

A Two-Decade Journey With People Who Inject Drugs:

Lessons
from....

**BACK
TO THE
FUTURE**

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September 10, 2024



Disclosures

- Research grants, study products and honoraria from Abbott Laboratories
- Research grants, study product and honoraria from Gilead Sciences
- Managing Trustee, YR Gaitonde Medical Educational Research Foundation
- Board of Directors, Serious Fun Children's Network



Solomon Víctor
1938-2006

Lessons learned

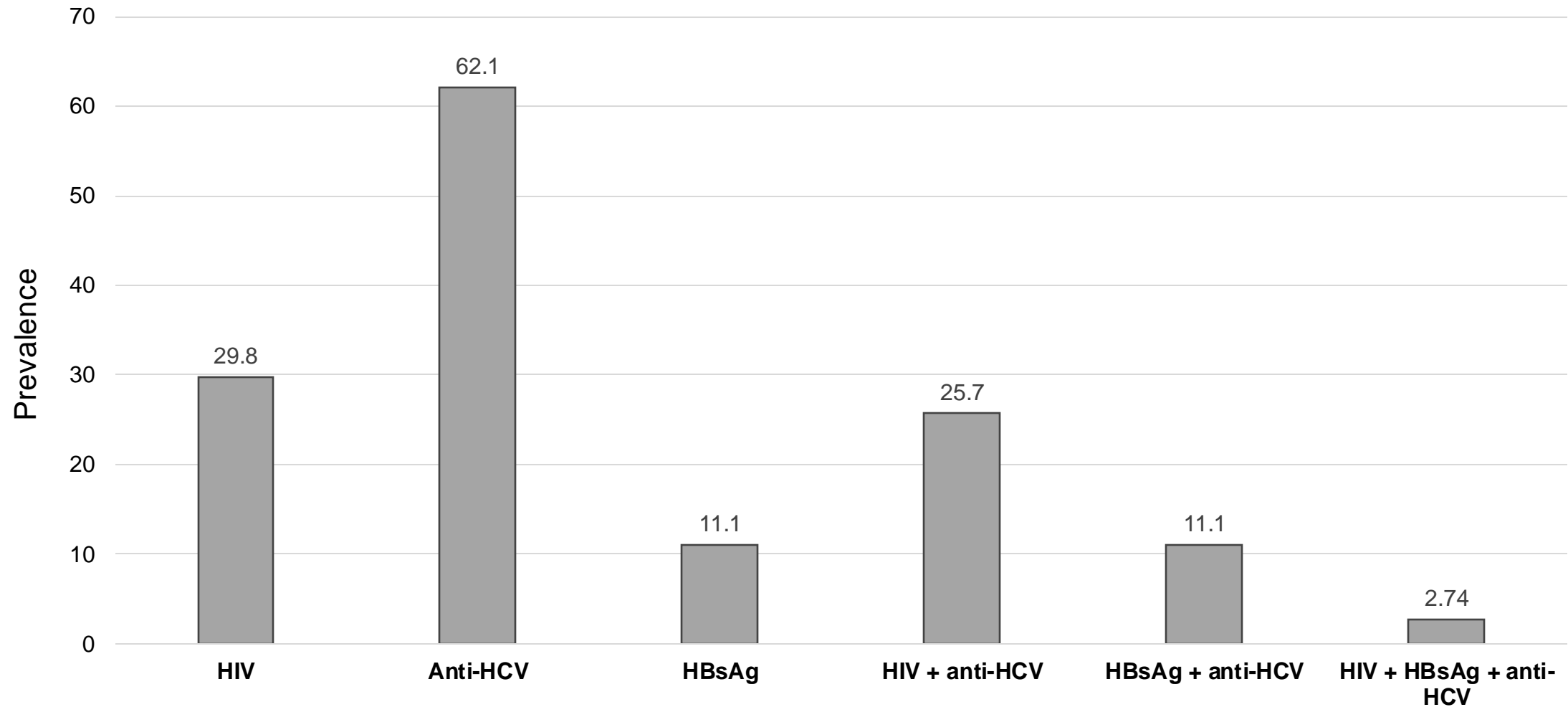
- Prevention is the currency of global health

Madras Injection Drug Users and AIDS Cohort Study (2004)

- Longitudinal cohort of ~1200 PWID in Chennai, India
- Administrative supplement
 - David Celentano
 - Carl Latkin



High prevalence of HIV, HBV and HCV

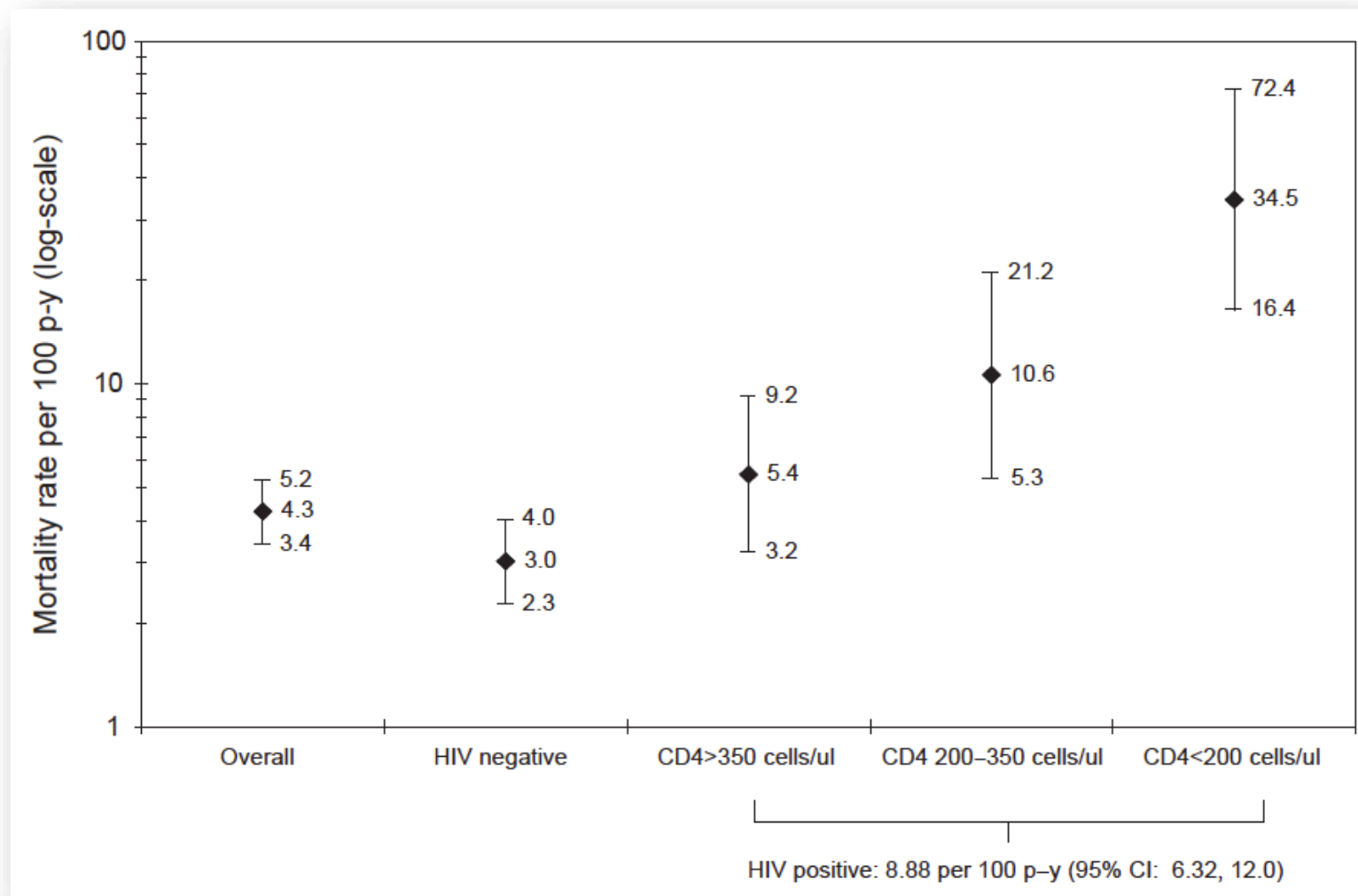


Established clinic on-site in 2005



- Medications donated by local pharmaceutical companies
 - Management of opportunistic infections
- Referred to government for antiretroviral therapy

High mortality despite free ART (2006-08)



