

HIV & Condomless Sex - What is the Risk? Why Not?

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Yes

No

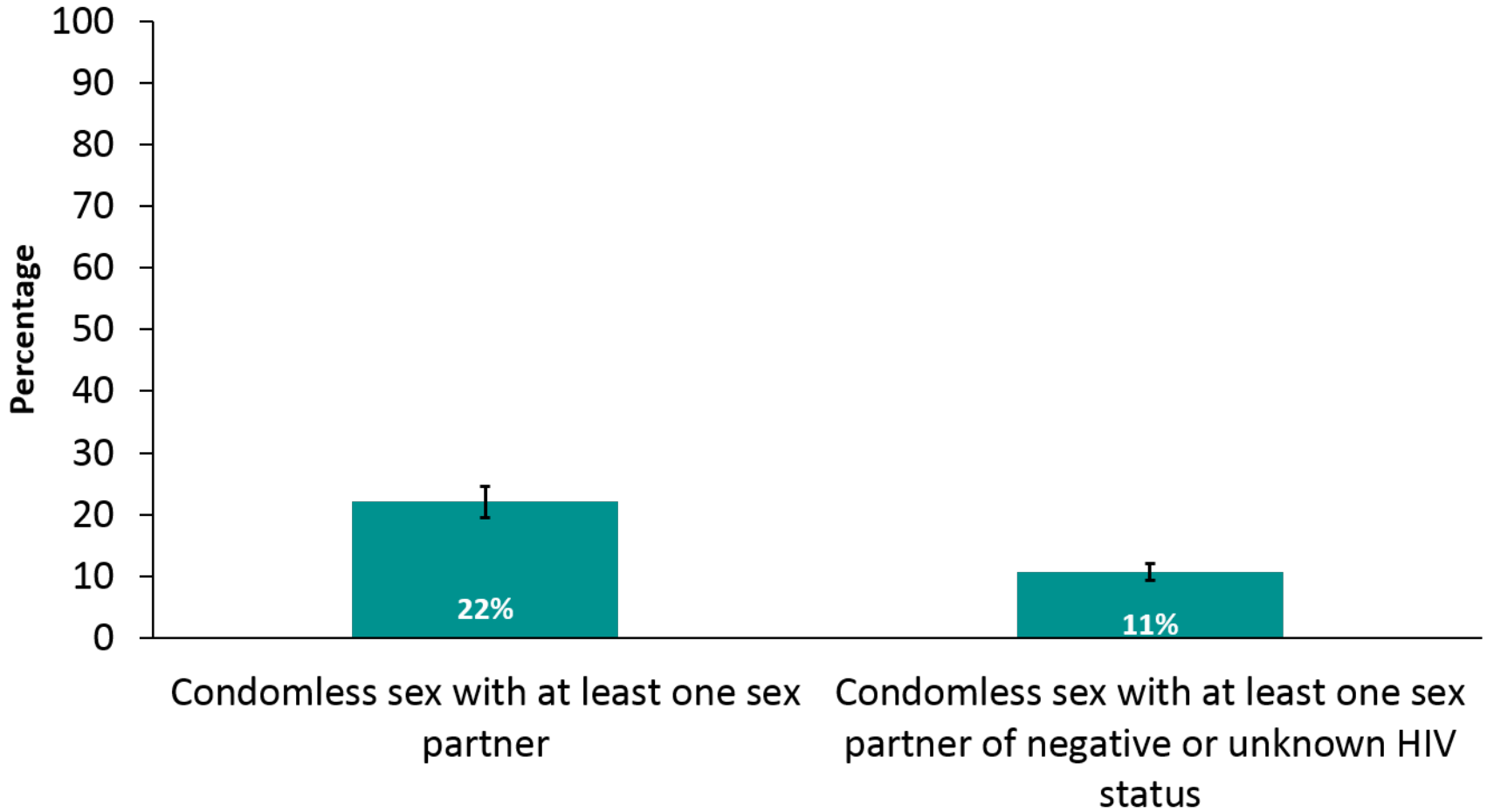


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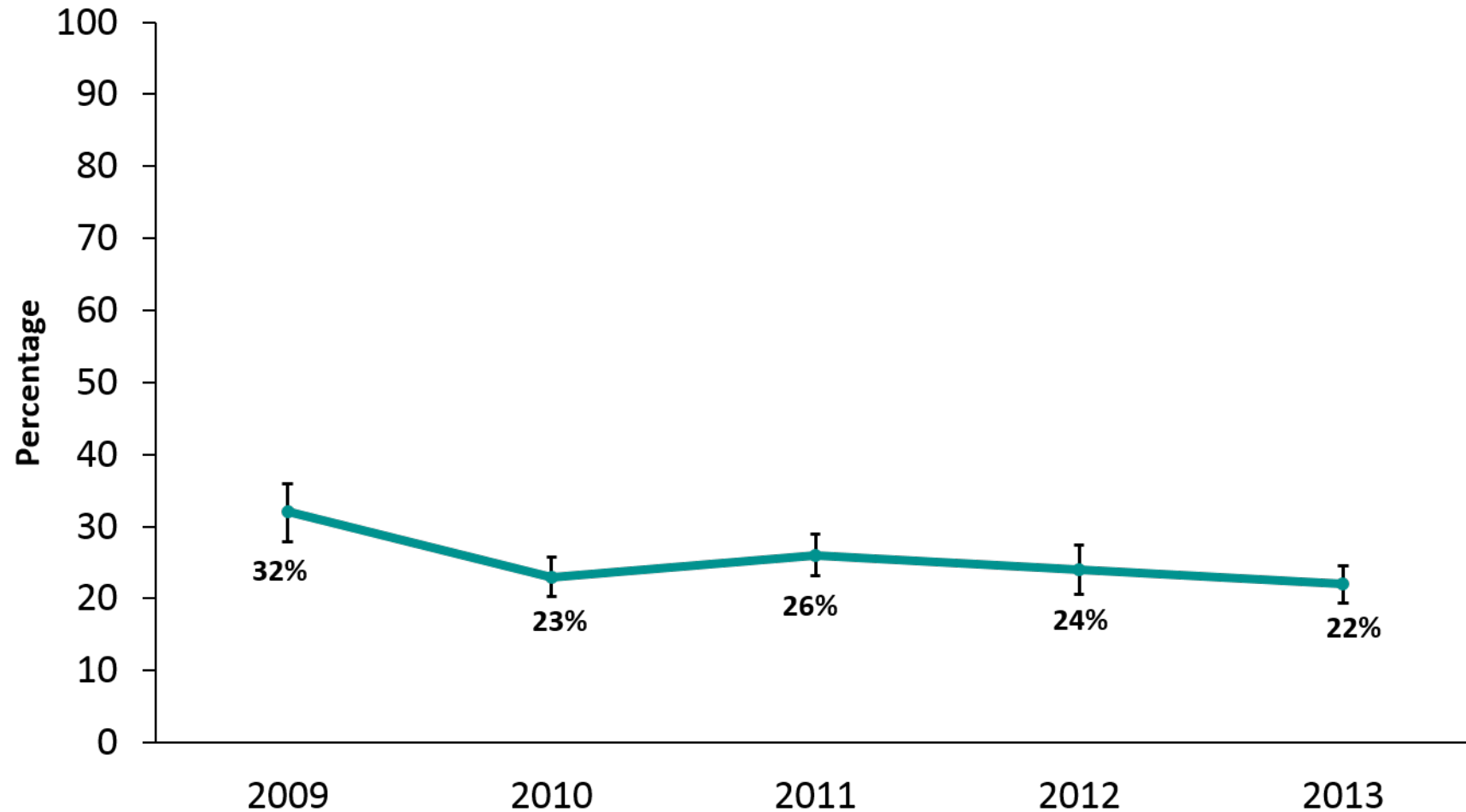
What's Going on Out There?



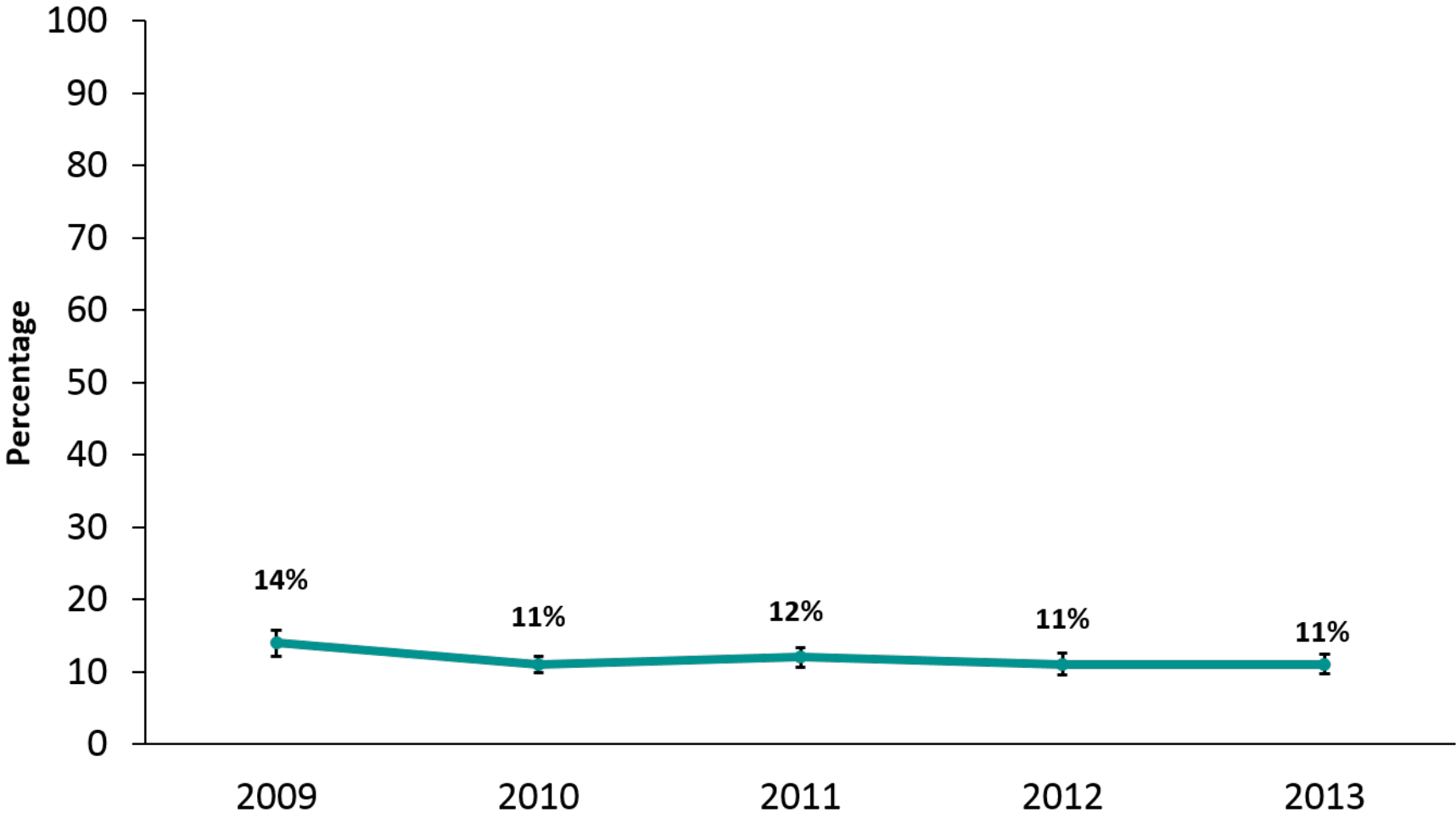
Condomless Sex among Adults Receiving HIV Medical Care, 2013 Cycle



Trends in Condomless Sex among Adults Receiving HIV Medical Care, 2009—2013 Cycles

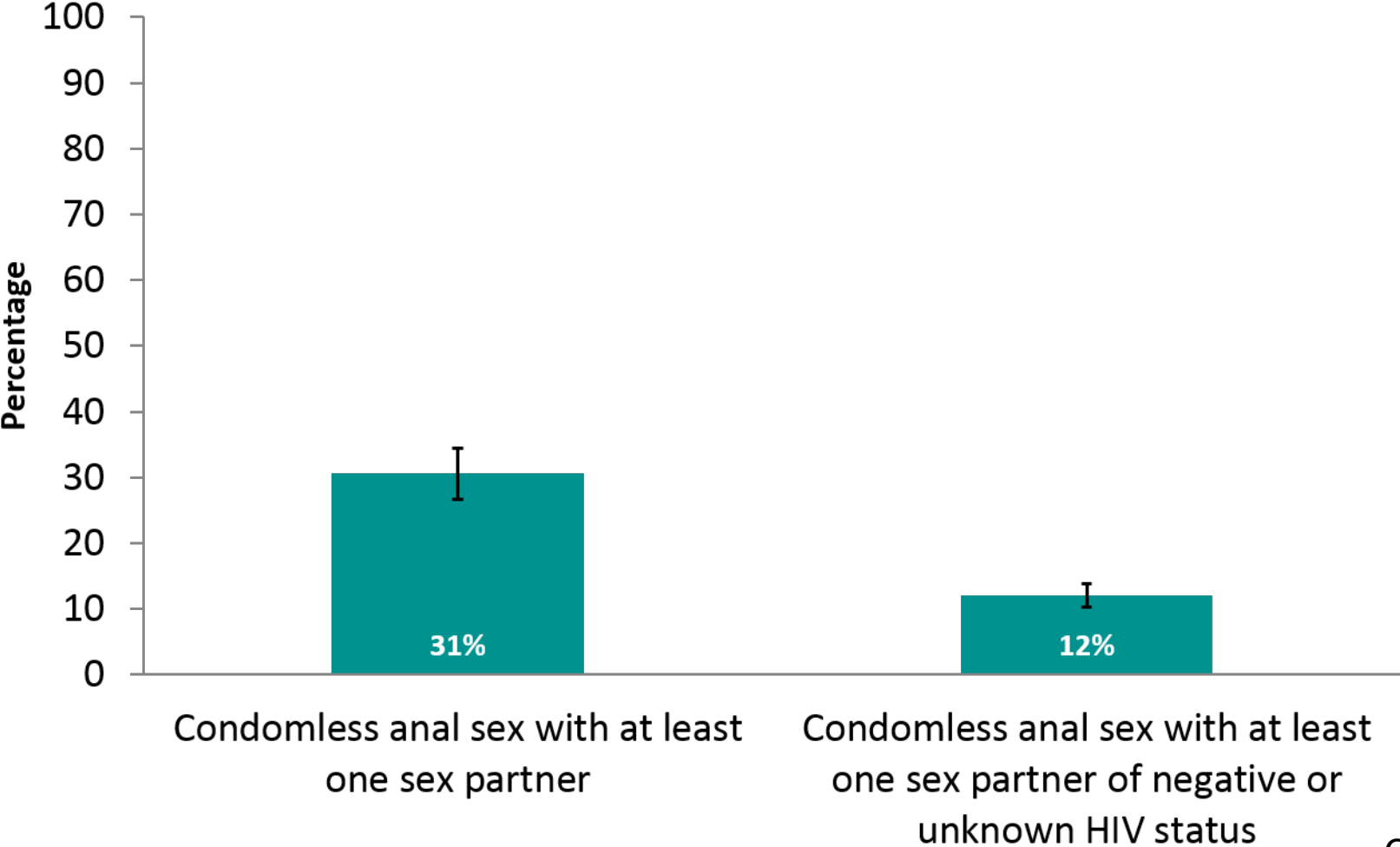


Trends in Condomless Sex with a Partner of Unknown or Negative HIV Status among Adults Receiving HIV Medical Care, 2009—2013 Cycles

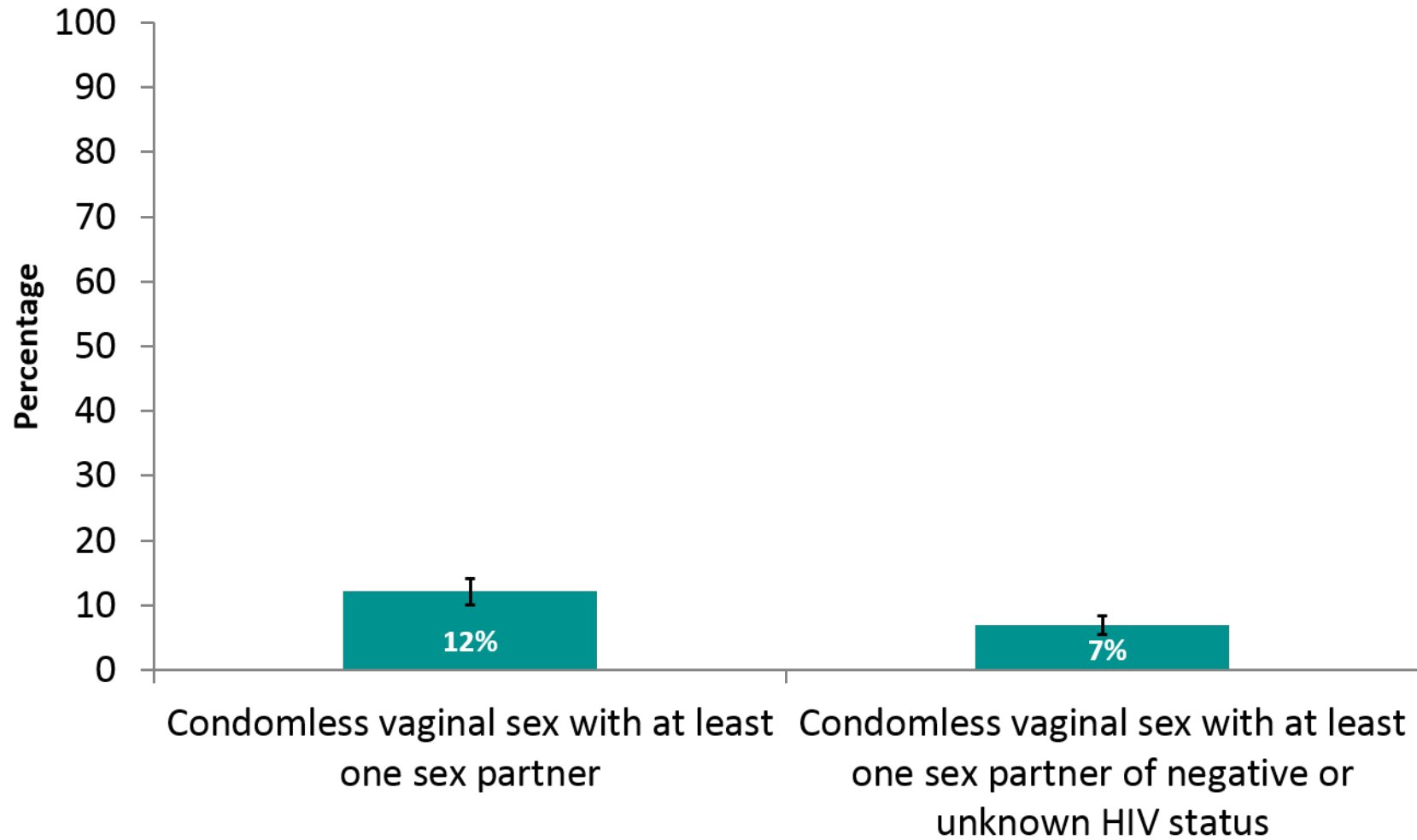




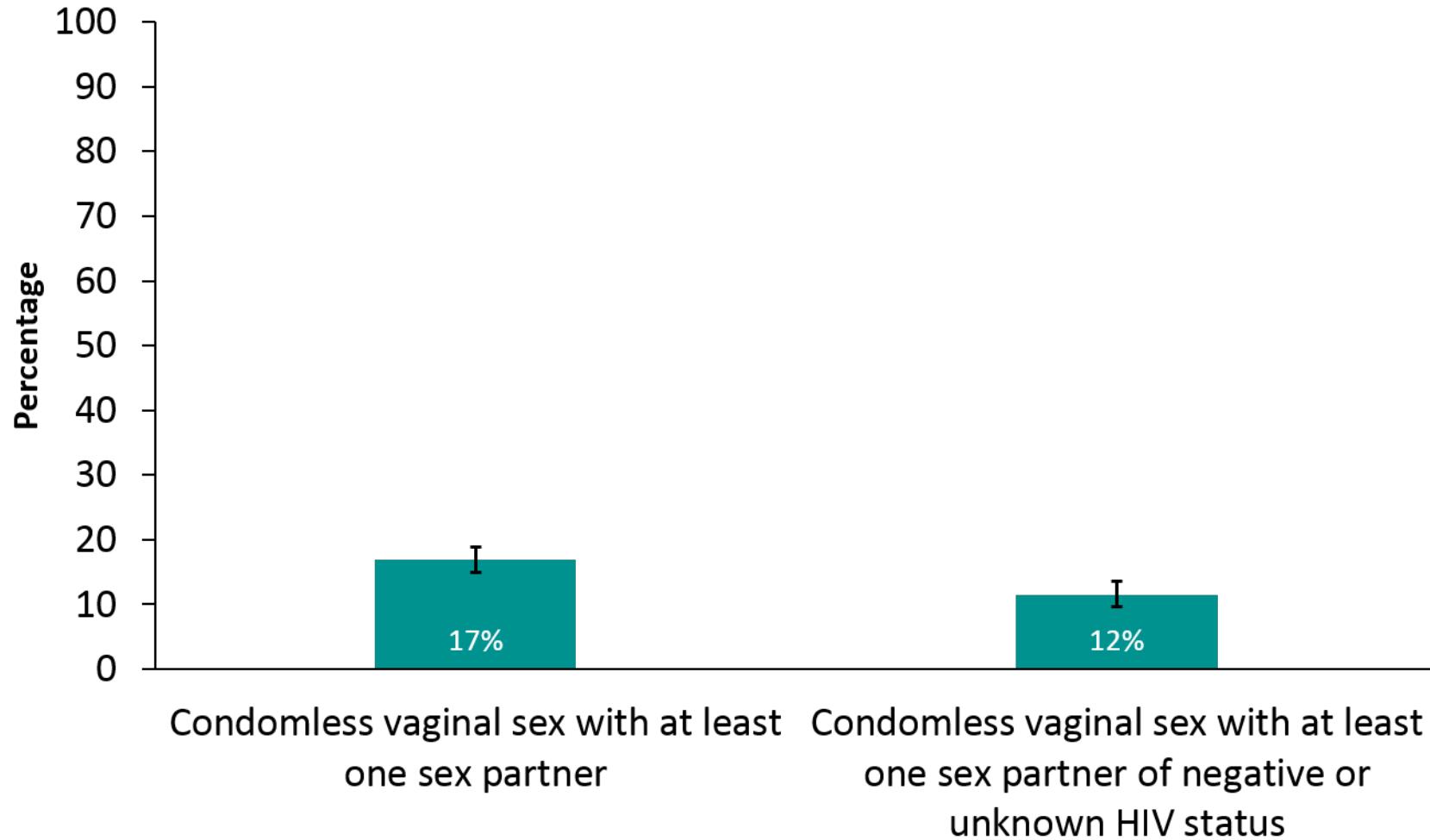
Condomless Anal Sex among Men Receiving HIV Medical Care who Have Sex with Men, 2013 Cycle



