

The Intersection of Sexually Transmitted Infections and HIV

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SOUTHEAST
STD/HIV PREVENTION
TRAINING CENTER
CONNECTING · PROVIDERS · PRACTICE · & PATIENTS

Disclosures

NIH/NIMH K23MH126794

UAB has received research funding from Merck as site PI for a clinical trial.



Objectives

1. Understand the epidemiological trajectories of bacterial STIs & HIV
2. Explain the interaction of STIs and HIV
3. Discuss biomedical strategies to improve both STIs & HIV outcomes



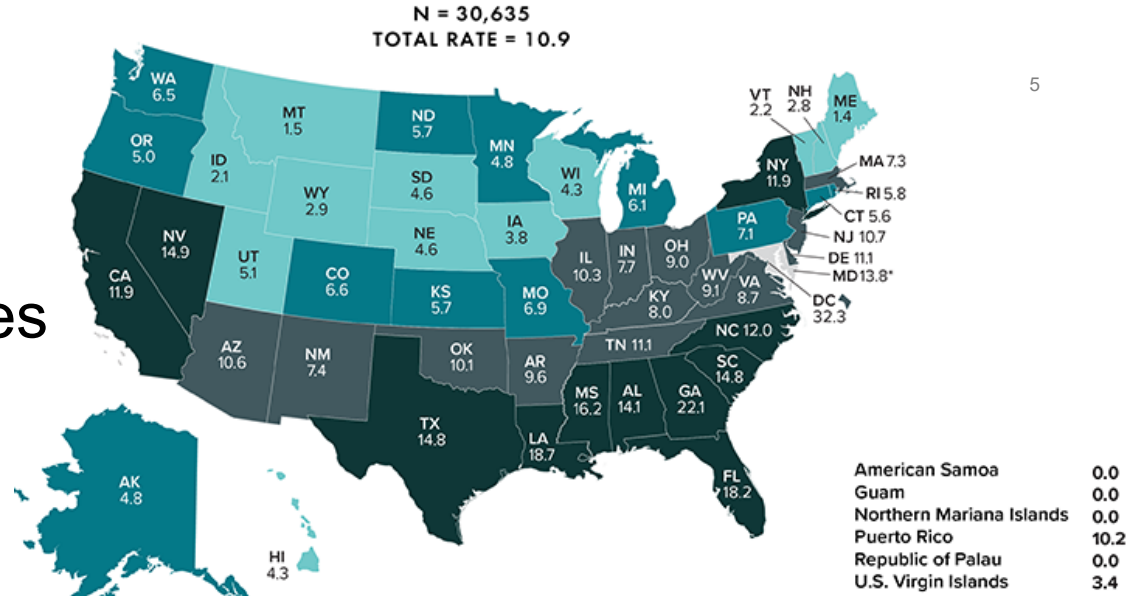
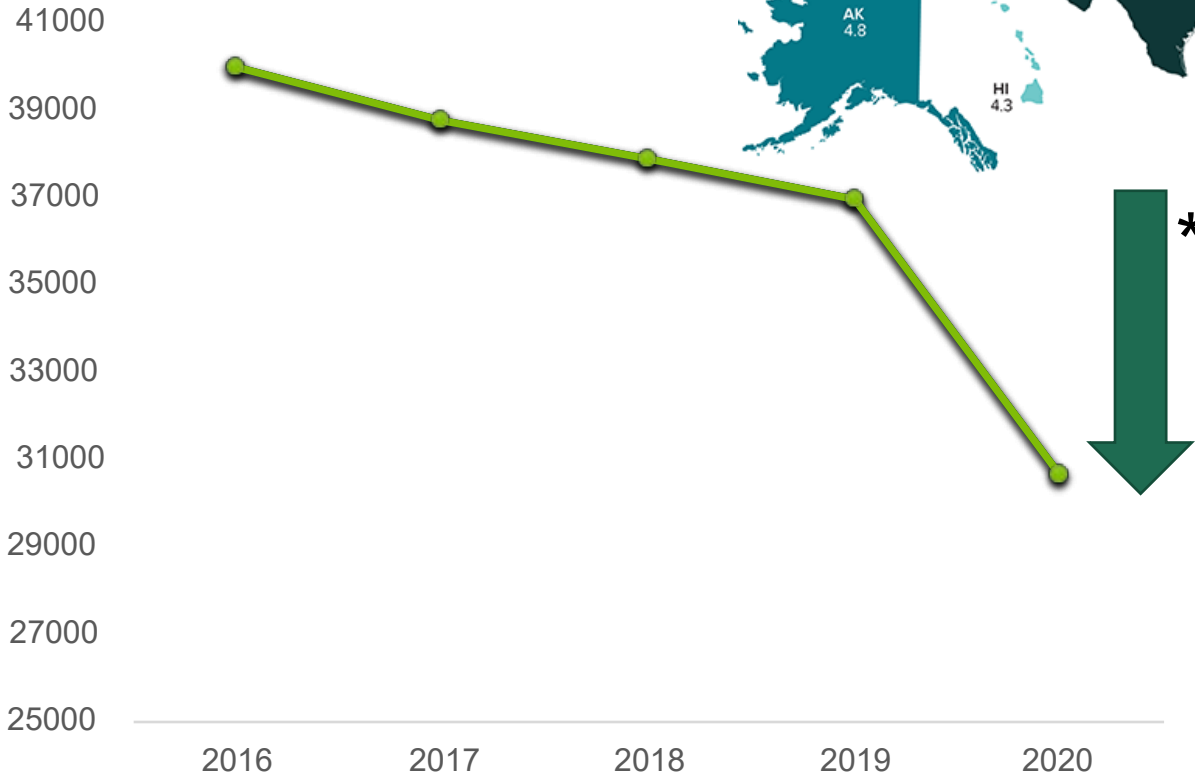
What about the intersection?

- HIV and STIs are often considered separately
 - Different funding sources, research programs, clinical programs
- HIV and STIs occur together
 - HIV and STI are sexually transmitted
 - Similar disparities and inequities affecting communities with need
- Programs to improve both could be co -opted to have success in both epidemics



HIV - 2020

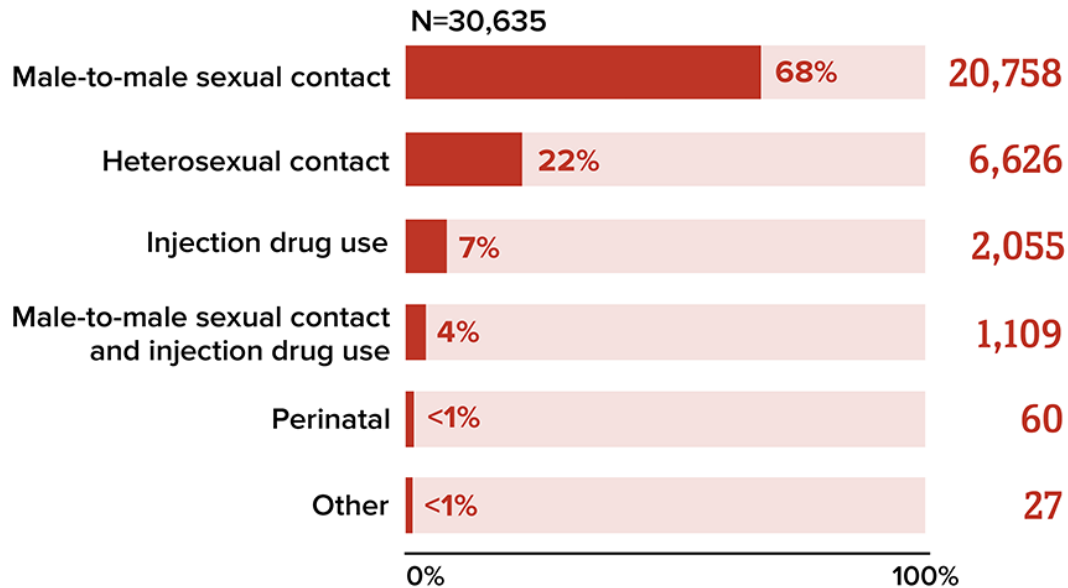
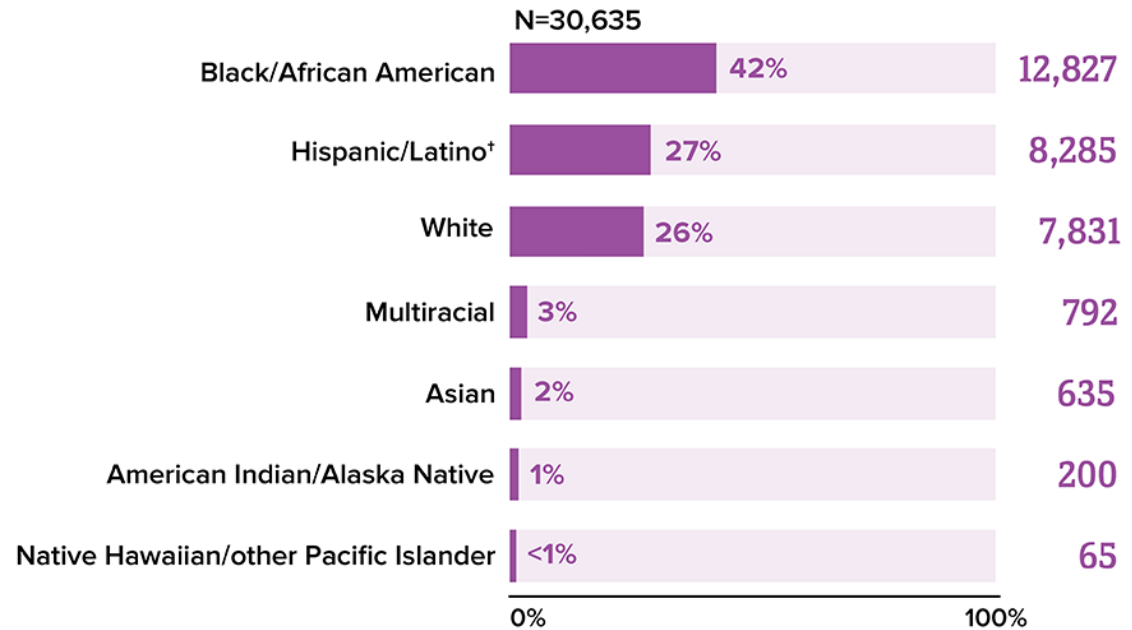
- 30,635* new diagnoses



*17% reduction in new diagnoses, but likely impacted by reduced testing.

