

# Elimination of Hepatitis C in People Who Inject Drugs in Low and Middle Income Countries: The Final Frontier

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## Disclosures

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- Research funding from:
  - Gilead Sciences, Inc
  - Abbott Diagnostics



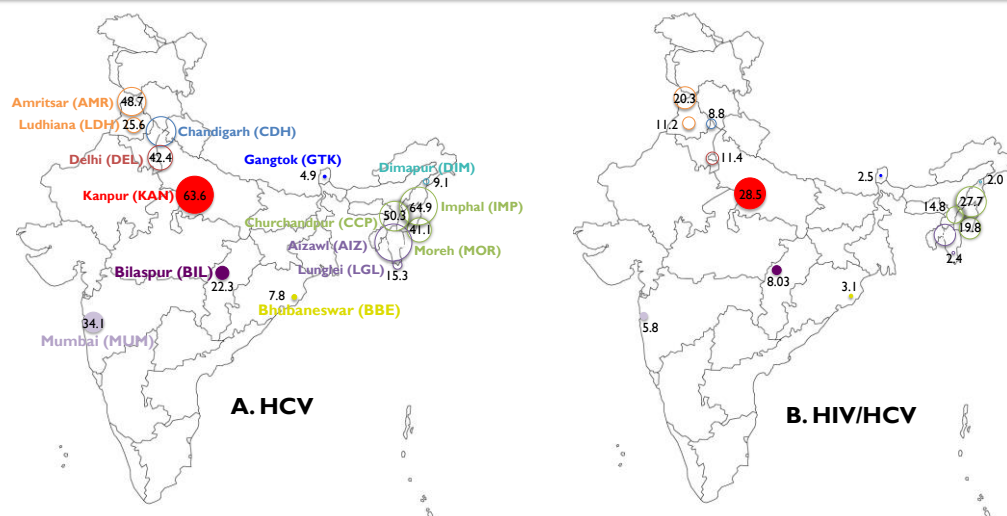
## (Sunil's) Steps to eliminate HCV among PWID

- For Hepatitis C elimination, we need to begin with **Data**, **Education**, **Harm reduction**

## Why data?

- Every epidemic is different!
  - Prevalence
  - Demographics (age, gender, etc.)
  - Types of drugs (heroin vs. pharmaceutical)
  - Other co-morbidities (HIV, HBV, TB, etc)
  - Setting (home-based vs. shooting galleries)
  - Availability/access to services

## Prevalence of HCV and HIV/HCV



Solomon SS et al, Lancet ID 2015

## Drugs use epidemics are diverse

	2013		
	Amritsar	Imphal	Kanpur
Number recruited	1001	1002	1002
Median age	27	35	34
% Female	1.2	12.5	0.7
% Married	47.8	50.5	41.4
Drugs injected prior 6 mths			
- Heroin	35.1	98.1	14.9
- Buprenorphine	64.6	0.3	67.2
- Prescription painkillers	1.2	1.5	43.4
Shared needle prior 6 months	40.0	71.1	69.1
History of ever HIV test	57.2	58.6	7.9
Used SSP in prior 6 months	33.8	15.1	6.3
Used OAT in the prior 6 months	36.8	15.3	1.6

## Drugs use epidemics are diverse

	2013		
	Amritsar	Imphal	Kanpur
Number recruited	1001	1002	1002
Median age	27	35	34
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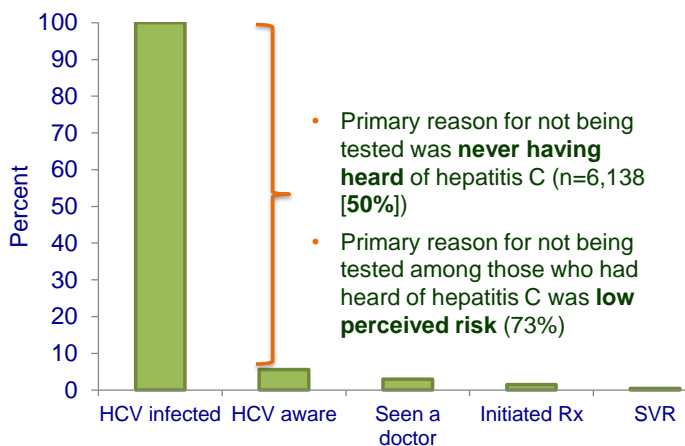
	2016-17		
	Amritsar	Imphal	Kanpur
Number recruited	1002	1002	1002
Median age	29	35	35
% Female	0	3.6	0.5
% Married	51.1	53.0	50.6
Drugs injected prior 6 months			
- Heroin	87.6	82.7	28.4
- Buprenorphine	36.4	0	72.4
- Prescription painkillers	12.0	0.5	8.1
Shared needle prior 6 months	56.9	26.0	32.7
History of ever HIV test	55.0	70.2	16.6
Used SSP in prior 6 months	29.2	12.6	7.0
Used OAT in prior 6 months	36.9	37.5	3.1