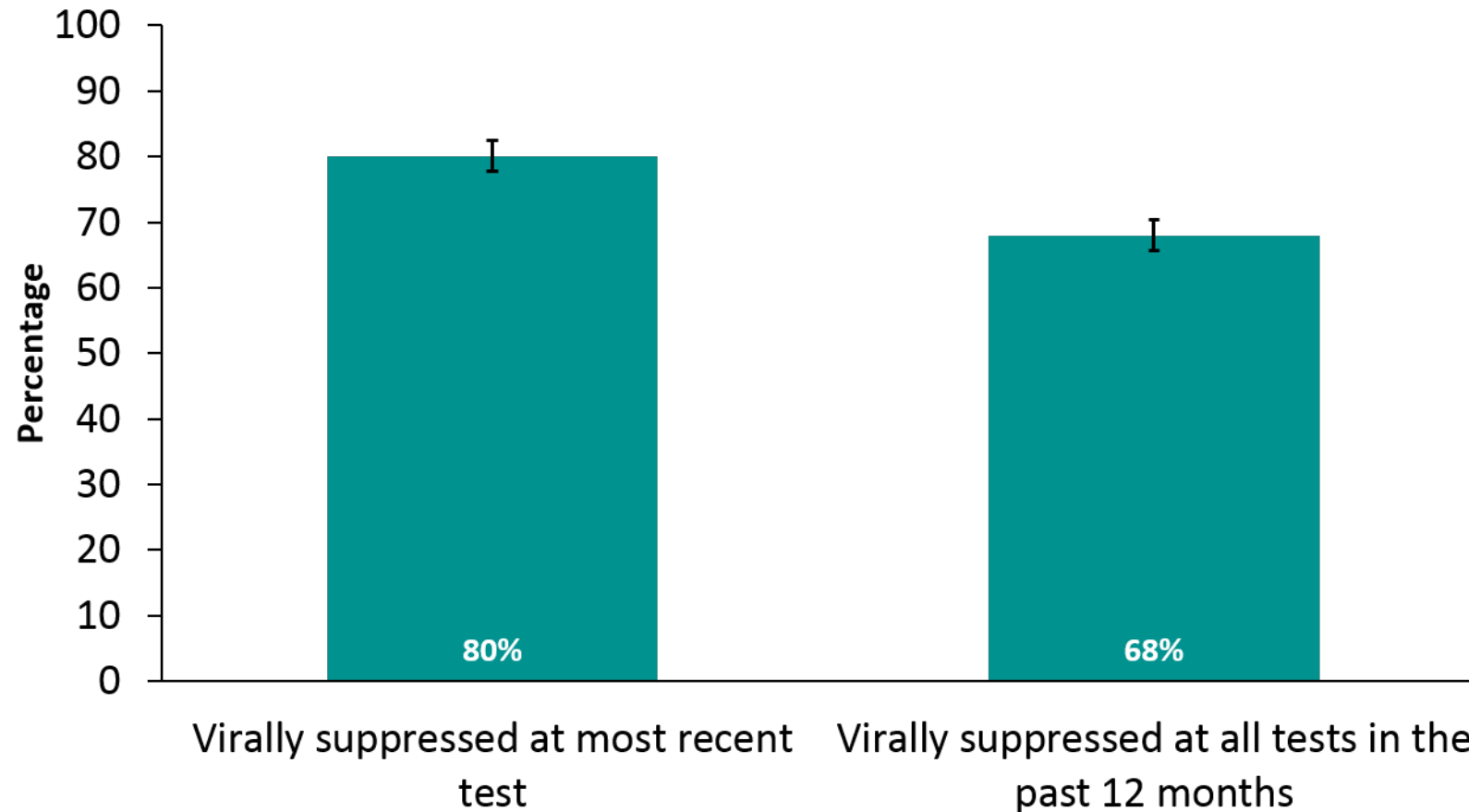
Condomless Vaginal Sex among Men Receiving HIV Medical Care who Have Sex with Women, 2013 Cycle



Condomless Vaginal Sex among Women Receiving HIV Medical Care who Have Sex with Men, 2013 Cycle

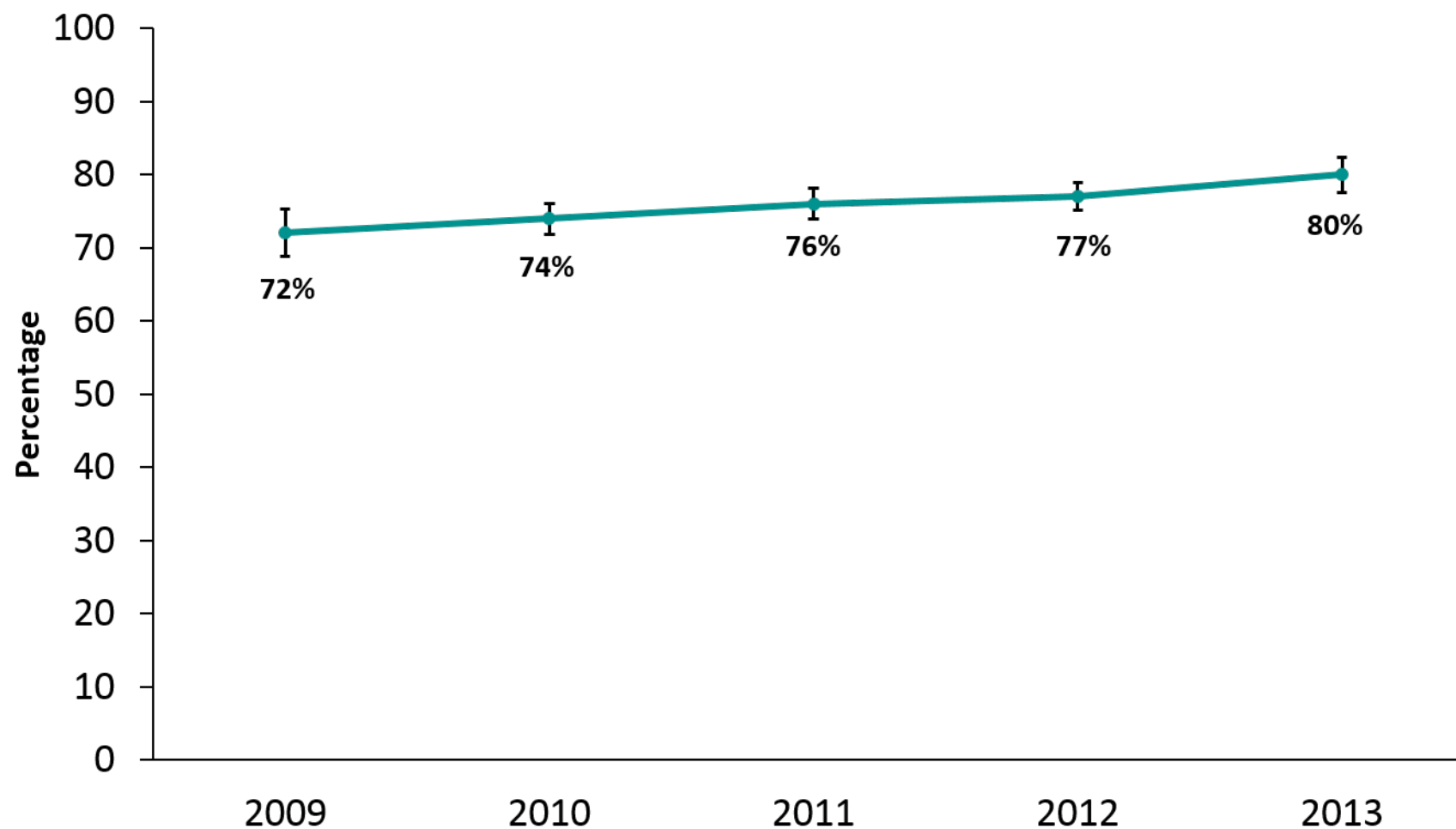


Viral Suppression among Adults Receiving HIV Medical Care, 2013 Cycle



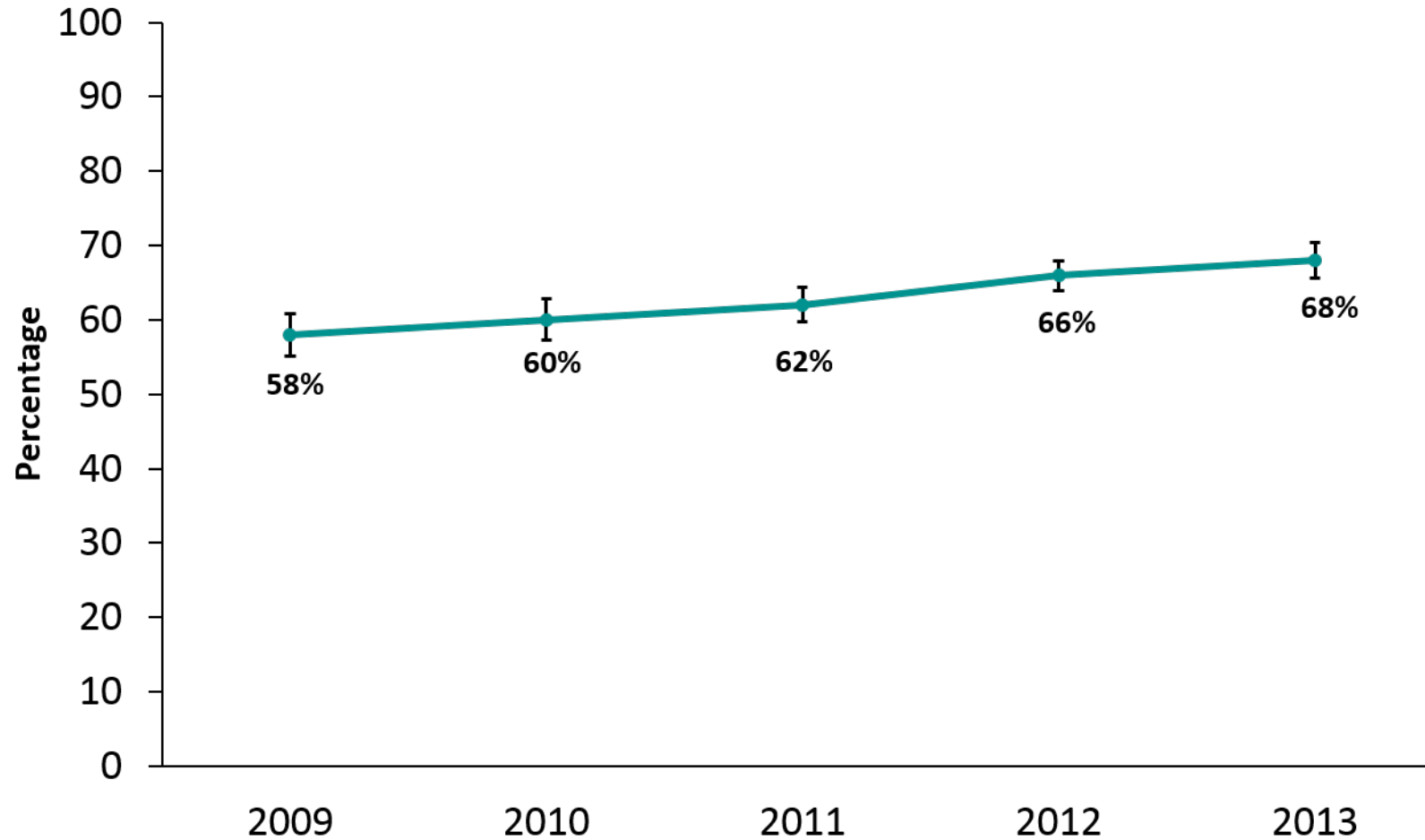
Viral suppression; viral load <200 copies/mL or undetectable

Trends in Viral Suppression at Most Recent Test among Adults Receiving HIV Medical Care, 2009—2013 Cycles



Most recent HIV viral load during 12 months before interview undetectable or <200 copies/mL

Trends in Viral Suppression at all Tests in the Past 12 Months among Adults Receiving HIV Medical Care, 2009—2013 Cycles



All HIV viral load tests in past 12 months undetectable or <200 copies/mL

Evaluation of Patients Who Acquired HIV Despite Healthcare Access/Engagement

- Retrospective analysis of all patients tested for HIV post 1997 at Montefiore Health System in Bronx, New York
 - Included adult pts with ≥ 1 negative test followed by positive test from 2009-2014
 - Clinical/demographic data collected from HIV Clinical Cohort Database of Einstein-Rockefeller-CUNY Center for AIDS Research and structured medical record reviews

Risk Factors for HIV Seroconversion

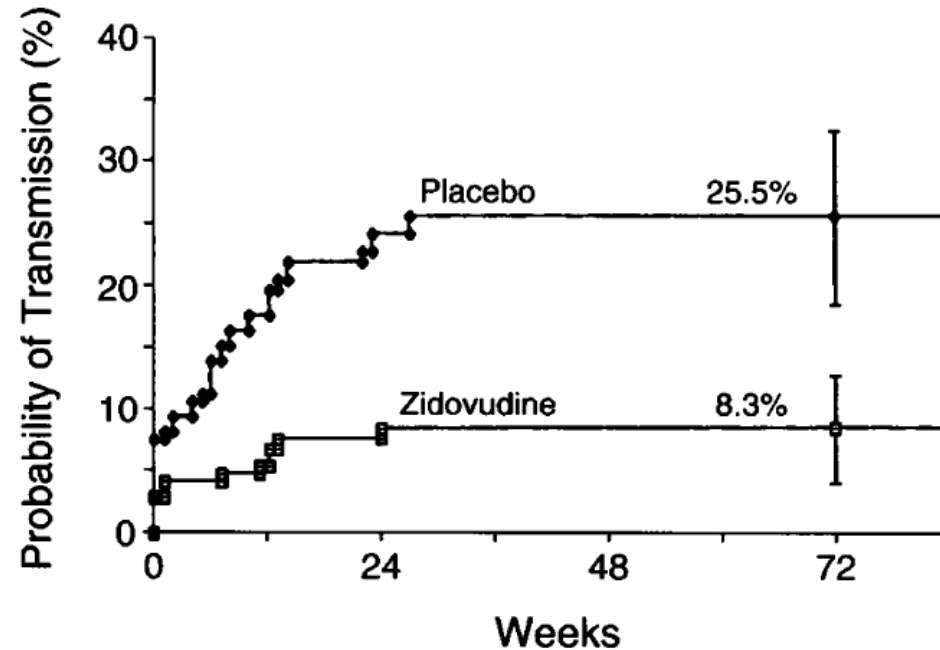
- Among 220 seroconverters, **heterosexual contact** most frequent risk factor from 2012-2014
 - Proportion of pts with heterosexual contact as HIV risk factor (vs IDU/other or MSM) **increased** over time ($P = .03$)
 - **Majority** of seroconverters **black or Latino**, 46% women; men were younger than women at time of diagnosis ($P < .0001$); **39% had STIs**

HIV Test Parameter	Overall (N = 220)	Women (n = 105)	Men (n = 115)	P Value
No. negative tests, n (%)				
▪ 1	108 (49)	58 (55)	50 (43)	.045
▪ 2-4	92 (42)	35 (33)	57 (50)	
▪ ≥ 5	20 (9)	12 (11)	8 (7)	
Median time between negative tests, yrs (IQR)	1.03 (0.6-1.7)	0.97 (0.6-1.4)	1.1 (0.7-1.8)	.284
Median no. visits between last negative and positive tests (IQR)	3 (1-5)	4 (1-7)	2 (0-4)	< .001

Evidence for Risk of Transmission

AZT prophylaxis pregnancy ACTG 076

- Have known for years that ART reduces transmission but how much?

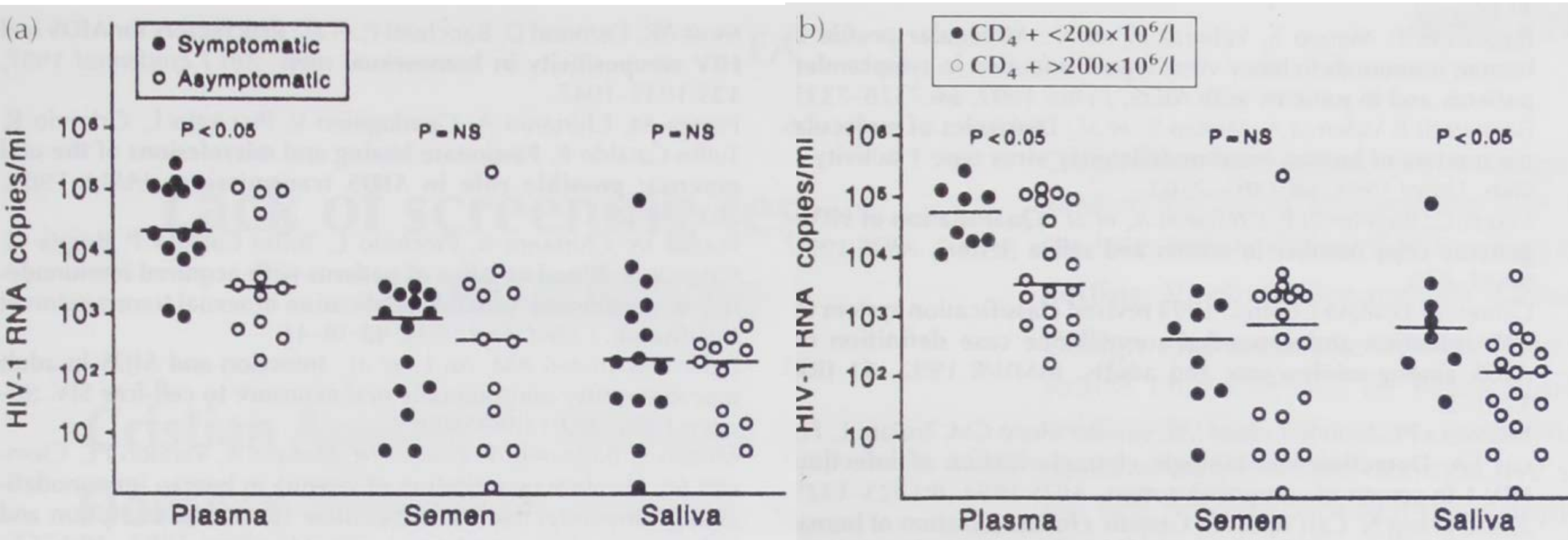


Placebo	183	84	42	37
Zidovudine	180	105	51	43

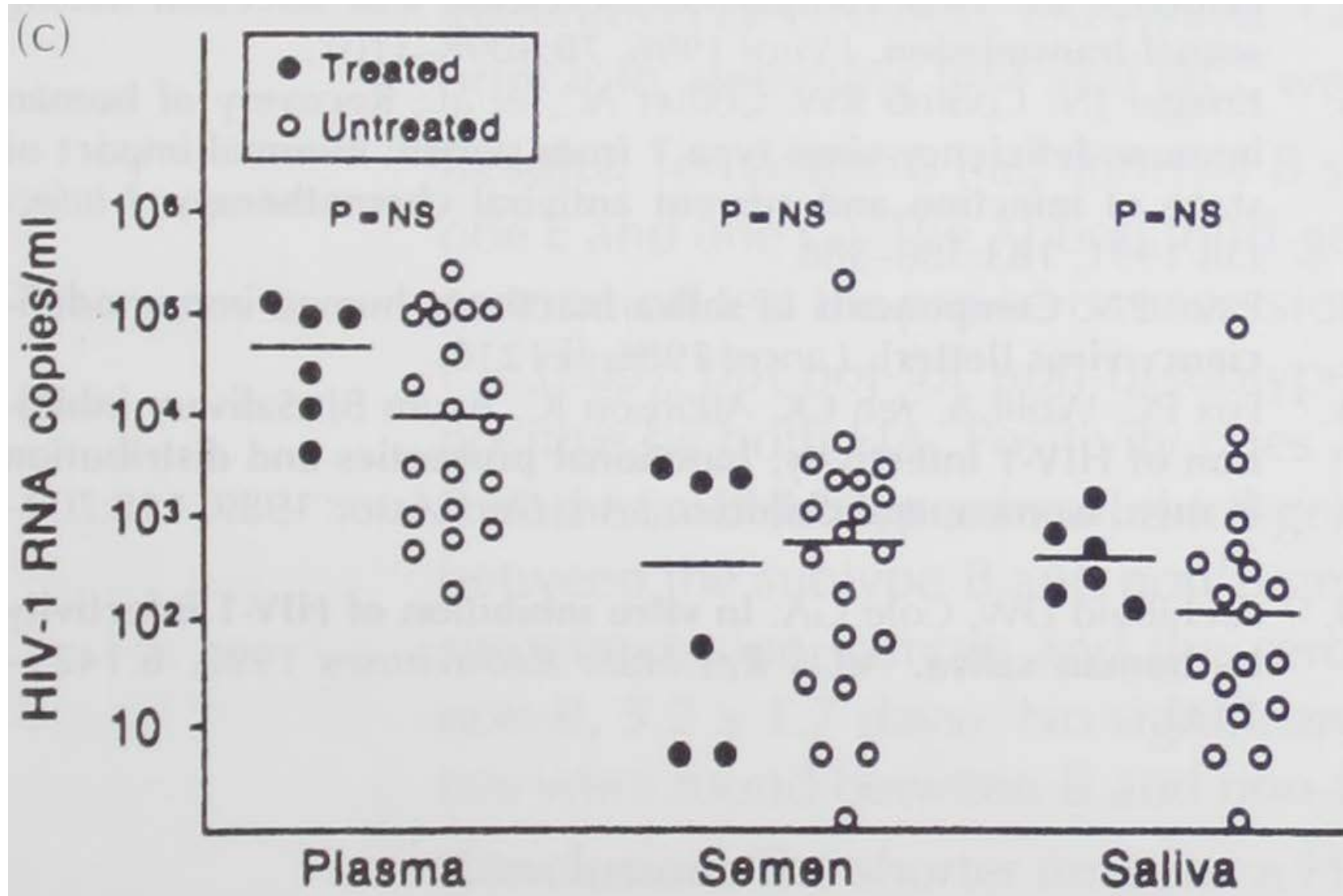
Figure 1. Kaplan–Meier Plots of the Probability of HIV Transmission, According to Treatment Group.

