# MODELING HEPATITIS C ELIMINATION AMONG PEOPLE WHO INJECT DRUGS ALONG THE US-MEXICO BORDER: IS MICROELIMINATION POSSIBLE?

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# HCV Elimination in Mexico

- Mexico was one of the first Latin American countries committed to HCV elimination
  - *First phase (2019):* 12,500 DAAs among ~450-550,000 people with HCV infection in Mexico[1] with priority for PLHIV, prisoners, PWID
- High burden of HCV infection in US-Mexico border cities (such as Tijuana and Ciudad Juarez) situated on main drug trafficking routes[2]
- Our previous modeling analysis in Tijuana in 2019 showed that HCV elimination was achievable[3] and cost-effective[4]

1. Secretaria de Salud, 2019; 2. Finckenauer et al., Nat Inst of Justice Pub, 2001; 3. Marquez et al., IJDP 2020; 4. Marquez et al., Addiction 2021

# HCV and PWID in Ciudad Juarez

Image credit: maps.google.com

- Ciudad Juarez, Mexico, is located directly across the border from El Paso, Texas (USA)
- ~10,000 current PWID reside there[1]
- Members of our team implemented a recent serosurvey among PWID the border region, including Ciudad Juarez, finding a seroprevalence of 92%[2]
- Access to harm reduction is minimal

1. CENSIDA, 2013; 2. Fleiz-Bautista et al., 2019

# Impact of COVID-19 pandemic on HCV elimination in Mexico

- In 2019, the Mexican government committed to providing HCV treatment, but resources remain limited
- Efforts for HCV treatment distribution stalled during the COVID-19 pandemic
- Shortage of sterile syringes due to ramp-up in COVID vaccine production[1]
- Basic needs of PWID (clean water, soap, shelter) were scarce[2]
  - Only provided in limited quantities by non-profit organizations (i.e., Prevencasa, Verter, Programa Compañeros)
- Need to understand what is needed to achieve HCV elimination in places with high transmission, e.g., border region

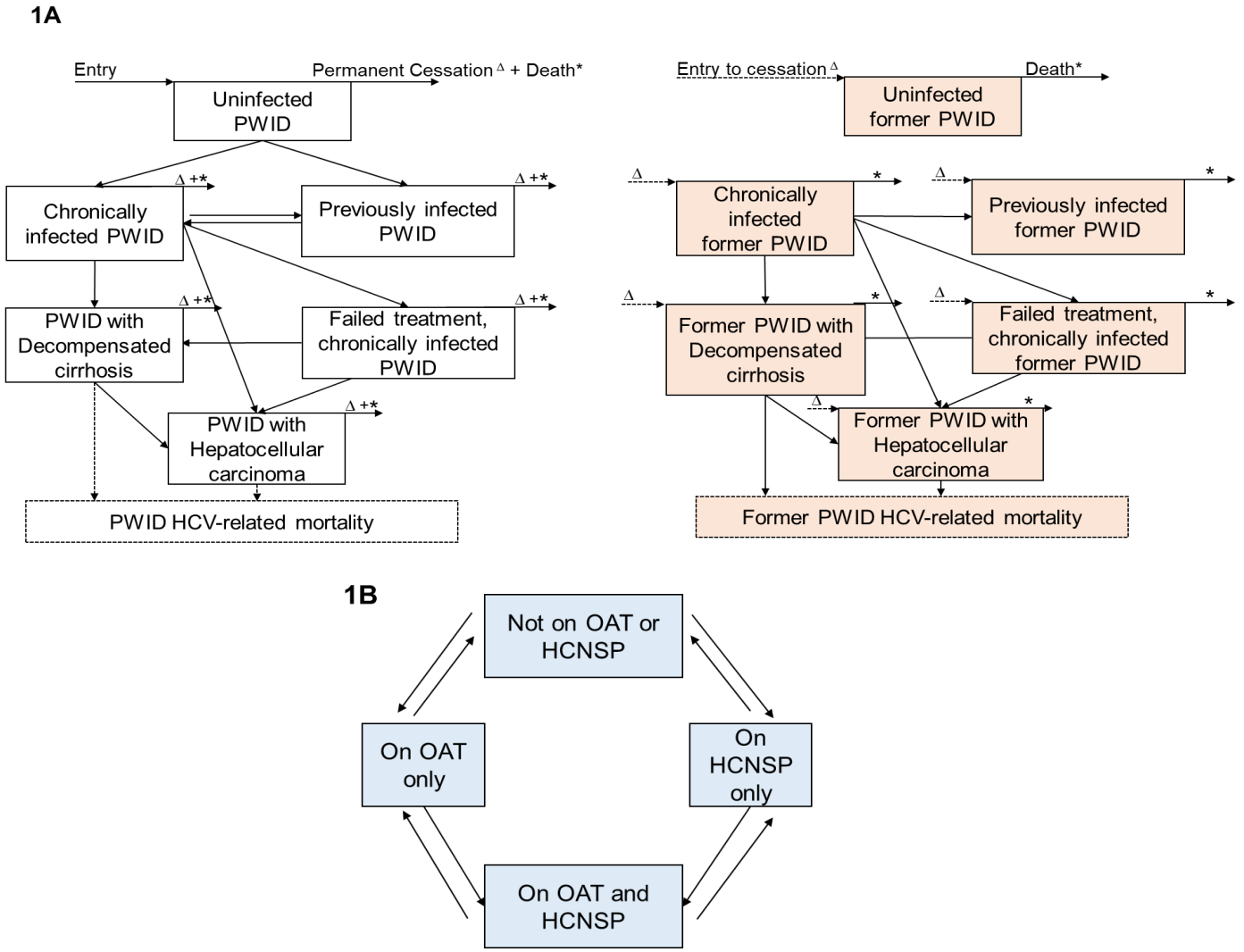
1. Strach et al., Rockafeller Inst of Govt 2021; 2. Opina-Escobar, Nexos 2021

