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Impact of CAB-LA Versus Oral PrEP in Reducing HIV Incidence Among MSM in Thailand: A Modelling Study

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BACKGROUND

- Cabotegravir as long-acting PrEP (CAB-LA) can address partial adherence in individuals using oral PrEP.
- We used PrEP dispensing records to predict the proportion of MSM in Thailand who may benefit from CAB-LA.
- We used a mathematical HIV transmission model to study the epidemiological impact of CAB-LA in Thai MSM (based on Versteegh Lancet Reg Health SE Asia 2022).

METHODS

PrEP dispensing and coverage

- Data from MSM with >2 prescriptions at 12 key population-led clinics (2019-22).
- Protected by CAB-LA when returning within 10 weeks.

Effectiveness of PrEP

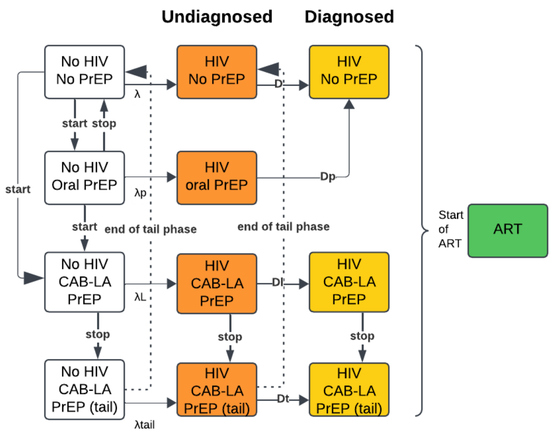
- Based on the ratio of days covered by PrEP (daily use): ratio>75% effectiveness=93%, ratio<75% effectiveness= 60% (Jourdain et al. 2022)
- CAB-LA increased effectiveness by 34% (Landovitz 2022).
- Reduced effectiveness in tail phase: 0-26% (1st 12 weeks), 49-76%(2nd), 82-95%(3rd) (Landovitz et al 2020).

Mathematical model

- Figure 1: schematic representation of the model.
- Table 1: parameters used in calibration.

Figure 1: Mathematical model

Based on model for oral PrEP in Thailand (Versteegh et al. Lancet Reg Health SE Asia 2022). HIV acquisition rate (λ) is reduced by PrEP (see methods). Diagnosis rate (D) increases with PrEP use. Individuals progress through acute, chronic, AIDS stages each with distinct infectivity (Sood et al. Clin Infect Dis 2013).



Although adherence & discontinuation to oral PrEP is a challenge, offering both CAB-LA and oral PrEP can further reduce HIV incidence in Thailand.

Table 1: Parameters used in calibration

Parameter	Range	Source
MSM	375-840 x1,000	National report on PrEP
CD4 at diagnosis		Local data
<200	40-70%	
200-350	10-30%	
Living with HIV	65-85 x1,000	Brown et al. JAIDS 2024
New acquisitions	5-7 x1,000	Brown et al. JAIDS 2024

Table 2: Predicted protection by PrEP modality

Data from 7,257 MSM (34,843 prescriptions) of whom 45% used oral PrEP for <6 months (or <3 prescriptions)

Parameter	Value
Partial adherence to oral PrEP not covered by CAB-LA	53%
Partial adherence to oral PrEP covered by CAB-LA	14%
Consistently protected by oral PrEP and CAB-LA	33%

RESULTS

- Table 2: Predicted protection by PrEP modality based on dispensing records
- Table 3: Epidemiological impact of CAB-LA in next ten years (2024-34). The number of PrEP users is unknown, we estimated this population to range between 10-100 thousand in 2024-2034.

Table 3: Epidemiological impact of CAB-LA in next ten year (2024-2034)

The number of PrEP users is unknown. The table therefore represents a wide range of PrEP users in 2024 (first column) and 2034 (other columns). According to a discrete choice experiment 14% will use CAB-LA. The numbers are infections averted (rounded to the nearest 100) if CAB-LA is introduced in 2024. The colors represent the reduction in HIV incidence in 2034 if CAB-LA is introduced in 2024:

1-2% | 3-4% | 5-6% | >6%

x 1,000 (2024)	2034 10,000	20,000	30,000	40,000	50,000	60,000	70,000	80,000	90,000	100,000
5-15	300	500	700	800	900	900	1000	900	800	700
15-25	300	600	800	900	1100	1100	1100	1000	1000	900
25-35	300	600	800	1000	1100	1100	1200	1100	1000	1000
35-45	400	700	900	1100	1200	1200	1200	1200	1100	1100
45-55	300	500	700	900	1000	1100	1200	1200	1200	1100
55-65	300	600	800	1100	1100	1200	1200	1300	1400	1400
65-75	400	700	900	1300	1200	1400	1400	1400	1400	1300
75-85	400	800	1100	1300	1500	1600	1700	1700	1700	1700

CONCLUSIONS

Although partial adherence and discontinuation of are challenges, offering both CAB-LA and oral PrEP as HIV prevention options can further reduce HIV incidence. The analysis should be updated once CAB-LA use patterns become available in Thailand.

ADDITIONAL KEY INFORMATION

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