



TRANSLATING EVIDENCE INTO ACTION FOR PUBLIC HEALTH: THE DOXY-PEP STORY



**IAS Webinar:
STIs: Global trends and prevention interventions**

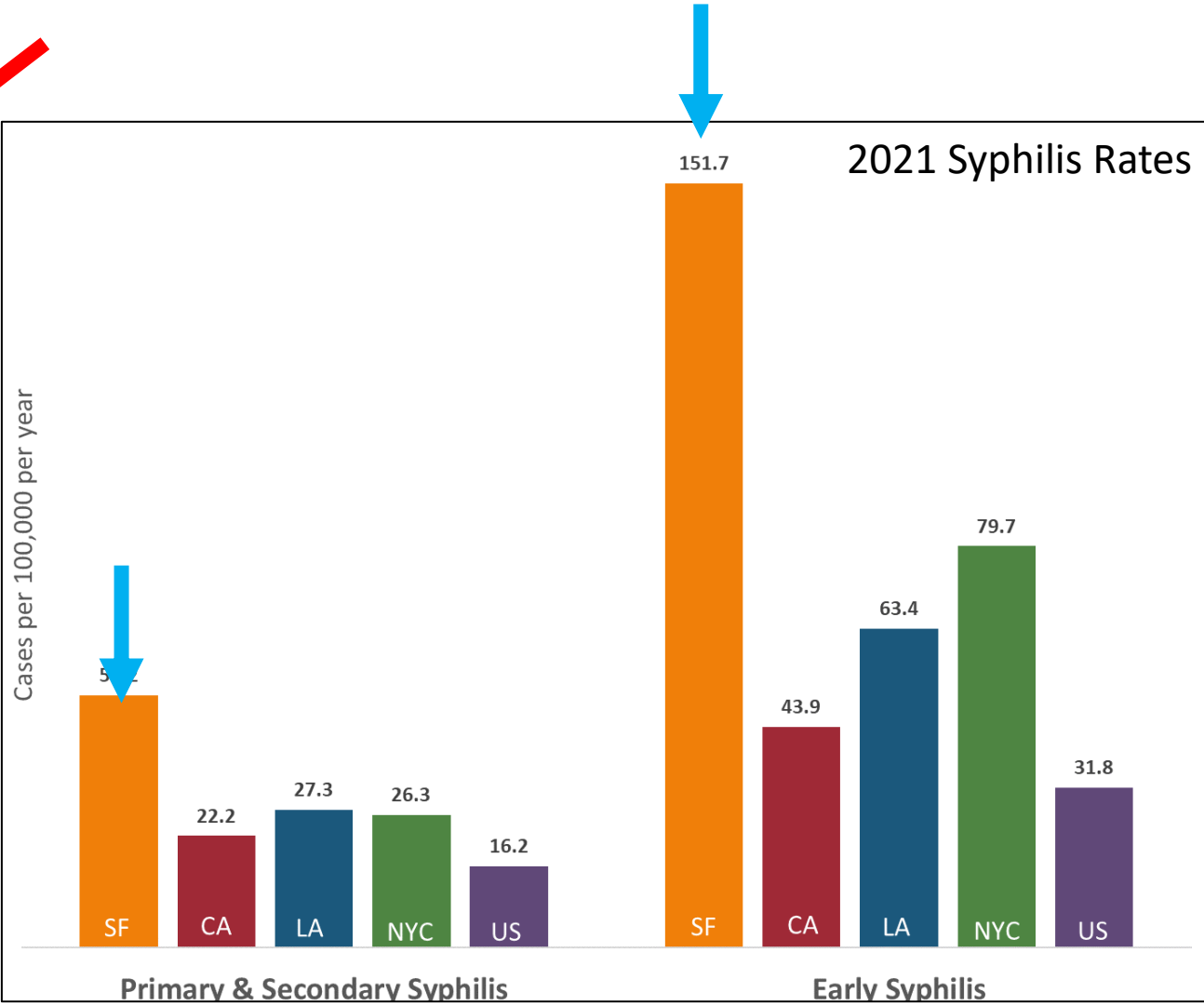
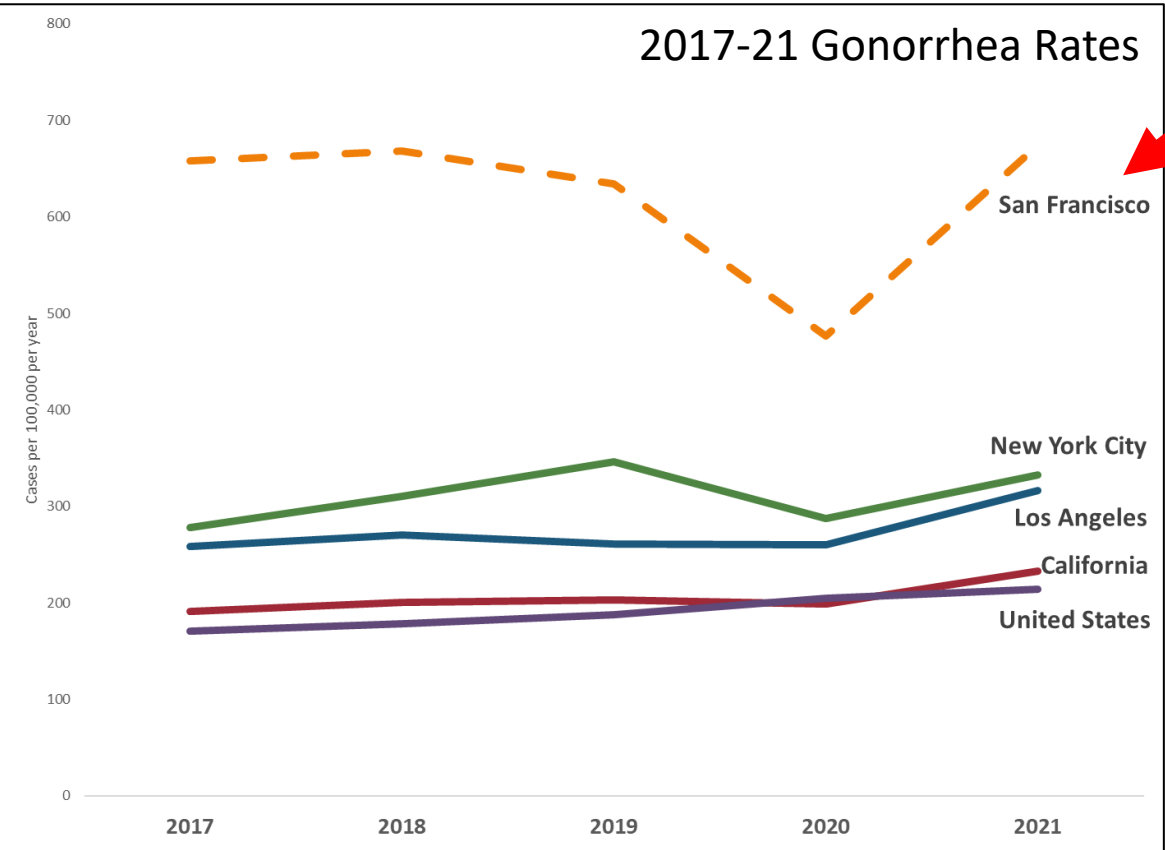
May 7, 2024