# Aim

- To estimate treatment allocations and combination treatment and harm reduction packages required to achieve the WHO incidence goal by 2030 in Ciudad Juarez, Mexico

# HCV transmission & intervention model schematic

- Dynamic, deterministic model of HCV transmission, disease progression, and harm reduction among current and former PWID parameterized to Ciudad Juarez




OAT: Opiate agonist therapy
HCNSP: High coverage needle/syringe programs

1. Marquez et al., IJDP, 2020

# Parameterization & Calibration

- **Ciudad Juarez:** Parameterized to data from CENSIDA[1], cross-sectional study and literature[2]
  - Assumed no coverage of harm reduction at baseline as minimal services, existing services further interrupted by the pandemic

- **Calibration:** Calibrated to steady-state HCV chronic prevalence (assuming 26% spontaneous clearance rate[3]) of:
  - 68% for Ciudad Juarez; based on 92% HCV seroprevalence in 2017-2018[2]

1. CENSIDA, 2013; 2. Fleiz-Bautista et al., 2019; 3. Micallef et al., J Viral Hep, 2005

# Methods – Intervention assumptions

- **Opiate Agonist Therapy (OAT):** reduces HCV acquisition by **50%** **[risk ratio (RR) =0.50, 95% confidence interval (CI) = 0.40-0.63]**[1]

- **High Coverage Needle/Syringe Programs (HCNSP):** which is receiving more than 1 sterile syringe for each injection, reduces HCV acquisition by **23%** **(RR= 0.77; 95% CI: 0.5–1.19)**[1]

- **OAT + HCNSP:** reduces HCV acquisition by **71%** **(RR=0.29; 95% CI 0.13-0.65)**[1]

- **DAA treatment efficacy**: Sustained virological response rate of **95% (95% CI: 91-99%)**[2,3]

1. Platt et al., Addiction, 2018; 2. Dore et al., Ann Intern Med 2016; 3. Grebely et al., Lancet Gastroenterol Hepatol 2018

# Methods – Scenarios

- Evaluated number of direct-acting antiviral (DAA) treatments needed from 2021 to achieve 80% incidence reduction target

## Model scenarios:

Treatment (DAAs) **alone**

Treatment (DAAs) + **20%** Harm reduction (OAT+HCNSP)

Treatment (DAAs) + **40%** Harm reduction (OAT+HCNSP)

Treatment (DAAs) + **50%** Harm reduction (OAT+HCNSP)

# Results

- Between 2021 and 2030, to achieve the WHO incidence goal using treatment alone (DAAs only), the total treatment initiations required are:

