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# Adherence to Pre-Exposure Prophylaxis (PrEP) in the Partners Demonstration Project: Preliminary Findings

Jessica Haberer, MD, MS

*On behalf of Jared Baeten, Renee Heffron, Deborah Donnell,  
Nelly Mugo, Elly Katabira, Elizabeth Bukusi, Stephen Asimwe,  
Katherine Thomas, Lara Kidoguchi, Connie Celum, David Bangsberg*

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# Background

- PrEP efficacy is highly dependent on adherence
- Data from the Partners PrEP Study showed adherence was high within HIV serodiscordant couples in East Africa
- It is unknown if similar adherence levels will be seen outside clinical trials





# Methods

- Study population: HIV serodiscordant couples in Kenya and Uganda with >5% risk of HIV transmission
- Study procedures for the Demonstration Project
  - Comprehensive HIV prevention services offered, including daily oral PrEP and ART
  - PrEP encouraged as a “bridge” while viral suppression is achieved
  - Follow-up at 1 month and every 3 months thereafter
  - Adherence measured with self-report and MEMS



# Population characteristics

	N (%) or Median (IQR)
Total HIV-uninfected participants enrolled to date	751
Follow-up per participant (months)	5.5 (2.8-5.5)
HIV-uninfected partner	
Female	246 (33%)
Age (years)	29 (IQR 26-36)
Education (years)	8 (IQR 7-12)
PrEP makes sex completely safe from HIV	362 (48%)
No concerns about daily PrEP use	658 (88%)
Perceived HIV risk moderate/high	236 (31%)



# Population characteristics

Serodiscordant partnership	
Partnership duration (years)	2.3 (IQR 0.8-6.3)
Polygamous	103 (14%)
No children with study partner	432 (58%)
Age difference within couple (years)	2 (-3,6)
Aware of HIV serodiscordancy before enrollment (months)	1 (1-3)
Unprotected sex with study partner in prior month	483 (67%)



# Population characteristics

HIV-infected partner	
HIV-infected partner CD4 count (cells/mm <sup>3</sup> )	435 (IQR 269-635)
HIV-infected partner HIV RNA level (log <sub>10</sub> copies/ml)	4.6 (IQR 4.0-5.0)



# Adherence to PrEP

- Started PrEP at enrollment: 720 (96%)
- Not initiated PrEP by month 6: 3/354 (<1%)
- MEMS data available for this analysis: 591 (82%)
- Overall MEMS adherence **Partners PrEP (AAS)**
  - Median: 97% (IQR 86-100%) - **Median: 97%**
  - Mean: 87% (SD 24%) - **Mean: 91%**
  - <80% adherence: 125 (21%) - **<80%: 26%**

