



Sciences Economiques et Sociales de la Santé
& Traitement de l'Information Médicale

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August EUBANKS

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Impact of pre-exposition prophylaxis (PrEP) in a combined prevention package for men who have sex with men (MSM) in West Africa

Décembre 2020



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Impact of pre-exposition prophylaxis (PrEP) in a combined prevention package for men who have sex with men (MSM) in West Africa

August EUBANKS

PhD Candidate (3rd year)

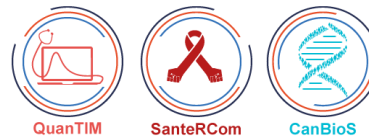
ANRS 12369 B105



Sciences Economiques et Sociales de la Santé & Traitement de l'Information Médicale
Inserm / IRD / Université AIX-MARSEILLE



SESSTIM Seminar - 4th December 2020



Context

- **HIV in West Africa**

- Mixed epidemic, variable prevalence
 - General population (1-3%) vs MSM (15-20%)

- **MSM discrimination**

- Limited access to HIV care and prevention

- **Heterogeneous MSM profile = different HIV exposures**

- **Comprehensive sexual health interventions for MSM**

- ↑ Participation and Engagement & ↓ Risky sexual behavior
- **BUT** not enough to reduce HIV infection and transmission over the long term



PrEP : biomedical prevention tool

- **Antiretroviral treatment to be taken before HIV exposition**

- Daily = once a day
- Event-driven = 2+1+1

- **Proven efficacy**

- Daily PrEP: iPrEX (44%) and PROUD (86%)
- Event-driven PrEP: Ipergay (86%)

- **Recommended use (WHO)**

- For MSM since 2014
- For high risk populations since 2015



Research questions : PrEP scale-up in W. Africa

- **Access remains difficult for MSM...**
- **Impact on sexual behaviors and feasibility in this context?**
 - Risk compensation, condom migration
 - Adherence, retention
 - Lack of studies and longitudinal data
- **Could the introduction of PrEP help reach MSM who are less involved in community associations?**
 - Marginalized MSM?
 - MSM at high risk of HIV exposure?

Previous study : CohMSM (ANRS 12324 – Expertise France)

- **Interventional cohort offering a community-based MSM-tailored prevention package in W. Africa**

- **Principal results**

- Risky sexual behaviors (transactional sex, condomless intercourse)
- High HIV incidence (10/100 person-years)
- High adherence to quarterly follow-up (77%)
- 87% declared interest for PrEP

= Eligible population for PrEP !

Next step: CohMSM-PrEP (ANRS 12369 – Expertise France)

• Where?

- Mali (Bamako), Cote d'Ivoire (Abidjan), Burkina Faso (Ouagadougou), and Togo (Lomé)

• Who?

- 18 years or older, reporting at least one episode of anal intercourse with a man in the 6 months prior to enrollment and at high risk of HIV exposure or wanted to take PrEP



• How?

- Recruited directly from CohMSM
- Identified by peer-educators (PE) through a specific network of community-based organizations
 - MSM attending clinics/prevention activities
 - Peer-educator networks (friends, partners)
 - Outreach via local LGBT organizations

Methods

- **Quarterly follow-up**

- Free clinical exams, HIV testing, STI screening/treatment
- PrEP (daily or event-driven)
- Condom and lubricant distribution

- **Prevention counseling by PE**

- Risk reduction
- Use of prevention tools
- PrEP adherence or changing strategy/stopping PrEP

- **Quantitative data collection**

- Sociobehavioral

- Face to face questionnaires administered every 3 months by trained research assistants
- Ex: individual characteristics, sexual behaviors, psychosocial aspects, etc.

- Clinical

- Standardized medical file filled in by medical staff at each visit
- Ex: PrEP strategy, HIV/STI testing results, etc.

