aware that they inject drugs.

One-quarter to almost one-half of PWID in Ndola and Livingstone did not acknowledge awareness of their status (as confirmed by biometric testing). ZAMPHIA 2016 similarly reported that in the general population, approximately 15%

of the people living with HIV did not acknowledge awareness of their HIV-positive status but had evidence of being on ART in their blood.[1] The biometric used as evidence of awareness of HIV-positive status and treatment status in this survey was having a viral load below 200 copies/mL, which indicates that not only were these individuals accessing care and treatment, but they had optimal virologic responses.

Approximately 26.0%-38.0% of the PWID who tested positive in the survey were previously unaware of their HIV-positive status. Avoidance of healthcare facilities could be a factor in the high rate of undiagnosed HIV infections among PWID. This is reflected in the 95-95-95 achievements, where each site fell substantially short of the first target related to awareness of HIV-positive status. Awareness among PWID was lower than that of the general population. The 2021 ZAMPHIA found that 88.7% of adults aged 15 and older living with HIV were aware of their HIV status.[4] HIV diagnosis was lagging among PWID, and efforts should be made to increase uptake of HIV testing in this KP.

Once aware of their HIV-positive status, PWID in Livingstone and Ndola did appear to be accessing treatment; based upon their viral load adjusted treatment status, all HIV-positive PWID aware of their status were on ART. Achievement of the UNAIDS treatment target was below 95% in Lusaka; however, the small number of HIV-positive PWID limits interpretation of this result.

Only PWID in Livingstone achieved the third 95 of VLS among those who were on treatment, which may be indicative of the provision of effective KP-friendly services. However, more than a quarter of PWID living with HIV and on ART in Lusaka and more than an eighth in Ndola did not have suppressed viral loads. The population VLS (which is calculated without regard of treatment or awareness of HIV-positive status) was well below that of the general adult population in Zambia. With more than one-quarter to 60% of PWID with unsuppressed viral loads across the survey sites, PWID may contribute to high viremia in the community, representing a substantial risk of onward transmission through both unsafe drug injection practices and high-risk sexual behaviors.

These results may reflect poor adherence, disruptions in treatment related to incarceration for drug use or COVID-19, or lack of KP-friendly services. Given the poor health outcomes, treatment failure, drug resistance, and onward transmission associated with unsuppressed viral load among those on ART, additional research is needed to understand factors associated with poor adherence and unsuppressed viral load among PWID living with HIV in Zambia.

Adherence and VLS could be supported by sensitivity training of healthcare workers and law enforcement officers, and by offering evidence-based drug treatment services, including methadone substitution therapy for heroin users.

4.4 HIV RISK FACTORS

In addition to earlier HIV diagnosis and ART adherence programs to support PWID living with HIV, programs addressing drug injection risk behaviors are needed to reduce the risk of transmission of HIV and other infections. The survey findings provide useful insights into the somewhat heterogenous drug use and injection practices in the three towns. For instance, in addition to having an older PWID population, those in Ndola injected different types of drugs than heroin or heroin-related drugs, which were the first and most used drugs among Livingstone and Lusaka PWID. In addition, the PWID in Ndola were substantially less likely to have injected the day before the survey than the PWID who predominately inject heroin, and less likely to have been incarcerated for drug use. One possible reason for this is that the substances they injected are readily available pharmaceuticals; some, such as promethazine, can be procured at pharmacies without a prescription. This suggests that a somewhat different drug culture existed in Ndola; hazardous drinking and alcohol dependency were also much more common. Nevertheless, injecting non-opiates and over-the-counter drugs such as promethazine can still lead to overdose and fatality.[9]

Unsafe injection practices that could increase the risk of transmission of HIV and other blood-borne viruses were common among PWID at all sites. Harm reduction programs where PWID can exchange or access sterile needles and syringes—without fear of arrest—may reduce some of these behaviors and provide a means to reach the population with other services.

HIV prevalence among PWID engaging in high-risk drug injection behaviors varied, suggesting that there may be other factors confounding the data. In addition to drug injection behaviors, PWID engaged in sexual risk behavior with regular, casual, and transactional sex partners. Levels of condom use at last sex were similar to what was reported among the general population in ZAMPHIA 2016; up to two thirds of PWID did not use a condom at last sex.[1] Among PWID with one or more STI symptoms in the 12 months before the survey, many did not abstain from sex or always use condoms consistently while experiencing symptoms. This suggests that, in a high HIV prevalence setting, sex may be a major driver of HIV acquisition among PWID and their partners.