The estimated percentages of infants infected at 72 weeks are shown with 95 percent confidence intervals. The numbers of infants at risk at 24, 48, and 72 weeks are shown below the figure.

Differential Viral Loads in Semen, Blood and Saliva



Differential Viral Loads in Semen, Blood and Saliva



Effect of antiviral treatment on the shedding of HIV-1 in semen (Vernazza)

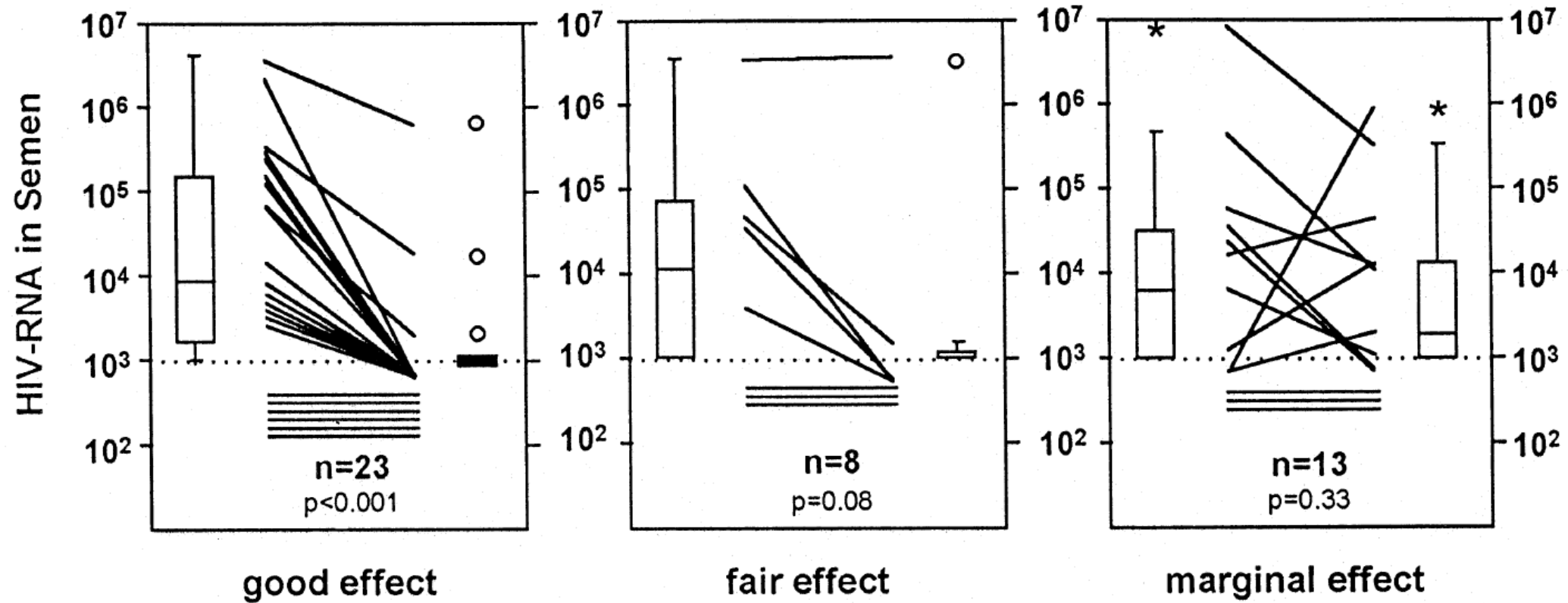


Fig. 1. HIV RNA concentration in semen for patients were grouped by the effectiveness of treatment on blood HIV RNA levels, as described in the text. Each line represents one patient's log₁₀-transformed HIV RNA levels (copies/ml) in semen at baseline (left) and during follow-up (right). Whisker's plots at left and right represent the range of HIV RNA values at baseline and follow-up, respectively. Comparisons of semen HIV RNA values at baseline and post-treatment were made using Wilcoxon's signed rank test.

Effect of antiviral treatment on the shedding of HIV-1 in semen

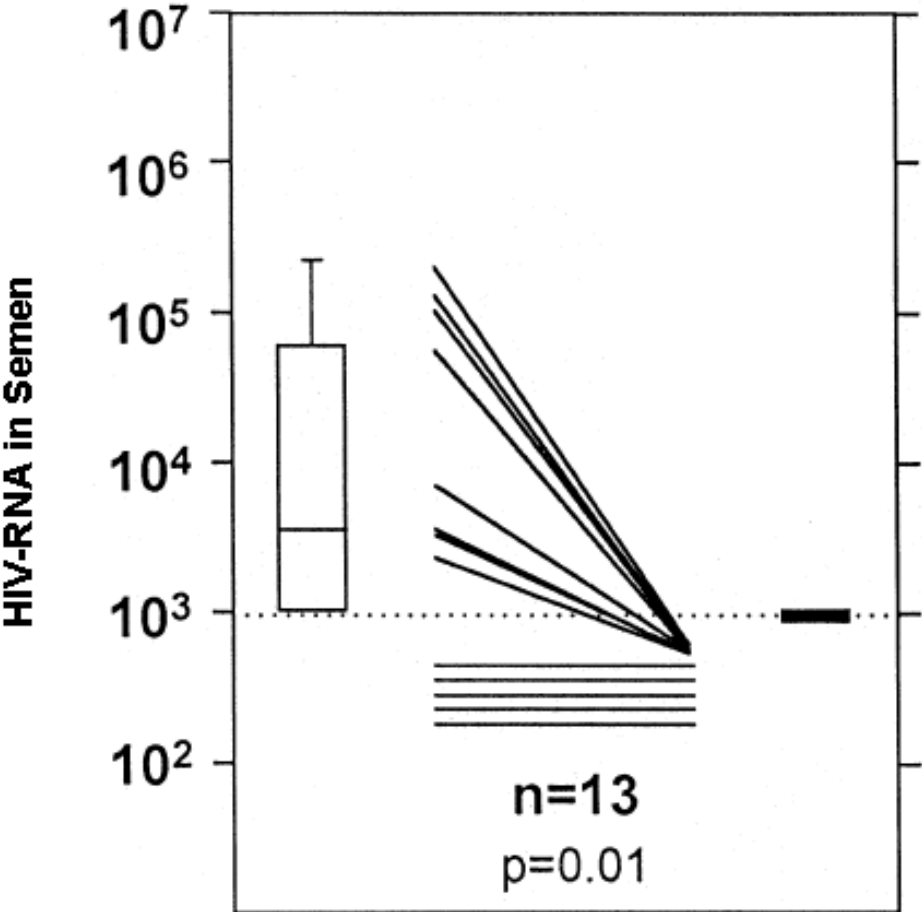


Fig. 2. HIV RNA in semen (\log_{10} copies/ml) in 13 patients who had no detectable HIV RNA in blood during treatment. See Fig. 1 for details.

HUMAN IMMUNODEFICIENCY VIRUS TYPE 1 IN THE SEMEN OF MEN RECEIVING HIGHLY ACTIVE ANTIRETROVIRAL THERAPY

(Zhang)

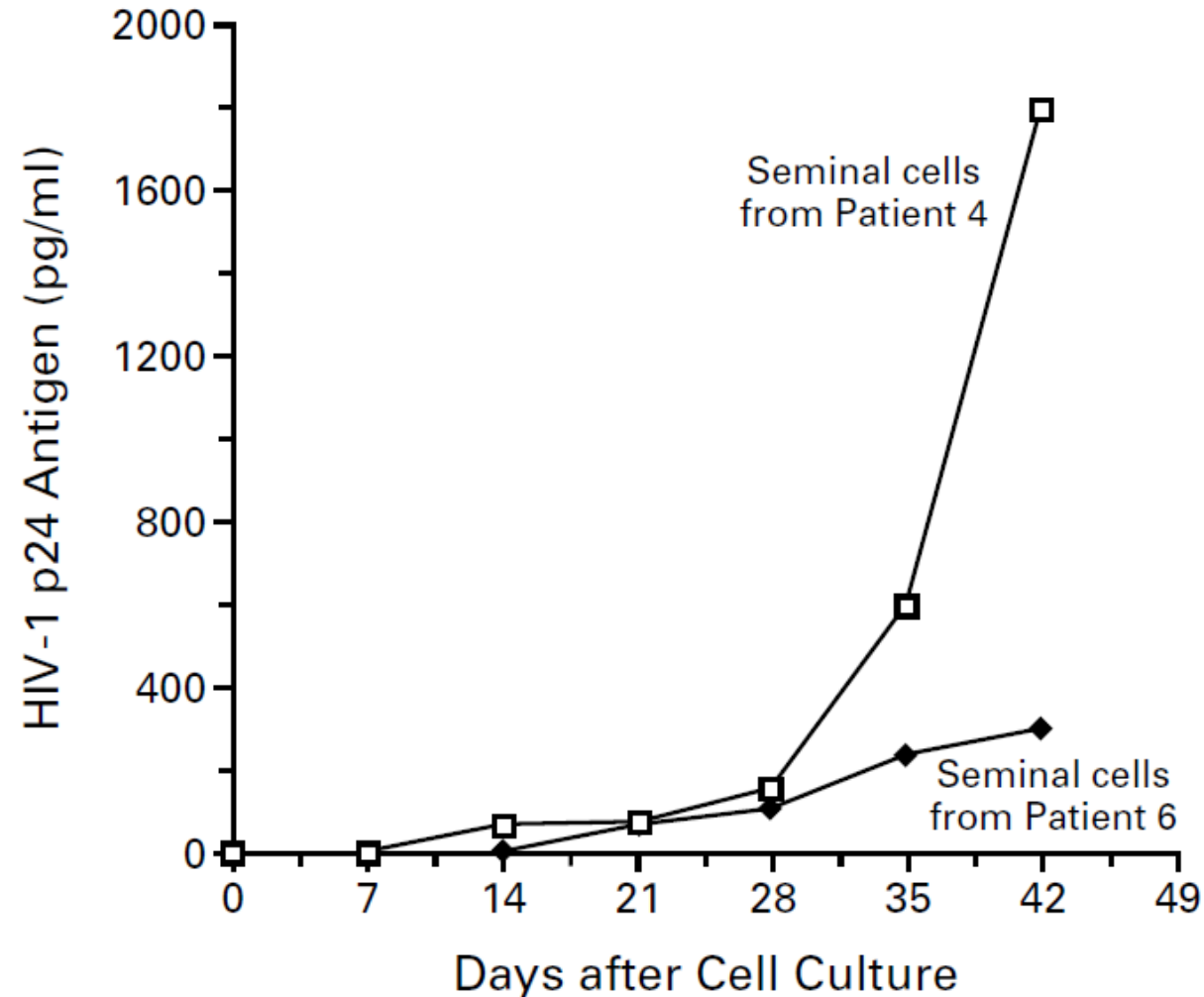


Figure 2. Growth Kinetics of Replication-Competent HIV-1 from Seminal Cells.

Viral Load and Heterosexual Transmission of HIV

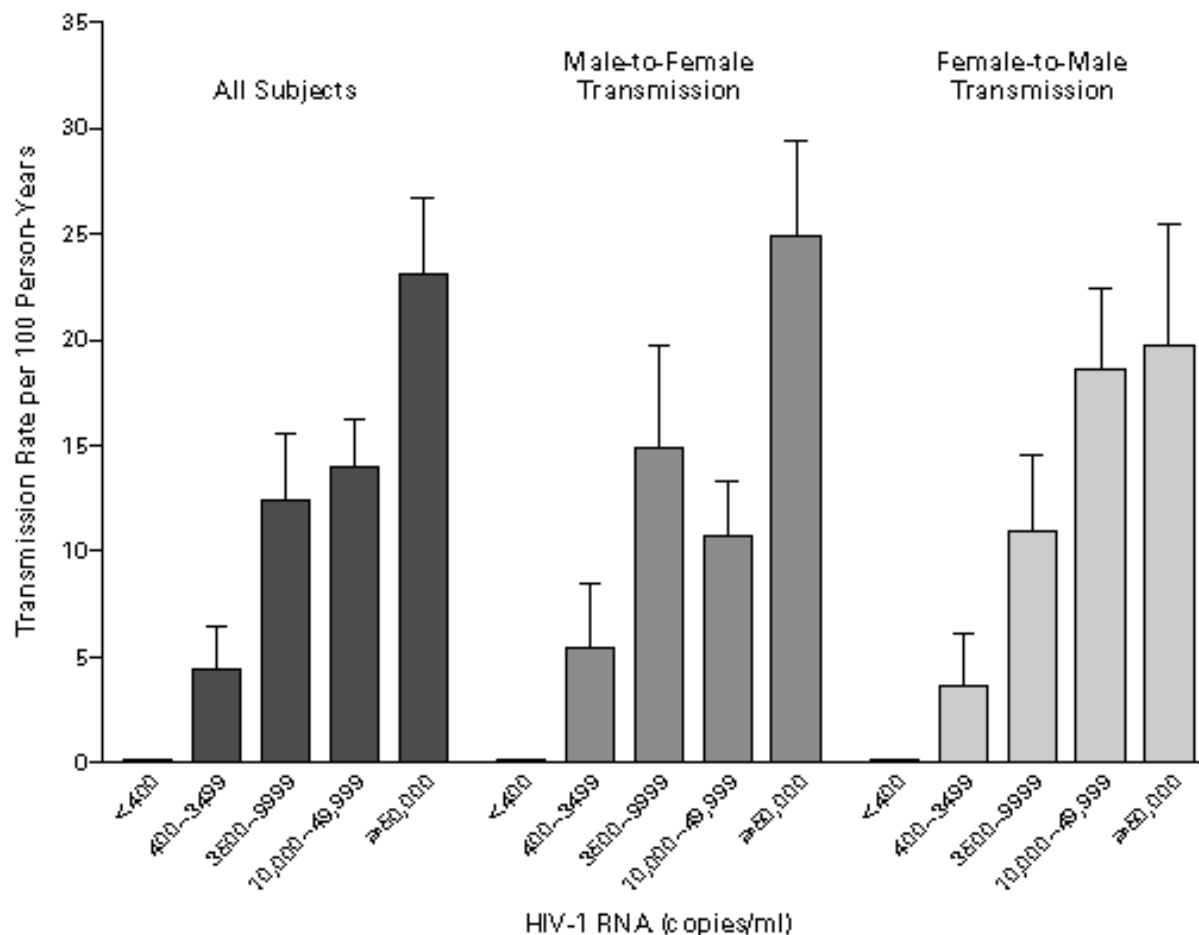


Figure 1. Mean (+SE) Rate of Heterosexual Transmission of HIV-1 among 415 Couples, According to the Sex and the Serum HIV-1 RNA Level of the HIV-1-Positive Partner.
 At base line, among the 415 couples, 228 male partners and 187 female partners were HIV-1-positive. The limit of detection of the assay was 400 HIV-1 RNA copies per milliliter. For partners with fewer than 400 HIV-1 RNA copies per milliliter, there were zero transmissions.

Sexual Transmission of HIV According to Viral Load and ART: Meta-analysis

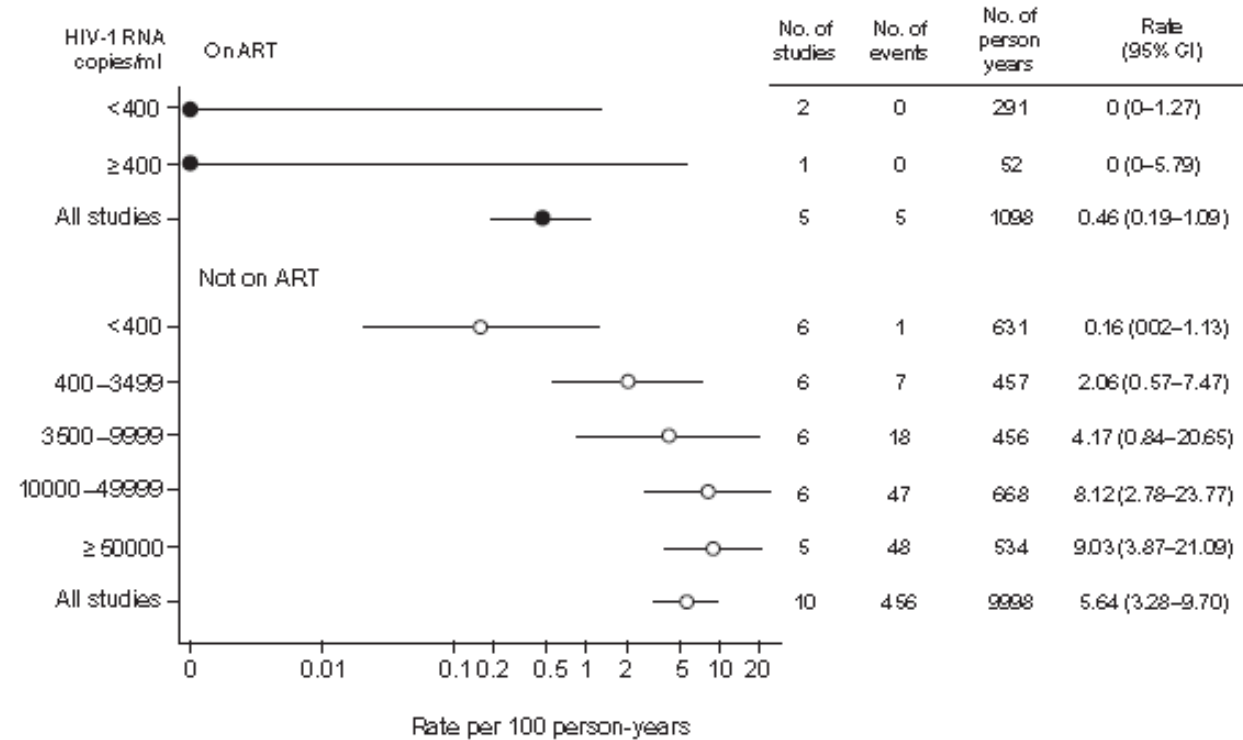
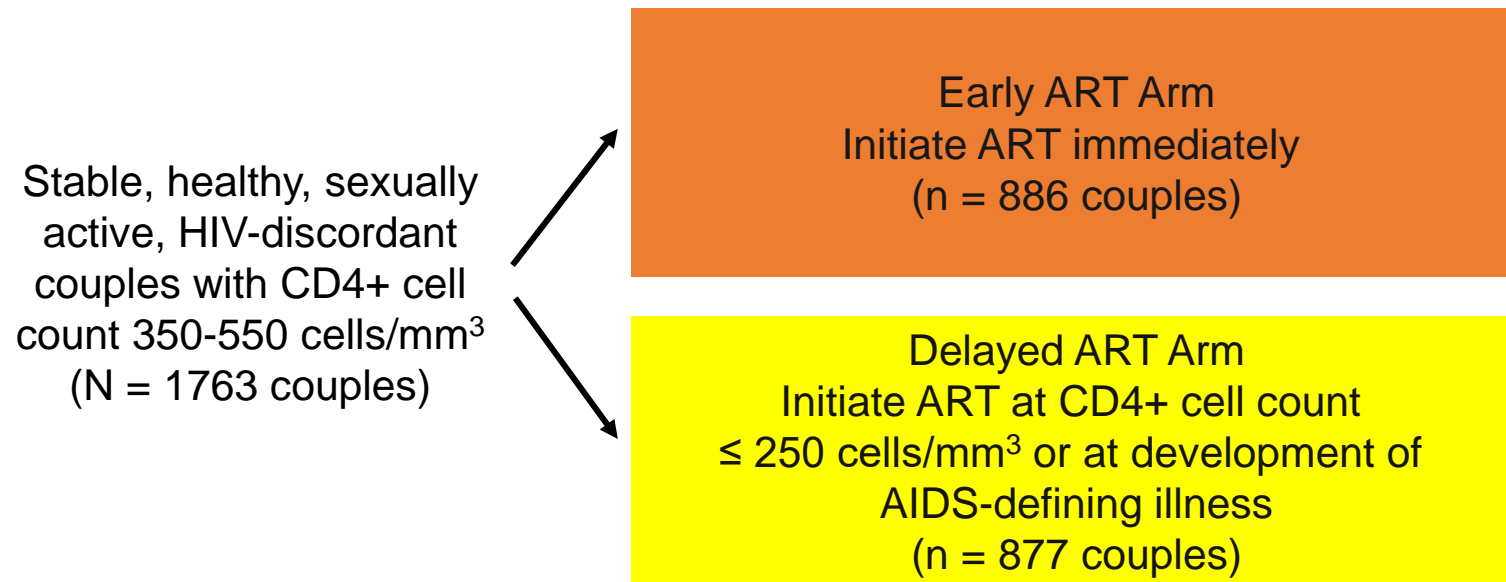


Fig. 2. Forest plot of summary HIV transmission rates, per 100 person-years, according to use of antiretroviral therapy and plasma viral load. ART, antiretroviral therapy; CI, confidence interval; the meta-analysis of couples where the HIV-infected partner received ART included two studies with viral load data [10,11] and three studies without viral load data [18,23,24]; the meta-analysis of couples with the HIV-infected partner not receiving ART included seven studies with viral load data in at least one category [9,10,11 14,17] and three studies without viral load data [21,23,24]. Note that not all studies with viral load data contributed to all viral load strata.