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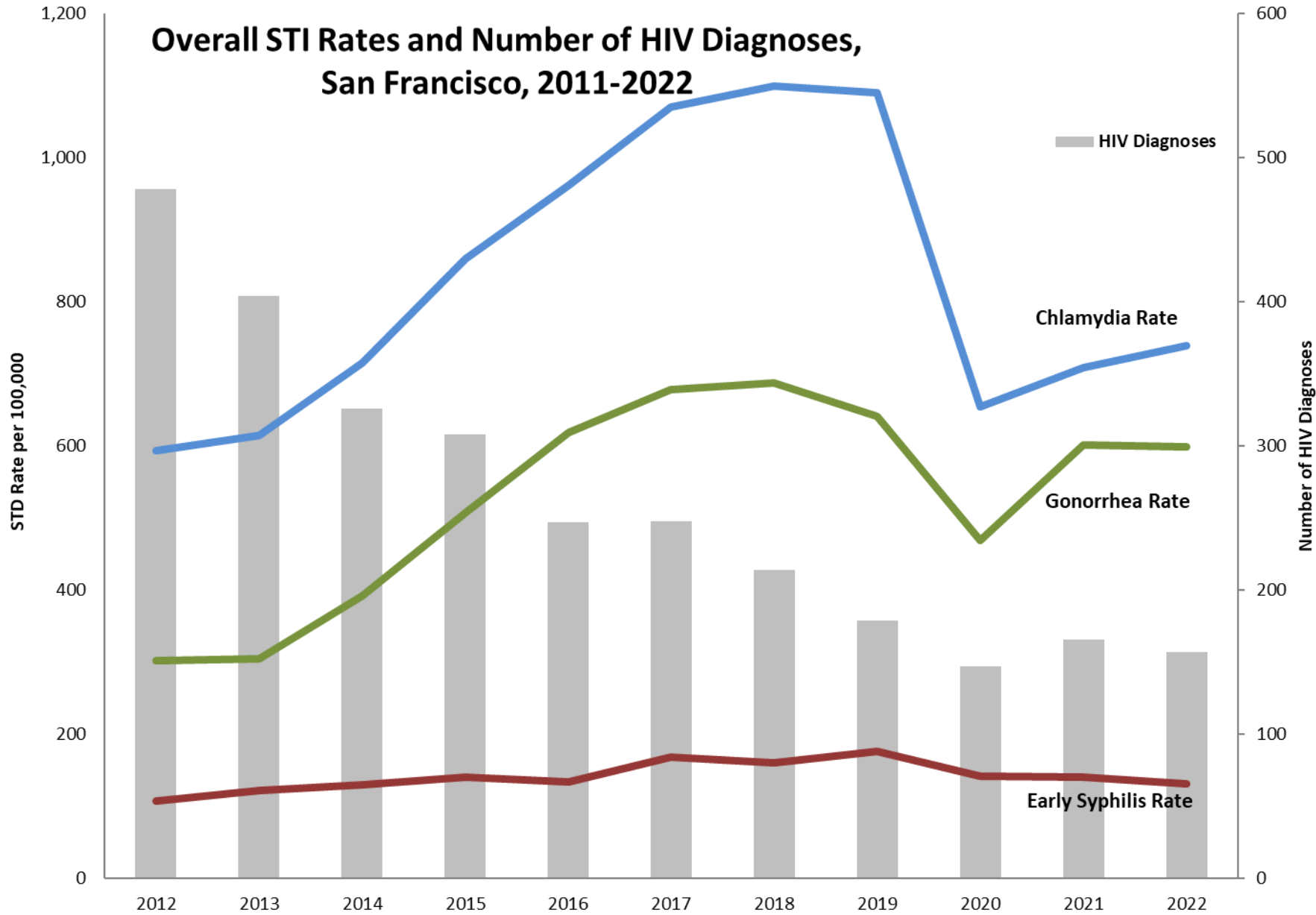


