Cost-Effectiveness of PrEP and Medications for Opioid Use Disorder in People Who Inject Drugs

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BACKGROUND

- In the US, 3.7 million people who inject drugs (PWID) face risks for HIV, HCV, and severe bacterial infection (SBI).
- Up to 78% of PWID have opioid use disorder (OUD), but only 18% are prescribed medications for OUD (MOUD).
- Despite an HIV prevalence of 5.1% among PWID, only 1% of eligible PWID take HIV PrEP.
- Data on long-acting injectable PrEP with cabotegravir (CAB) or lenacapavir (LEN) are lacking in PWID
- Integration of MOUD with PrEP may reduce risks for both HIV and other OUD-associated infections.

OBJECTIVE

Among PWID with OUD at risk for HIV, we assessed the cost-effectiveness of integrating PrEP with MOUD over 10 years.

Methadone-only is the economically preferred approach among PWID with OUD and is **cost-saving** over 10 years compared to no PrEP or MOUD.

METHODS

We used a validated micro-simulation model of multimorbidity from IDU (MYRIAD, see **Figure 1**): drug use, SBI, HIV, and HCV.

- Population: 1.6 million PWID with OUD without HIV
- Perspective: healthcare system
- Horizon: 10 years (2023-2032)
- Model inputs: derived from the published literature (**Table**)
- Outcomes projected: incidence of HIV, HCV, and SBI; deaths (by cause); life years (discounted); costs (discounted, 2023 USD)
- Incremental cost-effectiveness ratios (ICERs): in $/HIV infection averted or $/life-year saved (LYS)
  - "*Cost-effective*" defined as ICER <$100,000/LYS
- Strategies: PrEP-only, MOUD-only, and PrEP+MOUD combinations:
  - *PrEP modalities*: TDF/FTC (TDF), bimonthly IM CAB, biannual SQ LEN
  - *MOUD modalities*: methadone (MET), SL buprenorphine (BSL), extended-released SQ buprenorphine (BXR)

Figure 1. Schema for the Multimorbidity model to Reduce Infections Associated with Drug use (MYRIAD)

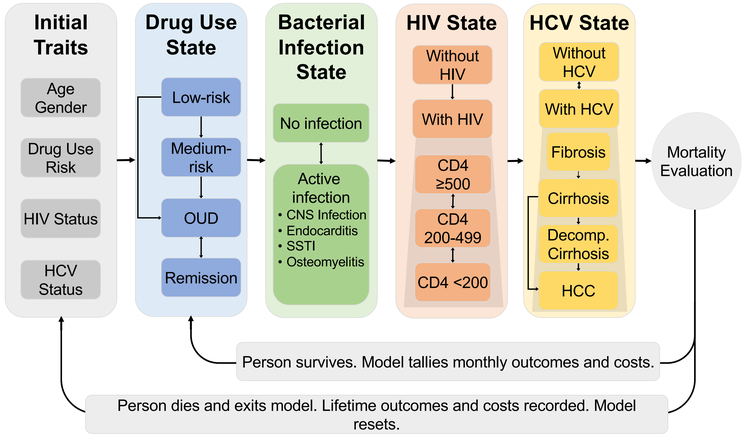


Table. Select model input parameters

Parameter (in year 2023)	No PrEP, no MOUD	PrEP			MOUD			Source (see Add'l Info)
		TDF	CAB	LEN	MET	BSL	BXR	
HIV incidence per 100,000	105	54	35	12		48		[1-6]
HCV incidence per 100,000	2,306		2,306			1,153		[1,7-8]
SBI incidence per 100,000	3,412		3,412			1,706		[1,8,9]
Overdose deaths per 100,000	1,696		1,696		347	678	575	[10-13]
Drug cost per person ($)	0	300	23,214	39,000	179	672	24,198	
Healthcare cost per person ($)	0	924	1,468	490	6,373	761	1,815	[14]

RESULTS

Without PrEP or MOUD, over 10 years we project:

- 13,758 new HIV infections, 224,837 new HCV infections/re-infections, and 590,899 hospitalizations due to injection-related SBIs.
- 306,909 overdose deaths (of 385,042 total deaths).
- $291 billion in excess healthcare costs (equating to $18,427 per person per year).