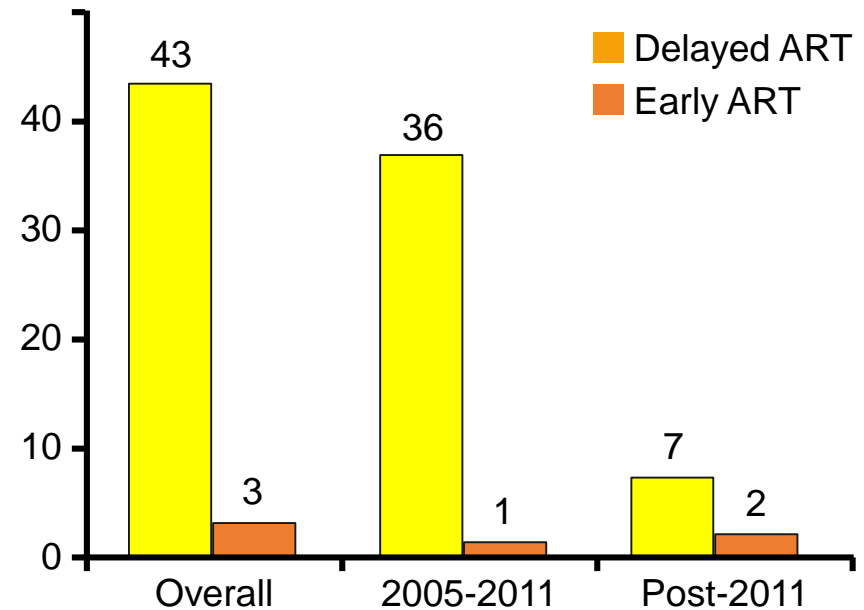
HPTN 052: ART for Prevention of HIV Transmission in Serodiscordant Couples

- International, randomized, controlled trial



HPTN 052: Key Results

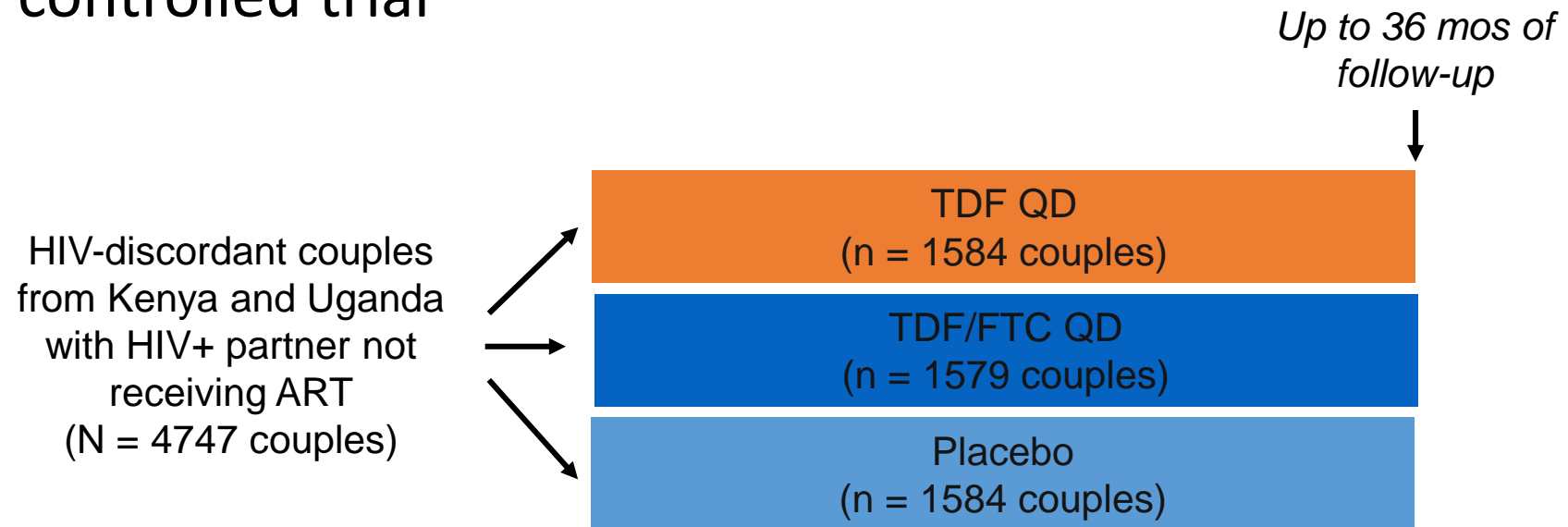
- N = 46 linked HIV transmissions to HIV-negative partner observed^[1]
 - Overall 93% reduction in risk of transmission with early therapy
- N = 8 linked partner infections diagnosed after index partner started ART^[1]
 - Recently initiated ART (n = 4)
 - Virologic failure (n = 4)
- **No linked HIV transmissions where index partner suppressed on ART^[1]**
- Rate of unlinked infections similar between arms^[1]



- For pts in early ART group experiencing tx failure (n = 85), resistance increased from 8.2% at BL to 35.3% at failure; higher BL HIV RNA levels were associated with new resistance at failure ($P = .005$)^[2]

Partners PrEP: PrEP in Serodiscordant Heterosexual Couples

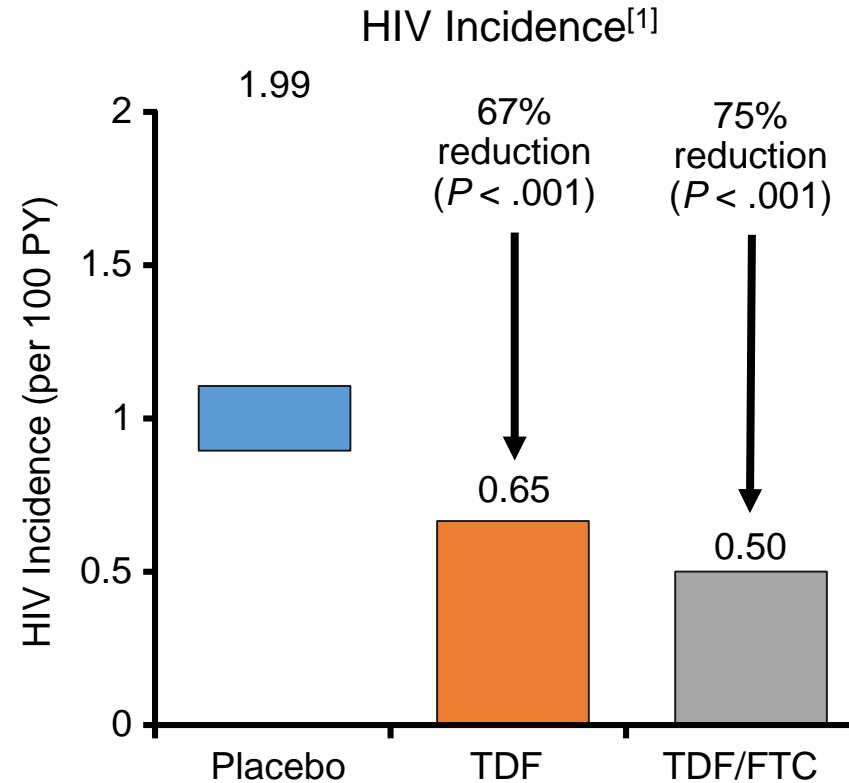
- Multisite, randomized, double-blind, placebo-controlled trial



All couples received standard HIV treatment and prevention services, including risk reduction counseling, free condoms and condom counseling, contraception counseling and provision, screening and treatment for STIs, counseling and referral for other HIV prevention interventions (eg, male circumcision)

Partners PrEP: Efficacy and Resistance Results

- Both PrEP arms significantly reduced HIV acquisition risk; similar efficacy in men and women^[1]
 - TDF levels correlated with HIV protection
- No differences in serious AEs, creatinine abnormalities across arms
- No evidence of risk compensation
- Ultradeep sequencing in 121 HIV seroconverters (25 TDF/FTC, 38 TDF, 58 placebo)^[2]
 - Overall resistance: 7.4% (9/121)
 - In 26 pts, drug levels suggested PrEP use during or after HIV acquisition; in 5/26, resistance detected



- Residual transmission risk within 6 mos of ART initiation by HIV+ partner comparable to pre-ART risk in placebo pts^[3]

1. Baeten JM, et al. N Engl J Med. 2012;367:399-410.
2. Lehman DA, et al. J Infect Dis. 2015;211:1211-1218.
3. Mujugira A, et al. CROI 2015. Abstract 989.

Partners PrEP: Efficacy in Women at High Risk of HIV Acquisition

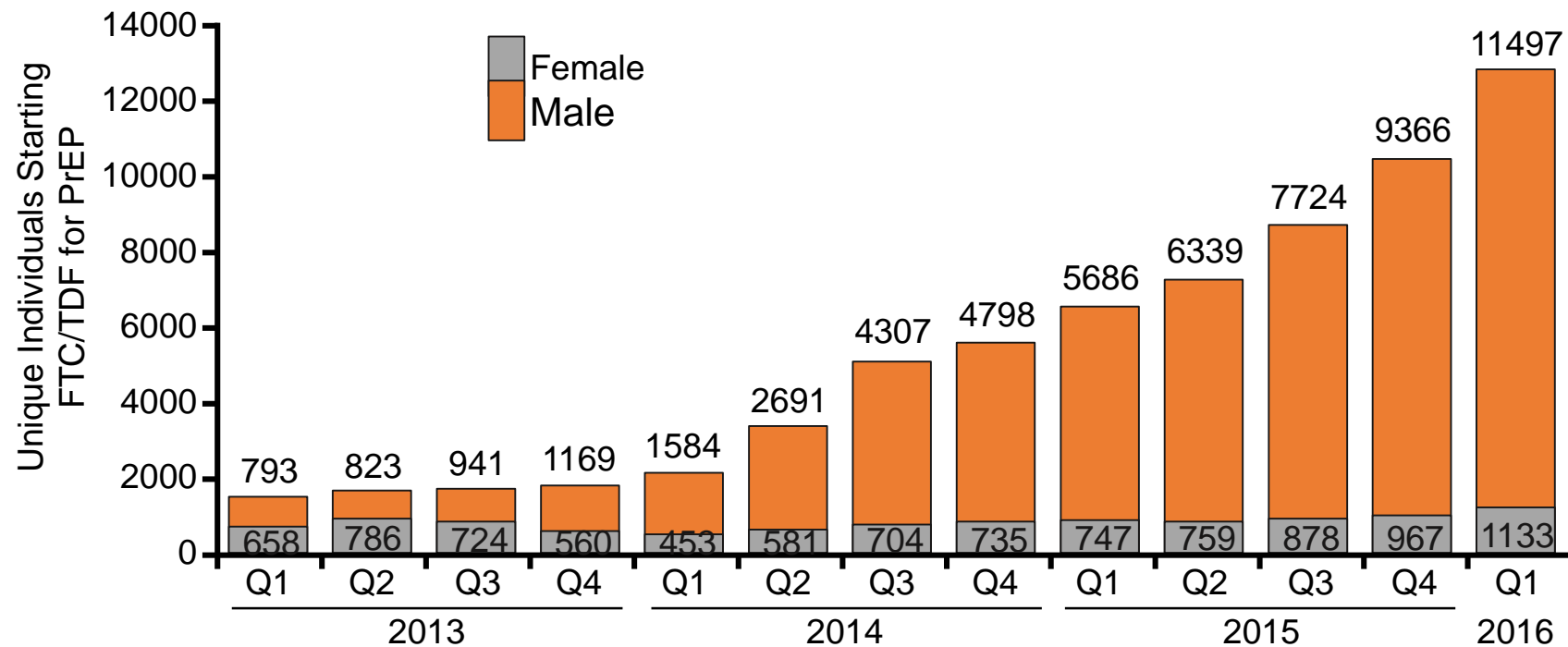
Subgroups (Women) ^[1]	Group	n	HIV-1 Incidence		PrEP Efficacy	
			Events	IR	% (95% CI)	P Value
All women	PBO	619	28	2.8		
	TDF	595	8	0.8	71 (37-87)	.002
	TDF/FTC	566	9	1.0	66 (28-84)	.005
Partner plasma HIV-1 RNA > 50,000 c/mL	PBO	154	13	5.4		
	TDF	144	2	0.9	84 (29-96)	.02
	TDF/FTC	146	4	1.7	72 (13-91)	.03
Younger than 30 yrs of age	PBO	194	17	6.1		
	TDF	202	4	1.3	77 (29-92)	.01
	TDF/FTC	188	5	1.8	72 (25-90)	.01
Composite risk score > 5*	PBO	165	16	6.6		
	TDF	140	4	1.9	69 (7-90)	.04
	TDF/FTC	140	5	2.4	64 (1-87)	.05

- No differences in pregnancy incidence, birth outcomes, infant growth across treatment arms; although PrEP discontinued if pregnancy detected^[2]

*Composite risk score includes age of the uninfected partner, number of children, circumcision status of male HIV-uninfected partner, married/cohabiting, unprotected sex, and HIV-infected partner viral load.

Sex Disparities in US FTC/TDF PrEP Use Expansion From 2013 to 2016

- Electronic pt-level data from 82% of US retail pharmacies with FTC/TDF dispensed for PrEP January 2013 to March 2016
- N = 67,403 individuals initiated FTC/TDF PrEP; quarter-by-quarter growth in utilization 870% overall, 172% among women, 1450% among men



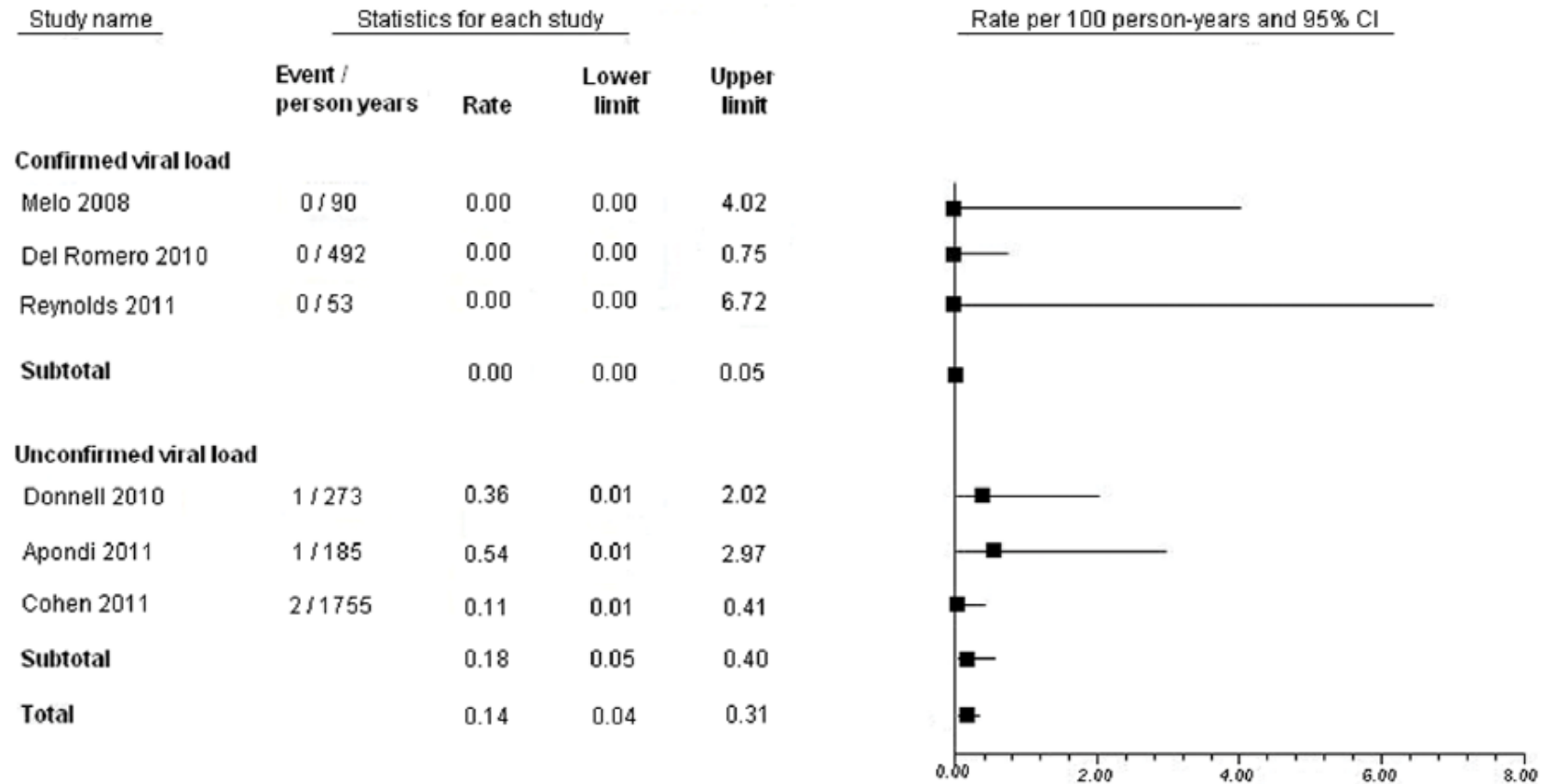


CDC: Time to Achieving Protection on PrEP

- Time from initiation of daily TDF/FTC to maximal protection against HIV infection is unknown
- No scientific consensus on what intracellular concentrations are protective for either drug or the protective contribution of each drug in specific body tissues
- TDF and FTC PK vary by tissue
- Preliminary PK data on lead-time to achieve maximal intracellular TFV-DP concentrations with daily TDF dosing:
 - Blood: ~ 20 days
 - Rectal tissue: ~ 7 days
 - Cervicovaginal tissues: 20 days
 - Penile tissues: no data

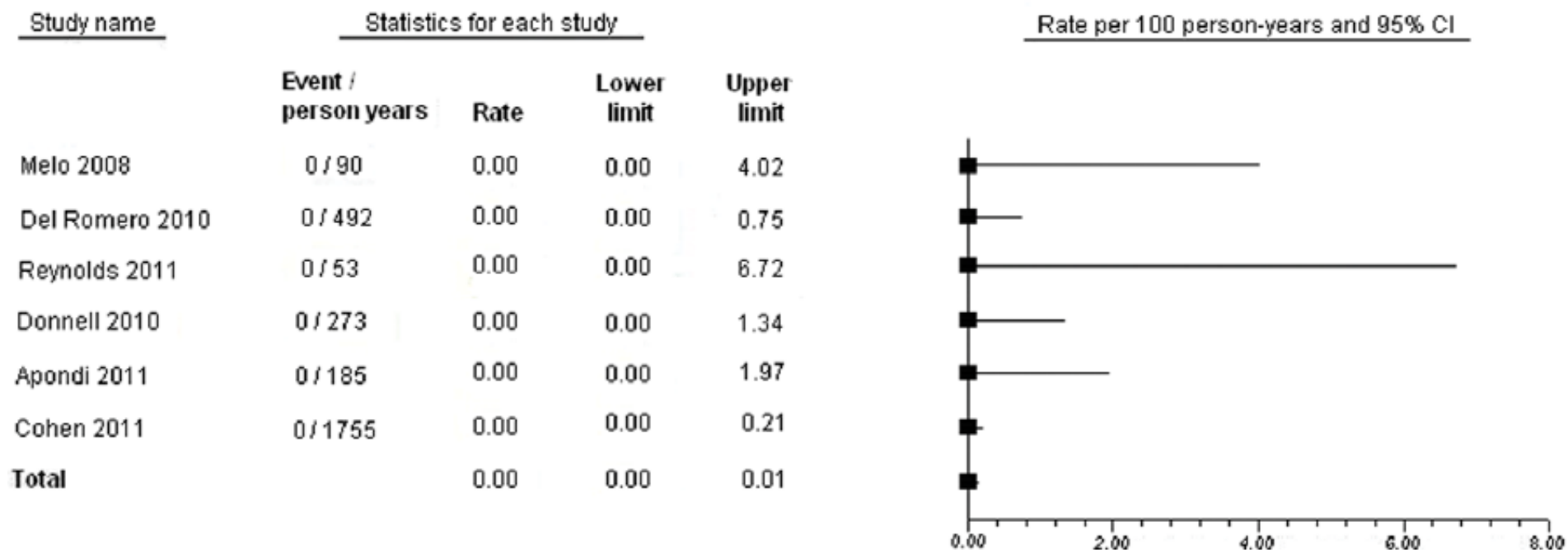
Heterosexual Discordant Couples

Forest plot of HIV transmission rates per 100 person-years of confirmed and unconfirmed viral loads



Heterosexual Discordant Couples (Fully Suppressed)

Forest plot of HIV transmission rates per 100 person-years, excluding unconfirmed viral loads



Per Act Risk

(estimates/10,000 exposures)

Table 1. Estimated per-act probability of acquiring HIV from an infected source, by exposure route.

