ORAL ABSTRACT

Cost-effectiveness of long-acting injectable HIV pre-exposure prophylaxis in the United States

Neilan AM*, Landovitz RJ, Le MH, Grinsztejn B, Freedberg KA, McCauley M, Wattananimitgul N, Cohen MS, Ciaranello AL, Clement ME, Reddy KR, Hyle EP, Paltiel AD, Walensky RP

**Massachusetts General Hospital*
Boston, MA

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RPW: The views expressed in this abstract do not necessarily represent the views of the CDC or the United States.

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Background

- The HPTN 083 Trial demonstrated the superior efficacy of CAB-LA vs. F/TDF for PrEP among MSM/TGW
- As new generic PrEP options are becoming available and the logistics of implementing LA-PrEP are being considered, we asked how much should we be willing to pay for the improved efficacy of CAB-LA over F/TDF?

Objective

- Our objective was to identify the highest price premium CAB-LA could command relative to tenofovir-based PrEP under the most favorable conditions for CAB-LA

- We examined 4 strategies for MSM/TGW in the US
  - No PrEP
  - Generic F/TDF
  - Branded F/TAF
  - CAB-LA

Methods

- Using the CEPAC microsimulation model, we simulated a PrEP-using population with characteristics similar to those of US HPTN 083 Trial participants

Methods: Outcomes

- Averted primary transmissions
- Quality-adjusted life expectancy (QALY)
- Costs
- Incremental cost-effectiveness ratios (ICER) =

  Δ costs/ Δ QALYs
  - 10-year horizon
  - 3% discount rate

Methods: Outcomes

- A willingness-to-pay threshold: $100,000/QALY
- Maximum price premium = CAB-LA – F/TDF

Lower: willing to pay less for CAB-LA

Higher: willing to pay more for CAB-LA

Neumann *NEJM* 2014

Simulated population

- Cohort similar to HPTN 083 participants (>18 years) reported behaviors or diagnoses that put them at high risk for HIV
- Using CDC data, we estimated the size of this population at approximately 480,000

Landovitz *AIDS* 2020; my.sexpro.org; Grey *JMIR Public Health Surveill* 2016; Singh *Ann Intern Med* 2018

Select model input parameters

Parameter	Value	Source
Age, mean (years)	30	HPTN 083
1° transmissions attributable to MSM/TGW, annual*	18,000	Singh *Ann Intern Med* 2020
No PrEP HIV incidence (/100PY)	5.3	
On PrEP HIV incidence (/100PY)		
Branded F/TAF	1.3	Derived from HPTN 083
Generic F/TDF	1.3	
CAB-LA	0.3	
PrEP retention, % at 6 years	28	Williams *IDWeek* 2020

*Assuming 10 year incidence is constant
HPTN 083 trial data were presented at *IAS* 2020: Abstract: OAXLB0101
HPTN 083 did not study F/TAF

Select model input parameters

Parameter	Value	Sources
PrEP costs, annual, USD 2020		
Generic F/TDF		Federal Supply Schedule, Pharmaceutical Catalog 2020
Drug + Program	8,300 + 400	
Branded F/TAF		Bernstein *The Washington Post* 2021
Drug + Program	16,600 + 400	
CAB-LA		Red Book, IBM Micromedex 2020
Drug + Program	25,800 + 700	Levinson Medicaid Drug Price Comparisons 2005
ART cost, annual total, USD 2020	32,000-69,000	

Reflecting potential adverse events on F/TDF relative to F/TAF

- To portray branded F/TAF as favorably as possible, we modeled renal and bone toxicity on generic F/TDF
- 2% of individuals ever treated with F/TDF experienced an adverse event
    - Decreased quality of life
    - Increased annual costs $5,600 per person affected

Walensky *Ann Intern Med* 2020

Scenario analyses: all potential MSM/TGW PrEP users in the US

- The general PrEP user may be at lower risk for HIV than those who enrolled in HPTN 083
- Estimated size 1.9 million
- Off PrEP HIV incidence one quarter of base case, 1.5/100PY