PrEP and/or MOUD would avert (**Figure 2**):

- Between 1,161 (TDF-only) and 5,244 (LEN+MET) HIV infections.
- Between 2,870 (TDF-only) and 147,733 (CAB+MET) total injection-related infections.
- Between 554 (TDF-only) and 88,760 (TDF+MET) deaths from any cause.

In cost-effectiveness analysis (**Figure 3**), several strategies would be cost-saving compared to no PrEP or MOUD:

- MET-only, MET+TDF, MET+CAB, BSL-only, and BSL+TDF.
- MET-only is the only cost-effective strategy at an ICER <$100,000/LYS.
- MET-only would lead to 441,893 LYS, 2,864 HIV infections averted, and $74.4 billion saved over 10 years compared to no PrEP or MOUD.
- MET+TDF would save additional life-years, but with an ICER of $1.1 million/LYS compared to MET-only.

RESULTS (cont.)

Figure 2. HIV infections averted (vs. No PrEP or MOUD)

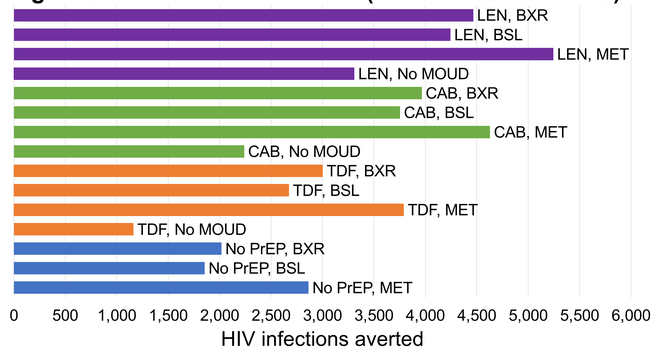
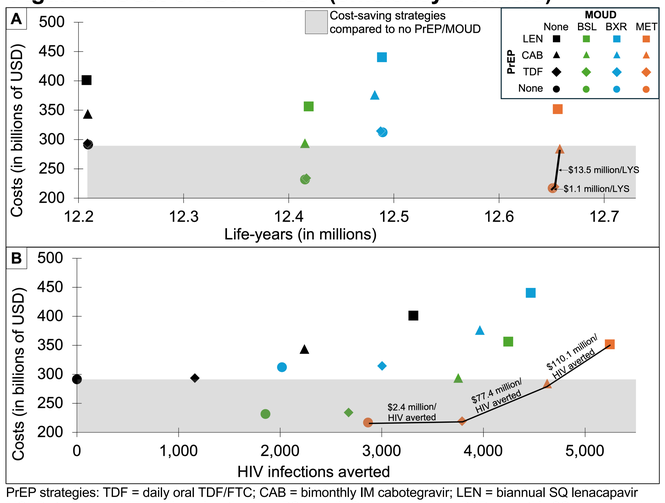


Figure 3. Cost-effectiveness (efficiency frontiers)



PrEP strategies: TDF = daily oral TDF/FTC; CAB = bimonthly IM cabotegravir; LEN = biannual SQ lenacapavir
MOUD strategies: MET = daily oral methadone; BSL = daily SL buprenorphine; BXR = monthly SQ buprenorphine

CONCLUSIONS

While long-acting injectable PrEP greatly reduces HIV incidence among PWID, methadone is cost-effective due to more life-years gained from reductions in overdose deaths and injection-related infections than from HIV averted over 10 years. PrEP provides additional health benefits but is not cost-effective at current drug prices over 10 years.

ADDITIONAL INFORMATION

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