How STD Programs can Increase PrEP Usage and Facilitate STD Prevention

April 27, 2017 12:00 – 1:00 PM ET

Thanks for joining the webinar! We will begin shortly.

Please remember to dial: 866.740.1260, access code 7153863 to join the Audio for this call.

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National Coalition of STD Directors
Promoting Sexual Health Through STD Prevention

IT'S YOUR CALL

Disclaimer

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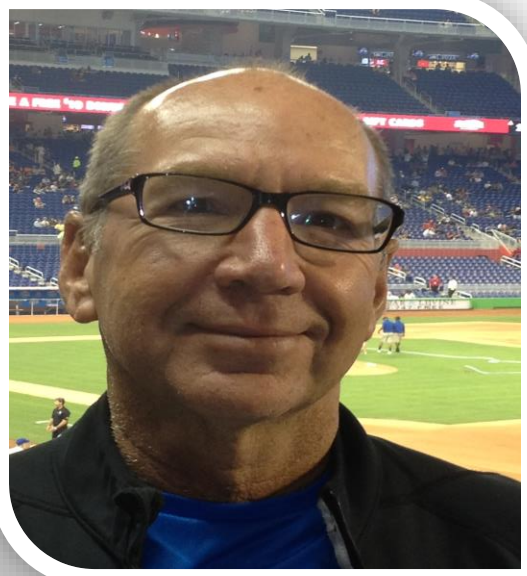
NCSD Webinar Facilitators

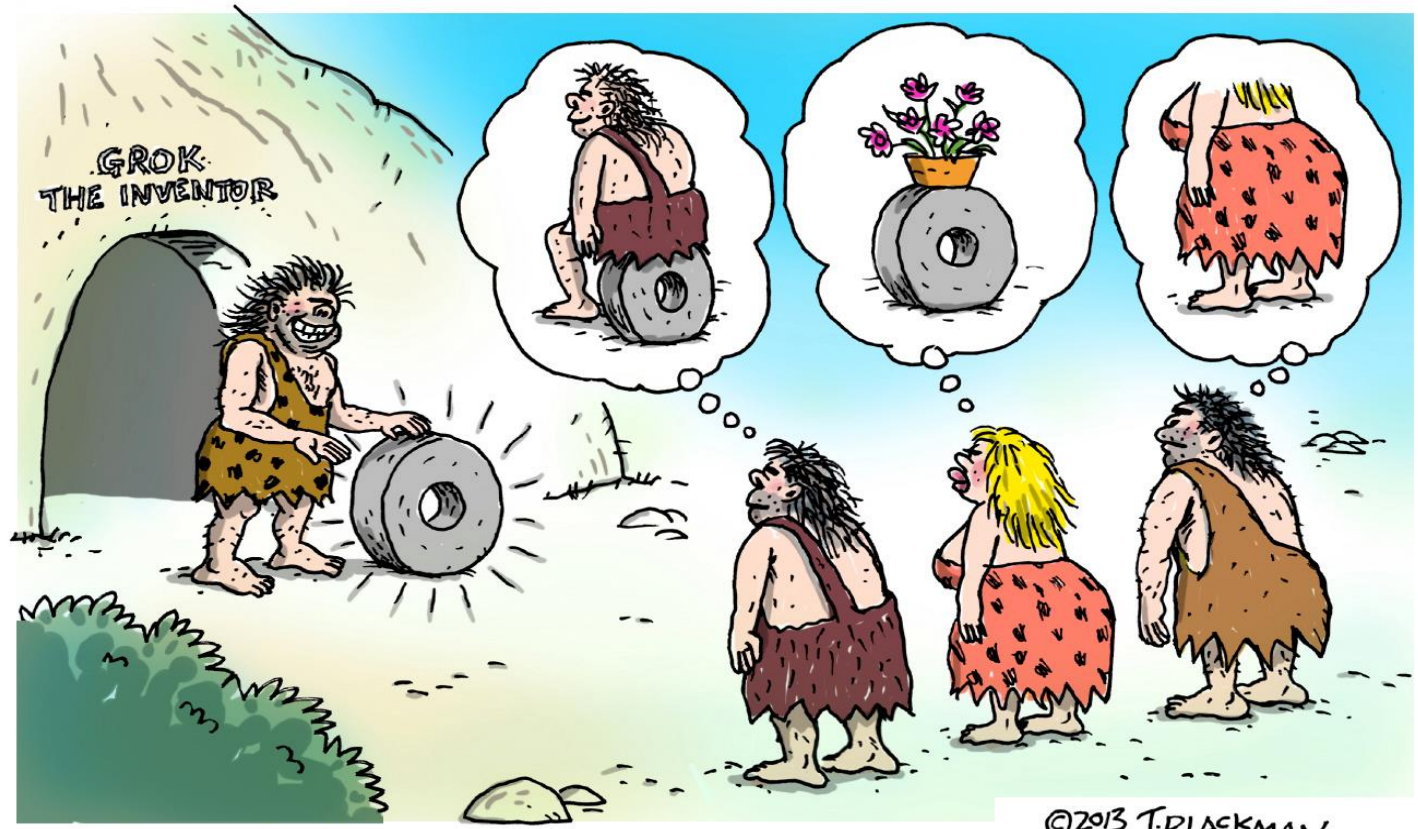


Charlie Rabins
Technical Assistance Consultant
National Coalition of STD Directors (NCSD)

Lindsay 0'Keefe
Program Assistant
National Coalition of STD Directors (NCSD)

NCSD - It's Your Call

STD Programs Learning From Each Other



A few housekeeping items

- **Please mute your phone unless you are speaking**
- If the facilitator loses web or voice connection during the presentation, please keep your video and audio connections until the facilitator reconnects.
- This call is being recorded.
- This recording and presentation slides (pdf) will be available after the webinar and posted on the NCSD website within a week.

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Questions or Comments?

- Have a question or a comment for our presenters?
  - Enter it in the chat box to the left of your screen!
- We will try to provide 5 minutes for answering chat questions after each speaker and time for chat questions after all speakers have finished.

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Agenda*

12:00 – 12:10 PM Introduction – Charlie Rabins

12:10 – 12:25 PM Rhode Island – Dr. Phillip Chan

12:25 – 12:40 PM Mississippi – Dr. Leandro Mena

12:40 – 12:55 PM Georgia – Dr. Samuel Jenness

12:55 – 1:00 PM Questions and Open Discussion

- We will try to take questions for five minutes after each speaker and have time at the conclusion for additional questions and discussion.

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Questions for Our Presenters

- Why and how can my STD Program foster PrEP usage and increase uptake?
- If STD Programs don't directly provide PrEP, how can they contribute to the PrEP Cascade?
- Why and how does increasing STD screening frequency for MSM on PrEP reduce STD Prevalence?
- When, how and for whom should condom usage by PrEP clients be encouraged?
- What are the factors that may be contributing to an increase in STDs among MSM?
- What protocols, plans, guidelines, etc. do you recommend for PrEP and STD screening?

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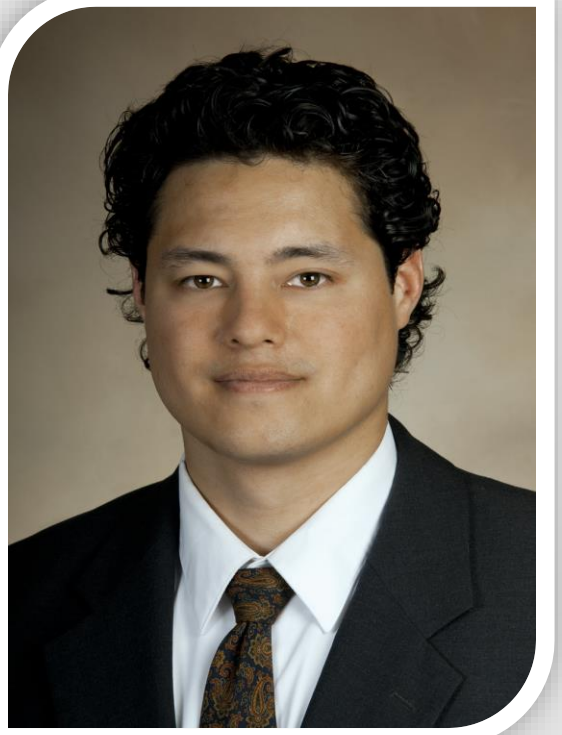
Dr. Phillip Chan
Rhode Island



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Dr. Phillip Chan
Bio-sketch

Philip A. Chan, M.D., M.S., is an Assistant Professor in the Department of Medicine at Brown University and physician in HIV and infectious diseases at The Miriam Hospital Immunology Center in Providence, Rhode Island. Dr. Chan is director of the Rhode Island STD Clinic. Dr. Chan also runs the pre-exposure prophylaxis (PrEP) program at the clinic. He serves as Consultant Medical Director for the Rhode Island Department of Health Center for HIV/AIDS, Viral Hepatitis, STDs, and TB. He is working with the Department of Health and other community organizations on several statewide initiatives related to HIV and other STDs.

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Pre-exposure prophylaxis implementation at the Rhode Island STD Clinic

BROWN UNIVERSITY

How STD Programs can Increase PrEP Usage and Facilitate STD Prevention

National Coalition of STD Directors (NCSD)

April 27, 2017

Philip A. Chan, MD, MS
Director, Rhode Island STD Clinic
Assistant Professor of Medicine
Brown University
Providence, Rhode Island

The Rhode Island STD Clinic

A collaboration between RIDOH and The Miriam Hospital

HIV and other STDs (syphilis, gonorrhea, chlamydia)
Wednesday, Thursday, and Friday
12:30-3:30pm

Protect Yourself!
HIV and other sexually transmitted diseases (STDs) are still a major problem in Rhode Island. We recommend that if you are sexually active, you should be tested at least once a year for HIV and other STDs. If you're interested in protecting yourself from HIV, use condoms and ask your sex partners if they have been tested recently. If you are having sex with someone who has HIV, they should be on treatment, which helps prevent them from transmitting HIV to you.

What is PrEP?
Pre-exposure prophylaxis (PrEP) is another potential option to protect yourself from HIV. PrEP is a single pill available by prescription that contains the medicines emtricitabine and tenofovir disoproxil fumarate. When PrEP is taken daily, it is highly effective at preventing HIV infection.

Who should consider PrEP?
Anyone can become infected with HIV. You must be negative for HIV to start PrEP. People who are at-risk of HIV infection should consider PrEP. This includes gay, bisexual, and other men who have sex with men who don't always use condoms for anal sex.

How should PrEP be used?
PrEP is not 100% effective. The usual dose of PrEP is one pill once a day. PrEP does not protect against other STDs. Condoms should still be considered.

What are most common side-effects of PrEP?
Stomach upset (nausea) can occur and typically goes away after a couple days. The medication can cause kidney problems. Other potential side effects include the weakening or softening of bones and liver problems (rare).

How effective is PrEP?
The medication depends on how well a person takes the pill each day. For people who take their pills almost every day, PrEP can significantly reduce their risk of getting HIV. People who take their pills less regularly have less protection against HIV.

How do I get on PrEP?
PrEP must be prescribed by a medical provider. To make an appointment with a medical provider for PrEP, please call (401) 793-4715 or ask the staff at the STD Clinic.

What happens at my appointment?
During your first medical appointment, the doctor will discuss the risks and benefits of PrEP with you and answer any of your questions. If you decide you would like PrEP, the doctor will perform testing for HIV, hepatitis B, kidney function, and other STDs (if needed). People on PrEP should follow up with a medical provider every three (3) months.

The Rhode Island STD Clinic
1125 North Main Street, Providence, RI 02906
Wednesday, Thursday, and Friday from 12:30-3:30pm

DO IT RIGHT
GET TESTED FOR HIV & STDS

Was today the first time you heard about PrEP? Yes____ No____
If not, where did you first hear about PrEP: HIV/STD Clinic_____ Referral (specify)_____
Website:_____ Other_____

Rate your understanding of PrEP: (Choose 1-5)

(1)	(2)	(3)	(4)	(5)
Very Well	Okay	Somewhat	Unclear	No idea

How would you rate your risk for contracting HIV? (Choose 1-5)

(1)	(2)	(3)	(4)	(5)
Extremely Unlikely				Extremely Likely

How would you rate PrEP in preventing HIV infection? (Choose 1-5)

(1)	(2)	(3)	(4)	(5)
Doesn't Prevent		Prevents half the time		Prevents all the time

If PrEP were prescribed to you today, how likely would you be to use it? (Choose 1-5)

(1)	(2)	(3)	(4)	(5)
Extremely Unlikely				Extremely Likely

Would you be more likely to take PrEP if: (Please Circle)

You knew it could lower your chance for acquiring HIV?	Yes	No
You knew your partner was HIV positive?	Yes	No
You thought you were at high-risk for HIV infection?	Yes	No

What are some reasons you would be concerned about taking PrEP? (Check ALL that apply)

____ Side-effects	____ Interactions with alcohol/drugs	____ I have no concerns about taking PrEP
____ Paying for it	____ Interaction with other medications	
____ Taking a medication everyday	____ Fear people may think I was HIV+	____ Other:_____

What is the MAIN reason you would be concerned about taking PrEP? (Check ONE)

____ Side-effects	____ Interactions with alcohol/drugs	____ I have no concerns about taking PrEP
____ Paying for it	____ Interaction with other medications	
____ Taking a medication everyday	____ Fear people may think I was HIV+	____ Other:_____

What additional questions do you have about PrEP?
_____
_____

Can we follow-up with you to discuss PrEP further? Yes____ No____
If not, why not:_____
Name:_____ Phone Number:_____
Insurance:_____ Email:_____

TO BE COMPLETED BY MEDICAL PROVIDER:
Follow-up: None Call Financial Assistance Medical Provider
Appointment Date:__ __ / __ __ / __ __ __ __ **Time:**__ __ : __ __ **Provider:**_____

