

HIV infection among men who inject drugs and their female spouses in Pakistan

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Index

Acknowledgements.....	1
Key Findings	2
Background.....	4
Aims.....	6
Methodology	
ART Adherence among MWID.....	7
Female spouses of HIV positive MWID.....	8
Findings	
ART Adherence among MWID.....	10
Female spouses of HIV positive MWID.....	13
Discussion	17
Conclusions.....	20
References.....	21
Appendix A	22
Appendix B	23

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Supporting publications

Iversen J, ul Hassan Qureshi S, Zafar M, Busz M and Maher L. Adherence to antiretroviral therapy among HIV positive men who inject drugs in Pakistan. *International Journal of Drug Policy*. 2021;103281.

Iversen J, ul Hassan Qureshi S, Zafar M, Busz M and Maher L. HIV incidence and associated risk factors in female spouses of men who inject drugs in Pakistan. *Harm Reduction Journal*. 2021;18(1):51.

Key Findings

Using service delivery data from Nai Zindagi Trust, the current project aimed to assess adherence to antiretroviral therapy (ART) among HIV positive men who inject drugs (MWID) and to estimate HIV prevalence and incidence among female spouses of HIV positive MWID.

ART among HIV positive MWID:

- Among 5,482 HIV positive MWID who had initiated ART, just over half (55%) were assessed as adherent to ART. Adherence was highest in the Districts of Jacobabad (84%) and Larkana (82%) and lowest in Quetta (5%) and Kech, where no MWID were assessed as adherent.
- Factors independently associated with ART adherence included being married and having five or more years of education. MWID who reported living on the street at night were significantly less likely to be adherent.

HIV incidence among female spouses of HIV positive MWID:

- Among 4,121 female spouses of HIV positive MWID who had at least one HIV test, prevalence at baseline was estimated at 5.9%.
- A total of 109 incident HIV infections were observed, yielding an incidence rate 1.5 per 100 person years. Incident HIV infection was observed in 23 Districts with cumulative incidence highest in the Districts of Sahiwal (7.2%) and Sanghar (6.7%).
- Overall HIV prevalence was 8.5%, observed in 28 Districts and highest in Quetta (37%) and Peshawar (23%) Districts. This is considerably higher than prevalent infection of 0.1% among the general population in Pakistan and higher than that observed among people who inject drugs in most countries globally.
- Residing in Punjab province and having no children were independently associated with incident HIV infection, while knowledge of HIV at registration and having a spouse who had initiated ART were protective against infection.

Summary:

Findings indicate that PWID living with HIV in Pakistan continue to face barriers to ART adherence with just over half (55%) of our sample of 5,482 MWID assessed as adherent.

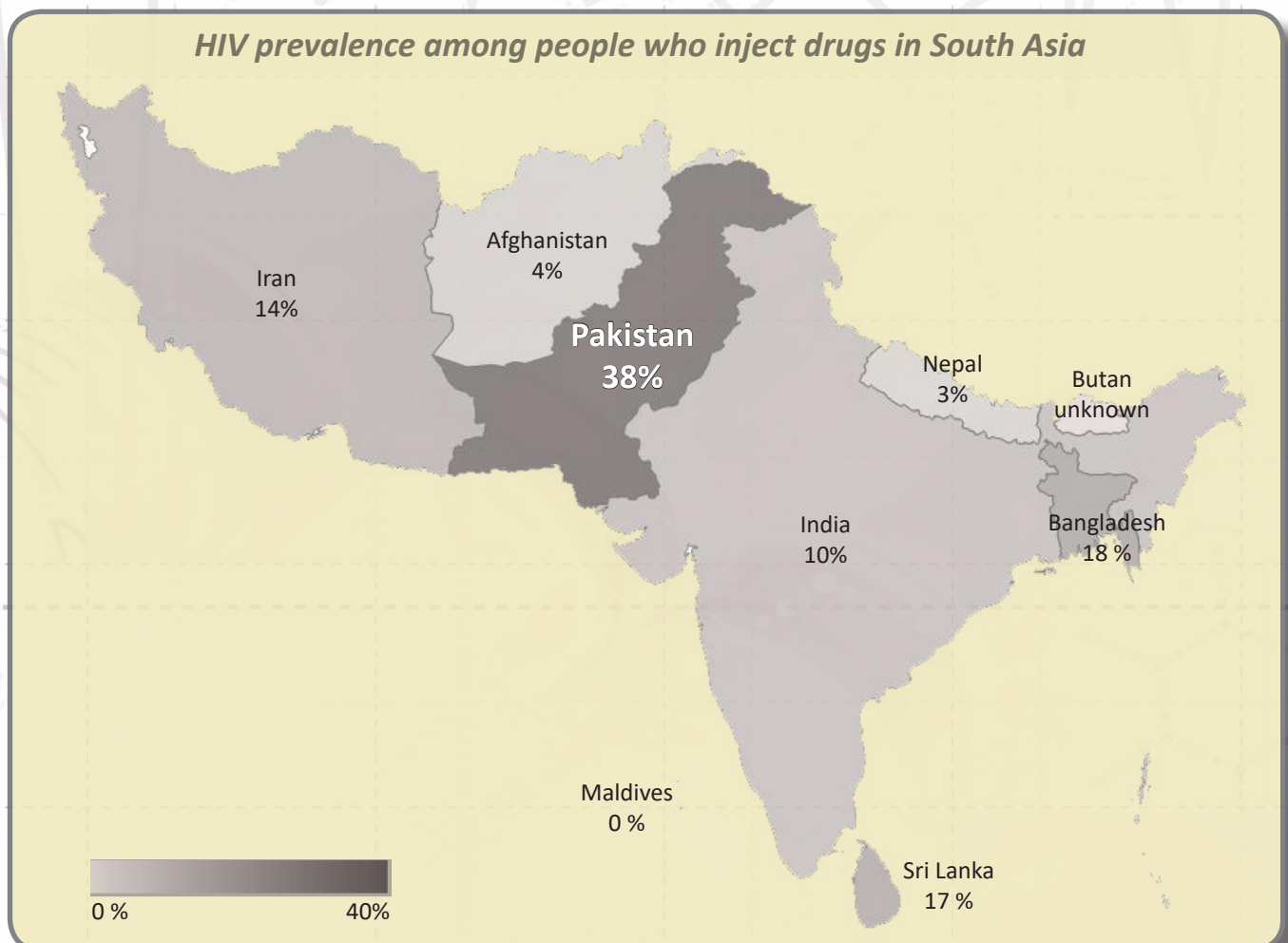
HIV prevention and treatment services targeting MWID and their female spouses in Pakistan require scale up to prevent further HIV infections.