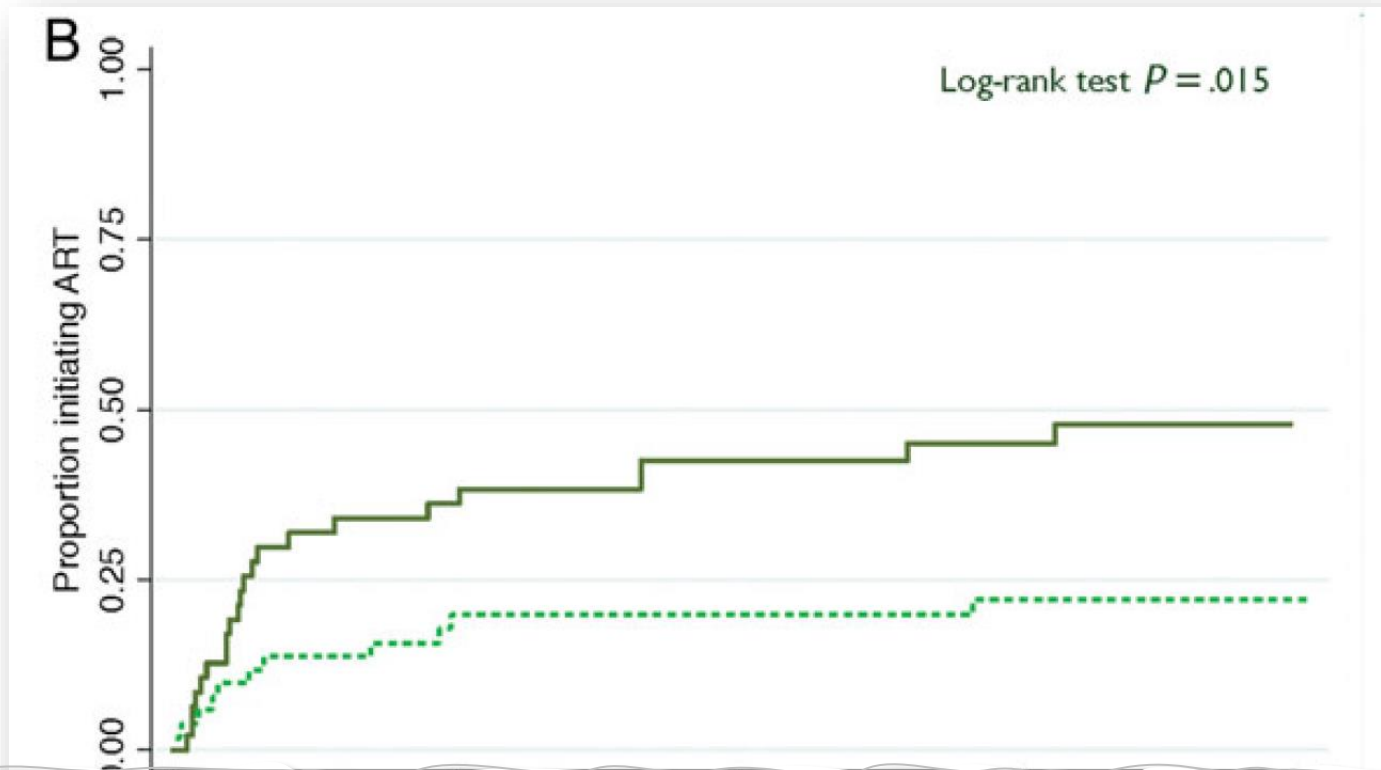
Lessons learned

- Prevention is the currency of global health
- To solve a problem, we need to ask the hard questions

Why was mortality high?

- PWID were not going to ART centers
 - Long wait times
 - Loss of wages (impacting families)
- Implemented a trial of contingency management to improve ART uptake
 - Non-monetary incentives (rice, dhal, soap, toothpaste, etc.)
 - Offset opportunity cost of time
- Administrative supplement: Greg Lucas

Contingency Management among PWID in Chennai (2009-2010)