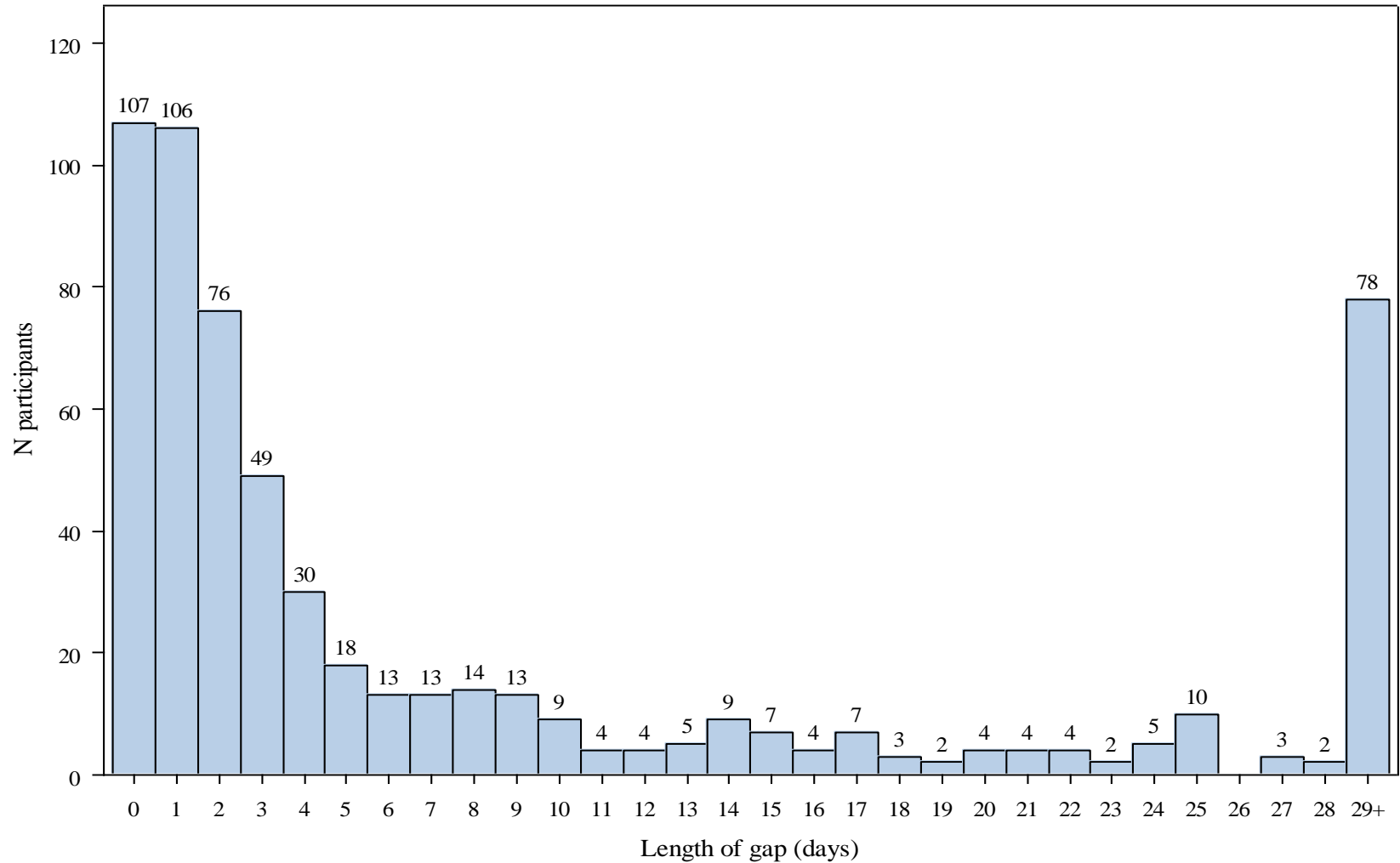


# Patterns of adherence

- Overall adherence is associated with efficacy
- Gaps in adherence may create periods of risk for HIV acquisition
- Need to categorize non-adherence to understand execution of adherence
  - Poor adherence while relying on PrEP for HIV prevention
  - Intentional non-use
    - Choice of other HIV prevention methods
    - Periods of no risk
- First step is to understand patterns of PrEP use



# Gaps in adherence



# MEMS adherence (execution)

Remove periods of non-use from denominator:

$$\text{Adherence} = \frac{\text{bottle openings}}{\text{days of intended PrEP use}}$$

Median (IQR) adherence

	Uncensored	Participant- months	Censored at 1 <sup>st</sup> 28 day gap	Participant- months	Censored at 1 <sup>st</sup> 7 day gap	Participant- months
Month 1	97% (86-100%)	578	97% (88-100%)	567	100% (93-100%)	505
Month 3	97% (85-100%)	432	98% (90-100%)	400	98% (95-102%)	333
Month 6	95% (80-100%)	289	97% (88-100%)	250	98% (92-100%)	195
Overall	97% (86-100%)	1,299	97% (89-100%)	1,217	99% (93-100%)	1,033

# Periodic PrEP use

## Self-reported intentional breaks in PrEP use\*

	Month 1	Month 3	Month 6	Overall
Participants on PrEP	416	390	308	1,114
Participants with 1+ breaks since last visit	30	32	30	92
Participants restarting since last visit	13	18	10	41
Median number of breaks	1 (1-1)	1 (1-2)	1 (1-1)	1 (1-1)
Median duration of longest break (days)	11 (3-20)	14 (4-40)	28 (10-74)	14 (4-28)

\*Data collected starting 7 months into study



# Periodic PrEP use

## Most common reasons for breaks

- Side effects (24%)
- Broke up with study partner (23%)
- Feeling unwell (14%)
- Not at home (12%)
- Ran out of pills (11%)
- Other (16%)