Grey *JMIR Public Health Surveill* 2016; Singh *Ann Intern Med* 2018

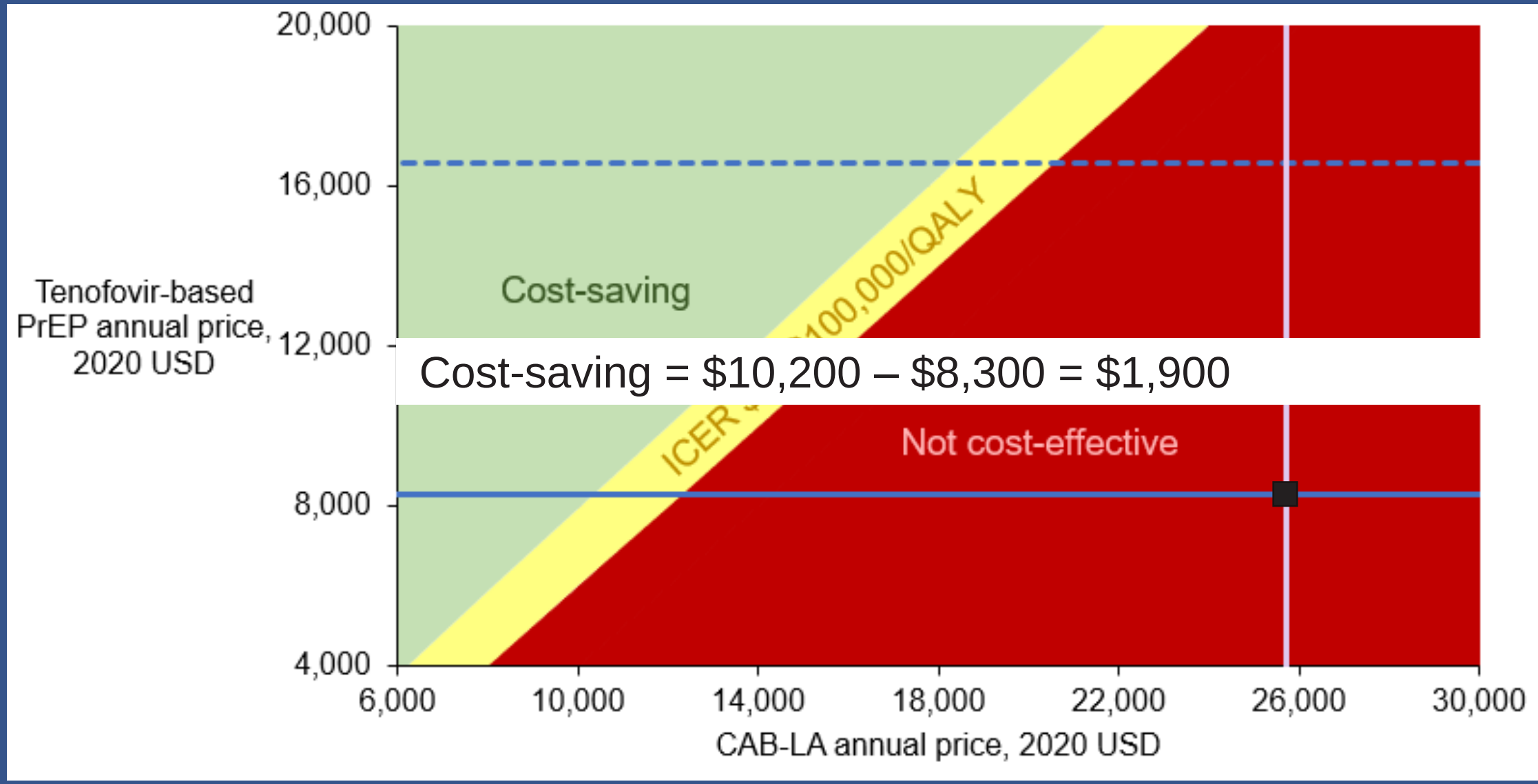
Results: 10-year outcomes of CAB-LA vs. tenofovir-based PrEP (n=480,000)

Strategy	Total Transmissions, n	Total QALY	Incremental QALY	Total cost, 2020 billion USD	ICER, $/QALY
No PrEP	178,000	4,500,000	--	33	--
Generic F/TDF	122,000	4,626,000	97,000	45	122,000
Branded F/TAF	122,000	4,628,000	2,000	60	*Dominated
CAB-LA	107,000	4,654,000	26,000	76	1,069,000

*Dominated: an intervention costs more and delivers fewer benefits than another program or some combination of other programs

ICERs are calculated from unrounded estimates

Sensitivity analysis: PrEP drug prices



Cost-saving = $10,200 – $8,300 = $1,900

Scenario analyses

Scenario	Impact on CAB-LA price premium	Maximum price premium, 2020 USD
Resistance due to CAB-LA	—	$3,100
HIV diagnostic testing sensitivity and costs in CAB-LA	—	$3,300 - $3,400
Among a population of all potential MSM/TGW PrEP users at lower risk for HIV	↓	$1,000

Limitations

Scenario resulting from limitation	Impact on CAB-LA maximum price premium
Lower transmissions	↓
More HIV infections during the lead-in	↓

Conclusions

- CAB-LA as PrEP would not be cost-effective if CAB-LA for HIV prevention is priced the same as the combination CAB-LA/RPV-LA regimen in use for HIV treatment
- CAB-LA should be priced to compete with generic, rather than branded, tenofovir-based PrEP
- The availability of effective alternatives limits the additional price payers should be willing to pay for CAB-LA as PrEP

Thank you

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- Supported by: FHI 360 UM1AI068619
- Additional support included:
  - NICHD [K08 HD094638]
  - NIAID [R37 AI093269; K23 AI137121]
  - NIDA [R01 DA015612]
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