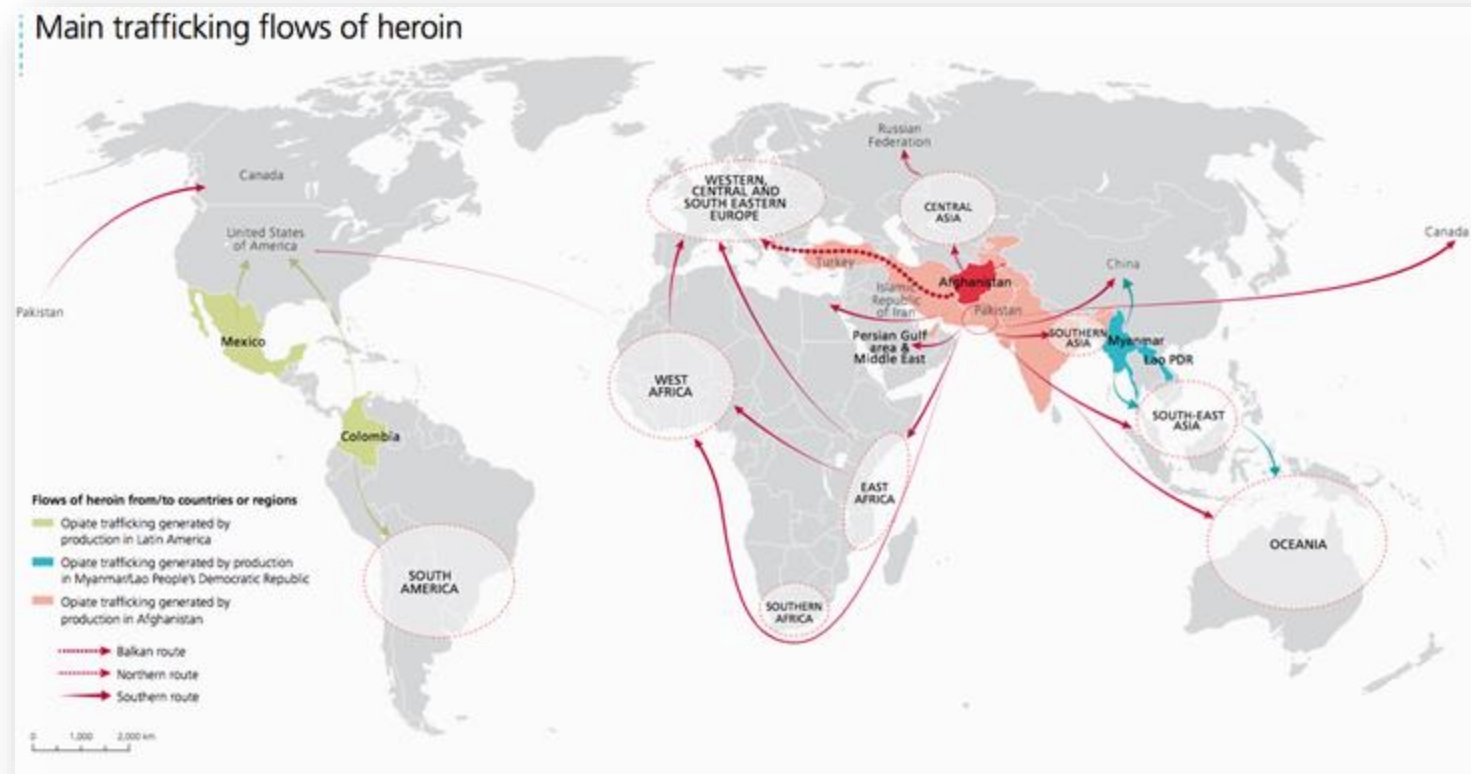


HR of ART initiation (contingency management vs. SOC) = 2.93

Lessons learned

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- Listen to the people

India's unique position

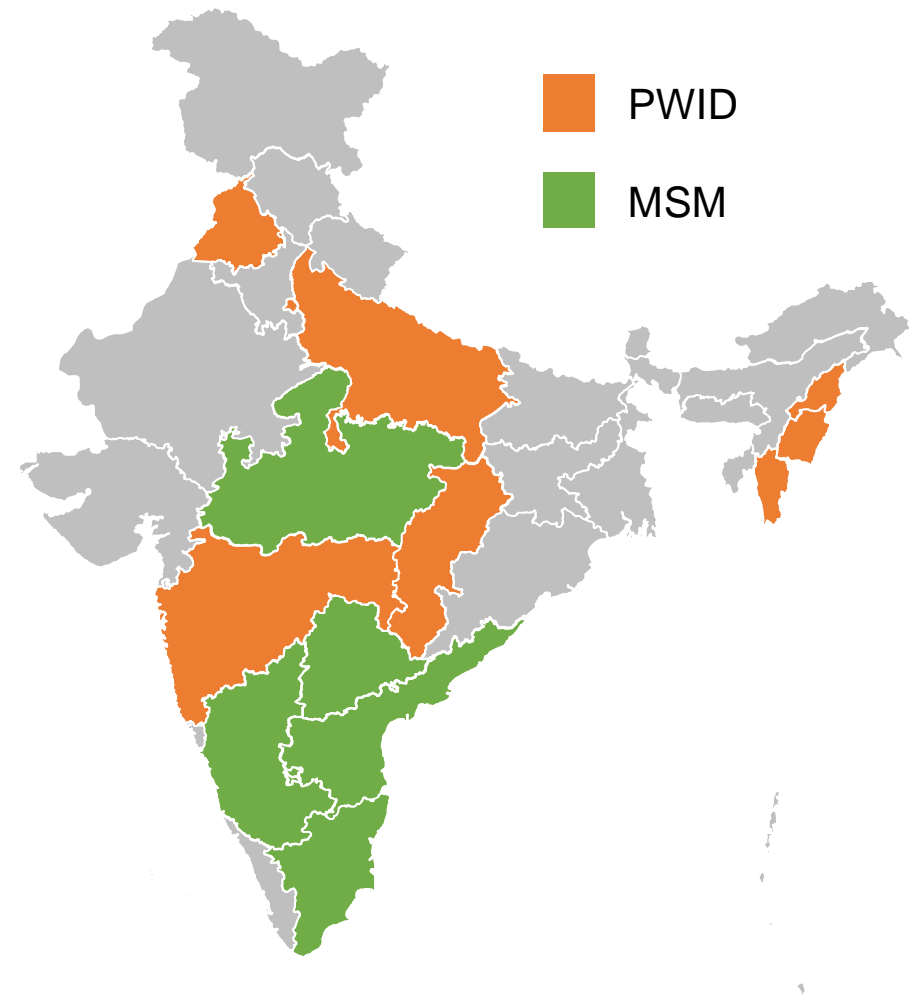


- Home to ~6 million opioid users
- ~850,000 PWID

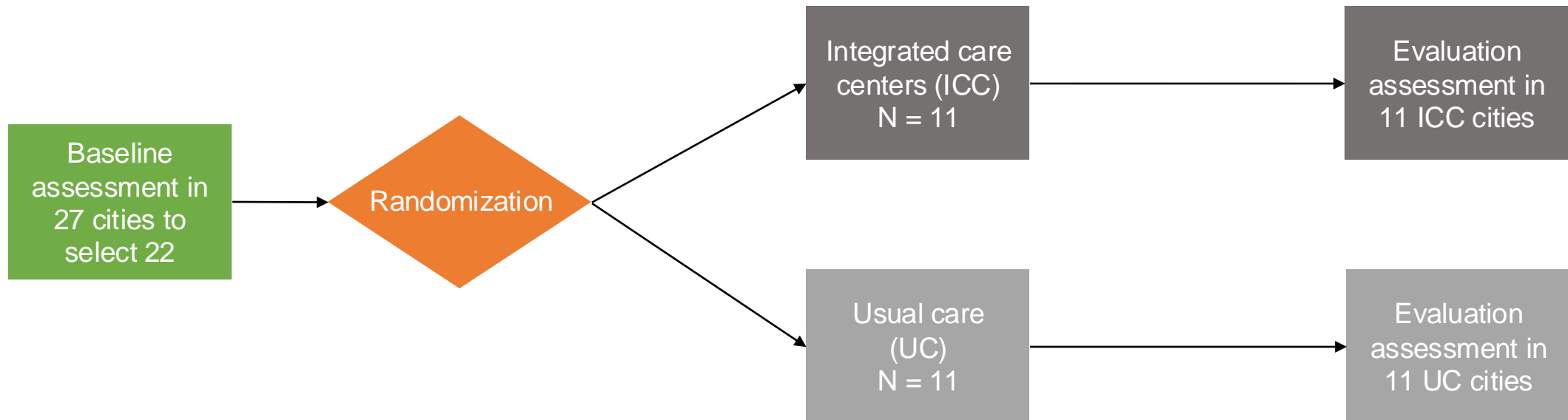
From Chennai to India...

The NCA Trial

- **MPIs: Celentano, Lucas, Mehta**
- **Objective:** Impact of integrated delivery of HIV prevention and treatment services in a non-discriminatory setting on uptake of HIV testing among PWID and MSM in India



ICC: A Cluster-Randomized Trial



2012-13

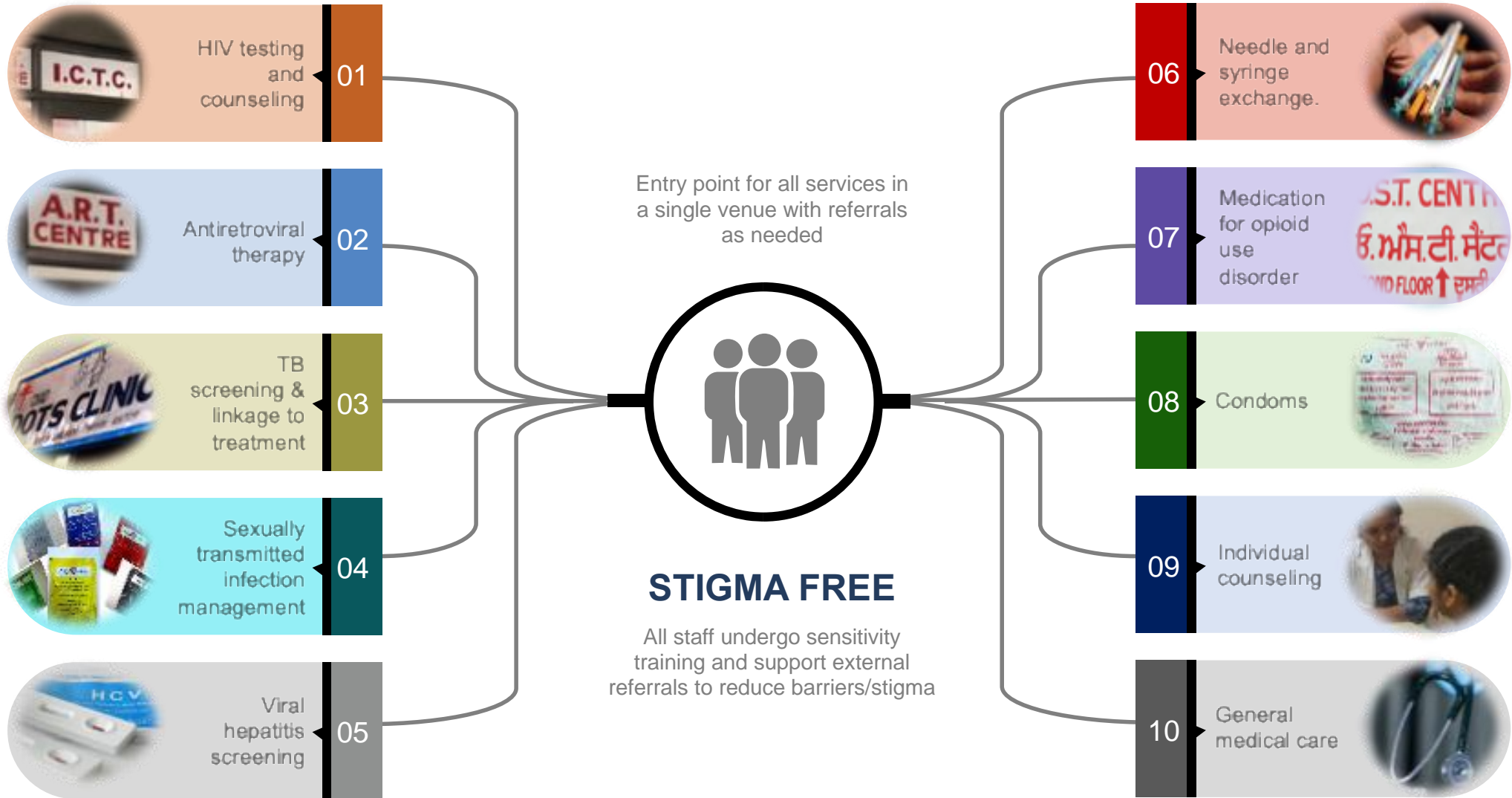
2014 (Q1/2)

2014(Q3) – 2016 (Q2)



2016 (Q3) – 2017 (Q2)

A “single window” model



ICCs improved testing but...

A SINGLE WINDOW COMPREHENSIVE HIV PREVENTION AND CARE FACILITY: THE NEXT STEP IN HIV PROGRAMMING

EXECUTIVE SUMMARY

The National AIDS Control Programme (NACP) envisages ending AIDS as a public health threat by 2030 and has adopted the Fast Track targets of 90-90-90 to be achieved by 2020 that is 90% of People Living with HIV (PLHIV) who know their status; 90% of PLHIV who know their status on Antiretroviral Therapy (ART) and 90% of PLHIV on ART with suppressed viral load. Despite significant progress in the coverage of the HIV programme in India over the past two decades, there are still a considerable number of people who are left behind i.e they are not yet reached by the national programme efforts. Today, the ART centres are thought to be overburdened, and the NACP proposes models of ART decentralization and ART incorporation with other essential services for PLHIV and other at-risk/vulnerable populations.

The National Collaboration on AIDS (NCA) study was conducted by Johns Hopkins University, USA, Yeshwanth Raghunath Gaitonde Centre for AIDS Research and Education (YRGCARE), and the National AIDS Control Organisation (NACO), India in order to test the feasibility and acceptability of a single window approach to improve HIV service delivery for Men Who have Sex with Men (MSM) and Injecting Drug Users (IDU). The NCA study was implemented across 22 Indian cities where Integrated Care Centres (ICCs) were established.

The study validated the feasibility of setting up a single window comprehensive health care model in both public sector and private sector venues. The ICCs provided a bouquet of HIV prevention and treatment services under a single roof and catered to a large number of clients, about a third of whom had not been reached through the traditional Targeted Intervention (TI) programmes. In conclusion, community-based care models that are non-Key Population (non-KP)-identified but in KP-enabling environments, delivering essential HIV prevention, treatment and other support services (e.g., mental health, non-communicable diseases) may potentially play a key role in ensuring India meets the 90-90-90 targets particularly for communities left behind, such as IDU, MSM and other Key Population (KP).