Evidence-based interventions, including opioid agonist therapy (OAT), are needed to increase ART adherence and improve clinical outcomes, health equity and survival among MWID.

More needs to be done to support early intervention to prevent HIV transmission to female partners of HIV positive MWID, including provision of HIV pre-exposure prophylaxis (PrEP) to female spouses at high risk of HIV transmission, particularly young women and women whose husbands are not receiving, or have difficulty adhering to, ART.

Background

Blood borne viral infections are transmissible through shared use of injection equipment, placing people who inject drugs (PWID) at high risk of HIV and hepatitis C virus infection. Globally, 18% of the estimated 15.6 million PWID are living with HIV infection (Harm Reduction International, 2018). UNODC (2019) estimates that PWID are 22 times more likely than the general population to be living with HIV. In South Asia, the regional HIV prevalence estimate among PWID is similar at 19%, although prevalence varies by country (Harm Reduction International, 2018). In Pakistan however, HIV prevalence among PWID is estimated at 38%, more than double global and regional prevalence estimates (National AIDS Control Program 2017; Harm Reduction International, 2019). This is also consistent with national service-level testing among PWID at Nai Zindagi Trust, where HIV prevalence of 36% was observed among clients in June 2019 (Nai Zindagi Trust 2019).



Source: Harm Reduction International (2018)

In 2017, 42 million years of “healthy” life were lost (due to premature deaths and years lived with disability) as a result of drug use, mostly attributed to drug use disorders, particularly from the use of opioids (UNODC, 2019). The greatest burden of disease is seen in East and South-East Asia, North America and South Asia, with 35% of the world’s opioid users residing in South Asia (UNODC, 2019). HIV also remains a leading cause of mortality and morbidity worldwide, with PWID living with HIV at higher risk of all-cause mortality than people living with HIV who do not inject drugs (Spiller et al., 2015). In Pakistan, HIV infection is largely concentrated among PWID, as well as gay and bisexual men, sex workers and transgender people (Ahmed et al., 2019). However, reported outbreaks of HIV among the general Pakistani population, including a recent outbreak among children, highlight the potential for transmission beyond key populations (Arif, 2019; The Lancet Infectious Diseases, 2019).

Although the majority of the 160,000 people living with HIV in Pakistan are men, in 2018, more than one quarter (27%) of new HIV infections occurred among women. Further, the estimated number of women living with HIV increased from 19,000 in 2010 to 48,000 in 2018 (UNAIDS, 2019). It is well documented that sexual partners of people living with HIV are at risk of HIV transmission (Patel et al., 2014). While risk of sexual transmission can be minimised through safe sex practices, less than one quarter of PWID in Pakistan use condoms with their spouse or regular sex partner (National AIDS Control Program, 2017). Sexual transmission risk can also be mitigated when HIV positive sexual partners achieve undetectable viral loads through adherence to HIV antiretroviral therapy (ART) (Loutfy et al., 2013), with viral suppression also resulting in decreased AIDS-related morbidity and mortality (Cohen et al., 2011).

Nai Zindagi Trust, established in 1989, is a non-profit organisation that provides a human rights and needs based holistic approach to health and social care among PWID, their spouses and extended families in 38 districts covering all four provinces in Pakistan. Nai Zindagi Trust provides a comprehensive package of HIV prevention services, including needle syringe programs, provision of condoms, HIV testing and counselling, referral, support, advocacy and facilitated access to HIV treatment. In January 2014, Nai Zindagi Trust commenced operation of the ART Adherence Unit (AAU), a residential detoxification and care program designed to assist HIV positive men who inject drugs (MWID) with opioid dependence and initiation and adherence to ART.

Aims

In 2019 a collaboration was established between Nai Zindagi Trust, Mainline Netherlands and the Kirby Institute at UNSW Sydney.

This project aimed to:

1

Assess adherence to ART among HIV positive men who inject drugs who attended Nai Zindagi Trust ART Adherence Unit between September 2016 and December 2018

2

Estimate HIV prevalence and incidence among female spouses of HIV positive men who inject drugs who registered with Nai Zindagi Trust between March 2012 and December 2018

Methodology

1 ART adherence among MWID

Nai Zindagi Trust provides a wide range of services to MWID, including monitoring adherence to ART. An ART analysis dataset was created using anonymous client-level data among all HIV MWID who had initiated ART. The analysis dataset comprised the date of ART initiation and details of all subsequent refills (date and refill quantity) between 2016 and 2018. ART adherence was defined as yes or no, based on whether sufficient refills were collected to cover the time between ART refill collection dates. Client demographic and drug use data from registration at Nai Zindagi Trust was merged with the ART analysis dataset using an anonymous unique identifier generated at first client contact. Attendance and discharge records from the ART Adherence Unit were also merged into the ART analysis dataset based on the anonymous unique identifier.

The proportion of MWID assessed as adherent was calculated as the number of ART adherent MWID divided by the total number of PWID who had initiated ART. The ART dataset was analysed using logistic regression to identify factors associated with adherence to ART. Demographic characteristics that were considered for inclusion in the analysis included: geographic location; age; education; main income source and marital status. Behavioural factors that were considered in the analysis included: type of drug injected; living on the street at night and attendance at the ART Adherence Unit.

MWID were assessed as ART adherent if the number of ART refills supplied covered the number of days on ART.

Logistic regression identified factors associated with ART adherence.

2 Female spouses of HIV positive MWID

Female spouses of MWID were identified by female outreach workers and provided with HIV prevention, care and support services after obtaining consent from husbands. HIV tests were offered to female spouses of MWID diagnosed to be living with HIV. Female spouses who tested HIV negative were provided with HIV prevention and counselling services, with follow up HIV testing and counselling (HTC) encouraged at 3 monthly intervals. HIV testing was conducted using rapid diagnostic tests according to Pakistan's National HIV testing guidelines.