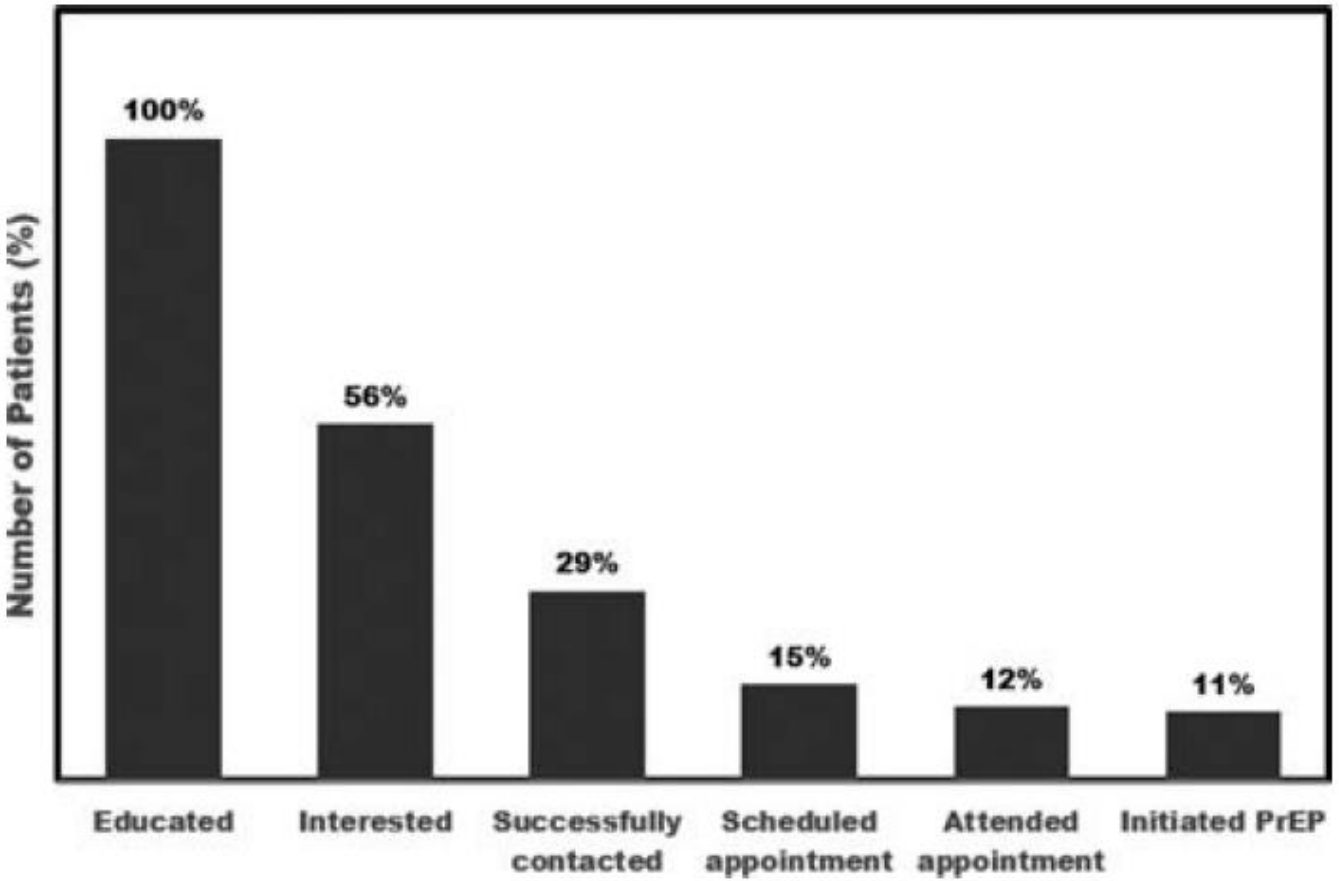


Figure 1. The PrEP implementation cascade among men who have sex with men presenting to the Rhode Island STD Clinic (N=234)

TABLE 4B. Logistic Regression Results Predicting Being Prescribed PrEP*

	AOR*	95% CI
HIV risk perception†	2.17§	1.29–3.64
Any sex with HIV-positive partner‡	7.08‡	2.35–21.34
Model: $\chi^2 = 30.58$ $P = 0.000074$		

*Model controls for age, race, and ethnicity. The dependent variable in this analysis is coded so that 0 = not interested in PrEP and 1 = Interested in PrEP.

†Likert scale ranging from 1 (no risk) to 5 (high risk).

‡Reference group = No, AORs displayed for Yes group.

§$P \leq 0.01$.

¶$P \leq 0.001$.

Welcome to The Rhode Island HIV/STD Clinic

All answers are confidential. We ask about some of your behaviors so that we can appropriately test you for certain STDs.

Have you heard of taking HIV medications <u>after</u> a possible sexual exposure to prevent HIV infection? (Post-exposure prophylaxis, PEP)	YES	NO
Have you ever taken post-exposure prophylaxis?	YES	NO

Have you heard of taking HIV medications to prevent infection in people who are HIV negative? (Pre-exposure prophylaxis, PrEP)	YES	NO
Have you ever taken pre-exposure prophylaxis?	YES	NO

PrEP Awareness and Racial Disparities

PrEP awareness and use among MSM visiting the Rhode Island STD Clinic (N=316)

	PrEP Awareness			PrEP Use
	%	OR	95% CI	%
Race/Ethnicity				
Non-Hispanic White (N=203)	51	Ref		3
Non-Hispanic Black (N=34)	26	0.35**	0.16 to 0.79	0
Hispanic/Latino (N=50)	40	0.65	0.35 to 1.21	4
Other/Unknown (N=29)	58	1.38	0.63 to 3.03	4
Age group				
16-19 (N=17)	18	Ref		0
20-24 (N=84)	35	2.46	0.65 to 9.26	0
25-29 (N= 61)	59	6.72***	1.75 to 25.85	10
30-34 (N=55)	58	6.49***	1.67 to 25.23	0
35-44 (N=34)	47	4.15**	1.01 to 17.11	0
45-54 (N=44)	59	6.74***	1.69 to 26.91	2
55+ (N=21)	33	2.33	0.50 to 10.91	0

Notes: PrEP use was not great enough to analyze differences in PrEP use by demographic characteristics. **p≤0.05, ***p≤0.01

Raifman et al., 2016 in-press

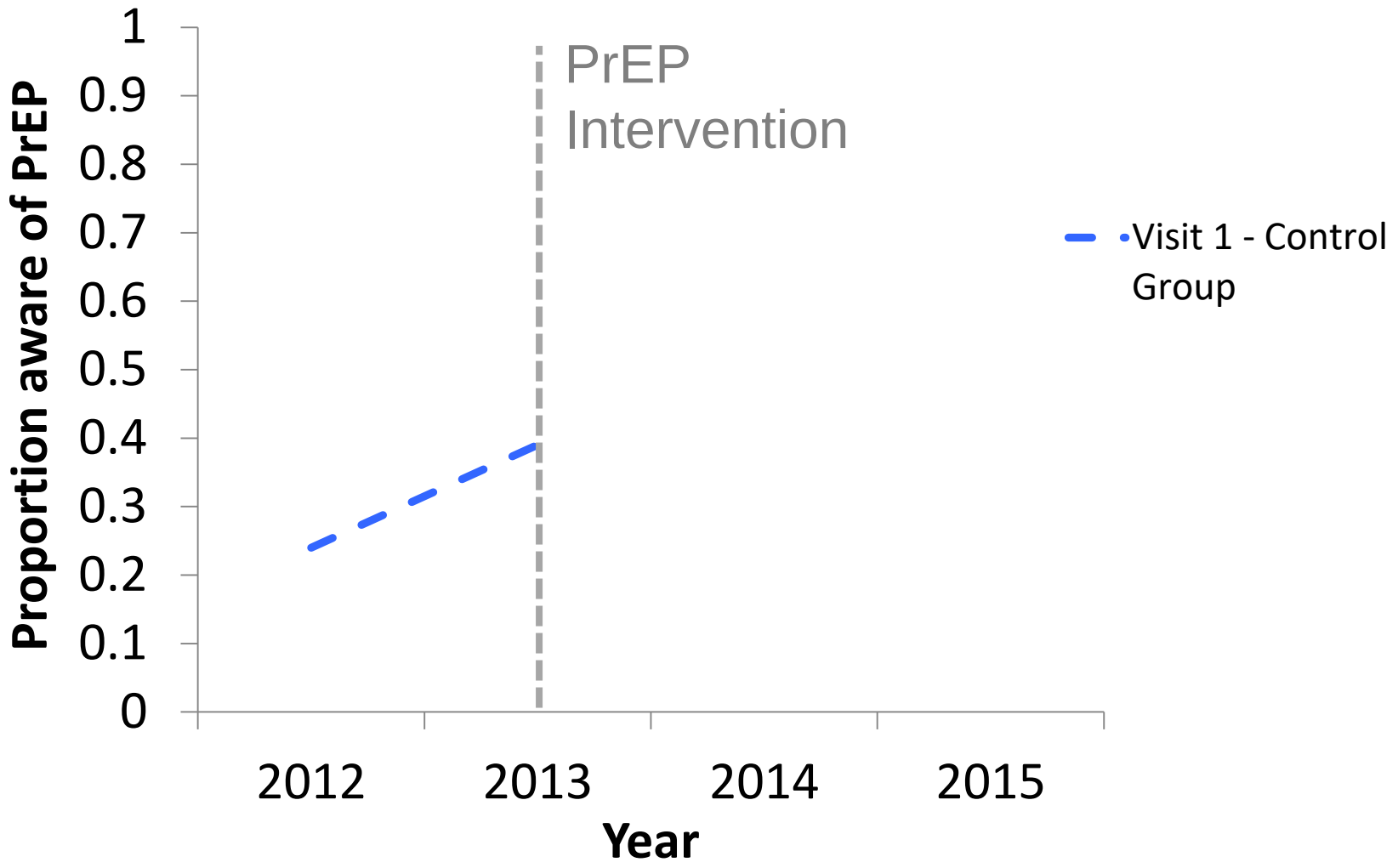
STD Clinic PrEP Education for MSM

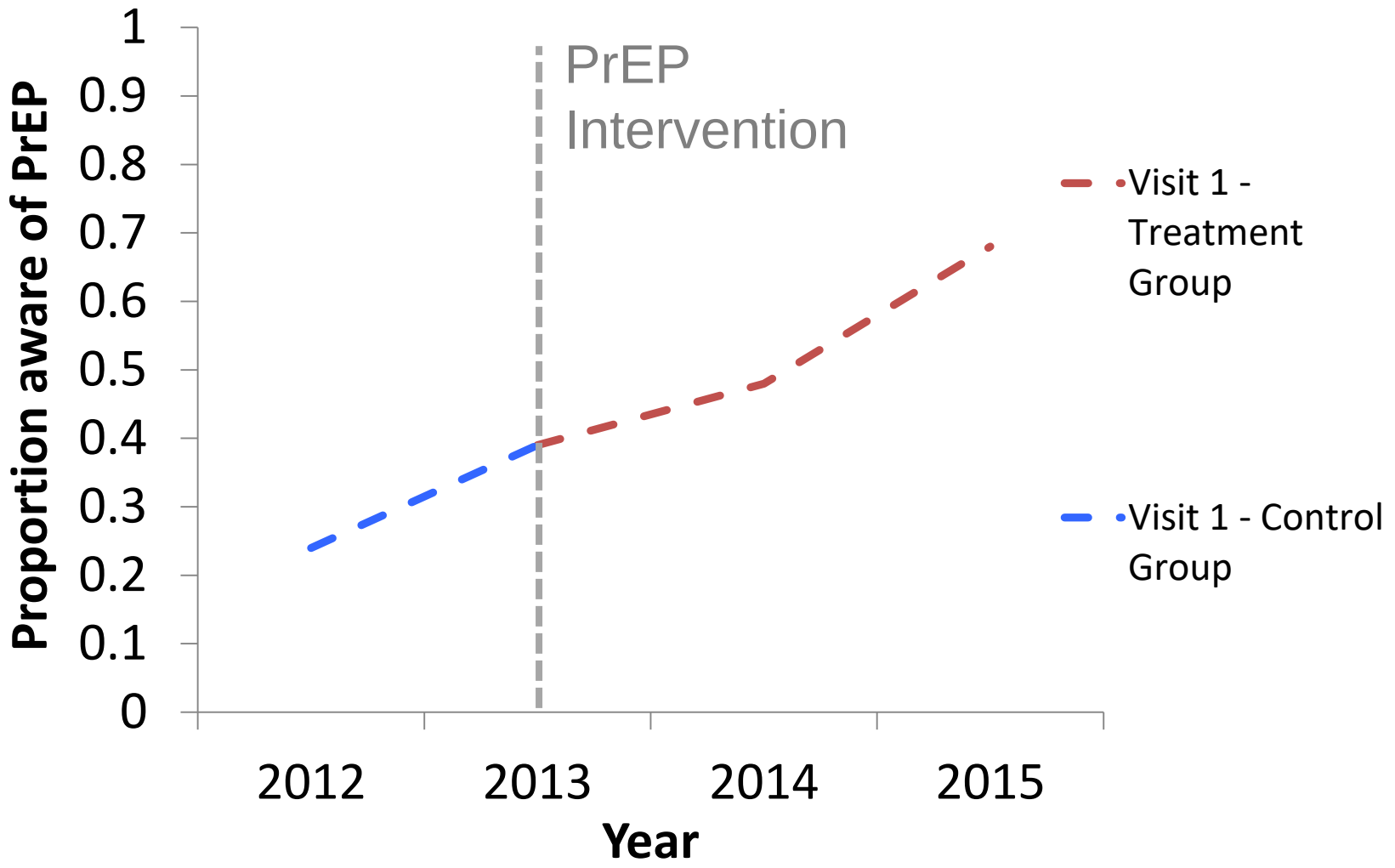
Difference-in-differences estimation of associations between intervention and PrEP awareness and use among MSM (N=316)

	PrEP awareness			PrEP use		
	Percentage points	95% CI	p-value	Percentage points	95% CI	p-value
Treatment group	1.4	-13.39 to 16.29	0.848	-1.6	-5.89 to 2.64	0.455
Second visit	-0.3	-14.97 to 14.47	0.974	-1.2	-6.84 to 4.43	0.675
Treatment group*Second visit	19.4	3.98 to 34.77	0.014	3.6	0.30 to 12.99	0.040
Year	11.5	5.44 to 17.53	<0.001	2.8	0.2 to 5.34	0.033
Age group						
16-20	Ref			Ref		
21-24	4.4	-8.90 to 17.71	0.516	-1.9	-8.13 to 4.25	0.539
25-29	13.5	-0.55 to 27.65	0.060	4.5	-4.05 to 13.13	0.300
30-34	15.1	0.55 to 29.73	0.042	3.2	-4.39 to 10.81	0.408
35-44	13.9	-2.64 to 30.38	0.100	-1.5	-8.58 to 5.48	0.666
45-54	26.6	10.89 to 42.30	0.001	4.5	-5.05 to 14.10	0.354
55+	1.9	-17.41 to 21.26	0.845	4.9	-5.75 to 15.52	0.368

Notes: We estimated linear models with patient fixed effects and robust standard errors, controlling for patient age. The patient fixed effects control for time-invariant patient characteristics, including race, ethnicity, and socioeconomic status. The mean duration between the first visit and the second visit was eight months.

