

An online survey for
HIV behavioral surveillance in Washington:
Findings and methodological insights

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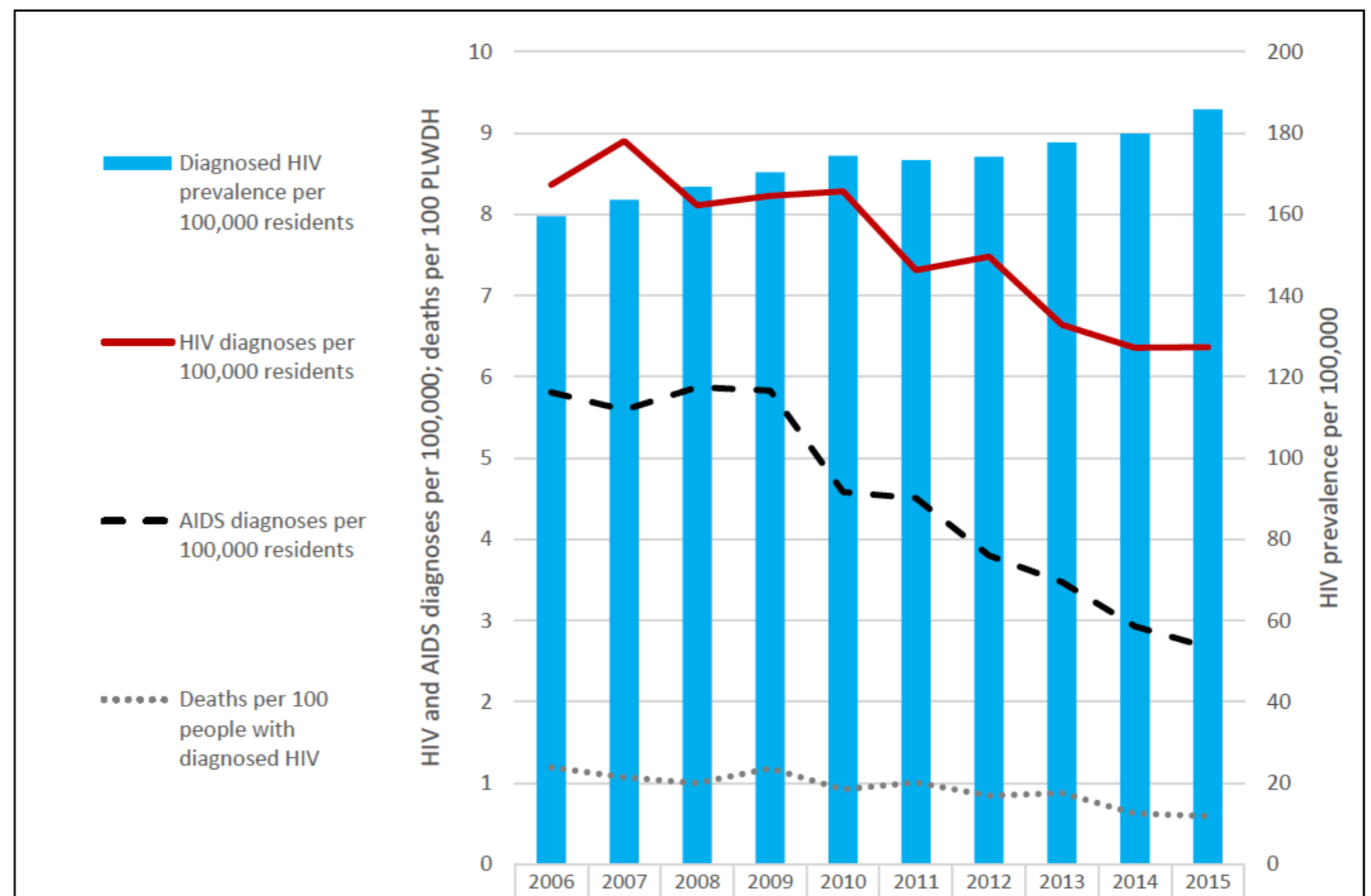
Outline

- Washington HIV epidemiology and prevention
- Approach
- Findings and methodological insights
- Limitations
- Conclusions and next steps
- Questions

Background

The Washington HIV epidemic

- 86% of cases are male
- 70% of cases are MSM
- King county has met the WHO 90-90-90 target
- 24% decline in the rate of diagnoses 2006-2015



Background

HIV pre-exposure prophylaxis (PrEP)

- Antiretroviral agents used *prior to exposure* to prevent HIV infection
- Shown to reduce the risk of infection **>90%** with high adherence (Anderson et al. 2012)
- Truvada (oral TDF/FTC) was approved for use in high-risk groups in the United States in 2012

Washington was among the first states to implement a drug assistance program to reduce financial barriers to PrEP

Background

PrEP implementation questions

- How many people in Washington are priority candidates for PrEP use?
- How are they distributed across the state?
- How many of those at high risk have been prescribed PrEP?
- What are the primary barriers to PrEP uptake and retention?
- What is the potential population-level impact of PrEP on HIV transmission?
- Will PrEP use lead to changes in sexual behavior and STI transmission?

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Background

Sources of data on PrEP in WA

Source	Measures
Seattle Pride Survey	<ul style="list-style-type: none">• Sexual behavior, STI history, and drug use• PrEP awareness; use (ever and past 12 months); clinic; costs; adherence; risk compensation; barriers
National HIV Behavioral Surveillance (NHBS)	<ul style="list-style-type: none">• Sexual behavior, STI history, and drug use• PrEP awareness; willingness; use in the past 12 months
PHSKC STD Clinic records	<ul style="list-style-type: none">• Sexual behavior, STI history, and drug use• PrEP use; risk compensation
Partner Services Records	<ul style="list-style-type: none">• Sexual behavior, STI history, and drug use• PrEP use (current)• Among those prioritized for PrEP: PrEP uptake, adherence, motivations and barriers
Drug assistance program enrollment and prescription records	<ul style="list-style-type: none">• Number using PrEP through these programs; discontinuation
Provider surveys	<ul style="list-style-type: none">• Number of residents prescribed PrEP; provider experience discussing and prescribing PrEP; barriers to PrEP provision

Background

- New systems of data collection are needed to monitor progress towards meeting public health objectives
 - Awareness, interest in, indications for, and use of PrEP
 - Access to health care, in particular HIV testing
 - HIV risk behavior
 - HIV-related disparities
 - Stigma

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statewide

low cost

efficient

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- Collaboration between the Washington State Department of Health, Public Health-Seattle & King County, and the University of Washington

Approach

- Cross-sectional online survey
- Target population: HIV-negative men and TGW who have sex with men in Washington State

Eligibility criteria

Age 16 and older

Male sex at birth

Residence in Washington

Oral or anal sex with a man in the
past 12 months

Never tested positive for HIV

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Updated eligibility criteria

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address in the US**
Oral or anal sex with a man **ever**
Never tested positive for HIV

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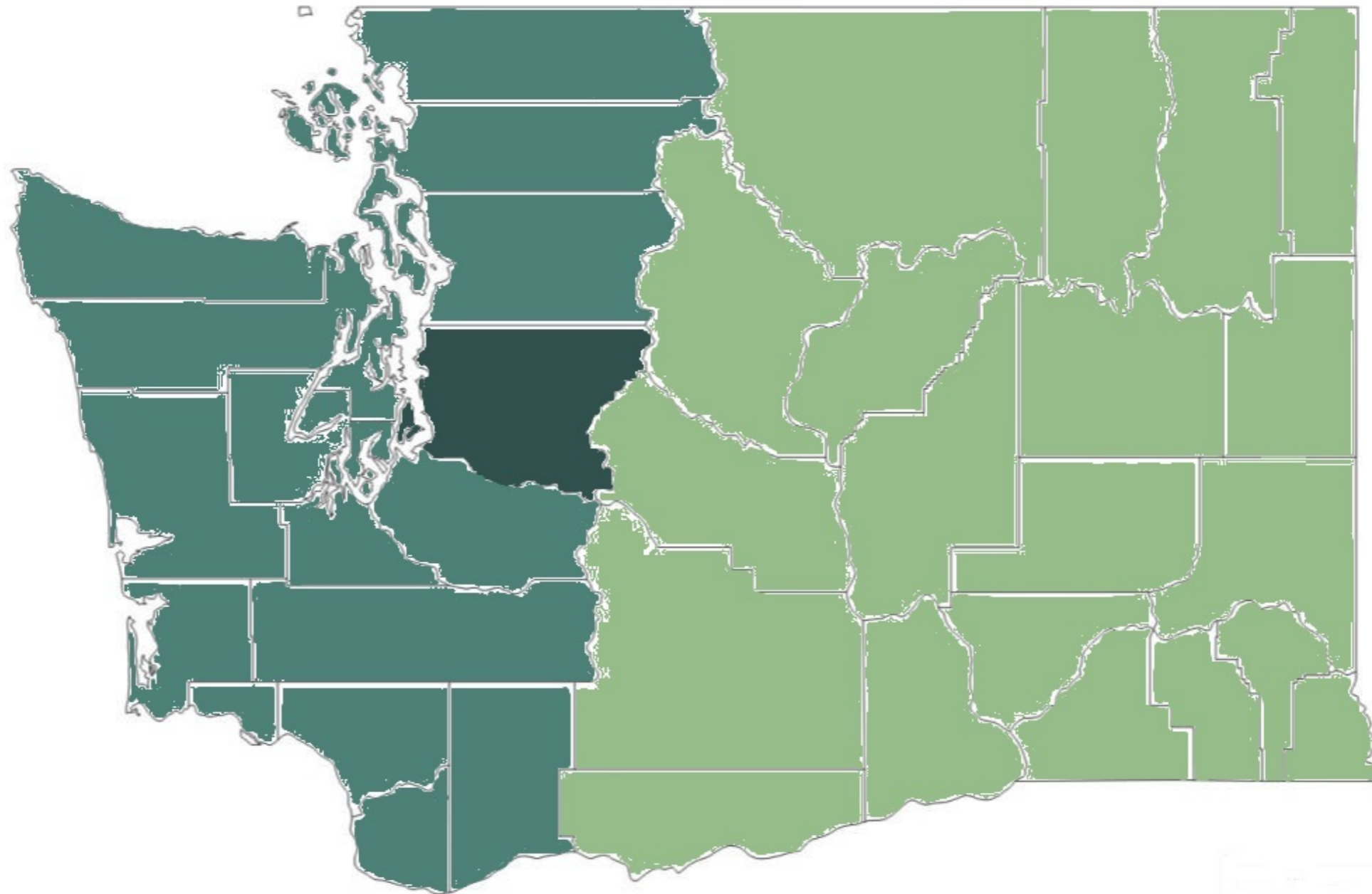
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- Target sample size of 1,000:
 - 400 in King County, 300 in Western WA, 300 in eastern WA

Approach

■ King County ■ Other Western Washington ■ Eastern Washington



Approach

- Recruitment through banner and broadcast ads on social media, sexual networking, and general LGBTQ interest websites
 - Ads in English and Spanish



Approach

- Potential participants were randomized to 1 of 3 informed consent pages stating different incentives:
 - \$10 Amazon gift certificate
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- Cognitive interviewing and community feedback to inform phrasing, content, and ad design

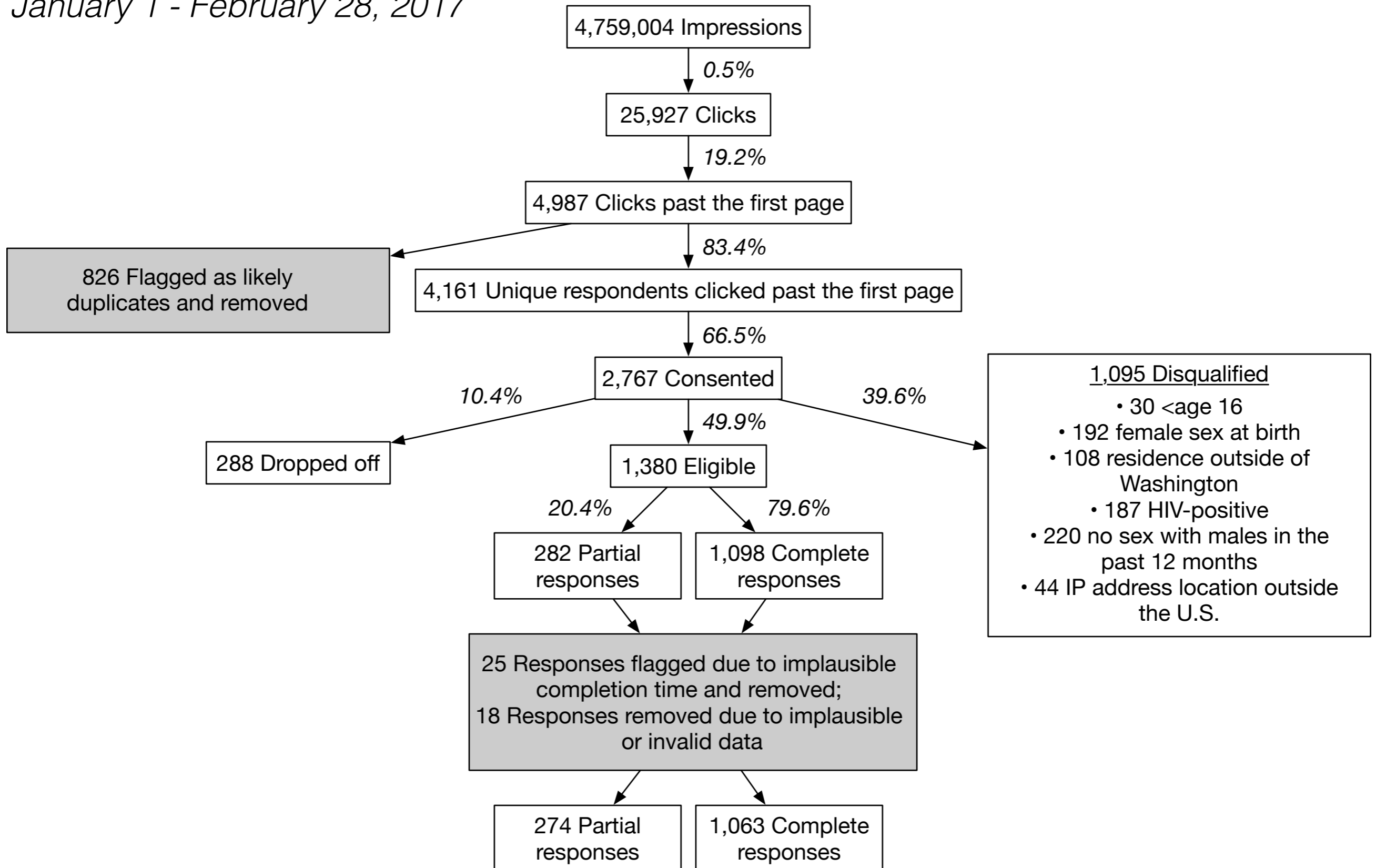
Analysis

- Remove duplicate and invalid entries
 - Modified version of a published protocol (Grey et al. 2015)
- Assess response bias
 - Identify factors associated with survey drop-off using chi-square tests
- Describe patterns of preventative and risk behaviors by region*
 - Bivariate analyses using chi-square and Kruskal-Wallis tests
- Describe and examine associations with PrEP use*
 - Log-binomial regression to test bivariate and multivariable associations