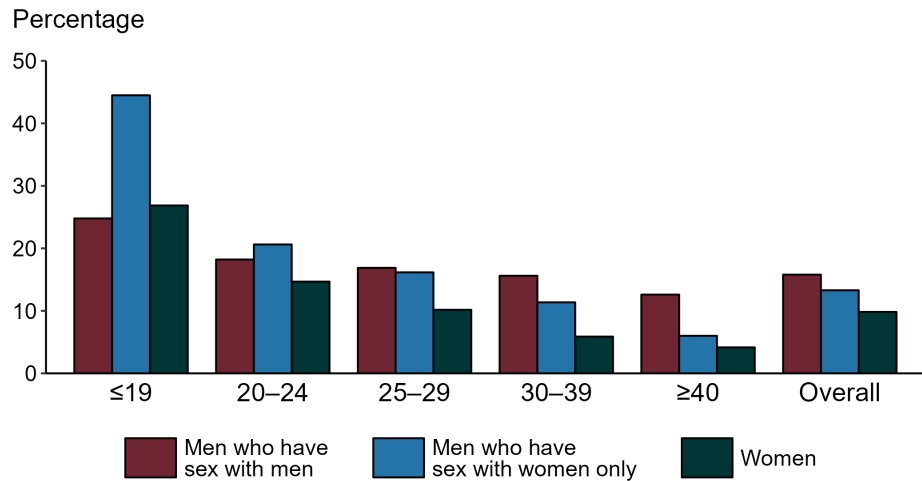
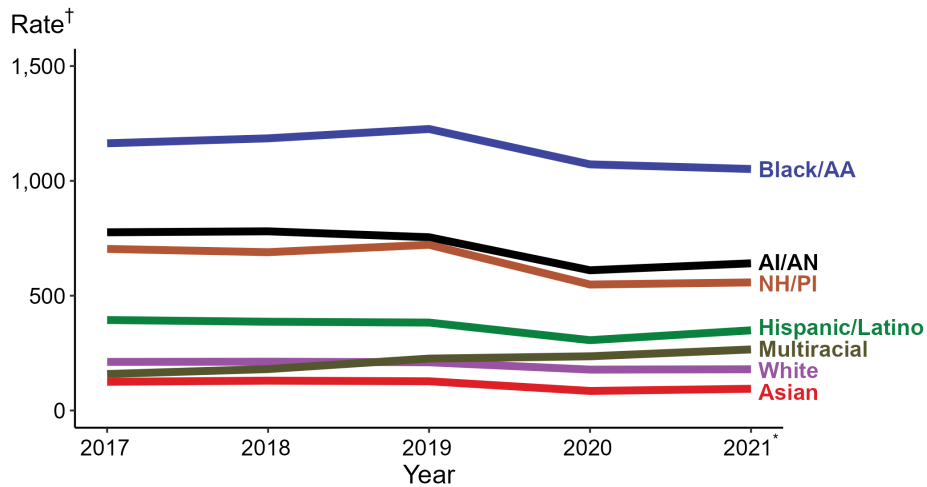
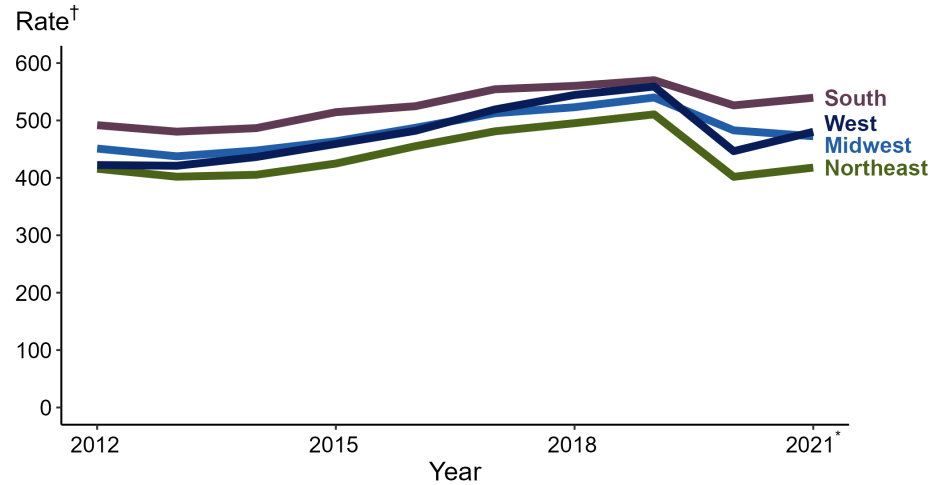
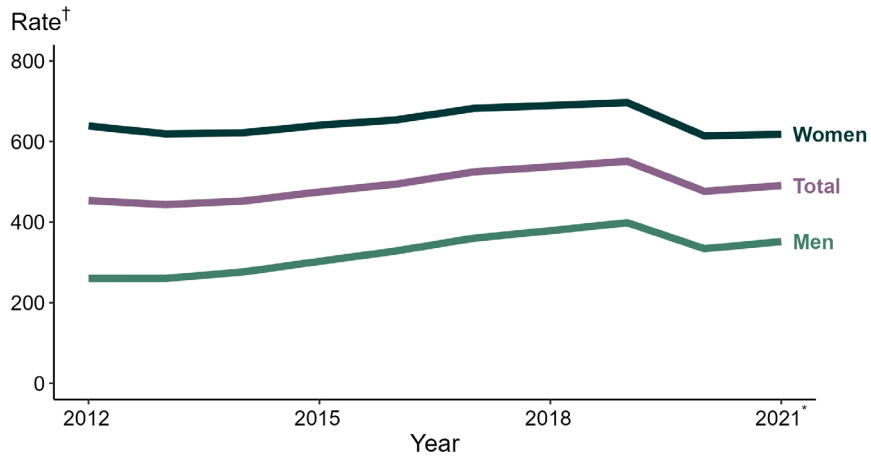
CDC, HIV Surveillance Report 2020, 2022.

HIV Disparities



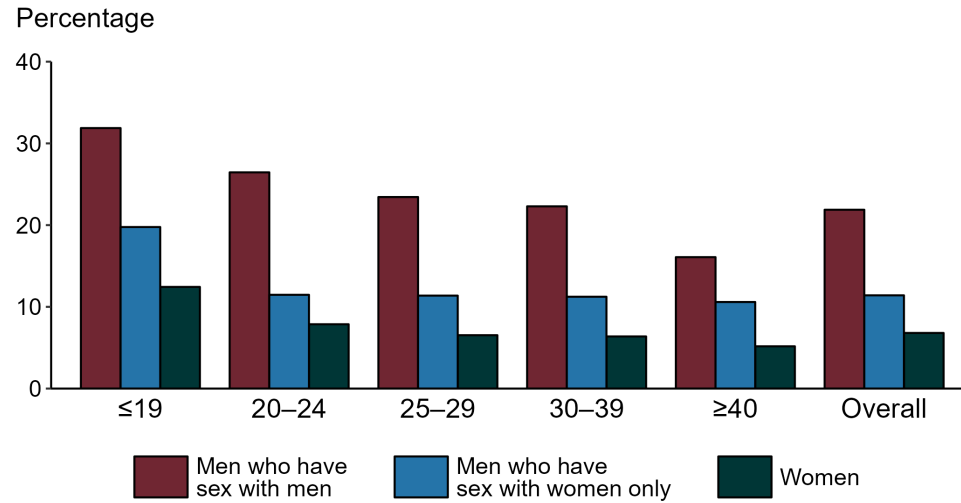
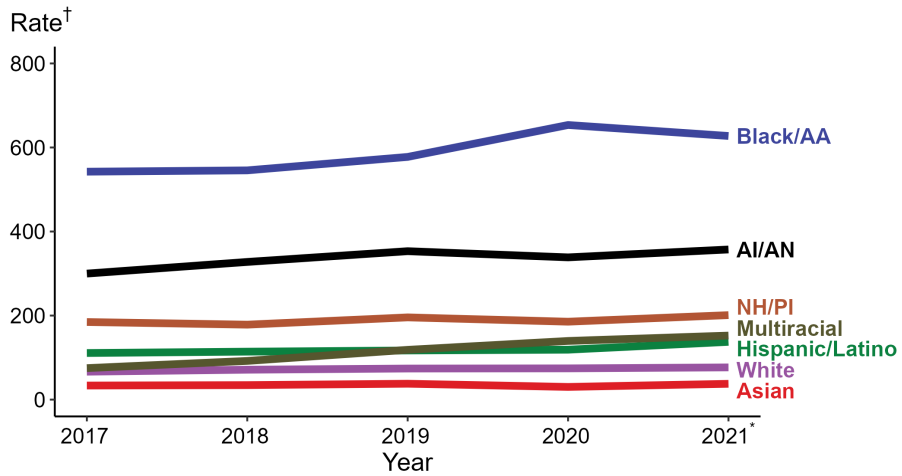
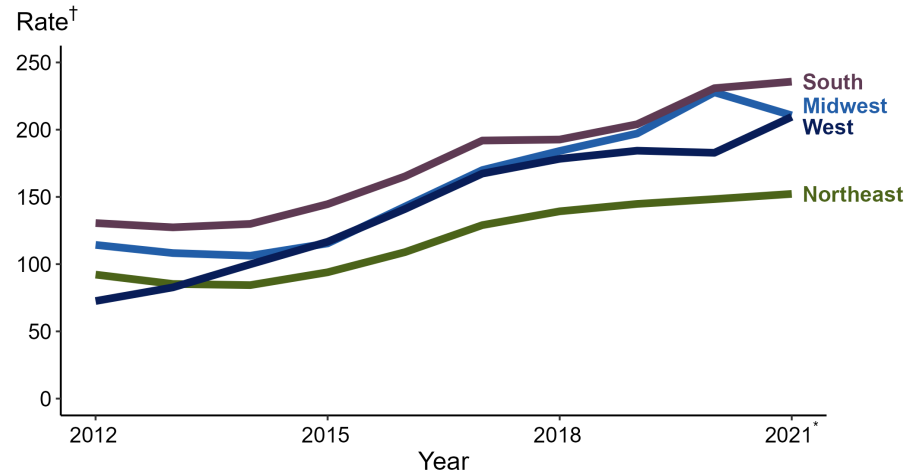
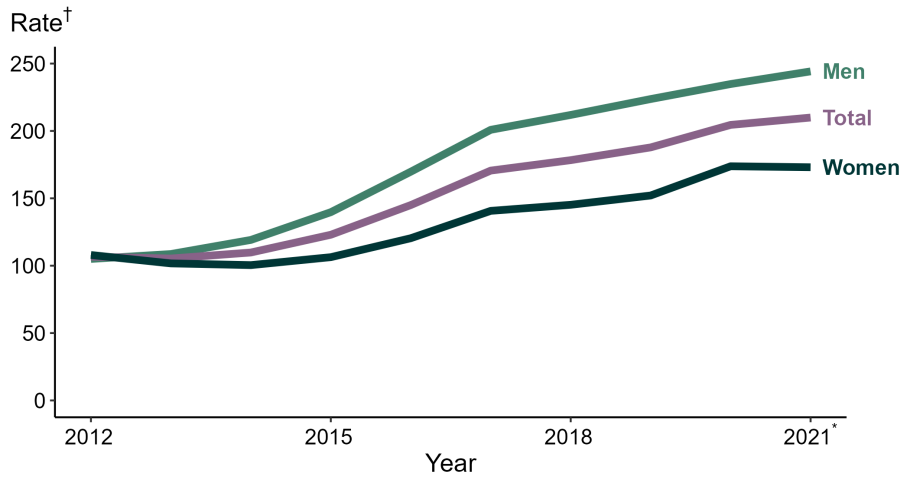
CDC, *HIV Surveillance Report 2020, 2022.*