Thesis objectives

- **General**

- Study the impact of PrEP on the sexual behavior and psychosocial perception of CohMSM-PrEP participants

- **Specific**

1. Determine whether the introduction of PrEP as an additional prevention tool influenced the type of participant signing up for CohMSM-PrEP
2. Describe sexual behavior, PrEP adherence and combined prevention strategies in CohMSM-PrEP, and determine whether these factors changed over time
3. Estimate the attrition rate in CohMSM-PrEP and identify the factors associated with loss to follow-up
4. Understand the onset of an HIV seroconversion despite the offer of PrEP

1. Determine whether the introduction of PrEP as an additional prevention tool influenced the type of participant signing up for CohMSM-PrEP

IMPLEMENTATION SCIENCE



Reaching a Different Population of MSM in West Africa With the Integration of PrEP Into a Comprehensive Prevention Package (CohMSM-PrEP ANRS 12369—Expertise France)

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Downloaded from <http://journals.lww.com/jaids>

Study design: Cross-sectional analysis @baseline

- **Outcome → CohMSM-PrEP participant type**

- “CohMSM” - recruited directly from CohMSM (=0)
- “New” – never participated in CohMSM (=1)

- **Covariates**

- Sociodemographic/socioeconomic characteristics, MSM identity, sexual behaviors, psychosocial factors

- **Statistical analysis**

- Descriptive → chi2 (categorical variables), non-parametric equality-of-medians test (continuous variables)
- Inverse propensity score weighting (IPSW) to correct for sampling bias : age, country and education
- Logistic regression
 - All covariates with p-value ≤ 0.25 in univariate analysis eligible for multivariate model
 - Final model selected by AIC using R's « step.AIC » backwards stepwise algorithm

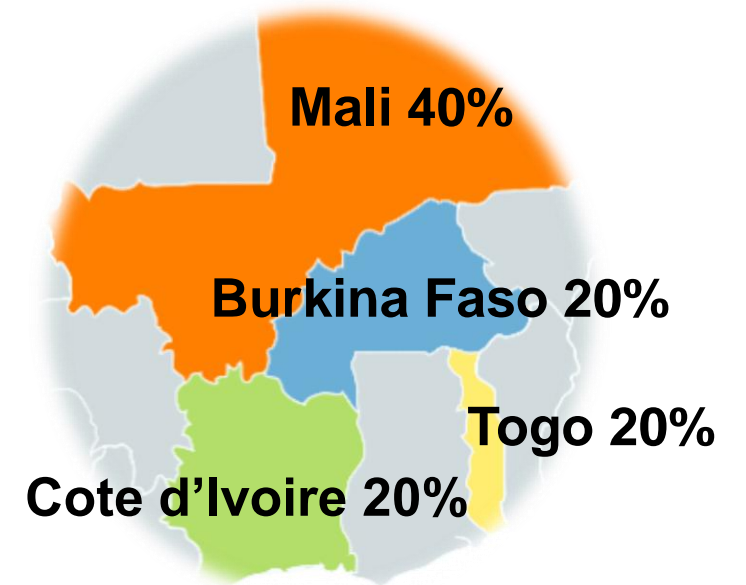
Sample characteristics (n=524)

Who are the CohMSM-PrEP participants?

- Mean age = 26 years
- 59% participated in CohMSM
- 41% are “new” participants

In the last 3 months...

- 49% had at least 2 male sexual partners
- 51% had male and female partners
- 15% had condomless receptive anal intercourse



Results – Logistic regression

“New” participants are...

↑ Financially unstable

↑ Alone

↓ Members of community associations

↓ Out

Reference = CohMSM, Standardized IPSW performed for age, city, and education level

↑ = More
↓ = Less

Table 1. Univariate and multivariate analysis of factors associated with being a new participant in CohMSM-PrEP, n=522.

Variable	Unadjusted OR [95% CI], p-value	aOR [95% CI], p-value
Perceive financial situation as comfortable or just enough	0.37[0.25,0.54], <0,001	0.34[0.22,0.52], <0,001
Member of a LGBT and or HIV/AIDS association	0.59[0.32,1.11], 0,102	0.41[0.21,0.80], 0,009
"Out" to at least one member of family	0.72[0.48,1.07], 0,106	0.56[0.35,0.90], 0,016
Feels alone	2.43[1.63,3.61], <0,001	2.01[1.28,3.16], 0,003

Results cont – Logistic regression

“New” participants have...

