

# STIs and HIV: Where Do We Go From Here?

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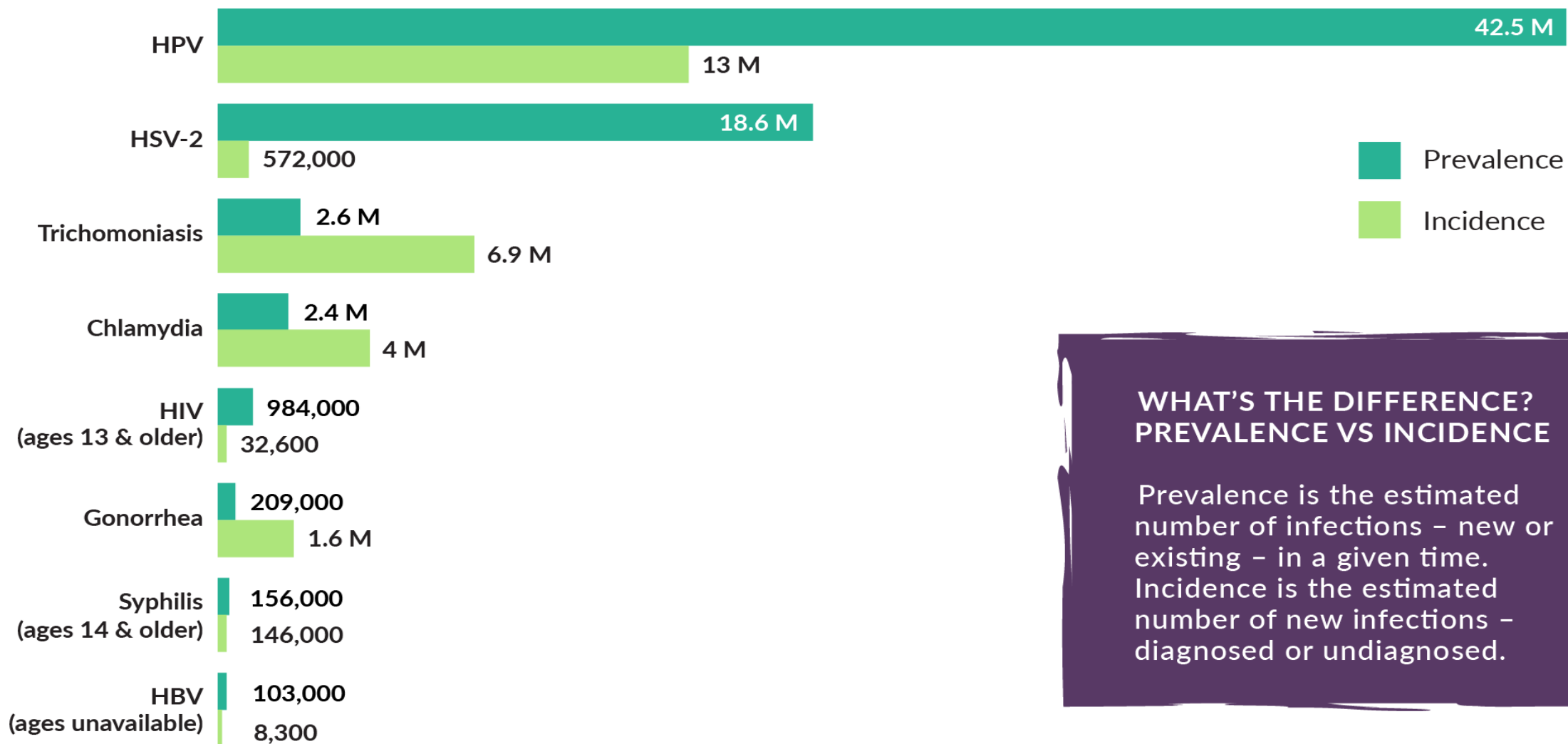
**HPTN** Annual  
Meeting



# HIV and STI: The Big Ideas

- STIs have major health consequences
- HIV is primarily an STI moved to a “silo”
- “Several “classical “ STIs increase transmission of HIV
- Treatment of some STIs reduce transmission of HIV
- STIs are used as markers of “sexual risk behaviors”

## STI Prevalence and Incidence in the US



### WHAT'S THE DIFFERENCE? PREVALENCE VS INCIDENCE

Prevalence is the estimated number of infections – new or existing – in a given time. Incidence is the estimated number of new infections – diagnosed or undiagnosed.

\*Bars are for illustration only; not to scale, due to wide range in number of infections. Estimates for adults and adolescents ages 15+ unless otherwise stated. HIV and HBV data only represent sexually acquired infections.



**World Health  
Organization**

Department of Global HIV, Hepatitis  
and Sexually Transmitted Infections  
Programmes

Implementing the global health sector strategies on HIV, viral hepatitis and sexually transmitted infections, 2022–2030: report on progress and gaps 2024.

Geneva: World Health Organization; 2024.

