MASSACHUSETTS GENERAL HOSPITAL
CENTER FOR GLOBAL HEALTH

HARVARD MEDICAL SCHOOL

Factors influencing adherence behavior for daily and intermittent regimens of PrEP among MSM in Kenya

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presenting on behalf of Peter Mugo, Gaudensia Mutua, Elisabeth van der Elst, Eduard Sanders, Omu Anzala, Burc Barin, David Bangsberg, Frances Priddy

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iavi
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I have no conflicts of interest to declare

Background

- HIV incidence in Kenyan MSM is as high as 35.2 per 100 person-years (*Sanders, AIDS 2013*)
- Pre-exposure prophylaxis (PrEP) may be useful for this very high risk population
- Adherence to daily medication use is known to be challenging
- In 2009-2010, IAVI conducted a pilot RCT of daily versus intermittent PrEP in Kenya and Uganda
  - Safety
  - Acceptability and adherence
  - Changes in risk behavior

ES1

Background

- Factors found to impact adherence in qualitative analyses (*van der Elst, AIDS Behav 2012*):
  - ‘Complexities of life’
  - Sex work
  - Mobility
  - Alcohol
- Numerous social challenges of pill taking in this population:
  - Stigma
  - Perception of being HIV+

Slide 4

ES1 social challenges such as stigma, roumours and relationship difficulties as perceived being HIV positive

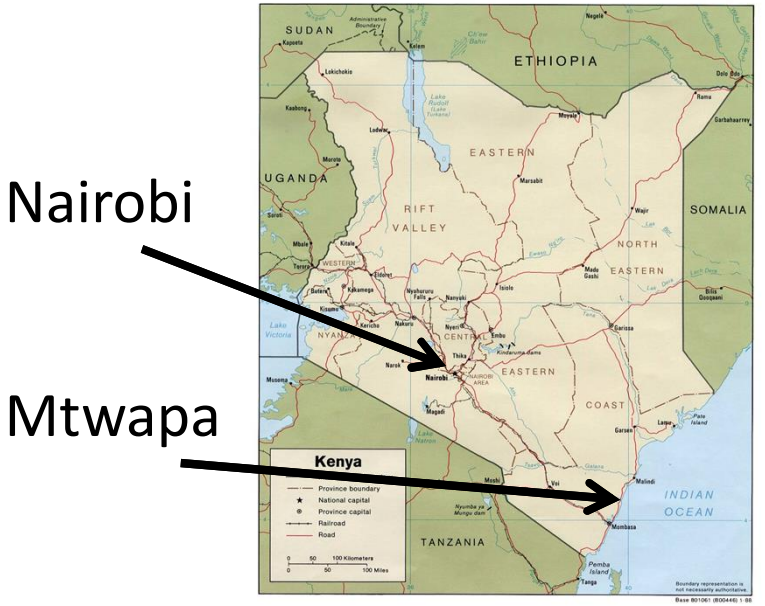
Eduard Sanders, 5/22/2013

Methods

- PrEP: oral emtricitabine/tenofovir
- Study design: randomized (2:2:1:1)

Daily (active)	Intermittent (active)	Daily (placebo)	Intermittent (placebo)

- Study population
  - MSM
  - FSW (not included)



Methods

- Followed monthly for 4 months
  - Distribution of PrEP
  - Downloading adherence data from the medication event monitoring system (MEMS)
  - Questionnaires
    - Socio-demographics, sexual behavior, substance use
    - Time line follow back for adherence and sexual behavior
  - Safety assessments
- SMS for adherence to post-coital dosing

Analysis

- Assessment of overall adherence
- Assessment of factors associated with adherence by linear, repeated measures multivariable regression analyses
  - Adherence to daily + adherence to Mon/Fri dosing combined as percentages
  - Post-coital doses not included in this analysis
  - Model includes factors found significant ($p<0.10$) on univariable analysis
  - Effect values indicate percentage point differences

Results
Enrollment characteristics

Characteristic	Daily group	Intermittent group
# Participants	29	33
Male gender	100%	100%
Mean age in years (range)	26 (20-38)	26 (18-35)
Mean years of education (range)	10 (0-16)	10 (0-15)
Source of income		
Self	62%	61%
Family	24%	15%
No employment	14%	24%
Monogamous, married	0%	6%
Engaged in sex work past month	48%	48%
Men had sex with men past month	83%	88%