# MEMS adherence (execution)

Data censored for any reported break

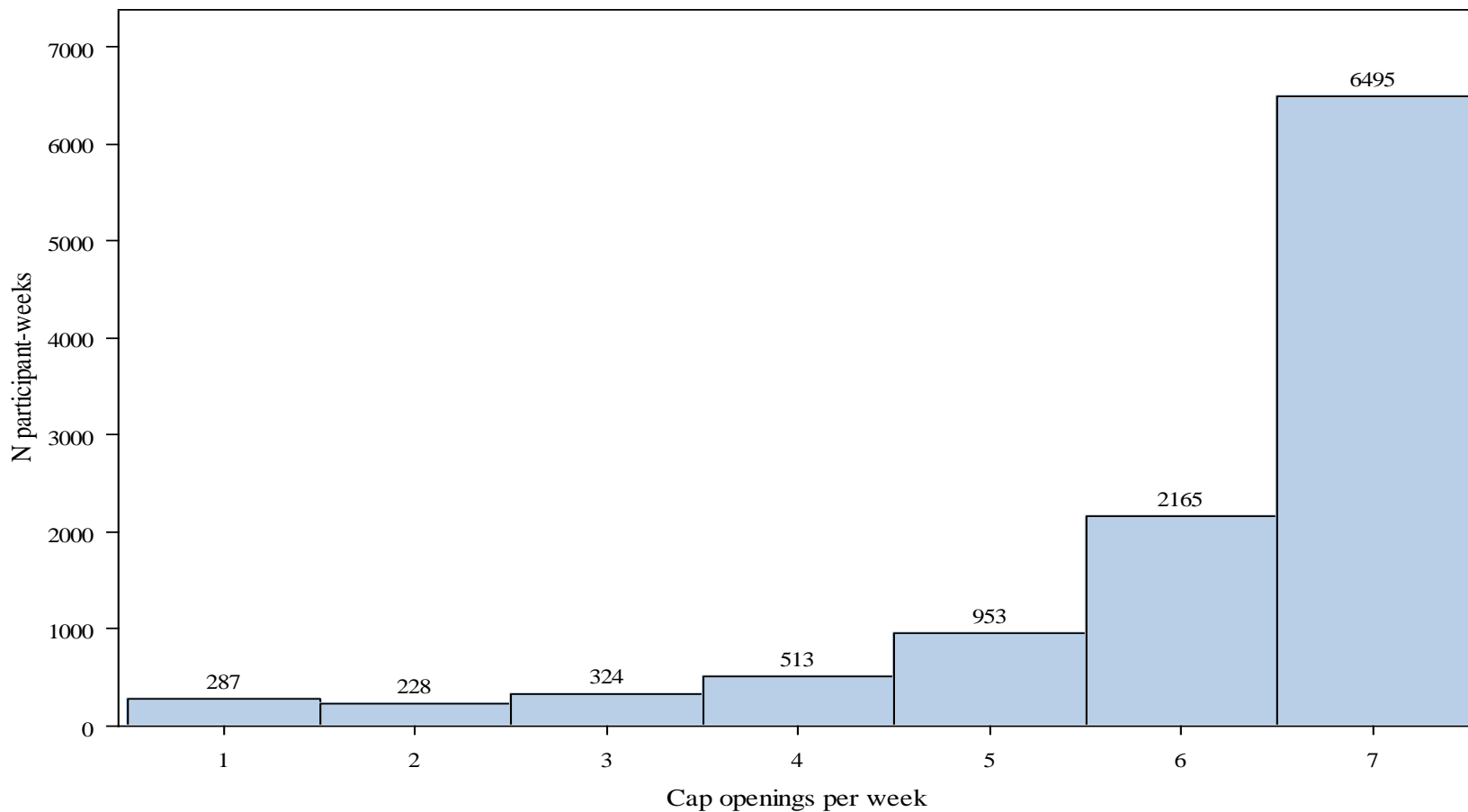
Median (IQR) adherence

PrEP break reported	Uncensored	Participant-months	Censored at 1 <sup>st</sup> 28 day gap	Participant-months	Censored at 1 <sup>st</sup> 7 day gap	Participant-months
Yes	73% (35-96%)	143 (12%)	84% (56-99%)	113 (11%)	96% (83-100%)	65 (7%)
No	97% (89-100%)	1,046 (88%)	98% (91-100%)	1,000 (89%)	99% (93-100%)	882 (93%)



# Number of openings per week

(Participant weeks = 10,965; excluded weeks with no openings)