Chlamydia



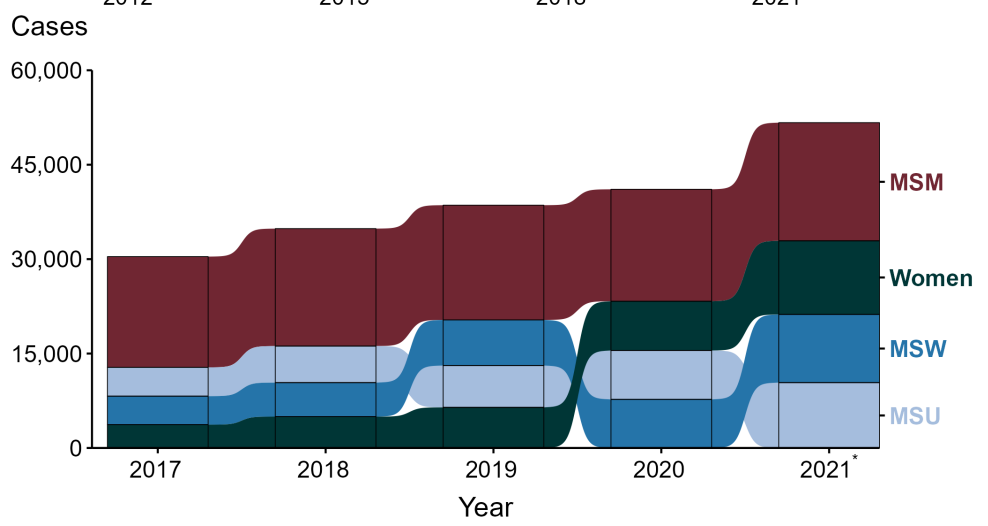
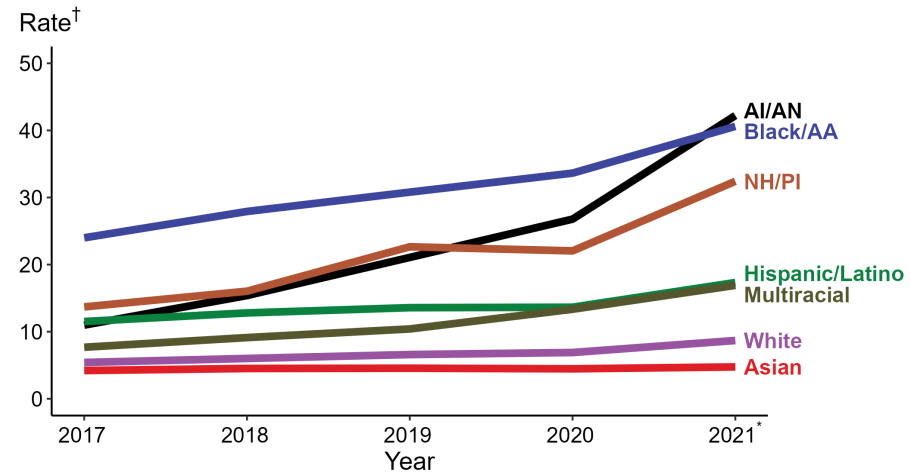
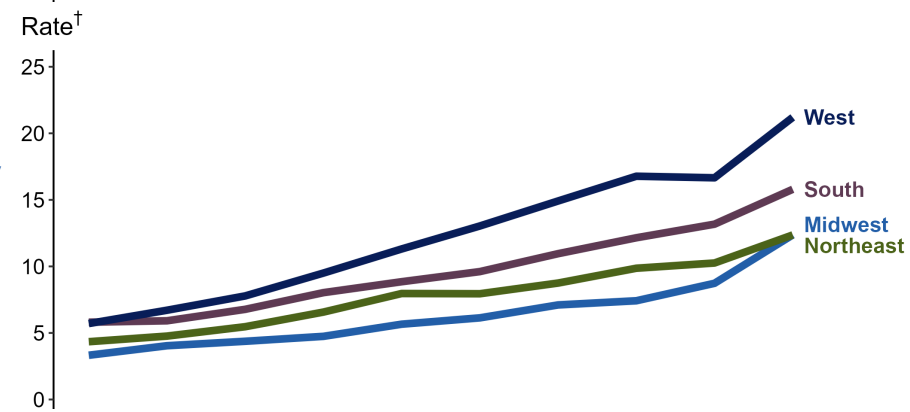
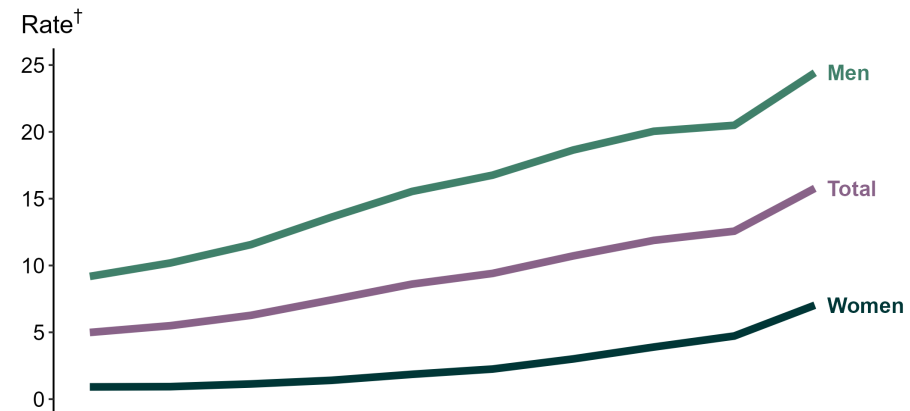
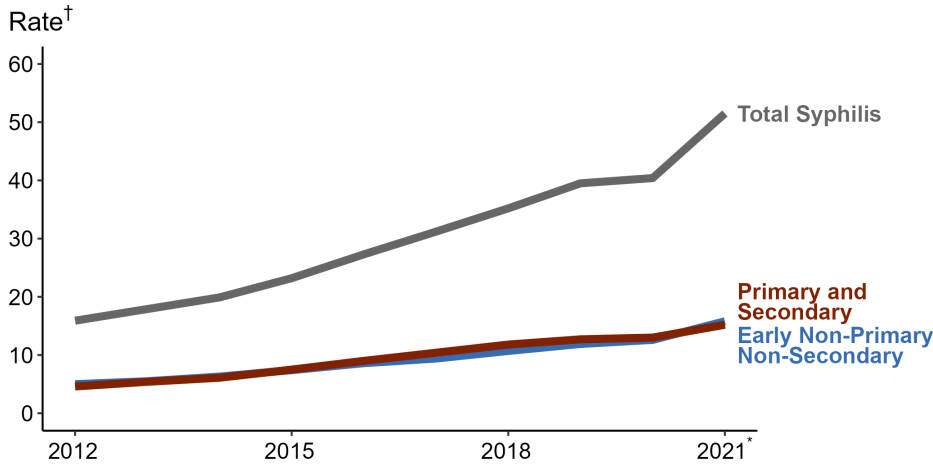
CDC Surveillance, prelim 2021 data

Gonorrhea



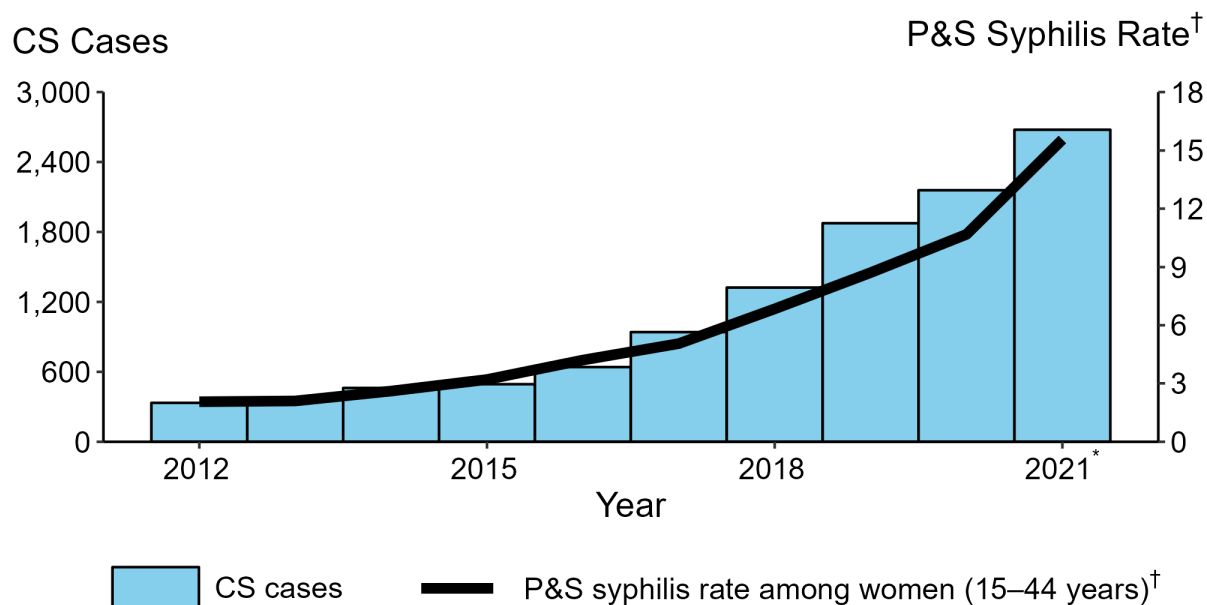
CDC Surveillance, prelim 2021 data

Syphilis



CDC Surveillance, prelim 2021 data

Congenital Syphilis — Reported Cases by Year of Birth and Rates of Reported Cases of Primary and Secondary Syphilis Among Women Aged 15–44 Years, United States, 2012–2021*



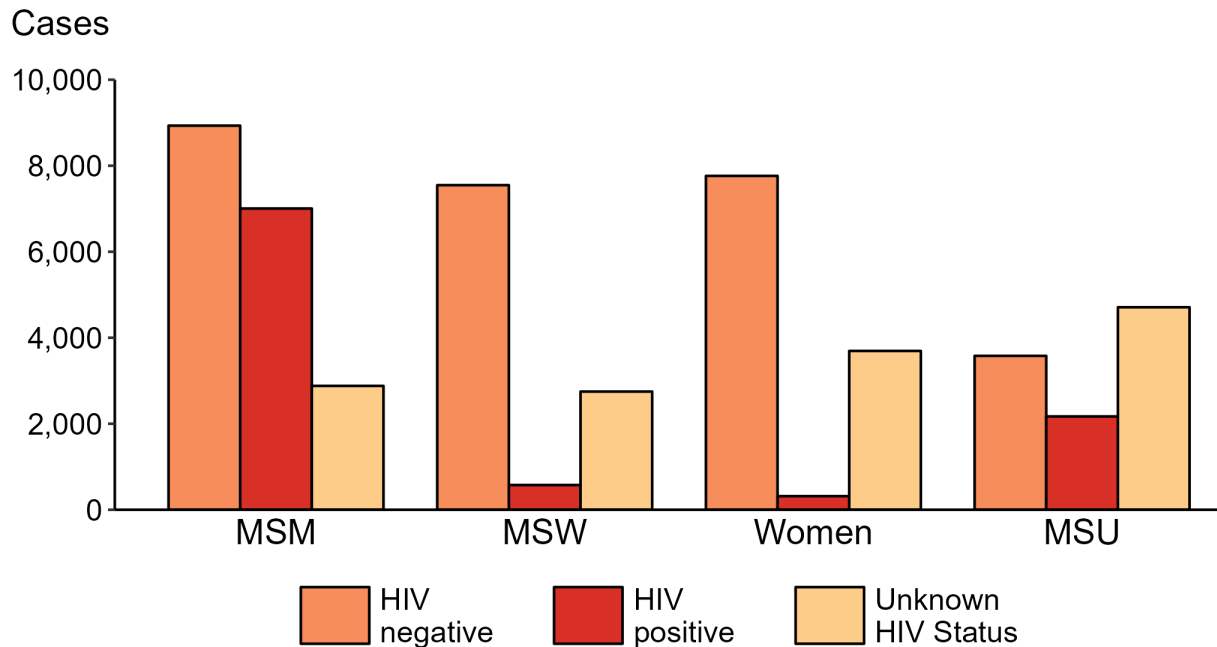
* Reported 2021 data are preliminary as of July 7, 2022