An analysis dataset was created using female spouse registration (March 2012 to December 2018) and subsequent service provision (to March 2019) data. The dataset was restricted to those with a HIV positive MWID spouse recorded as living with HIV.

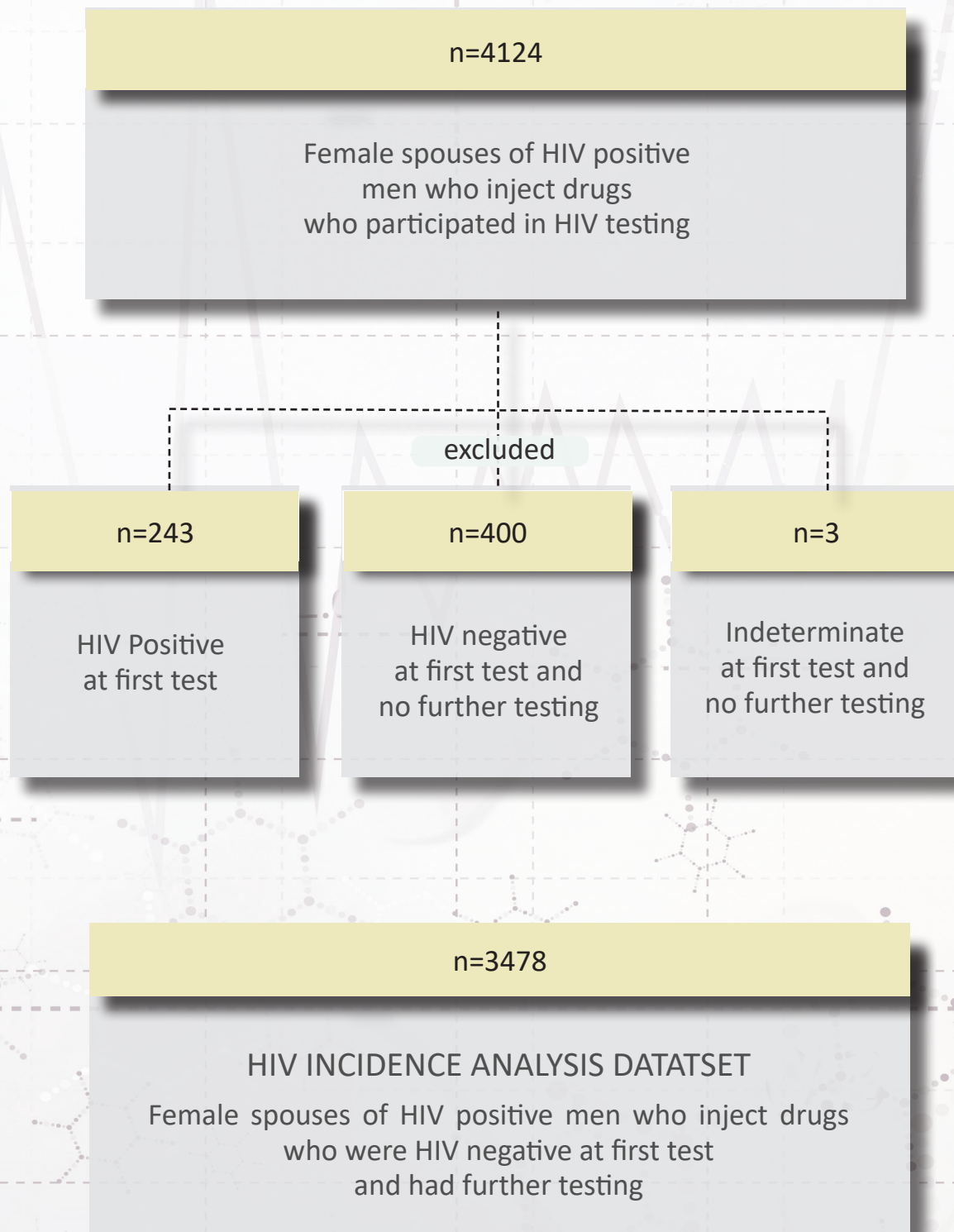
Baseline HIV prevalence was calculated among the group with a minimum of one HIV test result.

HIV incidence was calculated among the group who were HIV negative at first HIV test and who had at least one subsequent HIV test result.

Overall HIV prevalence was calculated among all female spouses who had an HIV test result.

HIV incidence was determined using Kaplan-Meier methods and cox proportional hazard models were used to identify factors associated with incident HIV infection.