### Box 6.1 Global epidemics of STIs: key facts

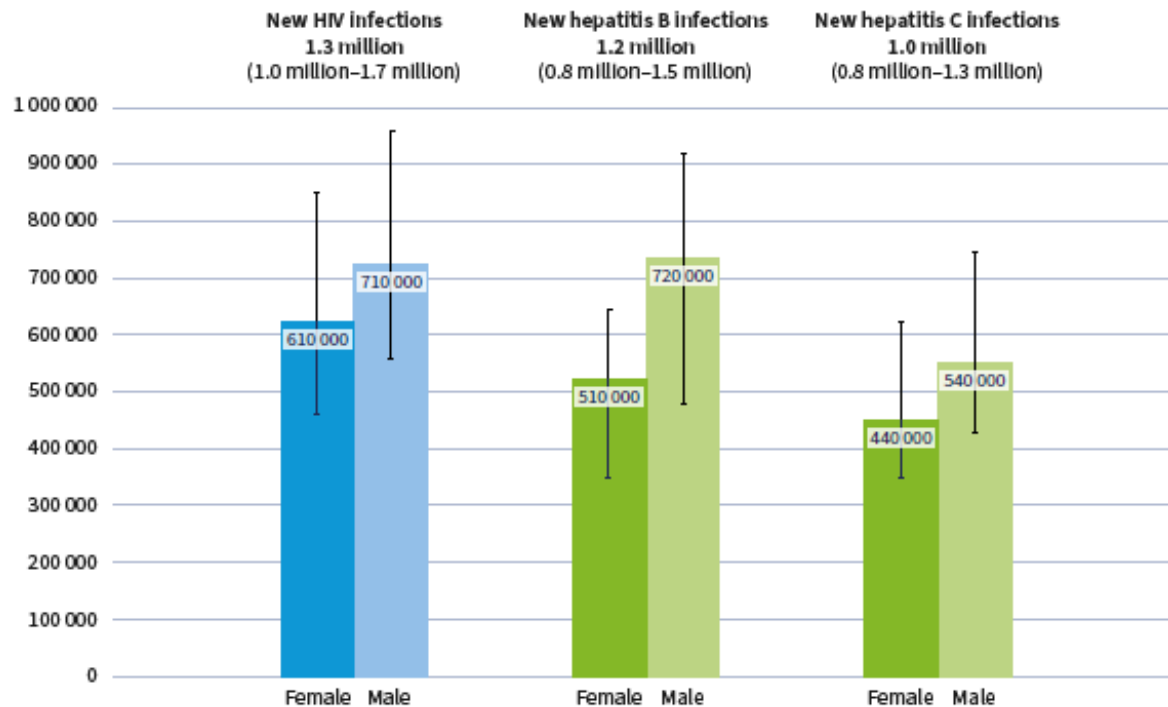
- In 2020, there were an estimated 374 million new cases of the four curable STIs – syphilis, gonorrhoea, chlamydia and trichomoniasis – in adults aged 15–49 years (32).
- The number of new cases of syphilis in adults aged 15–49 years increased from 7.1 million in 2020 to 8.0 million in 2022 (39).
- In 2022, there were an estimated 662 000 new cases of cervical cancer and 349 000 cervical cancer deaths globally (IARC, 2024).<sup>a</sup>
- Almost one in three men worldwide are infected with at least one genital HPV type and around one in five men are infected with one or more HR-HPV types.
- An estimated 520 million people aged 15–49 years were living with genital herpes simplex virus type 2 (HSV-2) infection in 2020, and slightly more than one third of these people had symptoms of genital herpes at least once in that year.

<sup>a</sup> HPV is further addressed in the World Health Organization's Global strategy to accelerate the elimination of cervical cancer as a public health problem (37).



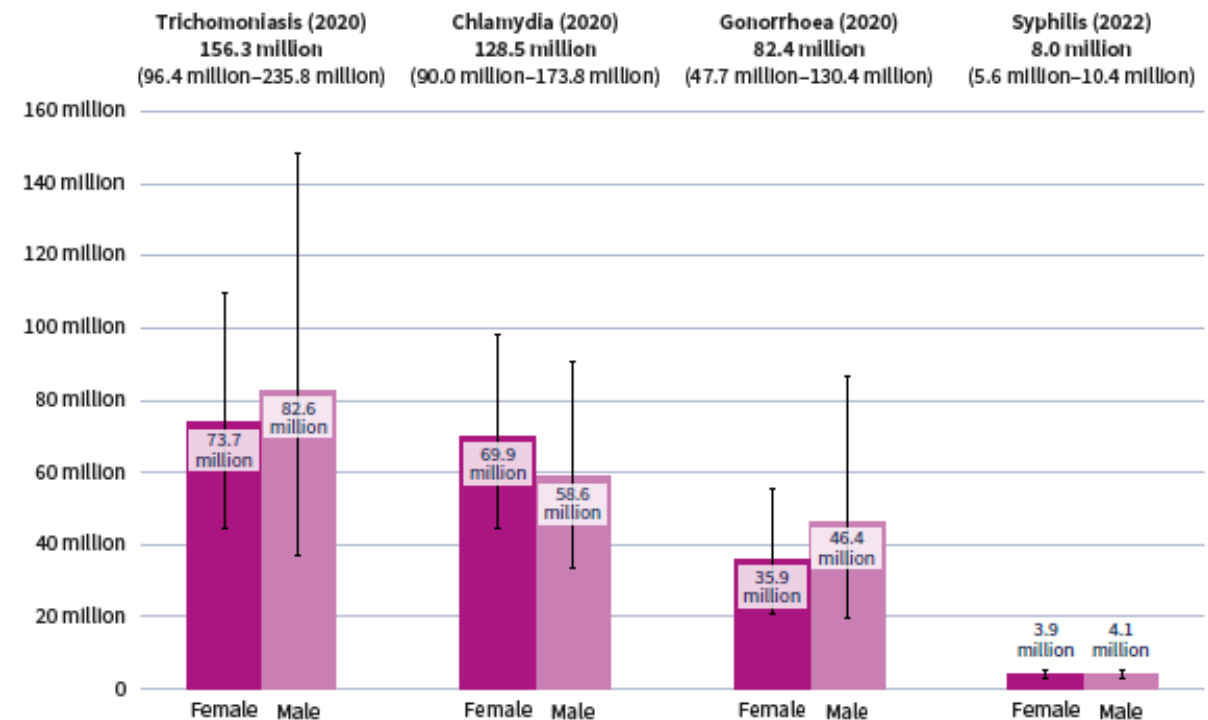
## Implementing the global health sector strategies on HIV, viral hepatitis and sexually transmitted infections, 2022–2030: report on progress and gaps 2024. Geneva: World Health Organization; 2024.