**Restricted to cisgender males who had sex with a man in the past 12 months*

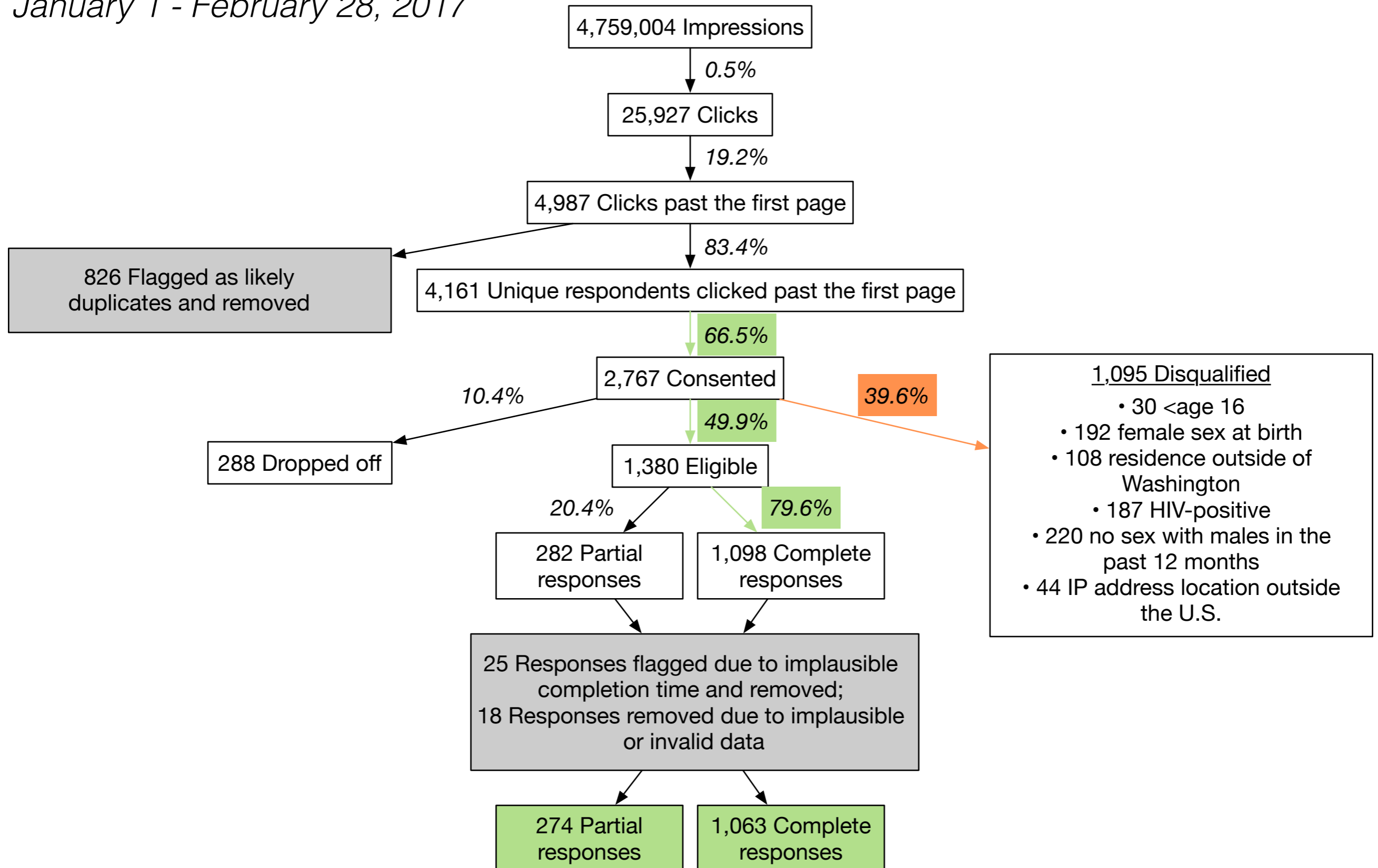
Recruitment and response rates

January 1 - February 28, 2017



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Invalid responses

- Fishing for higher incentive
 - 152 complete and 6 partial responses
- Duplicates
 - 55 complete and 37 partial responses
- Change in eligibility criteria
 - 25 complete and 14 partial responses
- Completion time less than half of the median time
 - 33 complete and 3 partial responses
- Implausible age, FTM gender, or without a valid Washington zip code
 - 13 complete and 5 partial responses

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-
- 236 complete and 63 partial responses removed
 - 196 from the Amazon incentive arm, 65 from the donation incentive arm, 38 from the no incentive arm

Budget and performance

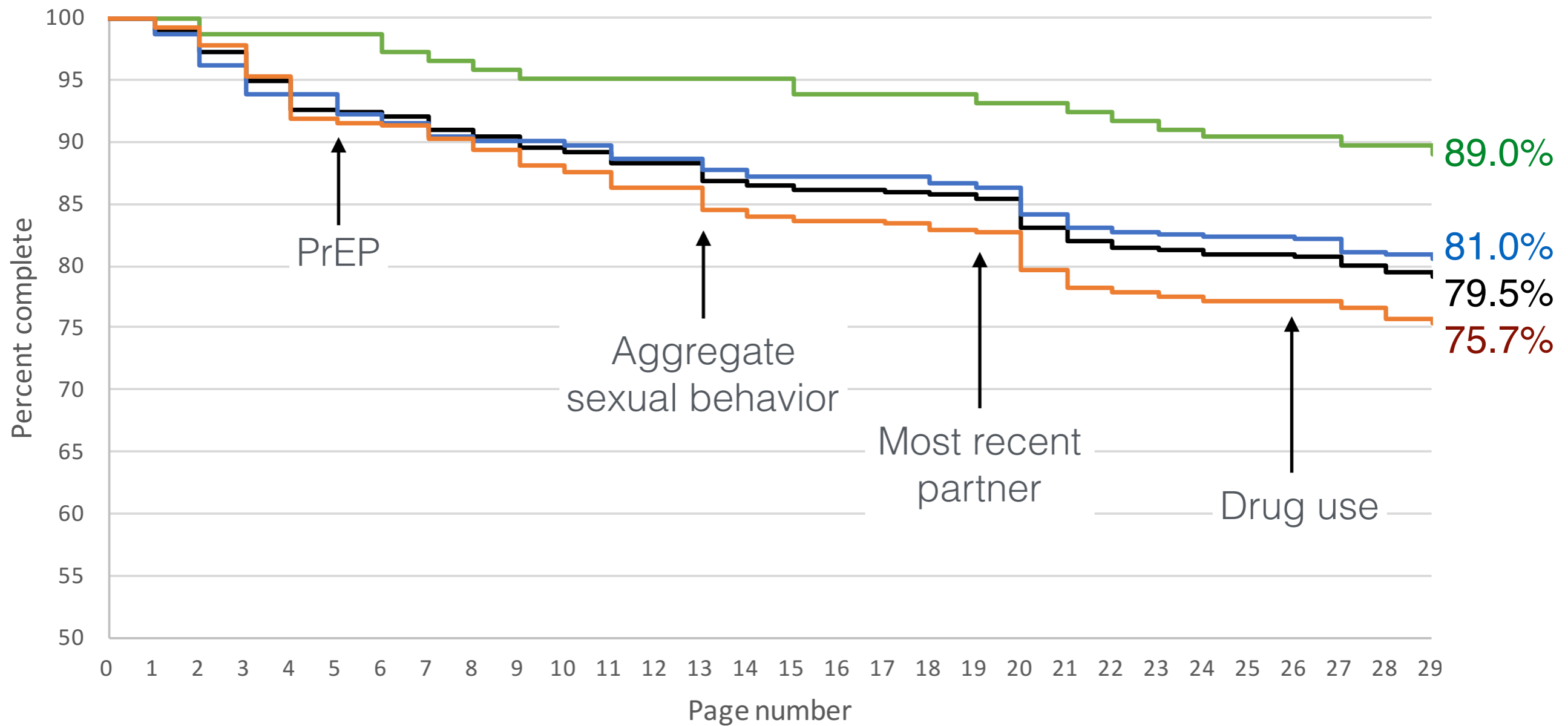
Recruitment	Total cost	Complete responses*	Cost per complete response*
Images and ad design	\$364.00	-	-
Social media	\$3,925.65	822	\$4.78
Geospatial sexual networking	\$4,000.00	181	\$22.10
General interest websites	\$2,400.00 [†]	60	\$40.00
Subtotal	\$10,689.65	1,063	\$10.06 ^{††}
Incentives			
Amazon gift certificate	\$2,970		
Donation	\$5,170		
Subtotal	\$8,140		
TOTAL	\$18,829.65		\$17.71

*Based on de-duplicated, valid responses;

[†] Contract signed for \$4,800 but discounted due to poor performance

^{††} Including image and ad design cost, and 32 responses from a second sexual networking app that was free

Drop-off by incentive arm



— Overall — Amazon — Donation — No monetary

N complete:	1,063	129	485	449
N partial*:	173	12	67	94

*Completed to page 5 or higher

Sample characteristics

	%	(n/N)*
Age		
16 to 24	29.0%	(313/1,080)
25 to 34	32.5%	(351/1,080)
35 to 44	15.5%	(167/1,080)
45 to 54	11.9%	(128/1,080)
55 and older	11.2%	(121/1,080)
Race/ethnicity		
Hispanic	18.6%	(198/1,067)
White	67.9%	(725/1,067)
Black	3.9%	(42/1,067)
Asian	3.2%	(34/1,067)
Other	1.9%	(20/1,067)
Multiple	4.5%	(48/1,067)
Gay/homosexual	82.6%	(889/1,076)
Education		
High school/GED or less	16.5%	(176/1,065)
Some college/vocational	34.2%	(364/1,065)
Four-year college degree or higher	49.3%	(525/1,065)
Region		
King County	56.5%	(610/1,080)
Other Western WA	28.5%	(308/1,080)
Eastern WA	15.0%	(162/1,080)

*Restricted to cisgender males who had sex with men in the past 12 months who completed the survey through questions about PrEP use

Sample characteristics

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16 to 24	29.0%	
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35 to 44	15.5%	
45 to 54	11.9%	
55 and older	11.2%	
Race/ethnicity		
Hispanic	18.6%	10.9%
White	67.9%	72.9%
Black	3.9%	3.9%
Asian	3.2%	7.5%
Other	1.9%	1.9%
Multiple	4.5%	3.0%
Gay/homosexual	82.6%	
Education		
High school/GED or less	16.5%	
Some college/vocational	34.2%	
Four-year college degree or higher	49.3%	
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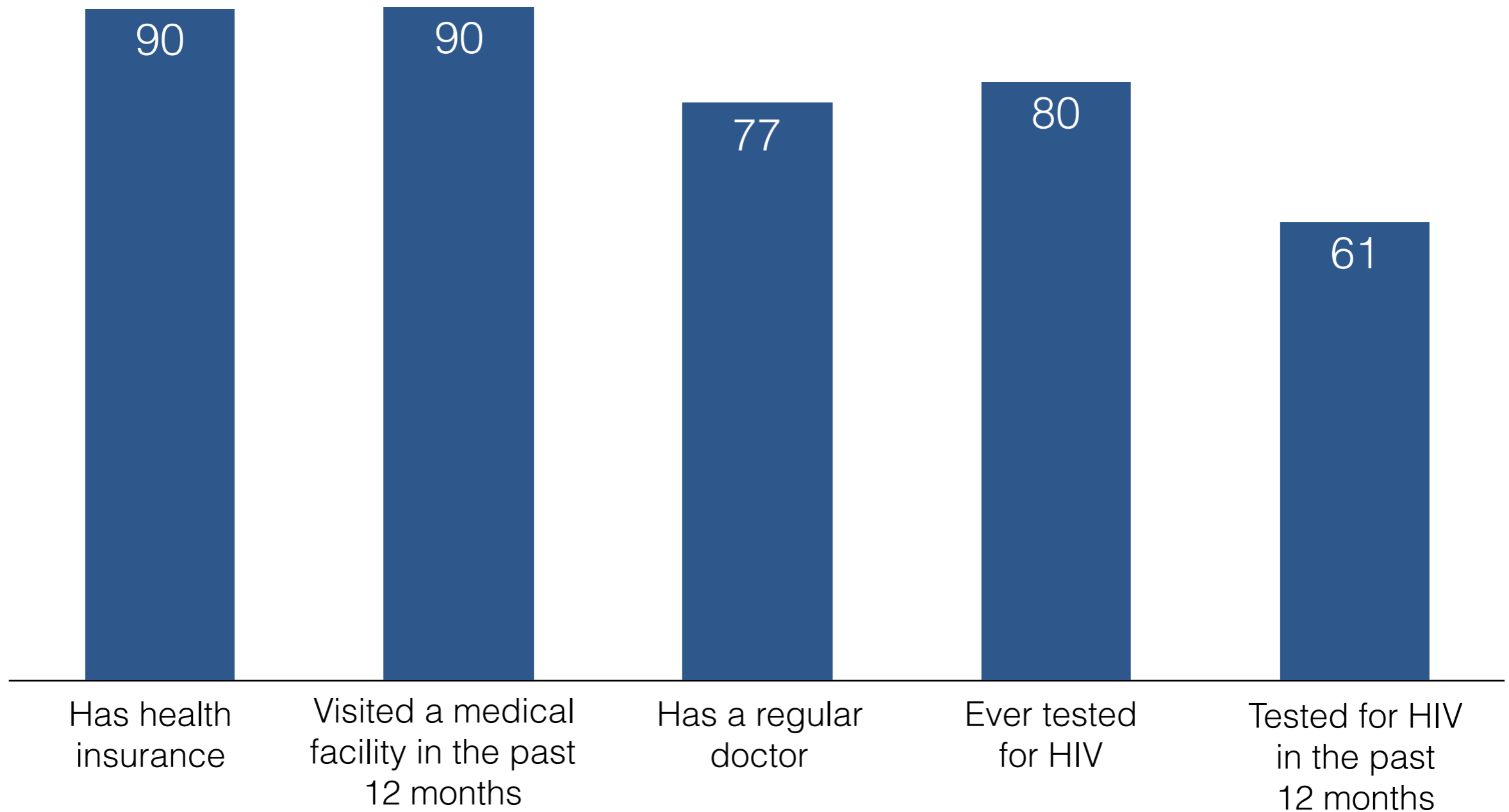
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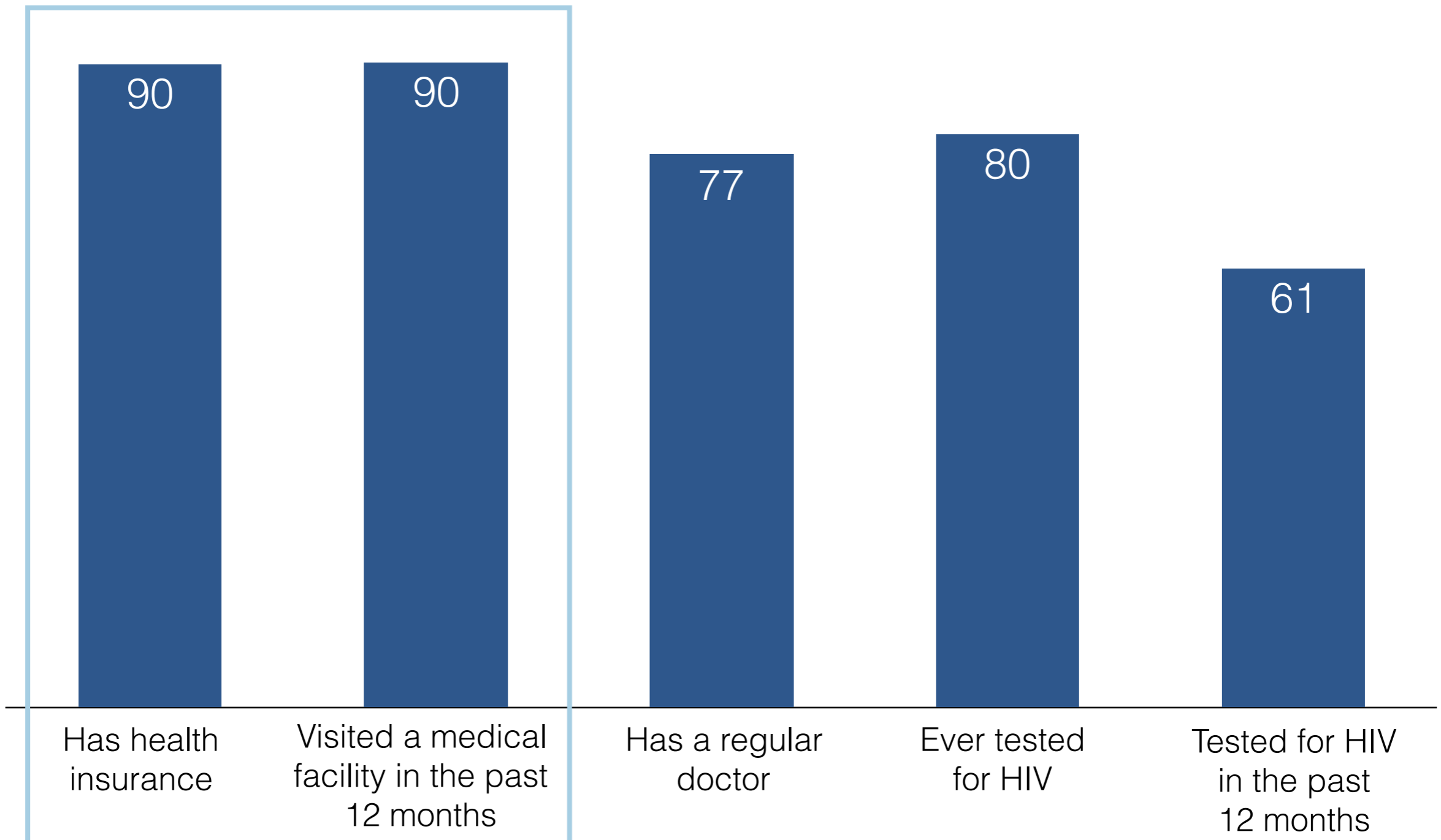
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55 and older	11.2%	33.0%
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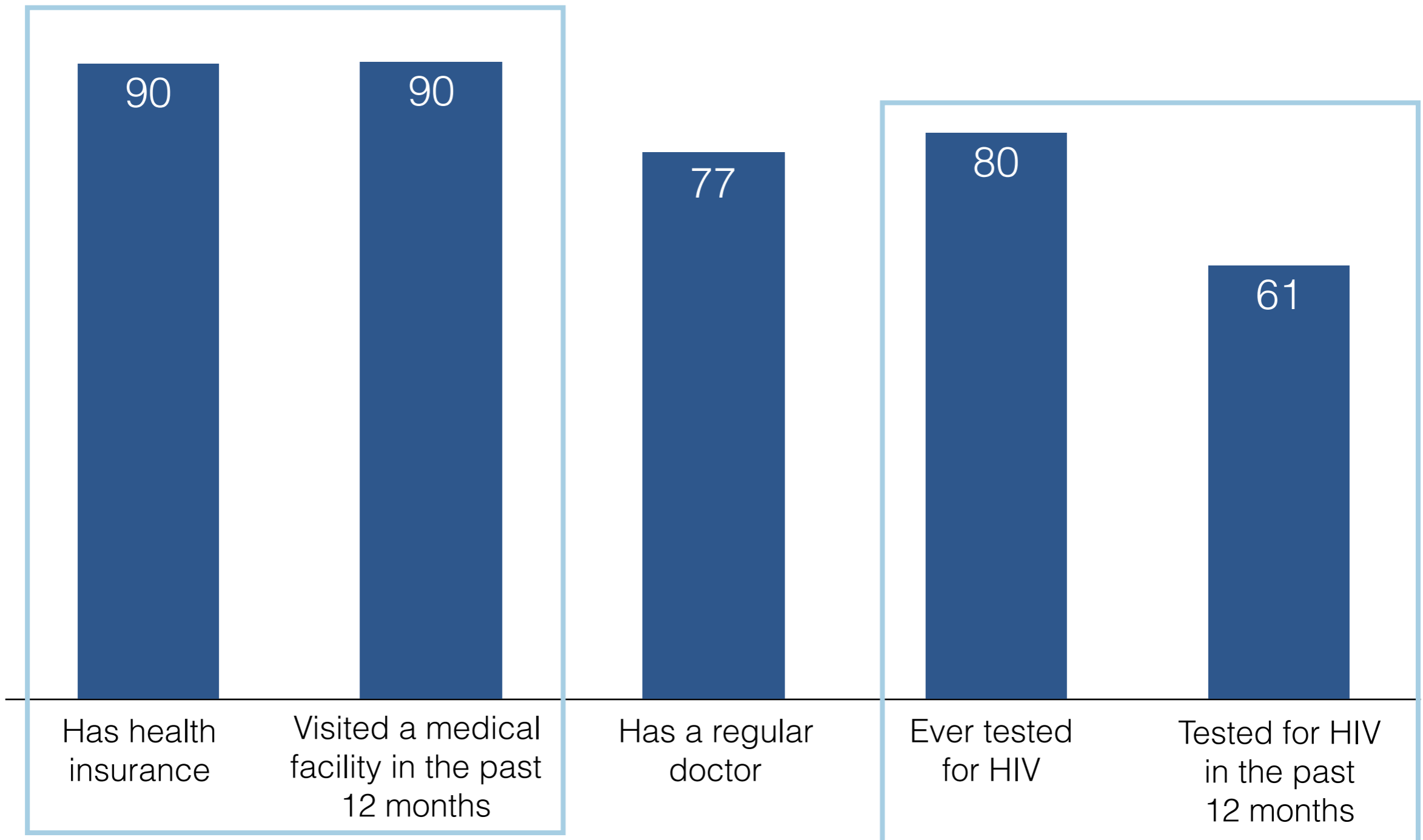
Healthcare utilization