Lucas GM et al, AIDS 2015; Solomon SS et al, CROI 2018

## Importance of Data

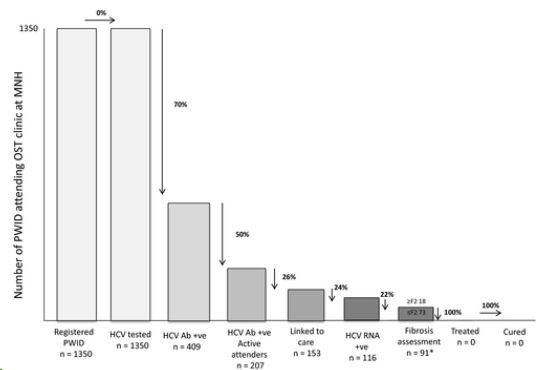
- Every epidemic is different!
  - Demographics (age, gender, etc.)
  - Types of drugs (heroin vs. pharmaceutical)
  - Prevalence
  - Other co-morbidities (HIV, HBV, TB, etc)
  - Setting (home-based vs. shooting galleries)
  - Availability/access to services
- We need to know where we started to measure progress!

## HCV Care Continuum in PWID



5,777 HCV-infected PWID from 15 cities across India  
(community-based sample)

Solomon SS et al, Lancet ID 2015



1350 PWID attending OST program in Dar-es-Salaam

Mohamed Z et al, Journal Vir Hep 2018

## HCV Literacy

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- Need to begin with the basics!
  - Types of hepatitis: A, B, C, D, E
  - Modes of transmission (very, very infectious)
- Consequences of HCV:
  - Asymptomatic for a long time
  - Cirrhosis and hepatocellular carcinoma
- There is a cure!
  - Safe, short and efficacious
- Re-infection is possible
  - Importance of harm-reduction

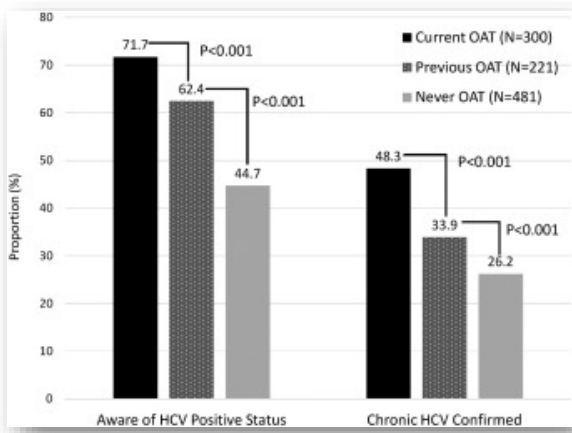
## Harm reduction: The “crux” of HCV programs

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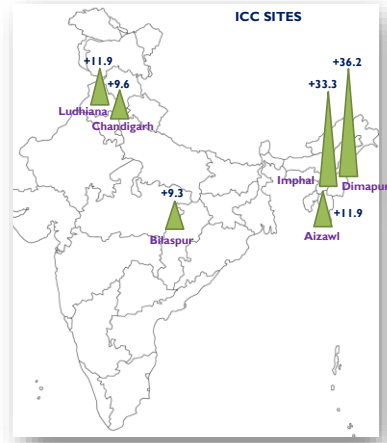
- OAT and SSP are critical for both primary prevention and prevention of re-infection of HCV
  - In 2015, needles/syringes distributed per PWID/year = 27
  - To eliminate by 2030, this needs to be 300\*
- Prevent overdose/mortality:
  - Mortality among PWID in India (2018): 18.3 per 100 p-y\*
- They also provide a venue for delivery of HCV services