Sunil S Solomon^{1,2}, Prof Suniti Solomon¹, Allison M McFall², Aylur K Srikrishnan¹, Santhanam Anand¹, Shobini Rajan³, Vinita Verma³, Canjeevaram K Vasudevan¹, Pachamuthu Balakrishnan¹, Elizabeth L Ogburn², Prof Lawrence H Moulton², Muniratnam S Kumar¹, Kuldeep Singh Sachdeva⁴, Oliver Laeyendecker², Prof David D Celentano², Prof Gregory M Lucas², Prof Shruti H Mehta²

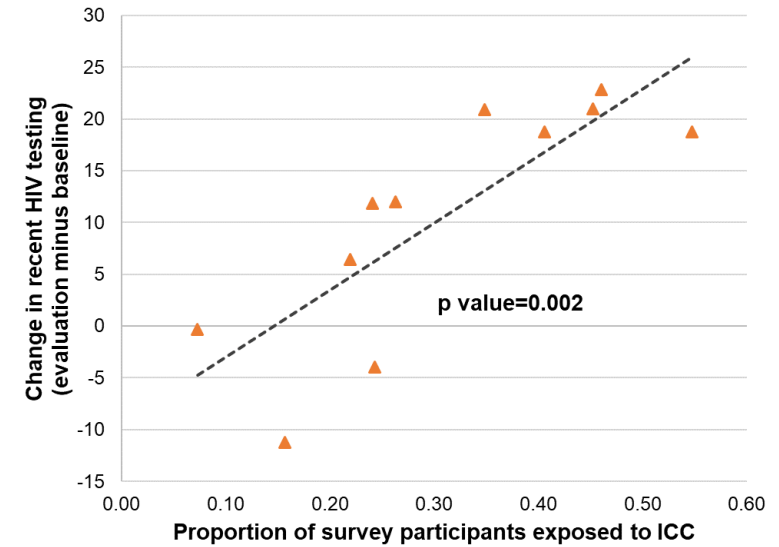
The NCA study was **implemented across 22 Indian cities** where Integrated Care Centres (ICCs) were established.

ICCs

MSM SITES

PWID SITES

0.09



aPR comparing level of ICC penetration vs. UC

| UC | 1 |
|--------------------------|---------------------------|
| ICC <20% penetration | 0.75 (95% CI: 0.48, 1.18) |
| ICC 20 – 35% penetration | 1.12 (95% CI: 0.80, 1.59) |
| ICC > 35% penetration | 1.77 (95% CI: 1.30, 2.41) |

Lessons learned

- Prevention is the currency of global health
- To solve a problem, we need to ask the hard questions
- Listen to the people
- Engaging government is critical to sustainability

STOP-C: A “Precision” RCT

3000
randomized

Prediction model using data on early ART adherence in these same 7 cities incorporating age, sex, income, homelessness, recent injection drug use, number of sexual partners and quality of life generates **prognostic score**
(Higher prognostic score = Higher risk of failure)

Basic support: Access to comprehensive infectious disease and harm reduction services
PN Only: Basic Support + patient navigation (PN) contact once every 2 weeks
PN + DOT: Basic Support + PN contact + flexible directly observed therapy (DOT) with ≥ 1 weekly dose observed

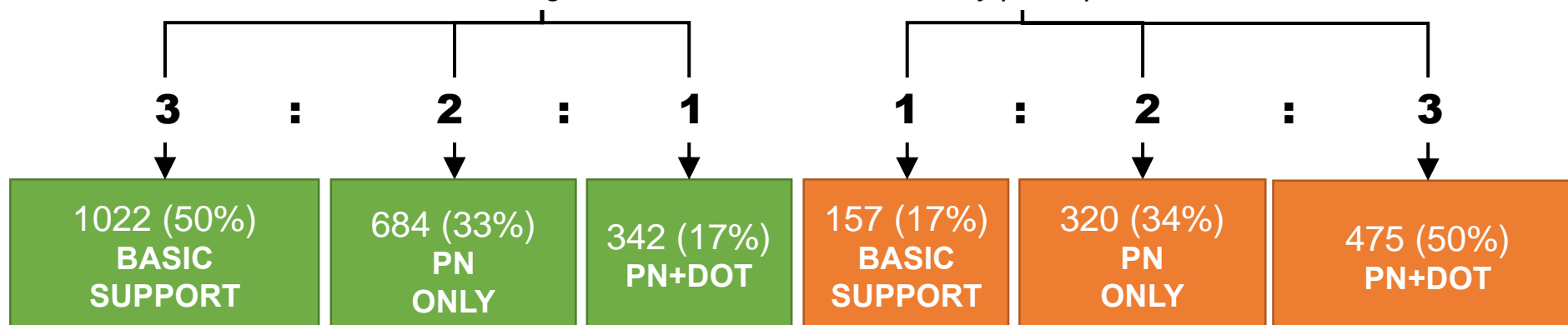
2048 (68%)
**LOW RISK
OF FAILURE**
Prognostic score:
0.31 (0.19, 0.44)

952 (32%)
**HIGH RISK
OF FAILURE**
Prognostic score:
0.71 (0.63, 0.82)

| | Low risk % (N) | High risk % (N) |
|---------------------------------|-------------------|--------------------|
| Median age (IQR) | 31 (26-36) | 27 (23-30) |
| Cis-gender male | 98 (2002) | 100 (950) |
| Never married | 43 (883) | 70 (660) |
| Median annual income USD (IQR) | 72 (0-120) | 97 (66-121) |
| < High school education | 70 (1436) | 85 (804) |
| Experiencing homelessness* | 6 (117) | 26 (247) |
| Ever incarcerated | 17 (353) | 29 (271) |
| Injection drug use* | 42 (865) | 89 (848) |
| Shared injection paraphernalia* | 4 (84) | 21 (198) |
| MOUD** | 41 (837) | 49 (464) |
| Harmful/hazardous alcohol use | 76 (1559) | 75 (711) |
| Living with HIV | 17 (356) | 30 (285) |
| On antiretroviral therapy | 92 (327) | 73 (208) |

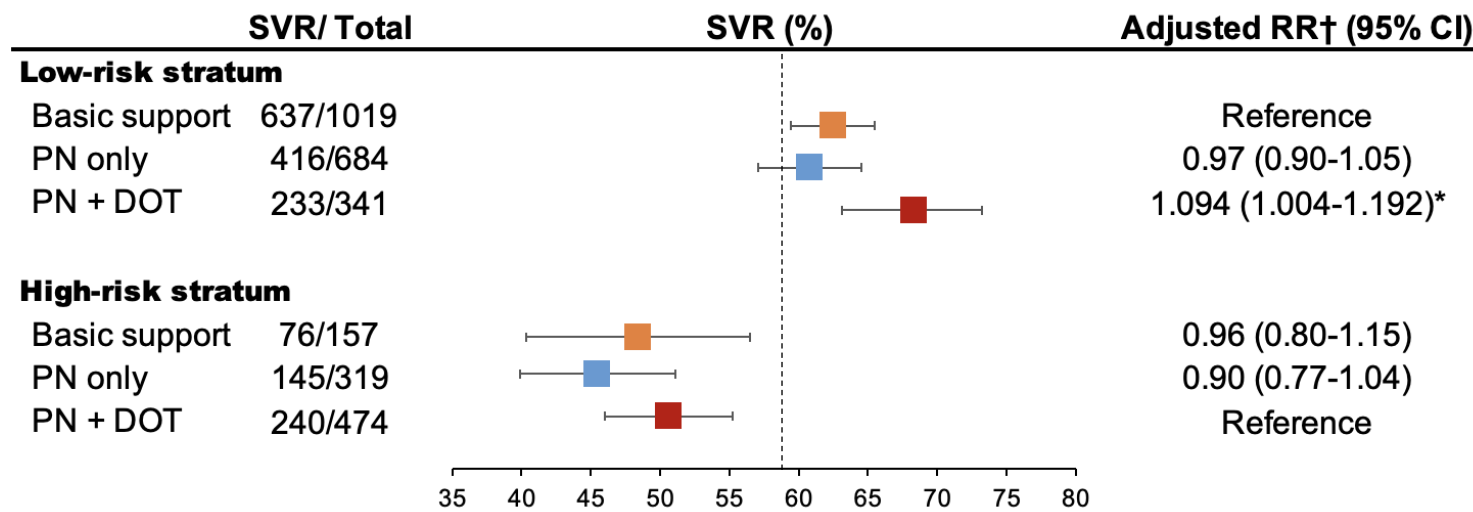
*in the prior 3 months; **in the prior 6 months

Unbalanced allocation: Arm assignment allocation ratio varies by participant’s estimated risk for failure