Fig. 3.1a Distribution of new cases of HIV, hepatitis B and hepatitis C by sex, global, 2022



Sources: HIV: UNAIDS/WHO, 2023. Global hepatitis report, WHO, 2024 (2).

Fig. 3.1b Distribution of new cases of four curable STIs among adults (aged 15–49 years), by sex, global, 2020 and 2022



Sources: Global progress report on HIV, viral hepatitis and sexually transmitted infections, 2021 (22). Global HIV, Hepatitis and STIs Programmes (HHS), WHO, 2024.



# ***Epidemiological Synergy***

## ***Interrelationships between Human Immunodeficiency Virus Infection And Other Sexually Transmitted Diseases***

**JUDITH N. WASSERHEIT, MD, MPH**

***From the Sexually Transmitted Diseases Branch,  
National Institute of Allergy and Infectious Diseases,  
National Institutes of Health, Bethesda, Maryland***

# Amplified Transmission of HIV

## Infectiousness

Blood Viral Load

Genital Tract Viral Load

Inflammatory STDs

Viral clade

ACUTE INFECTION

## Susceptibility

*Genital ulcers*

*Inflammatory STDs*

Cytokine profile

Lack of circumcision

Cervical ectopy

HLA Haplotype

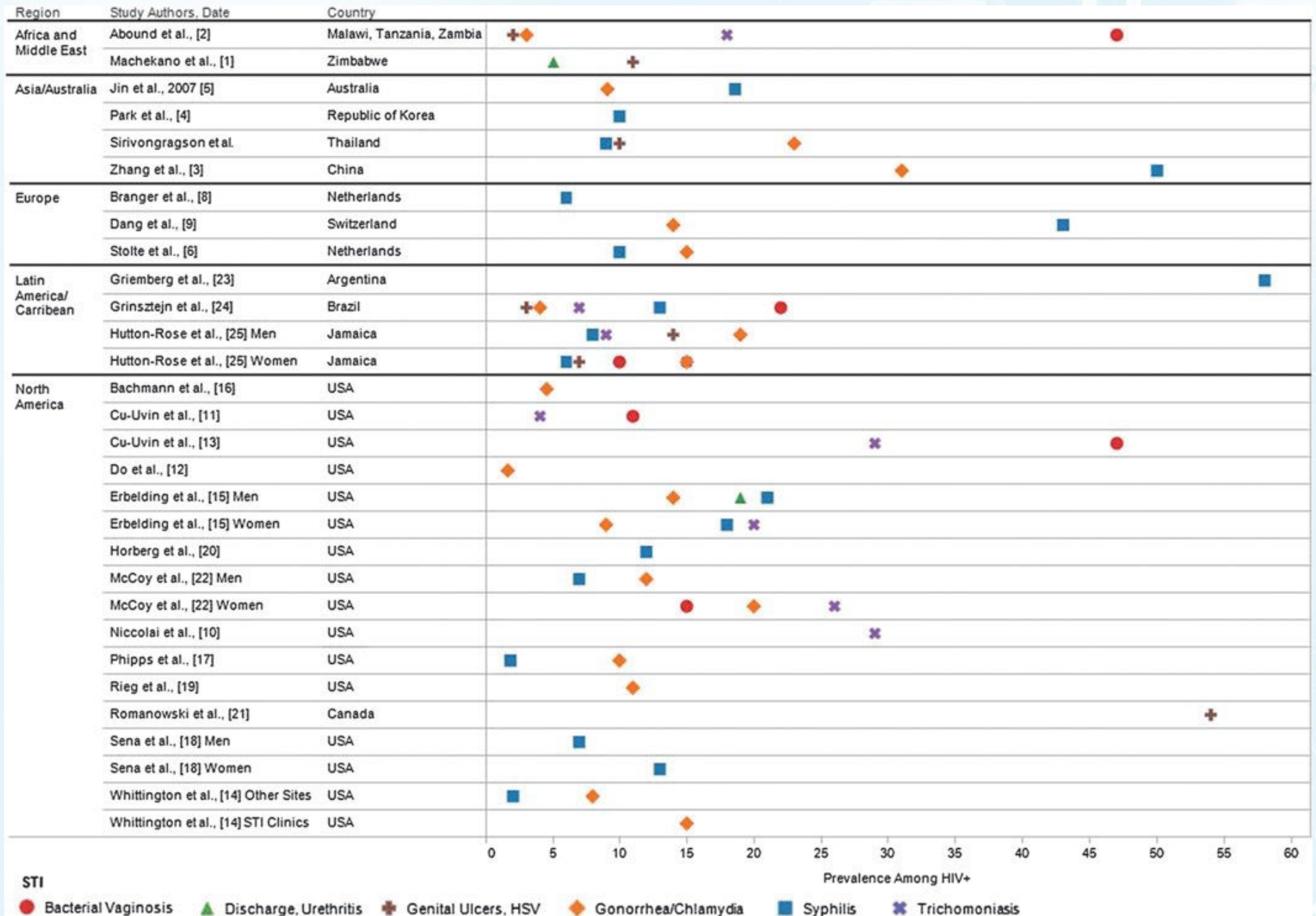
Hormonal contraception?

“Dysbiosis”?