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San Francisco has higher chlamydia, gonorrhea, and syphilis rates compared to the United States overall, the state of California, Los Angeles and New York City.



Overall STI Rates and Number of HIV Diagnoses, San Francisco, 2011-2022



2014 to 2019:

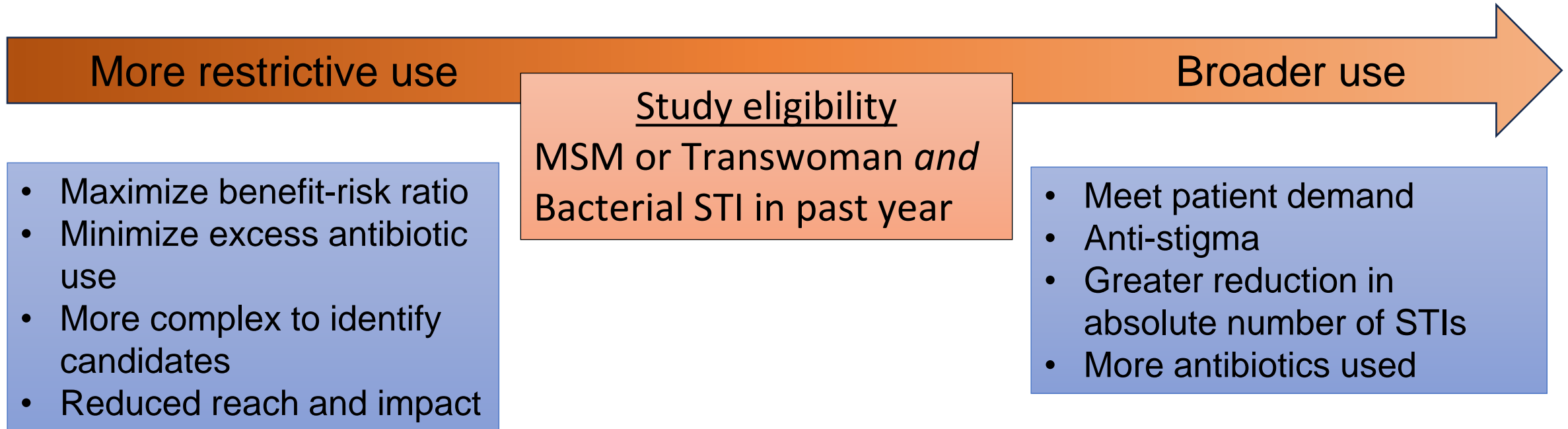
Chlamydia	76%
Gonorrhea	72%
Early Syphilis	45%

How to implement doxy-PEP in San Francisco?

