A review of health economic modeling challenges for opioid use disorder treatment in prison settings

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Tushar Srivastava[1], Shashwat Gaur[2], Anurag Gupta[2], Saeed Anwar[2], Madhusudan Kabra[3], Raju Gautam[1]

[1]ConnectHEOR, London, UK; [2]ConnectHEOR, Delhi, India; [3]MK Consultant Ltd., London, UK.
Email: tushar.srivastava@connectheor.com

BACKGROUND

Context:

- Opioid use disorder (OUD) presents a significant public health burden, particularly in correctional settings where prevalence is disproportionately high and access to treatment is limited.[1]
- Incarcerated individuals often face interrupted care pathways, high turnover rates, and limited integration between prison and community-based health systems.[2]
- These complexities create unique challenges for health economic modeling aimed at evaluating OUD interventions in prison settings.

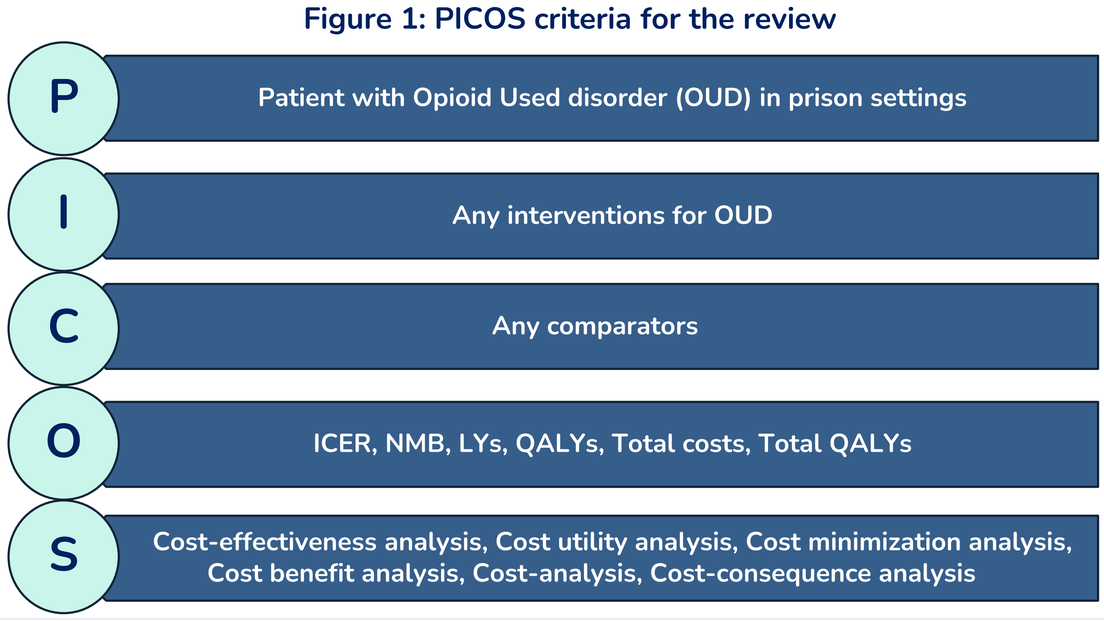
Objective:

This study aimed to identify and summarize key methodological challenges encountered in modeling the economic impact of OUD treatment in prison settings.

METHODS

- A targeted literature review was conducted using PubMed and Google scholar.
- The studies published between data-inception to May 2025 were retrieved.
- The studies evaluating the economic impact of OUD interventions in the prison settings were included in the analysis. The detailed PICOS are presented in **Figure 1**.

Figure 1: PICOS criteria for the review



RESULTS

- A total of 214 studies were identified, out of which 19 were selected for the full-text review based on abstract screening. **Sixteen** studies meeting the inclusion criteria were included in the analysis.
- **Cost-effectiveness analysis (CEA)** was conducted in **15/16 (94%)** studies whereas 1/16 (6%) study was a cost-analysis.
- The distribution of studies by country is presented in **Figure 2**.
- Interventions evaluated in the included studies were **methadone (8/16; 50%)**, **extended-release naltrexone/naltrexone (4/16; 25%)**, buprenorphine (3/16; 19%) and naloxone (1/16; 6%). Many studies evaluated more than one intervention.
- Six studies (38%) did not specify any time horizon. Within studies reporting **time horizon (n=10)**, it varies widely from <1 year to 15 years, with a major proportion of studies **(40%) had time horizon between or <1 year (Figure 3)**.
- The **structures of model** were reported in **10/15 CEAs**. Model structures varied greatly with **state transition models** being used most frequently **(3/15; 20%)**. The different model structures used, and the frequencies are presented in **Figure 4**.
- The health states used in **state transition models** differed widely across studies, reflecting different ways of capturing treatment, incarceration, relapse, and overdose risk:
  - Alive/never incarcerated, on Medications for Opioid Use Disorder (MOUD), in diversion program, incarcerated, post-incarceration (elevated overdose risk), death.
  - On MOUD (with or without remission), off MOUD (with or without remission), in the community, incarcerated, overdose events (fatal/non-fatal), death from other causes.
  - In treatment, incarcerated (jail/prison), relapse (opioid use outside treatment), abstinent (no opioid use), death.
- Half of the studies **(8/16; 50%) used a societal perspective** only, while **(4/16; 25%)** used **healthcare perspective** only. Two studies used both the societal and the healthcare perspective, whereas one study used a jail perspective. One study did not provide information on the perspective used.
- There was variations in benefits measured across included studies; the key measures included **quality-adjusted life years (QALYs), recidivism, overdose deaths averted, mortality, abstinence** and **treatment adherence**. The cost measures also varied widely and included medication costs, staff costs, diversion costs, etc.
- There were many modelling critiques observed among the studies reporting the model structures (n=10) **(Figure 5)**. The most cited critique was **inadequate model structures (n=6) unable to capture the complexities of patient pathways and long-term efficacy outcomes.**
- **Other challenges were lack/unreliability of evidence or data sources**, **short time horizons** that are difficult to capture long-term outcomes **like abstinence and remission, and unrealistic assumptions (e.g., not accounting for the overdose events)** that may not reflect real-world conditions, leading to biased results **(Figure 5)**.