No statistically significant differences were found

Participant characteristics during follow-up

Characteristic	Average event rate per month*	
	Daily group	Intermittent group
Any sex	89%	94%
Any occurrence of sex while drunk	36%	44%
Sex with a new partner	65%	65%
<100% condom use with new or HIV+ partners	34%	17%
Involved in transactional sex	63%	63%
Frequent travel	40%	44%
Any alcohol use	54%	69%
Any drug use	40%	52%

* Based on events reported for 114 and 126 follow-up months for daily and intermittent groups, respectively

Select characteristics shown

Adherence

Dosing regimens (MEMS)	Daily	Intermittent, Fixed	P Value
Active	80 (62-87)	56 (31-88)	0.07
Placebo	82 (63-95)	44 (19-72)	0.04
Overall	80 (63-88)	56 (28-78)	0.01

Post-coital adherence difficult to assess due to highly discrepant results (Mutua, 2012)

Adherence measure		Sexual behavior		Adherence
MEMS	Self-report	SMS	Self-report	
X		X		26%
X			X	33%
	X	X		105%
	X		X	100%

Analysis focuses on fixed/intermittent dosing; sensitivity analyses are underway using both SMS and self-reported sexual behavior

Factors associated with MEMS adherence

Factor	Estimate	P Value
Daily dosing regimen	18.42	0.003
Source of income		0.01
Self	21.74	
Family	26.19	
No employment	Reference	
Sex with a new partner*	9.54	0.01
Involved in transactional sex*	-13.18	0.003
Frequent travel*	- 5.75	0.07
Time (per study month)*	- 3.35	0.02

* Time-varying covariate (measured monthly)

Model includes above + any sex while drunk (non-significant)

Factors associated with MEMS adherence

Factor	Estimate	P Value
Daily dosing regimen	18.42	0.003
Source of income		0.01
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Family	26.19	
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Interactions were not significant

Given the large effect of dosing regimen and potential for difference in associated factors, stratified analyses were performed

Factors associated with MEMS adherence- stratified by dosing regimen

	Daily only		Intermittent only	
Factor	**Estimate**	**P Value**	**Estimate**	**P Value**
Source of income				0.02
Self			23.49	
Family			41.11	
No employment			Reference	
Sex with a new partner*			11.81	0.01
Frequent travel*	- 10.86	0.01		
Any occurrence of sex while drunk*	- 9.52	0.06		
Time (per study month)*			- 4.45	0.04
Involved in transactional sex*			- 16.66	0.01

* Time-varying covariate (measured monthly)

Model for daily MEMS includes above + source of income, any alcohol use, time per study month (non-significant)

Model for intermittent MEMS includes above + years of education (non-significant)

Factors associated with MEMS adherence- stratified by dosing regimen

	Daily only		Intermittent only	
Factor	**Estimate**	**P Value**	**Estimate**	**P Value**
Source of income				0.02
Self			23.49	
Family			41.11	
No employment			Reference	
Sex with a new partner*			11.81	0.01
Frequent travel*	- 10.86	0.01		
Any occurrence of sex while drunk*	- 9.52	0.06		
Time (per study month)*			- 4.45	0.04
Involved in transactional sex*			- 16.66	0.01

* Time-varying covariate (measured monthly)

ES2

Conclusions

- Data confirm the qualitative findings
- Adherence interventions should address challenges related to
  - Sex work
  - Mobility
  - Alcohol
  - Long-term PrEP use
- High risk population that will require support
- Unclear how best to reach and delivery PrEP to MSM in Kenya and other settings

Slide 15

ES2 You miss one of the most important challenges.. that is social impact (e.g. stigma, gossip, pill taking, perception being positive, etc)
Eduard Sanders, 5/22/2013

Conclusions

Å Factors appear to differ by dosing regimen

- Daily dosing:
  - ÅTravel
  - ÅAlcohol
- Intermittent dosing:
  - ÅSex work
  - ÅNew sexual partners
  - ÅSteady income
  - ÅTime on PrEP

Å May be due to the different behaviors and lifestyle requirements for each regimen

Limitations

- Small sample size
- MEMS is an imperfect measure
  - Potential for curiosity openings and pocket dosing
  - Pocket dosing (or key chain holders) may have caused disproportionate misclassification with intermittent dosing
  - Sensitivity analyses with post-coital dosing pending
- Other factors (e.g. depression) may be important, but were not measured
- Type of adherence assessment could have impacted recall and reporting of risk factors

Conclusions

- As researchers consider less frequent dosing (e.g. depot, vaginal rings) to decrease adherence challenges, careful assessment of adherence behavior will be needed
- Less frequent dosing ≠ better adherence

Acknowledgements

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- Study staff in Nairobi and Mtwapa, Kenya
- Study participants