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GLOBAL HEALTH



UNIVERSITY OF WASHINGTON
INTERNATIONAL CLINICAL RESEARCH CENTER
PARTNERS PrEP STUDY

High Adherence among HIV-1 Serodiscordant Couples in the Partners PrEP Ancillary Adherence Study

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I have no conflicts of interest to declare

Background

- Recent trials of pre-exposure prophylaxis (PrEP) against HIV infection have generated conflicting efficacy data
- Heterogeneity may be due to wide ranges in adherence
- Adherence has largely been based on drug levels, which do not describe behavior
- Objective measures of adherence behavior are critical for interpreting trial data and may help explain variability in efficacy results across trials

Methods

- Partners PrEP Study: a placebo-controlled trial of oral TDF and FTC/TDF PrEP among 4,758 HIV serodiscordant couples in 9 sites in East Africa
 - Clinic-based pill counts monthly
 - Self-report monthly
- The ancillary adherence study was conducted among 1,147 couples in 3 sites of Partners PrEP
 - Unannounced home-based pill counts (UPC) monthly for the first 6 months, then quarterly
 - MEMS downloaded monthly

Methods

- Socio-demographic data collected at enrollment, quarterly, and annually (depending on the factor)
- Couples-based adherence counseling provided at PrEP initiation and throughout the study
- More intensive additional counseling intervention provided when UPC adherence fell <80%
- Testing for HIV seroconversion performed monthly
- Data censored when Partners PrEP announced efficacy in July 2011

Enrollment characteristics

HIV-negative partner characteristics	N=1147
Female	539 (47%)
Years of education*	6 [3, 7]
Age in years*	34 [30, 40]
Placebo	402 (35%)
Clinic visit of AAS enrollment	
At PrEP enrollment	290 (25%)
Months 1 - 6	182 (16%)
Months 7-12	202 (18%)
After month 12	473 (41%)
Partnership characteristics	
Married	1135 (99%)
Living together	1129 (98%)
Number of years living together*	8.5 [3.7, 15.3]
Number of children in partnership*	2 [1-4]
Polygamy	282 (25%)
Age difference between partners*	0 [-5, 5]
Unprotected sex in prior month	321 (29%)
HIV-1 infected partner CD4 count*	491 [368-, 667]
HIV-1 infected partner viral load*	4.0 [3.3, 4.6]

*median [IQR]

Summary of adherence

		Unannounced Pill Count		MEMS		Clinic Pill Count		Self Report	
	N	Mean (SD)	Median (IQR)	Mean (SD)	Median (IQR)	Mean (SD)	Median (IQR)	Mean (SD)	Median (IQR)
Overall	1,039	97.6 (6.3)	99.1 (96.9-100)	86.9 (16.4)	92.1 (85.9-94.2)	96.6 (6.7)	98.8 (96-99.8)	98.2 (3.8)	99.4 (98-100)
By gender									
Female	490	98.2 (5.1)	99.3 (97.5-100)	89.6 (12.4)	92.9 (88.4-94.6)	97.4 (6.1)	99.1 (97-100)	98.4 (3.9)	99.5 (98.3-100)
Male	549	97.1 (7.2)	98.8 (96.2-100)	84.6 (19)	91.2 (83.5-93.6)	95.9 (7.2)	98.4 (95.5-99.6)	97.9 (3.8)	99.2 (97.6-100)
By quarter									
1st--3rd	922	98.4 (11.6)	100 (97.1-100)	88.8 (15.9)	92.4 (88.1-94)	97.1 (7)	98.8 (96.5-100)	98.4 (4)	100 (98.7-100)
4th--6th	908	98.3 (7.1)	99.6 (97.1-100)	87 (18.6)	91.7 (85.7-94)	97.1 (8)	98.8 (96.5-100)	98.4 (4.3)	100 (98.8-100)
Q7--9	680	97.8 (8.3)	100 (96.5-100)	87.8 (18.5)	93.8 (88.1-95.2)	96.6 (9.7)	98.8 (96.4-100)	98 (7.3)	100 (98.3-100)
Q10--12	517	97.2 (8.6)	98.8 (96.1-100)	86.3 (20.3)	92.9 (86.9-95.2)	96.9 (7.7)	98.8 (96.5-100)	98.2 (5.9)	100 (98.8-100)
Q13--15	390	97.7 (7.8)	99.2 (97-100)	84.9 (20.6)	92.9 (85.7-95.2)	96.6 (7.8)	98.8 (96.4-100)	98.3 (6.2)	100 (98.8-100)
Q16--18	221	96.6 (8.7)	98.7 (95.7-100)	85.8 (17.6)	92.7 (83.3-95.2)	95.8 (9.1)	98.8 (95.4-100)	97.8 (6.1)	100 (97.6-100)
Q19--21	56	98.2 (4.5)	98.8 (96.9-100)	87.4 (16)	92.8 (85.7-94.6)	97.8 (4.6)	100 (96.5-100)	98.7 (2.2)	100 (98.2-100)