Exposure route	Risk per 10 000 exposures to an infected source	95% Confidence interval	Reference(s)
Parenteral exposure			
Blood transfusion	9250	(8900–9610)	[5]
Needle-sharing injection drug use	63 ^b	(41–92)	[12]
Percutaneous needle stick	23	(0–46)	[5]
Sexual exposure ^a			
Receptive anal intercourse	138 ^c	(102–186)	[3,13–15]
Insertive anal intercourse	11 ^d	(4–28)	[13,14]
Receptive penile–vaginal intercourse	8 ^e	(6–11)	[7]
Insertive penile–vaginal intercourse	4 ^e	(1–14)	[7]
Receptive oral sex	Low ^f	(0–4)	[14,19]
Insertive oral sex	Low ^f	(0–4)	[19]
Vertical transmission			
Mother-to-child transmission	2260 ^g	(1700–2900)	[8]

Per Act Risk

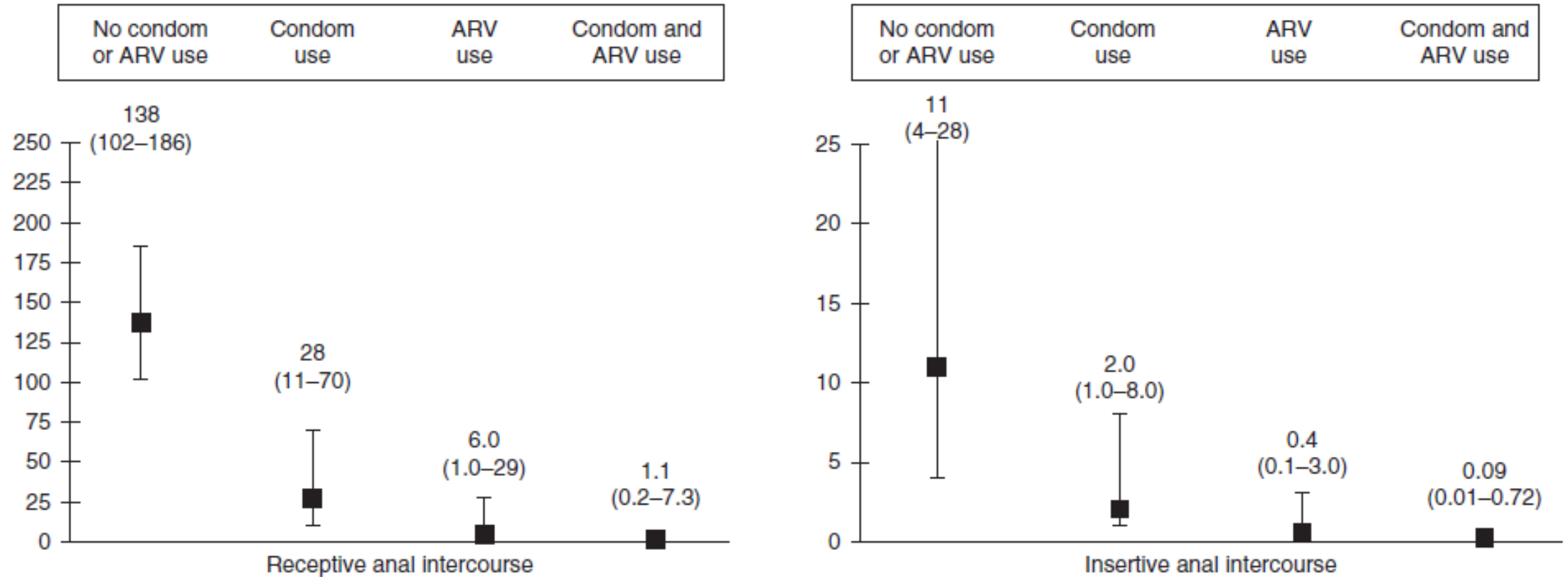
(compounding factors,
estimates)

Table 2. Relative risks of factors that increase or decrease per-act HIV transmission risk for sexual exposures.

Cofactor	Relative risk	95% Confidence interval	References
Factors that increase transmission probability			
High plasma viral load (log ₁₀ copies/ml)	2.89	(2.19, 3.82)	[69]
Genital ulcer disease ^a	2.65	(1.35, 5.19)	[69]
Acute versus asymptomatic stage of disease	7.25 ^b	(3.05, 17.3)	[70]
Late versus asymptomatic stage of disease	5.81 ^b	(3.00, 11.4)	[70]
Factors that decrease transmission probability			
Use of antiretrovirals by HIV-infected partner			
Early versus delayed treatment	0.04 ^c	(0.01, 0.27)	[72]
Received treatment versus no treatment	0.08	(0.00, 0.57)	[73]
Pre-exposure prophylaxis of HIV-uninfected partner			
Among heterosexual couples	0.29 ^d	(0.17, 0.47)	[16,17]
Among MSM	0.56	(0.37, 0.85)	[74]
Among injection drug users	0.52	(0.28, 0.90)	[75]
Condom use	0.20 ^e	(0.08, 0.47)	[18]
Male circumcision (heterosexual partners)			
HIV-uninfected partner is male	0.50 ^f	(0.34, 0.72)	[76]
HIV-uninfected partner is female	0.80	(0.53, 1.36)	[77]
Male circumcision (MSM)			
Insertive partner is HIV-uninfected	0.27 ^g	(0.17, 0.44)	[78]
Receptive partner is HIV-uninfected	1.20 ^g	(0.63, 2.29)	[78]

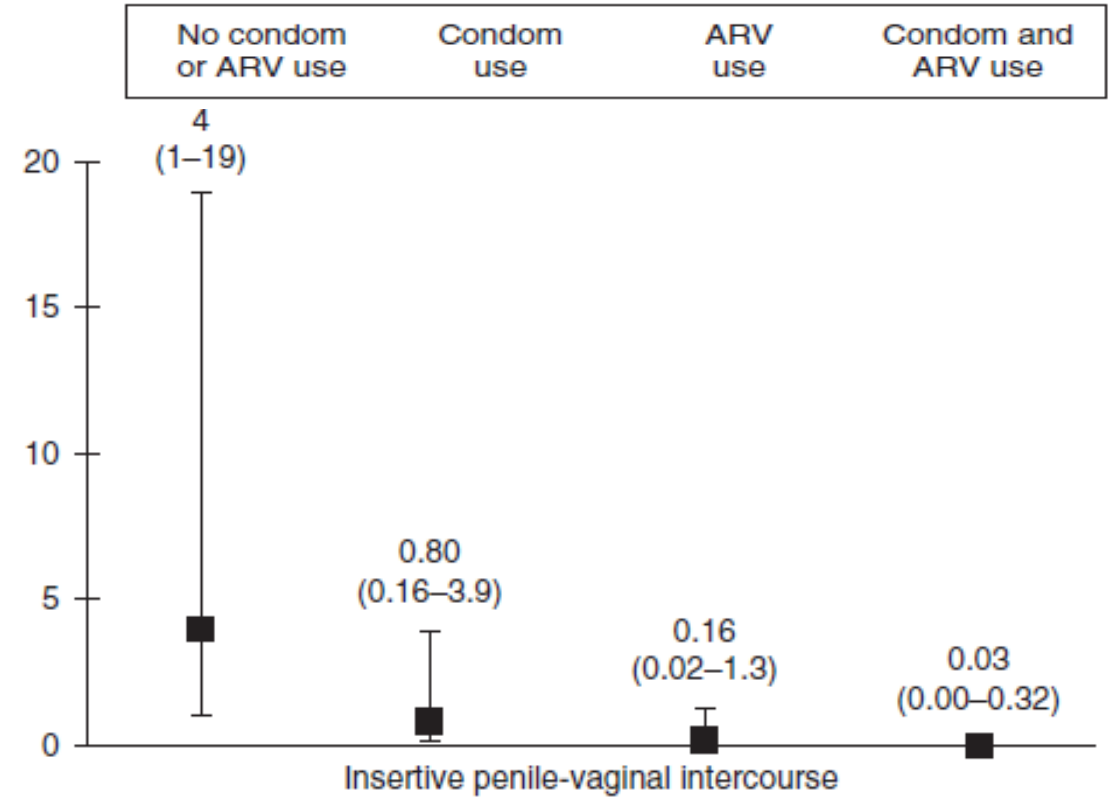
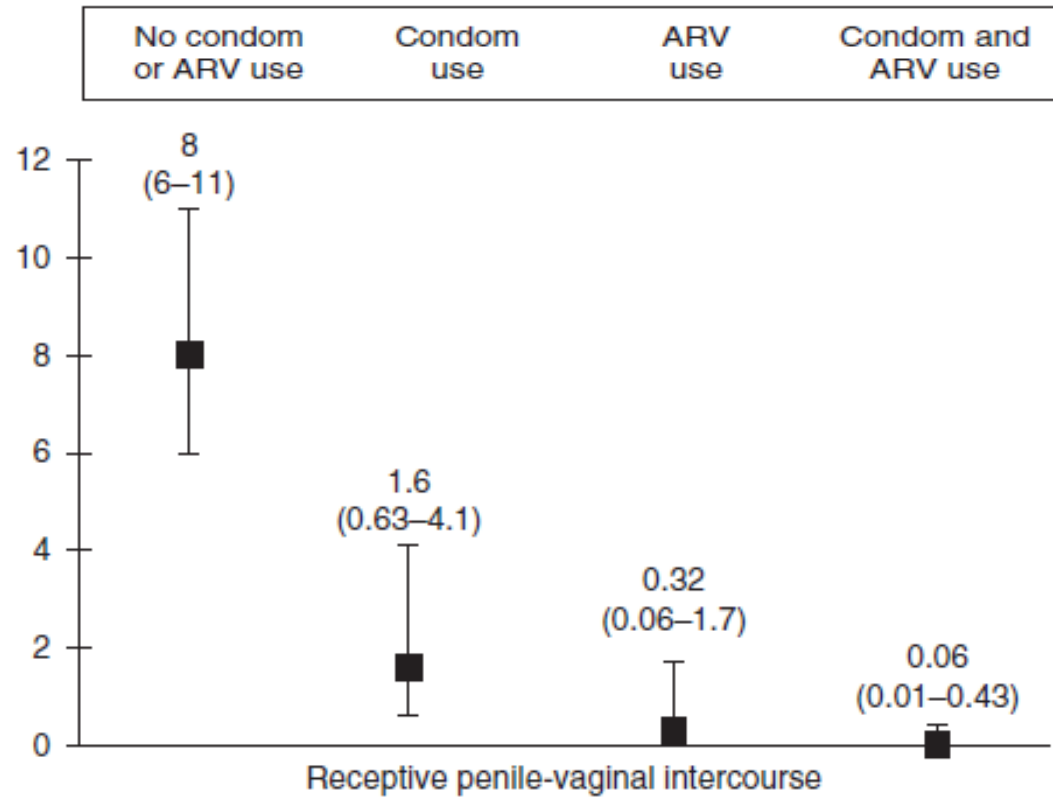
Per Act Risk

(estimates/10,000 exposures)



Per Act Risk

(estimates/10,000 exposures)



Partners Demonstration Project: PrEP + ART in High-Risk Serodiscordant Couples

- Oral daily TDF/FTC PrEP for HIV-uninfected partner in serodiscordant African couples continued 6 mos beyond initiation of ART for infected partner (N = 1013 couples)
- Follow-up through 24 mos
 - 97% of HIV-uninfected partners initiated PrEP
 - 91% of HIV-infected partners initiated ART; of these, > 90% experienced viral suppression

- 95% reduction in expected infections ($P < .0001$)

HIV Incidence, Actual vs Expected		
Group	Infected, n	Incidence/100 PY (95% CI)
Expected	83	4.9 (3.9-6.0)
Actual	4	0.2 (0.1-0.6)

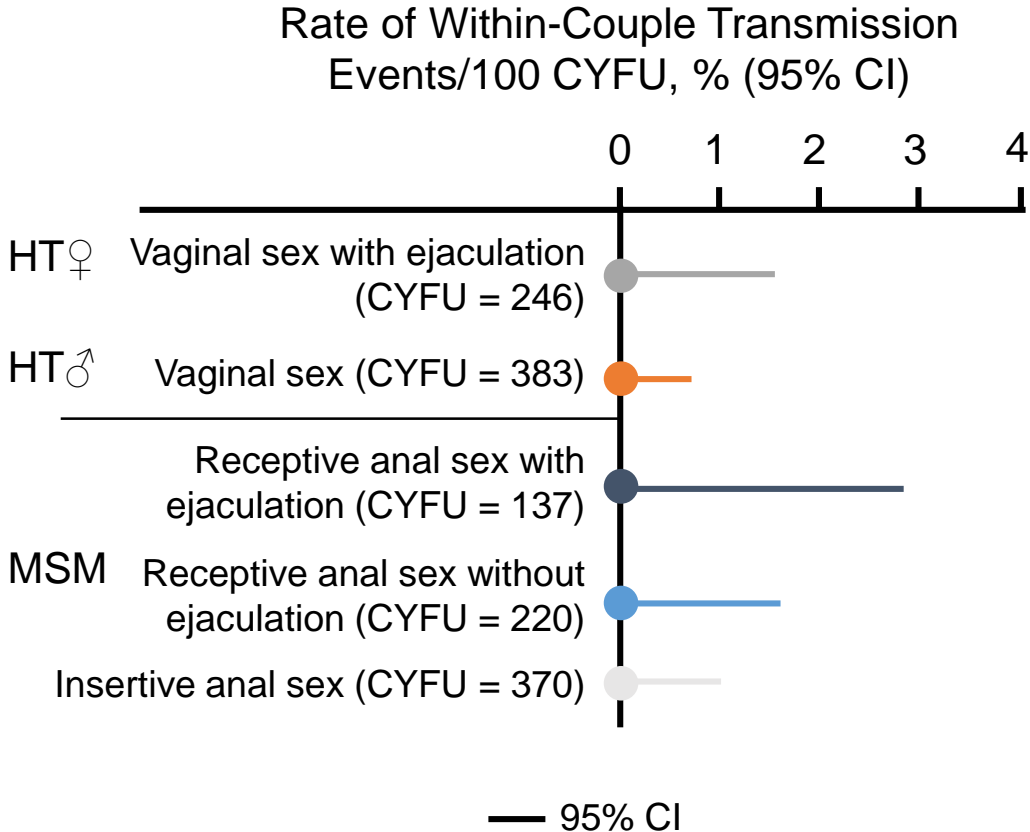
- In pts with seroconversion, no TFV detectable in plasma at time of seroconversion or declined PrEP



PARTNER:

Risk of HIV Transmission With Condomless Sex on Suppressible ART

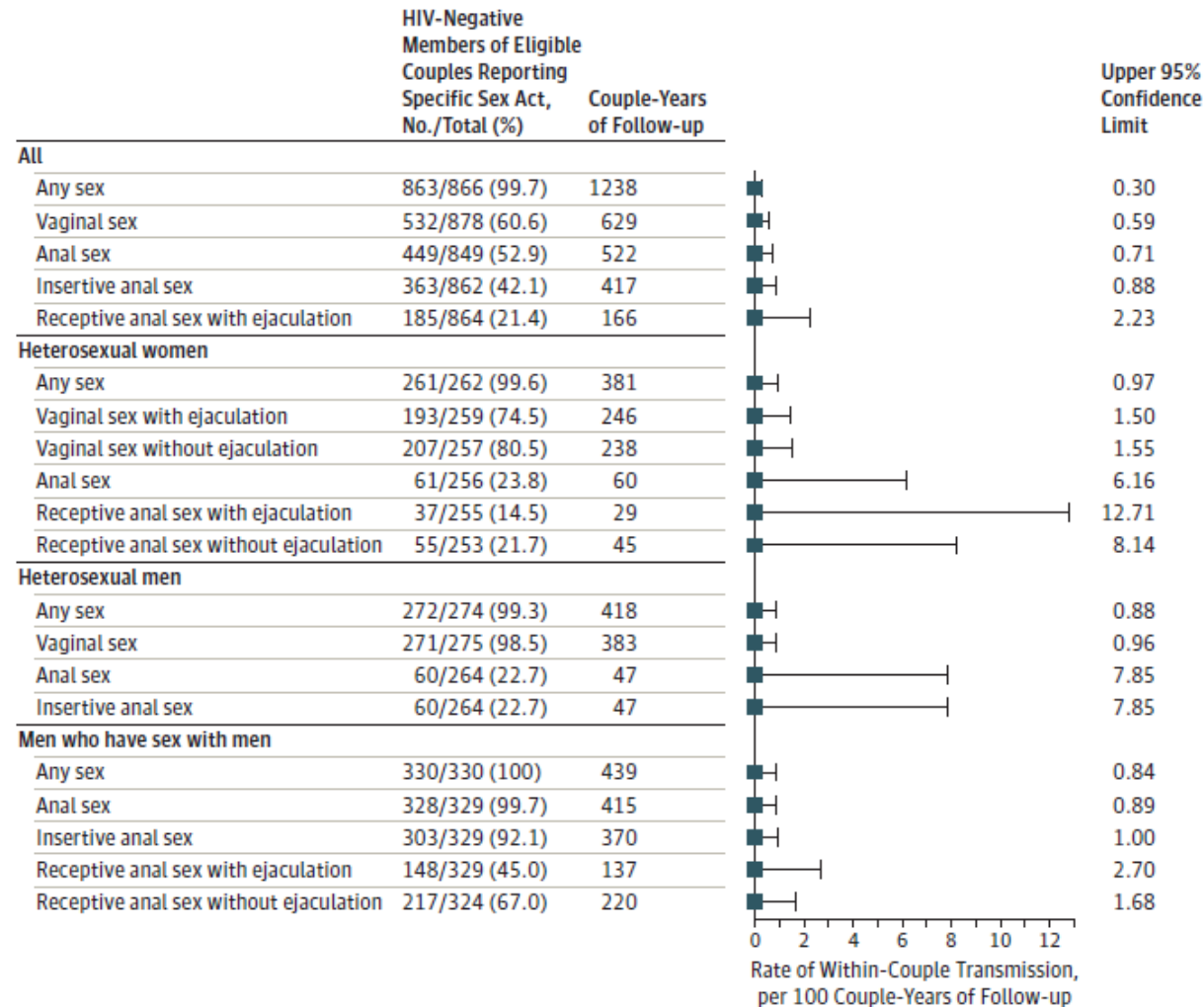
- Observational study of HIV transmission in heterosexual and MSM serodiscordant couples (N = 888 couples)
 - HIV-positive partner on suppressible ART
 - Condoms not used
- No linked transmissions recorded in any couple
 - Median follow-up: 1.3 yrs; ~ 58,000 sex acts
- Uncertainty over risk remains, particularly regarding receptive anal sex with ejaculation



PARTNER

(Partners of People on ART—A New Evaluation of the Risks)

Figure 1. Rate of HIV Transmission According to Sexual Behavior Reported by the HIV-Negative Partner



Denominators are the group-specific number of HIV-negative participants who contributed eligible couple-years of follow-up. The upper limit of the 95% confidence interval was estimated using the exact Poisson method.

PARTNER

(Partners of People on ART—A New Evaluation of the Risks)

Table 3. Condomless Sex Acts During Follow-up According to Number of Condomless Sex Acts at Baseline^a

No. of Condomless Sex Acts per 4 Months' Follow-up	No. of Condomless Sex Acts in The Past 4 mo Reported at Baseline by the HIV-Negative Partner						Total Couple-Years of Follow-up
	1 Time (n = 41)	2-10 Times (n = 291)	11-20 Times (n = 178)	21-40 Times (n = 163)	>40 Times (n = 199)	Not Reported (n = 16)	
Less than once	12 (23)	39 (10)	13 (5)	7 (3)	10 (4)	2 (9)	84
1 Time	1 (2)	9 (2)	1 (<1)	2 (1)	0	0	13
2-10 Times	25 (48)	223 (55)	101 (41)	70 (29)	38 (14)	9 (41)	466
11-20 Times	4 (8)	54 (13)	52 (21)	57 (23)	51 (19)	3 (14)	222
21-40 Times	3 (6)	32 (8)	44 (18)	78 (32)	109 (40)	3 (14)	269
>40 Times	1 (2)	3 (1)	6 (2)	13 (5)	35 (13)	0	58
Not reported	6 (12)	41 (10)	29 (12)	17 (7)	29 (11)	4 (18)	126
Total couple-years of follow-up	52	402	245	245	272	22	1238

^a Table reports total number eligible couple-years of follow-up (one of the main requirements being that condoms are not used) by frequency of condomless sex acts reported at baseline and during follow-up. Values in parentheses represent the number of couples reporting a certain frequency at baseline.

The number of couple-years of follow-up have been rounded to the closest integer; thus, some rows and columns do not sum exactly to the column or row total.

PARTNER

(Partners of People on ART—A New Evaluation of the Risks)

Table 2. Characteristics During Follow-up of HIV-Positive and HIV-Negative Partners Eligible for the Primary Analysis (N = 888)

Characteristic	HIV-Positive, No. (%) ^a			HIV-Negative, No. (%) ^a			P Value ^b	
	Heterosexual			Heterosexual			HIV-Positive	HIV-Negative
	Men (n = 269)	Women (n = 279)	MSM (n = 340)	Men (n = 279)	Women (n = 269)	MSM (n = 340)		
Years in the study, median (IQR)	1.9 (1.1-2.4)	1.8 (1.1-2.4)	1.4 (0.8-2.1)	1.8 (1.1-2.4)	1.9 (1.1-2.4)	1.4 (0.8-2.1)	<.001	<.001
STI ^c	16 (6)	16 (6)	59 (18)	16 (6)	17 (6)	56 (17)	<.001	<.001
Gonorrhea	1 (<1)	0	20 (6)	0	0	0	<.001	
Warts	2 (1)	5 (2)	8 (2)	8 (3)	0	4 (1)	.30	
Other STI	2 (1)	12 (4)	0	0	2 (1)	0	<.001	.09
Not specified	12 (5)	1 (<1)	32 (10)	8 (3)	15 (6)	52 (16)	<.001	<.001
Missing ^d	5	3	11	4	6	10		
Condomless sex with other partners, n (%)				11 (4)	10 (4)	108 (33)		<.001
Missing ^d				7	7	12		
Condomless sex with other positive partners ^e				9 (3)	0	103 (31)		<.001

Opposites Attract Study: HIV Transmission in MSM Serodiscordant Couples in Australia, Thailand, and Brazil

Serodiscordant men who have sex with men (MSM) couples: Australia, Thailand, Brazil

591 couple-years of follow-up in 358 couples

On ART (80%)

78% had HIV RNA <200 copies/mL

57% reported anal sex with outside partners

STI prevalence 12%-14%

No linked HIV transmission in ~ 6000 acts of CLAI

No linked HIV transmission in close to 17,000 acts of CLAI

Supports the view that a person who has consistently undetectable HIV RNA level will not transmit HIV to a sexual partner

HIV Incidence in Serodiscordant MSM Couples

	Number of Linked Transmissions	Follow-Up (couple-years)	Incidence (100 couple-years)
Overall	0	591	0 (0-0.62)
CLAI			
Any	0	318	0 (0-1.16)
Insertive	0	210	0 (0-1.76)
Receptive	0	132	0 (0-2.79)
CLAI, HIV RNA (copies/mL)			
≥200	0	5	0 (0-71.4)
<200	0	216	0 (0-1.56)

CLAI: condomless anal intercourse.