This review highlights the high variability in the economic evaluation methods for evaluating the OUD intervention in correctional settings.

Future research should aim to standardize economic evaluation frameworks to better inform decision-making and improved access to evidence-based OUD treatment in prison settings.

Figure 2: Geographic distribution of included studies by study location and type

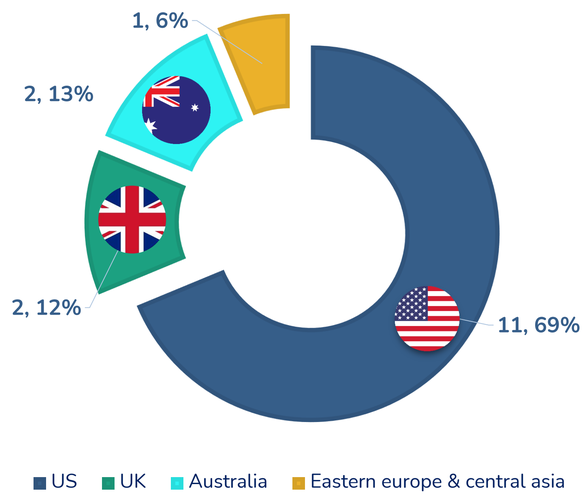


Figure 3: Distribution of time horizons across included studies

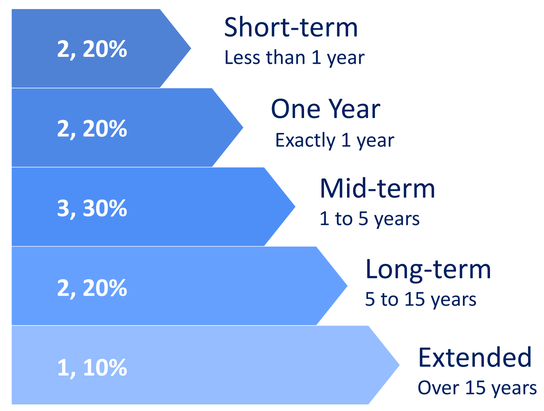


Figure 4: Distribution of model structures reported in analysed studies

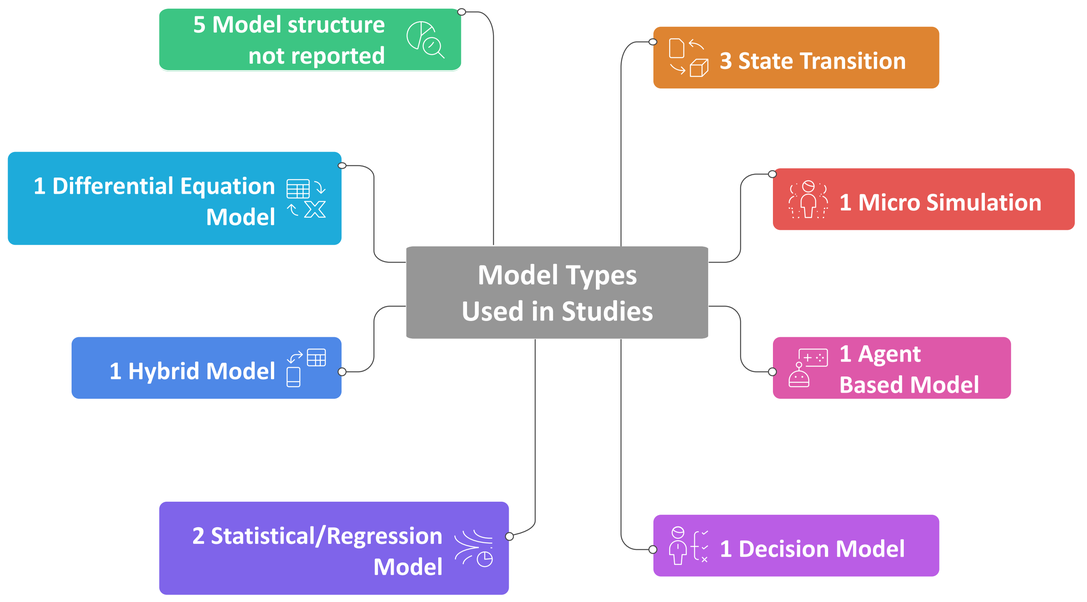


Figure 5: Types of model critiques observed across included studies

CONCLUSION

- This study highlights that modeling OUD treatment in prison settings encounter **several methodological and practical challenges** related to **data availability and system complexity**.
- Addressing these gaps requires **improved data availability, stakeholder engagement, and models that reflect real-world care pathways**.

REFERENCES

1. Zaller ND, Providing substance use disorder treatment in correctional settings, 2022.
2. Cloud DH, Public health and prisons: priorities in the age of mass incarceration, 2023.

FINANCIAL DISCLOSURE

Authors are employees of ConnectHEOR Limited. MK is an independent consultant affiliated with MK Consultant Ltd., London, UK. No external funding was received to conduct this research, and there are no conflicts of interest to declare.

Poster presented at ISPOR in Glasgow, Scotland, 9-12 November 2025