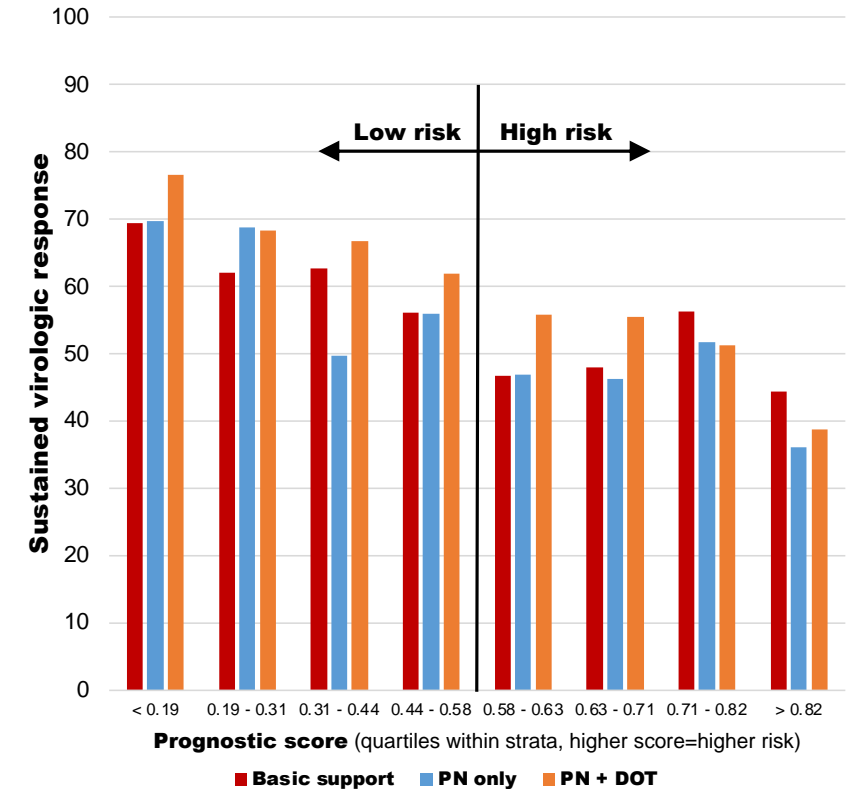


STOP-C: A “Precision” RCT

- 93% returned for SVR assessment
- Overall SVR: 59%



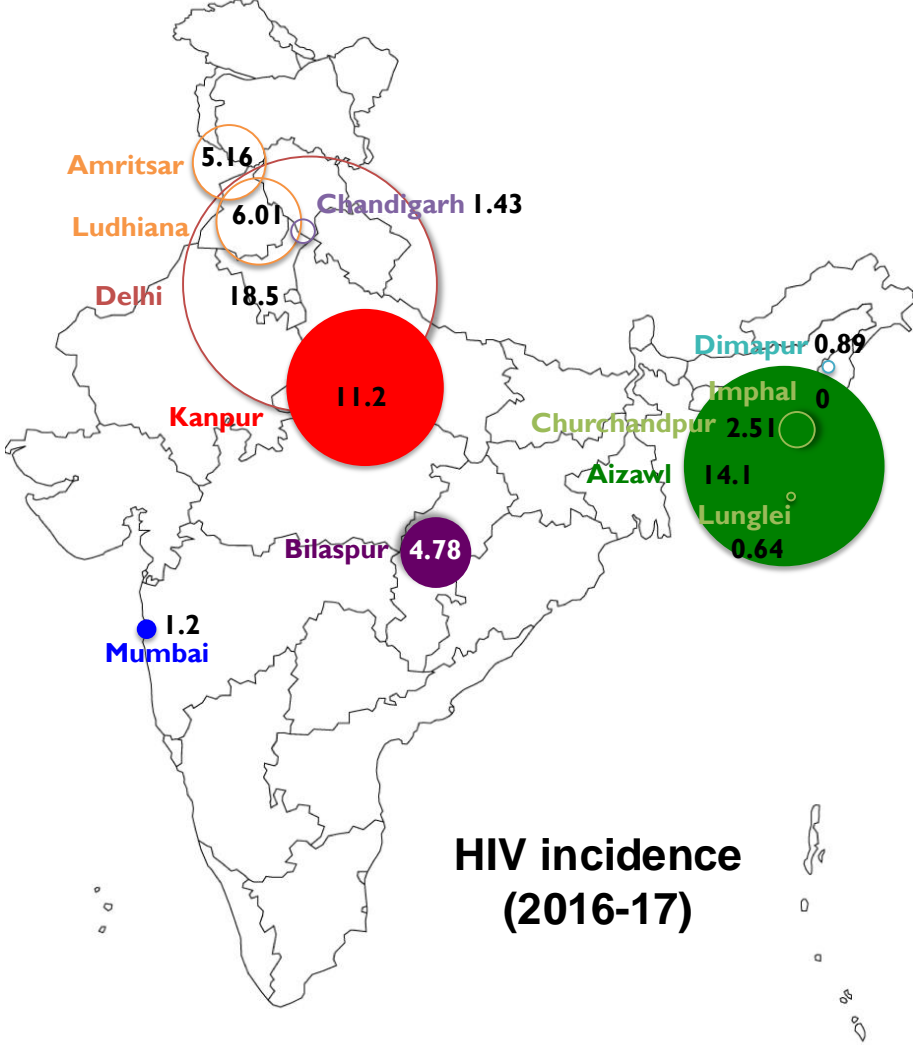
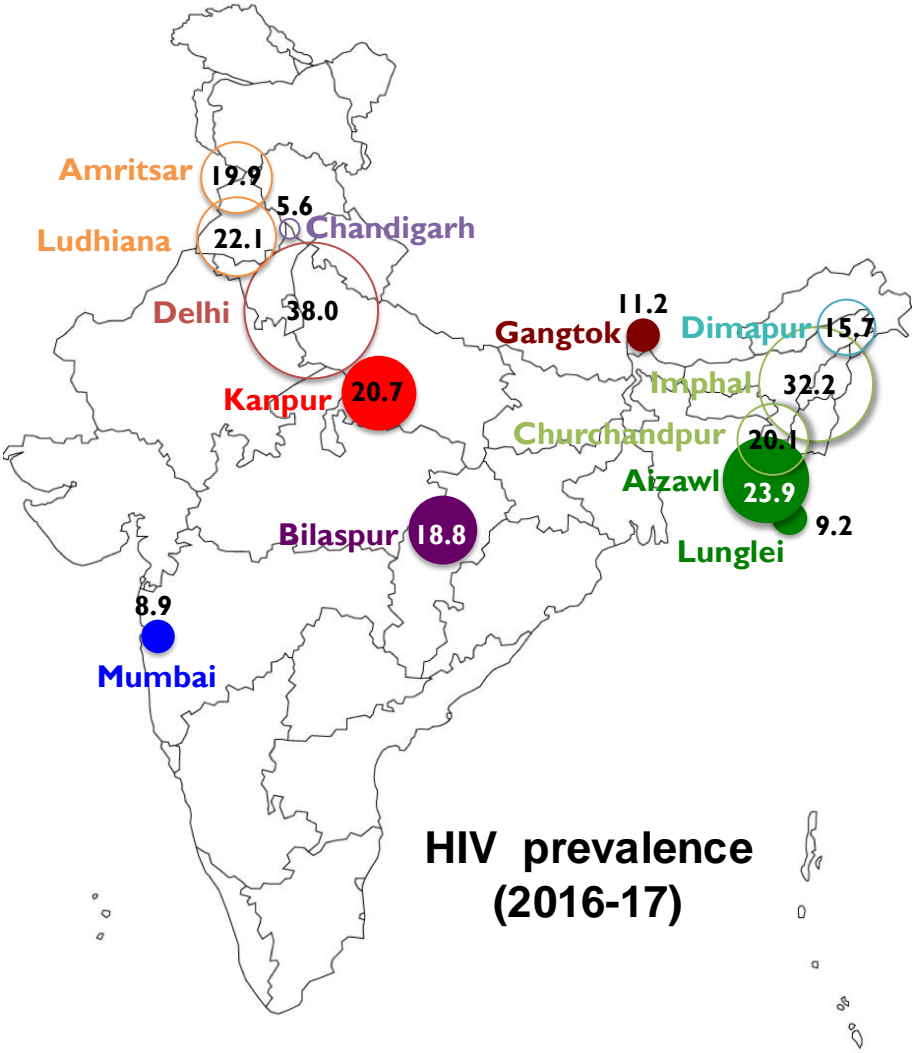
Sample N=2994. 6 participants excluded (4 ineligibility post randomization, 2 missing lab results); PN, patient navigation; DOT, directly observed therapy; RR, relative risk† Adjusted for site; * p<0.05



Lessons learned

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A heterogenous epidemic...

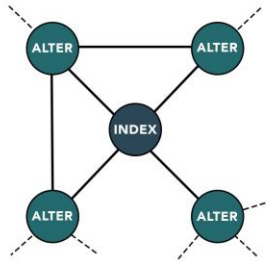


The Spatial Network (2017 – present)

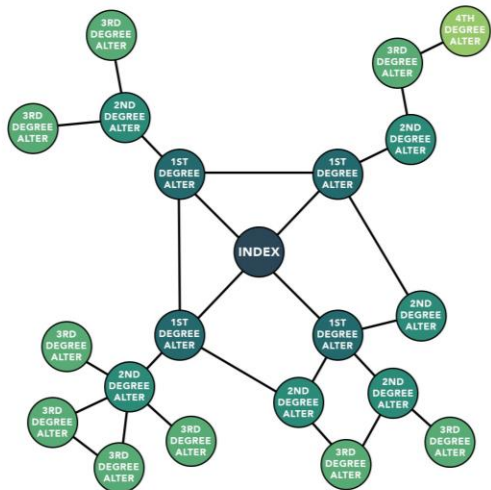
- Longitudinal cohort of PWID in New Delhi, India
- **Objective:** To characterize the role of egocentric, sociometric, spatial and sociospatial networks on HIV and HCV transmission among people who inject drugs (PWID) in New Delhi, India