↑ More female partners of unknown status

↑ Sexual violence

↓ Condom use

↓ Less intercourses with female partners

Reference = CohMSM, Standardized IPSW performed for age, city, and education level

* = previous 3 months, ** = previous month

↑ = More
↓ = Less

Table 1. Univariate and multivariate analysis of factors associated with being a new participant in CohMSM-PrEP, n=522.

Variable	Unadjusted OR [95% CI], p-value	aOR [95% CI], p-value
Primary female partner of unknown HIV status	1.42[0.91,2.22], 0,124	1.85[1.09,3.13], 0,022
Victim of intimate partner violence	2.09[1.18,3.71], 0,012	2.03[1.04,3.96], 0,037
Non-systematic use of condoms with male partner(s)*	1.83[1.25,2.70], 0,002	2.33[1.42,3.84], 0,001
5+ intercourses with primary female partner**	0.44[0.20,0.96], 0,038	0.58[0.35,0.97], 0,001
1-4 intercourses with primary female partner**	0.65[0.41,1.01], 0,056	0.58[0.35,0.97], 0,036

Discussion

- **New participants differed from CohMSM participants**

- More vulnerable and marginalized profile
 - Less financially stable
 - High risk of HIV exposure
 - Socially isolated, including within MSM community
- Even after reducing sampling bias with IPSW

- **Limits**

- Not representative of overall local MSM population
- Social desirability bias
- Cross-sectional nature of analysis

Conclusion

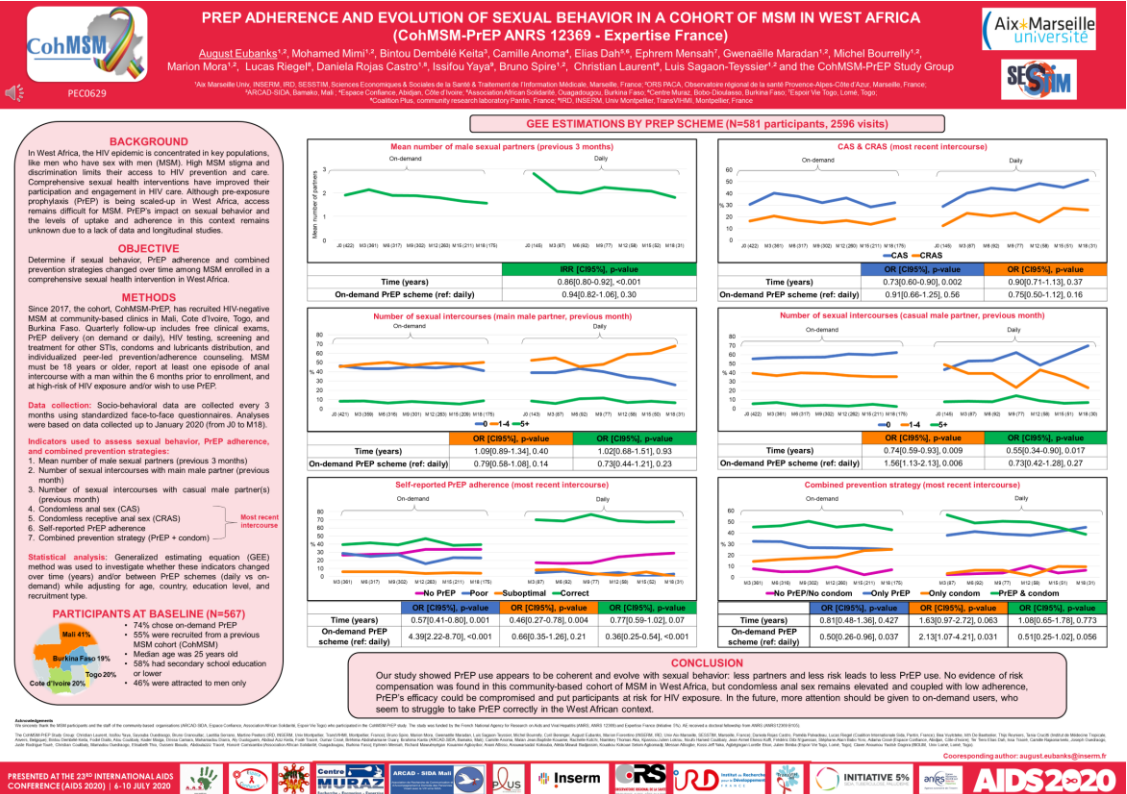
Introduction of **PrEP** as an additional prevention tool, and the use of **peer-based outreach services** over time, influenced the type of participant signing up for an existing community-based HIV prevention cohort in West Africa.