# Some PLWHIV May Acquire STIs

- 37 studies of co-infection **after** diagnosis
- POINT PREVALENCE STIs **19.6% (!!)**
- STD reinfection **SOON** after diagnosis





**STI**

● Bacterial Vaginosis    ▲ Discharge, Urethritis    + Genital Ulcers, HSV    ◆ Gonorrhea/Chlamydia    ■ Syphilis    ✖ Trichomoniasis

Prevalence Among HIV+

# THE LANCET

Volume 349 · Number 9069 · Pages 1851-1922 · June 28, 1997

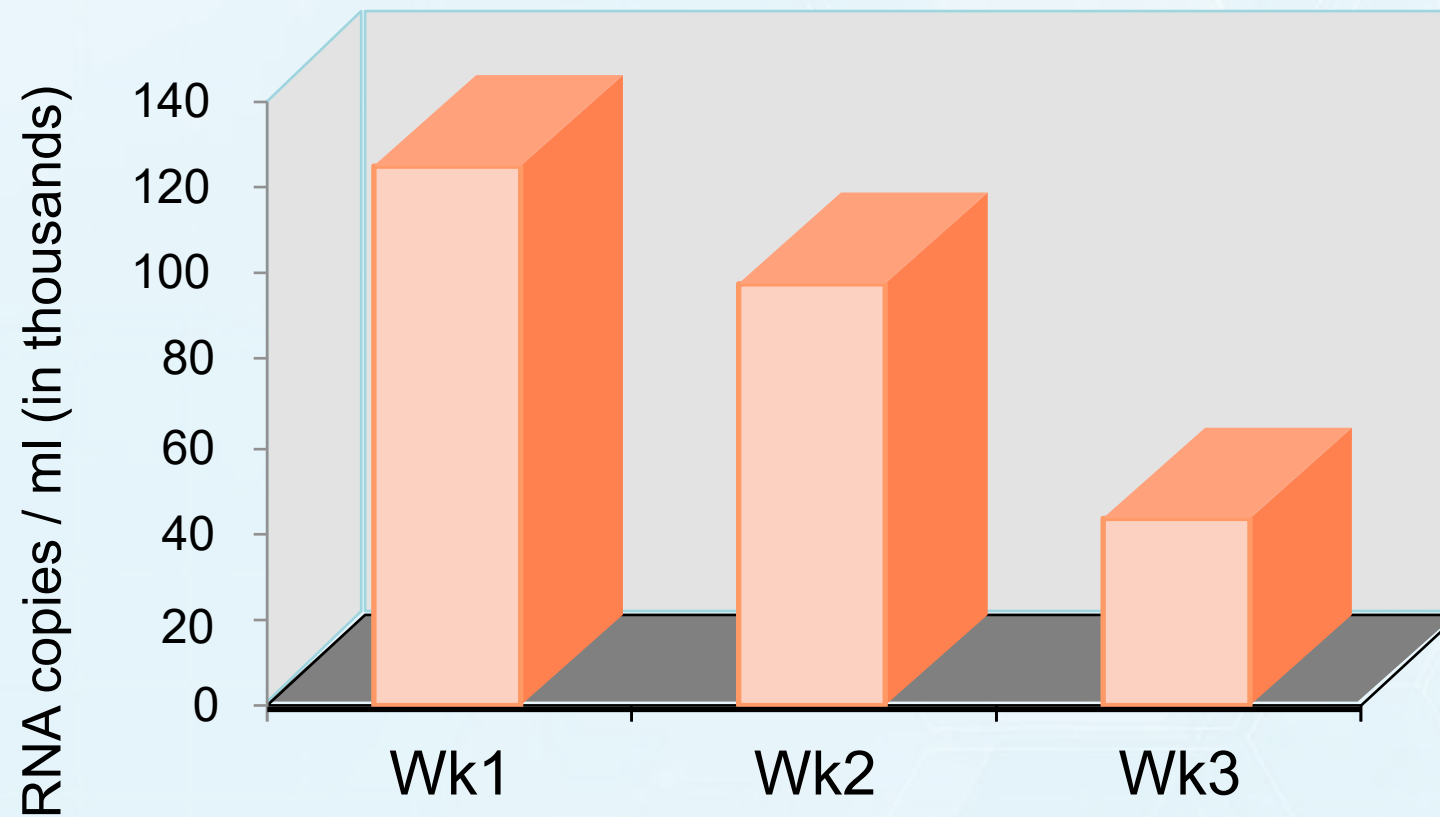
[www.thelancet.com](http://www.thelancet.com)

## **Reduction of concentration of HIV-1 in semen after treatment of urethritis: implications for prevention of sexual transmission of HIV-1**

Myron S. Cohen, Irving F. Hoffman, Rachel A. Royce, Peter Kazembe, John R. Dyer, Celine Costello Daly, Dick Zimba, Pietro L. Vernazza, Martin Maida, Susan A. Fiscus, Joseph J. Eron Jr, and the AIDSCAP Malawi Research Group\*

[Lancet](#). 1997 Jun 28;349(9069):1868-73.

# Effect of STD Treatment on HIV-1 RNA in Semen of Urethritis Patients (median values)



# Why not “MASS TREATMENT” of STIs to Prevent HIV?

- Mwanza, 1996: Treating STDs reduced HIV
- *Rakai, 1999: No benefit treating STDs?*
- Masaka, 2002: No benefit treating STDs?

(And... 4 more **negative** studies later)

# For STD Treatment to Prevent HIV

## You must treat the correct STD

- ✓ AT JUST THE RIGHT TIME
- ✓ IN JUST THE RIGHT PEOPLE (POPULATION)
- ✓ WITH THE CORRECT DRUGS (THAT WORK)
- ✓ FOR THE APPROPRIATE DURATION

*Only Mwanza met these criteria*

**Incomplete HSV-2 treatment compromises benefit**

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Genital Tract Viral Load

**Inflammatory STDs**

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ACUTE INFECTION

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Cytokine profile

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Hormonal contraception?