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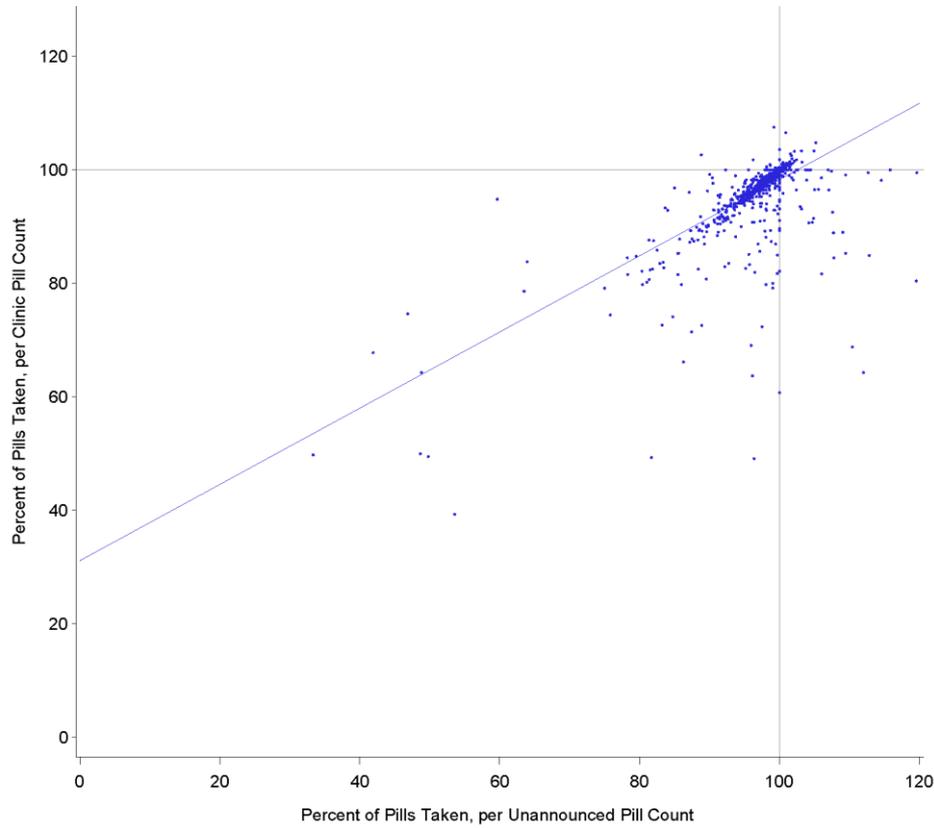
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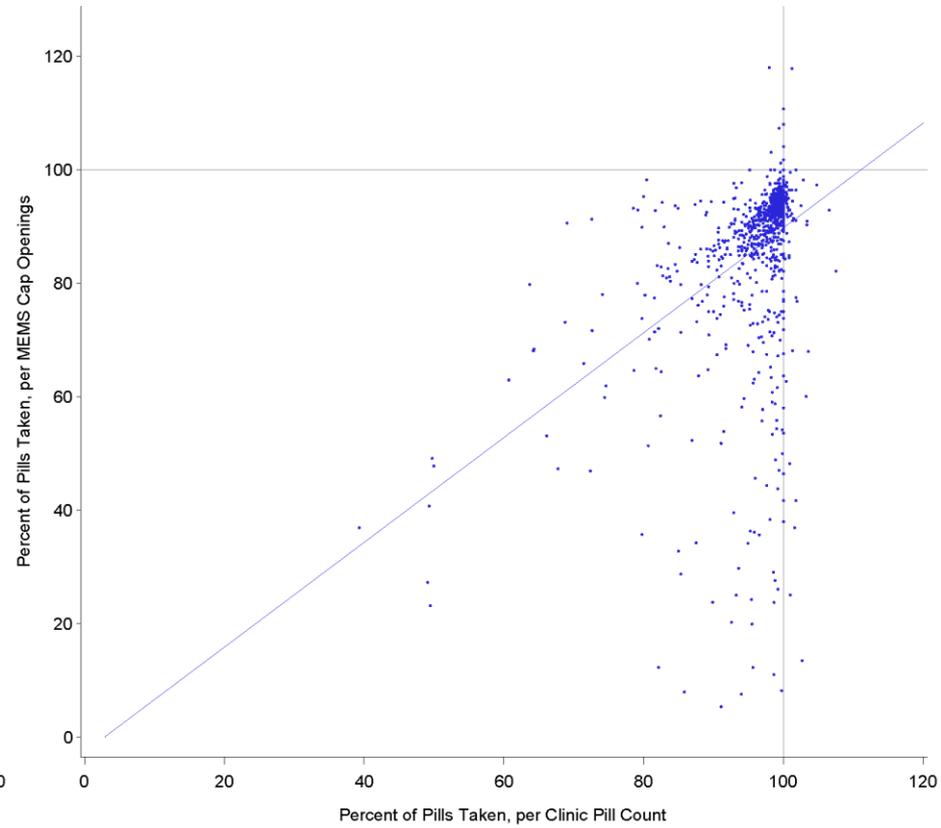
Correlations among measures