Creation of HIV incidence analysis dataset

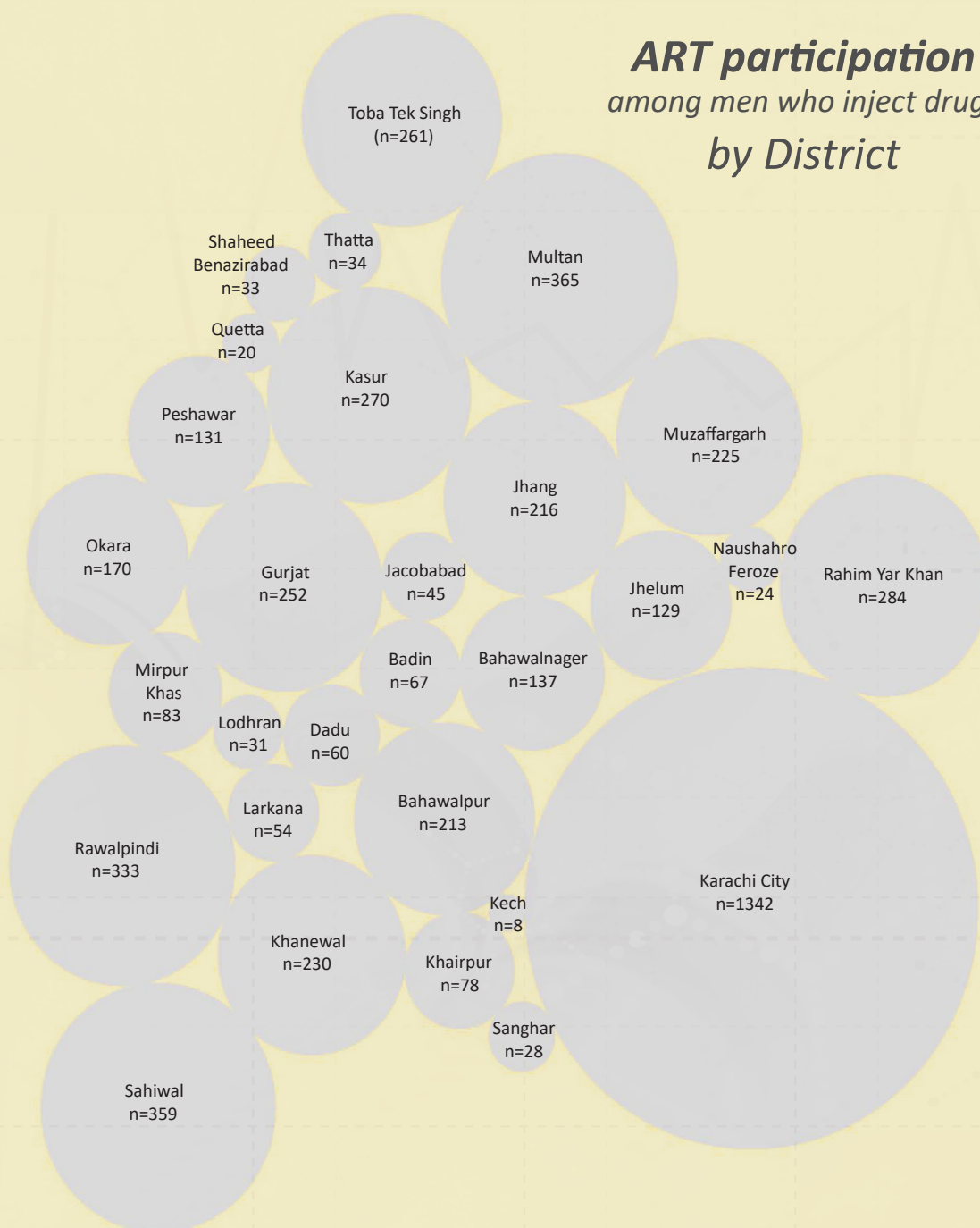


Findings

1 ART adherence among MWID

A total of 5,482 HIV positive MWID initiated ART between 2013 and 2018, with ART initiation observed in all 29 Districts.

ART participation among men who inject drugs by District

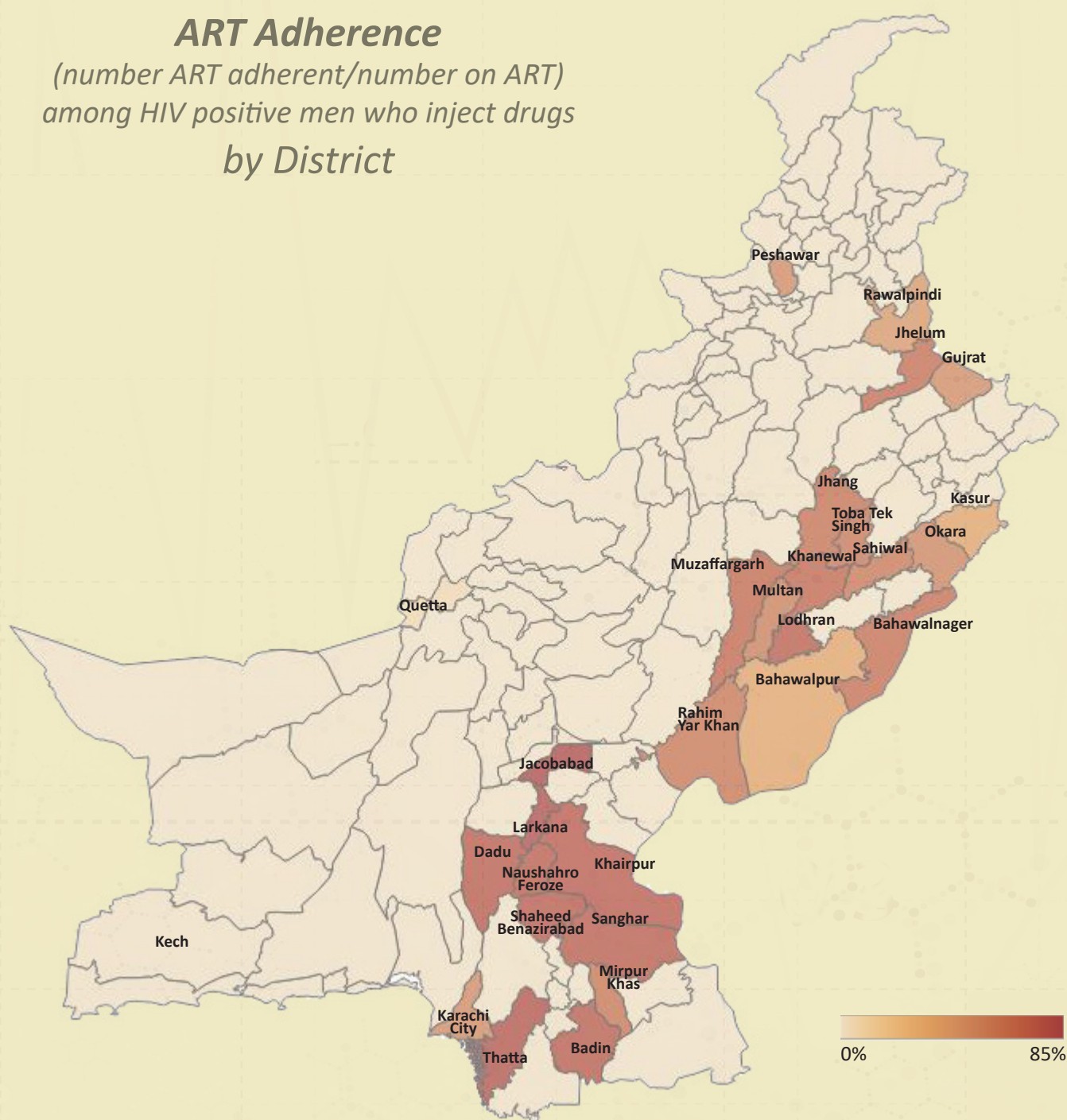


Note: Nai Zindagi Trust currently provides services in 45 Districts, however service provision was provided in 29 Districts during the study timeframe.

