Poster Board # 1063

# HIV Care Cascade among Hard to Reach Populations in India: Need to Expand HIV Counseling and Testing

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## ABSTRACT (revised)

**Background:** Early identification of HIV infection, prompt linkage to care, retention, initiation of ART and suppression of viral load (VL) are critical steps along the HIV care cascade. Hard-to-reach groups such as injection drug users (IDUs) and men who have sex with men (MSM) lag behind at each step particularly in low-and-middle-income settings where access challenges are complicated by stigma and discrimination. We characterize the spectrum of engagement in HIV care for IDUs and MSM in India.

**Methods:** We recruited 12,022 MSM and 14,481 IDUs across 26 cities in India (target=1000 per site) using respondent-driven sampling from 10/2012 – 12/2013. Participants had to be ≥18 years old and self-identify as male and report sex with a man in the prior year (MSM) or report injection drug use in the prior 2 years (IDU). All participants underwent a survey and blood draw. HIV was diagnosed using three rapid tests. We report the median of site-level proportions of each outcome along with 10th and 90th percentiles.

**Results:** 1,146 MSM were HIV-infected with prevalence across sites ranging from 2 -13%. Among those infected, a median 30% were diagnosed, 24% linked to care, 19.8% retained (saw provider in prior 6 months), 16.7% initiated on ART and 10.1% had suppressed VL. However, there was tremendous variability by site (percent diagnosed range: 0 – 90%; suppressed VL range: 0 – 59%). 2,906 IDUs were HIV infected with prevalence across sites ranging from 6 – 45%. Among those infected, a median 40.8% were diagnosed, 36.3% linked to care, 27.1% retained, 20.2% were on ART and 15.4% had suppressed VL. Similar variability across site was observed (percent diagnosed range: 3 – 92%; suppressed VL range: 0 – 47%). Factors significantly associated with diagnosis in both groups included older age, larger network size, more education, and a history of tuberculosis. Among MSM, diagnosis was also significantly associated with being married, being a receptive partner and history of a sexually transmitted infection. Among IDUs, diagnosis was also significantly associated with a history of opiate substitution.

**Conclusions:** In this large sample of MSM and IDUs across India, the major barrier to successful engagement in HIV care was diagnosis with fewer than 40% having been diagnosed. Overall, engagement was better in sites with higher HIV prevalence where there have been more government-led targeted interventions. Efforts should focus on improving access to HIV testing for these groups in all settings by linking HIV testing to other essential services.

## BACKGROUND

- Injection drug users (IDUs) and men who have sex with men (MSM) lag behind other groups with respect to engagement in HIV care
- India has an estimated 2.3 million HIV infections
- Government-led targeted interventions in India have historically been focused on heterosexual at-risk populations in high HIV prevalence states; current interventions target MSM and IDUs
- HIV prevalence in the general population is estimated to be declining in India
- HIV prevalence among MSM and IDUs in India is estimated to be stable / increasing

## METHODS

### *RECRUITMENT*

- Participants in both groups were recruited using respondent-driven sampling (RDS)
- Ethnographic research was initially conducted to identify "seeds" for RDS
- RDS in all sites was initiated with two "seeds" – a third "seed" was added in only MSM site (Delhi) and one IDU site (Gangtok)
- Each recruit was given two coupons

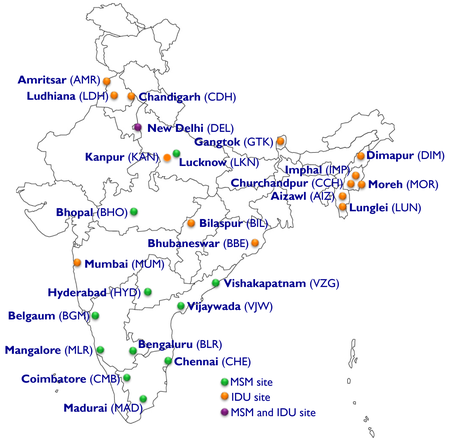



**Figure 1. Study sites**
HIV prevalence by site:
**MSM**: BLR – 7.4, BGM – 3.9, BHO – 4.1, CHE – 7.1, CMB – 11.2, DEL/MSM – 4.9, HYD – 12.7, LKN – 4.0, MAD – 13.1, MLR – 1.7, VGW – 10.6, VZG – 5.7
**IDU:** AIZ – 25.4, AMR – 21.1, BBE – 5.9, BIL – 8.9, CDH – 10.6, CCH – 22.3, DEL/IDU – 13.8, DIM – 21.8, GTK – 11.2, IMP – 31.3, KAN – 30.8, LDH – 13.1, LUN – 11.5, MOREH – 45.0, MUM – 8.6