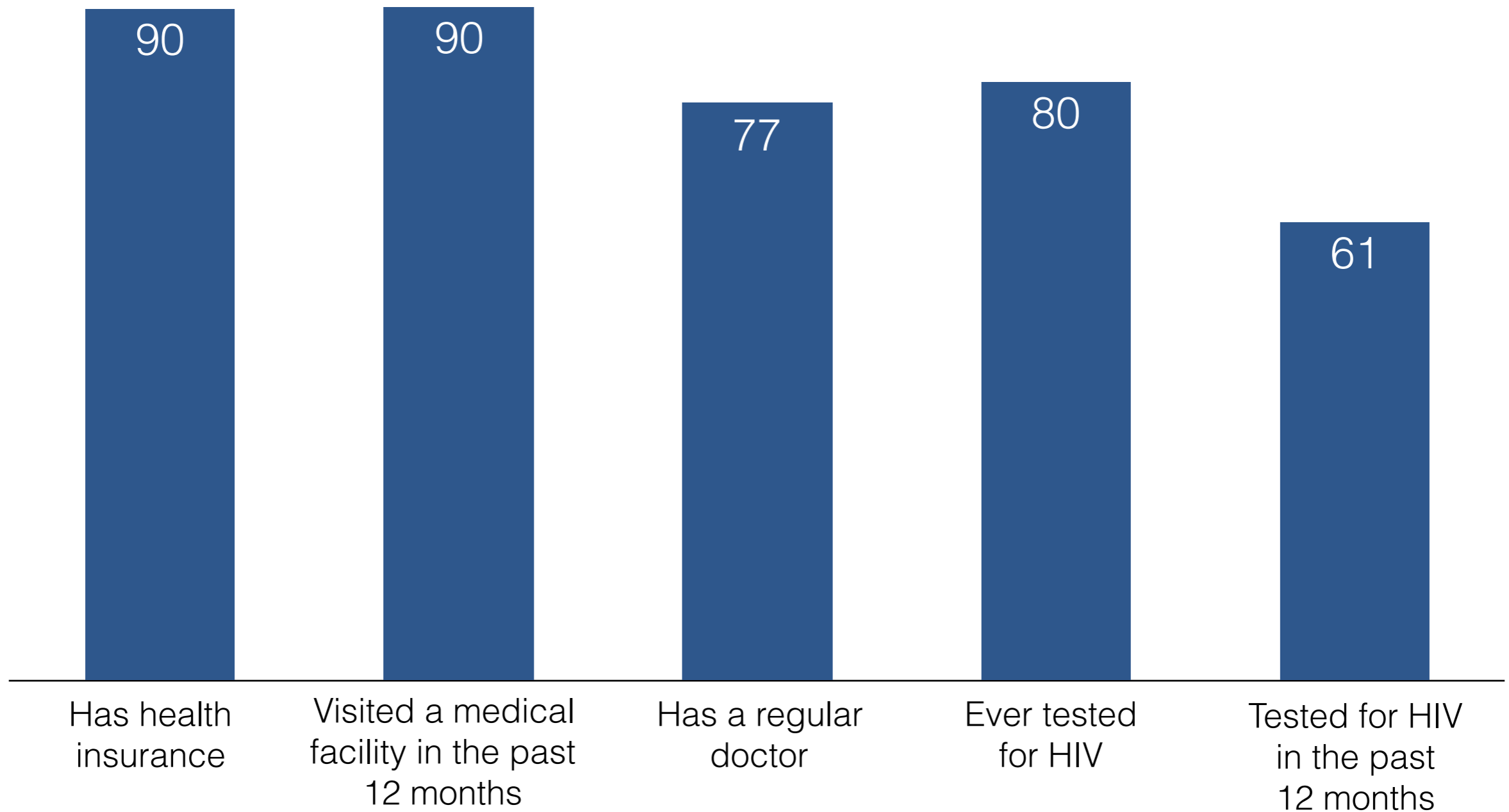
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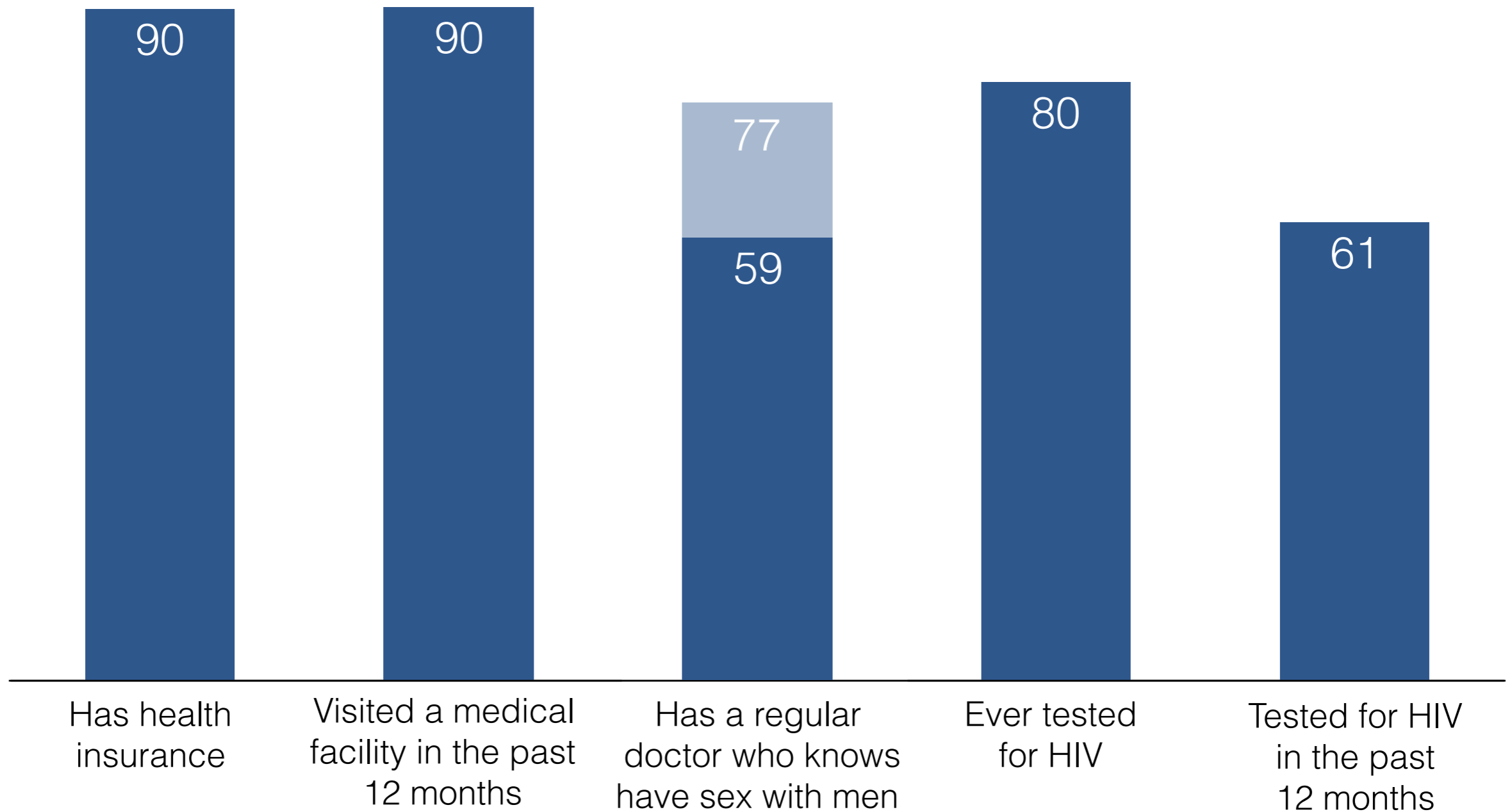
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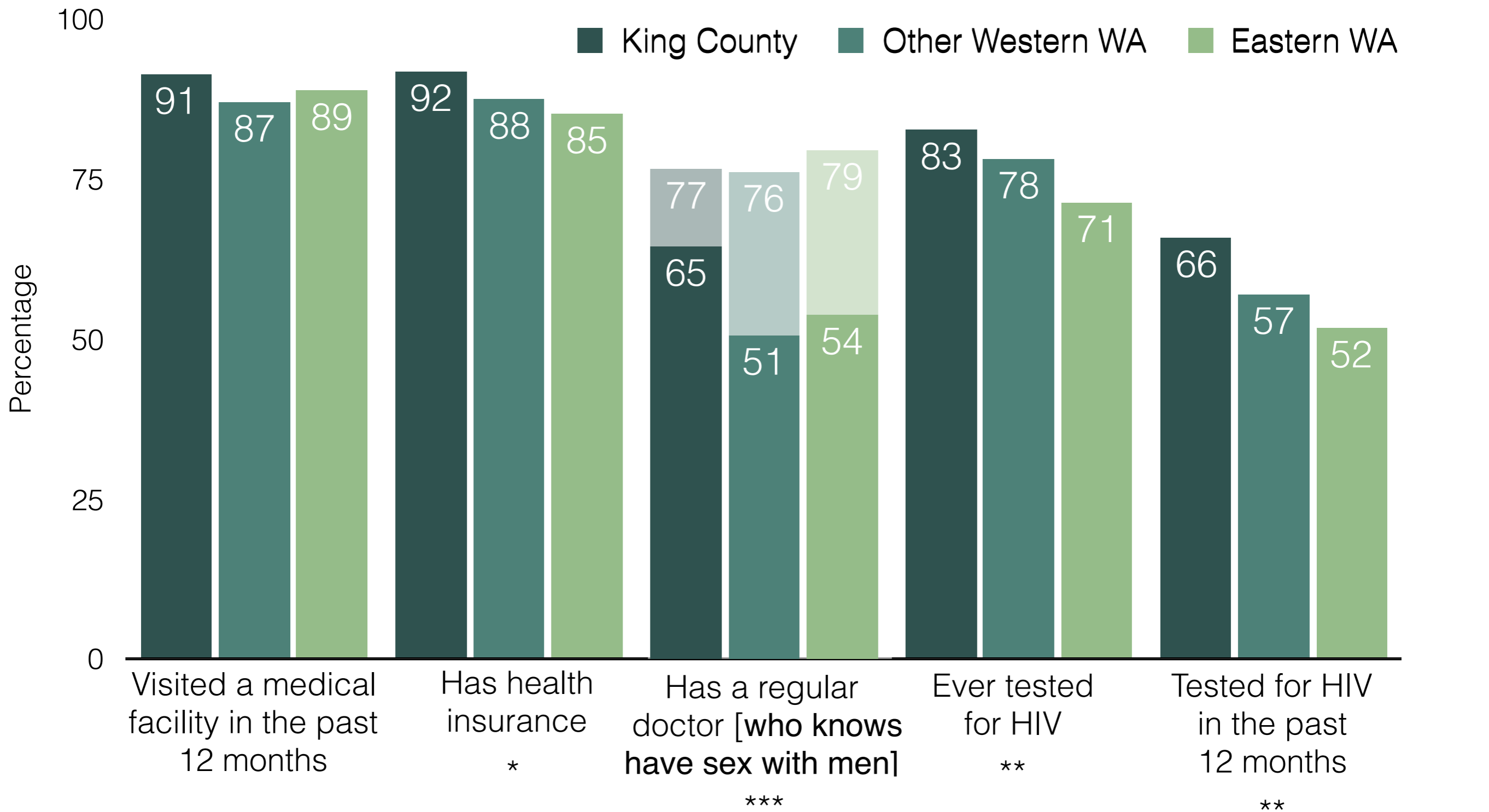
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p-value for regional differences: ***p<0.001; **p<0.01; *p<0.05