Among the 5,482 HIV positive MWID who had initiated ART, just over half (3,008, 55%) were assessed as adherent to ART. ART adherence was highest in the Districts of Jacobabad (38/45, 84%) and Larkana (44/54, 82%) and lowest in Quetta (1/20, 5%) and Kech, where no MWID were assessed as adherent (0/8, 0%).

ART Adherence

(number ART adherent/number on ART)
among HIV positive men who inject drugs
by District



See data table at Appendix A for more detail

Note: Nai Zindagi Trust currently provides services in 45 Districts, however service provision was provided in 29 Districts during the study timeframe.

The following factors were identified as independent predictors of ART adherence:

Men who were married were 1.4 times more more likely to be ART adherent than men who were unmarried.

ART adherence was associated with the number of years of education. Men with five or more years of education were 1.2 times more likely to be ART adherent than those with no education.

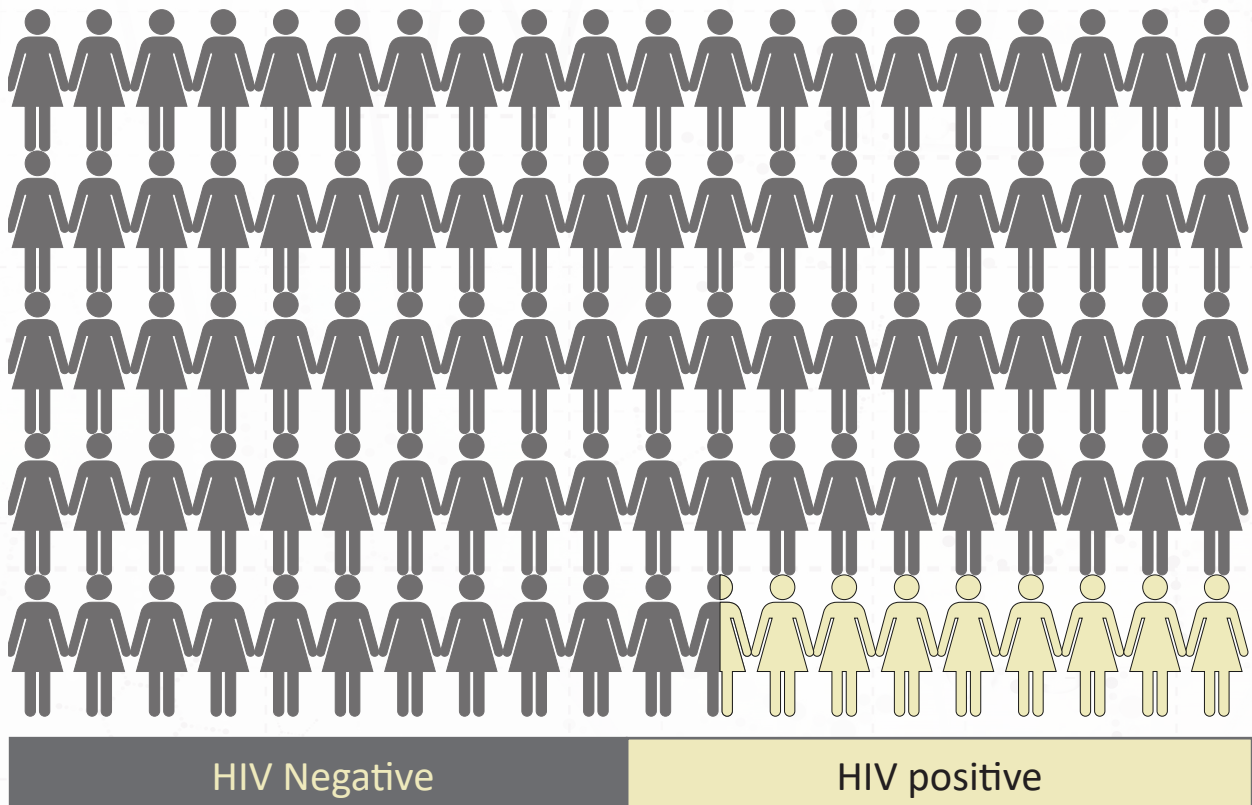
Men who reported living on the street at night were significantly less likely to be ART adherent.

2 Female spouses of HIV positive MWID

Among 4,121 female spouses of HIV positive MWID who had a minimum of one HIV test result:

- 243 HIV infections were observed at first test (5.9% baseline HIV prevalence).
- 109 incident HIV infections were observed for a HIV incidence rate of 1.5 per 100 person years.
- Overall HIV prevalence was 8.5%.