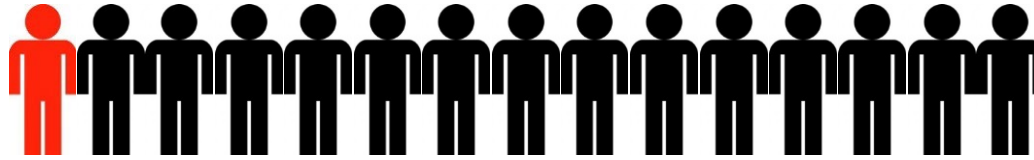
“Dysbiosis”?

# A Vicious Cycle: STDs *predict* future HIV Risk

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

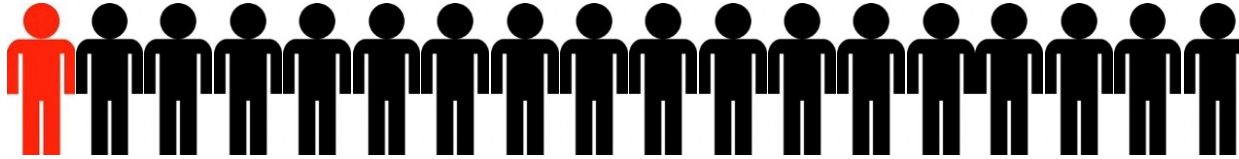
\*\*Matched STD/HIV Surveillance Data, New York City. Pathela, CID 2015:61

Rectal GC  
or CT



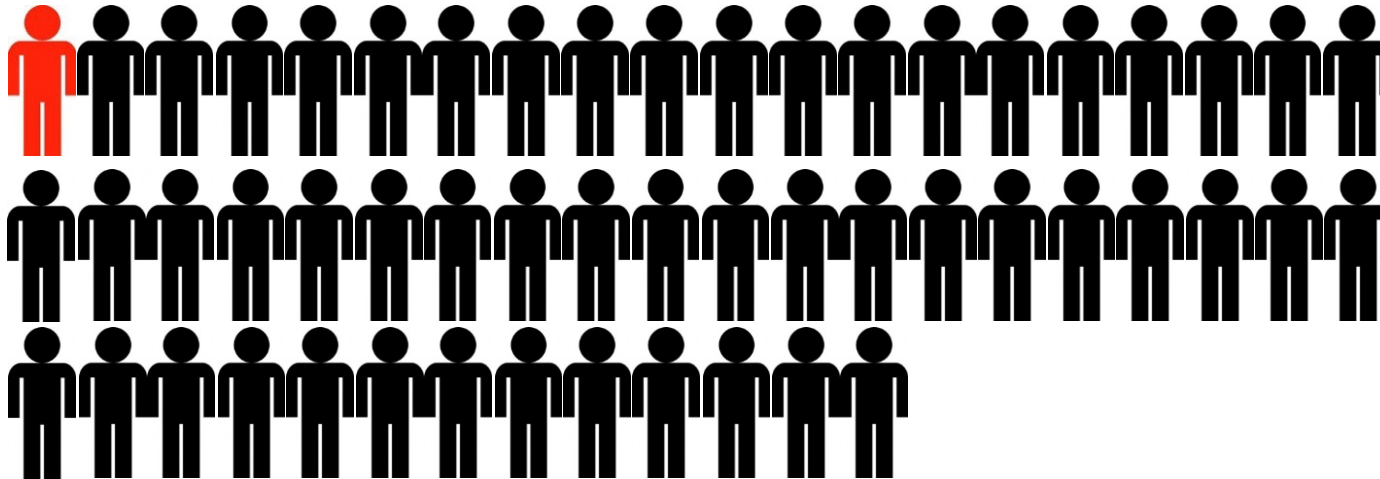
1 in 15 MSM were diagnosed with HIV within 1 year.\*

