Differences in biological and behavioral HIV risk before, during, and after PrEP use among a national sample of gay and bisexual men in the United States

Jeffrey T. Parsons, PhD[1,2,3]
H. Jonathon Rendina, PhD, MPH[1,2,3];
Thomas H. F. Whitfield, MA[1,2,3]
Christian Grov, PhD, MPH[4];

1. The City University of New York Graduate Center (CUNY)
2. The Center for HIV Educational Studies and Training (CHEST)
3. Hunter College, CUNY
4. The CUNY Graduate School of Public Health and Health Policy

Background

- Pre-exposure prophylaxis (PrEP) has been shown to be as high as 99% effective in the prevention of HIV. However, it does not protect against other sexually transmitted infections (STIs).
- In order to maintain a PrEP prescription users must attend a doctor's visit every three months for blood, HIV, and STI tests.
- Although the CDC recommendations include using other safer-sex methods (e.g. condoms), some researchers have expressed concerns that gay and bisexual men (GBM) who use PrEP will engage in more condomless anal sex (CAS) and acquire/transmit STIs more frequently.
- Other researchers have argued that increases in rates of acquiring and transmitting STIs is not a result of PrEP use, but rather they are diagnosed more frequently because of requirements for quarterly testing.
- There has been little longitudinal data published to support either conclusion.
- We sought to examine rates of CAS and odds of diagnosis with an STI (urethral and rectal gonorrhea and chlamydia) based on participants PrEP status (i.e. prescribed vs. no prescribed) using both between-subject and within-subject comparisons over the course of 2 years.

Methods

- We collaborated with Community Marketing and Insights (CMI) to enroll 1,071 HIV-negative GBM from across the U.S. to participate in our longitudinal study *One Thousand Strong*.
- All participants were 18 or older, biologically male and male-identified, self-identified as gay or bisexual, lived in the U.S., had English comprehension, had internet access, completed both at-home STI and HIV testing kits, and reported having sex with another man in the last year. *For further details, please see the publication below.
- Every 12 months participants were sent testing packages with an instructions pamphlet and a link to an instructional video on how to collect specimen samples for urethral and rectal STI testing. Participants were then asked to both urinate into a cup and swab their rectum using the provided testing materials. Additionally, participants were given an already paid for and addressed box to place their samples in and send to a lab for testing. The lab then provided us with testing results and participants were contacted for all positive results.
- Participants also responded to the question "have you ever been prescribed HIV medication (e.g., Truvada) for use as PrEP?" Possible responses were "no," "yes, but I am no longer prescribed PREP," and "yes, I am currently prescribed PrEP."

*Grov, C., Cain, D., Whitfield, T. H., Rendina, H. J., Pawson, M., Ventuneac, A., & Parsons, J.T. (2016). Recruiting a US National Sample of HIV-Negative Gay and Bisexual Men to Complete at-Home Self-Administered HIV/STI Testing and Surveys: Challenges and Opportunities. *Sexuality Research and Social Policy, 13*(1), 1-21.

Results

Figure 1. Demographic Characteristics of the Sample, N = 1,071

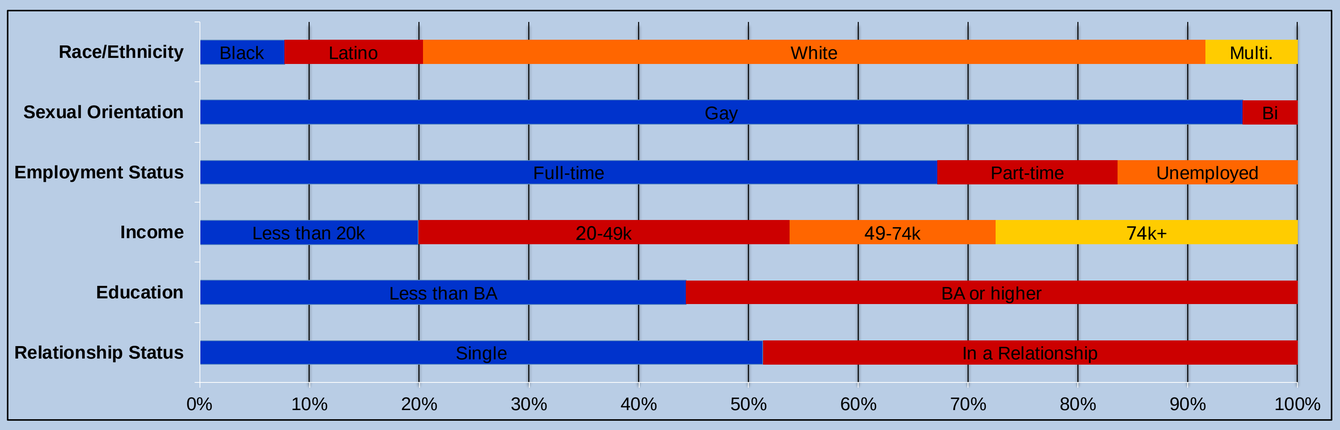
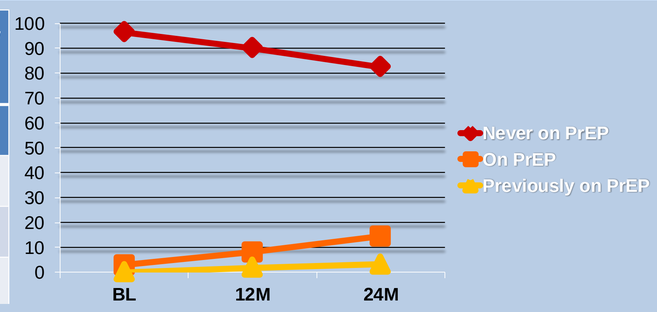