	Self report	Clinic pill count	UPC	MEMS
Self report	1.0	0.74 (p<0.0001)	0.63 (p<0.0001)	0.48 (p<0.0001)
Clinic pill count		1.0	0.75 (p<0.0001)	0.51 (p<0.0001)
UPC			1.0	0.45 (p<0.0001)
MEMS				1.0

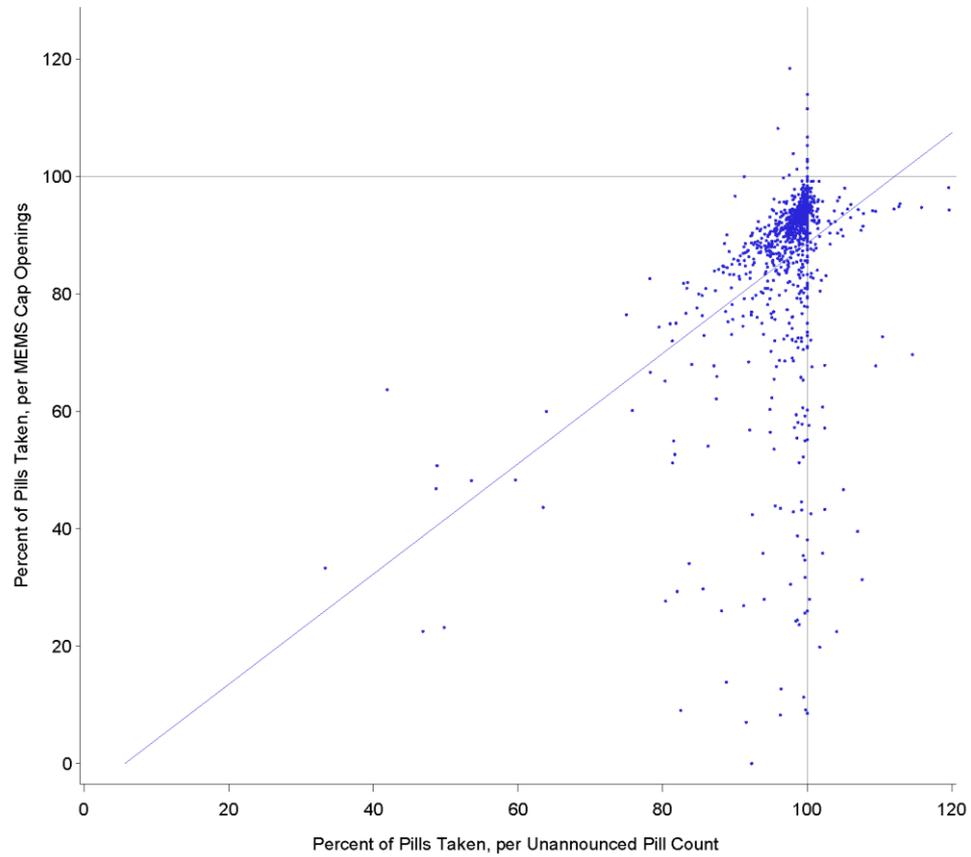
Clinic pill counts v UPC



MEMS v Clinic pill counts



MEMS v UPC



Significant univariable predictors of <80% PrEP adherence (UPC, N=83 quarters [2.3%])