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.\*

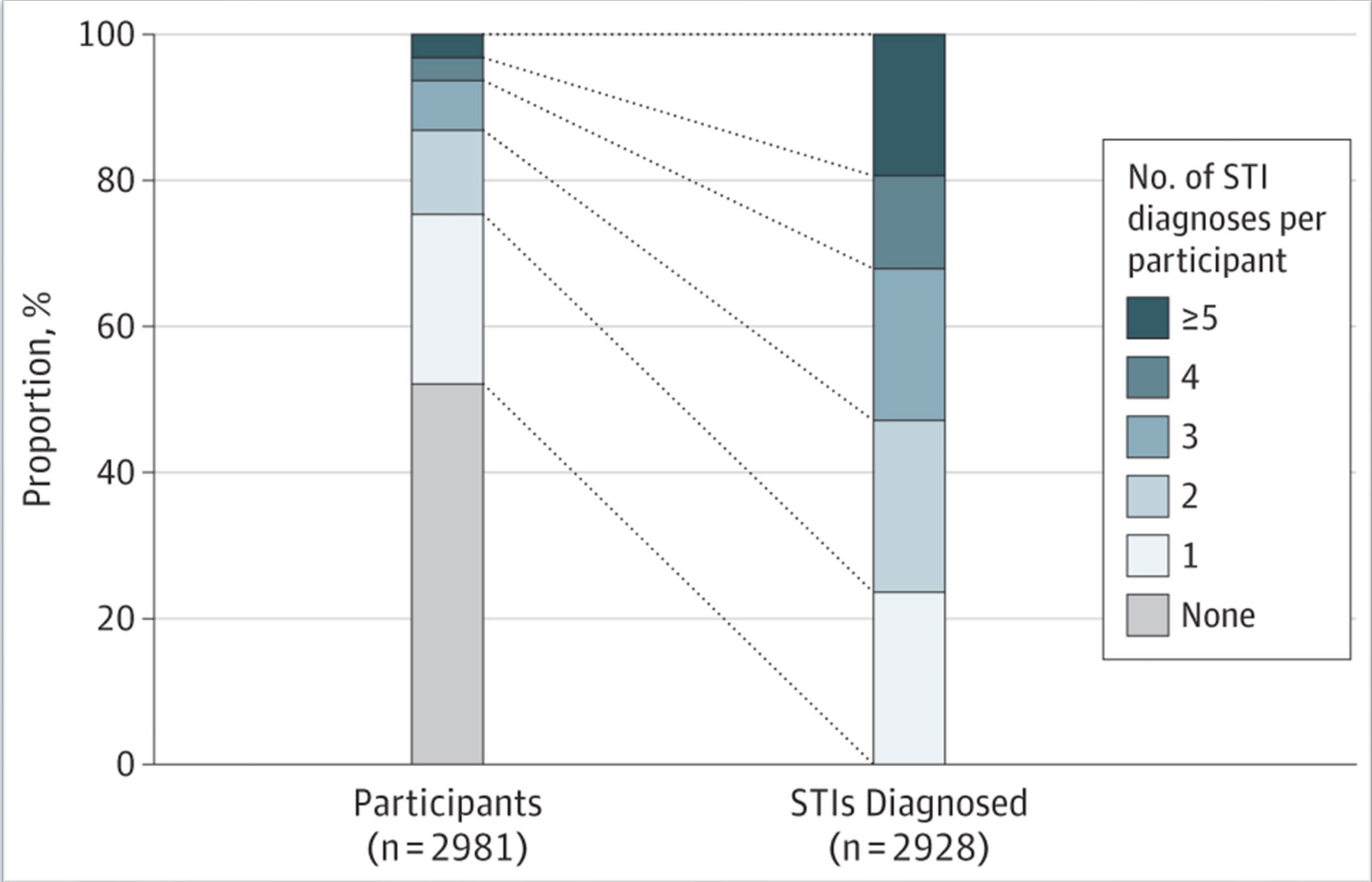
JAMA | **Original Investigation**

# Association of HIV Preexposure Prophylaxis With Incidence of Sexually Transmitted Infections Among Individuals at High Risk of HIV Infection

Michael W. Traeger, MSc; Vincent J. Cornelisse, MBBS, PhD; Jason Asselin, BSc; Brian Price, MBA; Norman J. Roth, MBBS; Jeff Willcox, MBBS; Ban Kiem Tee, MBBS; Christopher K. Fairley, MBBS, PhD; Christina C. Chang, MBBS, PhD; Jude Armishaw, BNurs; Olga Vujovic, MBBS; Matthew Penn, MBBS; Pauline Cundill, BM; George Forgan-Smith, MBBS; John Gall, MBBS, PhD; Claire Pickett, MBBS; Luxi Lal, BPharm; Anne Mak, BPharm; Tim D. Spelman, MBBS, MSc; Long Nguyen, MCom; Dean A. Murphy, PhD; Kathleen E. Ryan, PhD; Carol El-Hayek, MEpi; Michael West, BA; Simon Ruth, MSSc; Colin Batrouney, BA; John T. Lockwood, BN; Jennifer F. Hoy, MBBS; Margaret E. Hellard, MBBS, PhD; Mark A. Stoové, PhD; Edwina J. Wright, MBBS, PhD; for the PrEPX Study Team

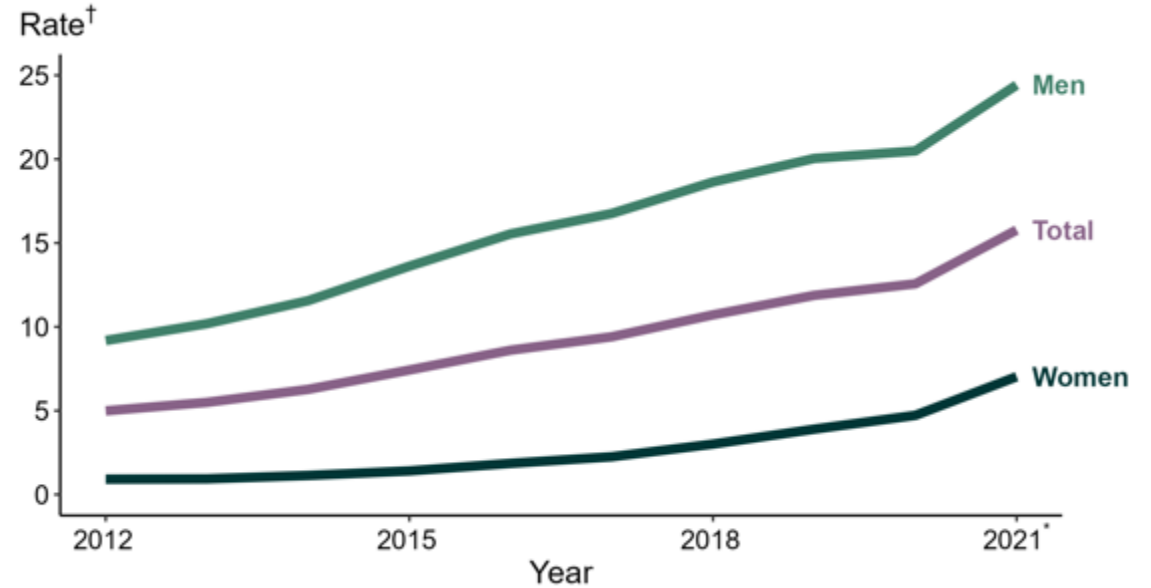
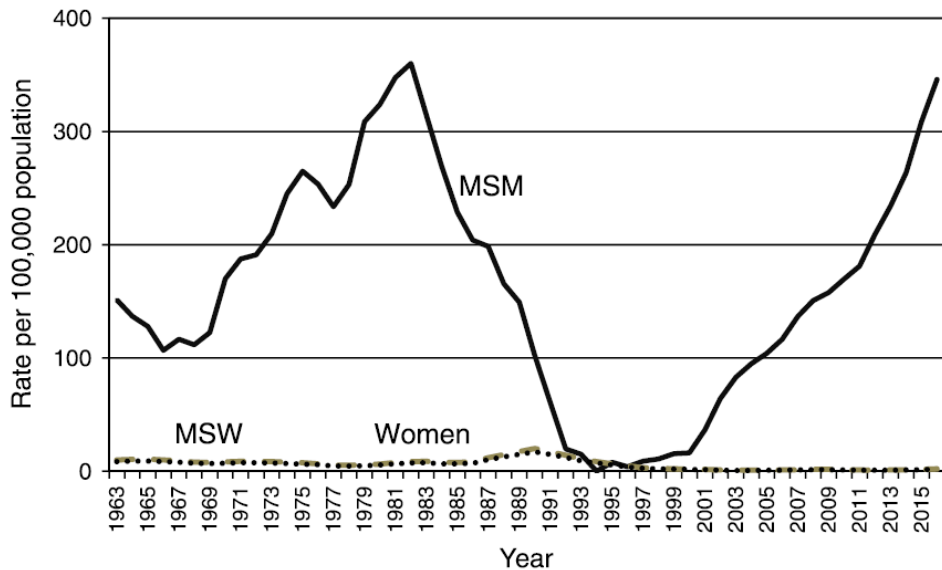