Adding these **two prevention elements** to existing interventions in Sub-Saharan Africa could be the key to **reaching MSM subpopulations** marginalized from HIV prevention and care programs, as part of an overall mission towards sustainably **reducing the risk of HIV infection** in this key population.

2. Describe sexual behavior, PrEP adherence and combined prevention strategies in CohMSM-PrEP, and determine whether these factors changed over time

Evolution of sexual behavior and pre-exposure prophylaxis adherence in a community-based cohort of men who have sex with men in West Africa (CohMSM-PrEP ANRS 12369 - Expertise France)

To be submitted to JIAS



Study design: Longitudinal analysis, M0-M24

• Outcomes

1. Mean number of male partners *
2. Number of sexual intercourses with main male partner **
3. Number of sexual intercourses with casual male partner(s) **
4. Condomless anal sex (CAS) ***
5. Condomless receptive anal sex (CRAS) ***
6. Self-reported PrEP adherence ***
7. Combined prevention strategy ***

• Covariates

- Time since study entry (years, continuous)
- PrEP regimen (event-driven, daily, no PrEP)

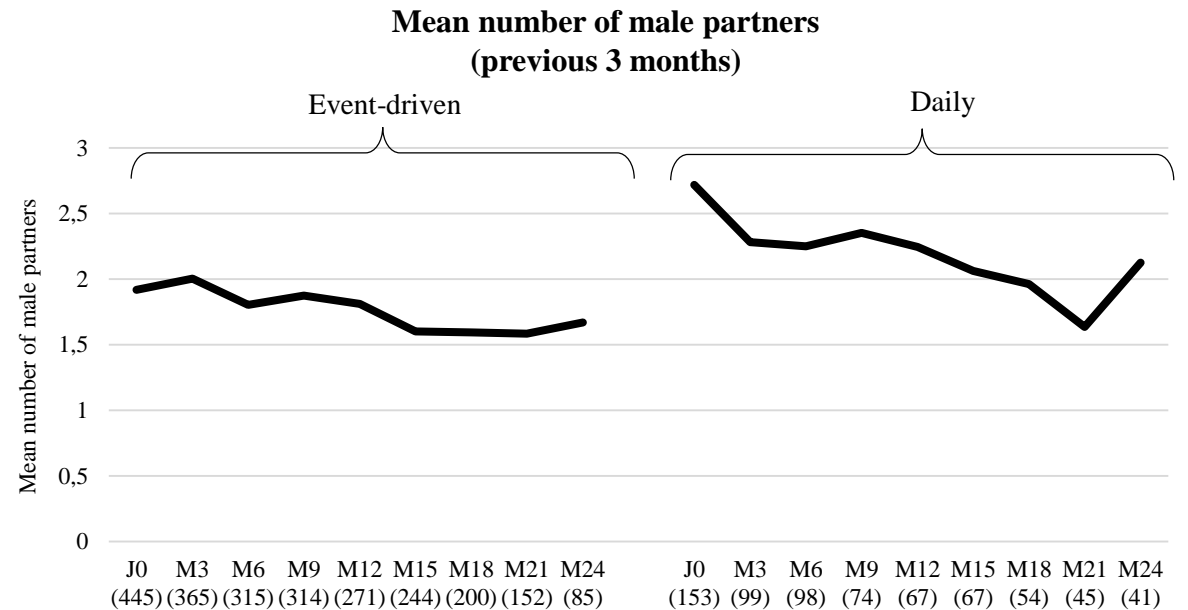
• Statistical analysis

- Descriptive → chi2 (categorical variables), t-test (continuous variables) measure changes in outcomes between M0 and M24
- Generalized estimating equation (GEE) method to investigate whether the outcomes changed over time, between PrEP regimens and the interaction between time and PrEP regimen
 - Continuous outcome → Negative binomial
 - Dichotomous outcomes → Binary logistic
 - Categorical outcomes (2+) → Multinomial logistic
- Adjusted for age, city, education level and recruitment type
- Best fit model chosen using QIC

Results – GEE, Sexual behavior

↓ Number of partners (M)

– IRR [95% CI], p-value; 0.87 [0.82-0.92], <0.001



Results – GEE, Sexual behavior

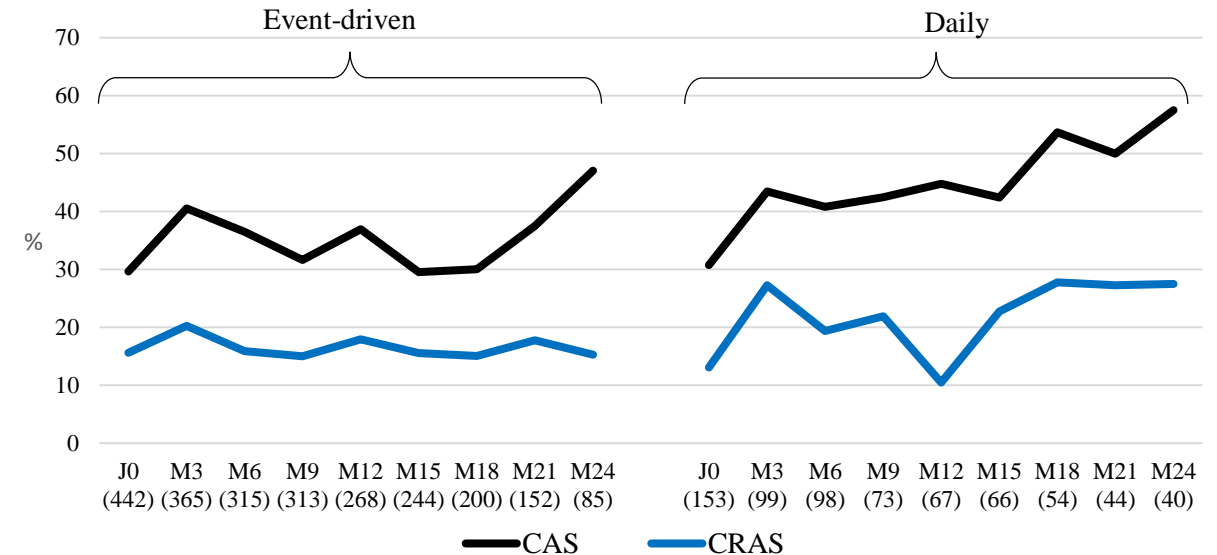
≠ Change in CAS or CRAS

– CAS, p-value = 0.711; CRAS, p-value = 0.856

↑ CAS (Daily PrEP only)

– OR [95% CI], p-value; 1.45[1.06-1.98], 0.021

Condomless anal sex (CAS) and condomless receptive anal sex (CRAS)
(most recent intercourse)