Grulich A, et al. CROI 2015. Abstract 1019LB.

Bavinton BR, et al. AIDS 2015. Abstract TUAC0306.

Bavinton B, et al. *J Int AIDS Soc.* 2017;20(suppl 5):115. Abstract TUAC0506LB.



Family Planning for HIV-Discordant Couples

- No reason to adopt, unless desired, given multiple other safe options and long life expectancy if HIV-infected partner is treatment adherent^[1]
- **ART decreases HIV transmission risk by > 90%^[2] but may take up to 6 mos^[3] to achieve HIV-1 RNA suppression**
- **PrEP is highly effective if used consistently by the HIV-uninfected partner**
- Assisted reproduction can decrease HIV transmission risk
 - Expensive, may not be necessary if ART and PrEP are used

1. DHHS Perinatal Guidelines. 2016

2. Cohen et al. N Engl J Med. 2011;365:493-505

3. DHHS Guidelines. 2016

Effectiveness of Semen Washing

A meta-analysis

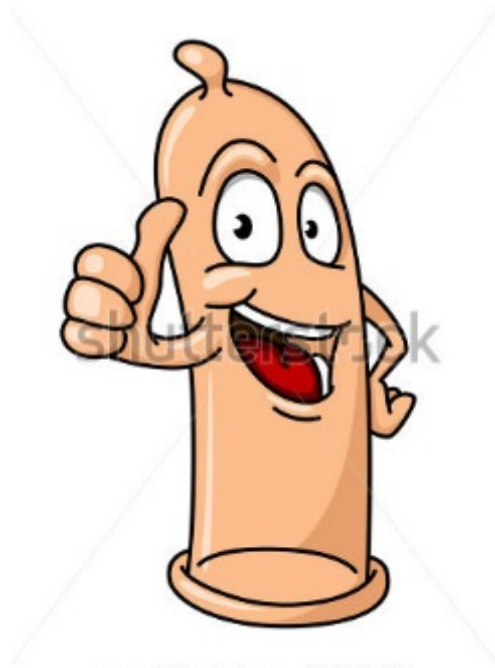
Numbers of couples and cycles included in this review, and number of HIV seroconversions.

Parameter	Result
Initiated cycles of assisted reproduction with washed semen	12,079
Completed cycles of assisted reproduction with washed semen	11,915
Couples with at least one completed cycle of assisted reproduction with washed semen	4,257
Women with known HIV results after exposure to washed semen	93.8% (3,994/4,257)
Completed cycles of assisted reproduction among women with known HIV results after exposure to washed semen	97.2% (11,585/11,915)
Men known to be taking antiretroviral therapy at time of semen washing	39.5% (1,685/4,257)
Men who were known to have not achieved viral suppression at time of semen washing (plasma testing)	27.7% (985/4,257)

Completed cycles of assisted reproduction with the use of washed semen among subgroup of couples with a male partner who was not virally suppressed	24.0% (2,863/11,915)
Number of HIV seroconversions (95% CI)	
Per completed cycle of assisted reproduction, overall	0/11,585 (0–0.0001)
Per woman with known HIV outcome, overall	0/3,994 (0–0.0004)
Per completed cycle, among subgroup of couples with a male partner who was not virally suppressed	0/2,863 (0–0.0006)
Per infant	0/1,026 (0–0.0029)

Note: CI = confidence interval; HIV = human immunodeficiency virus.

Zafer. Semen washing and HIV prevention. *Fertil Steril* 2016.



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Yes

No

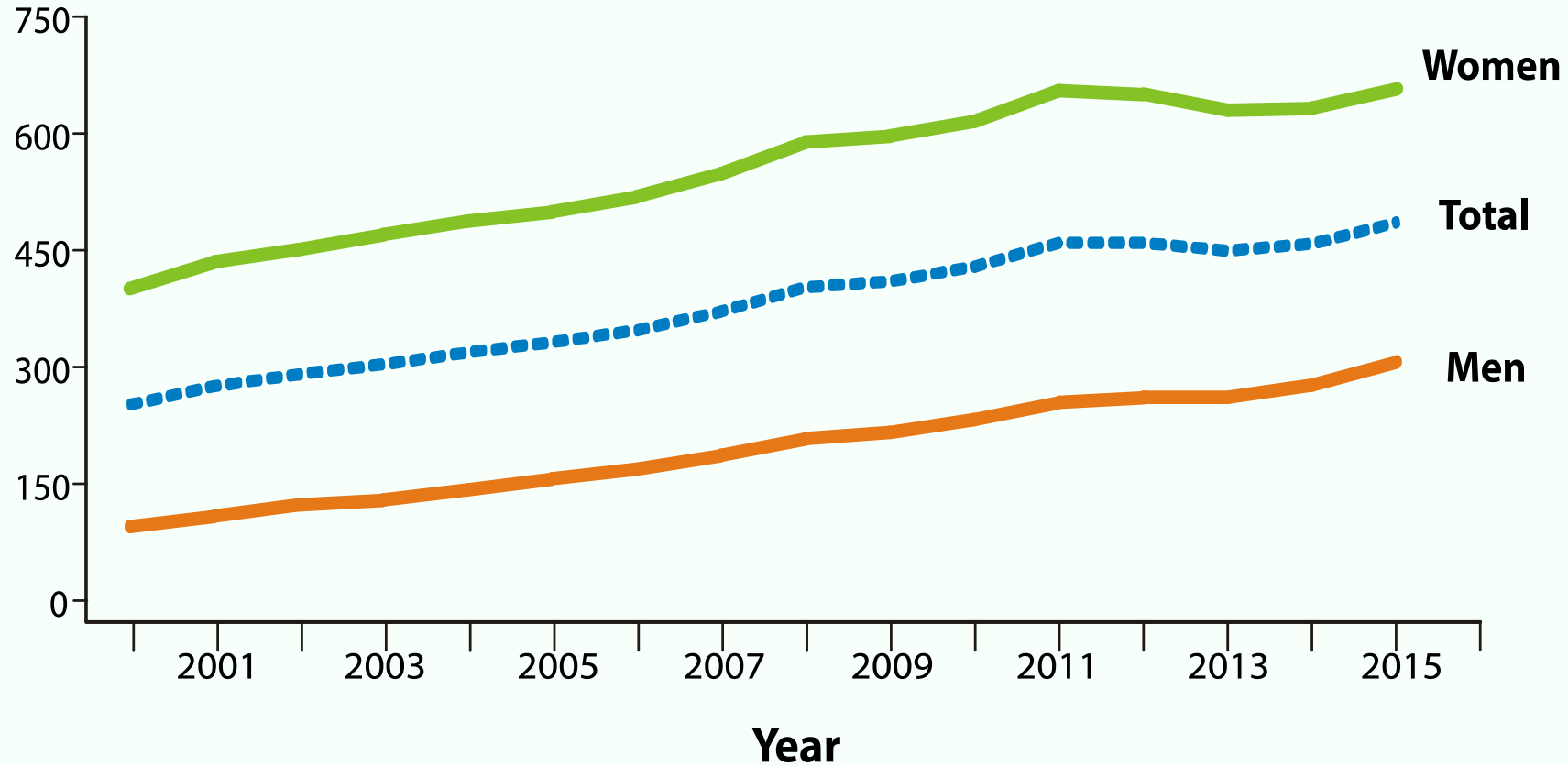


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Other Considerations?

Chlamydia — Rates of Reported Cases by Sex, United States, 2000–2015

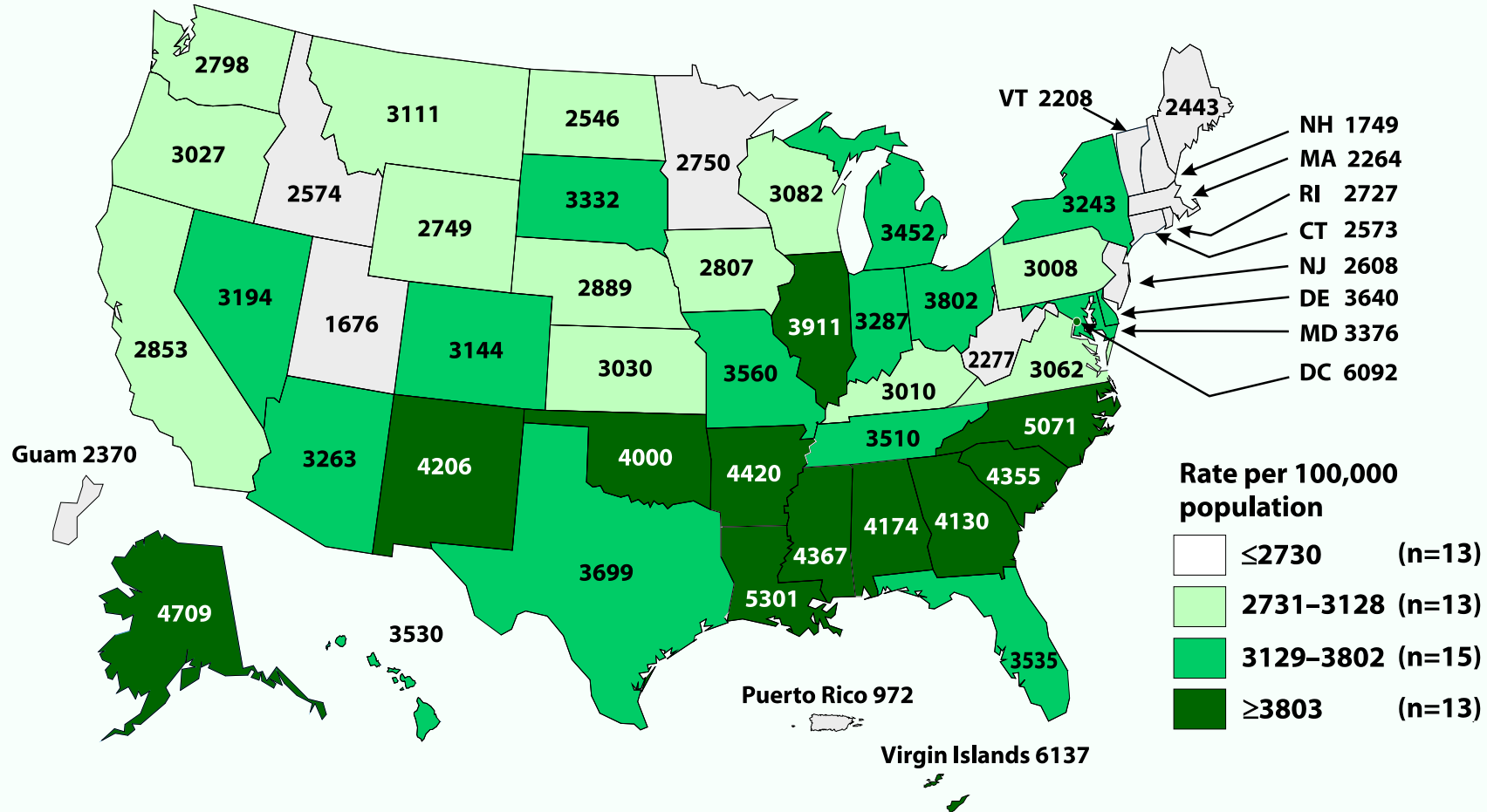
Rate (per 100,000 population)



NOTE: Data collection for chlamydia began in 1984 and chlamydia was made nationally notifiable in 1995; however, chlamydia was not reportable in all 50 states and the District of Columbia until 2000. Refer to the National Notifiable Disease Surveillance System (NNDSS) website for more information: <https://wwwn.cdc.gov/nndss/conditions/chlamydia-trachomatis-infection/>.



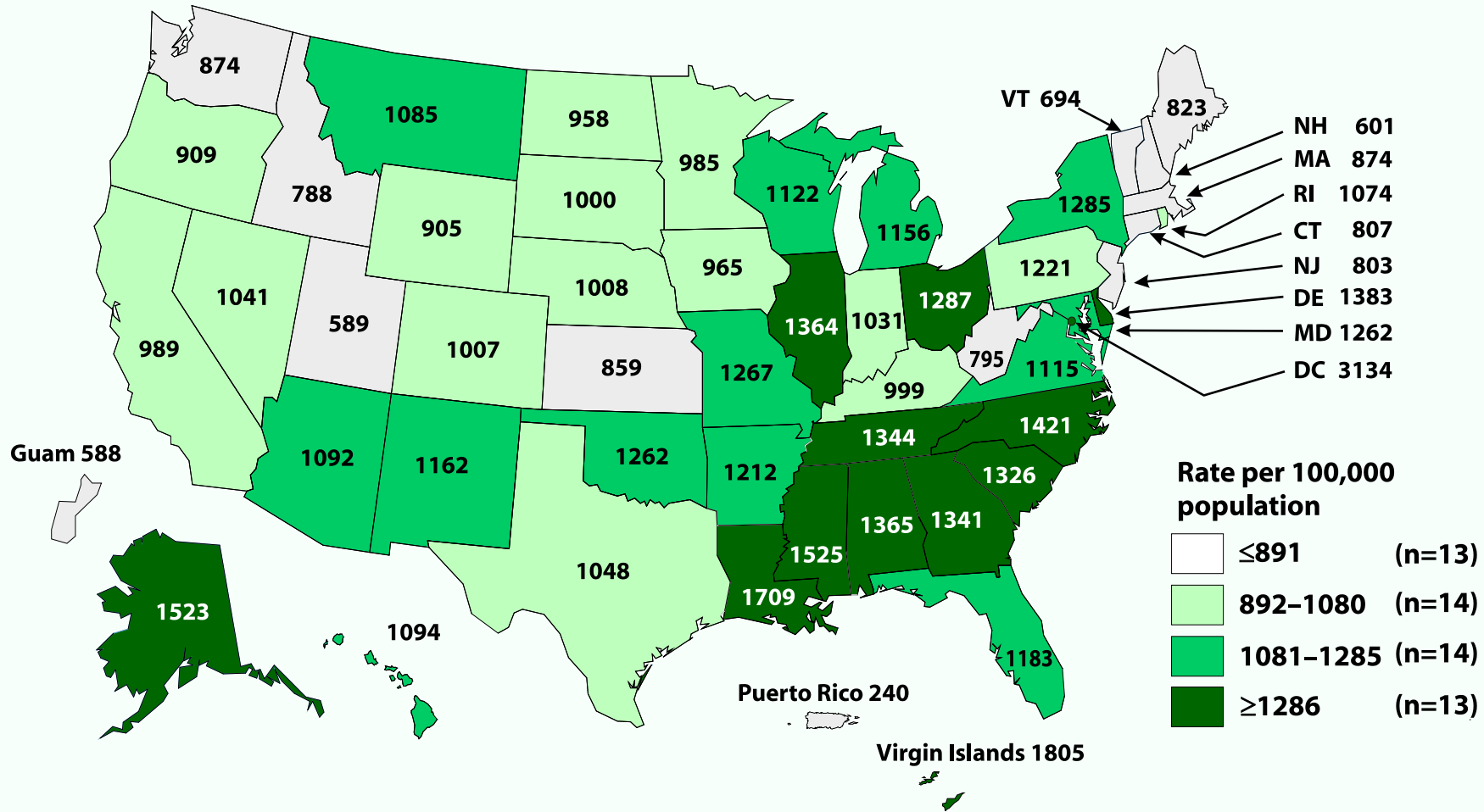
Chlamydia — Rates of Reported Cases Among Women Aged 15–24 Years by State, United States and Outlying Areas, 2015



NOTE: Rates for Guam and the Virgin Islands were calculated by using the 2010 population estimates.



Chlamydia — Rates of Reported Cases Among Men Aged 15–24 Years by State, United States and Outlying Areas, 2015

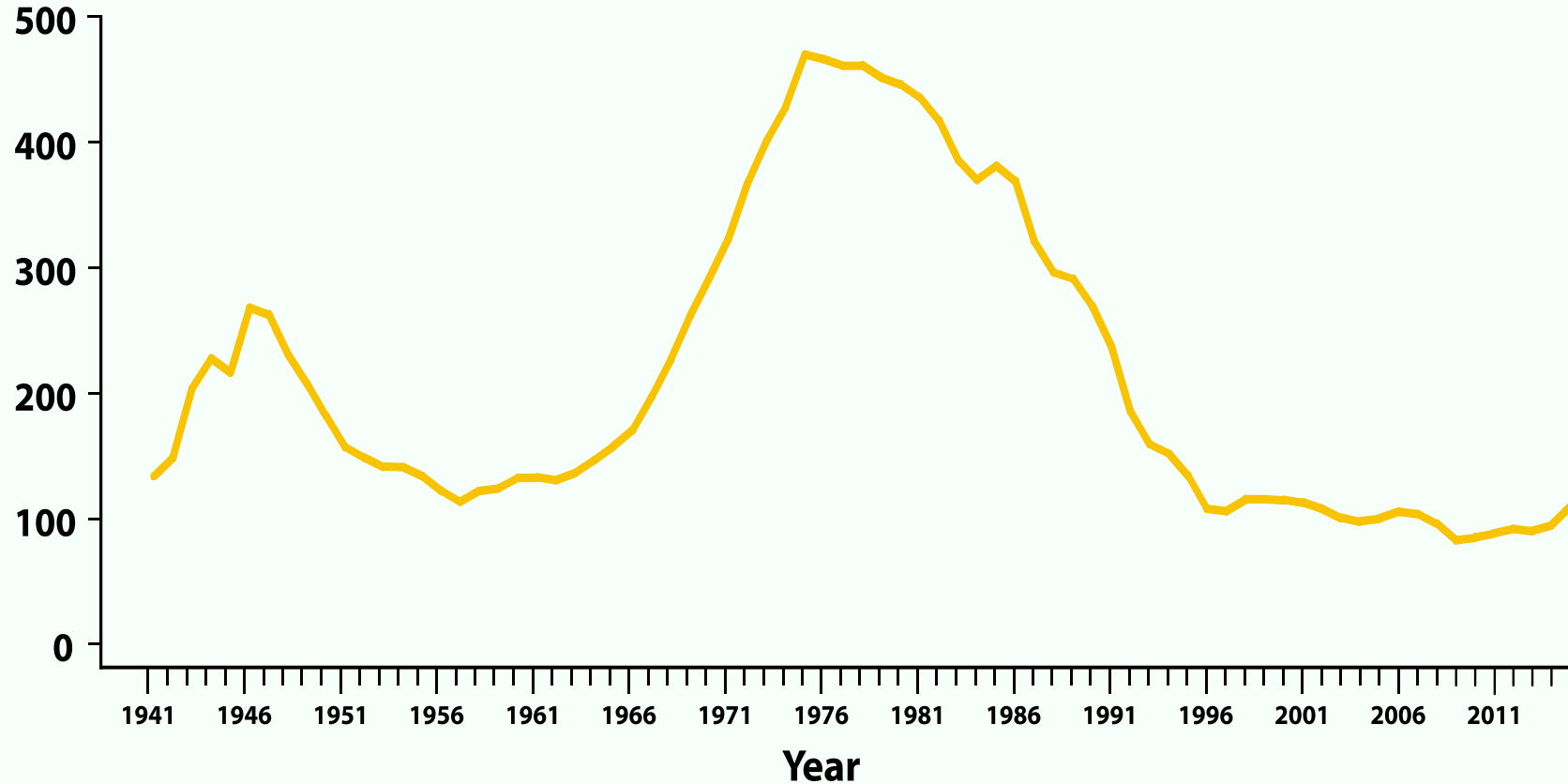


NOTE: Rates for Guam and the Virgin Islands were calculated by using the 2010 population estimates.