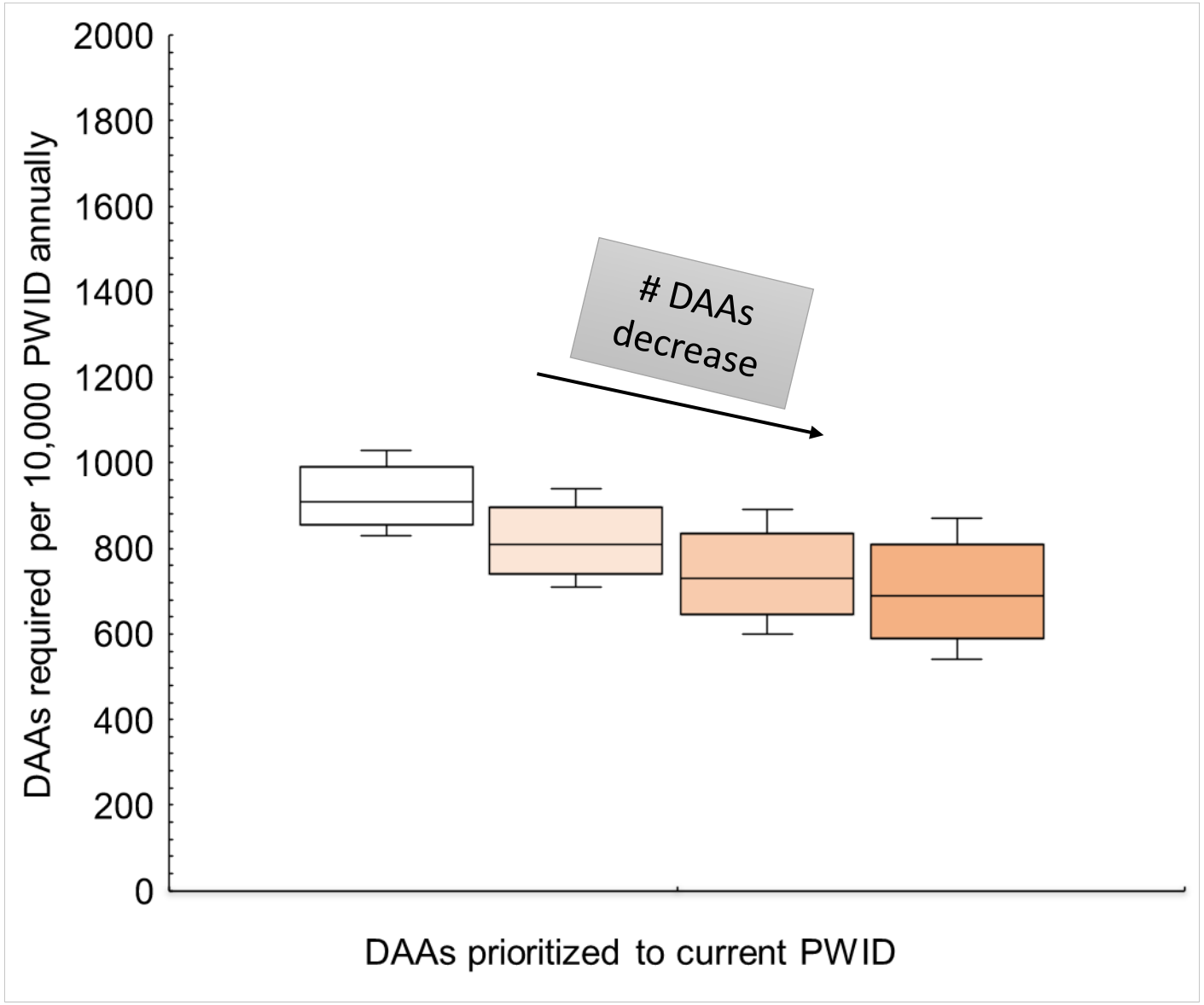
**DAAs only:**

**8,160** PWID
(95% CI: 7,470-9,075)

**DAAs + 50% OST/NSP:**

**6,255** PWID
(95% CI: 4,860-7,810)

# **Fewer treatments** required to achieve incidence target if scaled up **with harm reduction**




- **25%** fewer DAAs required if harm reduction scaled to 50%

DAAs only
DAAs + 20% OAT+HCNSP
DAAs + 40% OAT+HCSNP
DAAs + 50% OAT+HCNSP

# Strengths

- One of the few studies focus on HCV elimination in Latin America
- HCV elimination in the border region key to elimination in Mexico as well as likely implications for the US given frequent border crossing (see Abstract 399, Marquez et al.)

- Results support findings from other studies that:
  - Combination harm reduction and treatment strategies are a key component of HCV epidemic control[1,2]
  - HCV elimination is possible in high HCV prevalence settings, such as among PWID along the US-Mexico border[3]

1. Martin et al., CID 2013; 2. Heffernan et al., Lancet 2019; 3. Marquez et al., IJDP 2020

# Study limitations

- Focus on PWID only as key risk group for HCV transmission
- Assume treatment scale-up begins in 2021, but unclear what progress has been made
- Uncertainty in PWID population size estimate

# Conclusions

- Regional HCV microelimination among PWID along the US-Mexico is possible with a combination prevention approach

- Barriers:
  - Withdrawal of the Global Fund curtailed NSP provision[1]
  - Cost of OST remains prohibitive for many PWID[2]
  - Real-world accessibility of HCV treatment for PWID is unclear

- National treatment allocations should be prioritized and provided to PWID as planned

- Harm reduction program expansion along the US-Mexico border is critically needed

1. Cepeda et al., BMJ 2019; 2. Burgos et al., Harm Reduct J 2019

# Questions & Comments?

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