### *STUDY POPULATION*

**ELIGIBILITY CRITERIA**

***Men who have sex with men (MSM)***

1. 18 years of age or older
2. Provide verbal consent
3. Self-identify as male
4. History of oral or anal intercourse with another man in the prior 12 months
5. Present a valid RDS coupon

***Injection drug users (IDUs)***

1. 18 years of age or older
2. Provide verbal consent
3. History of injecting drugs for non-medicinal purposes in the prior 24 months
4. Present a valid RDS coupon

### *STUDY PROCEDURES*

- Participants underwent a survey and provided a blood specimen
- HIV testing was performed on-site (three rapid tests) and results were delivered to participants with pre- and post-test counseling
- Blood specimens were shipped to a central lab in Chennai for HIV RNA testing

### *STATISTICAL METHODS*

- HIV care cascade outcomes were estimated using RDS-II weights
- Correlates of HIV diagnosis were estimated using multi-level logistic regression models to account for clustering within site

### *ETHICAL CLEARANCES*

- This study was approved by the JHMI, JHSPH and YRGCARE Institutional Review Boards

## RESULTS

| | MSM (n= 1,146) | | IDU (n=2,906) | |
|---|---|---|---|---|
| | Median | Range | Median | Range |
| Age | 33 | 27 – 40 | 30 | 27 – 40 |
| Proportion male (%) | 100 | 100 – 100 | 94.5 | 57.6 – 100 |
| Marital status (%) | | | | |
| *Never married* | 39.6 | 10.6 – 55.2 | 28.0 | 12.0 – 70.5 |
| *Currently married* | 54.4 | 39.0 – 84.5 | 43.0 | 21.4 – 76.0 |
| *Widowed/Divorced/Separated* | 5.3 | 0.8 – 20.1 | 8.0 | 1.2 – 46.2 |
| Education (%) | | | | |
| *Primary school or less* | 32.7 | 13.5 – 70.3 | 33.6 | 9.5 – 80.6 |
| *Secondary school* | 45.2 | 15.9 – 86.5 | 43.9 | 17.3 – 69.7 |
| *High school and above* | 6.0 | 0 – 22.1 | 8.1 | 2.0 – 32.9 |
| *Vocational/trade or college* | 9.8 | 0 – 24.2 | 4.7 | 0 – 13.8 |
| Network size | 11 | 5-73 | 15 | 5 – 30 |
| History of tuberculosis | 9.0 | 1.0 – 45.7 | 13.9 | 1.9 – 62.4 |
| History of STI | 14.3 | 1.7 – 47.5 | | |
| History of needle exchange | | | 50.2 | 4.8 – 86.1 |
| History of opiate substitution | | | 26.3 | 0 – 68.9 |

Note: Numbers reported are the median (range) of the site-level proportions; number of MSM sites = 12 & number of IDU sites = 15

**Table 1. Site characteristics of HIV positive persons (n=27 sites)**

| | Unadjusted | | Adjusted | |
|---|---|---|---|---|
| | OR | 95% CI | OR | 95% CI |
| Region | | | | |
| *North* | 1 | | 1 | |
| *Northeast* | 9.6 | 3.2 – 28.6 | 6.4 | 2.1 – 19.6 |
| *Central* | 4.1 | 1 – 15.9 | 3.2 | 0.8 – 13.1 |
| Age | 1.1 | 1 – 1.3 | 1.1 | 1 – 1.3 |
| Marital status | | | | |
| *Never Married* | 1 | | 1 | |
| *Currently married* | 1.3 | 1 – 1.6 | 1.1 | 0.9 – 1.4 |
| *Widowed, Divorced, Separated* | 1.2 | 0.9 – 1.6 | 1.0 | 0.7 – 1.3 |
| Education | | | | |
| *Primary school or less* | 1 | | 1 | |
| *Secondary school* | 1.3 | 1 – 1.5 | 1.2 | 1 – 1.5 |
| *High school* | 2.0 | 1.4 – 2.7 | 1.9 | 1.4 – 2.7 |
| *Vocational/trade or college* | 1.3 | 0.9 – 2.1 | 1.4 | 0.9 – 2.7 |
| Gender | | | | |
| *Male* | 1 | | 1 | |
| *Female* | 2.4 | 1.8 – 3.1 | 3.6 | 2.6 – 4.8 |
| *Hijra/Transgender* | 0.5 | 0 – 6.6 | 1 | 0.1 – 14.6 |
| IDU network size[1] | 1.1 | 1 – 1.1 | 1.1 | 1 – 1.1 |
| History of tuberculosis | 3 | 2.3 – 3.8 | 2.8 | 2.1 – 3.6 |
| History of needle exchange | 1.3 | 1.1 – 1.5 | 1.1 | 0.9 – 1.3 |
| History of opiate substitution | 2.3 | 1.9 – 2.9 | 2.4 | 1.9 – 3.0 |
| History of needle sharing | 1.8 | 1.4 – 2.2 | 1.8 | 1.5 – 2.2 |

