

# HIV Preexposure Prophylaxis: Adherence and Discontinuation in Clinical Practice

Julia L. Marcus<sup>1</sup>, Leo B. Hurley<sup>1</sup>, C. Bradley Hare<sup>2</sup>, Dong Phuong Nguyen<sup>2</sup>, Tony Phengrasamy<sup>2</sup>, Michael J. Silverberg<sup>1</sup>, Jonathan E. Volk<sup>2</sup>

<sup>1</sup>Division of Research, Kaiser Permanente Northern California, Oakland, CA; <sup>2</sup>San Francisco Medical Center, Kaiser Permanente Northern California, San Francisco, CA

## Background

- ❖ Low adherence or early discontinuation may reduce the effectiveness of tenofovir/emtricitabine (TDF/FTC) preexposure prophylaxis (PrEP) in clinical practice

## Methods

### ❖ Study population and design

- Cohort study of Kaiser Permanente Northern California members initiating PrEP, July 2012 – December 2014
- Follow-up defined as days from PrEP initiation until earliest of discontinuation, health plan disenrollment, HIV seroconversion, death, or June 30, 2015

### ❖ Data sources

- Electronic health record, HIV registry, and U.S. census

### ❖ Outcomes

- 1) Pharmacy refill adherence, calculated by subtracting days without TDF/FTC in possession from total days between first fill and end of follow-up, and dividing by total days of follow-up, among patients with  $\geq 2$  fills
  - Low adherence defined as <60%, consistent with taking fewer than 4 of 7 doses per week
- 2) Discontinuation, defined as  $\geq 120$  days without TDF/FTC
- 3) HIV seroconversions during and after PrEP use

### ❖ Statistical analysis

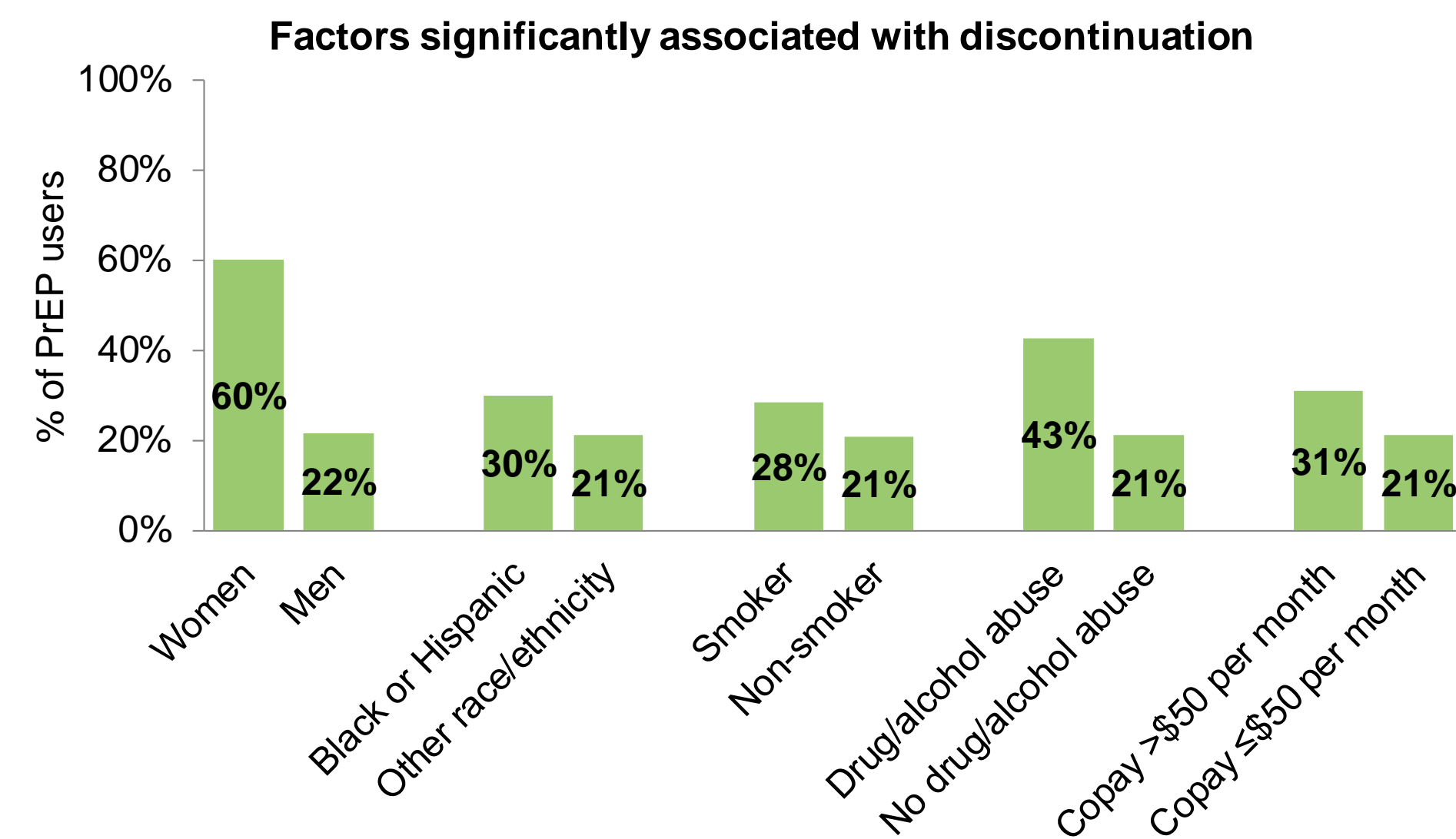
- Chi-square tests to compare low adherence and discontinuation by subject characteristics
  - Adherence: Evaluated age, gender, race/ethnicity, census-based socioeconomic status (SES) measures, average TDF/FTC copay per month, smoking, rectal sexually transmitted infection (STI) in prior 2 years, and drug/alcohol abuse diagnosis in prior 2 years
  - Discontinuation: In addition to the above variables, evaluated hypertension and diabetes in prior 2 years and baseline estimated glomerular filtration rate (eGFR)
- Multivariable log-binomial regression to estimate risk ratios