HIV risk behavior^a

	Overall	King County	Other Western WA	Eastern WA	
Sex with females	10.2%	7.9%	12.0%	15.4%	**
10+ male anal sex partners	16.0%	17.6%	12.0%	17.4%	
Current main male partner	44.4%	49.0%	37.5%	39.5%	**
Current sero-discordant partnership	8.1%	10.9%	5.1%	2.8%	**
CAI with a non-main partner	48.6%	49.2%	49.3%	44.8%	
CAI with an unknown-status partner	28.7%	29.1%	27.8%	28.9%	
CAI with an HIV-positive partner	14.8%	18.1%	10.6%	9.7%	**
STI diagnosis	18.4%	20.6%	17.5%	11.9%	*
Injection drug use	6.1%	5.5%	6.5%	7.4%	
Meth or popper use	28.5%	31.6%	26.2%	20.9%	*
Exchange sex	3.9%	3.9%	3.1%	5.1%	

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PrEP candidacy

	Overall	King County	Other Western WA	Eastern WA
Local guidelines				
Recommend PrEP	33.2%	36.5%	29.4%	27.8%
Discuss PrEP	29.7%	27.9%	31.8%	33.1%

Washington Guidelines for PrEP Implementation¹

Recommend PrEP for MSM who...

- use meth or poppers^a,
- were diagnosed with rectal gonorrhea or early syphilis^a,
- provided sex in exchange for money or drugs^a, *OR*
- are in ongoing sexual partnership(s) with HIV-positive partner(s) who are not on ART, started ART \leq 6 months ago, or are not virally suppressed

Discuss PrEP with MSM who...

- had CAI with a non-main/primary partner or with a partner of unknown or positive HIV status^{a,b},
- were diagnosed with urethral gonorrhea or rectal chlamydia^a,
- use injection drugs not prescribed by a medical provider^a,
- are in ongoing sexual partnership(s) with HIV-positive partner(s) who have been on ART more than 6 months and are virally suppressed

^aIn the past 12 months; ^bProxy measure for CAI outside of a long-term, mutually monogamous relationship with a man who is HIV-negative;

PrEP awareness and utilization

This section will ask you about your awareness and use of HIV pre-exposure prophylaxis, or PrEP.

PrEP is a pill taken every day by HIV-negative people to reduce the risk of getting HIV.
It is currently available under the brand name Truvada®



	Overall	King County	Other Western WA	Eastern WA	
PrEP awareness	78.9%	82.1%	76.6%	71.0%	**
Perceived effectiveness of PrEP (<i>median (IQR)</i>)	90 (70, 97)	93 (75, 97)	84 (60, 95)	84.5 (63.5, 94.5)	***
Use of PrEP					***
Current	18.5%	23.1%	12.3%	13.0%	
Past	4.4%	4.3%	5.8%	2.5%	
Adherence: 4+ pills per week ^a	93.4%	94.2%	86.8%	100.0%	
Interest in PrEP ^b					
Yes	33.5%	36.6%	33.1%	40.5%	
Not sure	30.4%	32.7%	36.7%	29.8%	

^a Among current PrEP users; ^b Among men who have never used PrEP

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PrEP is a pill taken every day by HIV-negative people to reduce the risk of getting HIV.
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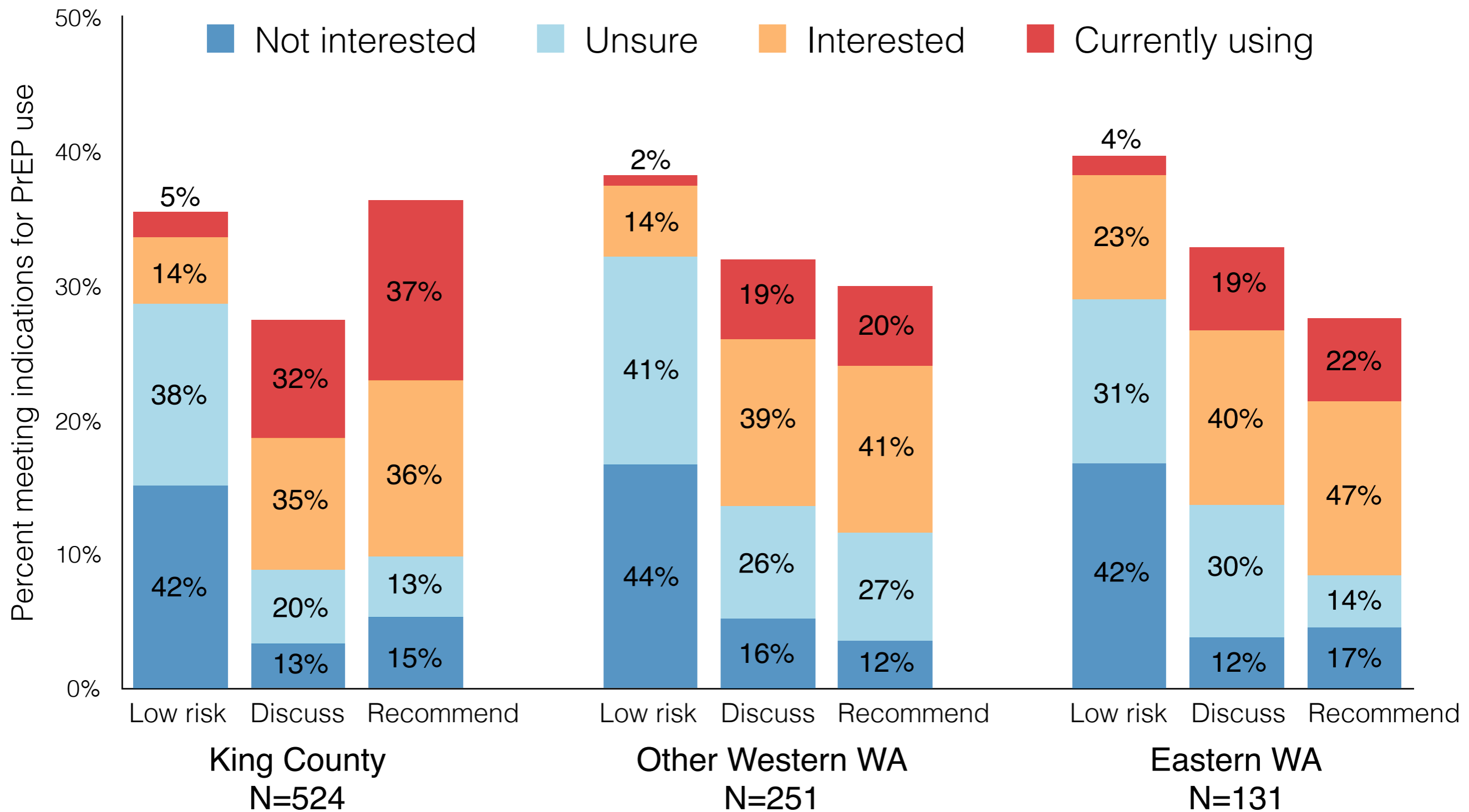


	Overall	King County	Other Western WA	Eastern WA	
PrEP awareness	78.9%	82.1%	76.6%	71.0%	**
Perceived effectiveness of PrEP (<i>median (IQR)</i>)	90 (70, 97)	93 (75, 97)	84 (60, 95)	84.5 (63.5, 94.5)	***
Use of PrEP					***
Current	18.5%	23.1%	12.3%	13.0%	
Past	4.4%	4.3%	5.8%	2.5%	
Adherence: 4+ pills per week ^a	93.4%	94.2%	86.8%	100.0%	
Interest in PrEP ^b					
Yes	33.5%	36.6%	33.1%	40.5%	
Not sure	30.4%	32.7%	36.7%	29.8%	

^a Among current PrEP users; ^b Among men who have never used PrEP

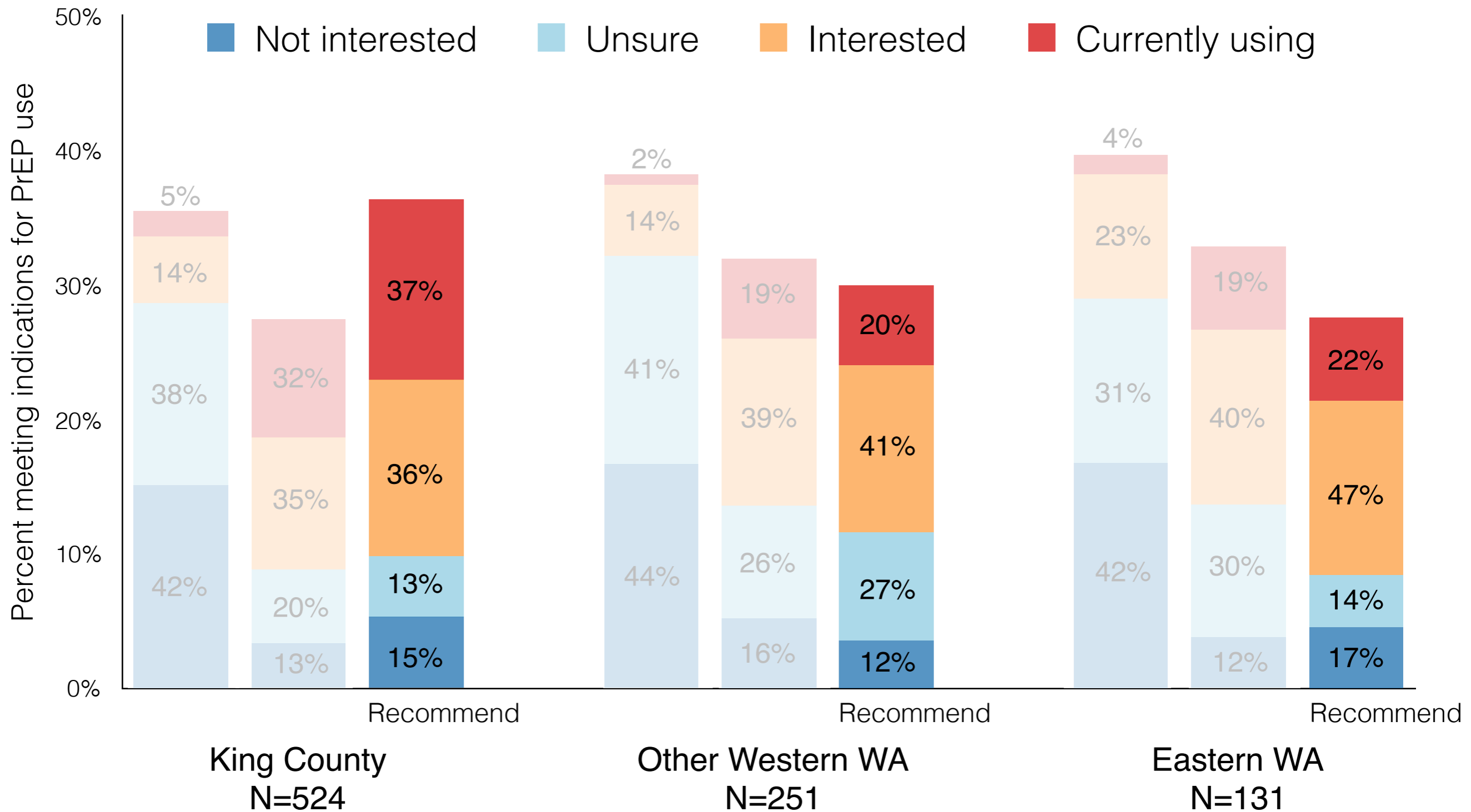
p-value for regional differences: ***p<0.001; **p<0.01; *p<0.05

PrEP interest and use by PrEP candidacy



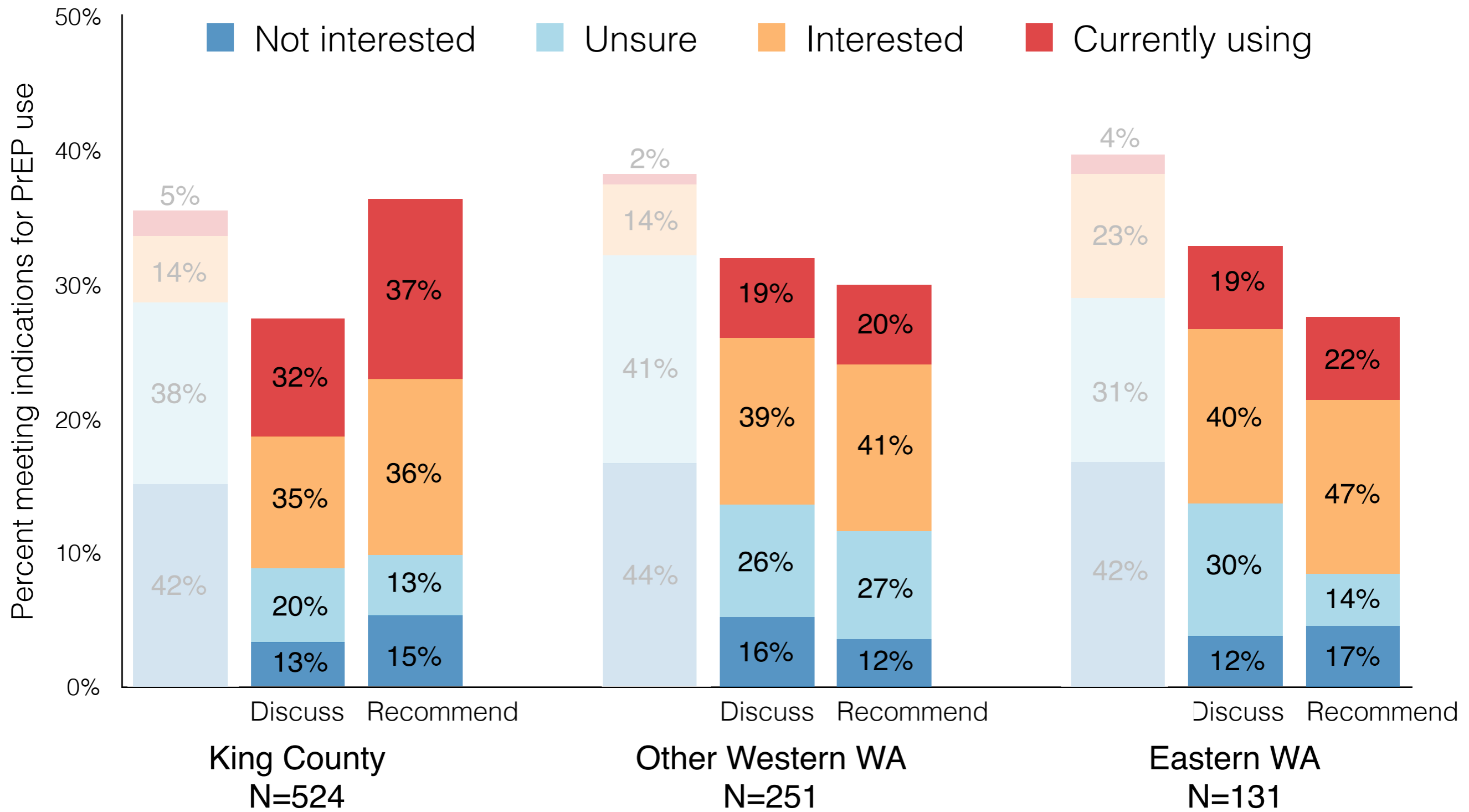
*The height of the columns corresponds to the percent in each PrEP candidacy category; the values inside the columns are the percent of men in each PrEP candidacy category who expressed interest or use of PrEP