Networks

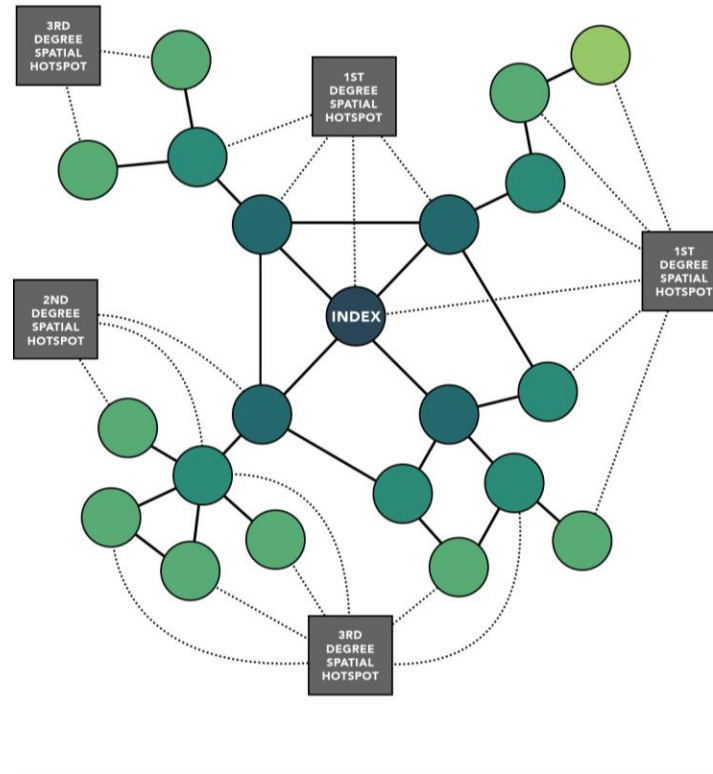
a Egocentric Network



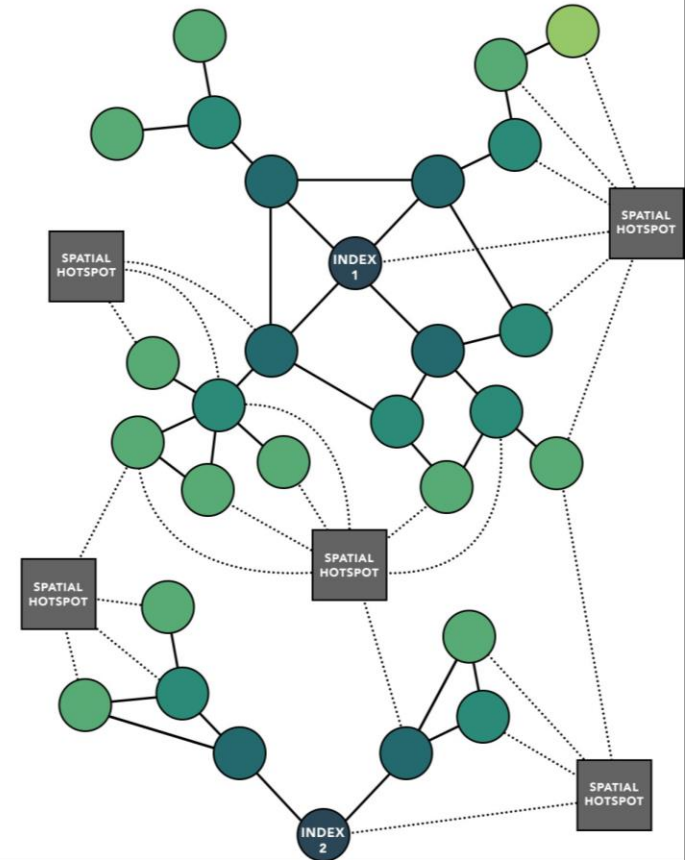
b Sociometric Network



c Sociospatial Network



d Sociospatial Network



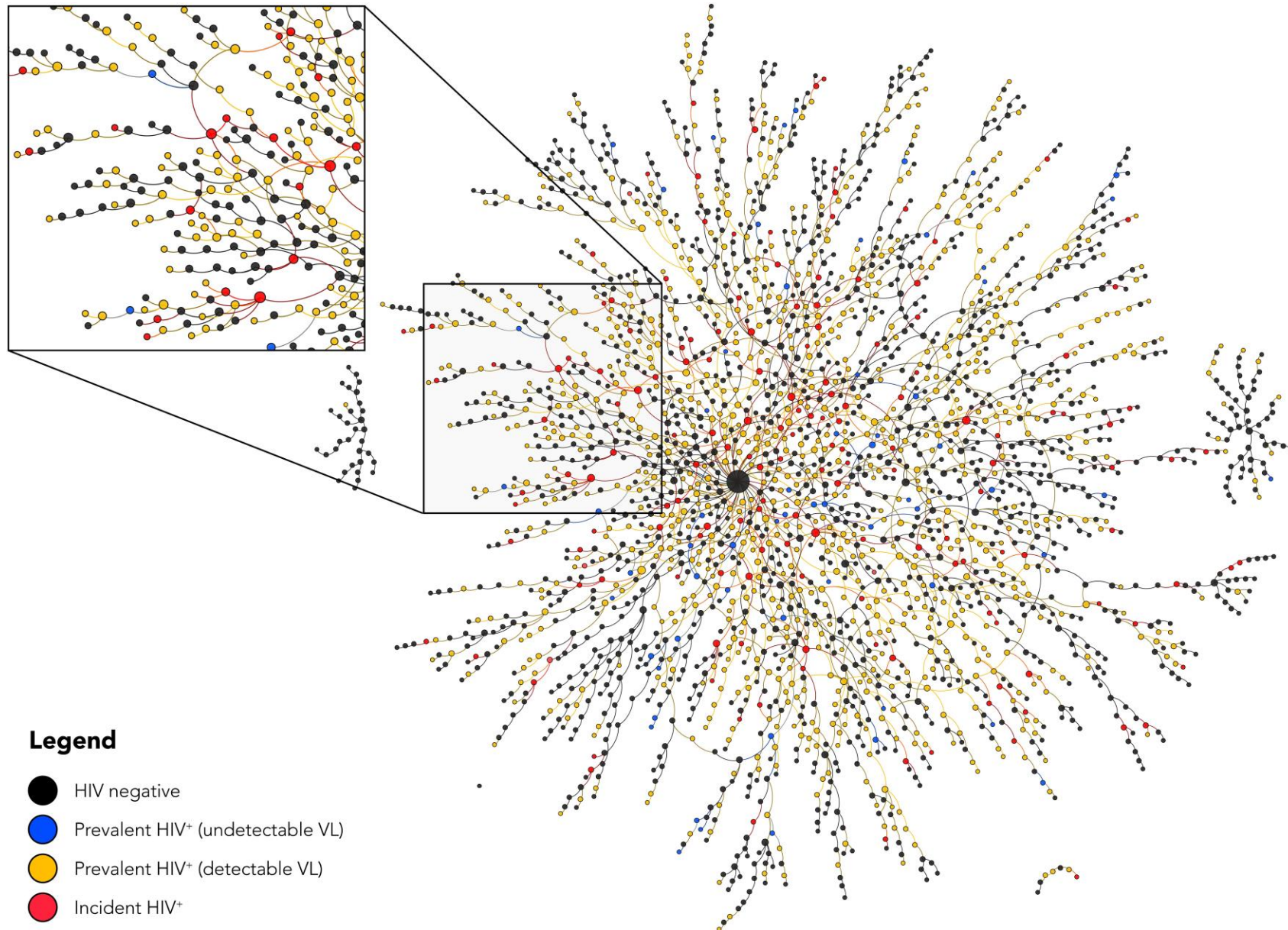
The Spatial Network (2017 – present)

- Longitudinal cohort of PWID in New Delhi, India
- **Objective:** To characterize the role of egocentric, sociometric, spatial and sociospatial networks on HIV and HCV transmission among people who inject drugs (PWID) in New Delhi, India
- Networks of PWID recruited
 - Recruitment initiated with “index” participants
 - “Index” participants recruited their active injection “network” members (injected with in prior month)
 - “Network” members served as next wave of “index” participants