Some of the PWID population also engaged in transactional sex and same-sex behavior, demonstrating overlap with other high risk KPs. A substantial proportion of the women who inject drugs in Livingstone and Ndola were also female sex workers; in Livingstone, selling sex for drugs was associated with a higher prevalence of HIV. Some men who inject drugs had a history of anal sex with another man and had main sexual partners who were men; prevalence of these behaviors was low but may be under-reported.

In addition to reducing the risk of HIV acquisition and transmission, reducing dependency on drug injection and use could support adherence to treatment of HIV, TB, and other illness, as well as uptake and adherence to preventive measures such as TB preventive treatment and PrEP. However, awareness and uptake of programs to "modify, reduce, or stop drug use" among PWID in the survey were low, and very few PWID at the sites had ever participated in PWID programs. Evidence-based treatment for PWID is limited in Zambia, and availability of methadone replacement therapy may need to be expanded, particularly in Livingstone and Lusaka.

4.5 HIV KNOWLEDGE AND ACCESS TO AND UPTAKE OF PREVENTION SERVICES

Despite a relatively high proportion of PWID having completed secondary school, comprehensive knowledge of HIV among PWID was roughly half that reported among young people living in urban settings in ZAMPHIA 2016.[1] However, almost all PWID were aware that a person can get HIV by injecting with a needle that was already used by someone else, and roughly half were aware that switching to drugs that are swallowed, sniffed, or inhaled reduces the risk of HIV acquisition. Nevertheless, the knowledge gaps suggest that PWID could benefit from targeted prevention and harm reduction services.

While most PWID had previously been tested for HIV, the number of PWID living with HIV who were unaware of their status may indicate gaps in HIV testing among PWID. With PWID avoiding healthcare services due to fear of being identified as a PWID, self-testing could offer a preferable testing alternative to those who avoid HIV testing sites where they may be stigmatized, discriminated against, or even be arrested. Increasing access to HIV self-test kits could lead to greater uptake of self-testing and increased awareness of HIV status among this population. In addition, PWID may benefit from access to evidence-based combination prevention tools for sexual transmission—but prevention services may need to be provided in settings that are safe and convenient for PWID.

Knowledge and uptake of PrEP among PWID was limited, despite PWID demonstrating a willingness to take PrEP. While PrEP has been shown to be safe and effective, implementation of a PrEP program focused on PWID should be accompanied by specific demand creation activities and educational resources, and packaged with adherence support services, including access to methadone replacement therapy and opportunities for direct observed therapy.

4.6 STIGMA, DISCRIMINATION, AND CRIMINALIZATION

The survey found high rates of stigma and discrimination experienced by PWID, with PWID being subject to rejection by their families, job loss, and physical, sexual, or verbal abuse, and to harassment by legal authorities and prosecution. Many were afraid to seek out healthcare for fear of being identified as a PWID, which may cause interruptions in treatment and jeopardize their physical and mental health. Up to one-third of PWID had a history of incarceration, which can also interrupt access to treatment or preventive therapy. Incarceration may also increase the risk of exposure to TB, particularly in high burden settings.

4.7 COVID-19 IMPACT

The survey also demonstrated conflicting ways in which the COVID-19 pandemic may have affected HIV risk behavior among PWID. COVID-19 may have decreased sexual risk behaviors (reduced number of sexual partners and opportunities) among PWID; however, some PWID also felt that access to and uptake of prevention services (condoms, STI testing, HIV testing and PrEP) were negatively affected due to COVID-19.

Data related to changes in injection drug use behaviors were mixed. Some experienced a decrease in drug supply and reduced frequency of injection (particularly in Ndola), but others maintained their frequency of drug injection during the COVID-19 pandemic. In addition, some PWID experienced an increase in unsafe injection practices, decreased use of clean needles, and increased use of used cooking equipment related to COVID-19.

Finally, most PWID living with HIV who were on ART did not find that access to HIV care and treatment services was impacted by COVID-19. However, some PWID had difficulty obtaining HIV medication and challenges with getting viral load and other labs done, which may have caused disruptions in their care and treatment and resulted in negative health outcomes.

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5. CONCLUSIONS AND NEXT STEPS

5.1 REACHING THOSE HARDEST TO REACH

The Zambia PWID BBS 2021 provided critical data on the primary outcomes of HIV prevalence, HIV recency, VLS, 95-95-95 achievements, as well as population size, demographics, risk-taking behaviors, and uptake of testing and prevention services among PWID in three large towns in Zambia. With more than 25 to 60% of PWID living with HIV with unsuppressed viral loads across the study sites, failing to reach this KP may contribute to high viremia in communities and represent a risk of onward transmission of HIV to the general public.

