HIV INCIDENCE & CHANGES IN NETWORK STRUCTURE AMONG PWID IN NEW DELHI FOLLOWING THE COVID-19 PANDEMIC

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BACKGROUND

- The UNAIDS 95-95-95 targets for 2030 are fast approaching, and progress among people who inject drugs (PWID) lags behind other key populations.
- Resources for HIV programs, particularly in low- and middle-income countries are beginning to plateau and are at risk of declining in many settings.
- Understanding HIV transmission in the context of evolving social and spatial injection networks could inform precision public health approaches to maximize the efficacy and efficiency of intervention delivery.

OBJECTIVE

- Examine changes in the social and spatial network structures among PWID in New Delhi, India following the COVID-19 pandemic.

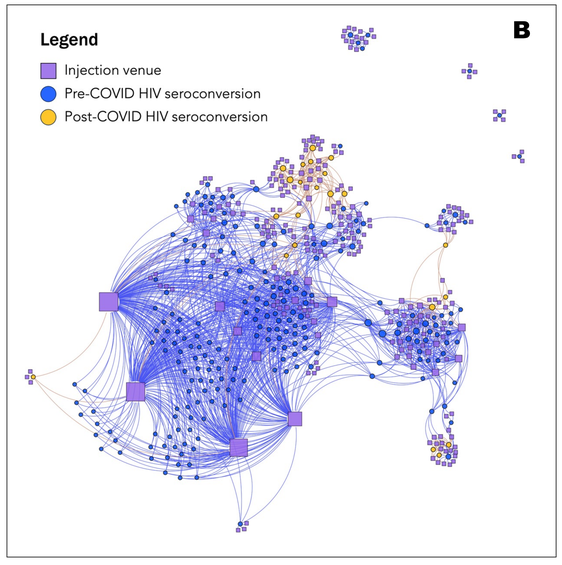
METHODS

- From 2017-19 (Pre-COVID), 2,512 PWID were recruited into a dynamic network-based cohort and followed semi-annually until March 2020
- Over 1,000 participants were lost (migrated or deceased) when the site re-opened. An additional 987 PWID were recruited to replace lost participants using identical procedures between February 2022 and April 2023 (Post-COVID) and followed semi-annually.
- An electronic interviewer-administered survey capturing demographics, network characteristics, risk behaviors, access to HIV/HCV services, and information on injection locations, among others was administered.
- Rapid on-site HIV (three rapid tests as per National guidelines) and HCV (anti-HCV antibody) testing was performed, and results were delivered with appropriate pre- and post-testing counseling and referrals.
- Statistical analyses were carried out in Python (v3.11) and R (v4.1.3), and networks were modeled using NetworkX. Individual and network variables were analyzed for an association with incident HIV infection using univariable and multivariable Poisson regression.

The topology of pre- and post-COVID networks differed, and post-COVID HIV seroconversions were driven by previously unseen spatial ties

RESULTS

- Since 2017, 3,499 PWID were recruited; 37.2% were living with HIV (37.0% and 37.6% in the pre- and post-COVID recruits, respectively).
- 243 seroconversions were observed over 1912.5 person years (HIV incidence of 12.7 per 100 p-y)
- Incidence in the pre- and post-COVID recruits was 13.8 and 7.3 per 100 p-y, respectively
- In pre-COIVD recruits, individual and network factors, and a particular venue were predictors of seroconversion. In post-COVID recruits, depression, needle sharing, network distance to an HIV-positive person, and 19 venues were associated. Further, venues associated with seroconversion in the new recruits differed from those pre-COVID (Fig 1B)