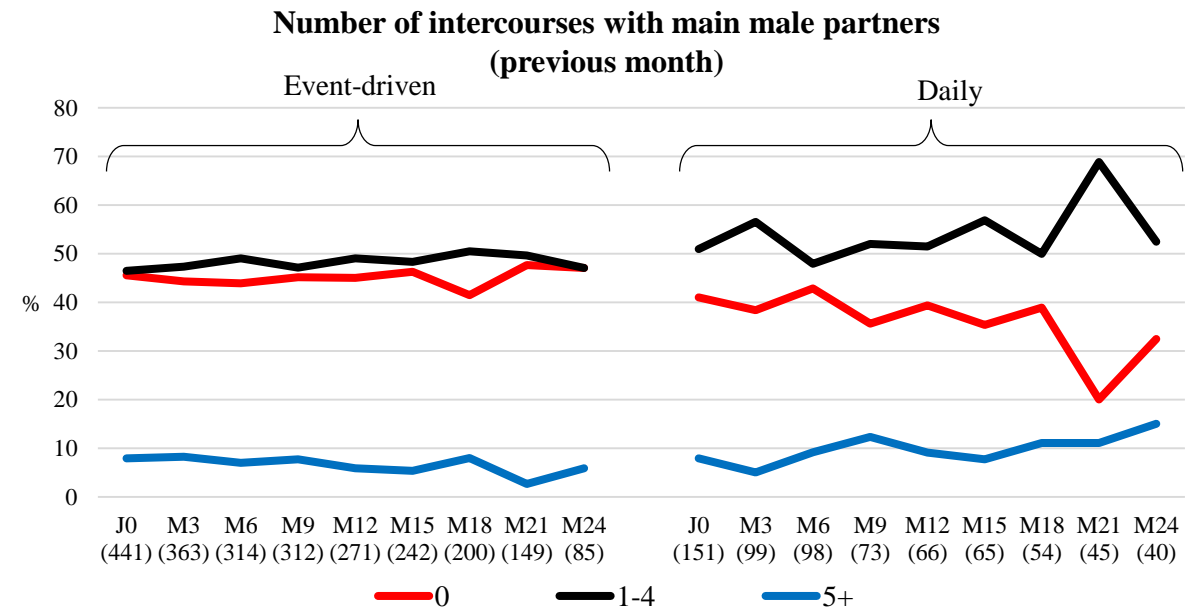
Results – GEE, Sexual behavior

≠ Evolution # intercourses with main male partner

– 1-4, p-value=0.675; ≥ 5 , p-value=0.705

Daily users more likely to have had 1-4 intercourses with main male partners

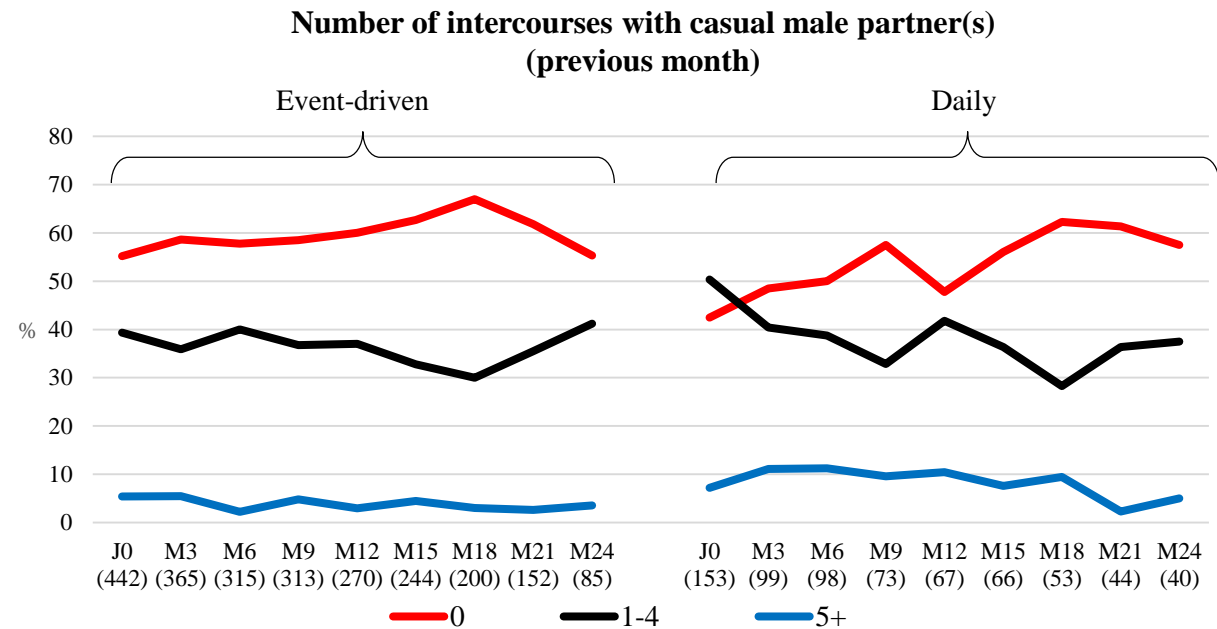
– OR [95% CI], p-value; 1.33[1.01-1.75], 0.044