OR = Odds ratio; CI = Confidence Interval; [1]Number of IDUs seen in prior 30 days; Highlighted variables are statistically significant

**Table 2. Correlates of awareness of HIV positive status among IDUS in India (n=2,906)**

| | Unadjusted | | Adjusted | |
|---|---|---|---|---|
| | OR | 95% CI | OR | 95% CI |
| Region | | | | |
| *North* | 1 | | 1 | |
| *Karnataka* | 2.3 | 0.4 – 13.8 | 2 | 0.2 – 17.7 |
| *Tamil Nadu* | 16.9 | 2.8 – 101.6 | 8.9 | 1 – 76.6 |
| *Andhra Pradesh* | 4.2 | 0.7 – 24.4 | 3.1 | 0.4 – 25.8 |
| Age | 2.1 | 1.8 – 2.5 | 1.7 | 1.4 – 2.1 |
| Marital status | | | | |
| *Never Married* | 1 | | 1 | |
| *Currently married* | 2.1 | 1.5 – 2.8 | 1.6 | 1.1 – 2.3 |
| *Widowed, Divorced, Separated* | 2.4 | 1.4 – 4.3 | 2.1 | 1 – 4.1 |
| Education | | | | |
| *Primary school or less* | 1 | | 1 | |
| *Secondary school* | 1.1 | 0.8 – 1.5 | 1.3 | 0.9 – 1.8 |
| *High school* | 1.1 | 0.6 – 1.7 | 1.2 | 0.7 – 2.1 |
| *Vocational/trade or college* | 0.6 | 0.4 – 1.0 | 0.6 | 0.4 – 1.0 |
| MSM network size[1] | 1.3 | 1.2 – 1.4 | 1.2 | 1.1 – 1.4 |
| History of tuberculosis | 8.5 | 4.9 – 14.9 | 7.9 | 4.3 – 14.6 |
| History of STI | 2.7 | 1.9 – 3.7 | 2.3 | 1.6 – 3.4 |
| History of injection drug use | 0.3 | 0.1 – 0.7 | 0.4 | 0.2 – 1.1 |
| Sexual Behavior | | | | |
| *History of insertive anal sex* | 1 | | 1 | |
| *History of receptive anal sex* | 1.9 | 1.2 – 2.8 | 1.7 | 1 – 2.7 |
| *Both insertive and receptive* | 1.5 | 1 – 2.2 | 1.2 | 0.8 – 1.8 |
| *Neither* | 3.0 | 1.2 – 7.5 | 4.5 | 1.5 – 13.7 |

OR = Odds ratio; CI = Confidence Interval; [1]Number of MSM seen in prior 30 days; Highlighted variables are statistically significant

**Table 3. Correlates of awareness of HIV positive status among MSM in India (n=1,146)**

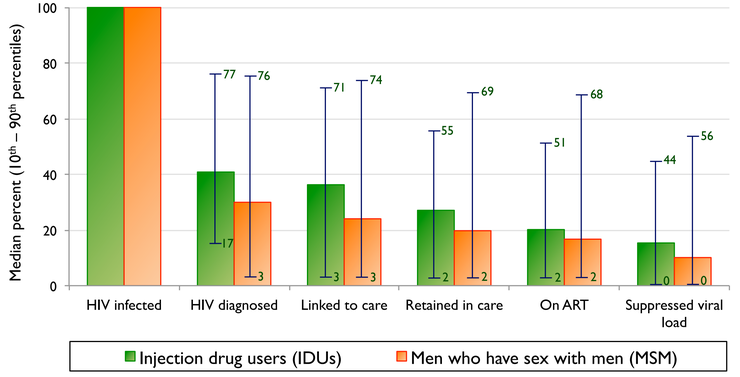



**Figure 2. HIV care cascade among HIV positive MSM (n= 1,146) and IDUs (n=2,906)**
Bars represent the median of the site-level proportions of each outcome; lines represent the 10th and 90th percentiles of the site-level proportions

## CONCLUSIONS

- There was striking regional variability in engagement in HIV care across India
- In general, engagement in HIV care was better in sites with more government-led targeted interventions
- The major barrier to successful engagement in HIV care for MSM and IDUs was diagnosis – fewer than 40% of both groups were aware of their HIV status
- Awareness of status was significantly higher among persons who had received other related services – TB treatment, STI treatment, and opiate substitution
- Awareness of status was also significantly higher among persons who reported having larger social networks
- Interventions should focus on improving access to HIV testing potentially by linking HIV testing to other essential services
- Additional efforts will also be needed to ensure successful virologic suppression among HIV-infected MSM and IDUs in India

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