The survey also explored stigma and discrimination in the community. Finally, the survey explored the impact of the COVID-19 epidemic on risk-taking behaviors and access to services among PWID. Several activities could help to reduce the burden of disease in this KP:

- Tailored programs that address the HIV prevention, care, and treatment needs of PWID could help to achieve the goal of achieving 95-95-95 by 2025. Such programs could include sensitivity training of healthcare workers and law enforcement officials to create a non-judgmental environment where PWID feel it is safe to disclose their drug injecting activity and seek the range of treatment and prevention services, packaged with harm reduction services including methadone substitution therapy.
- Access to and education about HIV self-test kits, in places frequented by PWID and PWID-friendly environments, could increase the frequency of HIV testing, and reduce the number of PWID living with HIV who are going undiagnosed.
- Provision of harm reduction services—including access to clean needles/syringes and combination HIV prevention services— in convenient and accessible at places where PWID feel safe from discrimination, abuse, and harassment by law enforcement could improve service uptake and reduce HIV acquisition. Services may include methadone replacement therapy for heroin users and other evidence-based services for non-heroin users to help PWID reduce their dependence on street drugs and adhere to other HIV prevention services, such as PrEP.

MoH encourages public health staff, programmers, epidemiologists, and policy makers to examine the data from this BBS for their respective program areas and utilize the data to inform program planning.

Appendices

APPENDIX A METHODOLOGY AND TECHNICAL DETAILS

This document provides a brief explanation of the statistical software and methods used to generate population size estimates and analytic tables for the 2021 Zambia PWID Biobehavioral Survey.

Population Size Estimation

Two independent methods were used to estimate the population size for PWID in each survey site. Because of the lack of providers in the survey sites who specifically serve the PWID population or keep high-quality records of which of their patients are PWID, service multiplier estimates could not be produced.

Three-source Capture-Recapture

Survey staff visited selected locations in each survey site where the formative assessment indicated that PWID congregate. At each site, they approached potential participants, confirmed they met eligibility criteria, and offered them small gifts (bracelets). This process was repeated approximately one week later at a different set of locations, and a second small gift was offered. Staff also recorded whether the eligible participants had previously received one of the gifts from the first round.

The Respondent-Driven Sample (RDS) include questions on whether participants had received either or both capture event gifts. The resulting data were combined with that collected from the first two captures to generate capture histories. These were input into the shinyrecap web app[1] and estimates were produced using a Bayesian Latent Class model.

Successive Sampling

The successive sampling recruitment patterns and participants' self-reported network sizes were used to compute population size estimates using the sspse R package[2]. The imputed visibility option was used to help account for measurement errors in reported network sizes.

Consensus Estimation

To generate a single estimate from the independent population size estimates in each site, we used a Bayesian synthesis model for consensus estimation[3]. Design confidence parameters were determined through discussion with stakeholders and interest groups as well as technical experts to determine realistic priors and to evaluate the level of bias or measurement error present in each estimate.

Analytic Tables

Data cleaning and preparation

Before beginning estimation, the RDS response data from each site were cleaned to remove duplicate or erroneous records and combined into a single dataset which included supplemental lab test data not captured on the interview form. Various recodes were programmed and tested to allow for estimation of outcomes such as viral load suppression and 95-95-95 goals, and scores computed for alcohol dependence, anxiety, and suicidal ideation from the corresponding question sets. Responses to variables with an "Other specify" category were examined and where necessary were upcoded: either re-assigned to existing response options or combined into new categories.

Data analysis and Estimation

Estimates of proportions for the analytic tables were generated from the RDS data using the RDS package in R[4]. Estimates were generally computed using Gile's bootstrap method as implemented in the function RDS.bootstrap.intervals. In some cases where the number of cases included was very small the bootstrap function

failed to give reasonable results, and the sequential sampling estimate using Gile's estimator was used via the function RDS.SS.estimates.

To validate coding and estimation, estimates were also computed using weights generated with Gile's sequential sampling estimator via the gile.ss.weights function. These weights were exported and appended to the data and used as input to SAS survey procedures to estimate proportions and confidence intervals with Taylor series variances. Generally, the point estimates computed this way are very close to the bootstrap estimates, but confidence intervals can differ by several percentage points, especially in small cells.

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