## Results

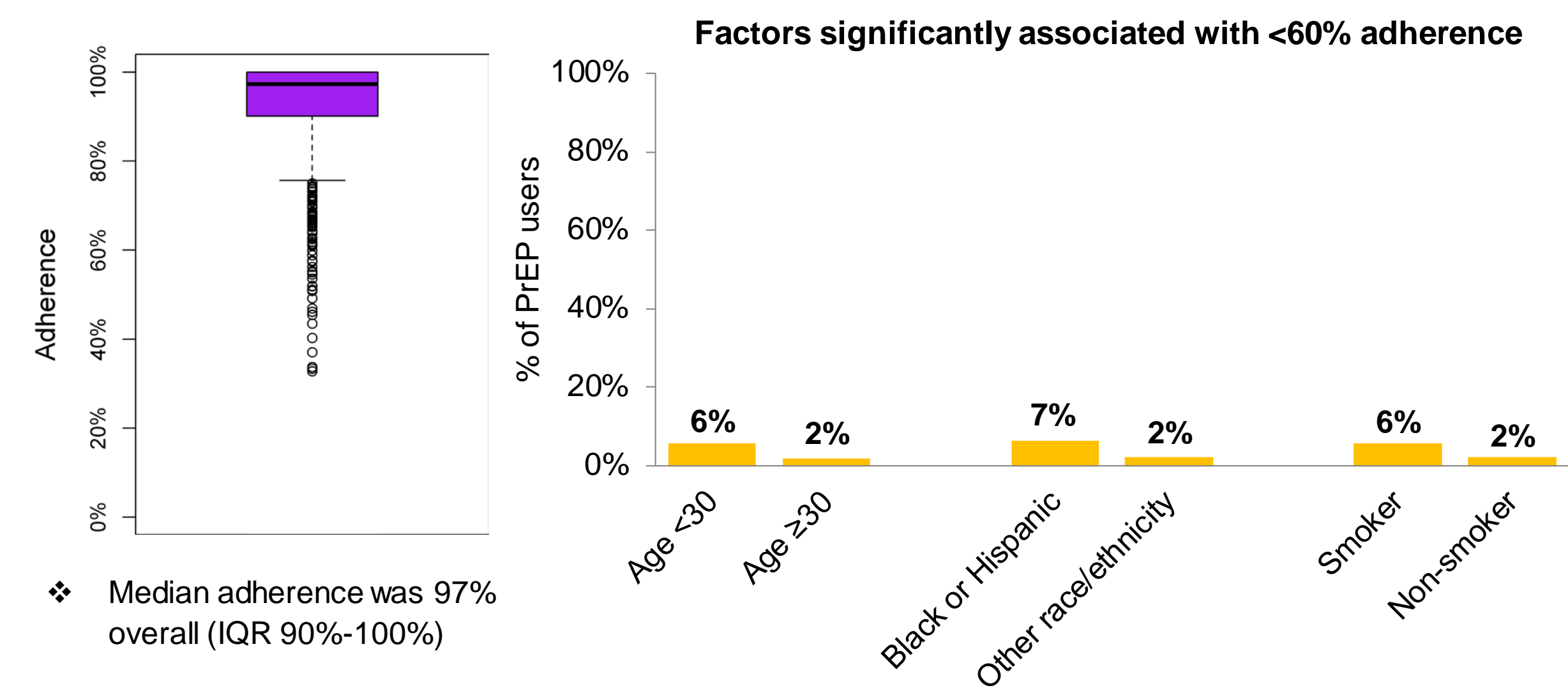
### 1. Cohort characteristics

N	972
Person-years on PrEP (median/subject)	850 (0.8)
Age, median (IQR)	36 (29-45)
% Men	98
% White / Black / Hispanic / Asian	70 / 4 / 12 / 10
TDF/FTC copay per month (USD), median (IQR)	23 (15-30)
% without high school diploma in census block, median (IQR)	3 (0-8)
Household income in census block (USD), median (IQR)	77,083 (54,536-99,231)
% Current smoking	23
% Baseline eGFR <80 mL/min/1.73m <sup>2</sup>	15
% Any STI, prior 2 years	33
% Rectal STI, prior 2 years	12
% Drug/alcohol abuse, prior 2 years	6
% Hypertension, prior 2 years	11
% Diabetes, prior 2 years	3

### 3. Discontinuation



### 2. Adherence



- ❖ Overall, 27 (3%) had <60% adherence
- ❖ Younger age ( $P=0.005$ ), Black/Hispanic race/ethnicity ( $P=0.007$ ), and smoking ( $P=0.009$ ) were associated with <60% adherence in chi-square analysis
- ❖ The rare outcome of low adherence precluded multivariable analysis

### Factors independently associated with discontinuation

	Risk ratio*	(95% CI)	P
Women	2.1	(1.4-3.2)	<0.001
Drug/alcohol abuse	1.6	(1.1-2.2)	0.005
TDF/FTC copay >\$50 per month	1.4	(1.0-1.9)	0.046