\* WHO 2017; \*\*unpublished data

# Integration of HCV and OAT

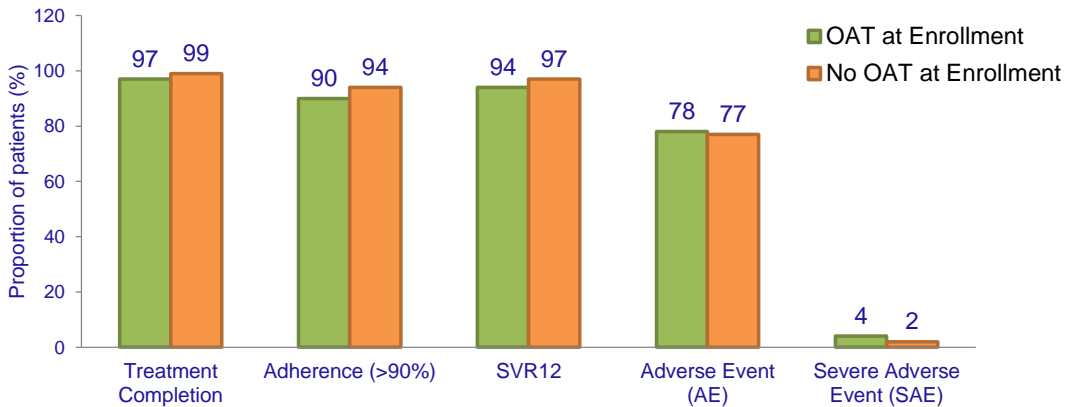


Integrated care model of OAT, HIV, and HCV testing in Ukraine (Lakunychkova et al, Intl J Drug Policy 2018)



Integrated care model of OAT, HIV, and HCV testing in India (Solomon SS et al, LBO-05 GHS 2018)