	Quarters with <80% adherence	Odds ratio (95% CI)	p-value
Socio-economic status index	0.23 (0.99)	1.2 (1.0-1.5)	0.05
Heavy alcohol use	10 (4.2%)	2.2 (1.1-4.5)	0.03
Sexual risk behavior			
No sex	10 (5.7%)	4.5 (2.1-9.4)	<0.001
Primary partner only, 100% condom use	27 (1.3%)	reference	
Primary partner only, <100% condom use	20 (2.5%)	1.9 (1.0-3.4)	0.04
Sex with other partner only	2 (2.2%)	1.7 (0.4-7.0)	0.49
Sex with other partner + 100% condom use with primary partner	12 (3.0%)	2.3 (1.2-4.3)	0.01
Sex with other partner + <100% condom use with primary partner	9 (5.5%)	4.3 (1.8-10.5)	0.001
Any verbal, physical or economic partner abuse	7 (15.2%)	7.0 (3.1-16.0)	0.02
Polygamous	10 (1.1%)	0.4 (0.2-0.9)	0.02
Primary income from farming	34 (1.5%)	0.5 (0.3-0.8)	<0.01
Age difference ≥ 10 years	12 (1.2%)	0.5 (0.2-0.9)	0.01
Female	29 (1.6%)	0.6 (0.4-1.0)	0.05
Age (increase in year)	32.7 (7.0)	0.95 (0.92-0.98)	0.001
Months on PrEP	12.8 (7.5)	0.97 (0.94-0.99)	0.02

Non-significant predictors of <80% PrEP adherence (UPC)

HIV-negative partner

- Active arm
- Education
- Depression (Hopkins)
- Time to clinic
- Side effects
- Belief in PrEP
- Pregnancy during study

HIV-positive partner

- WHO stage and CD4 count
- HIV+ partner alcohol use
- HIV+ partner HAART use
- Disclosure of HIV status

Partnership

- Married
- Living together
- No children

Multivariable predictors of <80% PrEP adherence

	OR (95% CI)	p-value
Socio-economic status index	1.1 (0.9-1.4)	0.36
Heavy alcohol use	2.3 (1.1-4.8)	0.02
Sexual risk behavior		
No sex	4.2 (1.9-9.3)	<0.001
Primary partner only, 100% condom use	reference	
Primary partner only, <100% condom use	1.8 (0.9-3.3)	0.08
Sex with other partner only	1.4 (0.3-6.1)	0.69
Sex with other partner + 100% condom use with primary partner	2.2 (1.1-4.6)	0.03
Sex with other partner + <100% condom use with primary partner	3.3 (1.3-8.7)	0.01
Age difference ≥ 10 years	0.3 (0.2-0.9)	0.03
Female	0.8 (0.5-1.4)	0.40
Age (increase in year)	0.96 (0.93-1.00)	0.04
Months on PrEP	0.98 (0.96-1.01)	0.26

PrEP Efficacy

- HIV-1 infections
 - 14 in 404 participants on placebo (333 person-years)
 - 0 infections in 750 participants on active drug (616 person-years)
- PrEP efficacy within this adherence sub-study was 100% (95% CI 87-100%, $p < 0.001$)
 - Active monitoring
 - Adherence intervention if UPC $< 80\%$

Conclusions

- Adherence is high by multiple behavioral measures
- Low adherence is predicted by heavy alcohol use, no sex, sex outside the partnership, and younger age
- This data provides a great deal of confidence in the efficacy of PrEP within the Partners PrEP Study
- High adherence may be dependent on intensive monitoring and support
- Adherence in demonstration settings in sero-discordant couples and other populations must be determined

Acknowledgments

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- Study staff
- DF/Net (data coordination)
- Study participants