Results – GEE, Sexual behavior

↓ **1-4 et 5+ intercourses with casual male partner**

- OR [95% CI], p-value; 0.75[0.65-0.87], <0.001
- OR [95% CI], p-value; 0.68[0.51-0.91], 0.011



Results – GEE, PrEP adherence

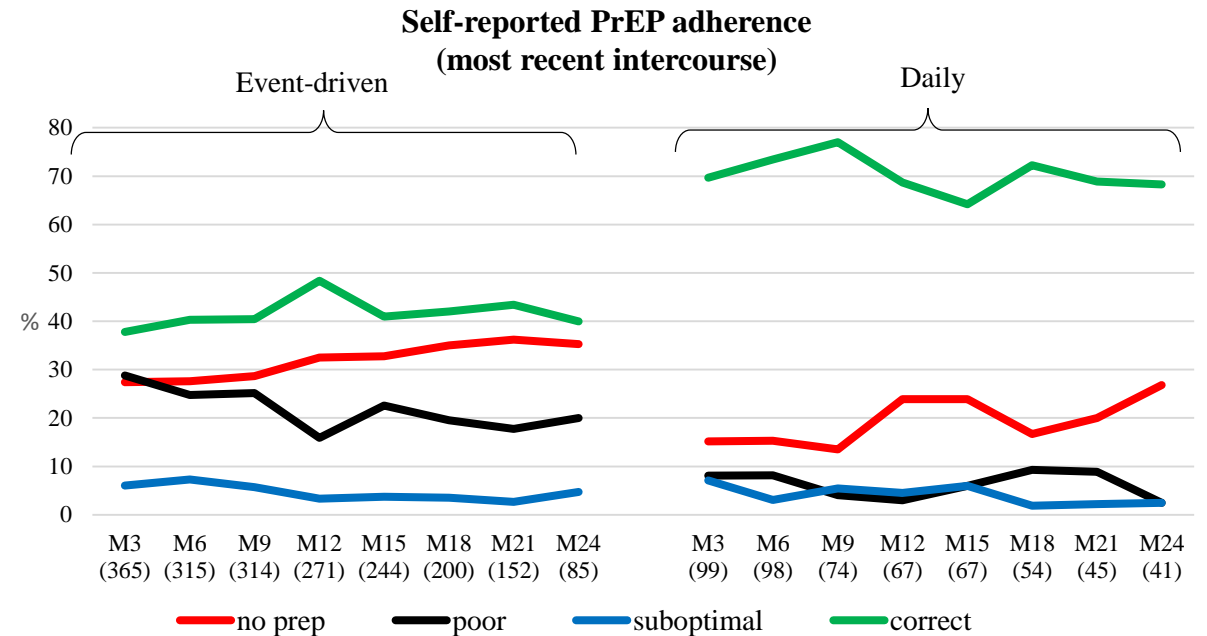
Better daily PrEP adherence vs event-driven