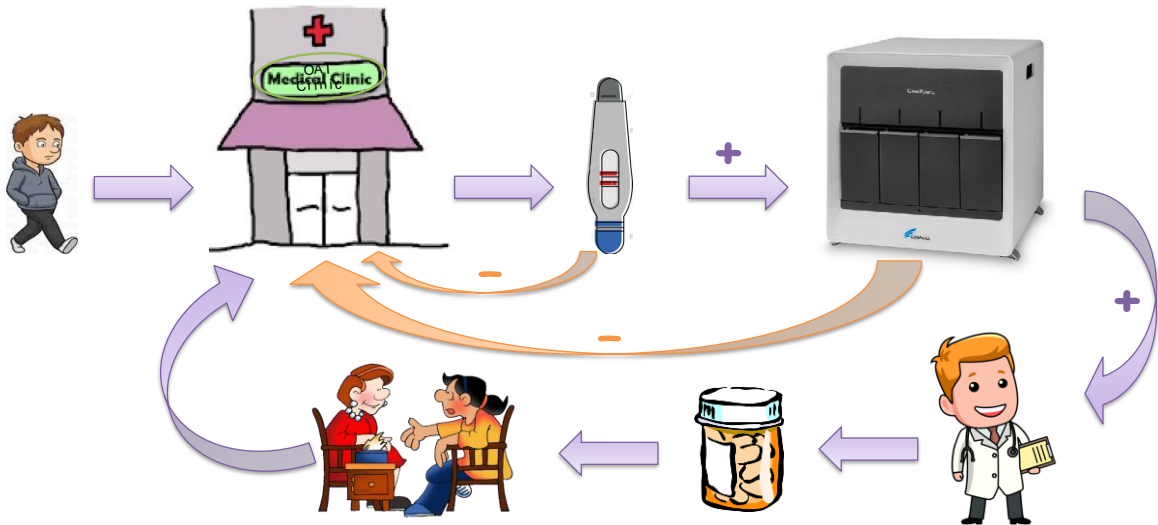
# SVR comparable among OAT vs. non-PWID



Post-hoc pooled analyses of patients enrolled in ION, ASTRAL and POLARIS

Grebely J et al, Open Forum Infect Dis 2018

## Harm Reduction HCV Care Model



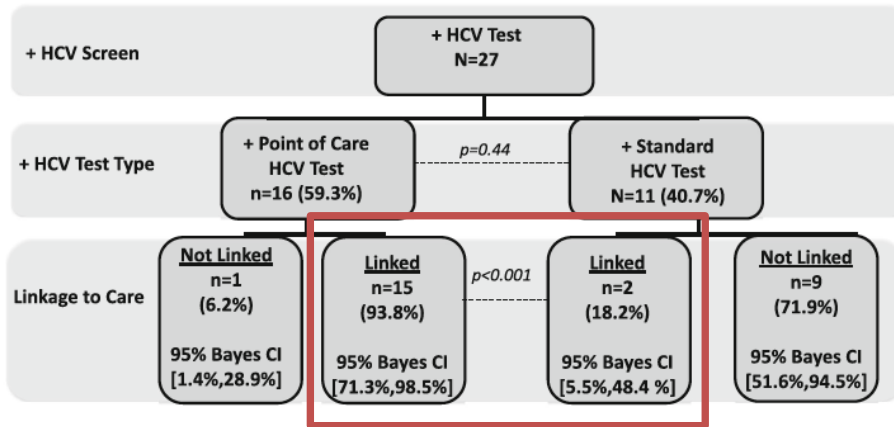
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- If PWID don't come to the clinic, take the clinic to them



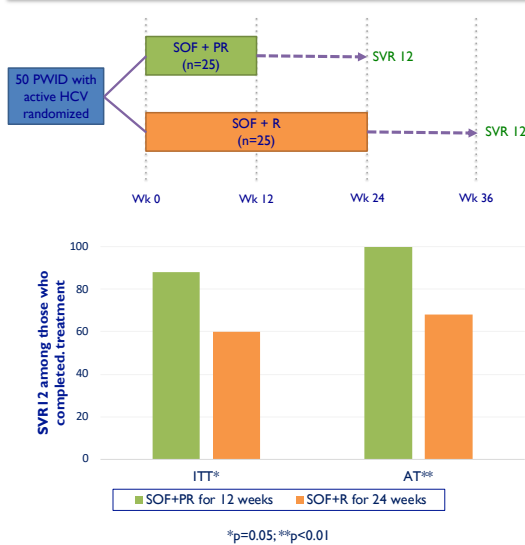
## Field/Community-based testing

- Mobile Medical Clinic for HCV screening in New Haven, US



Morano et al, J Community Health 2014

## Field-based treatment (DOT)



Solomon SS et al, J Viral Hepat 2018

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## Respondent Driven Sampling (RDS) in Kanpur



# RDS in Kanpur

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- HIV/HCV negative
- HCV only
- ▲ HIV & HCV positive
- HIV only