PrEP interest and use by PrEP candidacy



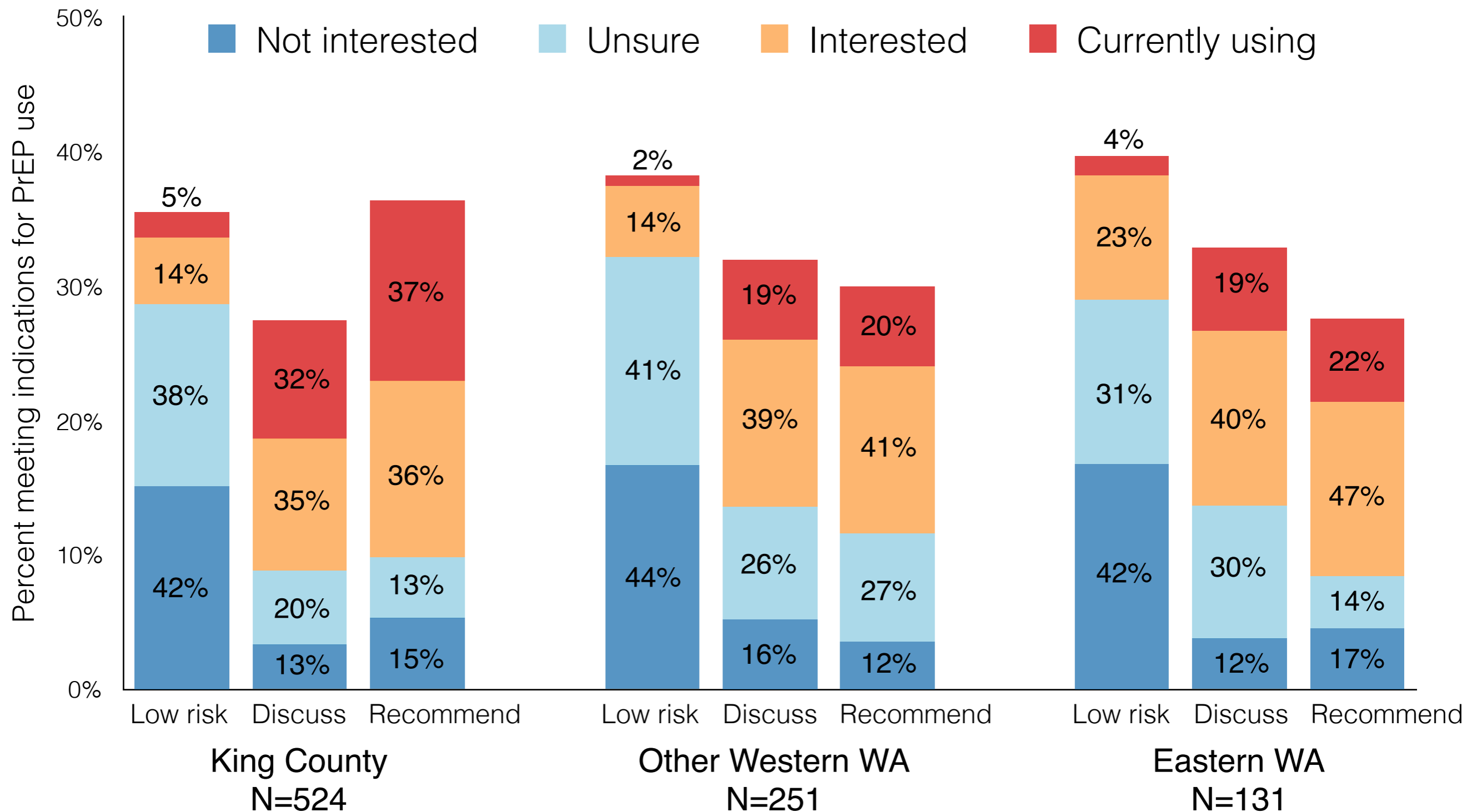
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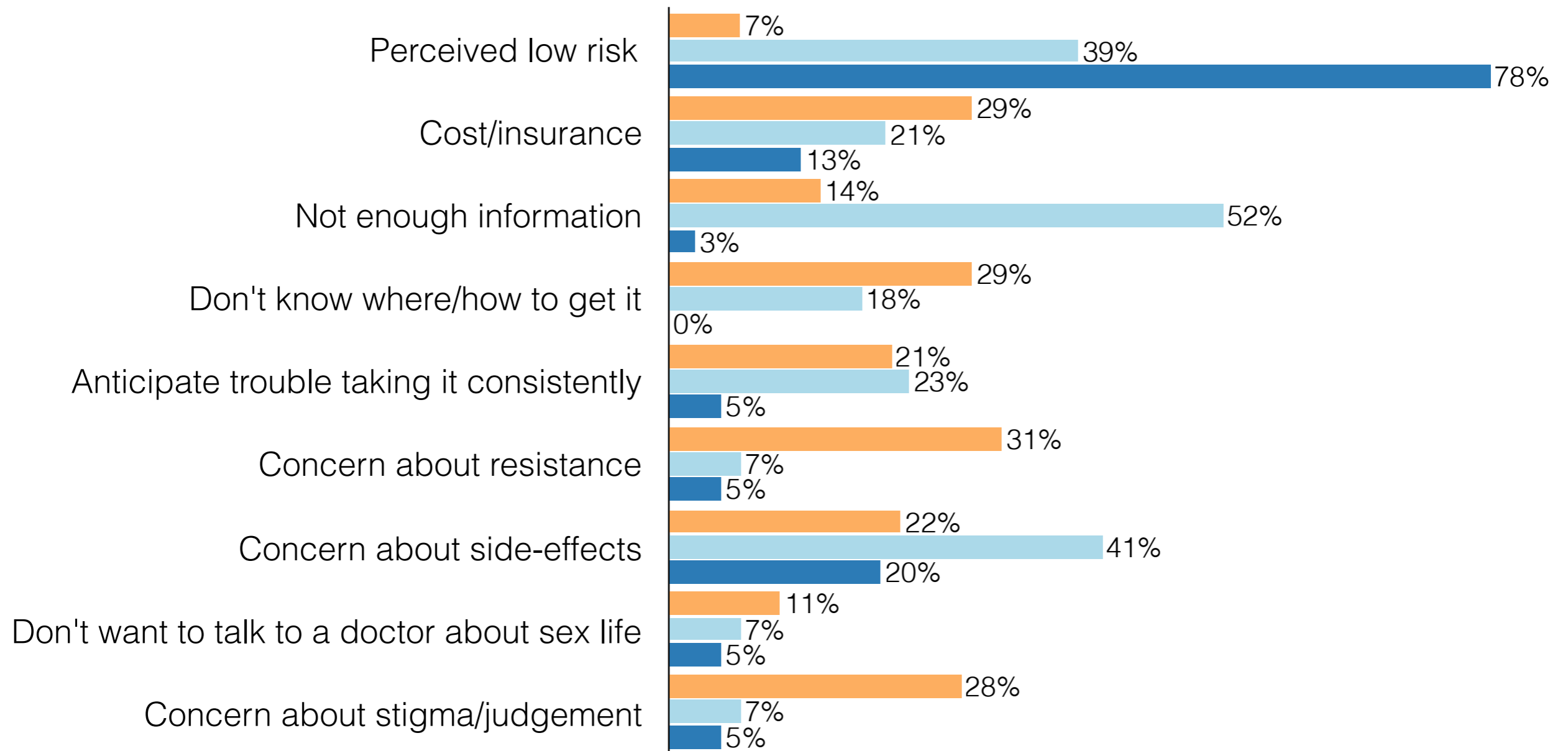
PrEP interest and use by PrEP candidacy



*The height of the columns corresponds to the percent in each PrEP candidacy category; the values inside the columns are the percent of men in each PrEP candidacy category who expressed interest or use of PrEP

Reasons for not taking PrEP

Interested (N=105) Unsure (N=44) Not interested (N=40)



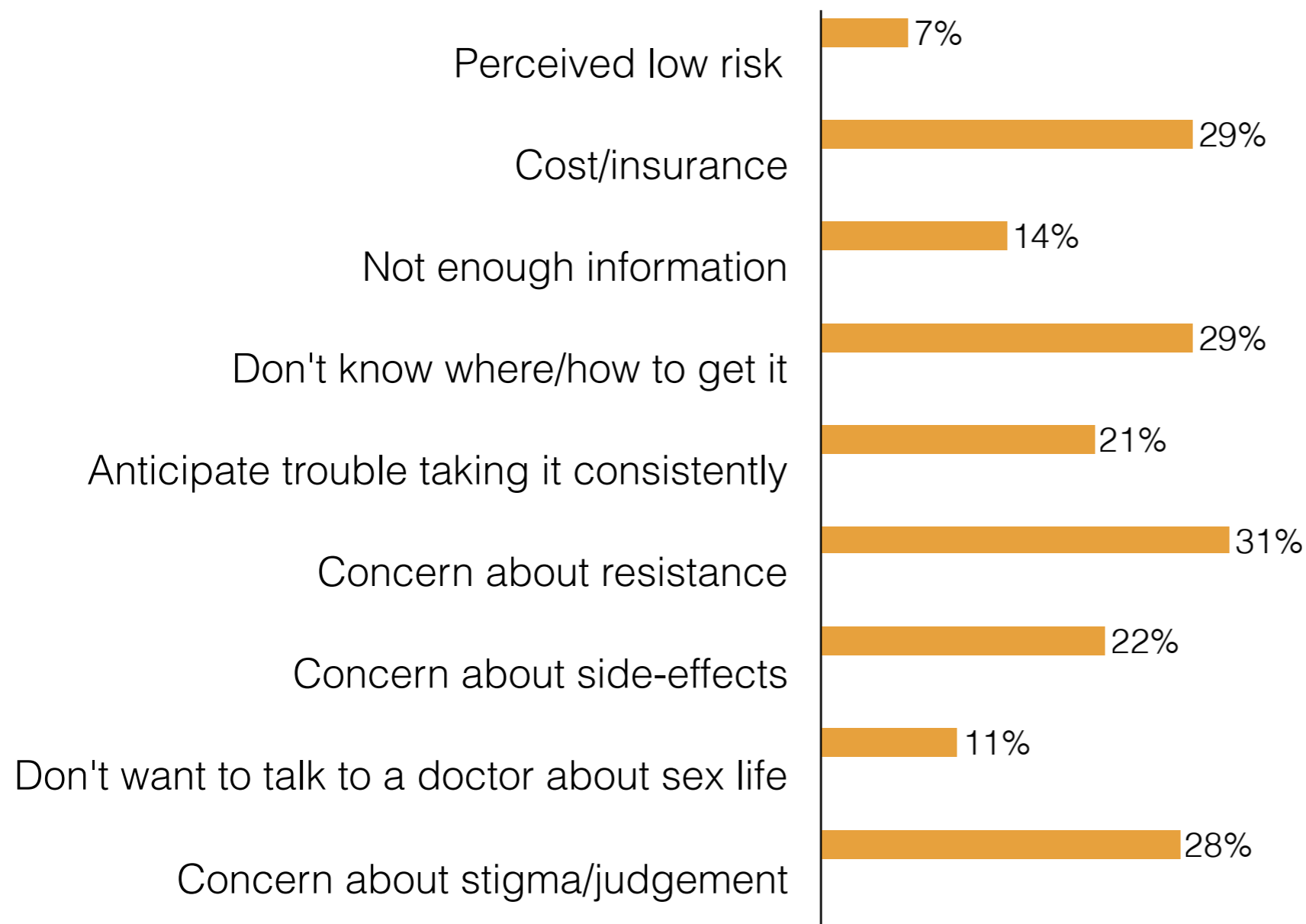
Restricted to men for whom local guidelines recommend PrEP and who have never taken it

Reasons for not taking PrEP

Interested (N=105)

Unsure (N=44)

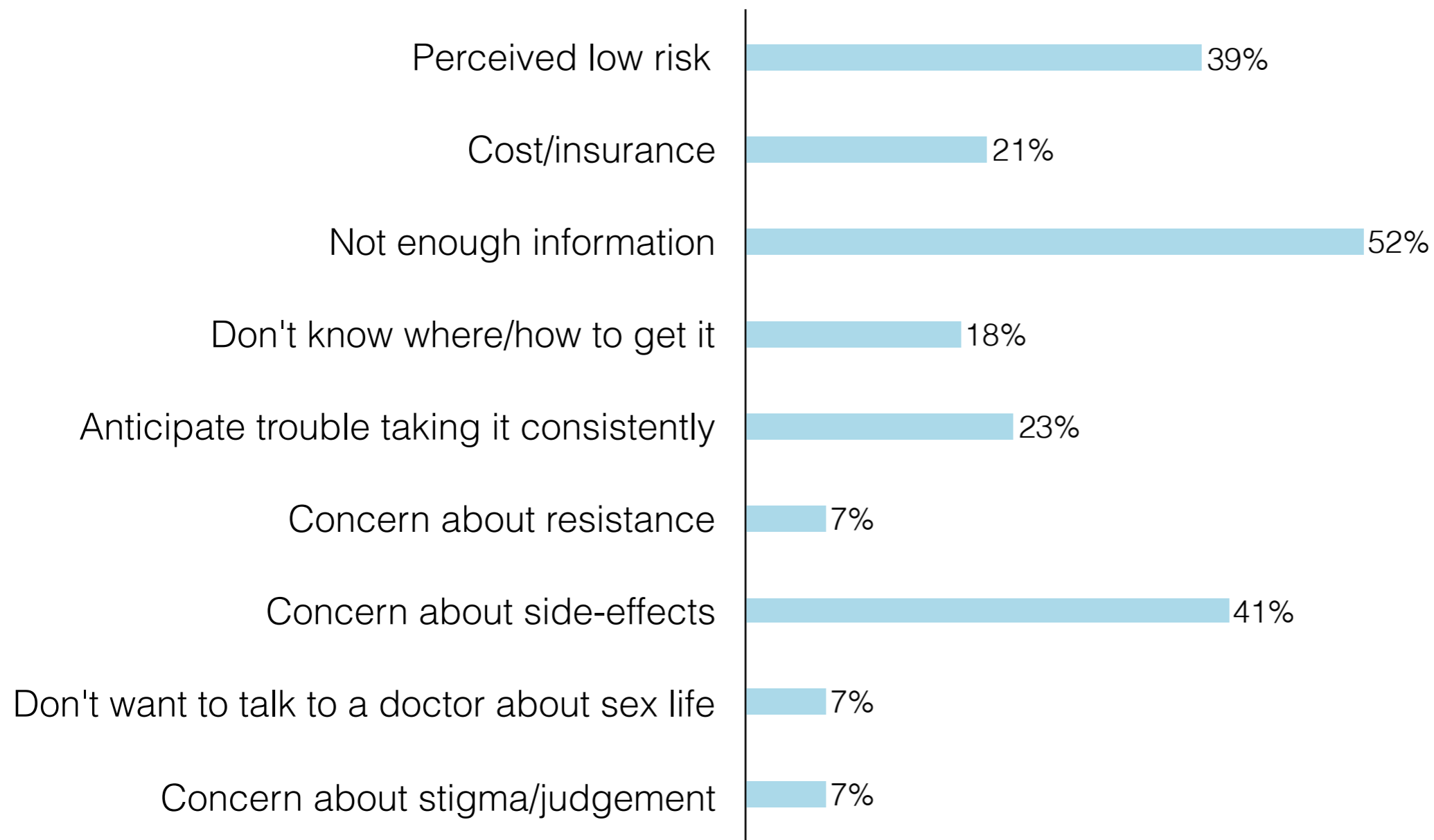
Not interested (N=40)