– OR [95% CI], p-value; 3.40[2.34-4.93], <0.001

↓ Poor and suboptimal adherence

– OR [95% CI], p-value; 0.63[0.49-0.81], <0.001

– OR [95% CI], p-value; 0.51[0.33-0.78], 0.002



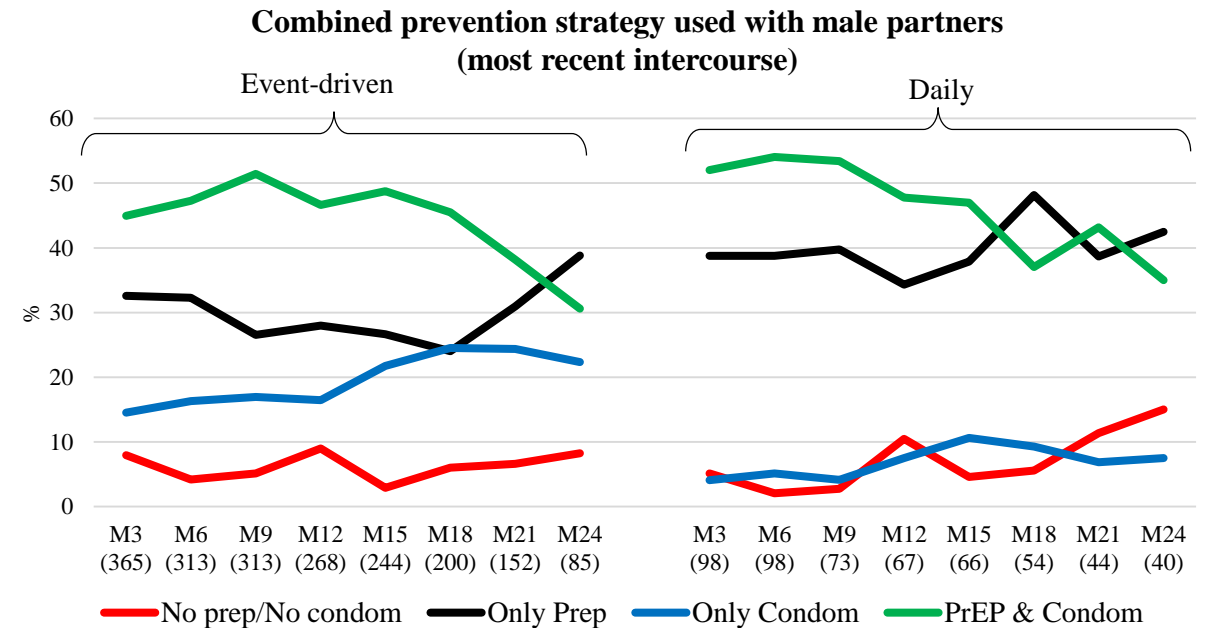
Results – GEE, combined prevention strategy

≠ Change over time

- PrEP & condom, p-value=0.336
- Condom only, p-value=0.347
- PrEP only, p-value=0.247

Daily users less likely to use condoms only

- OR [95% CI], p-value; 0.38[0.20-0.70], 0.002



Discussion

- **Generally, adherence was high**
 - But difficulties for event-driven PrEP use (15/17 seroconversions)
- **No risk compensation**
- **Increased CAS for daily users...BUT**
 - Risk of HIV contamination low
 - High PrEP adherence, decreasing or stable risk behaviors
 - More sex with main partners
- **Despite the prevention offer...**
 - Unprotected sex (i.e. no PrEP or condoms) ↑ from 7% at M0 to 10% at M24
 - No PrEP use ↑ from 25 to 33%.

Conclusion

Globally, **PrEP adherence** appeared to be **optimal**. However, the **event-driven PrEP regimen** needs to be explained in greater detail to participants, as they **struggled** to take it as prescribed.

No evidence of **risk compensation** was found.

Nevertheless, at M24 33% of participants declared **no PrEP use**, and 10% did not use condoms or PrEP during their most recent intercourse. **Studying** these participants and **adapting** the program to better accompany them will be essential for **PrEP's success** in West Africa.

Next steps...

3. Estimate the attrition rate in CohMSM-PrEP and identify the factors associated with loss to follow-up (LTFU)

- Kaplan-Meier technique and log-rank test → Estimate time to LTFU and test for significance between groups.
- Cox proportional hazards regression model → determine predictors of LTFU

4. Understand the onset of an HIV seroconversion despite the offer of PrEP

- 15 semi-directive interviews performed by Zoom with seroconverted participants
- To be analyzed thematically using NVivo

Acknowledgments