Raifman et al., 2016 in-press


Proportion aware of PrEP
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
PrEP
Intervention
Visit 1 - Control Group
2012
2013
2014
2015
Year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0.1
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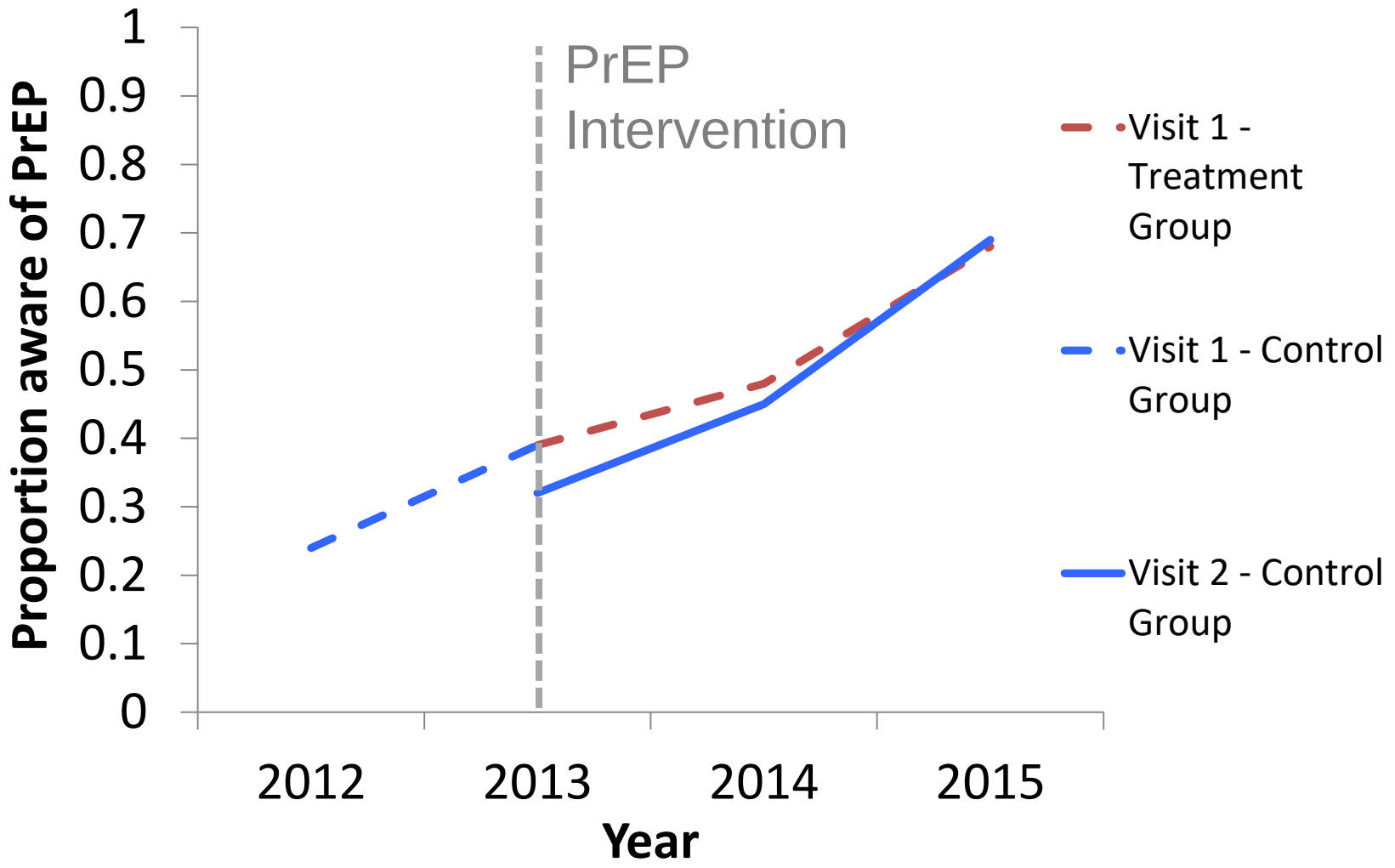
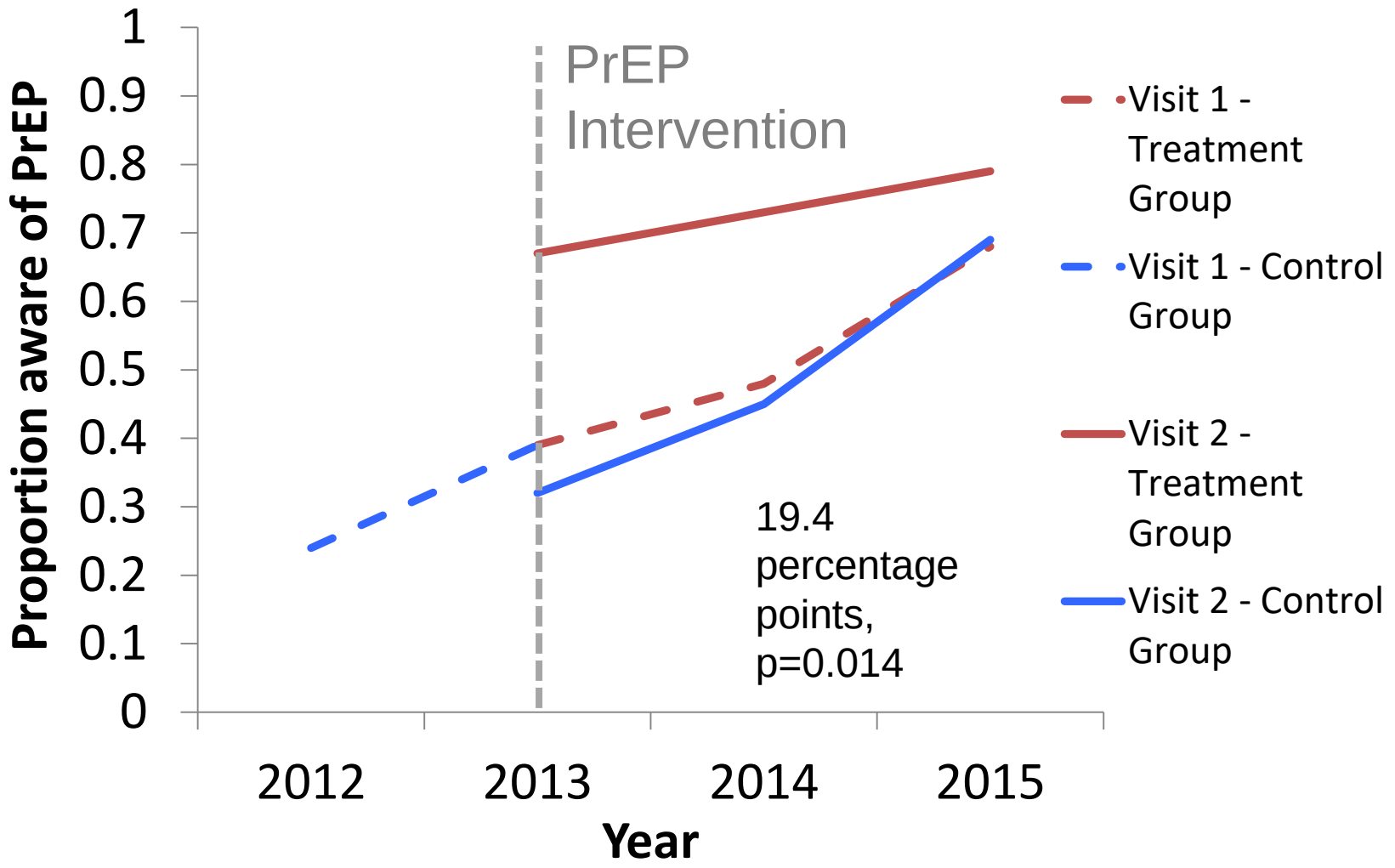
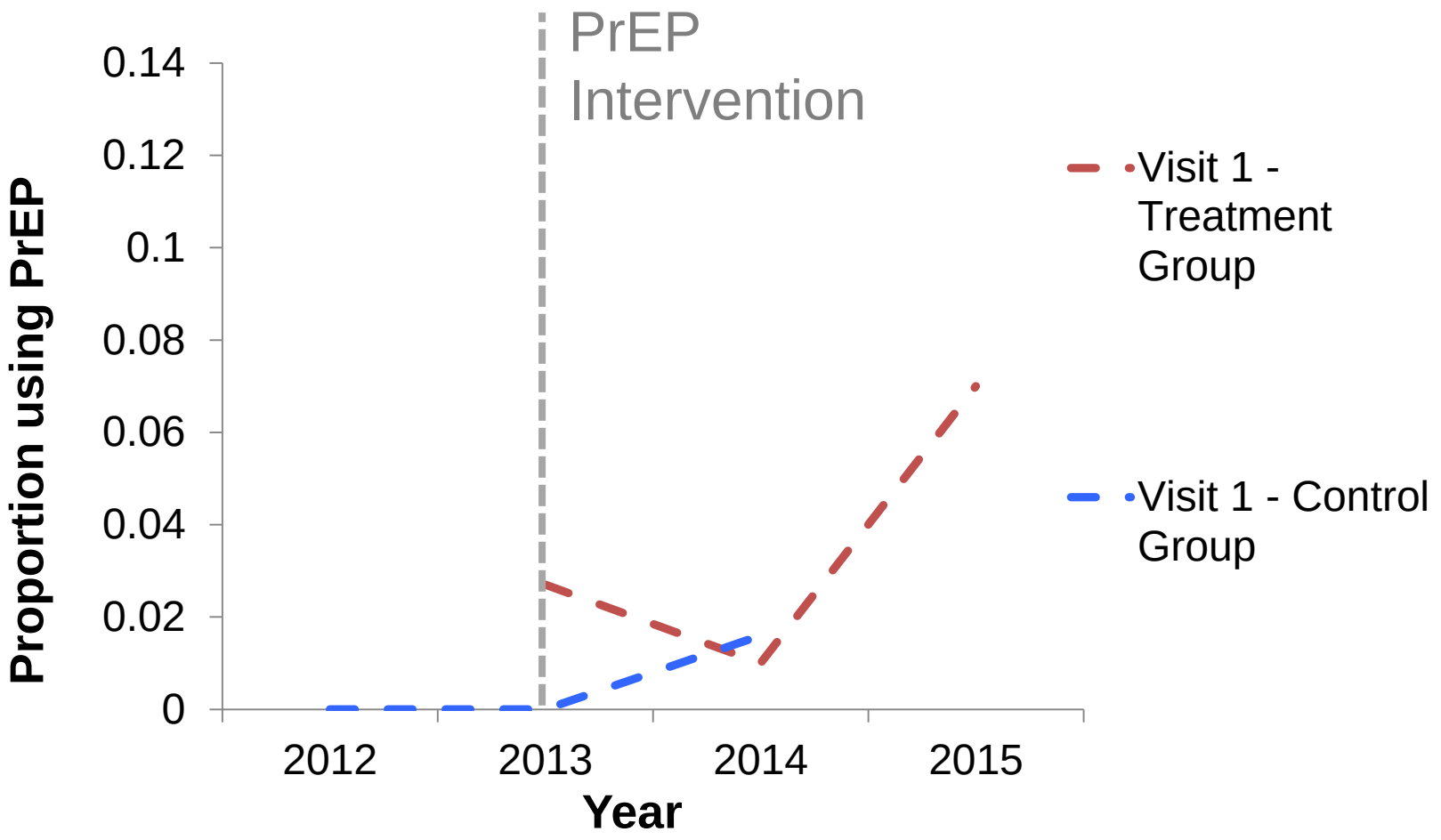
PrEP Intervention
Visit 1 - Treatment Group
Visit 1 - Control Group
2012
2013
2014
2015
Year


Proportion aware of PrEP
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
PrEP Intervention
2012
2013
2014
2015
Year
Visit 1 - Treatment Group
Visit 1 - Control Group
Visit 2 - Control Group


Proportion aware of PrEP
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
2012
2013
2014
2015
Year
PrEP Intervention
19.4 percentage points, p=0.014
Visit 1 - Treatment Group
Visit 1 - Control Group
Visit 2 - Treatment Group
Visit 2 - Control Group


PrEP Intervention
Proportion using PrEP
0.14
0.12
0.1
0.08
0.06
0.04
0.02
0
2012
2013
2014
2015
Year
Visit 1 - Treatment Group
Visit 1 - Control Group