HIV prevalence among female spouses of HIV positive MWID in Pakistan

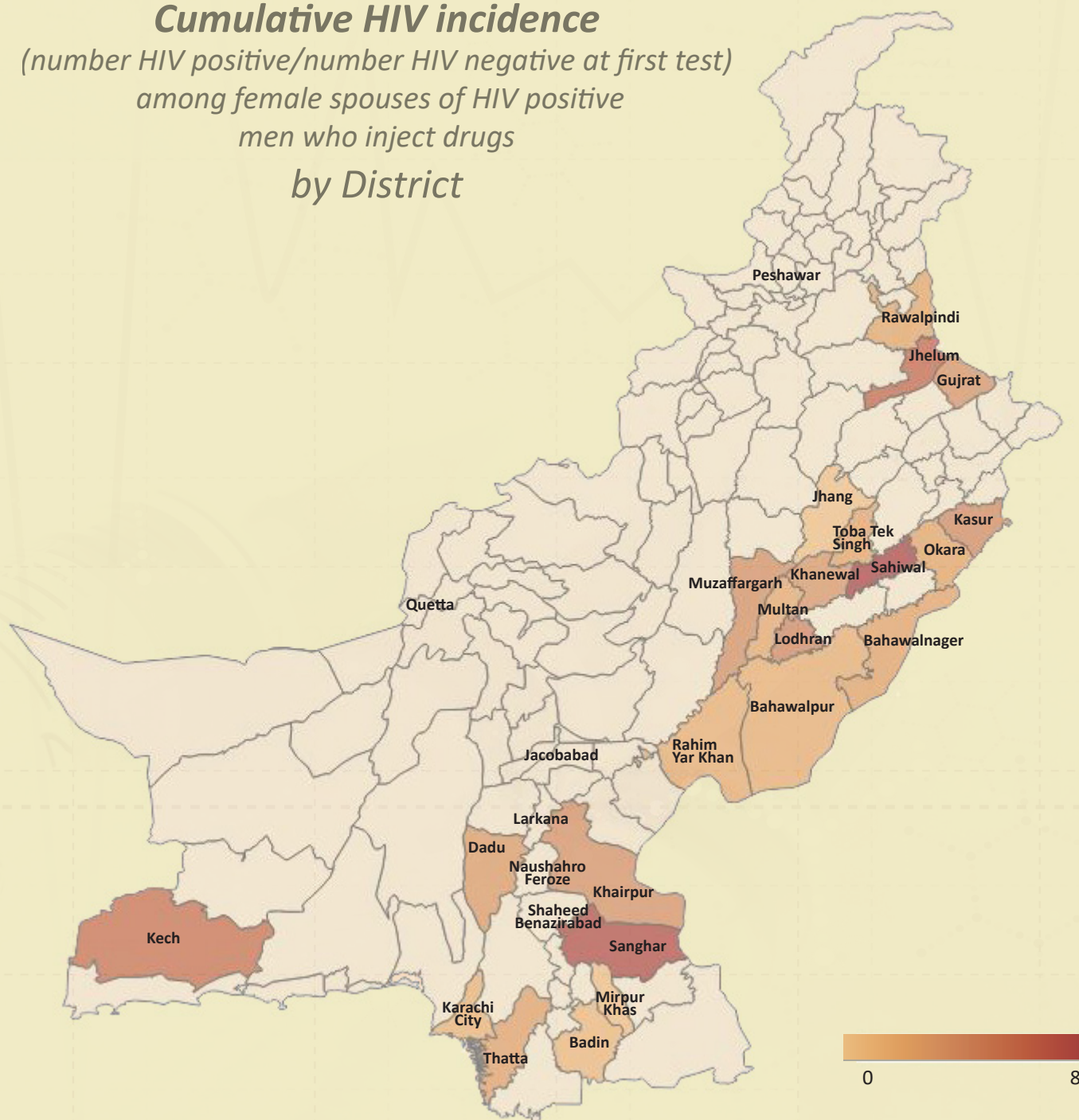


Cumulative HIV incidence was highest in the Districts of Sahiwal (14/195, 7.2%) and Sanghar (2/30, 6.7%).

Incident HIV infection was observed in 23 Districts, with no incident infections observed in Jacobabad, Larkana, Peshawar, Naushahro Feroze, Quetta and Shaheed Benazirabad Districts.

Cumulative HIV incidence

*(number HIV positive/number HIV negative at first test)
among female spouses of HIV positive
men who inject drugs
by District*



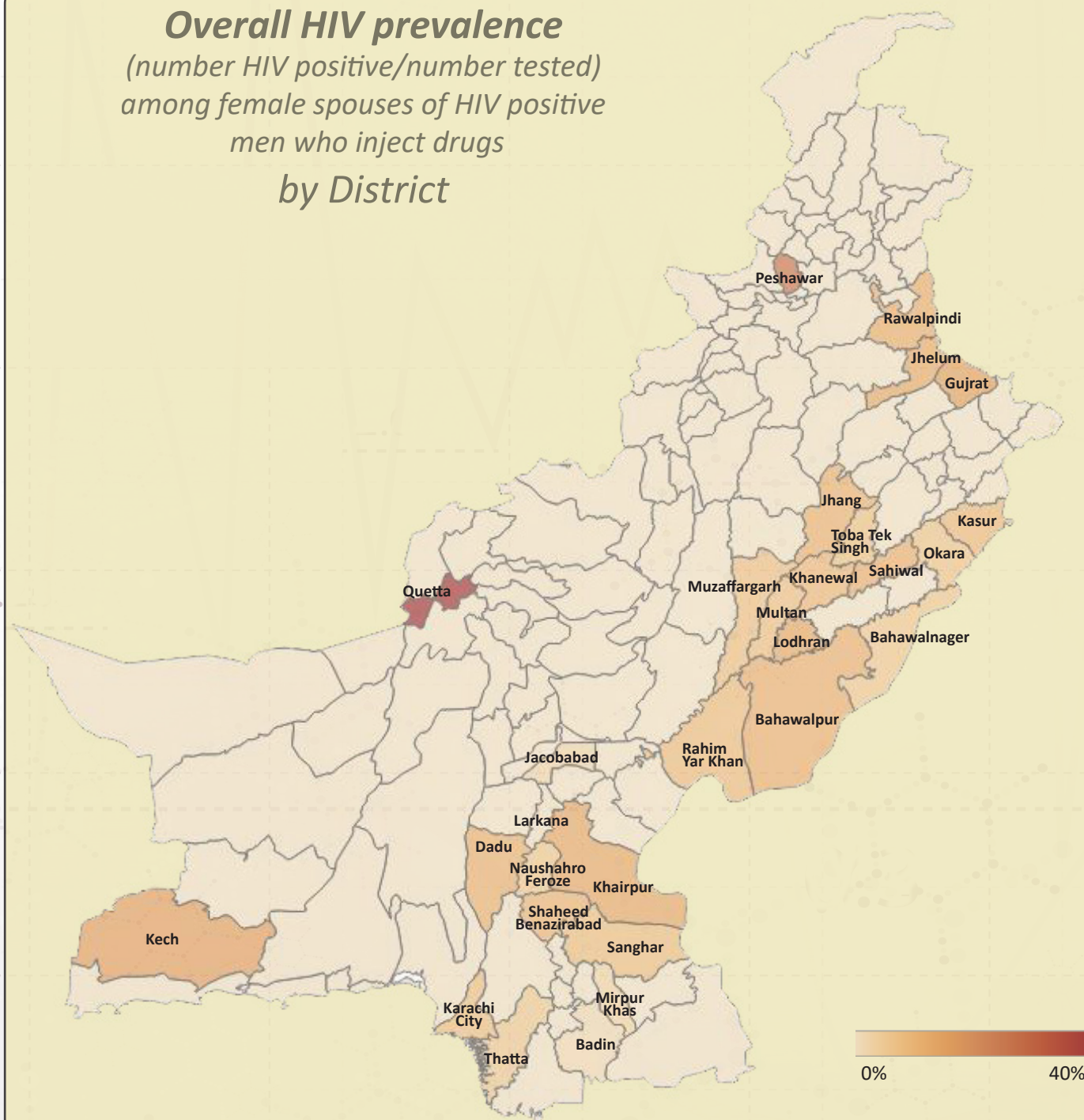
See data table at Appendix B for more detail

Note: Nai Zindagi Trust currently provides services in 45 Districts; however service provision was provided in 29 Districts during the study timeframe.