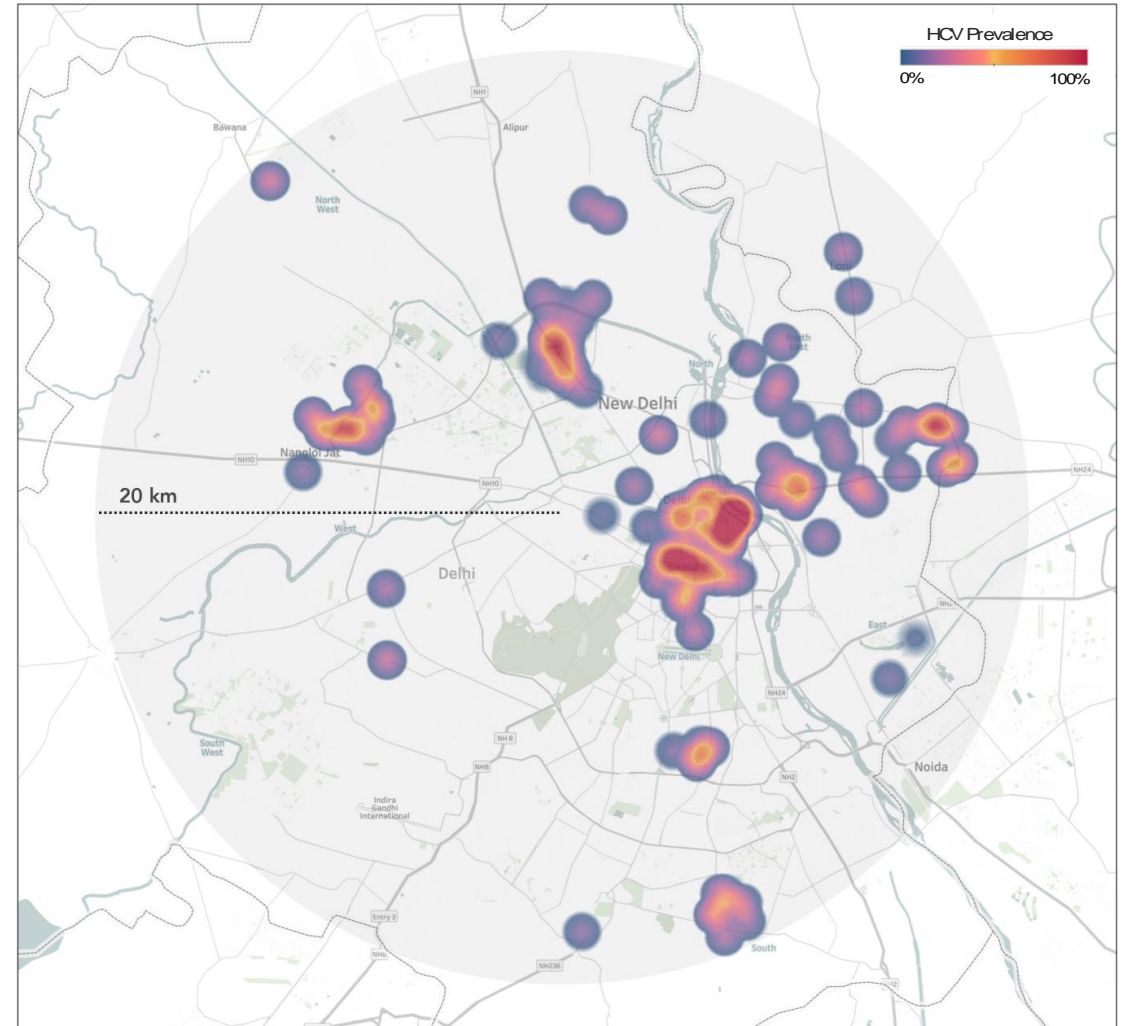
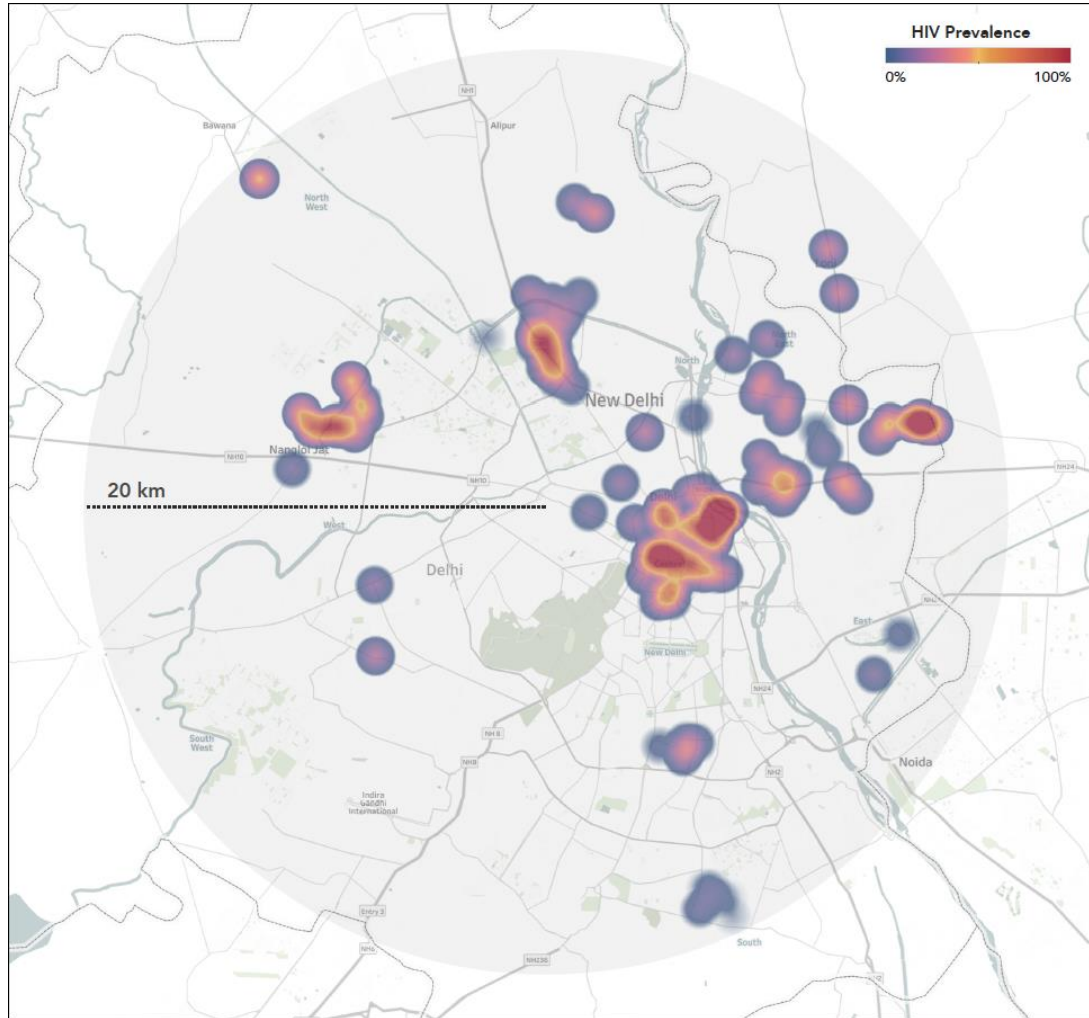
Study Population

- Recruitment was initiated with 10 indexes (all were cis men)
- 2512 PWID were recruited between November 2017 – July 2019
 - 20 cisgender women and 3 transgender women were recruited
- Median number of coupons handed out: 1 (Range: 0 – 6)
 - 75% (2437/3244) of coupons were returned
- Baseline disease prevalence:
 - Number HIV-infected (prevalence): 37.0% (928/2506)
 - Proportion with detectable HIV RNA: 92.6%
 - Number anti-HCV antibody positive (prevalence): 65.1% (1634/2512)
 - Proportion with chronic HCV (HCV RNA+): 79.6%