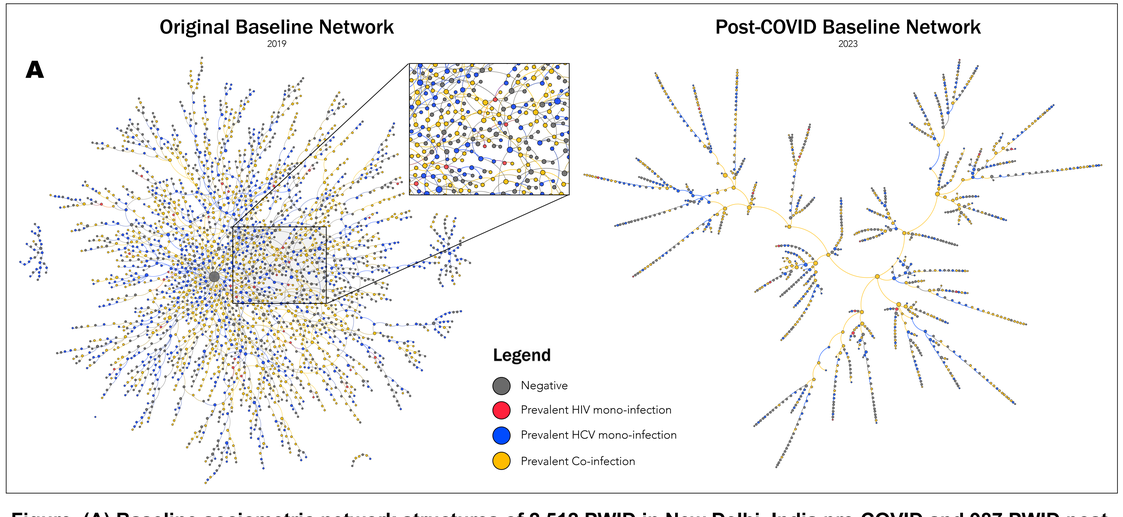


Figure. (A) Baseline sociometric network structures of 2,512 PWID in New Delhi, India pre-COVID and 987 PWID post-COVID. (B) Spatial network of 243 PWID in New Delhi, India with observed HIV seroconversions 2017-23

	Pre-COVID Recruits	Post-COVID Recruits
Number of participants	2,512	987
Median Age (IQR)	26 (22 – 34)	27 (23 – 33)
Male Gender	99% (2489)	98% (962)
Self-Report of Ever Having Sex with a Man	20% (498)	3% (34)
Highest Level of Education		
No Schooling	30% (754)	8% (79)
Primary School (Grades 1 – 5)	25% (618)	30% (296)
Secondary School (Grades 6 – 10) or above	45% (1130)	62% (607)
Employment		
Earn Daily Wage	62% (1545)	43% (428)
Earn Weekly or Monthly Wage	28% (714)	48% (472)
Unemployed	7% (165)	6% (56)
Currently Experiencing Homelessness	30% (754)	19% (190)
Median Years Injecting Drugs (IQR)	5 (2 – 10)	5 (3 – 8)
Median Injections in Prior 6 Mo. (IQR)	360 (180 – 540)	360 (360 – 540)
Mean No. Injection Partners in Prior Mo.	3.2	3.0
Ever Shared Syringes	60% (1518)	71% (696)
Shared Syringes in Prior 6 Mo.	51% (1284)	55% (540)
Type of Drug Injected (Lifetime)		
Heroin only	4% (89)	0.5% (4)
Buprenorphine only	54% (1350)	79% (783)
Heroin and buprenorphine	42% (1061)	20% (198)
Any other drug only	0% (0)	0.1% (1)
Type of Drug Injected (Prior 6 Mo.)		
Heroin only	4% (107)	0.2% (2)
Buprenorphine only	73% (1820)	97% (955)
Heroin and buprenorphine	22% (559)	3% (28)
Any other drug only	0.2% (5)	0.1% (1)
Access to Services		
Ever Tested for HIV	48% (1203)	73% (723)
Ever Tested for HCV	4% (104)	14% (138)
Ever Used Medication Assisted Therapy	36% (906)	916% (93)
Ever Used Syringe Service Program	17% (427)	29% (283)

Table. Baseline characteristics of participants pre- and post-COVID

LIMITATIONS

- The number of index participants pre- (n=10) and post-COVID (n=1) differed.
- ~25% of referral cards were not returned

CONCLUSIONS

- Post-COVID, network structures were less connected.
- HIV seroconversion in the post-COVID recruits was more strongly driven by spatial ties rather than individual-level behavior or social ties.
- The diffusion of incidence across several newer venues could signal an impending outbreak of HIV at venues that were previously low risk.

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