Overall HIV prevalence was highest in Quetta (7/19, 37%) and Peshawar (12/52, 23%) Districts. HIV infection was observed in 28 Districts. Larkana was the only District where no HIV infection was observed among female spouses of HIV positive MWID.

In total, 89% of women with prevalent HIV infection and 86% of the women who acquired incident HIV infection had children, and 32 women who tested HIV-positive were pregnant at the time of registration.

Overall HIV prevalence
(number HIV positive/number tested)
among female spouses of HIV positive
men who inject drugs
by District



See data table at Appendix B for more detail

Note: Nai Zindagi Trust currently provides services in 45 Districts, however service provision was provided in 29 Districts during the study timeframe.

The following factors were independently associated with incident HIV infection:

Compared to those from Sindh province, HIV incidence was 1.7 times higher among female spouses from Punjab province.

The risk of incident HIV infection was inversely associated with the number of children reported by female spouses; those with no children were at highest risk of HIV infection.

Knowledge of HIV at registration halved the likelihood of incident HIV infection, while those with 1-5 years of education were at higher risk of incident HIV.

Having a spouse who had initiated ART was also protective against incident HIV infection, although 27 of the 109 incident infections observed in this study were among spouses of MWID who had initiated ART.

Discussion

Our findings indicate that in Pakistan, HIV prevention and treatment services targeting MWID and their female spouses require additional scale up. HIV prevalence among PWID in Pakistan was 38% in 2016 (National AIDS Control Program 2017; Harm Reduction International, 2019) and 36% among all PWID attending NZT in 2019; double the regional and global prevalence estimates of 18% and 19% respectively. (UNODC, 2019)

Of the 160,000 people registered as living with HIV in Pakistan in 2018, only 15,800 were receiving ART (UNAIDS 2019). Nai Zindagi Trust provided follow up to 5,482 MWID who had initiated ART, with just over half (55%) assessed as adherent. While this is higher than the estimates of 17% (Bakht et al, 2018) and 20% (Daud et al, 2014) from earlier studies in Pakistan, it is lower than the mean weighted estimate of 72% derived from a recent review of adherence among PWID in low and middle income settings (Feelemeyer et al, 2015). MWID who had a record of attendance at the ART Adherence Unit were significantly more likely to be ART adherent than those who did not have a record of attendance.

ART suppresses HIV viral load and reduces AIDS-related mortality, morbidity and transmission risk among serodiscordant couples (Cohen et al, 2011; Loutfy et al, 2013). However, optimizing adherence to ART is essential for both individual and population-level outcomes, including prevention of HIV transmission (Cohen et al, 2016). Both access and adherence to ART among PWID is improved by flexible, comprehensive and well-integrated HIV, harm reduction and, importantly, opioid agonist therapy (OAT). OAT has been identified as a core component of the comprehensive package of HIV services recommended by the United Nations Programme on HIV/AIDS, the United Nations Office on Drugs and Crime and the World Health Organization, and methadone and buprenorphine are now included in the WHO's list of Essential Medicines.

In addition to the benefits of evidence-based treatment for opioid dependence, OAT has the potential to prevent new HIV and HCV infections, optimize adherence to ART among PWID and, by increasing viral load suppression, prevent secondary transmission of HIV among female spouses and within the population of PWID.

Among our sample of >4000 female spouses of HIV positive MWID HIV prevalence was 8.5%, considerably higher than prevalent infection at 0.1% among the general Pakistan population aged 15-49 years in 2018. Further, HIV prevalence at 8.5% among female spouses of HIV positive MWID in Pakistan was higher than that observed among PWID in most countries globally, with 59/104 countries reporting HIV prevalence among PWID at <8.5% (Harm Reduction International, 2019).

Prevalent HIV infection among female spouses was particularly high in the Districts of Quetta (37% of 19 women) and Peshawar (23% of 52 women), with all infections identified at first HTC contact with Nai Zindagi Trust. Larkana was the only District where no HIV infections among female spouses of HIV positive MWID were observed (21 women tested). Among HIV negative female spouses of HIV positive MWID (n=3,478), HIV incidence also varied according to geographic location, with significantly higher incidence observed in Punjab province compared to Sindh province. Incident HIV infection was observed in all Districts in Punjab, and although HIV incident infection was high in Sanghar District (7% of 30 women) there were four Districts in Sindh (Jacobabad, Larkana, Naushahro Feroze and Shaheed Benazirabad) where no incident HIV infections were observed.

HIV prevalent infection at first HIV test was high at 6%, declining to 3% among women who were provided with ongoing HTC. Counselling and testing can reduce HIV related-risk through modification of sexual behaviour in low income countries (Fonner et al, 2012) and it is therefore likely that HTC provided by Nai Zindagi Trust (among both MWID and their female spouses) confers an important prevention benefit.

Our findings support the need for early intervention to prevent HIV transmission among women who are married to MWID in this setting. The risk of HIV infection among female spouses of MWID was inversely associated with the number of children reported by female spouses, such that women with no children were at the highest risk of incident HIV infection. Knowledge of HIV at registration was protective against HIV infection in female spouses of HIV positive MWID, however awareness of HIV is

typically low in Pakistan (National Institute of Population Studies Pakistan and ICF, 2019). The provision of community HIV education programs that target women, particularly younger women and those with low levels of formal education, appears warranted and should be accompanied by access to HIV testing for those at risk of infection.

While uptake of ART among male spouses appeared to be protective against incident HIV infection among female spouses, 25% (27 of 109) incident HIV infections were observed among females with spouses who had initiated ART. This finding suggests a need to better understand the role of adherence among MWID in achieving viral suppression and preventing transmission to female partners. Finally, HIV pre-exposure prophylaxis (PREP) should be considered for female spouses of HIV-positive MWID who are at high risk of HIV transmission, particularly women living in Punjab province, younger women with fewer children and those with husbands who have not initiated, or have difficulty adhering to ART.