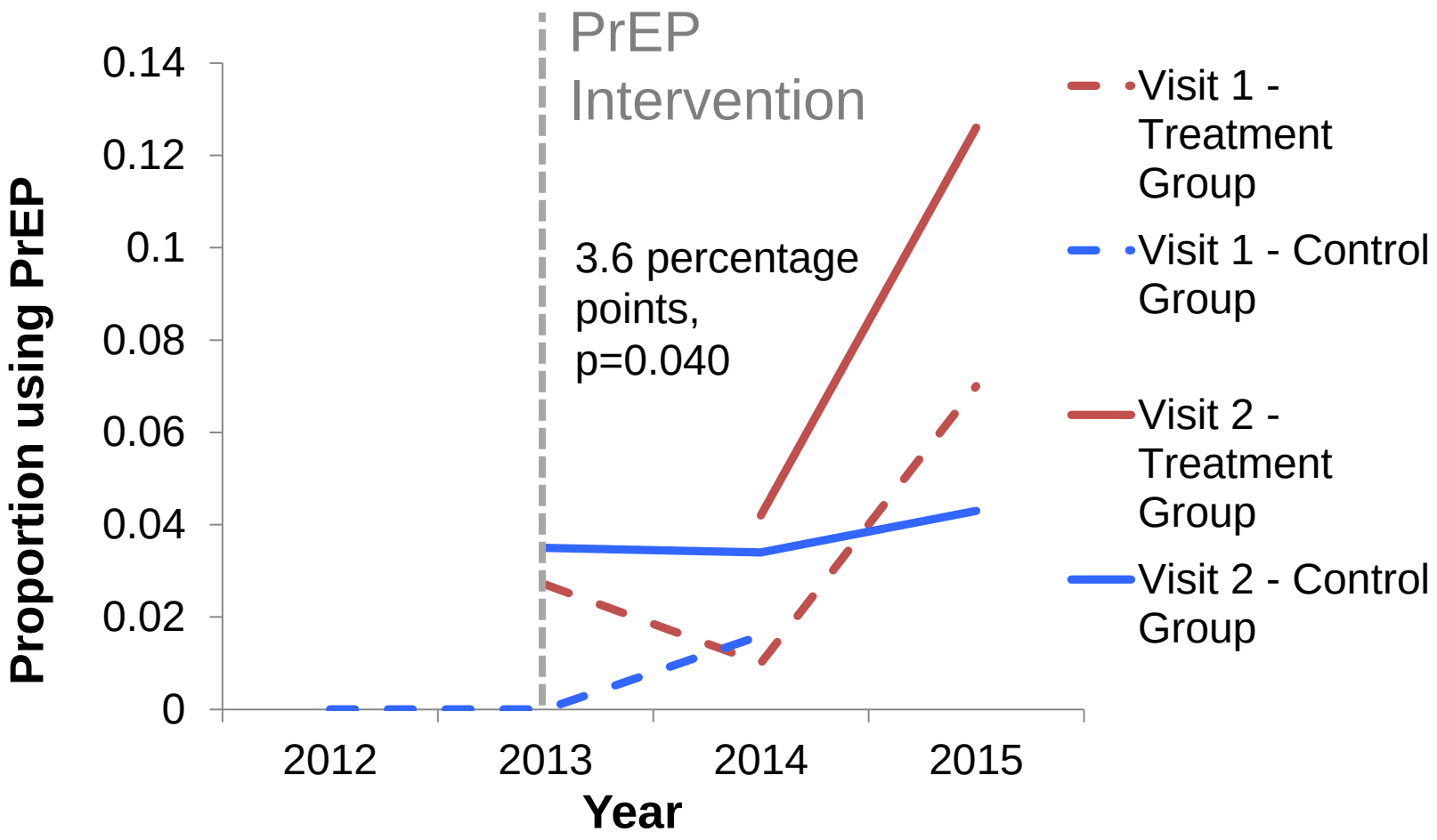
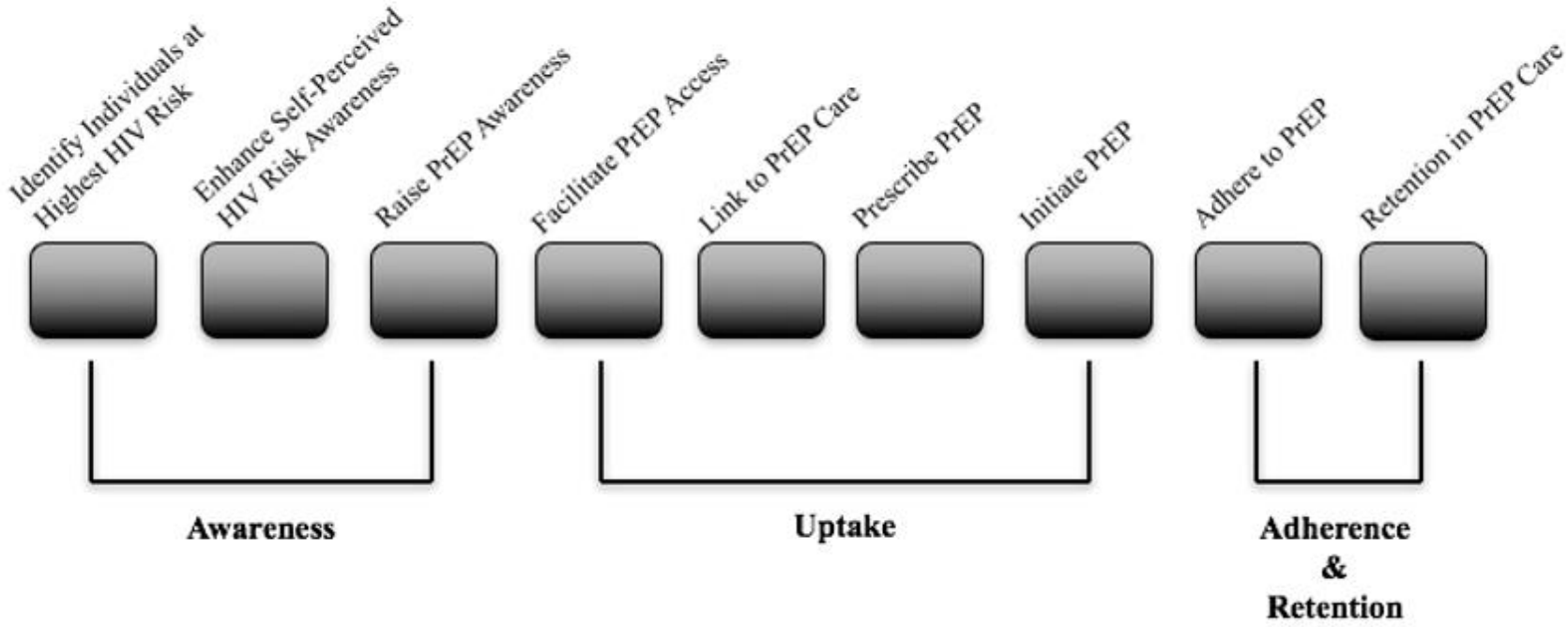
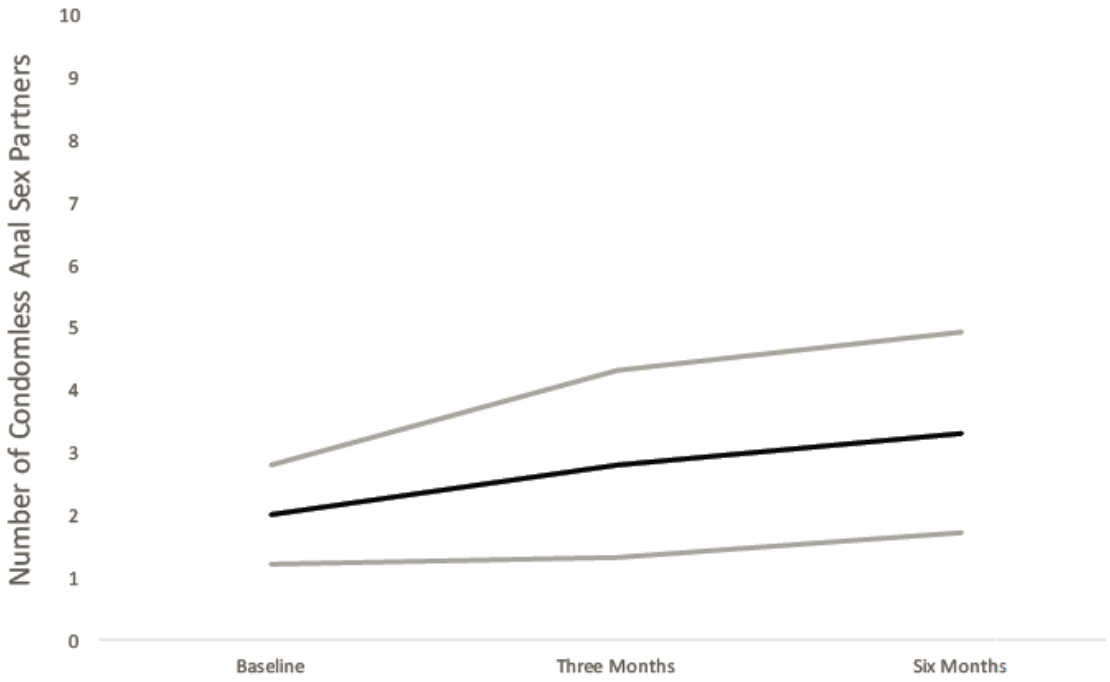

PrEP Intervention
3.6 percentage points, p=0.040
Proportion using PrEP
0.14
0.12
0.1
0.08
0.06
0.04
0.02
0
2012
2013
2014
2015
Year
Visit 1 - Treatment Group
Visit 1 - Control Group
Visit 2 - Treatment Group
Visit 2 - Control Group

Figure 1: The PrEP Care Continuum



Defining the HIV pre-exposure prophylaxis care continuum, Nunn, Chan et al., 2015

Decreased Condom Use among MSM on PrEP

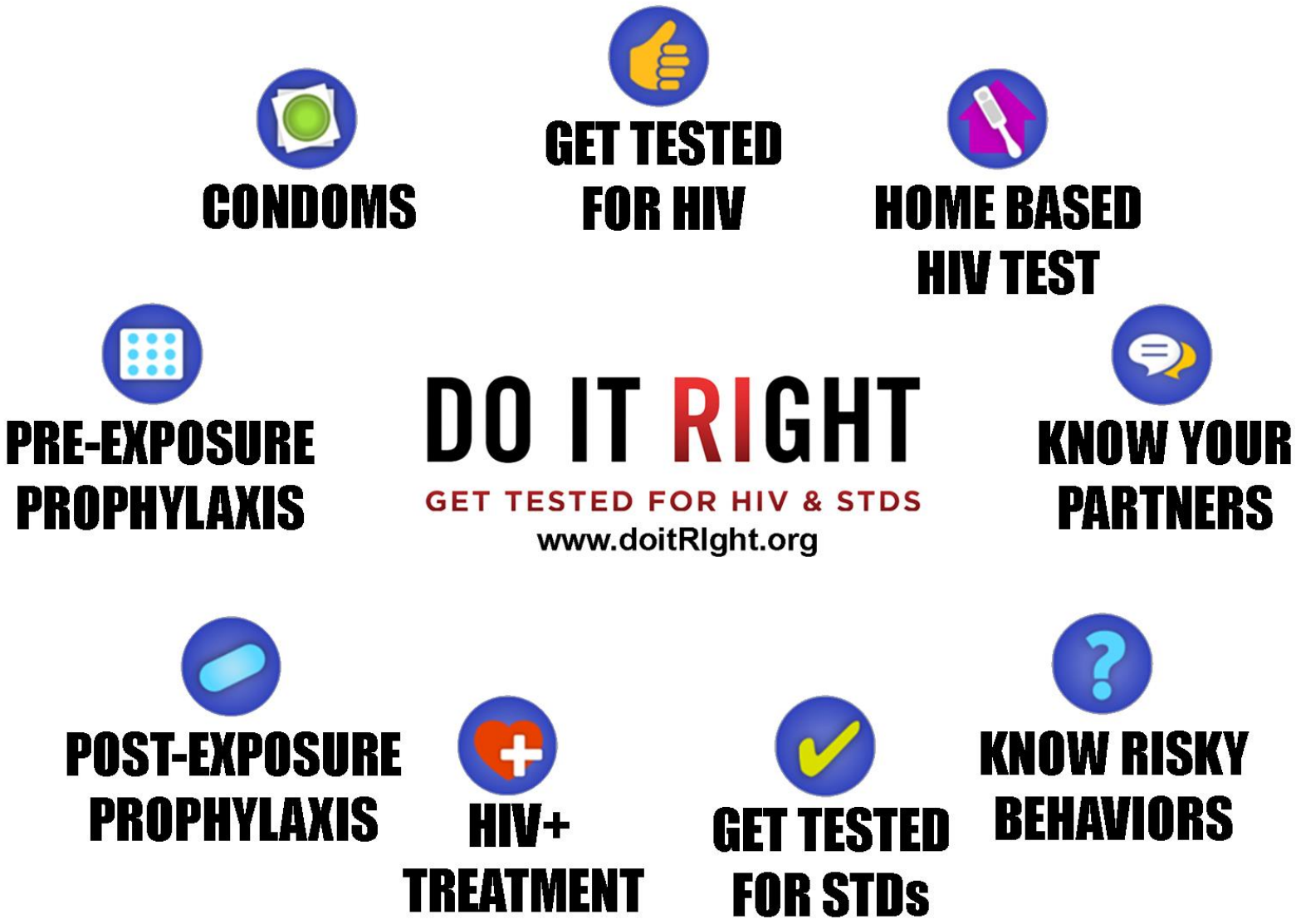


1)Longitudinal mixed effects model (N=61)

2) No difference in total number of partners

3) Significant increase in number of condomless anal sex partners at six months (+1.31 partners)

Behavioral Changes Following Uptake of HIV Pre-exposure Prophylaxis Among Men Who Have Sex with Men in a Clinical Setting, Oldenburg, Chan et al., 2017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POST-EXPOSURE PROPHYLAXIS
HIV+ TREATMENT
GET TESTED FOR STDs
KNOW RISKY BEHAVIORS

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Questions

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National Coalition of STD Directors
Promoting Sexual Health Through STD Prevention

Dr. Leandro Mena
Mississippi

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Dr. Leandro Mena
Bio-sketch

Dr. Mena is Professor and Chair of the School of Population Health Science at the John D. Bower School of Population Health Science and Associate Professor of Medicine, Infectious Diseases, at the University of Mississippi Medical Center. He has more than 14 years of experience in clinical and epidemiological research in the area of sexually transmitted infections (including HIV), with special interest in the dynamics of transmission and prevention, and the role that social determinants of health play in perpetuating these epidemics in sexual and gender minority populations. Dr. Mena serves as the medical director of the Crossroads Clinic (STD/HIV clinic in Jackson, MS), the only publicly funded exclusive STD/HIV clinic in the state, and as the medical director at Open Arms Healthcare Center, a community-based clinic that offers primary care services with an emphasis in the health care needs for LGBT populations in Jackson, MS. He also directs the only PrEP Clinic in the state of Mississippi. Dr. Mena has dedicated a significant proportion of his effort to the development, implementation, evaluation and dissemination models to provide culturally competent HIV services to MSM of color. For almost a decade, he has collaborated in a diversity of programmatic and research efforts addressing the HIV risk and prevention needs of racial/ethnic, gender and sexual minorities in the South and have contributed extensively to a number of publications.