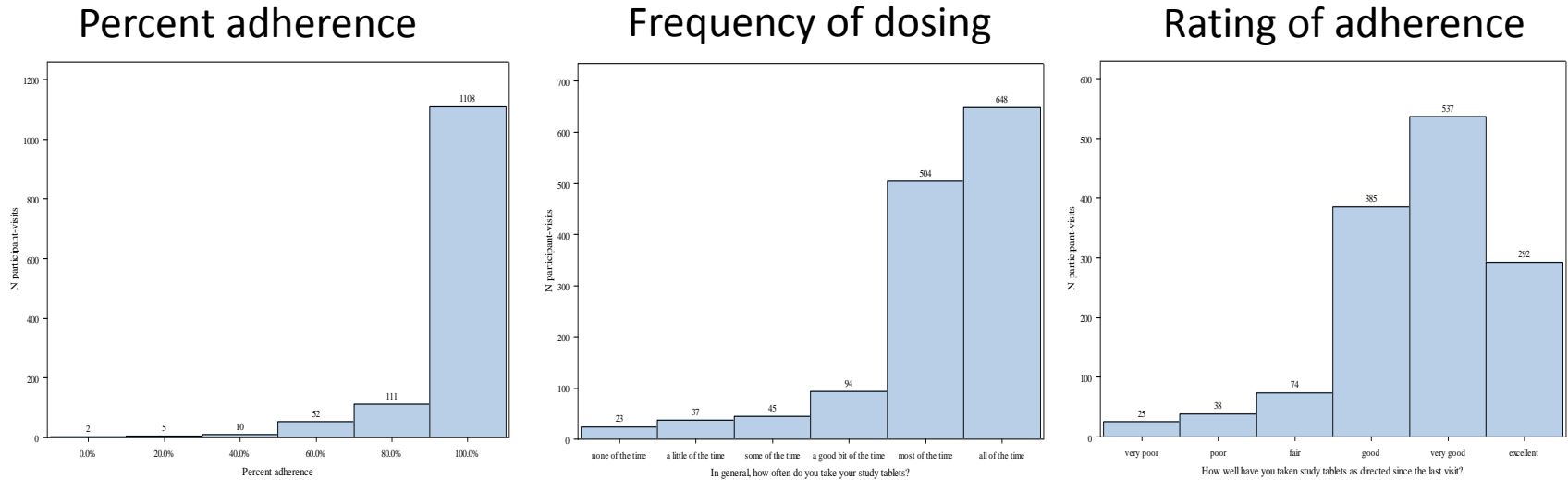
# Openings per week

Doses per week	Risk reduction per iPrEX modeling*	% Participants in Partners Demonstration Project
2	76%	95%
4	96%	92%
7	99%	59%

*\*(Anderson, Sci Transl Med. 2012)*

- iPrEX modeling reflects data from MSM
- Pharmacokinetics may differ for other routes of HIV transmission (*Louissant, AIDS Res Human Retro, 2013*)

# Self-reported adherence



- Likert scales converted to percents (*Lu, AIDS Behav, 2008*)
- At month 6 (N=354)
  - <80% by missed doses: 16 (5%)
  - <“All” or “most” doses: 59 (18%)
  - <“Excellent” or “Very good”: 131 (41%)





# Conclusions

- Uptake and adherence to PrEP is high among HIV serodiscordant couples in East Africa
- A minority exhibit suboptimal adherence
- We need to understand which gaps are important (execution of adherence)
- Both gaps (per MEMS) and deliberate breaks (per self-report) are frequent



# Conclusions

- Breaks are important in interpreting adherence and need to be understood in the context of comprehensive HIV prevention packages
- Doses per week suggest most will be protected *if* iPrEX modeling applies to this population
- Self-reported frequency or rating of adherence *may* be useful measures



# Future work

- Assessment of adherence over time and with a larger population
- Further characterization of gaps and breaks
- Determine which factors influence adherence behavior
- Correlation of objective and subjective adherence measures

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## Partners Demonstration Project Team

### Investigators

- University of Washington Coordinating Center: Jared Baeten (protocol chair), Connie Celum (protocol co-chair), Deborah Donnell (protocol statistician), Renee Heffron (project director), Ruanne Barnabas, Bettina Shell-Duncan, ICRC Operations, Data and Administration teams
- Kabwohe, Uganda (KCRC): Elioda Tumwesigye, Steven Asiimwe, Edna Tindimwebwa
- Kampala, Uganda (Makerere University): Elly Katabira, Nulu Bulya
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### Research participants



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