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Evaluating Spatially Targeted HIV and Harm Reduction Strategies Among People Who Inject Drugs

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BACKGROUND

- India is home to some of the fastest-growing HIV epidemics globally, primarily among people who inject drugs (PWID).
- HIV transmission is not homogeneously distributed: social (injection partners) and spatial (injection venues) networks are major influences.
- Given low service coverage and limited resources, it is important to identify optimal delivery points for HIV clinical (testing & treatment) and harm-reduction services (Medication for Opioid Use Disorder (MOUD) & Syringe Service Program (SSP)).
- Providing services at injection venues may be a cost-effective intervention strategy.

METHODS

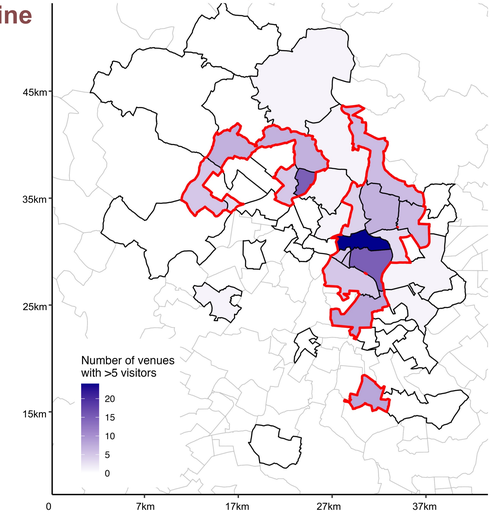
Population: A sociometric network-based cohort of PWID (10 seeds + 2502 subsequent recruits [named injection partners] with cross-network linkages).

Location: New Delhi, India.

Time: Nov 2017 – Jul 2019.

Model: Dynamic injection network and injection venue attendance of all 2512 participants were simulated with exponential random graph model (ERGM) from 2017 to 2023. HIV burden (baseline prevalence = 37%) was simulated with increased service coverage 50%/75%/100% to UNAIDS/UNODC goals.

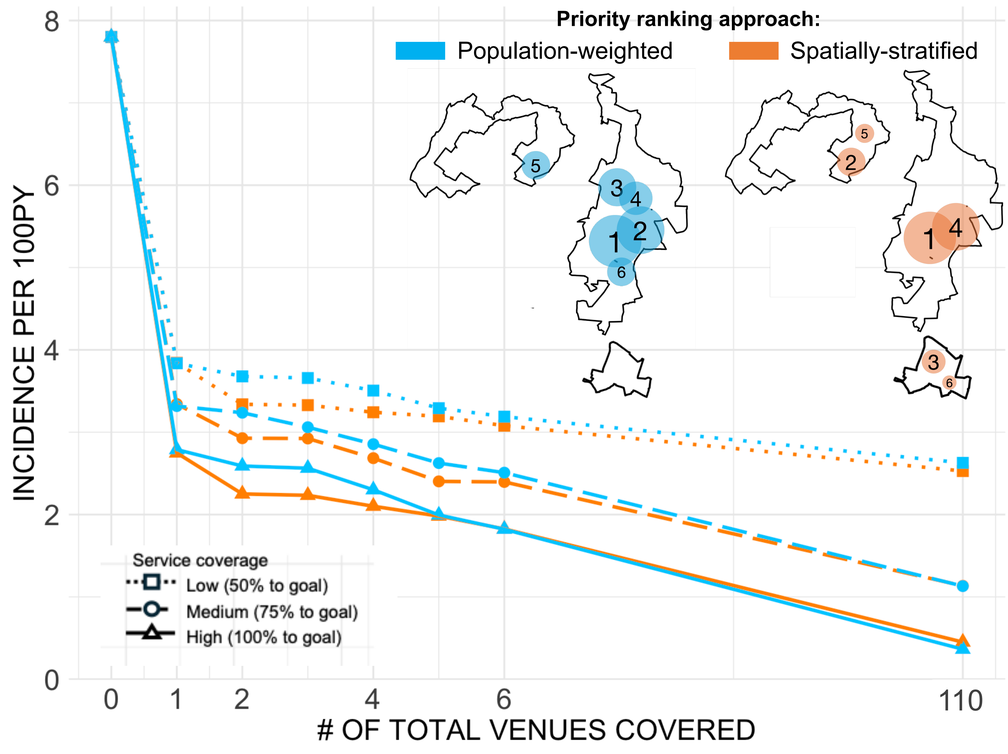
FIGURE 1. Self-reported injection venues reported at baseline



HIV interventions at spatially-stratified injection venues can more efficiently provide services for hard-to-reach populations.

FIGURE 2. Impact of targeted service coverage by injection venues

HIV incidence after 3 years of upscaled service coverage (SSP, MOUD, HIV testing and treatment) at 0 to 110 total injection venues by different venue priority ranking approaches for service deployment.



RESULTS

- Three disparate geographical clusters of injection venues were identified by comparing venue density in each pin code region and their neighbors. A ***population-weighted approach*** ranked the order of intervention priority based on venue population, while a ***spatially-stratified approach*** considered both population and spatial clusters.
- Three levels of combined interventions (SSP, MOUD, HIV testing, and ART prescription) were simulated: low/medium/high coverage = all services were scaled up to 50%/75%/100% of their respective coverage goals.
- Service delivery to the most populated injection venue led to the largest decrease in HIV incidence (7.8 per 100PY to 3.3 per 100PY), followed by decreases at slower rates when interventions were expanded to more venues.
- Expanding services at 2 to 4 total venues yielded a slight marginal advantage when following the delivery order of ***spatially-stratified approach***.

CONCLUSIONS

- Service delivery in the most populated injection venue yielded the largest decrease in HIV incidence.
- In this densely clustered spatial network, different orders of venue prioritization for service deployment led to small differences in HIV incidence.
- In a population with a less clustered spatial network, a spatially-stratified order of service delivery could potentially cover harder-to-reach PWID populations sooner.

KEY REFERNCES

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