† Per 100,000

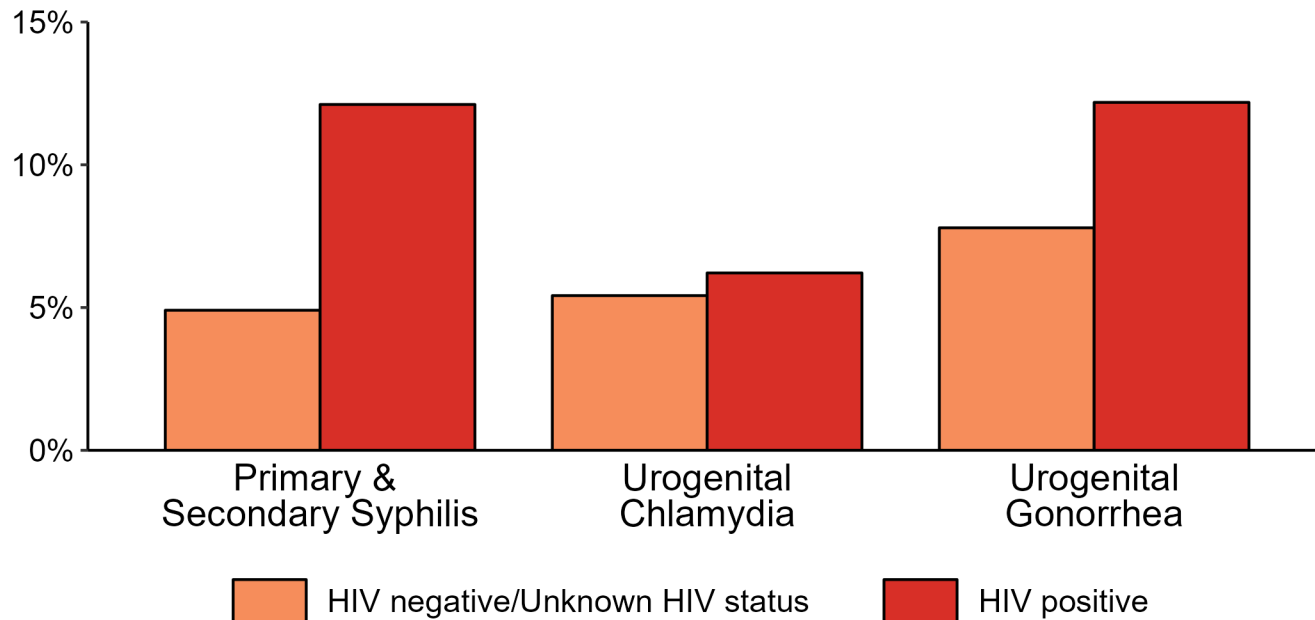
ACRONYMS: CS = Congenital syphilis; P&S = Primary and secondary syphilis



STIs by HIV



Percentage

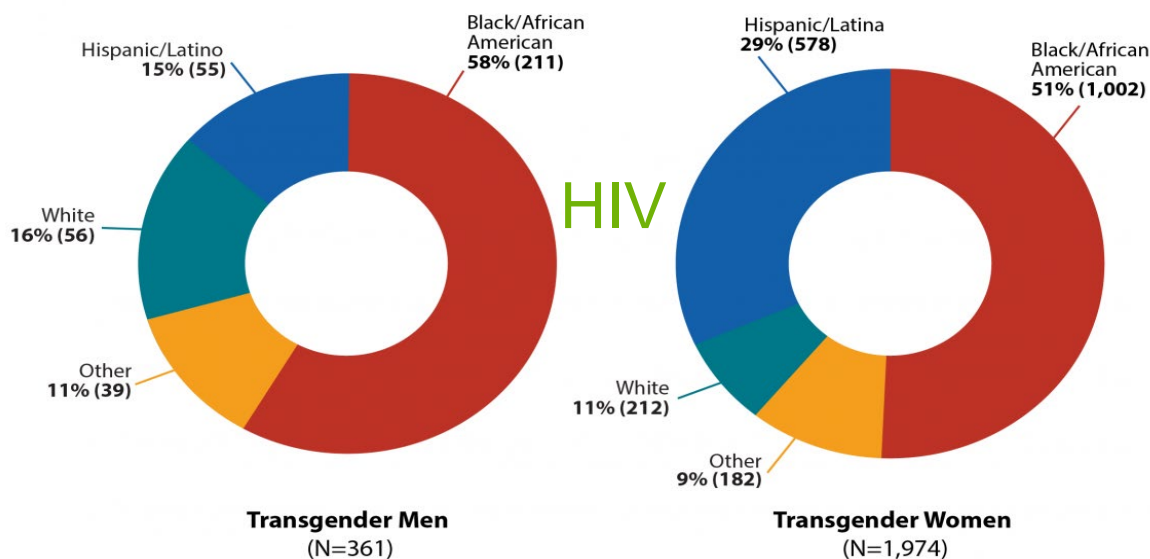


CDC Surveillance, prelim 2021 data

STI – Transgender Individuals

	Transgender Women (n = 506)						Transgender Men (n = 120)					
	Tested			Positive			Tested			Positive		
	n	%	Range [†]	n	% [‡]	Range [†]	n	%	Range [†]	n	% [‡]	Range [†]
Chlamydia												
Overall	405	80.0	40.2–95.5	53	13.1	5.7–19.6	104	86.7	72.7–95.5	8	7.7	0–25.0
Urogenital	383	75.7	38.7–94.6	3	0.8	0–1.9	97	80.8	27.3–95.5	4	4.1	0–6.3
Extragenital [§]	298	58.9	10.3–84.4	50	16.8	11.8–25.0	49	40.8	17.6–72.7	7	14.3	0–33.3
Rectal	285	56.3	9.2–83.9	44	15.4	9.3–36.4	32	26.7	13.0–54.5	5	15.6	0–66.7
Pharyngeal	112	22.1	0–77.8	6	5.4	0–11.1	34	28.3	0–52.3	4	11.8	0–20.0
Gonorrhea												
Overall	406	80.2	40.2–95.5	51	12.6	5.4–32.1	105	87.5	76.0–95.5	11	10.5	0–33.3
Urogenital	394	77.9	40.2–94.6	11	2.8	1.3–4.5	99	82.5	45.5–95.5	7	7.1	0–11.9
Extragenital [§]	314	62.1	11.5–89.3	47	15.0	6.0–42.9	58	48.3	26.1–81.8	7	12.1	0–33.3
Rectal	288	56.9	9.2–83.9	34	11.8	5.3–40.0	34	28.3	13.0–63.6	5	14.7	0–42.9
Pharyngeal	295	58.3	11.5–86.6	29	9.8	2.5–26.7	51	42.5	21.7–63.6	3	5.9	0–10.0

Cisnormativity is a barrier to affirming & effective sexual health care for transgender and GNBNC persons

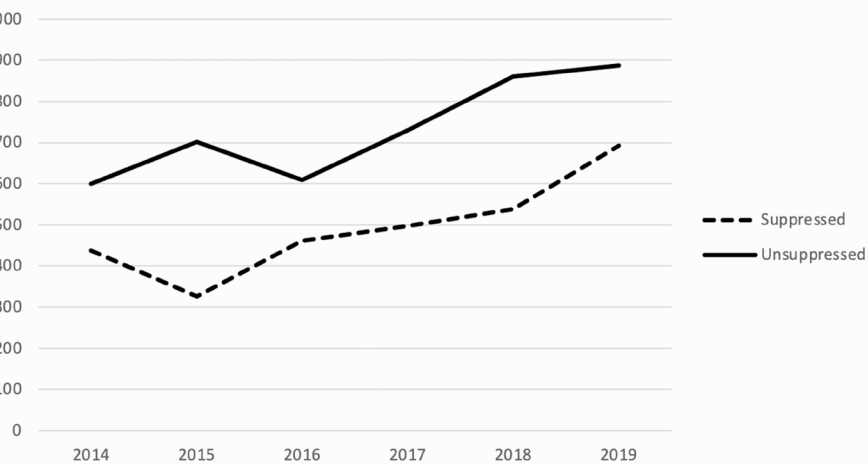


Stewart et al., PLoS One 20222
 Pitasi et al. *Sexually Transm Dis* 2019
www.cdc.gov/hiv/group/gender/transgender/index.html

STIs in MSM with HIV

- Regardless of viral load control status, STI incidence increasing
- While HIV control is improving, STI incidence is worsening

Incident STI per 1k Person Years



	2014	2015	2016	2017	2018	2019
MSM, n	884	1,105	1,112	1,253	1,295	1,343
Age < 40yrs, n(%)	226 (25.6)	326 (29.5)	338 (30.4)	427 (34.1)	488 (37.7)	522 (38.9)
Black/AA, n(%)	439 (49.7)	600 (54.3)	648 (58.3)	727 (58.0)	740 (58.7)	812 (60.5)
White, n(%)	434 (49.1)	486 (44.0)	449 (40.4)	500 (39.9)	500 (38.6)	494 (36.8)
VL<200, n(%)	746 (84.4)	940 (85.1)	940 (84.5)	1,077 (86.0)	1,113 (85.9)	1,110 (86.4)
VL>200, n(%)	138 (15.6)	165 (14.9)	172 (15.5)	176 (14.0)	182 (14.1)	183 (13.6)
Years with HIV, yrs (std)	11.5 (7.8)	10.0 (8.6)	9.1 (8.8)	7.2 (8.3)	6.2 (8.0)	7.7 (9.1)
MSM with Incident STI, n(%)	103 (11.6)	113 (10.2)	142 (12.8)	182 (14.5)	191 (14.7)	252 (18.8)
MSM with Incident STI, VL<200, n(%)	80 (9.0)	80 (7.2)	112 (10.1)	147 (11.7)	152 (11.7)	201 (15.0)
MSM with Incident STI, VL>200, n(%)	23 (2.6)	33 (3.0)	30 (2.7)	35 (2.8)	39 (3.0)	51 (3.8)

Sexually Transmitted Infections on PrEP

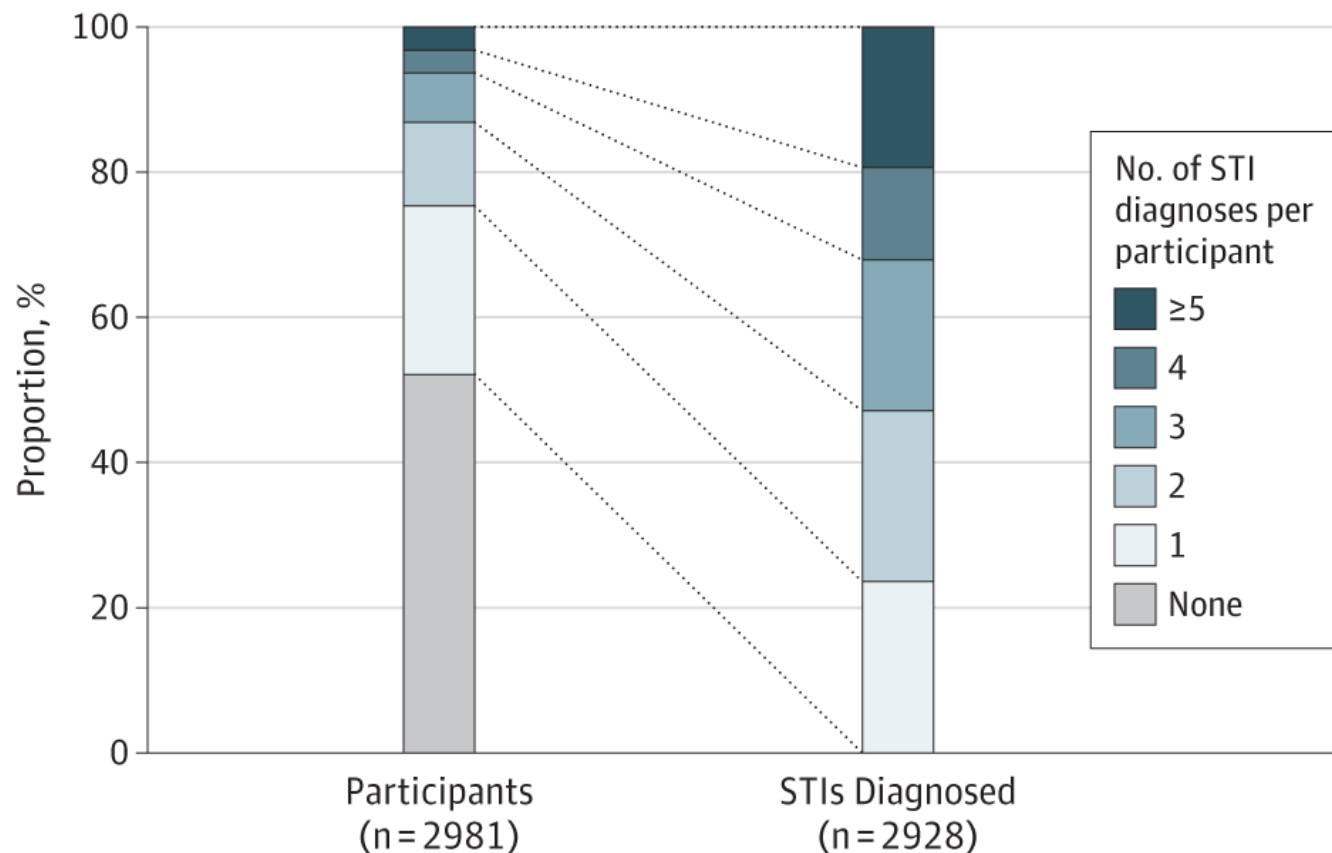
- Longitudinal study of ~3000 MSM on PrEP
- Bacterial STI incidence rate: 9.19 / 100 PYs
- 48% of participants had at least 1 incident STI