Dr. Mena earned his medical degree from the Universidad Nacional Pedro Henriquez Urena in Santo Domingo, Dominican Republic, and his MPH from Tulane University School of Public Health and Tropical Medicine in New Orleans, La.

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PrEP implementation in Jackson, MS

Leandro A. Mena, M.D., M.P.H.
Chair and Professor of Population Health Science
John D. Bower School of Population Health
Professor of Medicine
University of Mississippi Medical Center

UMMC
Mississippi AIDS Education and Training Center
University of Mississippi Medical Center

Crossroads STD Clinic

- Located in Jackson, MS at the Jackson Medical Mall
- Open Monday, Wednesday,
  Thursday and Friday 8 a.m.-5 p.m.
  Open Tuesday 8.a.m.-7p.m.
- Walk-in Clinic
- Funded primarily through Federal Funds
  Few salaries are paid from State Funds
- Free Clinic—Bill Medicaid/Medicare
- Provide STD/HIV Services

Crossroads STD Clinic (Jackson, MS)

- 9,796 patients
  - 93.4% Black
  - 53.3% Female
  - 15.5% MSM
  - 11.6% YBMSM
  - 95.3% STD Screening

STD Patients Characteristics	%
Age:	
<18	1
18-27	50.3
28-36	28.3
37+	20.2
CT	14.2
GC	6.6
RPR Reactive	4.9
HIV (all)	1.9
HIV (YBMSM)	11.9

A tool for risk-stratifying MSM: CDC risk index ("HIRI")

"In the past (year) have you had sex?"

"With men, women, or both?"

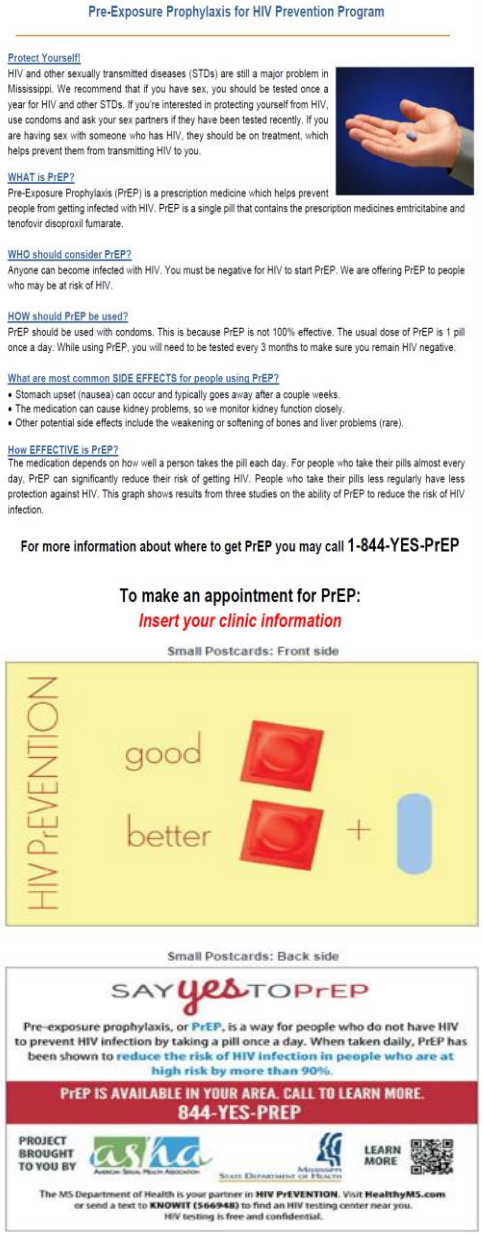
Score < 9: standard prevention
Score≥ 10: strongly consider PrEP

HIRI-MSM Risk Index*			
1	How old are you today (yrs)?	<18 years	score 0
		18–28 years	score 8
		29–40 years	score 5
		41–48 years	score 2
		≥49 years	score 0
2	How many men have you had sex with in the last 6 months?	>10 male partners	score 7
		6–10 male partners	score 4
		0–5 male partners	score 0
3	In the last 6 months, how many times did you have receptive anal sex (you were the bottom) with a man?	1 or more times	score 10
		0 times	score 0
4	How many of your male sex partners were HIV positive?	>1 positive partner	score 8
		1 positive partner	score 4
		<1 positive partner	score 0
5	In the last 6 months, how many times did you have insertive anal sex (you were the top) with a man who was HIV positive?	5 or more times	score 6
		0 times	score 0
6	In the last 6 months, have you used methamphetamines such as crystal or speed?	Yes	score 5
		No	score 0
7	In the last 6 months, have you used poppers (amyl nitrate)?	Yes	score 3
		No	score 0
		Add down entries in right column to calculate total score	Total score†