Restricted to men for whom local guidelines recommend PrEP and who have never taken it

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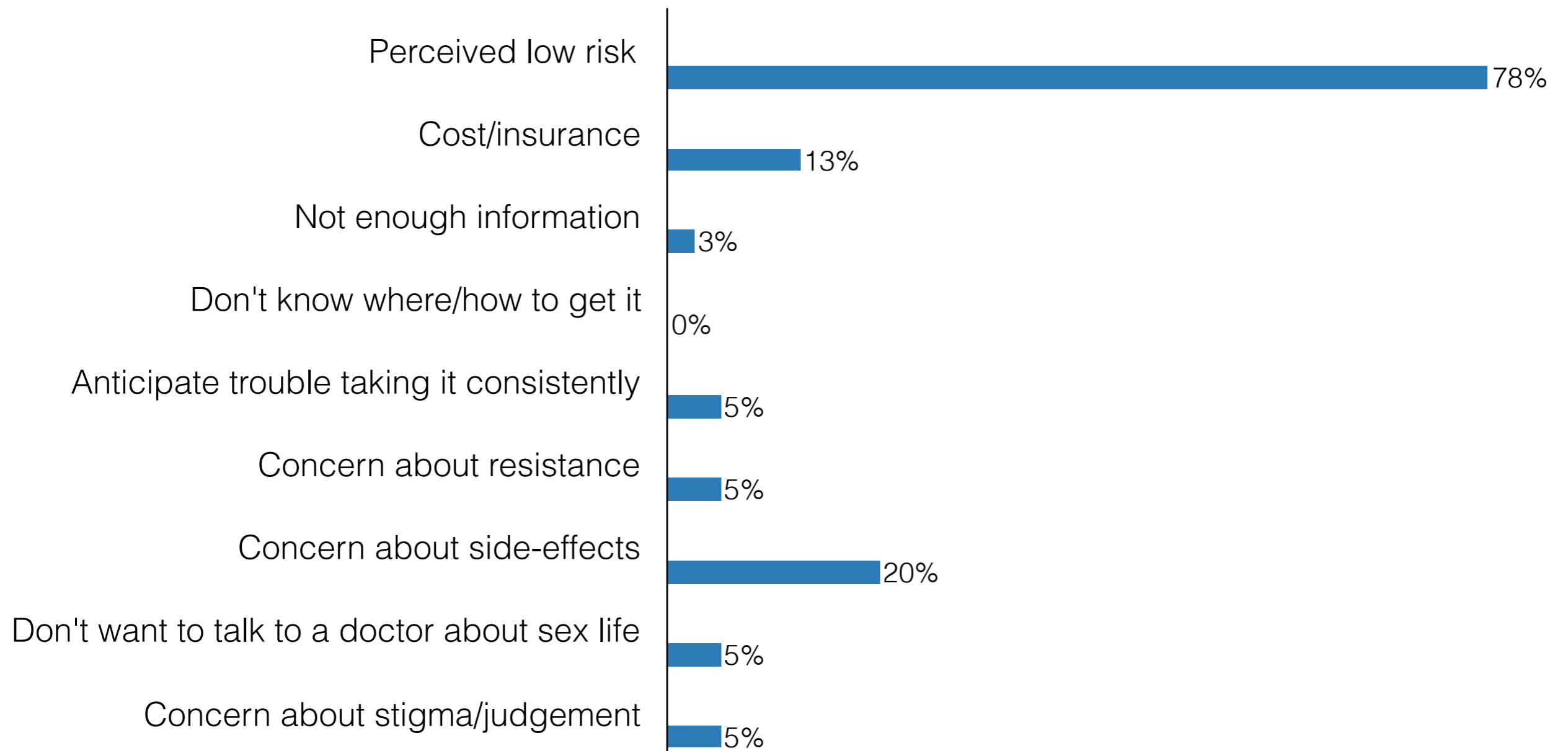
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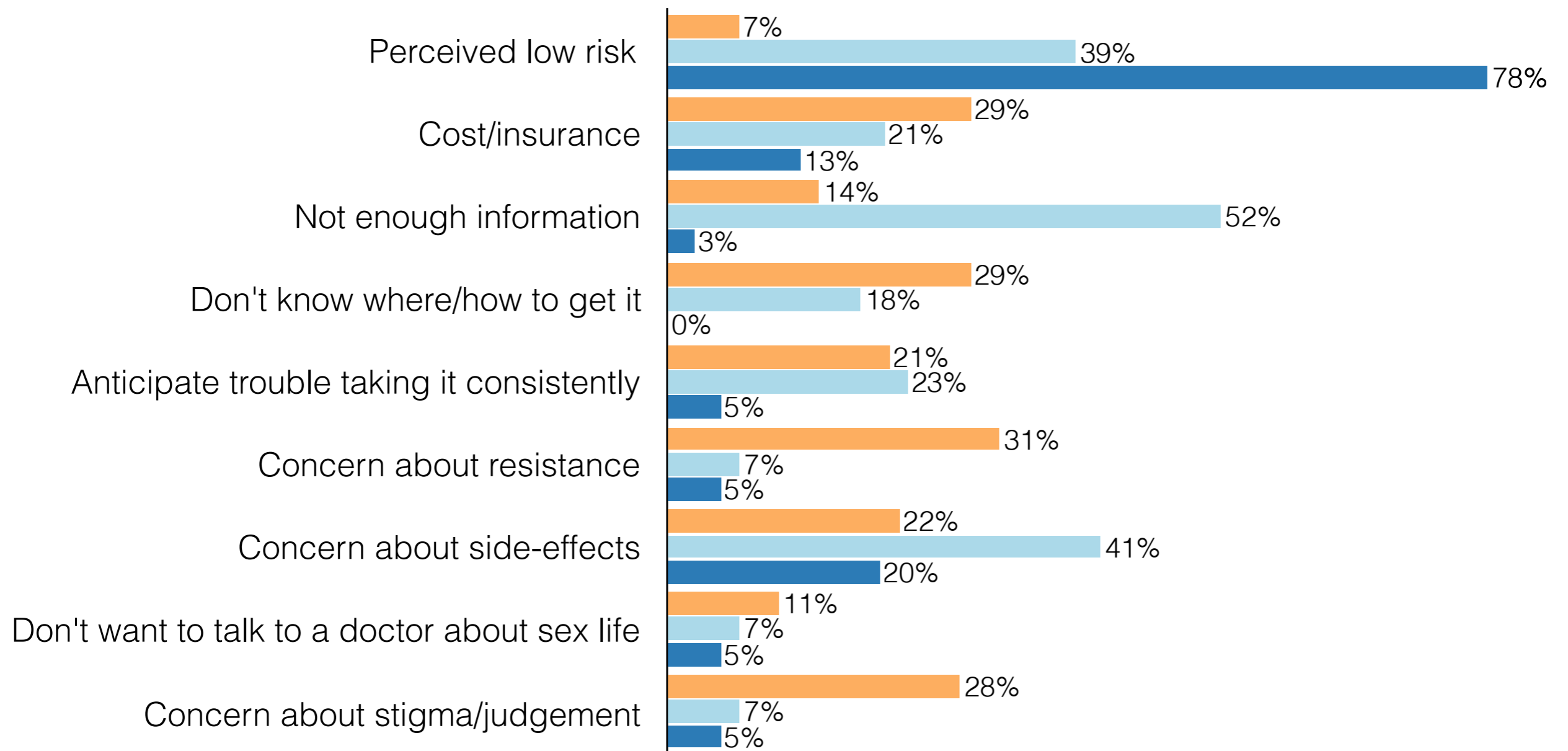
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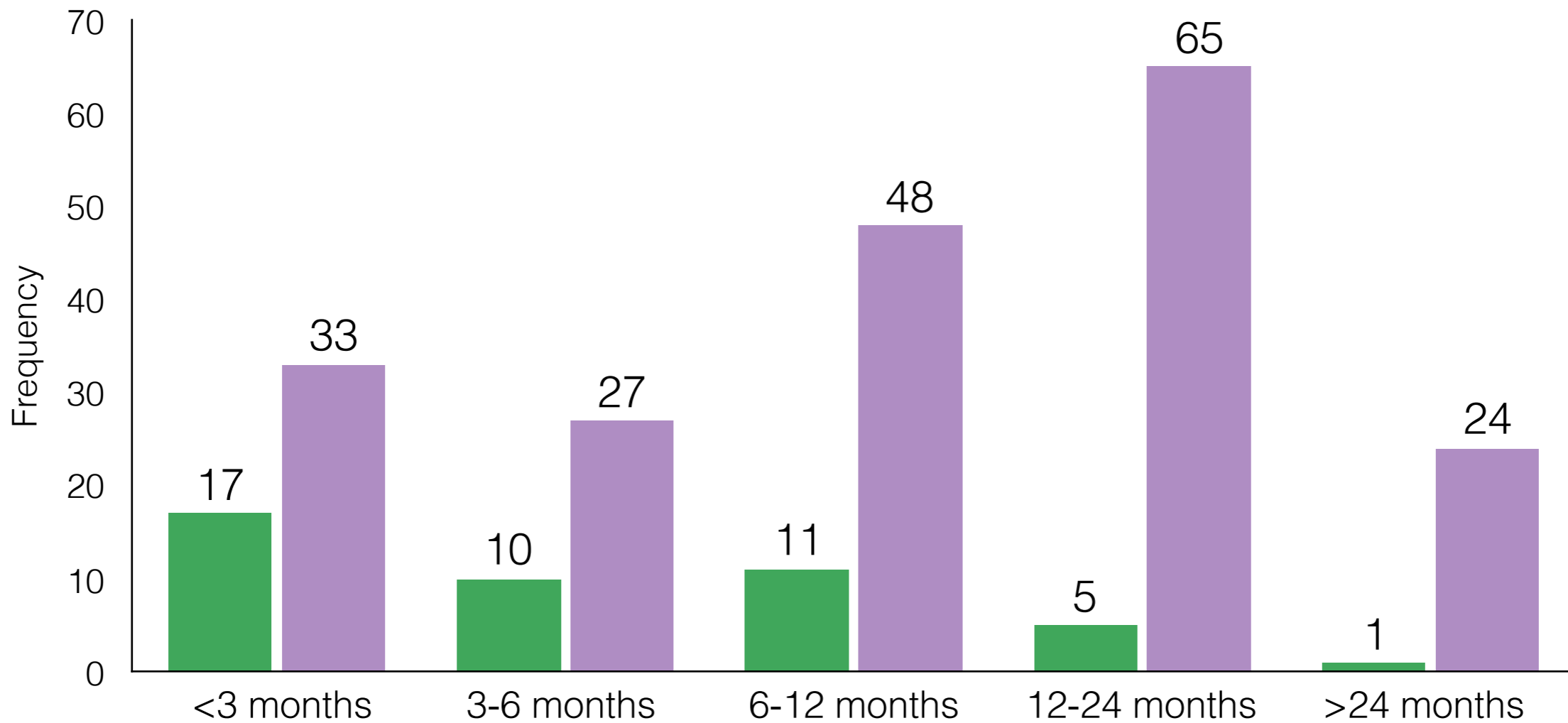


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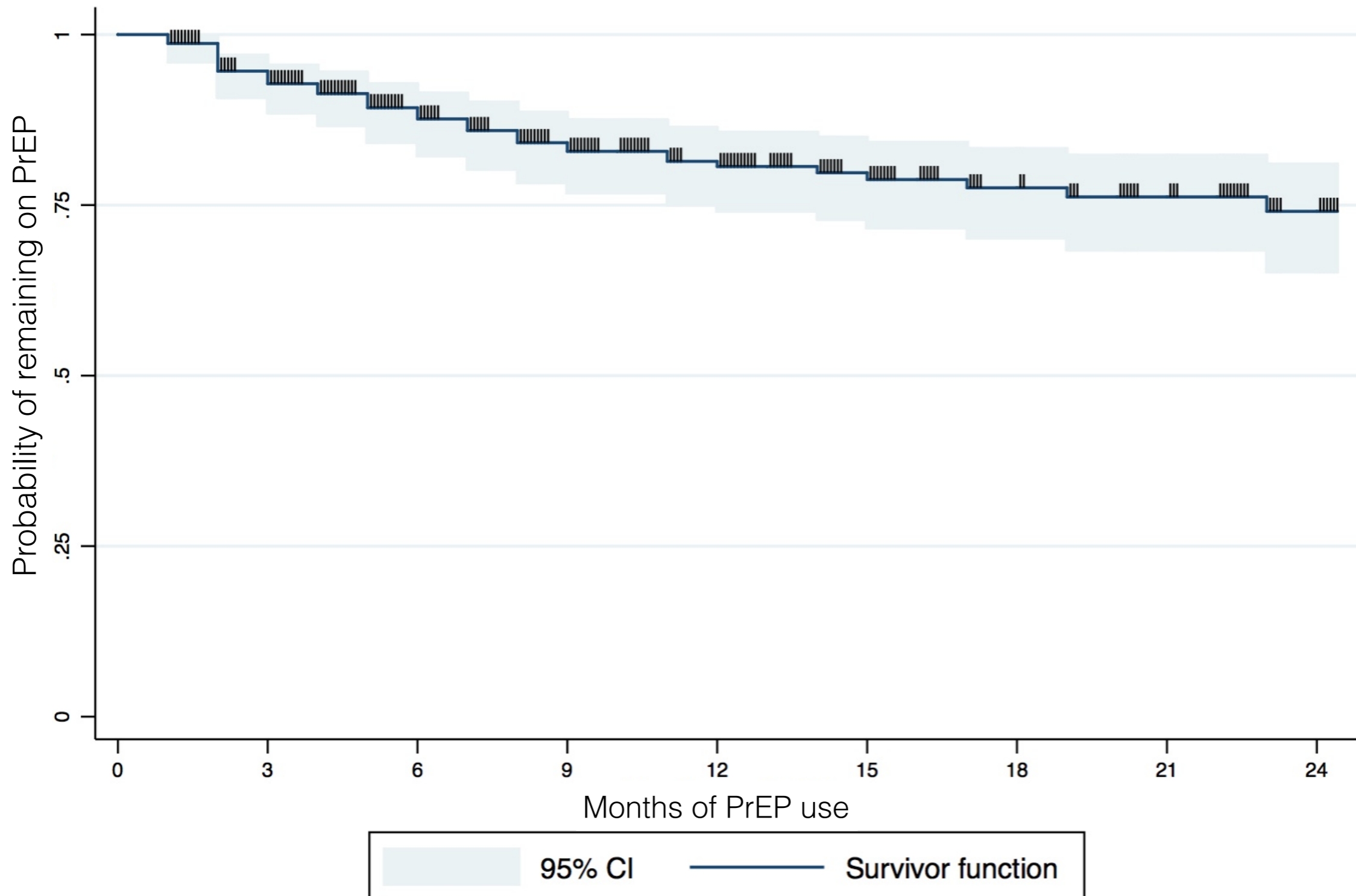
Time on PrEP