Self-reported PrEP adherence (%) ^b				
Taking PrEP daily (95.5)	1 [Reference]			
Taking PrEP 4-6 d per wk (3.4)	1.18 (0.81-1.55)	.24		
Taking PrEP 1-3 d per wk (0.4)	0.81 (0.42-1.56)	.52		
Intermittent use of PrEP (0.8)	0.67 (0.37-1.21)	.19		
No. of oral sex partners in last 6 mo (%) ^b				
1-5 (36.6)	1 [Reference]		1 [Reference]	
6-10 (26.9)	1.64 (1.38-1.95)	<.001	1.17 (0.94-1.45)	.16
11-20 (19.9)	1.97 (1.64-2.35)	<.001	0.95 (0.74-1.22)	.69
21-50 (12.8)	2.31 (1.90-2.82)	<.001	0.86 (0.63-1.17)	.33
>50 (3.8)	2.85 (1.49-2.81)	<.001	0.78 (0.30-1.07)	.50
No. of anal sex partners in last 6 mo (%) ^b				
1-5 (45.3)	1 [Reference]		1 [Reference]	
6-10 (25.3)	1.54 (1.31-1.82)	<.001	1.30 (1.06-1.59)	.01
11-20 (17.6)	2.19 (1.85-2.58)	<.001	1.91 (1.48-2.46)	<.001
21-50 (9.5)	2.32 (1.88-2.86)	<.001	2.17 (1.57-3.00)	<.001
>50 (2.4)	2.47 (1.72-3.55)	<.001	2.53 (1.58-4.03)	<.001
Condom use with regular partner in last 6 mo (%) ^b				
Always (7.3)	1 [Reference]		1 [Reference]	
Usually (>50% of the time) (19.7)	2.08 (1.37-3.15)	.001	1.27 (0.81-2.00)	.30
Sometimes (≤50% of the time) (25.5)	2.42 (1.62-3.62)	<.001	1.27 (0.82-1.98)	.29
Never (47.5)	1.84 (1.23-2.74)	.003	1.06 (0.36-1.29)	.24
Condom use with casual partners in last 6 mo (%) ^b				
Always (14.0)	1 [Reference]		1 [Reference]	
Usually (>50% of the time) (29.2)	1.82 (1.41-2.36)	<.001	1.38 (0.96-1.97)	.08
Sometimes (≤50% of the time) (38.4)	2.13 (1.67-2.71)	<.001	1.38 (0.96-1.99)	.08
Never (18.5)	1.94 (1.48-2.54)	<.001	1.31 (0.88-1.97)	.18
Group sex in last 6 mo (%) ^b				
None (40.0)	1 [Reference]		1 [Reference]	
Once or a few times (47.9)	1.89 (1.64-2.19)	<.001	1.28 (1.09-1.49)	.002
≥Monthly (10.8)	2.70 (2.22-3.29)	<.001	1.45 (1.15-1.83)	.002
≥Weekly (1.4)	3.17 (2.14-4.71)	<.001	1.67 (1.16-2.40)	.006

Traeger et al, JAMA 2019

STIs in PrEP

- About half of persons had at least one STI after starting PrEP
- Highest number of STIs occur in the relatively smaller proportion



STIs on PrEP

- Incidence: 33.1 per 100 py
- Adherence associated with increased HR

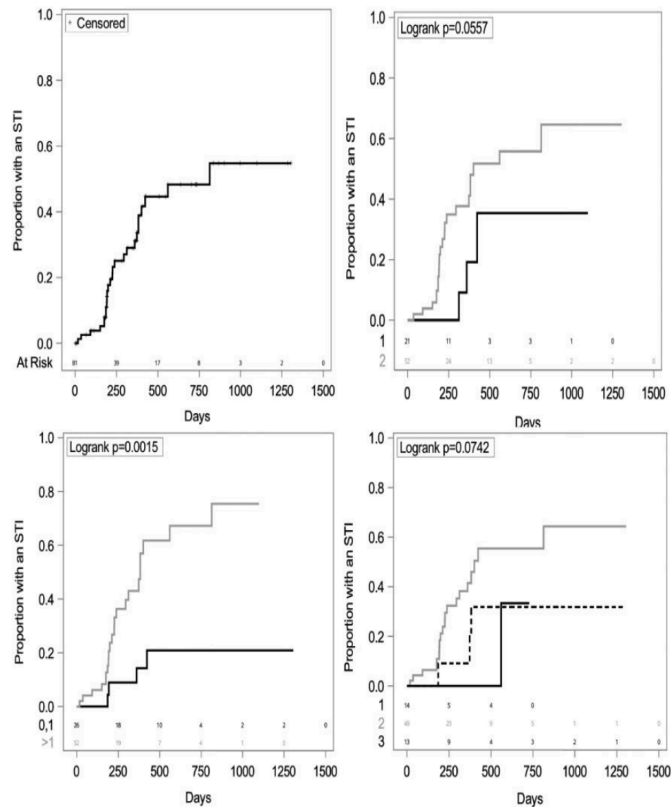


Figure 2. Cumulative incidence plots for time to incident STI: top left: overall, top right: adherence (light shade line: >2 weeks from last missed dose, dark shade line: 0-2 weeks from last missed dose), bottom left: multiple sex partners (light shade line: >1 partner, dark shade line: 0-1 partner), bottom right: condom use with anal sex (light shade: inconsistent, dashed: no anal sex, dark shade line:

Table 3. Univariate cox proportional hazard analysis.

	Primary analysis		Sensitivity analysis	
	HR (95% CI)	p value	HR (95% CI)	p value
Age, years				
18-24	1.95 (0.73-5.23)	0.18	1.80 (0.69-4.69)	0.23
25-34	1.56 (0.61-4.0)	0.35	1.30 (0.53-3.16)	0.56
35+	Referent			
Race				
Black	0.52 (0.19-1.39)	0.19	0.46 (0.17-1.22)	0.12
White	Referent			
Other	0.82 (0.19-3.5)	0.79	0.73 (0.17-3.14)	0.68
Insurance				
Yes	Referent			
No	1.28 (0.29-5.47)	0.74	1.2 (0.19-7.29)	0.83
Adherence				
Less adherent	Referent			
More adherent	3.05 (0.91-10.22)	0.07	3.51 (1.06-11.67)	0.04
Sexual partner number				
0-1	Referent			
>1	4.82 (1.65-14.10)	0.004	4.73 (1.63-13.72)	0.004
Condom use with anal sex				
Consistent	Referent			
Inconsistent	5.28 (0.71-39.58)	0.11	5.15 (0.69-38.40)	0.11
N/A	2.11 (0.22-29.39)	0.52	1.96 (0.20-18.95)	0.56

CI: confidence interval; HR: hazard ratio; N/A: no anal sex.

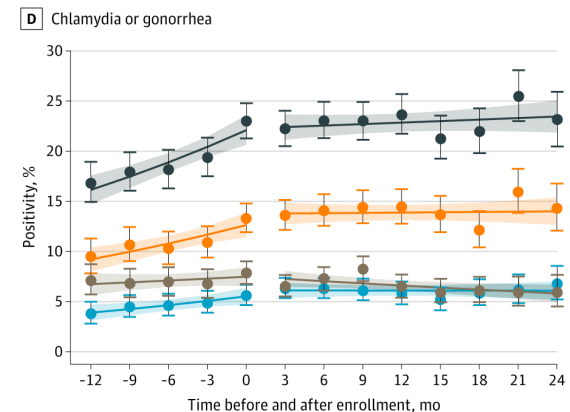
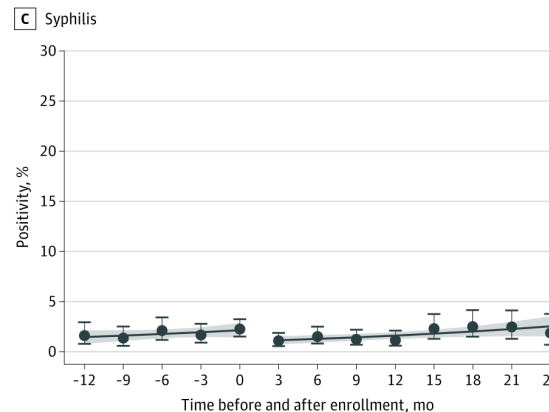
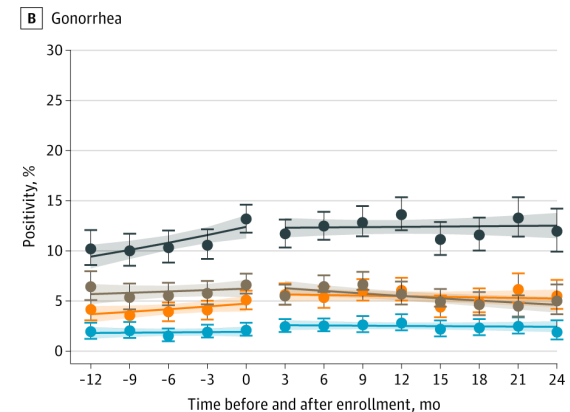
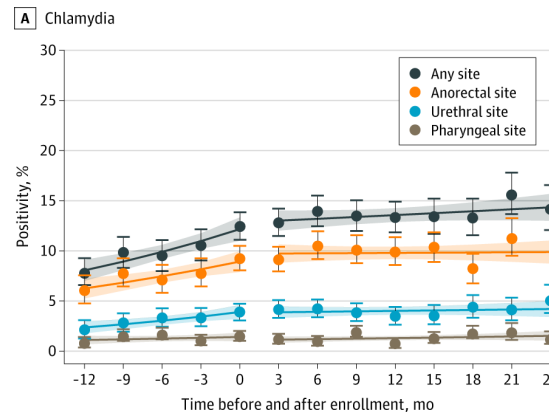
Table 4. Interaction model comparing adherence and multiple sexual partners.

	Primary analysis	
	HR (95% CI)	p value
More adherent vs. less adherent (among patients with 0-1 partners)	0.47 (0.07-3.36)	0.45
More adherent vs. less adherent (among patients with multiple partners)	7.50 (1.00-56.09)	0.05
Multiple partners vs. 0-1 partners (among less adherent patients)	0.47 (0.04-5.25)	0.54
Multiple partners vs. 0-1 partners (among more adherent patients)	7.57 (1.75-32.74)	0.01

CI: confidence interval; HR: hazard ratio.