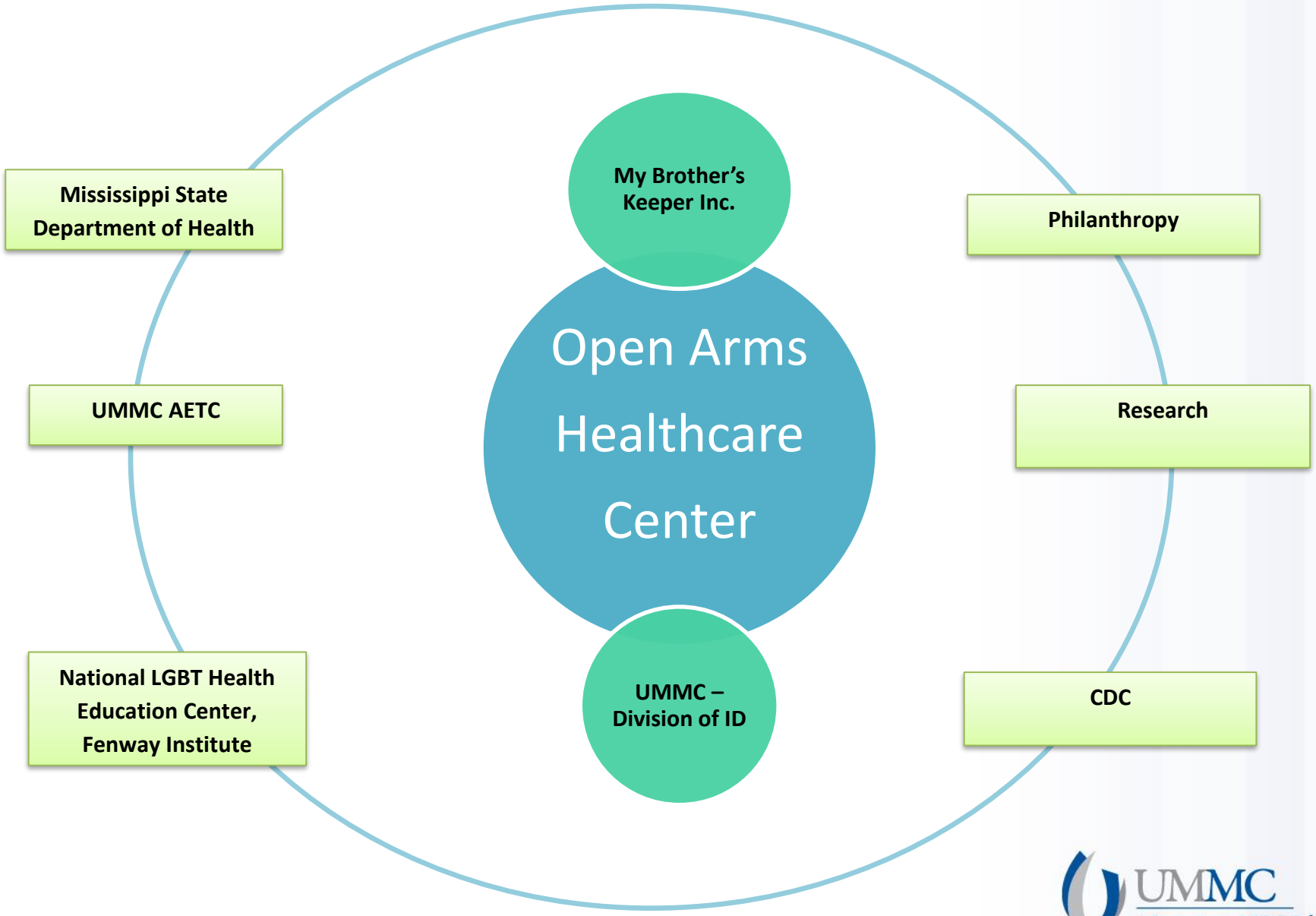
Smith JAIDS 2012

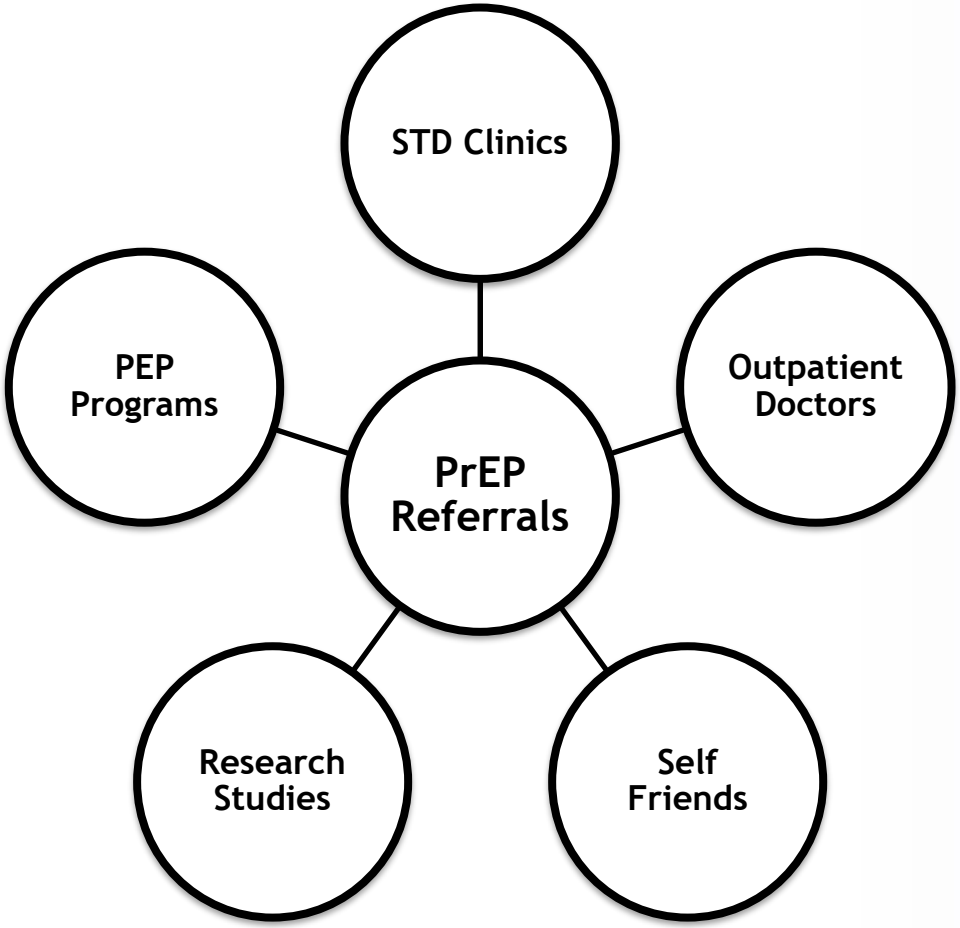
PrEP Education

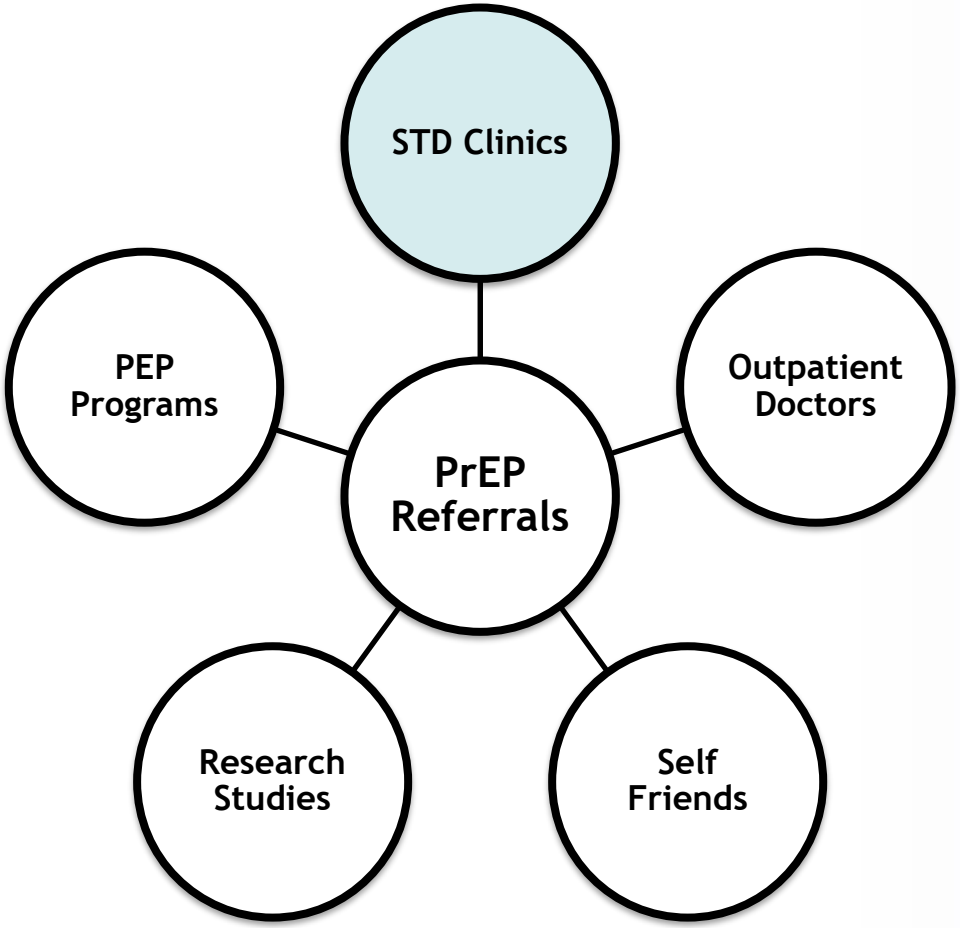
- Flyers about PrEP
- Educational Programs:
  - Healthcare Providers
  - Healthcare Professionals and advocate
  - STD clinic staff and DIS
  - Consumers
- 1-800-Yes-PrEP
  - Push Cards
  - Social Media Posts
  - Wrist bands with phone number



Open Arms Healthcare Center




STD Clinics
PEP Programs
Outpatient Doctors
PrEP Referrals
Research Studies
Self Friends


STD Clinics
PEP Programs
Outpatient Doctors
PrEP Referrals
Research Studies
Self Friends

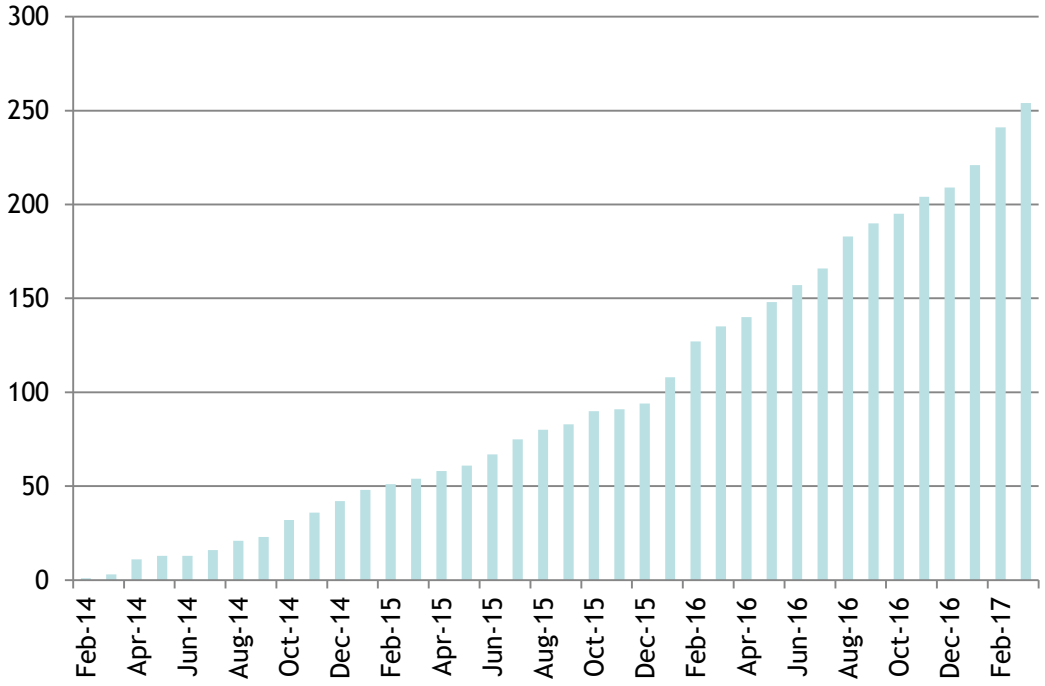
PrEP: Recruitment and link to care in Jackson, MS

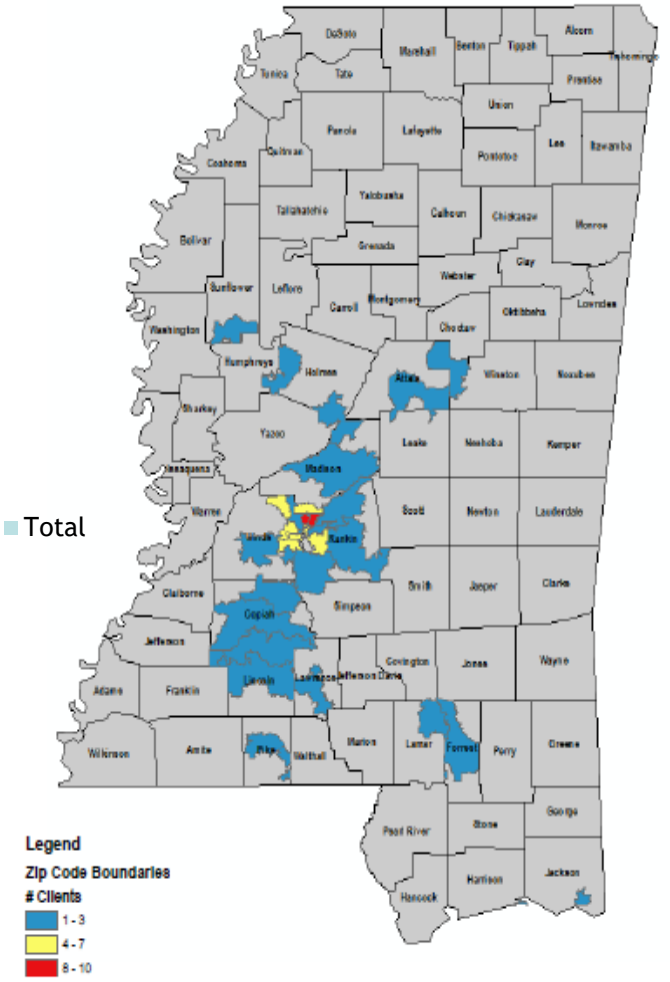
Crossroads (STD Clinic) → **Open Arms Healthcare Center**

- Screen for risk behaviors
- HIV/STD testing
- Discuss PrEP
- First PrEP Appointment
- First Clinical Eval and Rx
- Q3 month follow up

Open Arms
HEALTHCARE CENTER
WWW.OAHCC.ORG

Total Intiated on PrEP





University of Mississippi Medical Center

Questions

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Dr. Samuel Jenness
Georgia

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Dr. Samuel Jenness Bio-sketch

Samuel Jenness, PhD MPH is an Assistant Professor in the Department of Epidemiology at the Rollins School of Public Health at Emory University. At Emory, he is the Principal Investigator of the EpiModel Research Lab, where his research focuses on developing the methods and software tools for mathematical modeling of infectious diseases over complex dynamic contact networks, and applying these to investigate HIV and STI transmission dynamics and emerging prevention tools in the United States and globally.

He received his PhD in Epidemiology at the University of Washington

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STI Incidence Following HIV PrEP Initiation Among US MSM

National Coalition of STD Directors Webinar

April 27, 2017

Samuel M. Jenness, PhD MPH

PI // EpiModel Research Lab

Assistant Professor // Department of Epidemiology

Rollins SPH // Emory University

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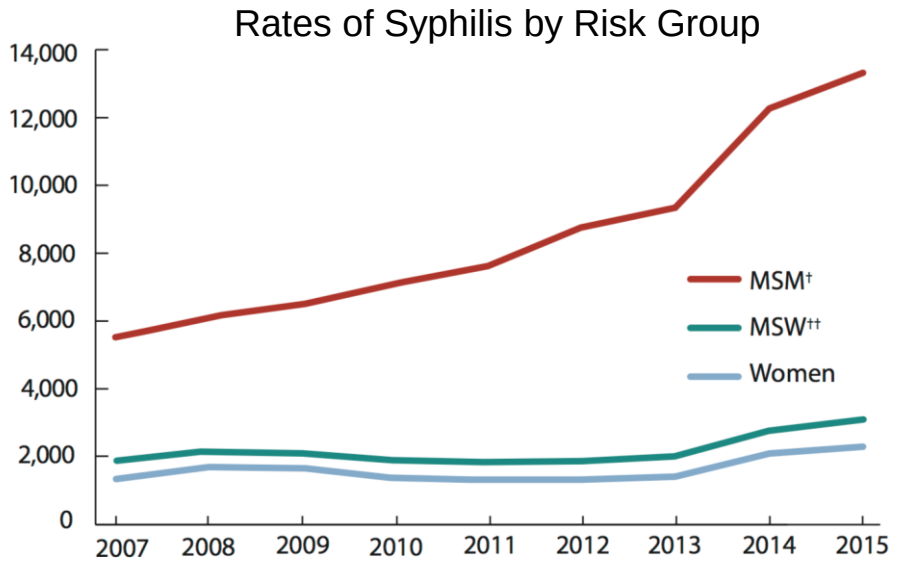
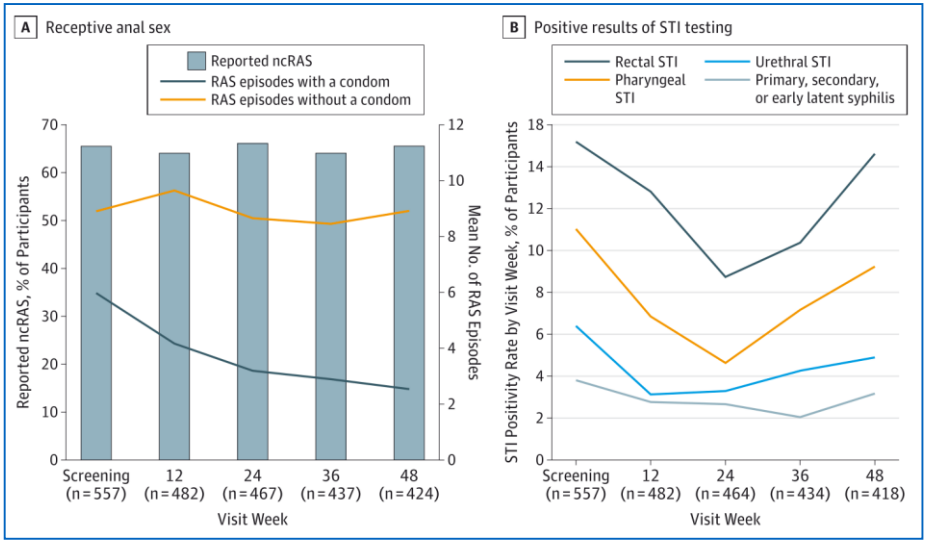
STIs as Unintended Consequence of PrEP Uptake

- Limited but growing evidence to show that men who initiate PrEP may reduce use of condoms: risk compensation
- PrEP protects against HIV but not other STIs
- STI incidence rising before PrEP and continuing higher as PrEP use increases





The Causal Question

Table 1. Meta-analysis of studies of sexually transmitted infection incidence among men who have sex with men using pre-exposure prophylaxis for HIV versus MSM not using pre-exposure prophylaxis for HIV

	MSM using PrEP			MSM not using PrEP				
Sexually transmitted infections	Incidence per 100 person-years, 95% CI	Number of studies	Total person-years followed	Incidence per 100 person-years, 95% CI	Number of studies	Total person-years followed	Incidence rate ratio, 95% CI	*P* value
Any *Neisseria gonorrhoeae* infection	37.5 (24.3, 50.7)	4	1561	4.2 (2.7, 5.7)	5	43 294	25.3 (22.6, 28.4)	<0.001 or <0.001
Any *Chlamydia trachomatis* infection	38.0 (20.3, 55.7)	4	1561	6.6 (3.8, 9.4)	6	54 703	11.2 (10.2, 12.3)	<0.001 or <0.001
Syphilis	14.5 (3.8, 25.2)	5	4887	0.9 (0.6, 1.3)	11	50 957	44.6 (39.1, 51.1)	<0.001 or <0.001

Shown are crude incidence per 100 person-years and crude incidence rate ratios with 95% confidence intervals and *P* values. Studies included are from 2010 to 2016 for MSM using PrEP infection and from 1998 to 2016 for studies in MSM not using PrEP infection. CI, confidence interval; PrEP, pre-exposure prophylaxis.