Conclusions

In Pakistan, a multi-pronged approach is required to reduce the risk of HIV transmission among men who inject drugs and their female spouses and to improve health outcomes for those living with HIV.

This approach will require:

1

Scale up of harm reduction services

Target PWID through scale up of existing harm reduction programs to improve coverage and prevent further HIV transmission.

2

Integration of ART and adherence support

Improve access and adherence to ART among PWID through provision of people-centred, differentiated and integrated HIV and harm reduction services.

3

Introduction of Opioid Agonist Therapy

Provision of OAT prevents HIV and HCV infections and is the single most important facilitator of ART initiation and adherence among PWID.

4

Development of gender-specific and sensitive HIV prevention programs

Develop targeted prevention approaches, including early intervention, to prevent HIV transmission among women who are married to MWID.

5

Provision of HIV PrEP

Consider the introduction of HIV PrEP for female spouses at high risk of HIV transmission, particularly young women and women whose husbands are not receiving, or have difficulty adhering to, ART

6

Assess local epidemiology

Given considerable geographic variation, progressive scale up of existing or implementation of new HIV prevention and treatment services should be based on local epidemiology.

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Appendix A

Adherence to ART among men who inject drugs by province and district			
Geographic location	Number with ART initiation	Number assessed as ART adherent	ART adherent %
Total	5482	3008	54.9
Balochistan	28	1	3.6
Quetta	8	0	0.0
Kech	20	1	5.0
Khyber Pakhtunkhwa	131	65	49.6
Peshawar	131	65	49.6
Punjab	3475	1914	55.1
Bahawalnagar	137	89	65.0
Bahawalpur	213	75	35.2
Gujrat	252	122	48.4
Jhang	216	138	63.9
Jhelum	129	84	65.1
Kasur	270	96	35.6
Khanewal	230	158	68.7
Lodhran	31	23	74.2
Multan	365	204	55.9
Muzaffarabad	225	154	68.4
Okara	170	89	52.4
Rahim Yar Khan	284	171	60.2
Rawalpindi	333	139	41.7
Sahiwal	359	214	59.6
Toba Tek Singh	261	158	60.5
Sindh	1848	1028	55.6
Badin	67	50	74.6
Dadu	60	45	75.0
Jacobabad	45	38	84.4
Karachi	1342	651	48.5
Khairpur	78	59	75.6
Larkana	54	44	81.5
Mirpur Khas	83	50	60.2
Naushahro Feroze	24	18	75.0
Sanghar	28	21	75.0
Shahēed Benazirabad	33	25	75.8
Thatta	34	27	79.4

Appendix B

HIV prevalence at first and last test and cumulative incidence among female spouses by province and district			
Geographic location	HIV prevalence at first test N (%)	Cumulative HIV incidence N (%)	HIV prevalence at last HIV test N (%)
Total	243/4121 (5.9)	109/3478 (3.1)	352/4121 (8.5)
Balochistan	9/41 (22.0)	1/30 (3.3)	10/41 (24.4)
Quetta	7/19 (36.8)	0/11 (0.0)	7/19 (36.8)
Kech	2/22 (9.1)	1/19 (5.3)	3/22 (13.6)
Khyber Pakhtunkhwa	12/52 (23.1)	0/38 (0.0)	12/52 (23.1)
Peshawar	12/52 (23.1)	0/38 (0.0)	12/52 (23.1)
Punjab	152/2607 (5.8)	80/2197 (3.6)	232/2607 (8.9)
Bahawalnagar	3/107 (2.8)	3/89 (3.0)	6/107 (5.6)
Bahawalpur	8/98 (8.2)	2/84 (2.4)	10/98 (10.2)
Gujrat	28/267 (10.5)	8/209 (3.8)	36/267 (13.5)
Jhang	13/151 (8.6)	2/129 (1.6)	15/151 (9.9)
Jhelum	6/99 (6.1)	5/88 (5.7)	11/99 (11.1)
Kasur	11/225 (4.9)	8/192 (4.2)	19/225 (8.4)
Khanewal	9/159 (5.7)	5/137 (3.6)	14/159 (8.8)
Lodhran	2/25 (8.0)	1/23 (4.3)	3/25 (12)
Multan	15/315 (4.8)	7/260 (2.7)	22/315 (7)
Muzaffarabad	11/293 (3.8)	10/255 (3.9)	21/293 (7.2)
Okara	4/113 (3.5)	3/103 (2.9)	7/113 (6.2)
Rahim Yar Khan	11/190 (5.8)	4/159 (2.5)	15/190 (7.9)
Rawalpindi	14/168 (8.3)	4/141 (2.8)	18/168 (10.7)
Sahiwal	11/246 (4.5)	14/195 (7.2)	25/246 (10.2)
Toba Tek Singh	6/151 (4.0)	4/133 (3.0)	10/151 (6.6)
Sindh	70/1421 (4.9)	28/1213 (2.3)	98/1421 (6.9)
Badin	0/60 (0.0)	1/50 (2.0)	1/60 (1.7)
Dadu	6/79 (7.6)	2/58 (3.4)	8/79 (10.1)
Jacobabad	1/39 (2.6)	0/35 (0.0)	1/39 (2.6)
Karachi	51/965 (5.3)	19/842 (2.3)	70/965 (7.3)
Khairpur	5/59 (8.5)	2/53 (3.8)	7/59 (11.9)
Larkana	0/21 (0.0)	0/18 (0.0)	0/21 (0.0)
Mirpur Khas	1/67 (1.5)	1/58 (1.7)	2/67 (3)
Naushahro Feroze	1/18 (5.6)	0/13 (0.0)	1/18 (5.6)
Sanghar	1/40 (2.5)	2/30 (6.7)	3/40 (7.5)
Shaheed Benazirabad	3/33 (9.1)	0/24 (0.0)	3/33 (9.1)
Thatta	1/40 (2.5)	1/32 (3.1)	2/40 (5.0)

The background of the page features a light beige color with a faint, dashed grid pattern. Overlaid on this grid are several scientific illustrations in a muted, light brown tone. These include several molecular structures, some resembling benzene rings or more complex organic molecules, and a prominent DNA double helix structure on the left side. The overall aesthetic is clean and professional, with a focus on scientific or medical themes.

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Program - Health and Rights for Key Populations**