STIs on PrEP

- STIs are high before and after starting PrEP
- STI data for PrEP users should consider the trajectory before starting PrEP



STIs in Recent PrEP Clinical Trials

DISCOVER

Emtricitabine and tenofovir alafenamide group (n=2694) Emtricitabine and tenofovir disoproxil fumarate group (n=2693)

Participants with any adverse event	2498 (93%)	2494 (93%)
Discontinuation of study drug because of adverse event	36 (1%)	49 (2%)
Serious adverse event*	169 (6%)	138 (5%)
Treatment-related serious adverse event†	545 (20%)	630 (23%)
Death‡	1 (0.04%)	1 (0.04%)
Common adverse events (≥10% in either group)		
Rectal chlamydia	770 (29%)	792 (29%)
Oropharyngeal gonorrhoea	740 (27%)	722 (27%)
Rectal gonorrhoea	693 (26%)	671 (25%)
Exposure to a communicable disease	483 (18%)	441 (16%)
Diarrhoea	430 (16%)	422 (16%)
Nasopharyngitis	350 (13%)	355 (13%)
Upper respiratory tract infection	356 (13%)	310 (12%)
Syphilis	342 (13%)	321 (12%)
Urethral chlamydia	280 (10%)	259 (10%)
Grade 3 or 4 laboratory abnormality (≥1% in either group)		
Any	196 (7%)	206 (8%)
Increased alanine aminotransferase§	39 (1%)	40 (2%)
Increased amylase§	34 (1%)	46 (2%)
Increased aspartate aminotransferase§	63 (2%)	51 (2%)
Hyperglycaemia, fasting§	12 (<1%)	17 (1%)
Increased LDL, fasting§	51 (2%)	18 (1%)
Glycosuria§	19 (1%)	32 (1%)

Table S5. Incident sexually transmitted infections

HPTN 083

	Overall	TDF-FTC	Cabotegravir
Enrolled participants*	4566	2284	2282
Syphilis			
Person years – no.	5531	2755	2776
Rate per 100 person-years†	16.7	16.7	16.6
Gonorrhoea (urine)			
Person years – no.	5464	2718	2746
Rate per 100 person-years†	2.45	2.13	2.77
Gonorrhoea (rectal)			
Person years – no.	5434	2709	2725
Rate per 100 person-years†	11	11	11.1
Chlamydia (urine)			
Person years – no.	5463	2718	2745
Rate per 100 person-years†	4.56	4.67	4.44
Chlamydia (rectal)			
Person years – no.	5435	2710	2725
Rate per 100 person-years†	16.8	17.8	15.8
Hepatitis C virus			
Person years – no.	4105	2056	2050
Rate per 100 person-years†	0.54	0.58	0.49

Data are n (%). *The most common serious adverse events in the emtricitabine and tenofovir alafenamide group were appendicitis (n=8, 0.3%), suicidal ideation (n=7), acute kidney injury (n=5), hepatitis A (n=5), cellulitis (n=4), pneumonia (n=4), depression (n=4), suicide attempt (n=4), and road traffic accident (n=4); the most common serious adverse events in the emtricitabine tenofovir disoproxil fumarate group were appendicitis (n=9), suicidal ideation (n=5), cellulitis (n=4), pneumonia (n=4), atrial fibrillation (n=4), chest pain (n=4), anal abscess (n=3), and diverticulitis (n=3). †Serious adverse events considered to be associated with emtricitabine tenofovir alafenamide included nephrotic syndrome (n=1), chest pain and loss of consciousness (n=1), and agranulocytosis and pyrexia in the same participant (n=1); serious adverse events considered to be associated with emtricitabine tenofovir disoproxil fumarate included acute kidney injury (n=2), migraine (n=1), pneumonia (n=1), urinary calculus (n=1), and renal tubular necrosis (n=1).

Landovitz et al., NEJM 2021
Mayer et al., Lancet 2020

STI Testing on PrEP

PrEP uptake leads to increased STI screening and treatment

Prevent 42% NG and 40% CT in 10y

“PrEP as a combination STI/HIV prevention package”

Clinical Infectious Diseases

MAJOR ARTICLE

 IDSA
Infectious Diseases Society of America

 hivma
hiv medicine association

 OXFORD

Incidence of Gonorrhea and Chlamydia Following Human Immunodeficiency Virus Preexposure Prophylaxis Among Men Who Have Sex With Men: A Modeling Study

Samuel M. Jenness,¹ Kevin M. Weiss,¹ Steven M. Goodreau,² Thomas Gift,³ Harrell Chesson,³ Karen W. Hoover,⁴ Dawn K. Smith,⁴ Albert Y. Liu,⁵ Patrick S. Sullivan,¹ and Eli S. Rosenberg¹

¹Department of Epidemiology, Emory University, Atlanta, Georgia; ²Department of Anthropology, University of Washington, Seattle; ³Division of STD Prevention, and ⁴Division of HIV/AIDS Prevention, Centers for Disease Control and Prevention, Atlanta, Georgia; and ⁵San Francisco Department of Public Health, California

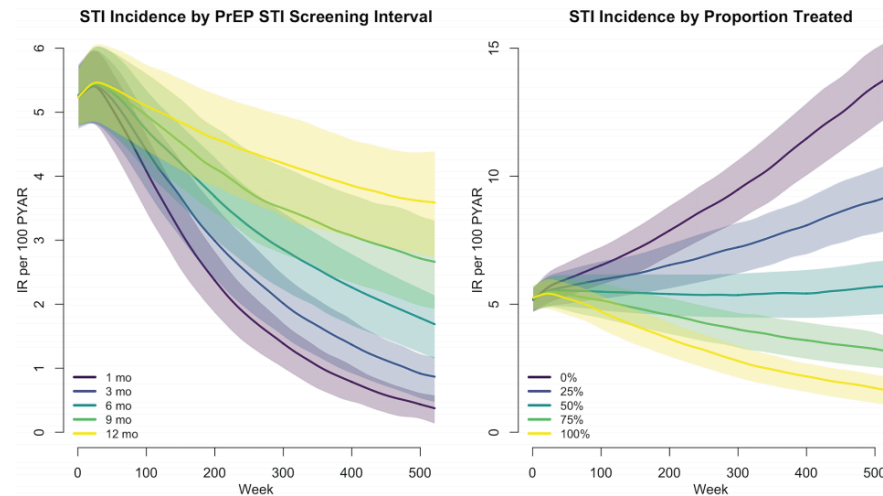


Figure 2. Incidence rates, per 100 person-years at risk, of combined gonorrhea and chlamydia infections under varying preexposure prophylaxis (PrEP)-associated sexually transmitted infection screening intervals and proportion of PrEP users screened and treated among men who have sex with men in the United States over 10 years of 250 simulations. Abbreviations: IR, incidence rate; PrEP, preexposure prophylaxis; PYAR, person-years at risk; STI, sexually transmitted infection.

Jenness et al., CID 2017

DEBATE

Give PrEP a chance: moving on from the “risk compensation” concept

Daniela Rojas Castro^{1,2§} , Rosemary M Delabre¹  and Jean-Michel Molina^{3,4}

§ **Corresponding author:** Daniela Rojas Castro, Coalition PLUS, Community-based Research Laboratory, 14 rue Scandicci, 93500 Pantin, France. Tel: +33699176940. (drojascastro@coalitionplus.org)

Risk compensation should not be used to exclude vulnerable populations from HIV prevention services

STIs – Increased Chances to Acquire HIV in Persons with Vaginas

HIV/AIDS

MAJOR ARTICLE

STIs led to inflammation even if there are no symptoms

Inflammation increases risk for HIV acquisition

Genital Inflammation and the Risk of HIV Acquisition in Women

Lindi Masson,^{1,2,a} Jo-Ann S. Passmore,^{1,2,3,a} Lenine J. Liebenberg,^{1,a} Lise Werner,¹ Cheryl Baxter,¹ Kelly B. Arnold,⁴ Carolyn Williamson,^{1,2} Francesca Little,⁵ Leila E. Mansoor,¹ Vivek Naranbhai,¹ Douglas A. Lauffenburger,⁴ Katharina Ronacher,⁶ Gerhard Walzl,⁶ Nigel J. Garrett,¹ Brent L. Williams,⁷ Mara Couto-Rodriguez,⁷ Mady Hornig,⁷ W. Ian Liokin,⁷ Anneke Grobler,¹ Quarraisha Abdool Karim,^{1,8} and Salim S. Abdool Karim^{1,8}

Inflammatory cytokine biomarkers of asymptomatic sexually transmitted infections and vaginal dysbiosis: a multicentre validation study

Mwalela R et al. *Journal of the International AIDS Society* 2019, **22**(S6):e25346
<http://onlinelibrary.wiley.com/doi/10.1002/jia2.25346/full> | <https://doi.org/10.1002/jia2.25346>



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COMMENTARY

Mechanisms of sexually transmitted infection-induced inflammation in women: implications for HIV risk

Ruth Mwalela^{1*}, Lyle R McKinnon^{1,2*}, Cheryl Baxter², Quarraisha Abdool Karim^{2,3} and Salim S Abdool Karim^{2,3§}

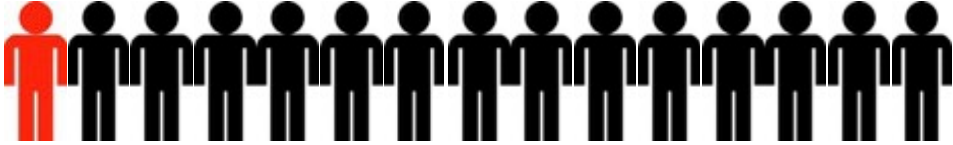
§Corresponding author: Salim S Abdool Karim, Centre for the AIDS Programme of Research in South Africa (CAPRISA), Private Bag X7, Congella, 4013 Durban, South Africa. Tel: +2731 260 4550. (salim.abdoolkarim@caprisa.org)

*These authors have contributed equally to the work.

Passmore et al., *Curr Opin HIV AIDS*. 2016 Mar;11(2):1562

STIs – Increased Risk for HIV among MSM

Rectal GC
or CT



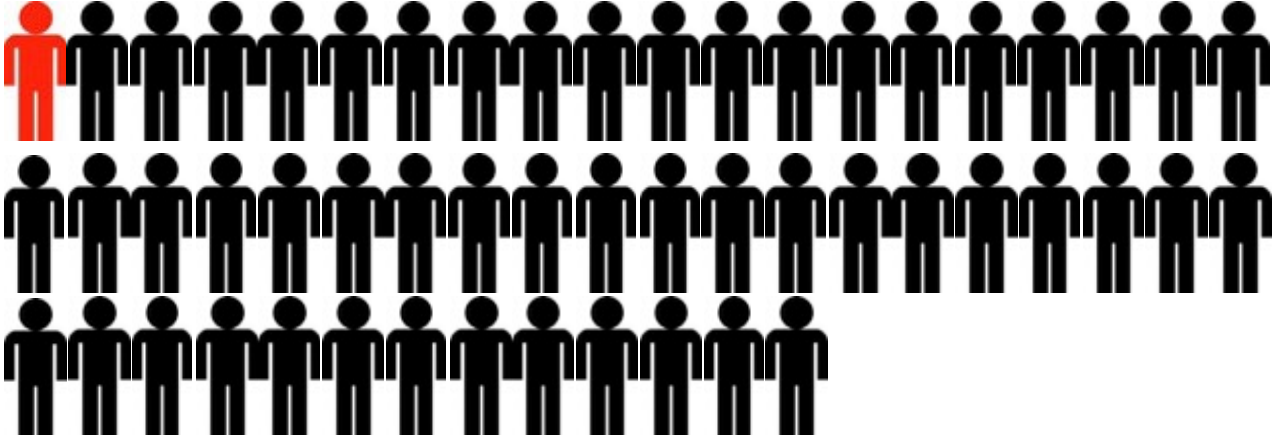
1 in 15 MSM were diagnosed with HIV within 1 year.*