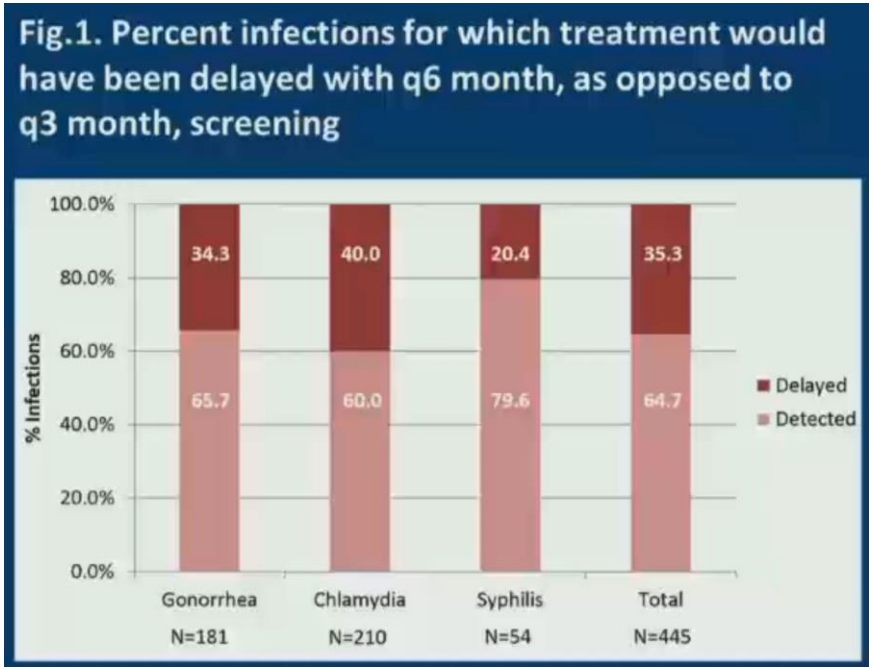
- Kojima et al meta-analysis, AIDS 2016: STI incidence 11 to 45 times higher in “PrEP cohorts” compared to “non-PrEP cohorts”
- Several potential explanations why, but is it causal? Non-causal explanations include secular trends, diagnostic biases, selection effects

CDC PrEP Guidelines for Clinical Practice

- **US PHS/CDC** released clinical practice guidelines indicating PrEP for those at “substantial risk” in **2014**
- For MSM, prescription **indications** were:
  - Unprotected anal intercourse (UAI) in monogamous partnership with person not recently tested for HIV
  - UAI outside of a monogamous partnership
  - AI (including with condoms) in a known serodiscordant partnership
  - Any non-HIV STI diagnosis
- Clinicians recommended to screen for conditions in past 6 months, **reevaluate** risk every 12 months
- Clinicians should screen and treat bacterial STIs (syphilis, gonorrhea, chlamydia) every 6 months on PrEP

Optimizing STI Screening and Treatment

- Cohen et al. found that biannual STI screening would delay treatment of 35% of STIs in MSM using PrEP compared to quarterly screening
- Prevention issue: 3 more partners (median) exposed with less frequent testing
- Questions about how to optimize the CDC guidelines with respect to STIs



Cohen et al, 2016, CROI

Study Aims

- Develop a mathematical model for transmission of urogenital and rectal NG and CT transmission dynamics among MSM in the US
- Investigate evidence for the causal versus non-causal contributions of risk compensation to higher STI incidence in PrEP users
- Estimate the impact of the CDC PrEP guidelines on STI incidence among MSM

Methods Overview

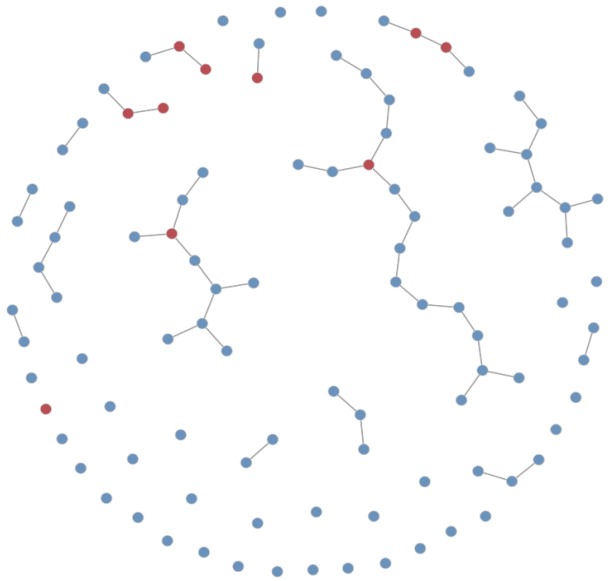
- Stochastic network-based mathematical model
- Robust sexual behavioral and clinical epidemiology based on local and national parameters
- Epidemiological, demographic, and intervention modules designed in EpiModel software (www.epimodel.org)
- Simulates open population of adult MSM in the US over a 10-year time span

Model Extensions

Jenness SM, Goodreau SM, Rosenberg E, Beylerian EN, Hoover KW, Smith DK, Sullivan PS. Impact of CDC's HIV Pre-Exposure Prophylaxis Guidelines among MSM in the United States. *Journal of Infectious Diseases*. 2016; 214(12): 1800–1807.

Disease Transmission over Dynamic Sexual Networks

- Temporal exponential random graph models (ERGMs) define partnership formation and dissolution
  - Sexual network types: main, casual, one-off
  - Men form partnerships according to model terms based on numbers of each partner type, mixing on race and age, sexual role segregation



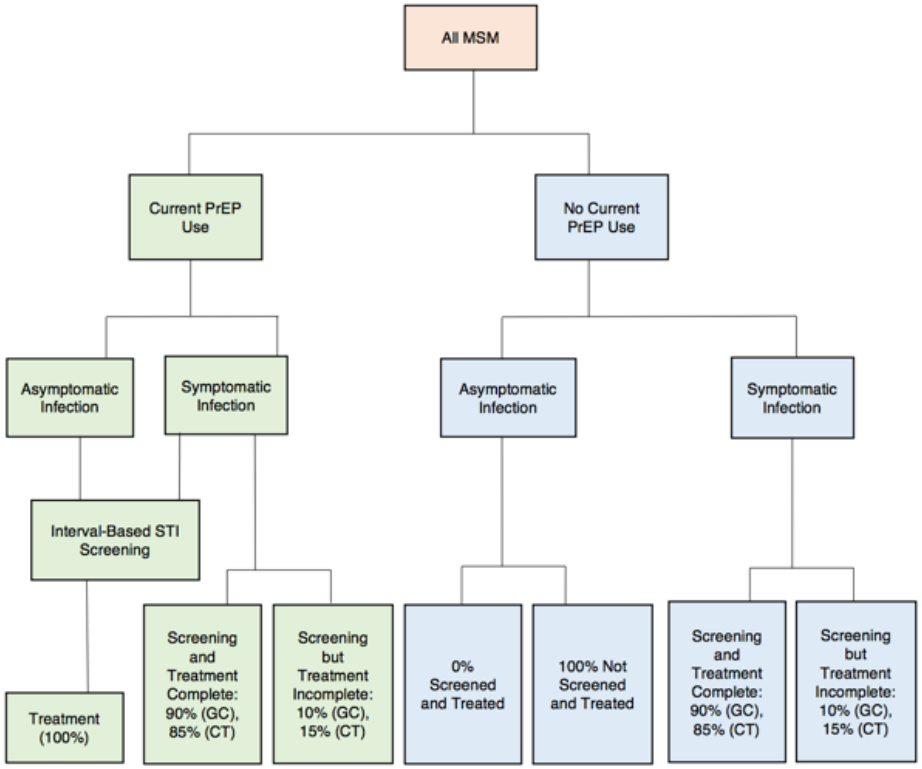
- HIV epidemiology
  - Natural history (disease stages, continuous VL, HIV-related mortality)
  - ART initiation and adherence
  - HIV transmission dynamics within serodiscordant partnerships
- Demographic processes (births and deaths)

PrEP Initiation and Adherence

- Initiation
  - HIV-uninfected men encounter diagnostic HIV testing
  - Risk assessment for PrEP over past 6-month window based on CDC indications
  - Indicated men start PrEP if the % of already initiated men is less than a **fixed coverage threshold** (40% in base models)
- Adherence
  - Men assigned a **fixed adherence profile** following PrEP demonstration project data (62% high, 10% moderate, 7% low, and 21% null adherence)
  - Adherence translates into a 95%, 81%, 31%, and 0% reduction in transmission risk
  - Men **discontinued** from PrEP if, at yearly follow-up visit, no longer behavioral indications

NG/CT Transmission,Treatment, and Recovery

- Urogenital and rectal NG and CT transmission directional by receptive versus insertive sexual act
- Infection site strongly associated with probability of disease symptoms
- Disease symptoms strongly associated with treatment outside of PrEP
- PrEP added biannual interval-based screening and treatment for both symptomatic and asymptomatic infections



- MSM on PrEP could exhibit varying levels of condom-related risk compensation
- Other sensitivity analyses for PrEP coverage and STI screening interval

GC and CT Incidence by Coverage and RC

Table 1. Gonorrhea and Chlamydia Incidence Rates, Hazard Ratios, Percent of Infections Averted, and Number Needed to Treat (NNT) on PrEP, by PrEP Coverage Level and Behavioral Risk Compensation Level among Men Who Have Sex with Men in the United States

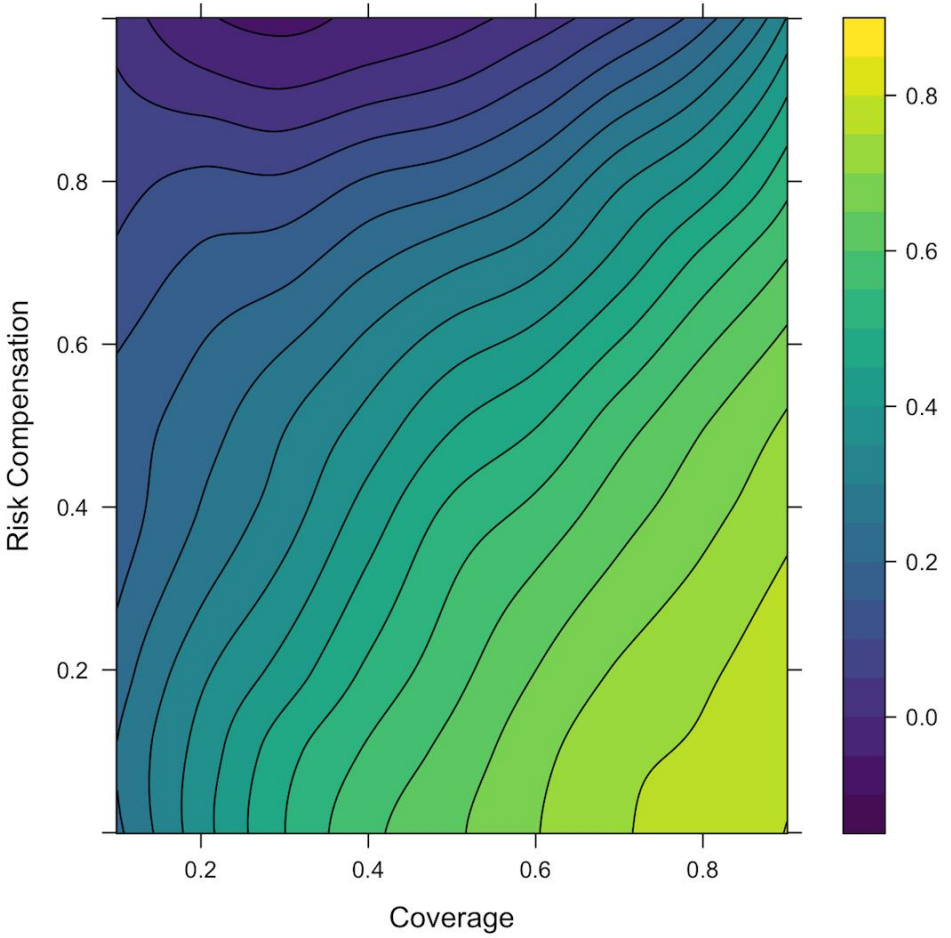
Model Scenario	Gonorrhea			Chlamydia		
	Incidence (IQR)	*Hazard Ratio (IQR)*	*PIA (IQR)*	*Incidence (IQR)*	*Hazard Ratio (IQR)*	*PIA (IQR)*
Base Model (No PrEP)	4.35 (2.57, 5.73)	1.00	-	6.76 (5.47, 8.03)	1.00	-
PrEP Coverage						
10%	3.36 (2.57, 4.38)	0.76 (0.53, 1.13)	15.5 (-13.0, 41.5)	5.38 (4.54, 6.57)	0.83 (0.64, 1.06)	10.5 (-9.1, 23.9)
40% (Ref)	1.38 (0.80, 2.18)	0.32 (0.19, 0.48)	41.6 (20.8, 56.7)	2.08 (1.57, 2.61)	0.30 (0.22, 0.42)	40.3 (23.5, 49.3)
90%	0.00 (0.00, 0.06)	0.00 (0.00, 0.02)	73.2 (62.2, 80.8)	0.04 (0.00, 0.17)	0.01 (0.00, 0.03)	70.5 (63.3, 74.9)
Risk Compensation						
0%	0.51 (0.19, 0.92)	0.11 (0.05, 0.24)	58.0 (39.1, 71.6)	1.13 (0.80, 1.51)	0.17 (0.11, 0.24)	51.0 (41.8, 59.4)
40% (Ref)	1.38 (0.80, 2.18)	0.32 (0.19, 0.48)	41.6 (20.8, 56.7)	2.08 (1.57, 2.61)	0.30 (0.22, 0.42)	40.3 (23.5, 49.3)
100%	5.64 (3.81, 7.08)	1.21 (0.83, 1.86)	-3.2 (-39.9, 23.9)	5.74 (4.77, 6.74)	0.84 (0.66, 1.08)	6.2 (-11.3, 21.1)

IQR = interquartile range (25% and 75% percentiles) of the simulation outcomes. Incidence expressed per 100 person-years at risk.