Past users: total time on PrEP (N=44)
Median: 5 months

Current users: time since starting PrEP (N=197)
Median: 12 months

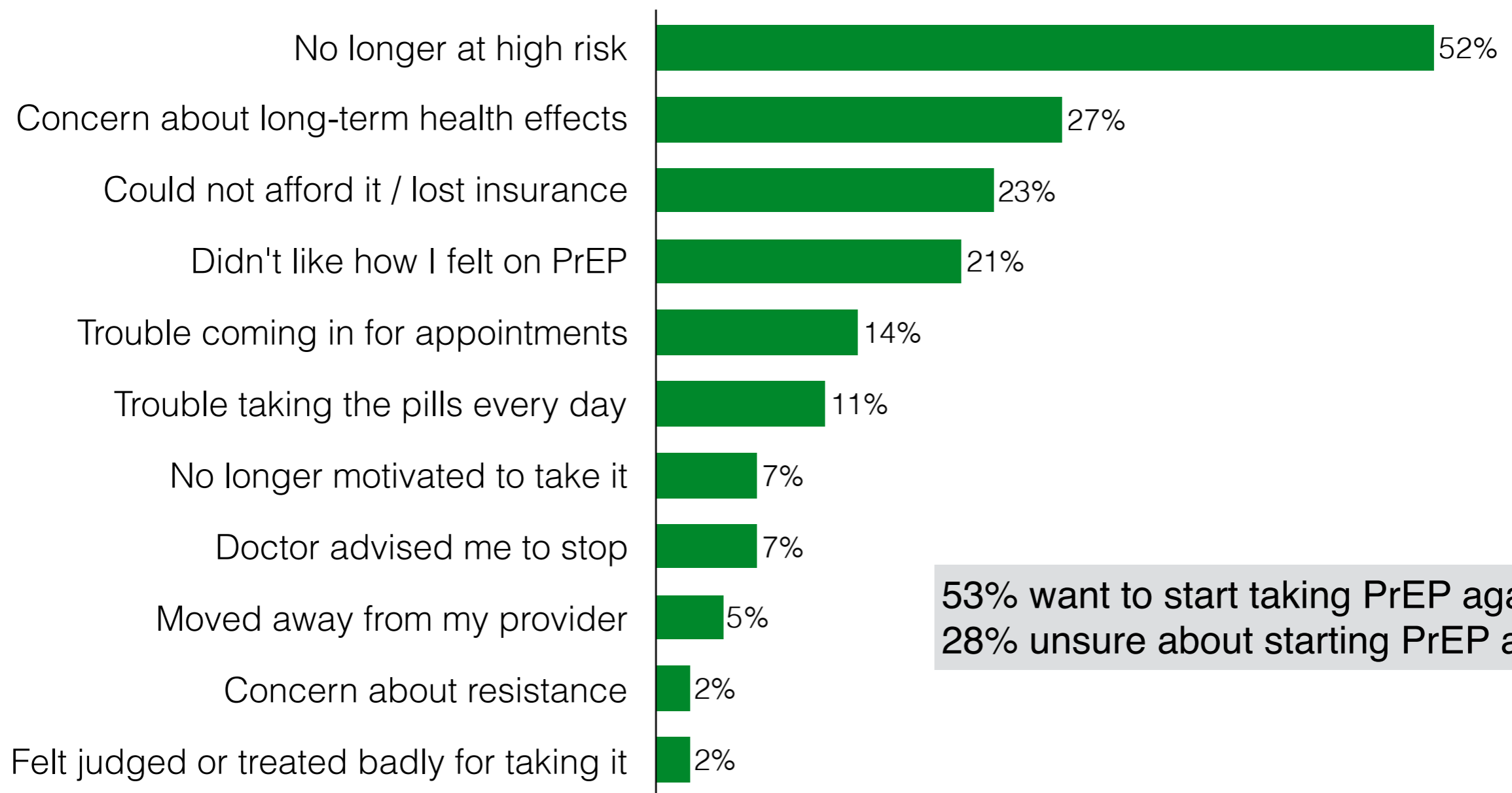


Time on PrEP



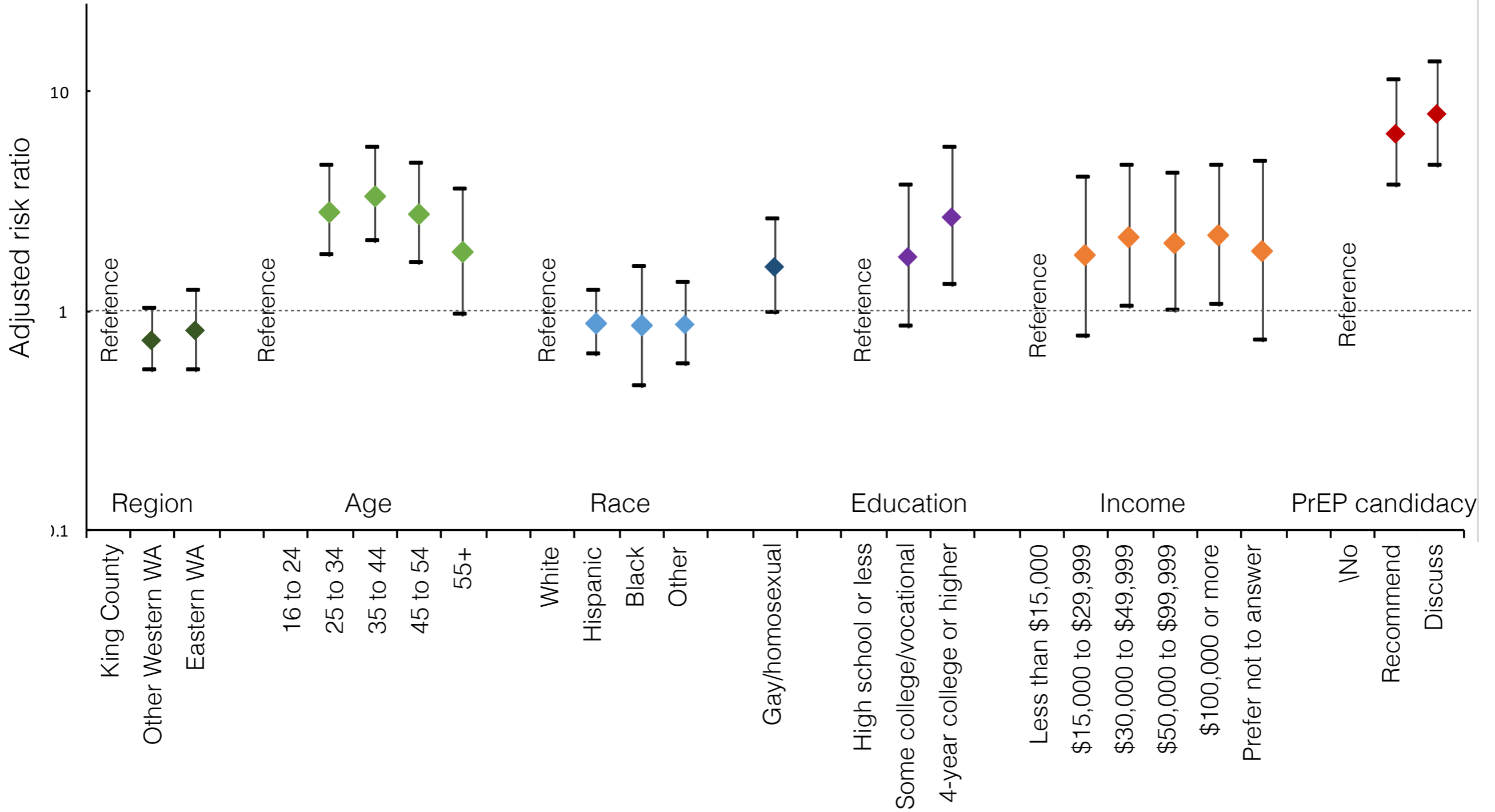
Reasons for stopping PrEP

N=44

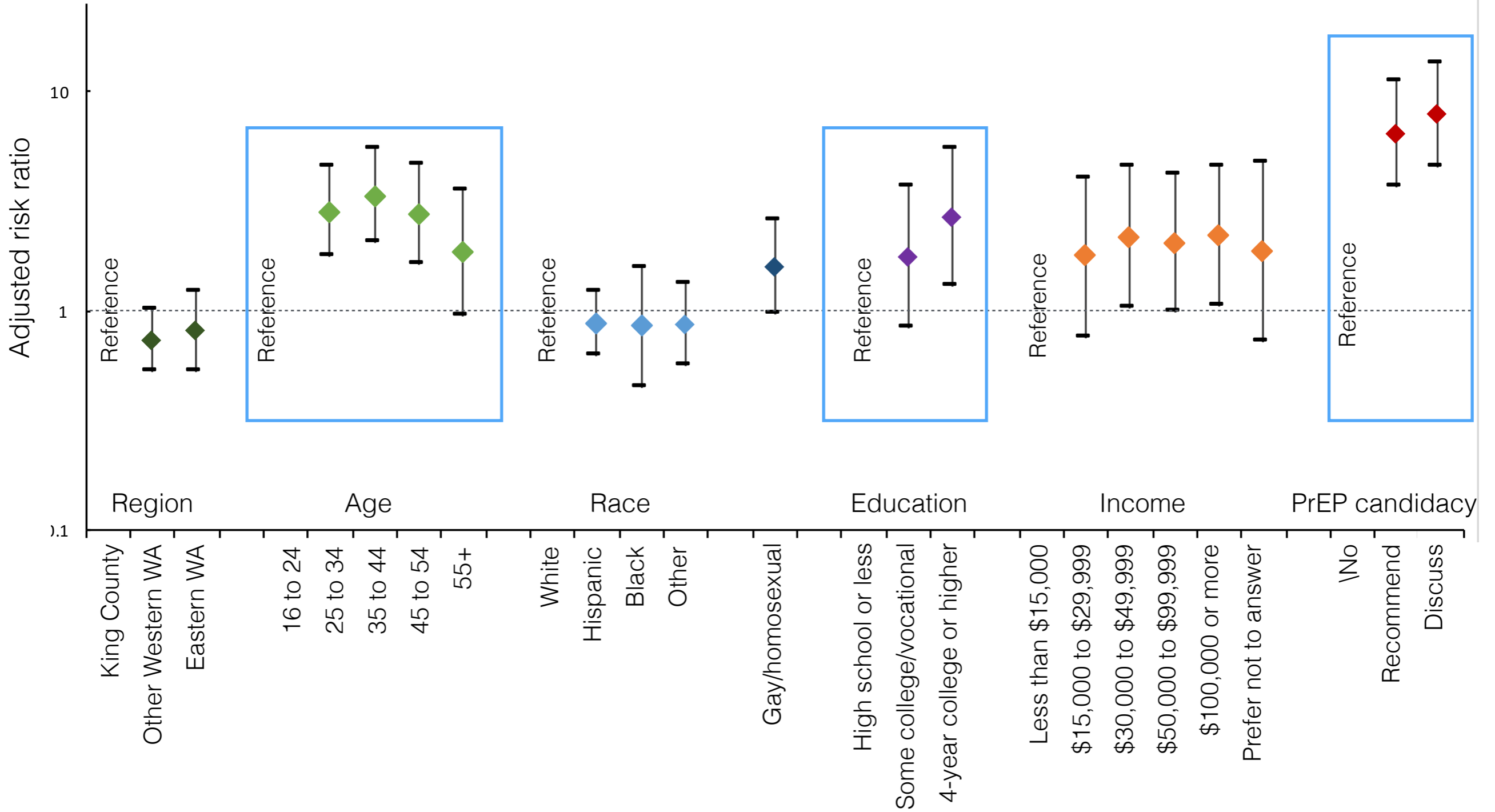


53% want to start taking PrEP again
28% unsure about starting PrEP again

Associations with PrEP utilization (n=852)



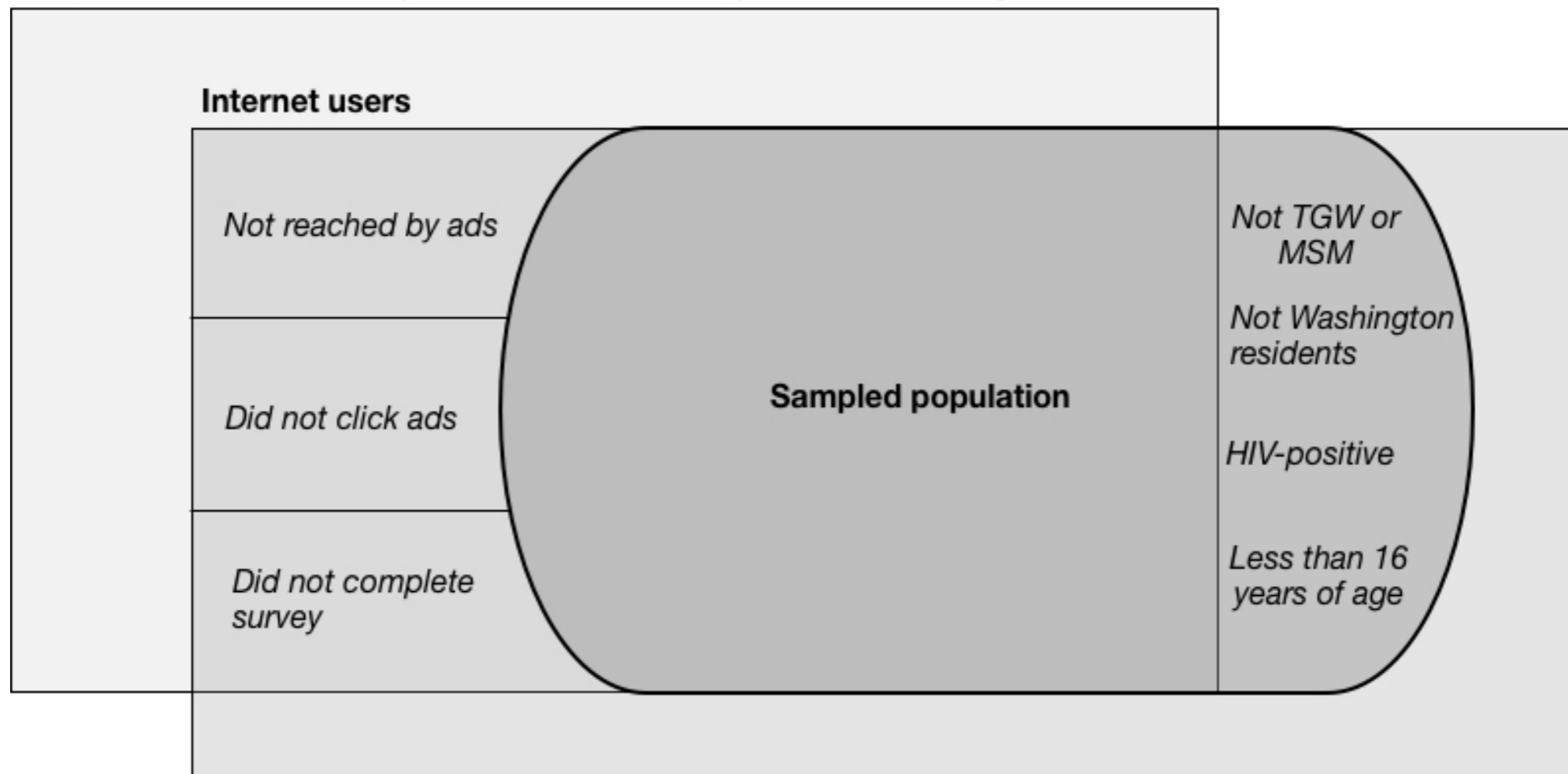
Associations with PrEP utilization (n=852)



Limitations

- Selection and response biases
- Difficult to verify eligibility

Target population: HIV-negative MSM and TGW aged 16+ in Washington



Comparison with other studies

	High risk	PrEP use	PrEP use among high risk
Comparison with national data (CDC guidelines for PrEP use^a)			
NHANES (2007-2012) ¹	25%	—	—
NHBS (2014) ²	57%	4%	6%
National online panel (2015) ³	65%	8%	13%
Current survey (2017)	58%	19%	30%
Comparison with Seattle area data (Menza risk score^b)			
Seattle NHBS (2014) ⁴	—	5%	—
KC Healthcare Provider Survey (2016) ⁴	—	11%	—
Seattle Pride Parade (2016) ⁵	31%	10%	26%
Current survey (Seattle area 2017) ^b	52%	19%	32%