Gonorrhea — Rates of Reported Cases by Year, United States, 1941–2015

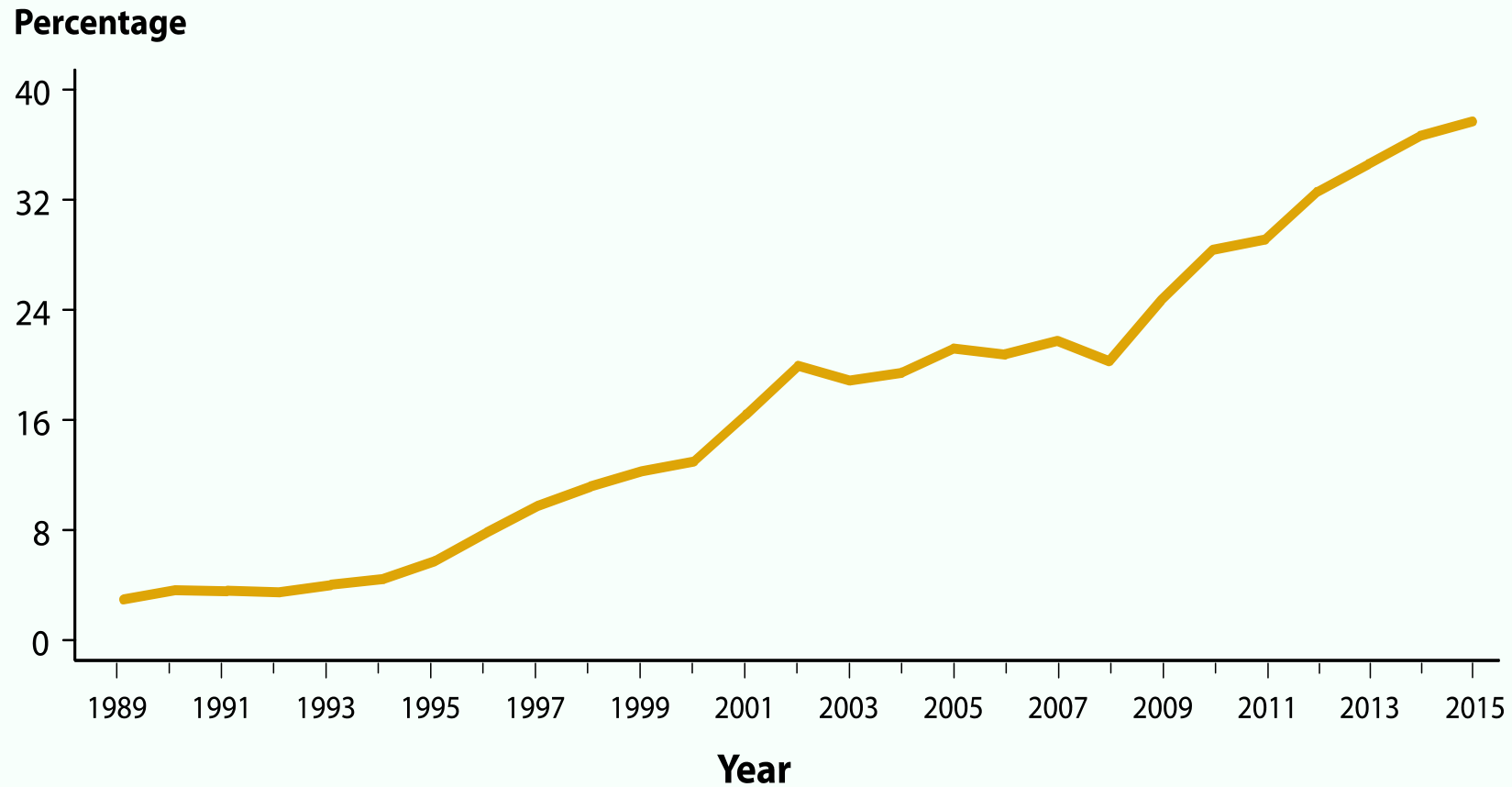
Rate (per 100,000 population)



NOTE: Data collection for gonorrhea began in 1941; however, gonorrhea became nationally notifiable in 1944. Refer to the National Notifiable Disease Surveillance System (NNDSS) website for more information: <https://wwwn.cdc.gov/nndss/conditions/gonorrhea/>.



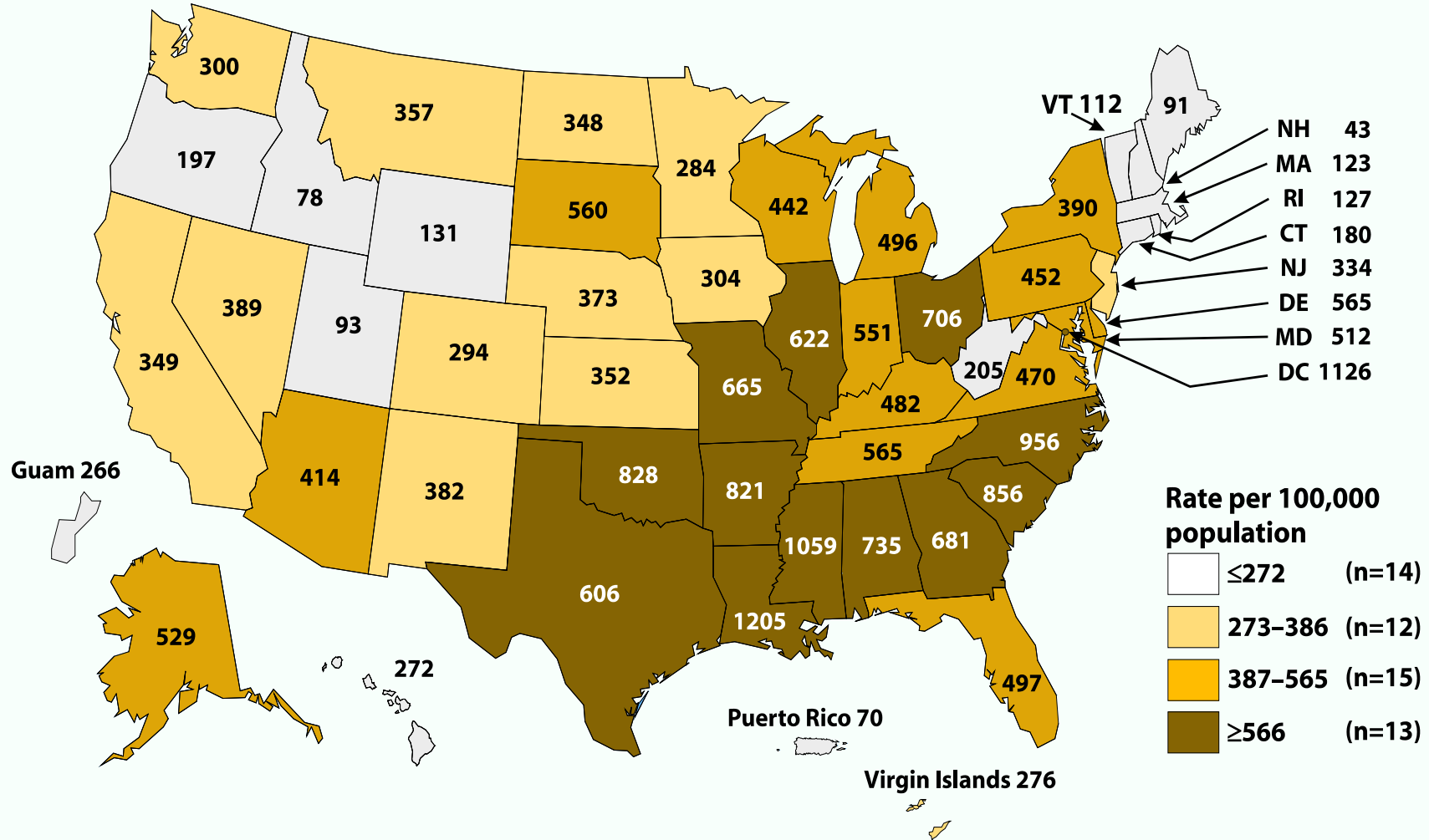
Neisseria gonorrhoeae — Percentage of Urethral Isolates Obtained from MSM* Attending STD Clinics, Gonococcal Isolate Surveillance Project (GISP), 1989–2015



* MSM = Gay, bisexual, and other men who have sex with men (collectively referred to as MSM).



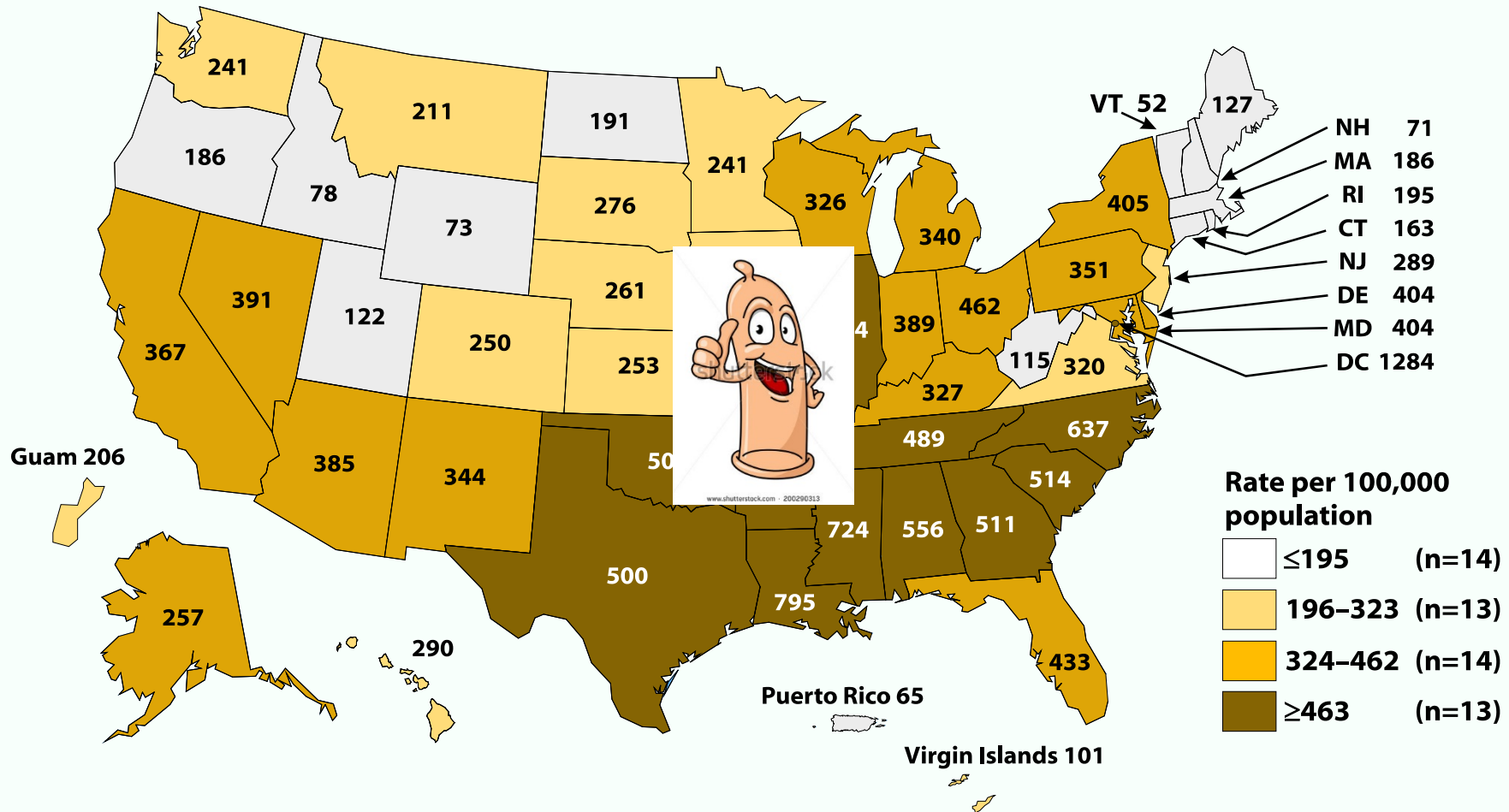
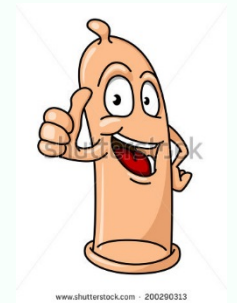
Gonorrhea — Rates of Reported Cases Among Women Aged 15–24 Years by State, United States and Outlying Areas, 2015



NOTE: Rates for Guam and the Virgin Islands were calculated by using the 2010 population estimates.



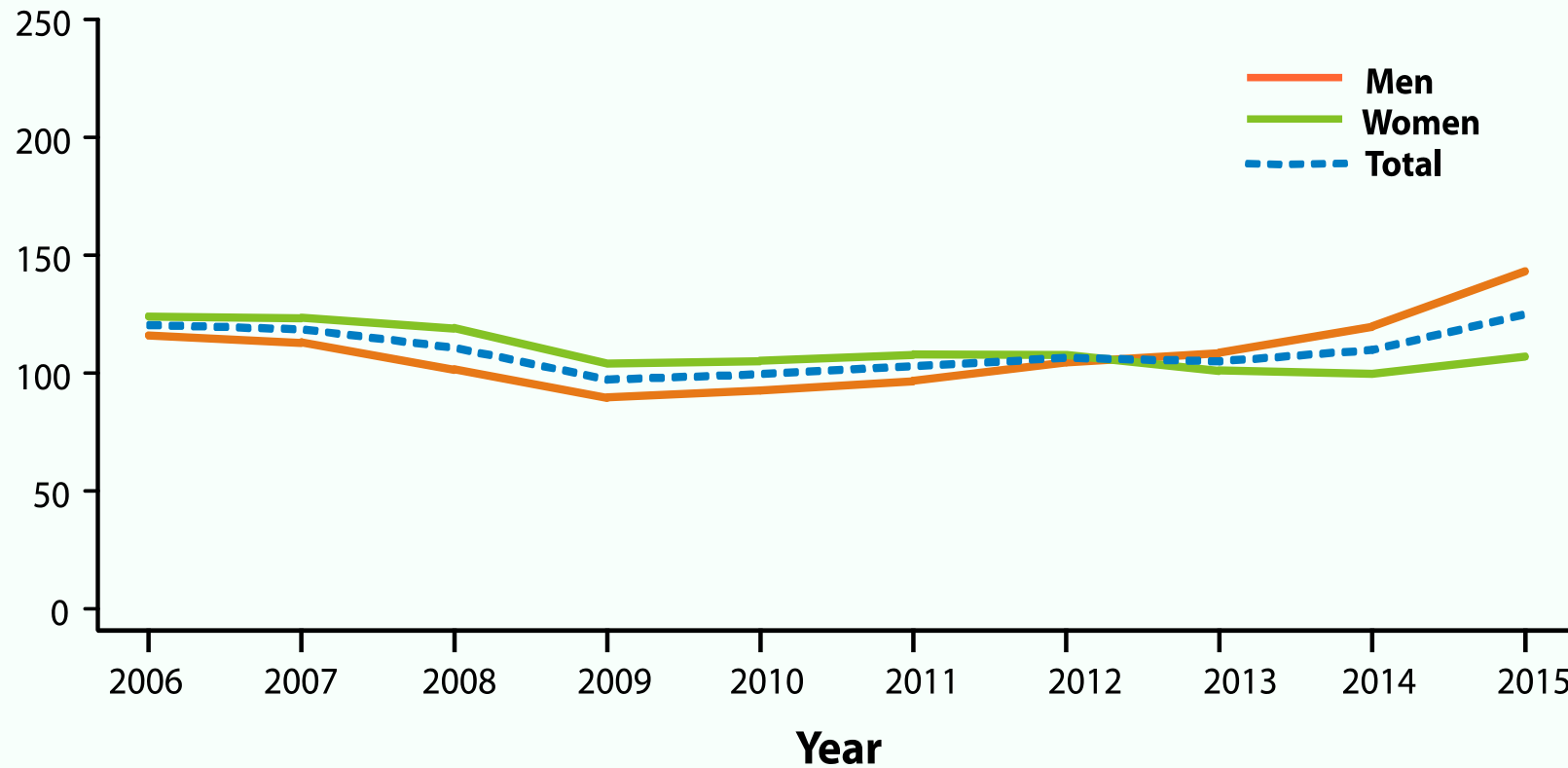
Gonorrhea — Rates of Reported Cases Among Men Aged 15–24 Years by State, United States and Outlying Areas, 2015



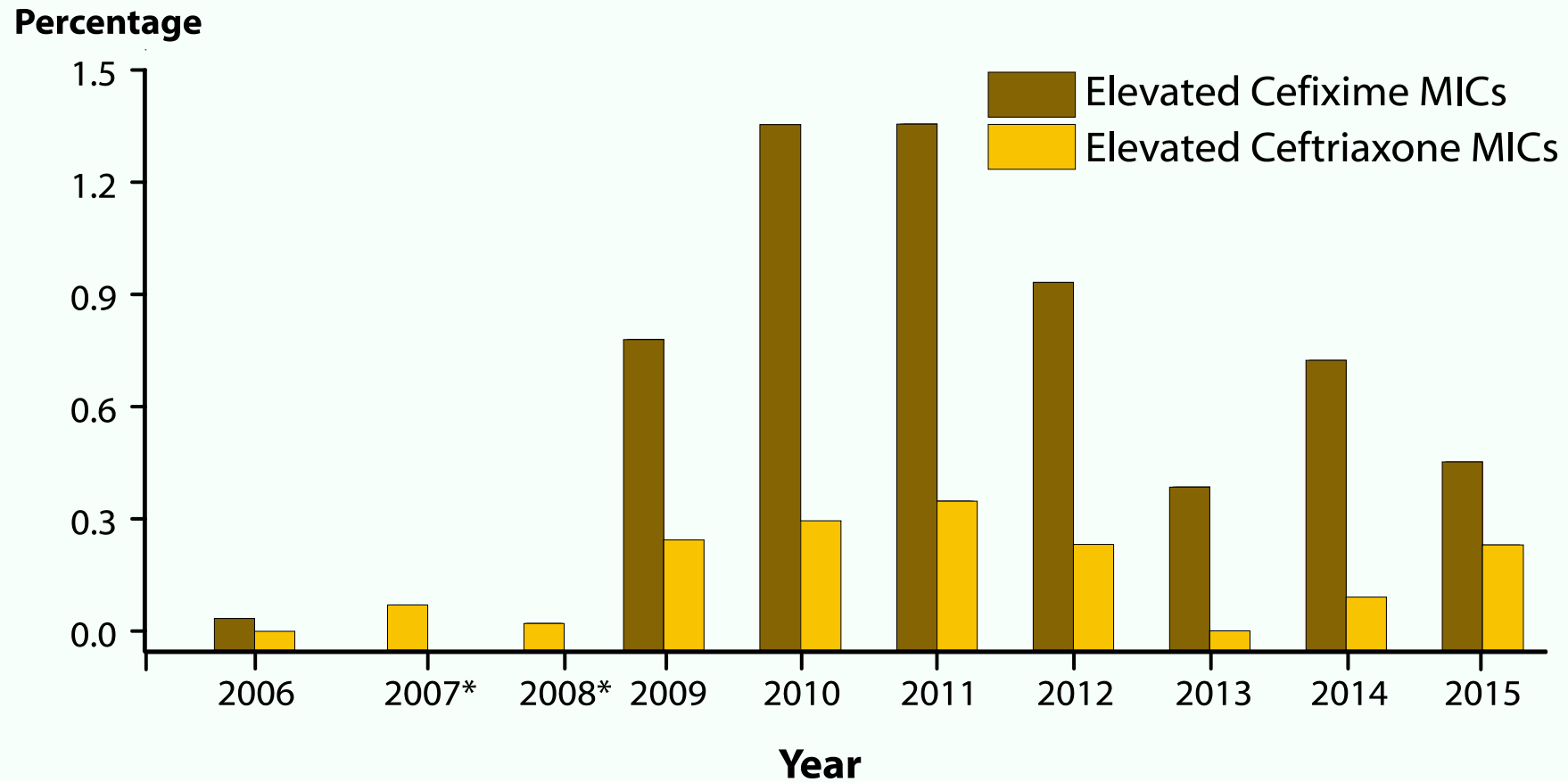
NOTE: Rates for Guam and the Virgin Islands were calculated by using the 2010 population estimates.