# RDS in Kanpur

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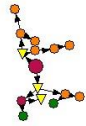
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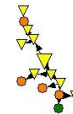
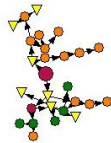
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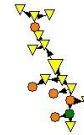
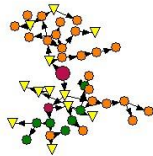
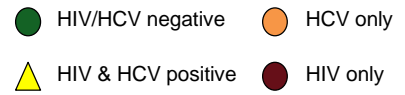
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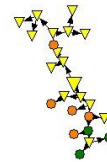
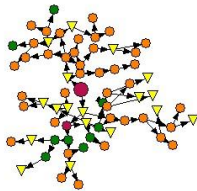
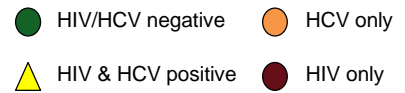
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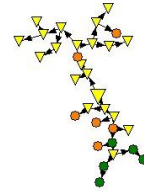
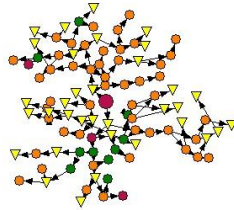
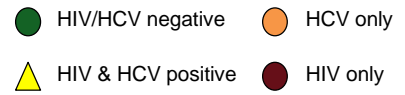
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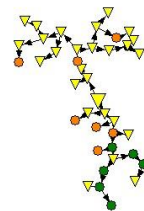
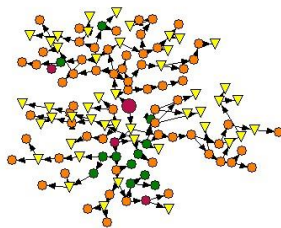
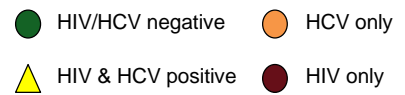
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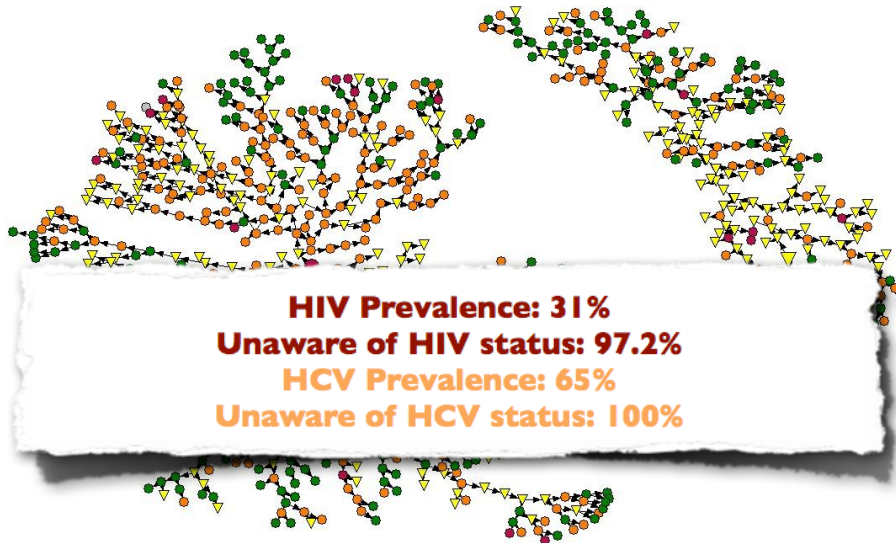
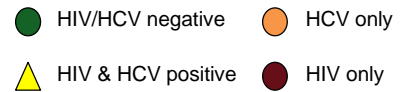


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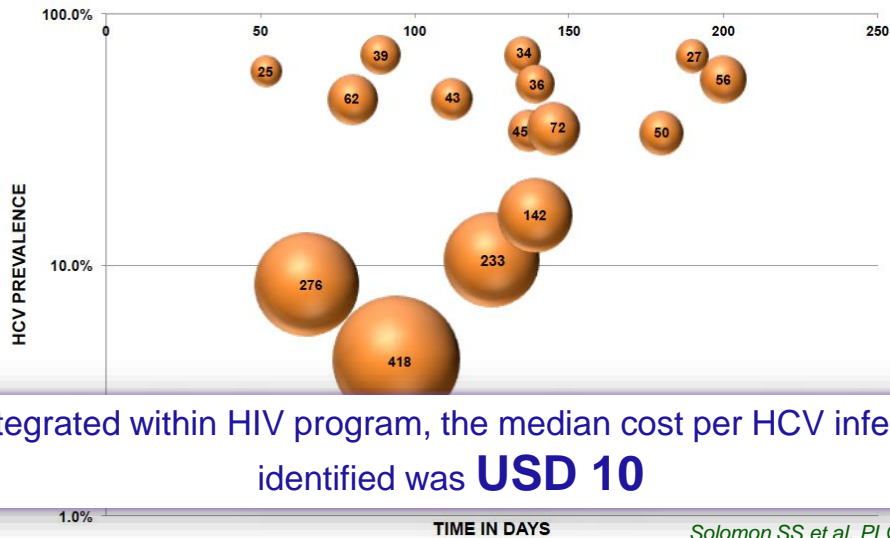
## RDS in Kanpur



## RDS in Kanpur

- How much did it cost?
  - Cost of RDS without testing: USD 14,000
  - Cost of HIV testing (USD 3/test): USD 3000
- Cost per unaware HIV infection: USD 40
- If you added HCV:
  - Cost of HCV testing (USD 4.5/test): USD 4500
  - Number unaware of HCV status: 674
  - Cost per unaware infection identified: USD 7

## Cost of RDS to identify HCV infections



## Steps to eliminate HCV among PWID

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- If PWID don't come to the clinic, take the clinic to them
- Leverage networks – a little money can go a long way!
- Diagnostics and monitoring should be simplified