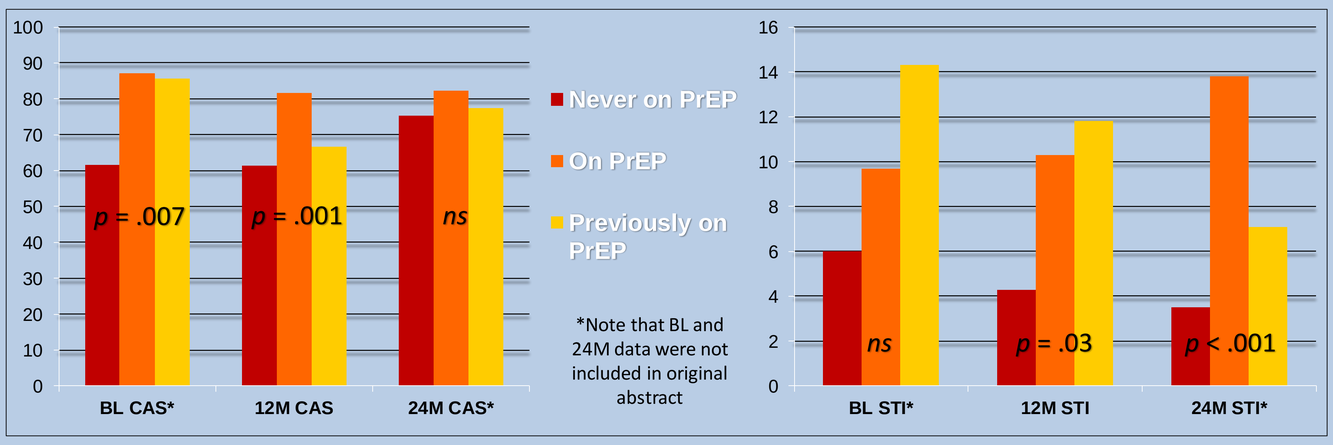
Table 1/Figure 2. PrEP use over time in the 1KS sample

	Never on PrEP		Currently on PrEP		Previously on PrEP	
	n	%	*n*	%	*n*	%
Baseline	1033	96.5	31	2.9	7	0.01
12M	913	90.1	82	8.1	18	1.8
24M	810	82.5	141	14.4	31	3.2



- As shown in **Table 1** and **Figure 2**, we observed an increase in both PrEP uptake and PrEP discontinuation over time.
- **Figure 3** presents between-groups comparisons of reporting <u>any CAS</u> with casual partners and receiving a positive rectal/urethral STI diagnosis by PrEP group across the three time points. Findings were mixed—there were significant differences in reporting any CAS between groups at BL and 12M with those on PrEP being the highest risk in both cases, and there were significant differences at both 12M and 24M in STI prevalence, with those never on PrEP being lowest at both time points.

Figure 3. Prevalence of CAS with casual partners and STI infection by PrEP status



- We conducted a series of within-group mixed models to examine how movement onto and off of PrEP influenced risk *only among those who had been on PrEP* at some time in the study (*n* = 190; person-visits = 527).
  - Compared to visits when they were not on PrEP, we saw a significant increase in the <u>rate*</u> of casual CAS during visits when men were actively on PrEP (ARR = 2.52, $p < .001$), and a slight but non-significant decrease once they had discontinued PrEP (ARR = 0.88, $p = 0.76$). We found that this effect of behavior change while on PrEP was particularly strong when looking at receptive CAS with HIV-positive partners (ARR = 12.38, $p < 0.001$). **Abstract presented findings with risk analyzed as dichotomous*
  - Compared to visits when they were not on PrEP, we saw slight but non-significant increases in the odds of STI diagnosis during visits when men were actively on PrEP (AOR = 1.58, $p = .10$) and once they discontinued PrEP (AOR = 1.22, $p = .70$).

Conclusions

- Using between-subjects comparisons of all participants, we found some evidence that GBM on PrEP have higher levels of both behavioral and biological risk, though findings were mixed when examining multiple time points.
- Using within-subjects comparisons over time among only those who had been on PrEP during at least one of the three visits, we found that the rate of CAS increased while on PrEP but returned to pre-PrEP levels after discontinuation. Further, we did not see a statistically significant increase in odds of STI infection.
- PrEP is intended for individuals who are at substantial risk for HIV acquisition and these results show that PrEP is indeed being utilized by GBM that are at higher risk. The absence of significant evidence for within-person increases in STI risk while on PrEP coupled with the highly effective HIV-protective effects of PrEP may help to limit concerns about the increased rates of CAS while using PrEP, particularly given its return to baseline levels upon discontinuation.
- These findings support a nuanced view of how behavioral and biological risk for HIV and other STIs is influenced by PrEP use and suggest directions for future research.
- This sample is limited by the fact that men who are former or current users of PrEP are considered early adaptors. Further research is needed to determine behavioral differences in larger samples of men who may be engaging in lower levels of HIV risk behavior at the time of PrEP initiation.

Contact Information:
Jeffrey T. Parsons
142 West 36th Street, 9th Floor
New York, NY 10018
jparsons@chestnyc.org

Funding Information:
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Principal Investigators -
Dr. Jeffrey T. Parsons
& Dr. Christian Grov

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