# Distribution of Participants and STI Diagnoses by Number of Infections per Participant During Follow-up



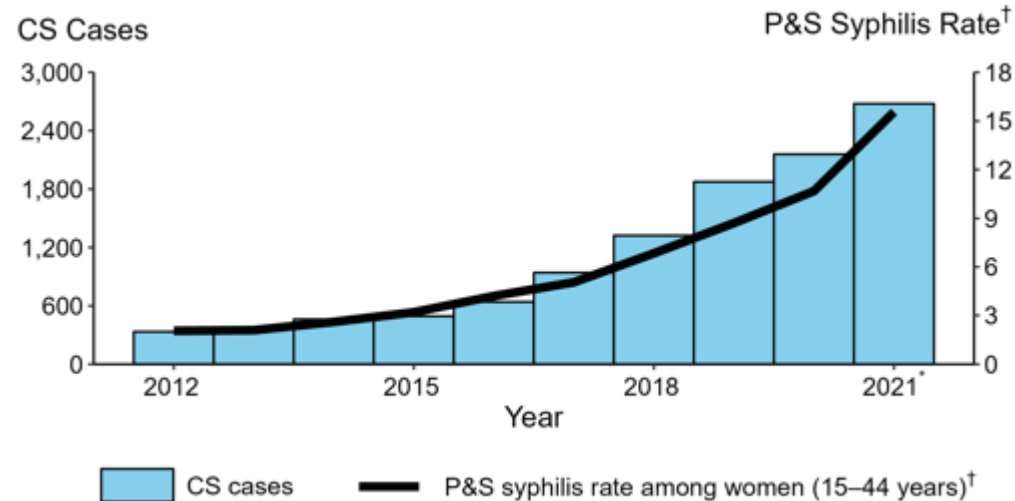
# The U.S. Syphilis Epidemic: 2021

## Primary / Secondary Syphilis in Men



## Primary/ Secondary & Congenital Syphilis in Women

- Primary / Secondary: 204% increase last 5 years; 49% from last year
- Congenital syphilis: 701% increase from 2012; 25% from last year



- 2677 congenital cases (74.1/100K live births)
- >50% of cases without prenatal care



Source: <http://www.cdc.gov/std>

# Doxycycline PEP in MSM

## Randomized open-label trial

- HIV-negative MSM on PrEP
- Enrolled in the ANRS IPERGAY open-label extension study
- No contra-indication to Doxy

On Demand PEP with doxycycline  
(200 mg, within 24-72h after sex)  
N=116

No PEP  
N=116

- \*  $\leq 6$  pills/week to limit antibiotic exposure: **use of a median of 6.8 pills/month per patient**
- Visits at baseline and every two months with serologic assays for HIV and syphilis and PCR assays for CT and NG in urine samples, anal and throat swabs

U.S. Centers for Disease Control and Prevention

**MMWR**

Recommendations and Reports / Vol. 73 / No. 2

Morbidity and Mortality Weekly Report

June 6, 2024



**U.S. DEPARTMENT OF  
HEALTH AND HUMAN SERVICES**  
CENTERS FOR DISEASE  
CONTROL AND PREVENTION

# **CDC Clinical Guidelines on the Use of Doxycycline Postexposure Prophylaxis for Bacterial Sexually Transmitted Infection Prevention, United States, 2024**

Laura H. Bachmann, Lindley A. Barbee, Philip Chan, Hilary Reno,  
Kimberly A. Workowski, Karen Hoover, Jonathan Mermin, Leandro Mena

# Gonorrhea in the US: 2021

National rate **210 per 100,000**

**696,764** cases reported



in last 5 years

Higher rate in **men** than women, but both increasing



**244.2** all ages  
64% of men= MSM

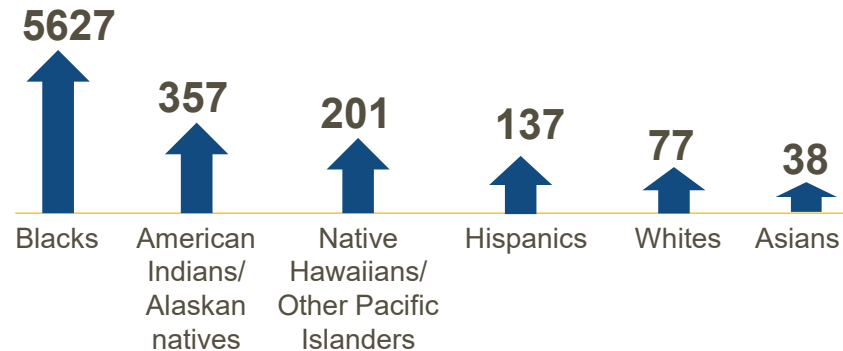


**173.1** all ages

Highest incidence among **15–24** year olds:

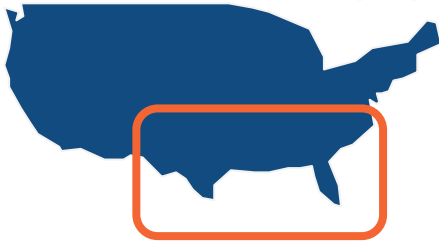


Highest rate (per 100,000) among certain ethnic groups:



Highest incidence in the south:

**235.7** per 100,000



The West had greatest 5-year increase (167.3 to 209.6 / 100,000; 25.3% increase from 2017) & 10-year increase (72.6 to 209.6 / 100,000; 188.7% increase from 2012)

# DRUG-RESISTANT GONORRHEA

## AN URGENT PUBLIC HEALTH ISSUE



# A Phase II randomized, observer-blind, placebo-controlled study to assess efficacy of meningococcal Group B vaccine MenB+OMV NZ (Bexsero) in preventing gonococcal infection (DMID Protocol 19-0004/HPTN 108)

## Study design

Phase II, randomised, observer-blind, placebo-controlled trial (USA and Thailand)

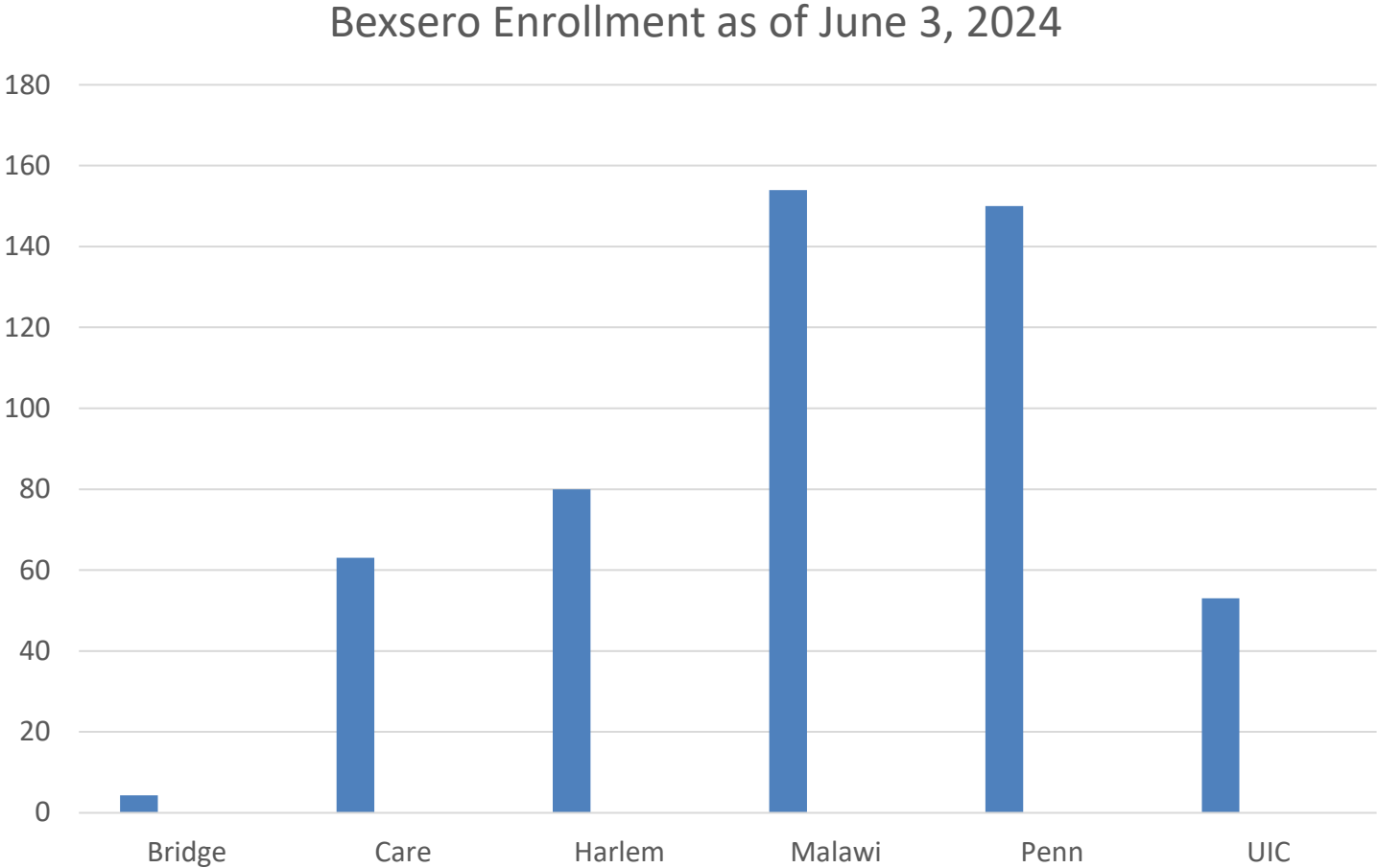
## Primary objective

Bexsero efficacy in preventing urogenital and/or anorectal gonococcal infection



**Recruiting** estimated completion **2024**  
**Target enrolment 2,200** to achieve **202** incident infections

# Enrollment of Participants in HPTN 107





# Where Do We Go From Here?

- STIs have their own serious consequences
- TASP and PrEP likely “overwhelm” STIs
  - HIV shed is either below concentration needed or NOT replication competent or bathed in ART
- Anticipate detection of AHI in STI clinics
- GC and syphilis have a special relationship to HIV

# Acknowledgements



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