^aNot in a monogamous relationship with a recently-tested HIV-negative man, sexually active, AND recent STI diagnosis, any CAI, or in an ongoing partnership with an HIV-positive male partner;

^bUse of meth or poppers in the past 12 months, diagnosis with a bacterial STI, 10+ anal sex partners, CAI with HIV-positive or status-unknown male partners (Menza et al., 2009);

^cRestricted to 628 respondents from King, Pierce, and Snohomish Counties

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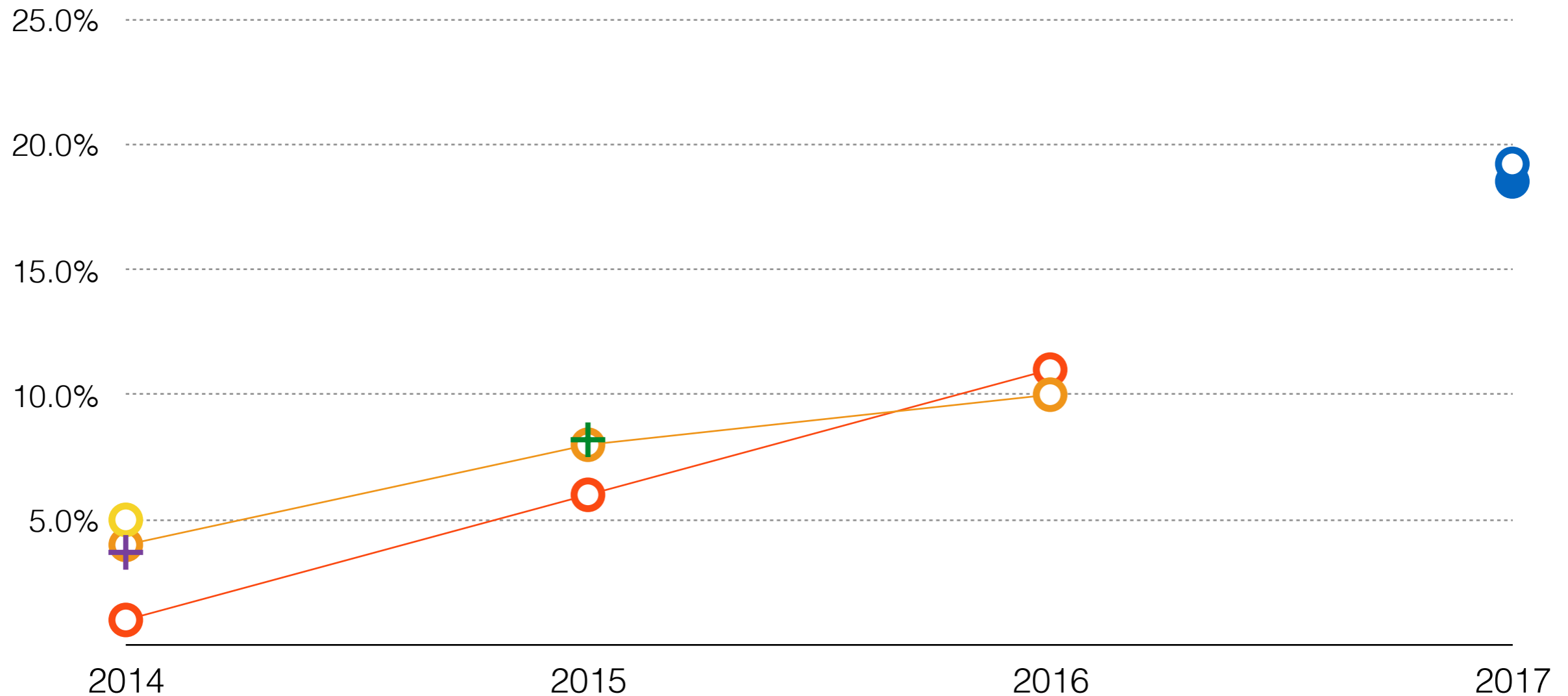
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Comparison with other studies

Percent using PrEP

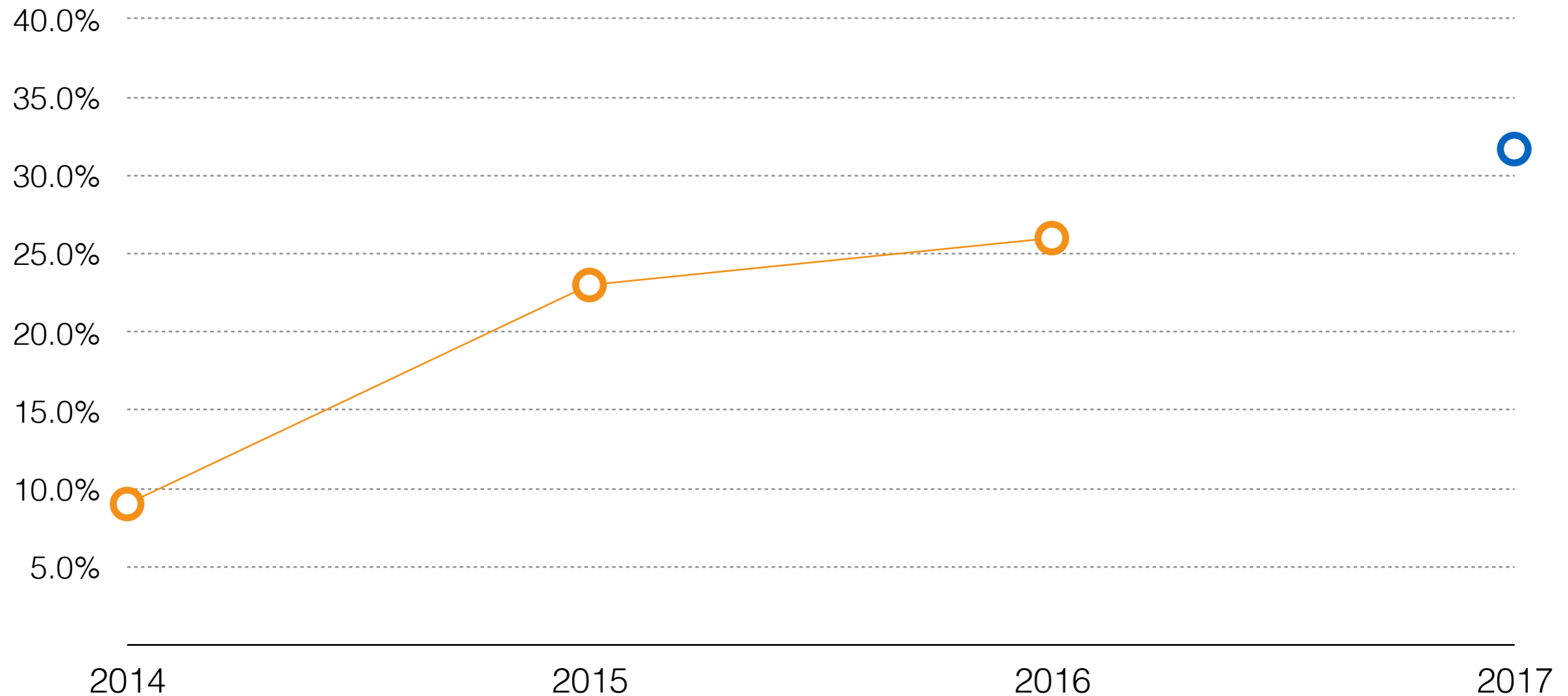


- + US NHBS¹
- + National online panel²
- Seattle NHBS³
- Seattle Pride⁴
- KC Healthcare Provider Survey³
- Current survey - Seattle area
- Current survey - all WA

¹Hoots et al. (2016); ²Parsons et al. (2017); ³Buskin et al. (2017); ⁴Hood (2016)

Comparison with other studies

Percent using PrEP among high risk (Seattle area)



○ Seattle Pride⁴

○ Current survey - Seattle area

¹Hoots et al. (2016); ²Parsons et al. (2017); ³Buskin et al. (2017); ⁴Hood (2016)

Limitations

- Selection and response biases
- Difficult to verify eligibility
- Recall, motivation, and social desirability biases
- Relatively small sample sizes outside of King County
- Data quality: inconsistencies in self-reported sexual behavior
 - Conclusions did not change in sensitivity analyses dropping observations with inconsistent data

Conclusions

- Internet-based surveillance is low cost and efficient
 - Large sample sizes attainable in weeks to months
 - Broad geographic reach
 - Low cost: ~\$17 per complete response
- Data appear consistent with previous estimates from the Pride survey, adjusting for risk group
- Similar online surveys could be implemented in other jurisdictions to monitor demand and uptake for PrEP and other prevention interventions
- Collaboration between public health and academic partners was key to the ability to conduct this survey in Washington

Conclusions

- Awareness and interest in PrEP are high among Washington MSM
- In combination with data from other surveys, these data suggest that PrEP uptake continues to increase
 - Men at higher risk are more likely to initiate PrEP, as are those aged 25-54 and men with a college degree
- Barriers to PrEP use include low perceived risk of infection, not having enough information, cost or insurance barriers, concerns about side-effects or drug resistance, and concerns about stigma
 - Improved messaging and risk counseling could alleviate some of these barriers

Next steps

- Analysis
 - Comparison with the 2017 Pride survey, Seattle NHBS, and PHSKC STD clinic samples
 - Population standardized estimates of PrEP candidacy and use
 - Reference populations: Pride survey sample and ACS data for race and education of Washington males
 - Parameter estimation for mathematical modeling
- Dissemination
 - Report provided to participants

Acknowledgments



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Martina Morris

Steven Goodreau

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Emory University

PRISM Health

Tanya Avoundjian

Questions?

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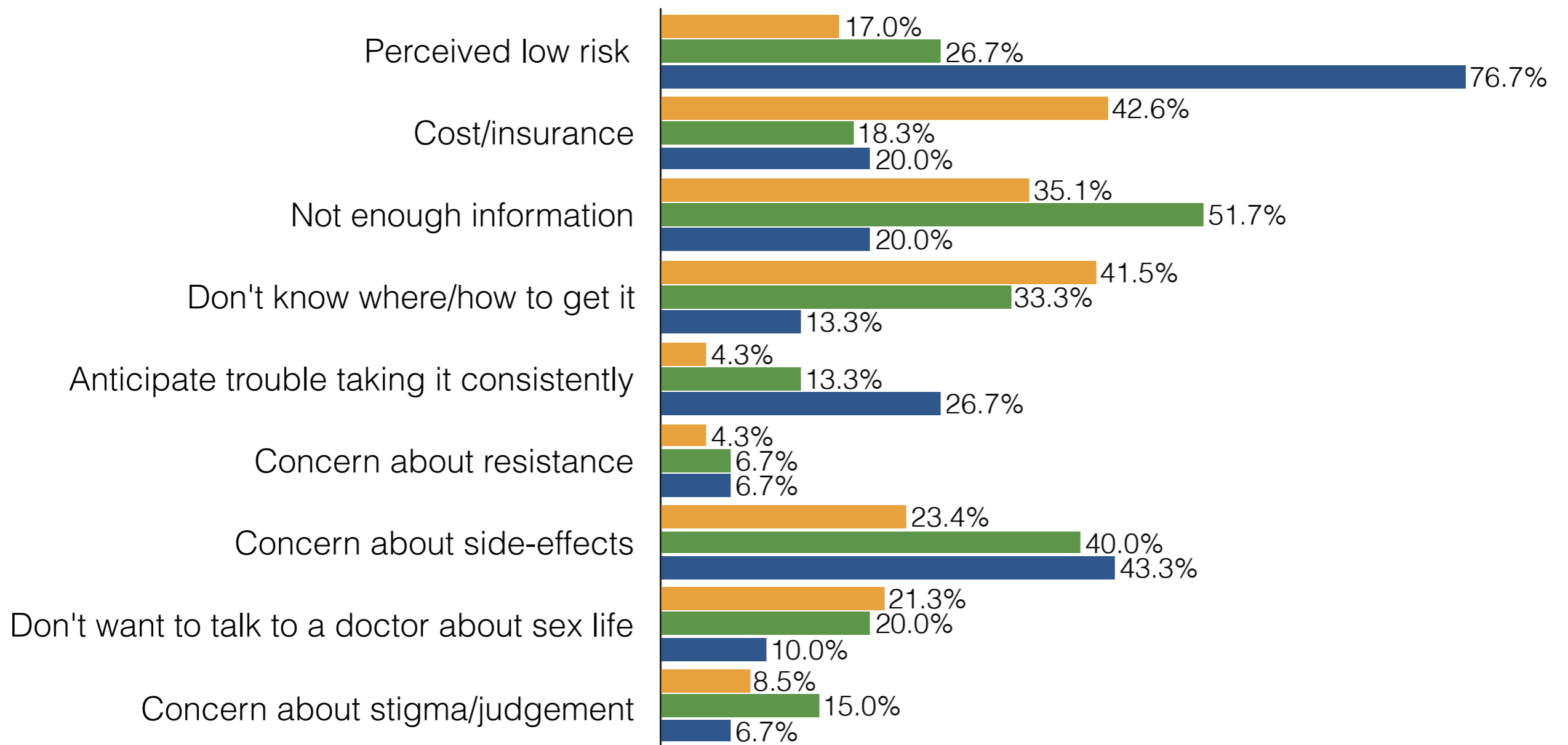
Supplementary slides

Reasons for not taking PrEP

Interested (N=94)

Unsure (N=60)

Not interested (N=30)



Restricted to men with whom local guidelines call for discussing PrEP and who have never taken it

Associations with PrEP utilization (n=852)

	Using PrEP %	Unadjusted RR (95% CI)	Adjusted RR (95% CI)
Age			
16 to 24	7.3%	Reference	Reference
25 to 34	25.6%	3.49 (2.14, 5.69)	2.82 (1.76, 4.52)
35 to 44	33.3%	4.54 (2.74, 7.52)	3.35 (2.05, 5.48)
45 to 54	28.4%	3.87 (2.25, 6.65)	2.77 (1.64, 4.68)
55 and older	13.3%	1.81 (0.91, 3.62)	1.84 (0.95, 3.55)
Race/ethnicity			
White	21.6%	Reference	Reference
Hispanic	17.6%	0.82 (0.55, 1.19)	0.88 (0.63, 1.22)
Black	21.9%	1.02 (0.52, 1.99)	0.85 (0.45, 1.58)
Other	18.3%	0.85 (0.52, 1.38)	0.86 (0.56, 1.32)
Gay/homosexual	22.4%	2.23 (1.31, 3.80)	1.57 (0.96, 2.57)
Education			
High school/GED or less	5.4%	Reference	Reference
Some college/vocational	15.1%	2.81 (1.30, 6.09)	1.75 (0.83, 3.69)
Four-year college degree or higher	28.3%	5.26 (2.52, 10.99)	2.66 (1.29, 5.46)
Income			
Less than \$15,000	7.2%	Reference	Reference
\$15,000 to \$29,999	13.0%	1.80 (0.75, 4.32)	1.76 (0.76, 4.04)
\$30,000 to \$49,999	23.4%	3.25 (1.50, 7.03)	2.16 (1.03, 4.51)
\$50,000 to \$99,999	22.7%	3.14 (1.49, 6.64)	2.03 (0.99, 4.16)
\$100,000 or more	27.4%	3.80 (1.80, 8.03)	2.17 (1.05, 4.50)
Prefer not to answer	14.0%	1.93 (0.69, 5.41)	1.84 (0.72, 4.69)
Region			
King County	25.3%	Reference	Reference
Other western WA	13.7%	0.54 (0.38, 0.77)	0.73 (0.52, 1.02)
Eastern WA	14.8%	0.58 (0.37, 0.92)	0.80 (0.53, 1.21)
PrEP candidate (local guidelines)			
No	4.0%	Reference	Reference
Recommend	32.9%	8.11 (4.64, 14.18)	6.77 (3.92, 11.71)
Discuss	27.2%	6.71 (3.80, 11.85)	4.77 (2.72, 8.36)