Primary or
Secondary
Syphilis



1 in 18 MSM were diagnosed with HIV within 1 year.**

No rectal STD
or syphilis
infection



1 in 53 MSM were diagnosed with HIV within 1 year.*

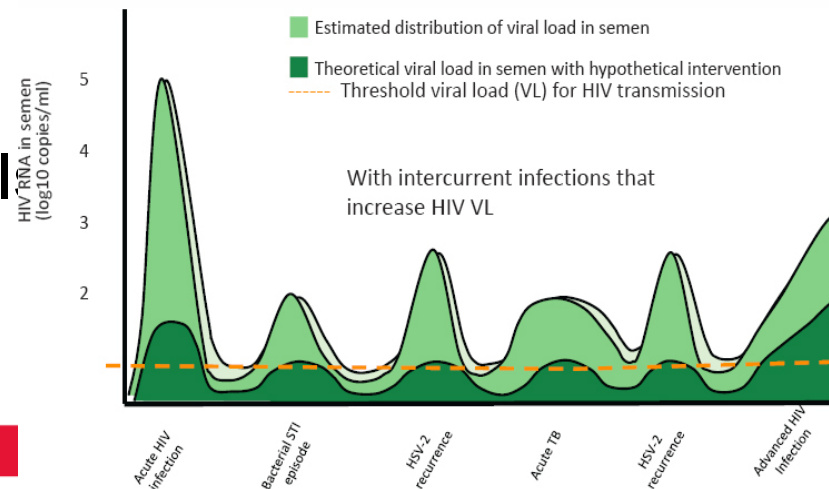
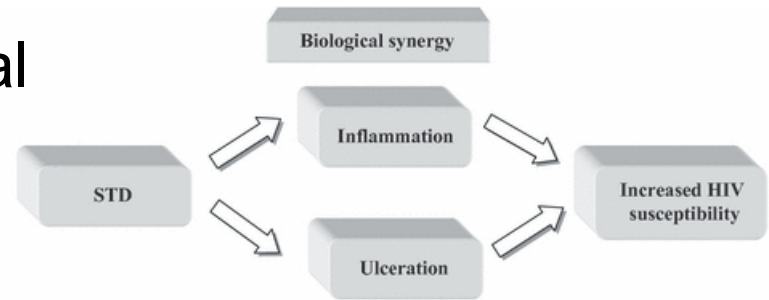
Chen R4P 2018
Slide courtesy Jeanne Marrazzo, MD

*STD Clinic Patients, New York City. Pathela, CID 2013:57;

**Matched STD/HIV Surveillance Data, New York City. Pathela, CID 2015:61

STIs and HIV – A Biologic Syndemic

- STIs increase HIV viral load in genital fluids of PLWH
- Detectable HIV even if on ART
 - Likely some degree of viral escape
 - Are these virions defective?
- HPTN 052 and PARTNERS had STI yet no genetically linked HIV transmissions



REVIEW

Sexually transmitted infections and HIV in the era of antiretroviral treatment and prevention: the biologic basis for epidemiologic synergy

Myron S Cohen¹, Olivia D Council² and Jane S Chen³

Mayer K and Venkatesh K, Am J Reprod Immunol 2011
 Cohen MS, Council OD, and Chen JS; JIAS 2019
 Cohen

Daily Oral - Tenofovir

Table 5 Timing of Oral PrEP-associated Laboratory Tests

Test	Screening/Baseline Visit	Q 3 months	Q 6 months	Q 12 months	When stopping PrEP
HIV Test	X*	X			X*
eCrCl	X		If age ≥ 50 or eCrCl < 90 ml/min at PrEP	If age < 50 and eCrCl ≥ 90 ml/min at PrEP	X
Syphilis	X	MSM /TGW	X		MSM/TGW
Gonorrhea	X	MSM /TGW	X		MSM /TGW
Chlamydia	X	MSM /TGW	X		MSM /TGW
(F/TAF)					
Hep B serology	X				
Hep C serology	MSM, TGW, and PWID only			MSM, TGW, and PWID only	

* Assess for acute HIV infection (see Figure 4)

Long-Acting Injectable - Cabotegravir

Table 7 Timing of CAB PrEP-associated Laboratory Tests

Test	Initiation Visit	1 month visit	Q2 months	Q4 months	Q6 months	Q12 months	When Stopping CAB
HIV*	X	X	X	X	X	X	X
Syphilis	X			MSM~/TGW~ only	Heterosexually active women and men only	X	MSM/TGW only
Gonorrhea	X			MSM/TGW only	Heterosexually active women and men only	X	MSM/TGW only
Chlamydia	X			MSM/TGW only	MSM/TGW only	Heterosexually active women and men only	MSM/TGW only

* HIV-1 RNA assay

STI Screening – HIV Primary Care

Clinical Infectious Diseases

MAJOR ARTICLE



Initial Visit

Chlamydia, gonorrhea, trichomoniasis Recommendations

19. Persons with HIV should be screened for gonorrhea and chlamydia infection at initial presentation. Screening should include all sites of contact (oral, anal, urethral [urine], and vaginal). Those found to have gonorrhea or chlamydia on initial screening should be treated and rescreened in 3 months because of high reinfection rates.
20. All persons who have receptive vaginal sex should be screened for trichomoniasis at entry into care. Those found to have trichomoniasis on initial screening should be

Primary Care Guidance for Persons With Human Immunodeficiency Virus: 2020 Update by the HIV Medicine Association of the Infectious Diseases Society of America

Melanie A. Thompson,^{1*} Michael A. Horberg,^{2*} Allison L. Agwu,³ Jonathan A. Colasanti,⁴ Mamta K. Jain,⁵ William R. Short,⁶ Tulika Singh,⁷ and Judith A. Aberg¹

Subsequent Follow-Up

Screening and Vaccination for Infectious Diseases: Screening for Chlamydia, Gonorrhea, Trichomonas and Syphilis Recommendations

50. Screening for syphilis, chlamydia, and gonorrhea in asymptomatic persons should be repeated at least annually after initial screening or every 3–6 months depending on sexual activities, presence of other STIs in the patient or their partner, and local community STI prevalence.
51. All persons who have vaginal sex should be screened for trichomonas annually.
52. Tailored messages are critical for patients who report persistent high-risk behavior or who have symptoms or signs of STIs. In nearly all situations, the provider should offer brief counseling. In general, persons who exhibit ongoing risk behaviors should be referred to programs capable of offering more extensive interventional treatment.

Extragenital Testing

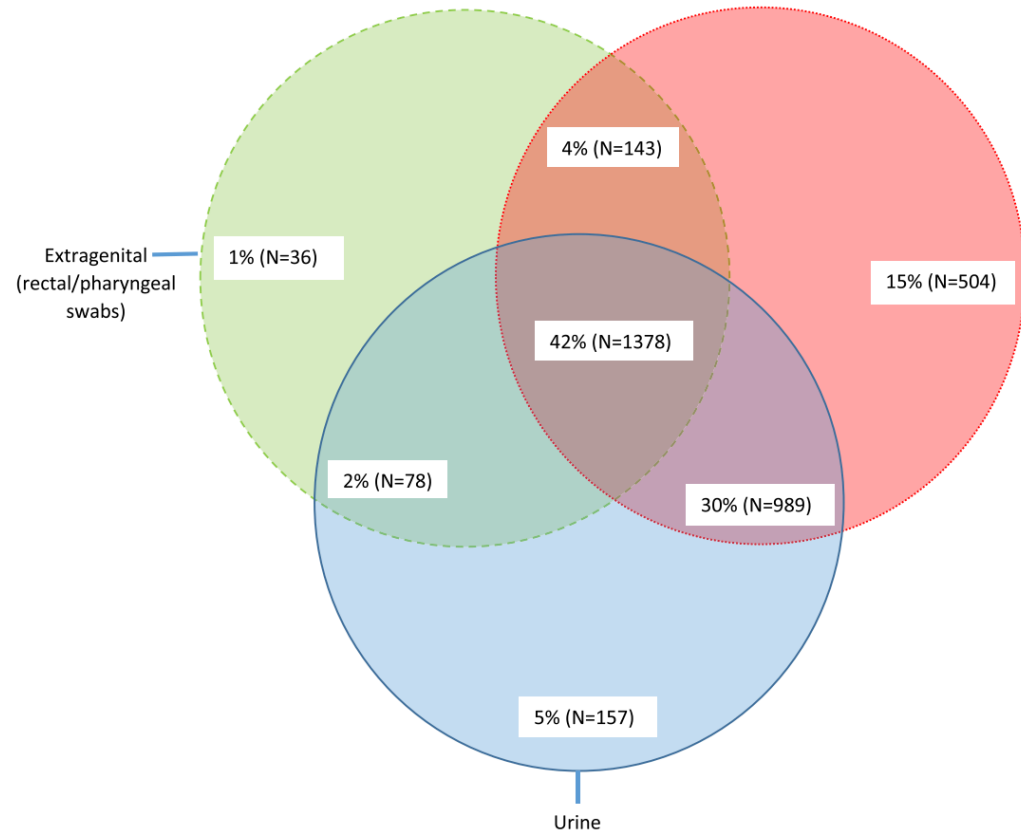
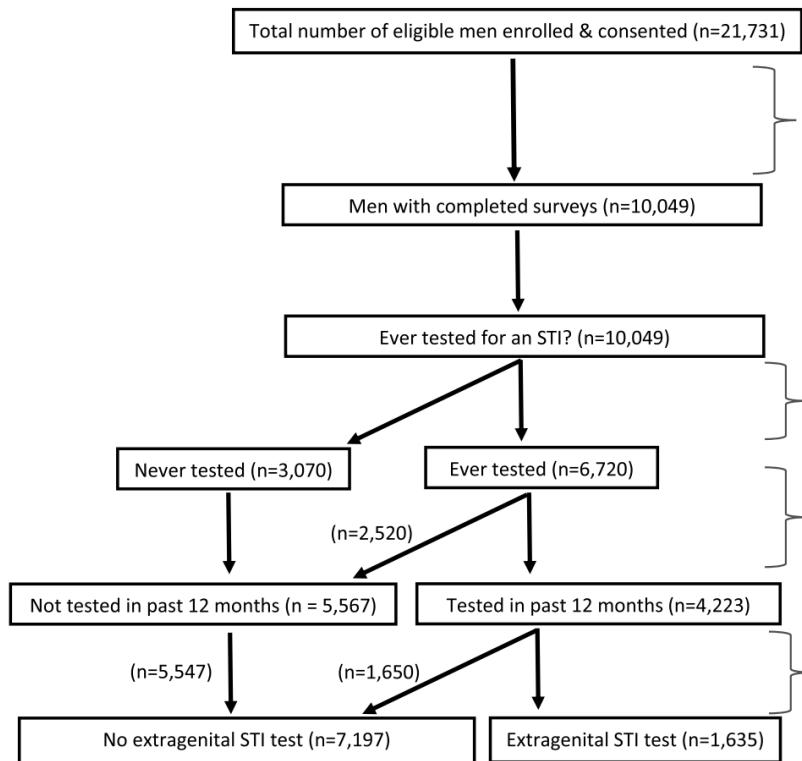
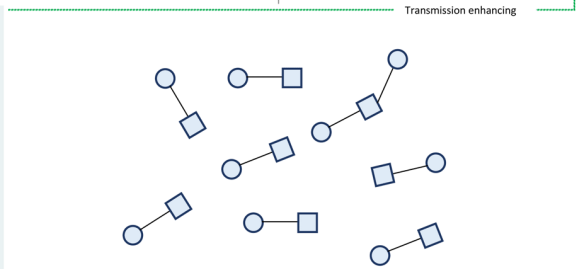
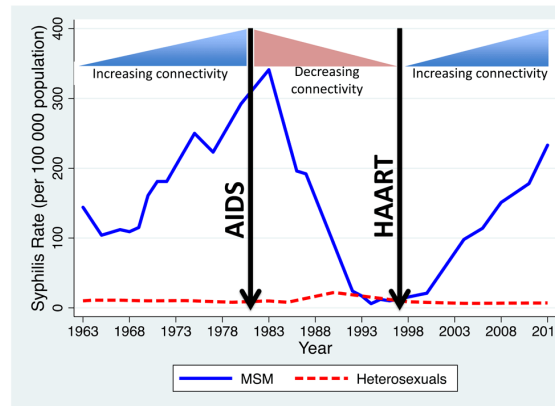
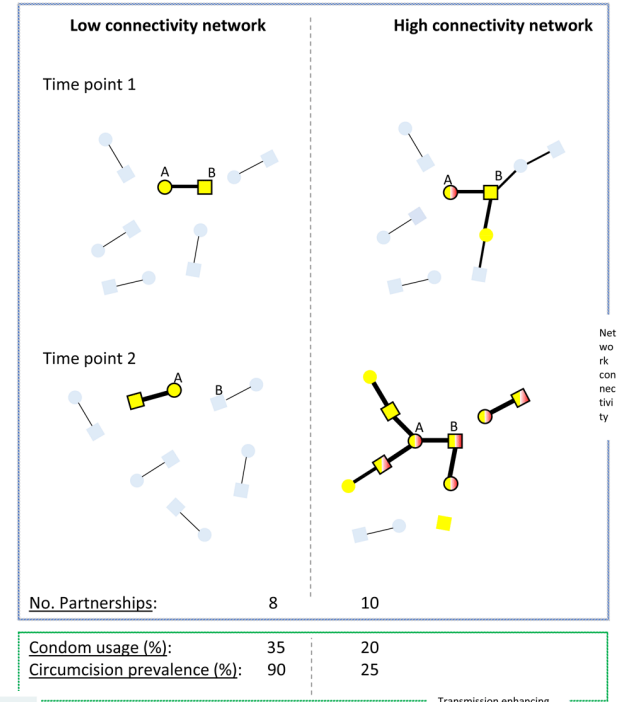


Figure 1. Flowchart outlining participants included in the analytical sample—American Men's Internet Survey, 2017.