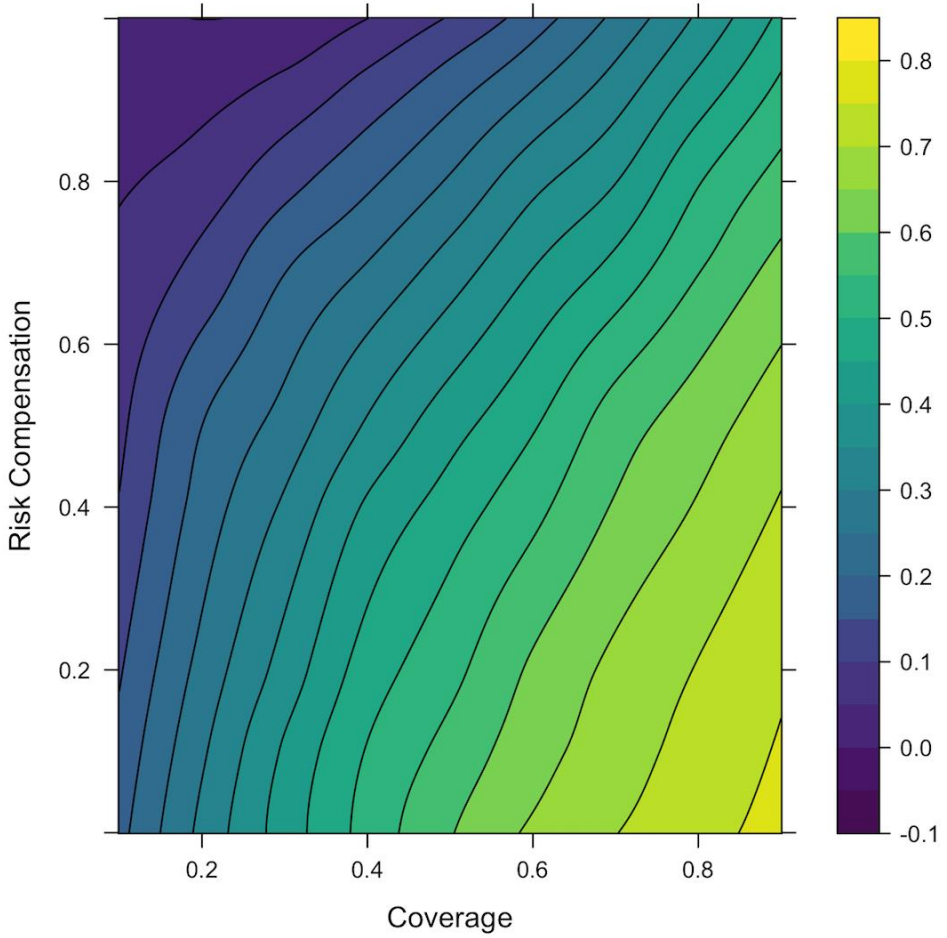
- Compared to no PrEP (base model), 40% coverage and 40% RC associated with a major reduction in both GC and CT incidence
- Measured reduction in hazard ratio at end of time series (HR) and percent of infections averted (relative to base model) cumulatively

NG and CT Infections Averted by Coverage and RC

Percent NG Infections Averted



Percent CT Infections Averted



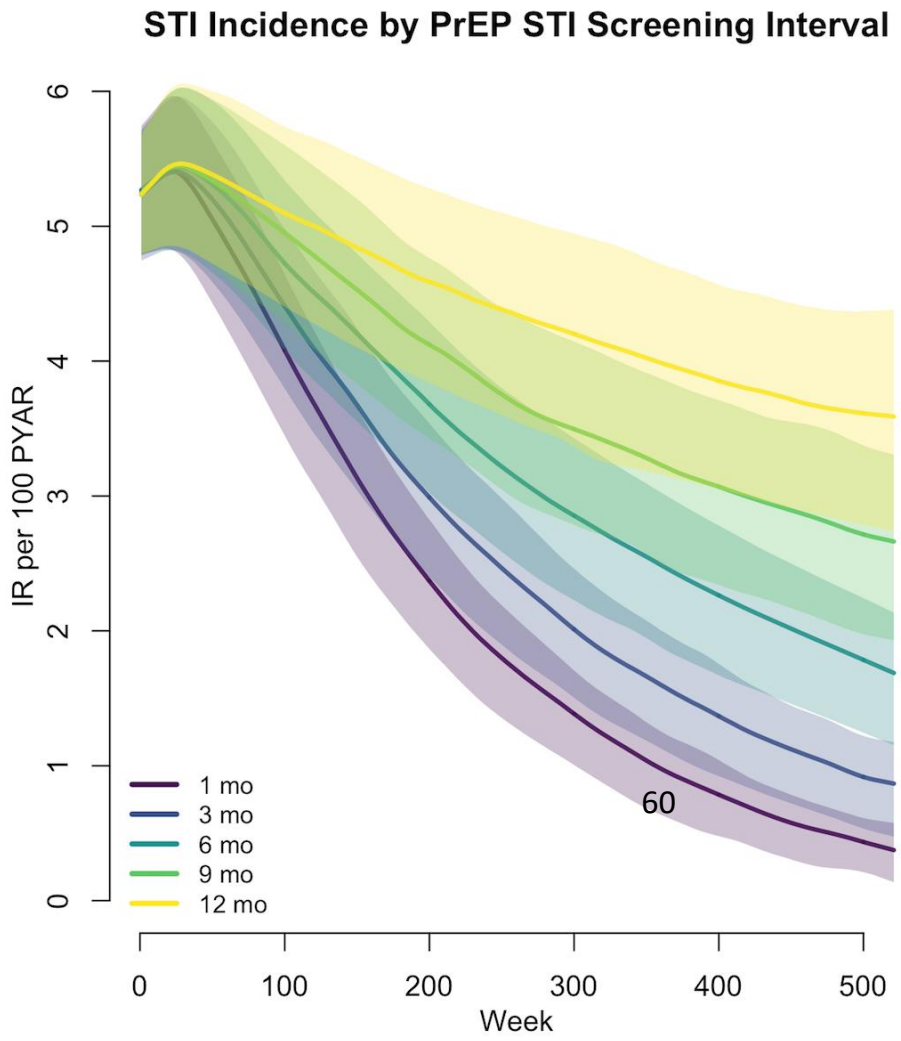
Mechanisms of PrEP-Related STI Prevention

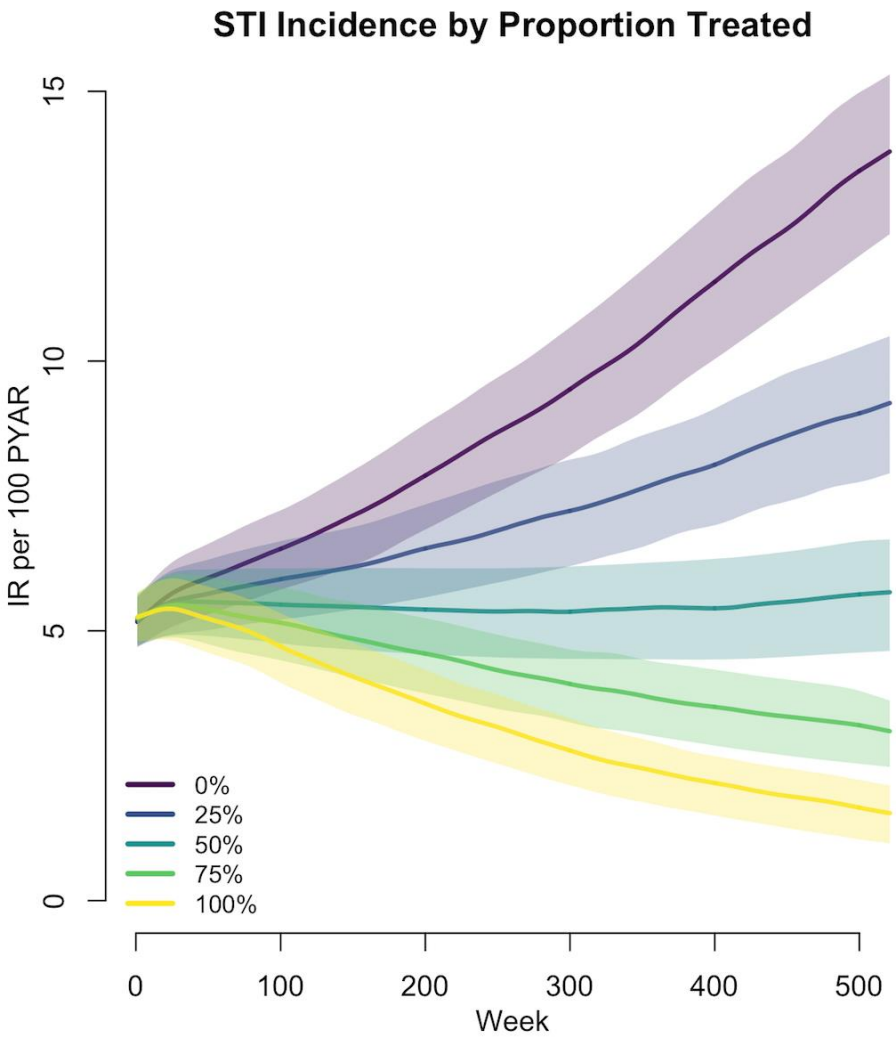
Table 2. Gonorrhea and Chlamydia Incidence Rates, Hazard Ratios, Percent of Infections Averted, and Number Needed to Treat (NNT) on PrEP, by PrEP Coverage Level and Behavioral Risk Compensation Level among Men Who Have Sex with Men in the United States

Model Scenario	*Incidence (IQR)*		*Asymptomatic Cases Treated (%; IQR)*	*Rectal Cases Treated (%; IQR)*
	All MSM	*PrEP Users*	*All MSM*	*All MSM*
Base Model (No PrEP)	5.32 (4.41, 6.38)	—	0 (0, 0)	8.2 (7.9, 8.4)
PrEP Scenarios				
STI Testing Interval				
1 month	0.40 (0.30, 0.58)	0.45 (0.29, 0.63)	26.4 (25.6, 27.2)	33.5 (32.5, 34.4)
3 months	0.89 (0.65, 1.18)	0.93 (0.65, 1.27)	21.3 (20.6, 21.9)	28.3 (27.6, 29.0)
6 months (ref)	1.77 (1.34, 2.16)	1.85 (1.42, 2.24)	17.3 (16.9, 17.8)	24.4 (23.7, 25.2)
9 months	2.68 (2.16, 3.22)	2.75 (2.17, 3.52)	14.9 (14.6, 15.4)	22.2 (21.7, 22.8)
12 months	3.58 (2.97, 4.25)	3.71 (3.00, 4.45)	13.3 (12.8, 13.6)	20.6 (20.1, 21.2)
Proportion of Screened PrEP Users Treated				
0%	13.40 (12.13, 14.62)	13.58 (12.15, 14.78)	0 (0, 0)	8.0 (7.7, 8.1)
25%	9.07 (7.87, 10.03)	9.36 (8.18 10.44)	4.7 (4.6, 4.8)	12.2 (12.0, 12.5)
50%	5.61 (4.77, 6.50)	5.80 (4.92, 6.82)	9.1 (8.9, 9.4)	16.4 (16.1, 16.9)
75%	3.23 (2.79, 3.77)	3.33 (2.84, 3.93)	13.3 (13.0, 13.7)	20.5 (20.1, 21.1)
100% (ref)	1.77 (1.34, 2.16)	1.85 (1.42, 2.24)	17.3 (16.9, 17.8)	24.4 (23.7, 25.2)
Proportion Asymptomatic Randomly Screened (No PrEP-Related Screening)				
0% (ref)	13.40 (12.13, 14.62)	13.58 (12.15, 14.78)	0 (0, 0)	8.0 (7.7, 8.1)
5%	10.81 (9.73, 11.99)	11.05 (10.00, 12.37)	4.2 (4.1, 4.3)	11.8 (11.6, 12.1)
10%	8.30 (7.43, 9.29)	8.37 (7.50, 9.52)	8.4 (8.2, 8.5)	15.7 (15.4, 16.0)
15%	6.22 (5.52, 7.14)	6.37 (5.57, 7.30)	12.6 (12.3, 12.8)	19.6 (19.3, 19.9)
20%	4.65 (3.96, 5.47)	4.74 (4.05, 5.56)	16.8 (16.4, 17.1)	23.4 (23.1, 23.8)

IQR = interquartile range (25% and 75% percentiles) of the simulation outcomes. Incidence expressed per 100 person-years at risk.

Incidence Curves by Screening and Treatment





Partial completed treatment (50%) results in stable STI incidence

Conclusions

- HIV PrEP could result in a significant decline in STI incidence among MSM in the US
  - Attributable to recommended screening and treatment of STIs
  - HIV PrEP as a combination HIV/STI prevention package, not just meds
  - MSM indicated for HIV PrEP also at substantial risk for STIs through same sexual partnership networks and behaviors
- No levels of risk compensation could reproduce PrEP/Non-PrEP STI IR differential, suggested strong non-causal differences in cohorts
- Reducing STI screening interval from biannually to quarterly could further reduce incidence, although with complex cost implications

Questions

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Where to Get Technical Assistance From NCSD

- Programmatic
  - Charlie Rabins, crabins@ncsddc.org (217-801-4312)
- State Policy/Legislation

  Midwest/Northeast
  - Matt Prior, mprior@ncsddc.org (202-715-7215)

  West/South
  - Rebekah Horowitz rhorowitz@ncsddc.org (202-618-4035)
- Adolescent Sexual Health
  - Sara Stahlberg sstahlberg@ncsddc.org (202-715-3863)
- Health Equity
  - Stephen Hicks shicks@ncsddc.org (202-787-5993)

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Where to Get Programmatic Technical Assistance for STD AAPPS Funded Grantees

- Centers for Disease Control and Prevention
  - Division of STD Prevention
    - Program Development and Quality Improvement Branch
      - Dayne Collins
      - Email: zvl1@cdc.gov
      - Phone: 404-639-8188
      - Alternative Email: STD_AAPPS@cdc.gov

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Questions and Discussion

- Please use the chat function to the left of your screen for questions or if you want to comment on an issue related to PrEP.

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Thanks for Participating

- Please complete the post call evaluation survey link at the end of the call or that you will receive via email.
- Both this recording and the presentation slides will be available one week after the webinar and will be posted on the NCSD Website

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