## Diagnostics and monitoring

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- Limited access to molecular testing in LMICs
  - Diagnostics can be more expensive than treatment in some settings!
- Simplify diagnostics and monitoring:
  - HCV RNA confirmation at baseline (PCR/GeneXpert/Core Ag?)
  - No pre-treatment genotyping
  - No on-treatment monitoring (there are exceptions)
  - SVR!?!? (need to monitor for re-infection anyway)
- HCV self-testing
- **My wish list:**
  - Rapid diagnostic test for HCV Core Ag/RNA

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- Diagnostics and monitoring should be simplified
- Treatment could be shortened

## Shortening of treatment

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- 8 – 12 weeks is amazing!
  - **But 4 – 6 weeks could be even more AMAZING!!!**
  - Combining DAAs across pharma companies?
- Don't rule out Peg:
  - 4WIDUC (Ovrehus et al; EASL 2017)
  - PWID on drug treatment given 4 weeks of SOF/LDV/PEG 2a/RBV
  - **ITT: 15/16** achieved SVR 24; **PP: 15/15** achieved SVR 24
- **My wish list:**
  - Long acting injectable DAAs
  - I would like “**one injection to cure them all**” but will settle for 2 or 3

## Steps to eliminate HCV among PWID

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- Advocacy/activist groups are critical to funding/political buy-in

# Advocacy



## Advocacy issues

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- **Every PWID in every country should have access to harm-reduction services!**
- All DAAs should be made available in LMICs
- Better treatment for HIV (dolutegravir) will lead to easier management of HCV
- We have a disease we could potentially eliminate; yet there is limited political/funding commitment
- WHO targets and #NOHEP are achievable only if: **“No one is left behind!”**

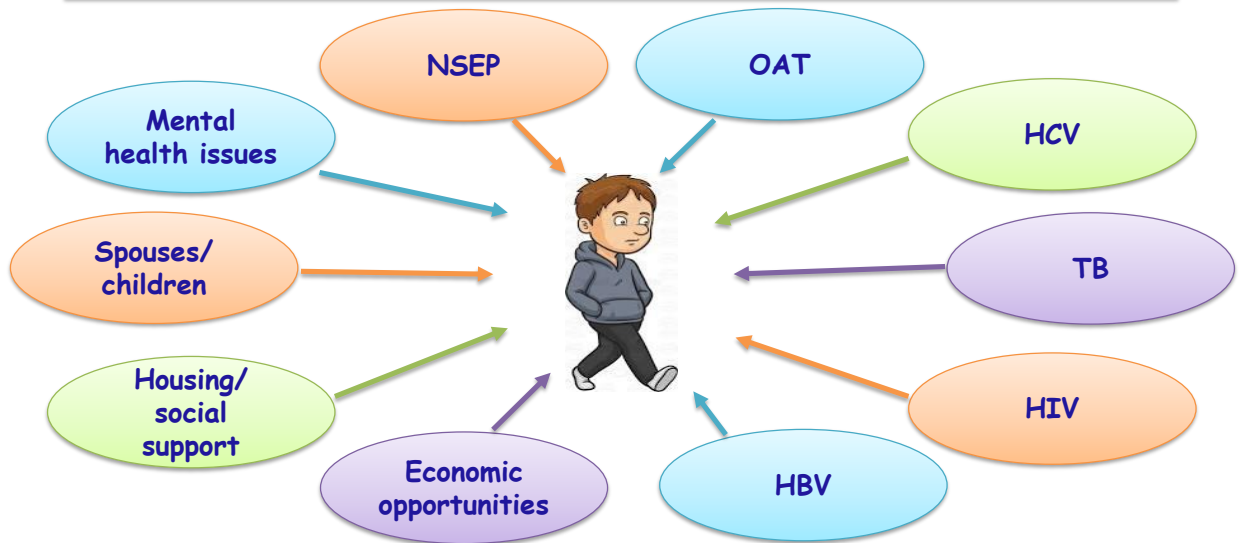
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- **Treat the individual and not an individual disease!**

The goal of any program should be to improve survival and quality of life

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## Acknowledgements

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- People who inject drugs and people living with viral hepatitis who generously participate in research studies globally
- Johns Hopkins University
  - Greg Lucas, Shruti Mehta, Mark Sulkowski, David Thomas, Allison McFall
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  - Aylur K Srikrishnan, S Anand, CK Vasudevan, Pradeep Amrose
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