Sexual Behaviors or Sexual Networks

- Sexual network and connectivity predicts STI prevalence
- Networks impacted by social determinants, racism, stigma, homophobia, transphobia,
- These contextual factors exacerbate STI and HIV inequities



Adimora AA and Schoenbach VJ, JID 2005
 Doherty IA et al., JID 2005
 Kenyon CR, Devla W, F1000 Research 2019

Biomedical Prevention

- Doxycycline Post-Exposure Prophylaxis (Doxy-PEP)

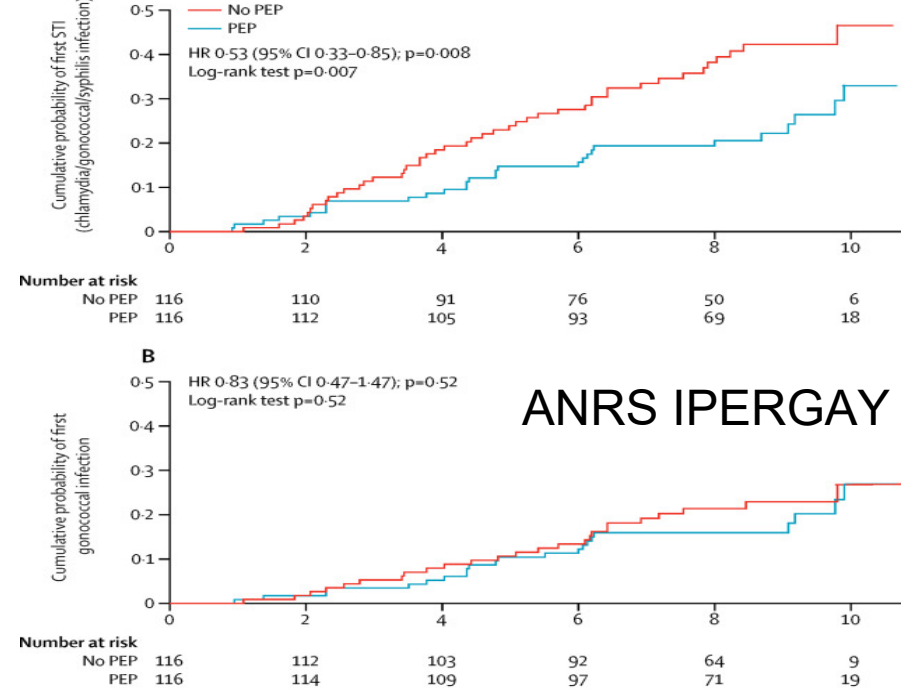
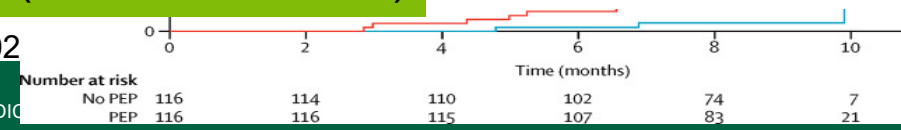


Table: Quarterly STI incidence by HIV status and by randomization to doxyPEP & control arms

	HIV uninfected MSM/TGW on PrEP		MSM/TGW living with HIV		Total	
	Doxy arm N=240	Control arm N=120	Doxy arm N=134	Control arm N=60	Doxy Arm N=374	Control arm N=180
Follow up quarters	491	220	266	108	757	328
Participants with an incident STI (GC, CT or syphilis)	41	42	24	18	65	60
Primary STI endpoints						
Gonorrhea	40 (8.1%)	45 (20.5%)	21 (7.9%)	20 (18.5%)	61 (8.1%)	65 (19.8%)
Chlamydia	7 (1.4%)	23 (10.5%)	12 (4.5%)	16 (14.8%)	19 (2.5%)	39 (11.9%)
Syphilis	1 (0.2%)	5 (2.3%)	3 (1.1%)	2 (1.9%)	4 (0.5%)	7 (2.1%)

RR 0.33 (95% CI, 0.23-0.47) RR 0.42 (95% CI, 0.25-0.75)

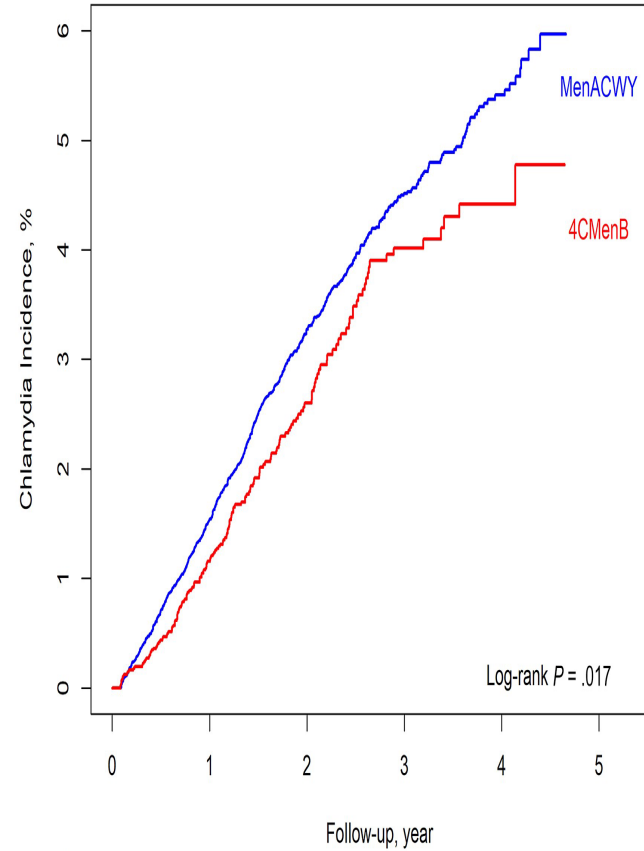
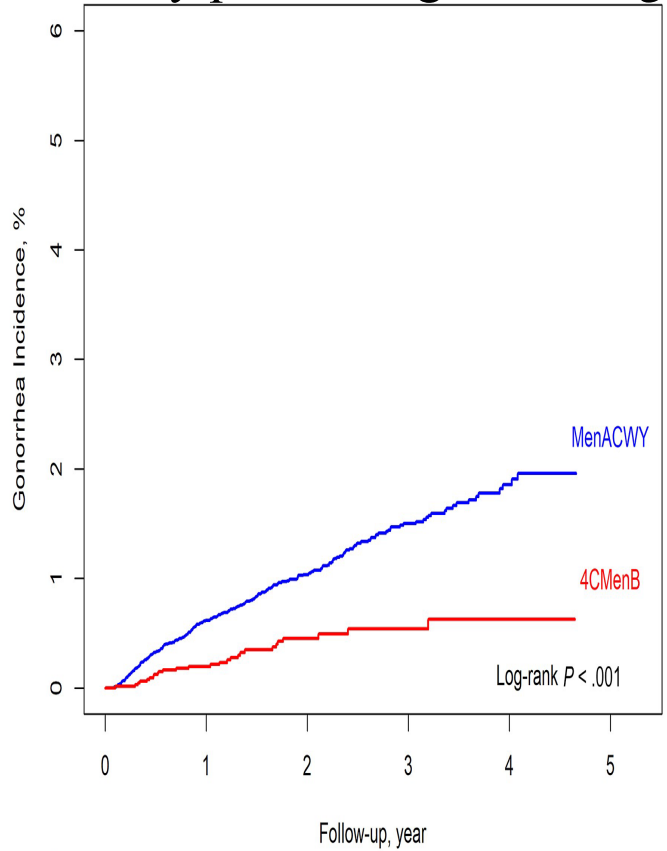
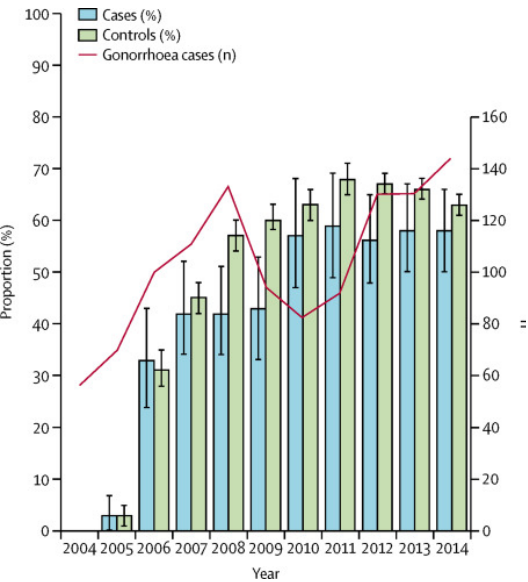


Molina et al., Lancet ID 2017; Luetkemeyer et al., AIDS Conference 202

Biomedical Prevention Strategies

- Gonococcal Vaccine?

- 4CMenB vaccine may protect against *N. gonorrhoeae* infection



	Number at Risk									
MenACWY	26 471	26 383	23 284	17 010	13 063	9 063	6 136	3 853	2 190	430
4CMenB	6 641	6 630	6 125	4 006	2 785	1 958	1 622	914	568	37

	Number at Risk									
MenACWY	26 471	26 383	23 063	16 706	12 742	8 797	5 956	3 728	2 129	411
4CMenB	6 641	6 609	6 066	3 937	2 729	1 904	1 567	881	557	35

Petousis-Harris et al., Lancet 2017
 Bruxvoort et al., CID 2022

Silos are for corn.



Sexual Health
HIV
STIs

BOX 5-2 Examples of Potential Synergies Between HIV and STI Prevention, Treatment, and Control

- HIV and sexually transmitted disease (STD) programs at the Centers for Disease Control and Prevention could collaborate to identify areas for enhanced HIV/STD program integration at the state and local levels and monitor and promote recommended activities. These could include activities such as integrating pre-exposure prophylaxis (PrEP) referrals and the identification of out-of-care, HIV-positive persons into STI partner services, enhancing the provision of PrEP in STI clinics, increasing STI testing in Ryan White clinics, and using PrEP programs to develop new mechanisms to promote nonclinical STI testing.
- Ending the HIV Epidemic planning and community engagement could integrate efforts to develop and implement a broader STI control plan.
- Point-of-care diagnostics could be deployed for STIs in nearly all venues where rapid HIV testing is available.
- Programs that reach out to persons living with HIV, or perceived to be at higher risk to acquire HIV, could have STI screening and control components.

National Academies of Sciences, Crowley JS, Geller AB, Vermund SH, editors. Sexually Transmitted Infections: Adopting a Sexual Health Paradigm. Washington (DC): National Academies Press (US); 2021 Mar 24. <https://www.ncbi.nlm.nih.gov/books/NBK573154/> doi: 10.17226/25955

Summary

- Although improvements in HIV trends, STIs are soaring
- STIs occur at high rates among PLWH as well as HIV negative persons on PrEP
- Equitable access to STI testing and treatment is critical, and novel biomedical strategies need to be implemented with a focus on equity

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Thank you!

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