Gonorrhea — Rates of Reported Cases by Sex, United States, 2006–2015

Rate (per 100,000 population)

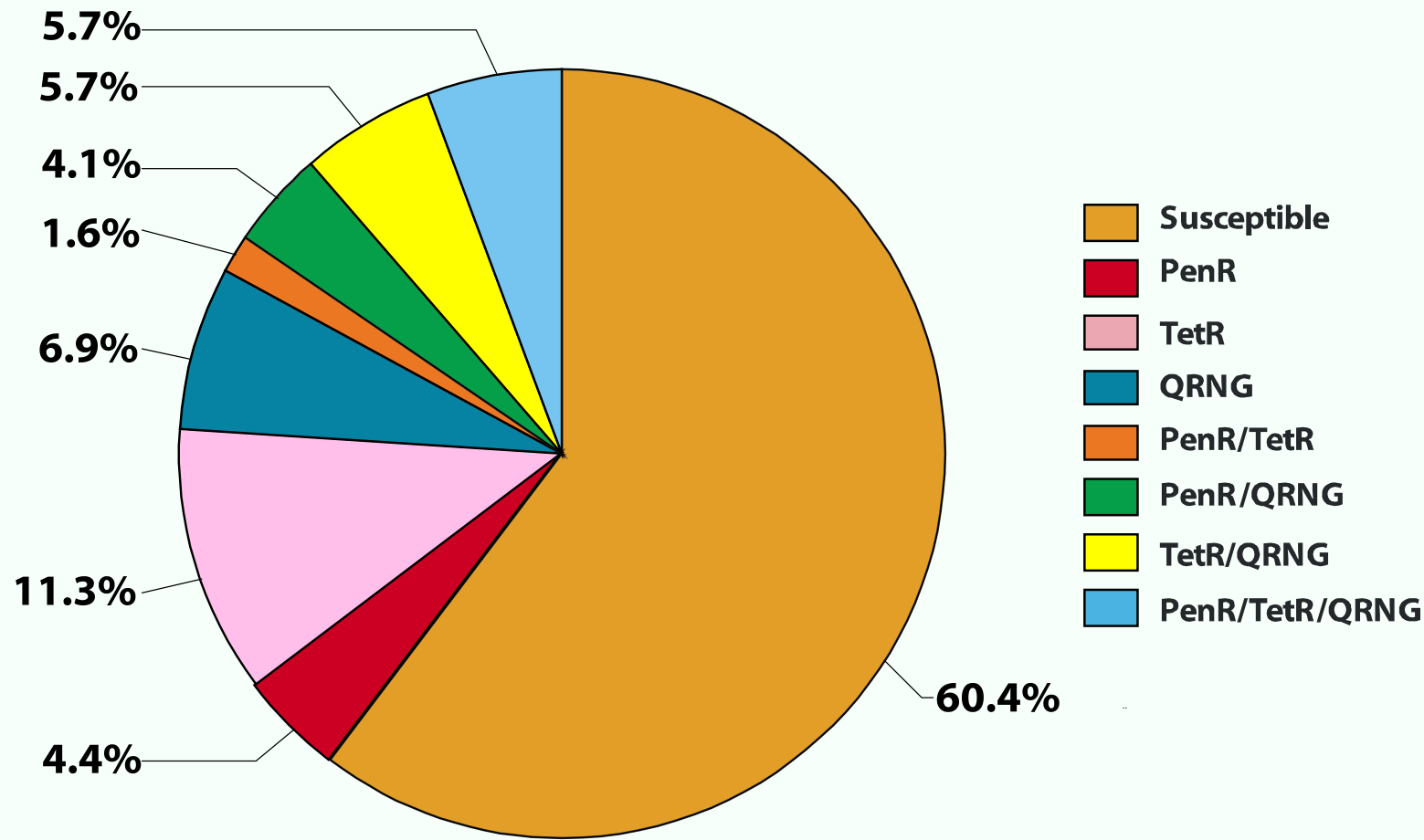


Neisseria gonorrhoeae — Percentage of Isolates with Elevated Ceftriaxone Minimum Inhibitory Concentrations (MICs) (≥ 0.125 $\mu\text{g/ml}$) and Elevated Cefixime MICs (≥ 0.25 $\mu\text{g/ml}$), Gonococcal Isolate Surveillance Project (GISP), 2006–2015



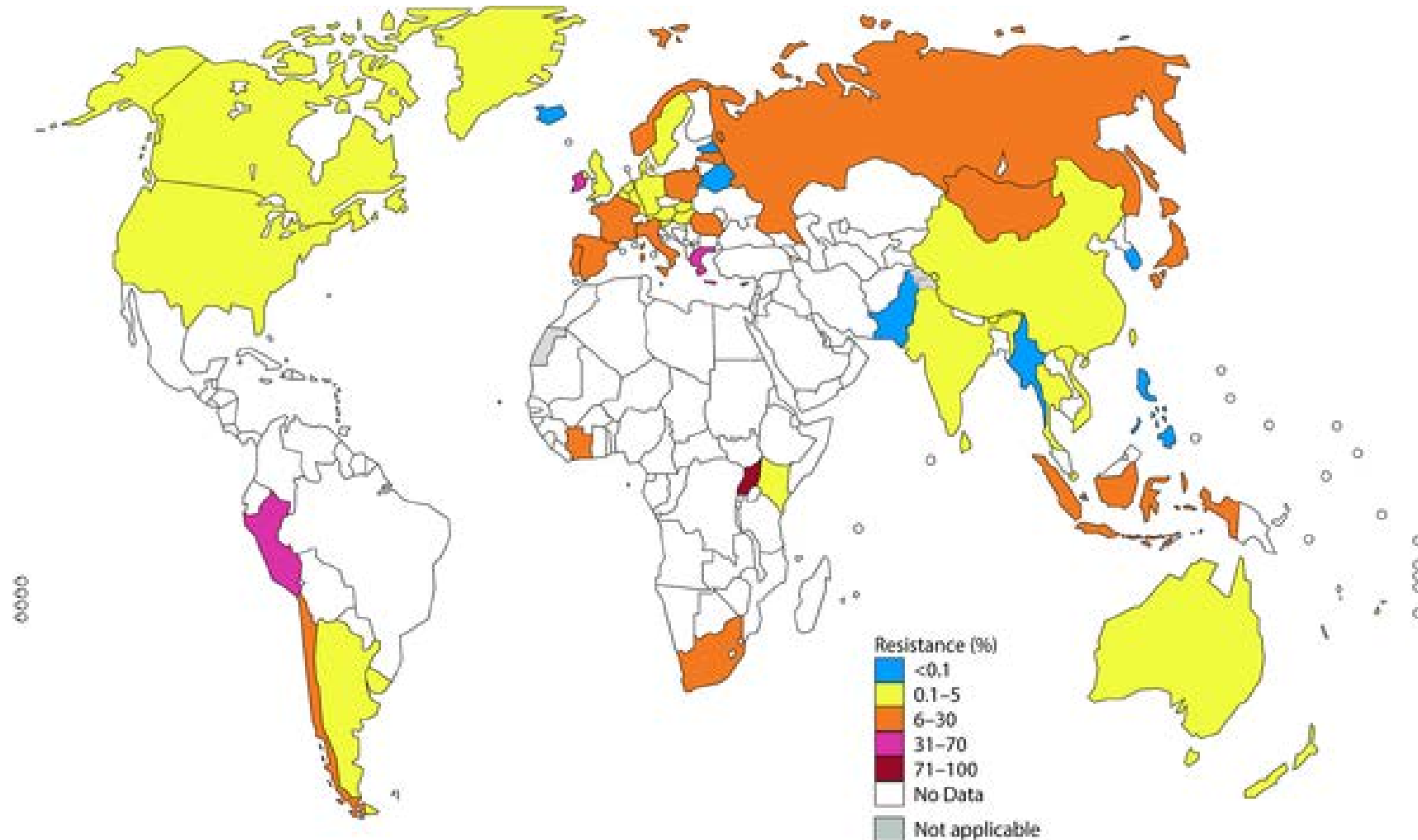
* Isolates not tested for cefixime susceptibility in 2007 and 2008.

Neisseria gonorrhoeae — Distribution of Isolates, with Penicillin, Tetracycline, and/or Ciprofloxacin Resistance, Gonococcal Isolate Surveillance Project (GISP), 2015



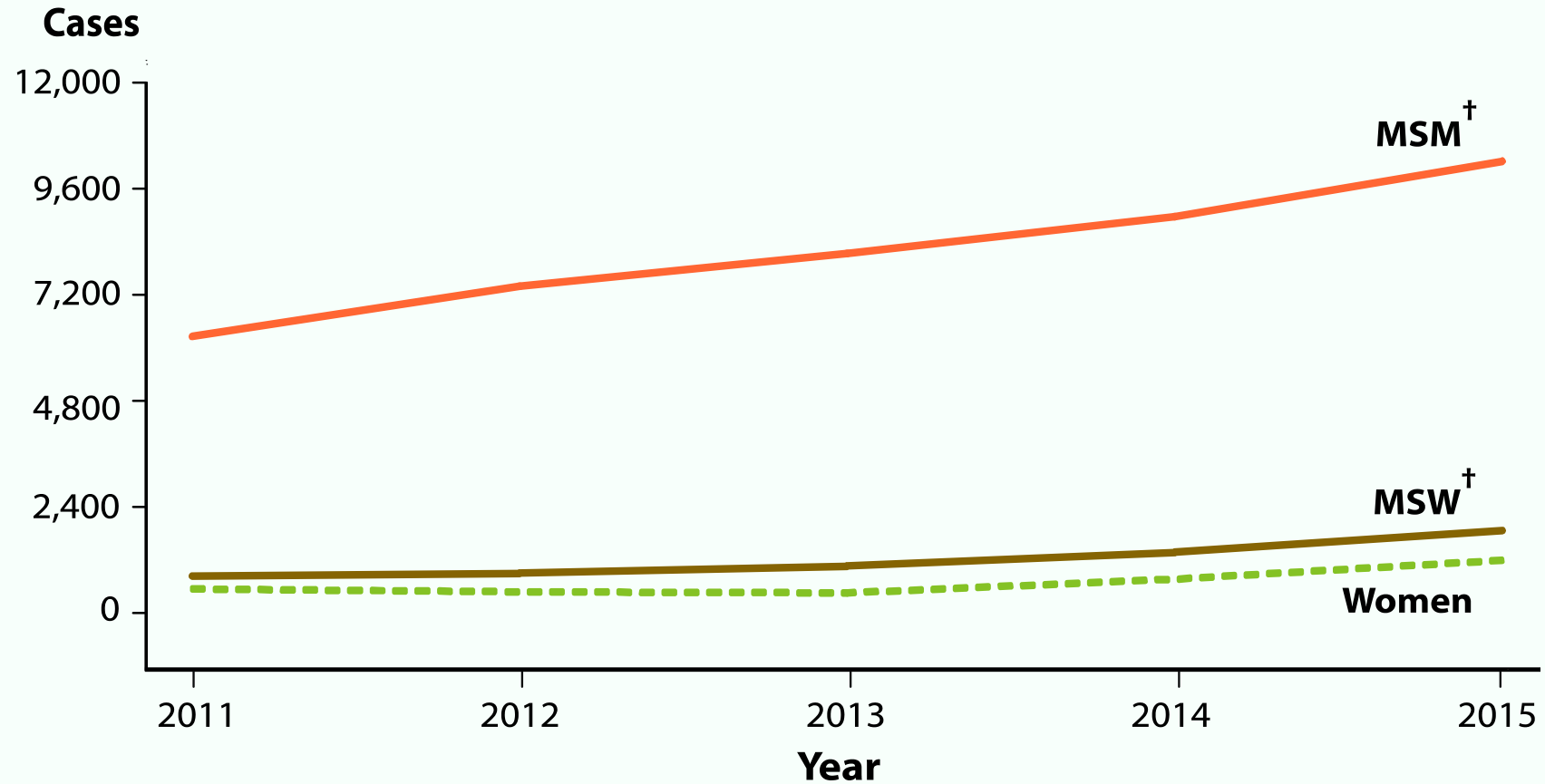
NOTE: PenR = penicillinase-producing *Neisseria gonorrhoeae* and chromosomally-mediated penicillin-resistant *N. gonorrhoeae*; TetR = chromosomally- and plasmid-mediated tetracycline-resistant *N. gonorrhoeae*; and QRNG = quinolone-resistant *N. gonorrhoeae*.

Fig 2. The percentage (%) of isolates with resistance to azithromycin according to the most recent World Health Organization (WHO) Gonococcal Antimicrobial Surveillance Programme (GASP) data (2014 for most countries, but for a few countries, only 2011–2013 data were available).



Wi T, Lahra MM, Ndowa F, Bala M, Dillon JAR, et al. (2017) Antimicrobial resistance in *Neisseria gonorrhoeae*: Global surveillance and a call for international collaborative action. *PLOS Medicine* 14(7): e1002344. <https://doi.org/10.1371/journal.pmed.1002344>
<http://journals.plos.org/plosmedicine/article?id=10.1371/journal.pmed.1002344>

Primary and Secondary Syphilis — Reported Cases by Sex and Sexual Behavior, 37 States*, 2011–2015

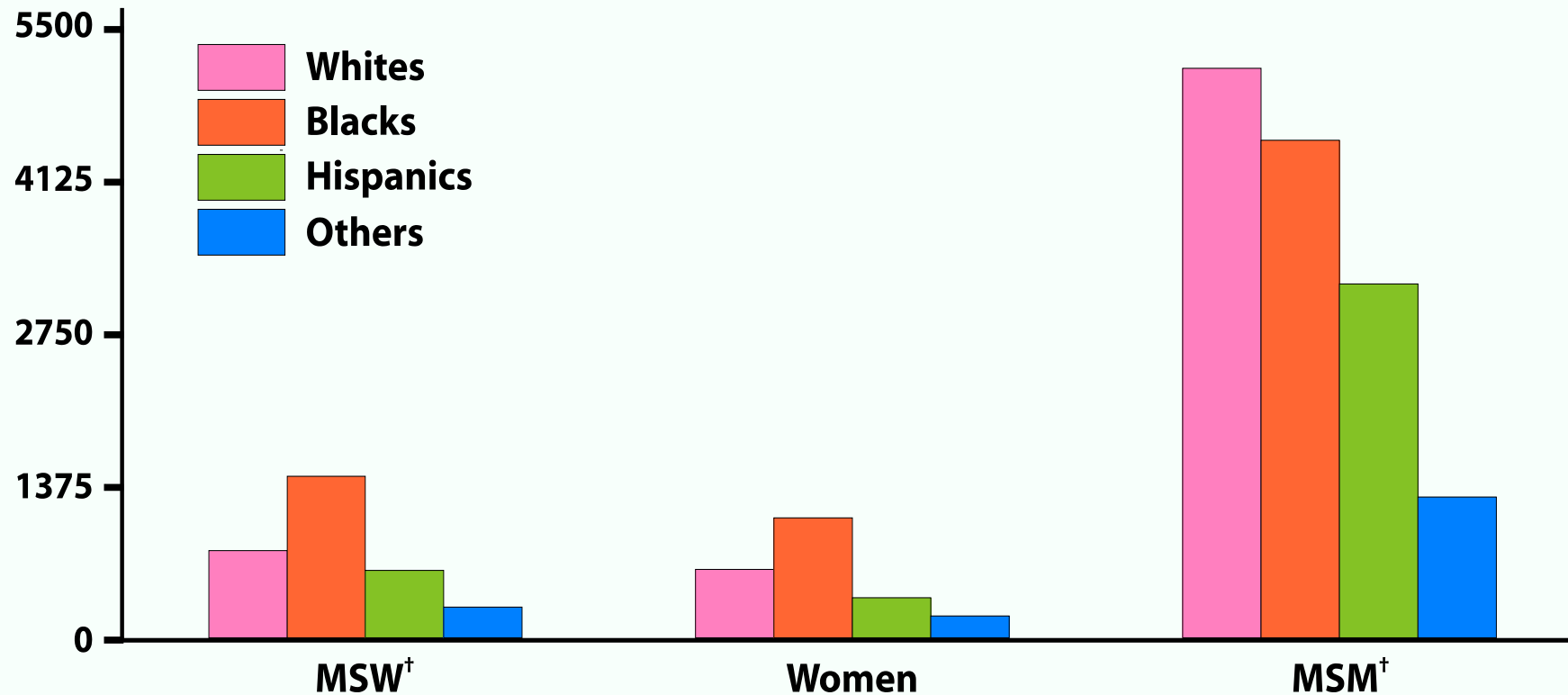


* 37 states were able to classify ≥70% of reported cases of primary and secondary syphilis as either MSM[†], MSW[†], or women for each year during 2011–2015.

[†] MSM = Gay, bisexual, and other men who have sex with men (collectively referred to as MSM); MSW = Men who have sex with women only.



Primary and Secondary Syphilis — Reported Cases* by Sex, Sexual Behavior, and Race/Ethnicity, United States, 2015
Cases

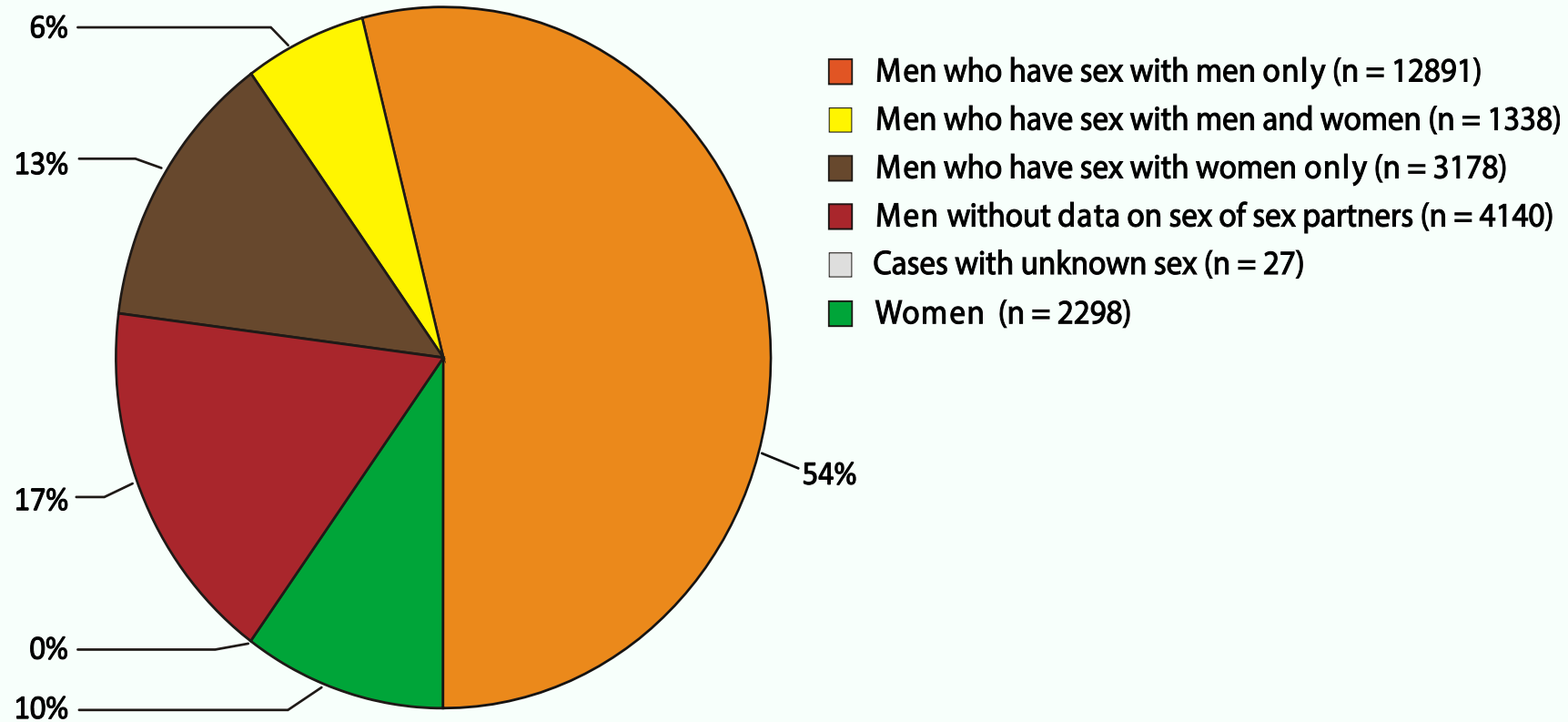


* Of all reported cases of primary and secondary syphilis, 17.3% were among men without data on sex of sex partner, and <1% were cases with unknown sex; 5.0% of all cases had missing or unknown race/ethnicity.

[†] MSM = Gay, bisexual, and other men who have sex with men (collectively referred to as MSM); MSW = Men who have sex with women only.

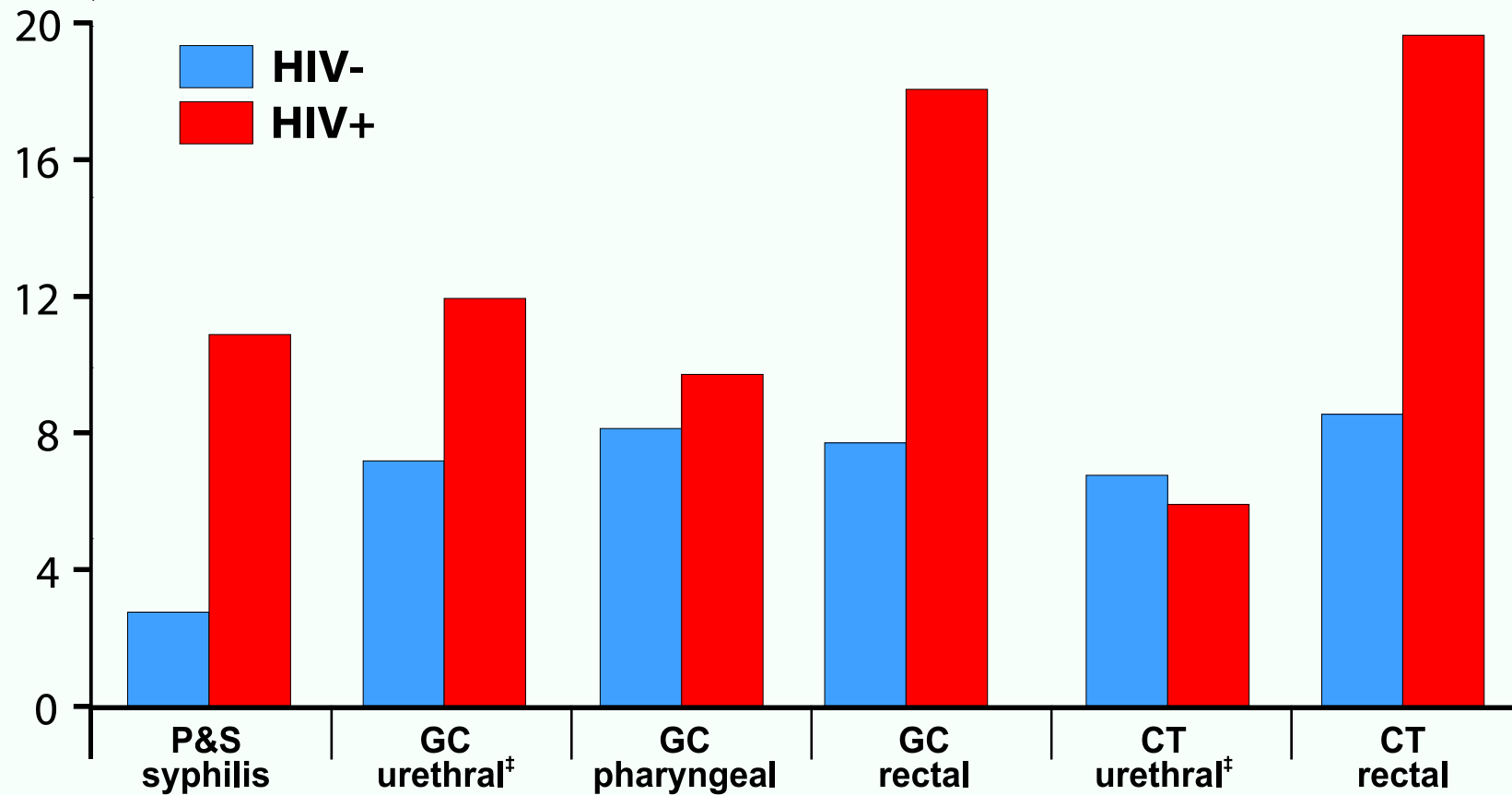


Primary and Secondary Syphilis — Distribution of Cases by Sex and Sexual Behavior, 2015



Proportion of MSM* Attending STD Clinics with Primary and Secondary Syphilis, Gonorrhea (GC) or Chlamydia (CT) by HIV Status[†], STD Surveillance Network (SSuN), 2015

Percentage



* MSM = Gay, bisexual, and other men who have sex with men (collectively referred to as MSM).

[†] Excludes all persons for whom there was no laboratory documentation or self-report of HIV status.

[‡] GC urethral and CT urethral include results from both urethral and urine specimens.





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Yes

No



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Thank You