\* Risk ratios adjusted for age, gender, race/ethnicity, SES, copay, smoking, rectal STI, drug/alcohol abuse, eGFR, hypertension, and diabetes

- ❖ Overall, 219 (23%) discontinued
- ❖ Women ( $P<0.001$ ), Black/Hispanic race/ethnicity ( $P=0.017$ ), smoking ( $P=0.017$ ), drug/alcohol abuse ( $P<0.001$ ), and copay >\$50 per month ( $P=0.035$ ) were associated with discontinuation in chi-square analysis
- ❖ Only gender, drug/alcohol abuse, and copay remained associated with discontinuation in multivariable analysis

### 4. HIV seroconversions

- ❖ No seroconversions during 850 person-years of PrEP use
- ❖ Two seroconversions in Black and Hispanic men aged <30 years who had discontinued PrEP

## Summary and Conclusions

- ❖ Adherence was very high, which is consistent with the lack of HIV seroconversions among those who continued to use PrEP
- ❖ Younger age, Black or Hispanic race/ethnicity, and smoking were associated with <60% adherence, while women, individuals with drug/alcohol abuse, and individuals with higher copays for PrEP were more likely to discontinue
- ❖ Given two seroconversions after PrEP discontinuation, there is a critical need for strategies to support continuation of PrEP throughout periods of HIV risk