Network structure

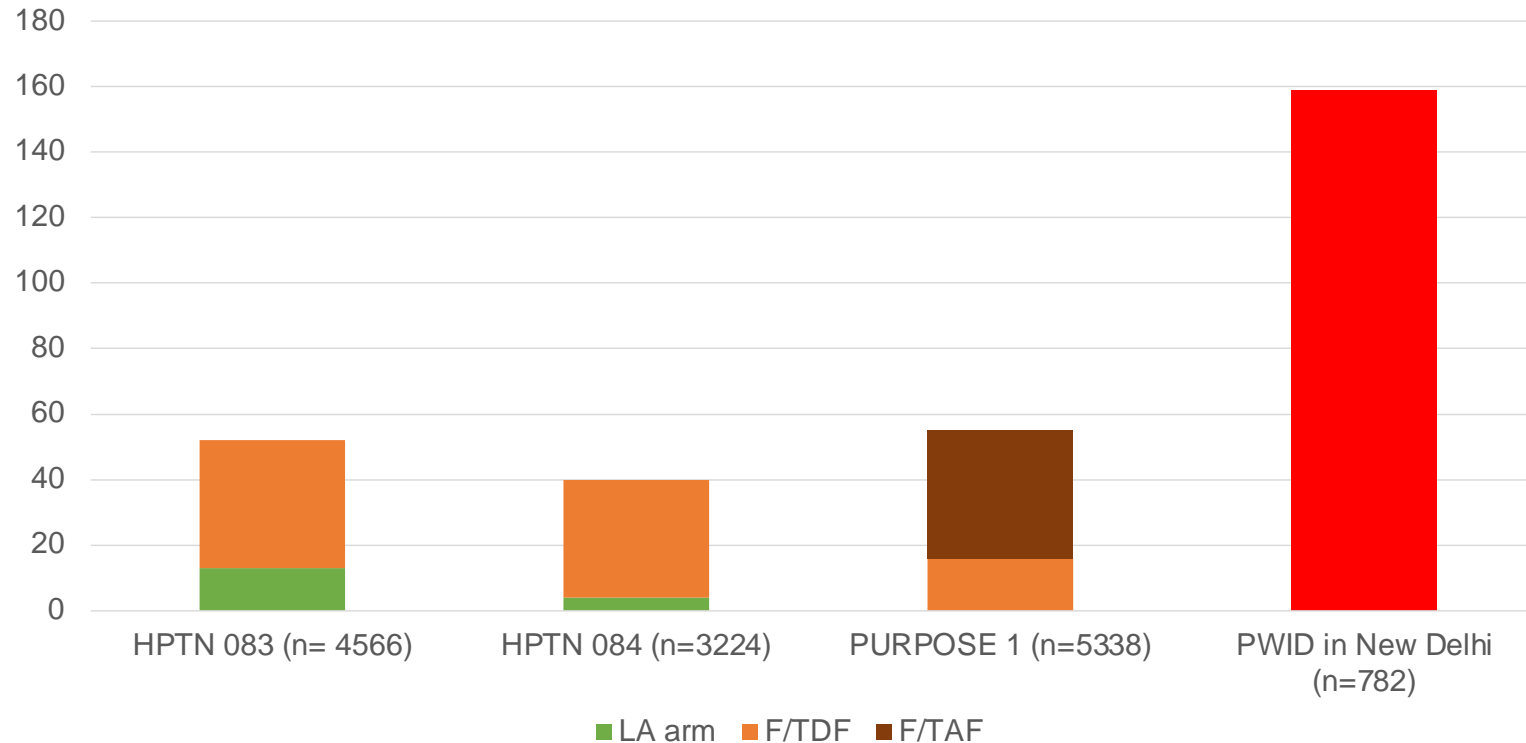


Clustering of infections

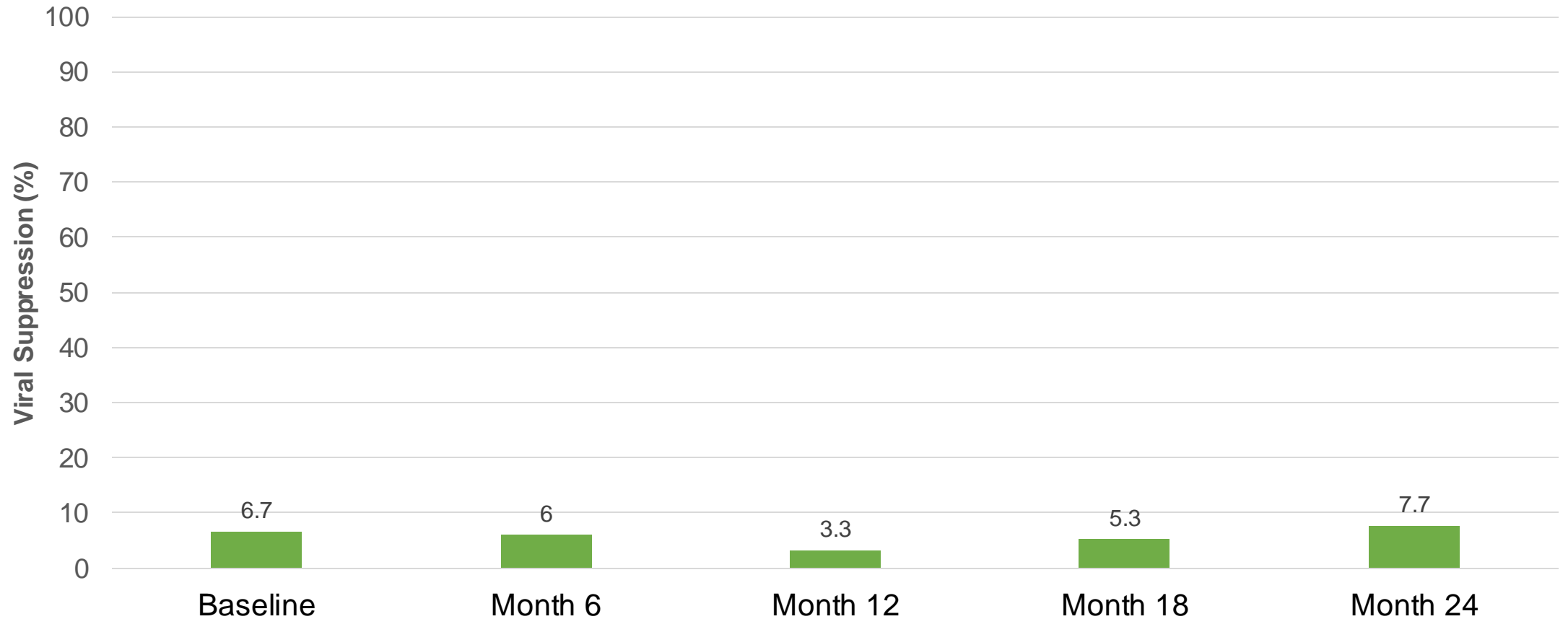


HIV incidence in New Delhi

- 159 seroconversions in 747 person years of follow-up
 - **21.3 per 100 person-years**
 - **PURPOSE-1 bHIV = 2.41 per 100 p-y**



Viral suppression among PWID in Delhi in a voucher incentive trial (2017-20)



Predictors of HIV incidence

Table 2. Risk factors for HIV incidence by multivariable Poisson regression. Columns represent a regression model and depict the AIRR and 95% CIs for the included variables. An en dash signifies that the variable was not included in the model for that column.

| Factors associated with incident HIV | Univariable model, IRR (95% CI) | Multivariable model 1, AIRR (95% CI) | Multivariable model 2, AIRR (95% CI) | Multivariable model 3, AIRR (95% CI) | Multivariable model 4, AIRR (95% CI) | Multivariable model 5, AIRR (95% CI) |
|---|---------------------------------|--------------------------------------|--------------------------------------|--------------------------------------|--------------------------------------|--------------------------------------|
| Age (per 5-year increase) | 0.80 (0.74–0.88) | 0.83 (0.76–0.91) | 0.83 (0.75–0.90) | 0.82 (0.75–0.90) | 0.82 (0.74–0.90) | 0.81 (0.74–0.89) |
| Sexual activity (vaginal or anal sex in prior 6 months) | 0.53 (0.38–0.75) | 0.62 (0.43–0.88) | 0.61 (0.43–0.86) | 0.61 (0.43–0.87) | 0.69 (0.48–0.98) | 0.65 (0.46–0.92) |
| Shared syringes (prior 6 months) | 3.37 (2.35–4.80) | 2.50 (1.73–3.63) | 2.37 (1.63–3.45) | 2.33 (1.61–3.38) | 1.99 (1.37–2.88) | 2.10 (1.45–3.04) |
| Injection frequency (per 50 injections in prior 6 months) | 1.08 (1.05–1.11) | 1.05 (1.02–1.09) | 1.05 (1.02–1.08) | 1.05 (1.02–1.08) | 1.04 (1.01–1.07) | 1.04 (1.01–1.07) |
| Number viremic injection partners | 1.31 (1.12–1.54) | – | 1.28 (1.08–1.50) | 1.03 (0.82–1.30) | – | – |
| Network distance from an HIV viremic participant | 0.61 (0.17–0.79) | – | – | 0.63 (0.45–0.88) | 0.68 (0.52–0.89) | 0.72 (0.55–0.95) |
| Injecting at a venue no. 40 | 4.04 (2.88–5.68) | – | – | – | 3.11 (2.19–4.42) | – |
| Network distance from venue no. 40 | 0.74 (0.63–0.86) | – | – | – | – | 0.74 (0.65–0.84) |

Legend

- Negative & Undetectable Prevalent HIV+
- Spatial Hotspot
- Prevalent HIV+ (Detectable VL)
- Incident HIV+

113 (71%) of incident infections reported injecting at venue #40

For every increased step in path to venue #40, risk of HIV acquisition reduced by **23% (IRR: 0.77)**

Lessons learned

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- Listen to the people
- Engaging government is critical to sustainability
- Efficiency is essential to scalability
- “Follow the white rabbit” and build interdisciplinary teams





Lessons learned from the field

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- To solve a problem, we need to ask the hard questions
- Listen to the people
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- Efficiency is essential to scalability
- “Follow the white rabbit” and build interdisciplinary teams
- We need to transition from disease-centered to person-centered models

The “Blue Shed” Model



Registration



Haircuts



Medical Care



Food packets



MOUD



Diagnostics



Showers & toilets

Blue Shed Utilization (October 19, 2023 – August 28, 2024)

- 819 provided HIV testing
 - **410 (48%)** positive
- 823 provided HCV screening
 - **657 (80%)** positive for Ab
- 830 provided HBsAg testing
 - **56 (7%)** positive
- 168 receive medications for opioid use disorder at facility
- >400 linked to syringe service programs (SSP)
- >760 have used showers/toilets
- >804 receive food-packets
- Abscess care to 54 clients
- All provided with counselling

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- Listen to the people
- Engaging government is critical to sustainability
- Efficiency is essential to scalability
- “Follow the white rabbit” and build interdisciplinary teams
- We need to transition from disease centered to person centered models
- Never give up on a dream!!!



Sunithi Solomon
Oct 14 1939 - July 23 2015

Once upon a time, there was an old man who used to go to the ocean to do his writing. He had a habit of walking on the beach every morning before he began his work. Early one morning, he was walking along the shore after a big storm had passed and found the vast beach littered with starfish as far as the eye could see, stretching in both directions.

Off in the distance, the old man noticed a small boy approaching. As the boy walked, he paused every so often and as he grew closer, the man could see that he was occasionally bending down to pick up an object and throw it into the sea. The boy came closer still and the man called out, "Good morning! May I ask what it is that you are doing?"

The young boy paused, looked up, and replied "Throwing starfish into the ocean. The tide has washed them up onto the beach and they can't return to the sea by themselves," the youth replied. "When the sun gets high, they will die, unless I throw them back into the water."

The old man replied, "But there must be tens of thousands of starfish on this beach. I'm afraid you won't really be able to make much of a difference."

The boy bent down, picked up yet another starfish and threw it as far as he could into the ocean.

Then he turned, smiled and said, "It made a difference to that one!"

adapted from The Star Thrower, by Loren Eiseley (1907 – 1977)

Acknowledgements

- People who graciously participate in research studies
- Johns Hopkins University
 - David Celentano, Shruti Mehta, Gregory Lucas, Carl Latkin, Allison McFall, Steven Clipman, Katie Zook, Cat Hess
- YRGCARE
 - AK Srikrishnan, AK Ganesh, Pradeep Amrose, Shobha Mohapatra, Danish Ansari, Deepak
- National AIDS Control Organisation, India
- State AIDS Control Societies, India
- Community-based organizations
- Funding sources:
 - NIDA (DP1DA060602, R56DA059552, R01DA041736, DP2DA040244, R01DA018577, R01DA12568, R01DA032059), NIMH (R01MH089266), NIAID (R01AI145555)
 - Abbott Laboratories
 - Elton John AIDS Foundation