- Eligibility criteria
- Monitoring uptake and population level impact of doxy-PEP



Who Should be Offered Doxy-PEP?



SFDPH: First jurisdiction in US to release guidelines for DoxyPEP



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Health Update

Doxycycline Post-Exposure Prophylaxis Reduces Incidence of Sexually Transmitted Infections

October 21, 2022

Situational Update

Researchers at the San Francisco Department of Health (SFDPH), Zuckerberg San Francisco General, University of California, San Francisco, and the University of Washington recently collaborated on a randomized controlled clinical trial of post-exposure prophylaxis (PEP) of sexually transmitted infections (STIs) using a single dose of doxycycline 200 mg within 72 hours after oral, anal, or vaginal sex, in men who have sex with men (MSM) and transgender women (TGW) who were living with HIV (PLWH) or taking HIV pre-exposure prophylaxis (HIV PrEP). **The study showed that this regimen significantly reduced acquisition of chlamydia, gonorrhea, and syphilis in these populations.**

Participants randomized to doxycycline PEP (doxy-PEP) had a 66% (HIV-negative and on PrEP) and 62% (PLWH) reduction in STIs per quarter of study follow-up, compared with participants randomized to standard of care (no doxy-PEP). Taking doxycycline was also safe and well-tolerated by participants, with no drug-related serious adverse events. These [data](#) were recently presented at the 2022 International AIDS Conference in Montreal, Canada. Data are still being collected and analyzed to assess the impact of doxy-PEP on risk for drug resistance in bacterial STIs, *Staph aureus*, and commensal *Neisseria*, and on the gut microbiome.

The CDC has released [considerations](#) for doxy-PEP as an STI prevention strategy, but there is not yet detailed guidance from CDC on doxy-PEP, for which its indication is currently off-label. STIs can cause significant morbidity and reducing STI rates in San Francisco is an urgent public health priority. **Doxy-PEP is the first biomedical prevention tool that has been shown to be effective and well-tolerated, community awareness is growing, and many providers in SF are already prescribing doxy-PEP to their patients at risk for STIs.** SFDPH is providing guidance to SF clinicians on the use of doxy-PEP to reduce STI incidence in MSM and TGW at risk of bacterial STIs.

Doxy-PEP

Interim Guidelines



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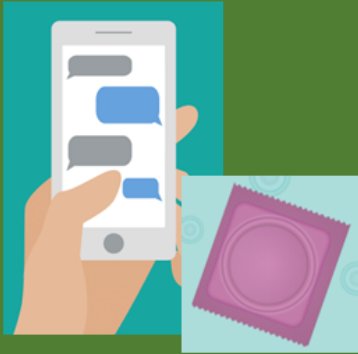
Health Update

Doxycycline Post-Exposure Prophylaxis Reduces Incidence of Sexually Transmitted Infections

October 21, 2022

- 1. Recommend doxy-PEP** to cis men and trans women who: 1) have had a bacterial STI in the past year and 2) report condomless anal or oral sexual contact with ≥ 1 cis male or trans female partner in the past year. Patients with a history of syphilis should be prioritized for doxy-PEP.
- 2. Offer doxy-PEP using shared decision making** to cis men, trans men and trans women who report having multiple cis male or trans female sex partners in the prior year, even if they have not previously been diagnosed with an STI.
- 3. Results from the Kenya D-PEP study found that doxy-PEP was *not* effective at preventing STIs among cis women.** Drug level data suggest that this may have been due to low adherence to doxy-PEP. Providers can consider offering doxy-PEP to cis women on a case-by-case basis, for example to women with a history of syphilis or women who exchange sex for money or drugs.

Doxy-PEP as part of a comprehensive package of sexual health services



Primary prevention

Education
Condoms
Risk reduction counseling
Contraception



Vaccines

Hepatitis A & B
HPV
Mpox
Meningococcal Vaccine (ACWY)



PEP, PrEP and TASP

HIV PEP
HIV PrEP (Daily, 2-1-1, LA-injectable)
Doxy-PEP
Linkage to ART



Secondary prevention

STI Screening & Treatment
Partner Services



Address social determinants of health

Mental health & Substance Use treatment
Anti-Poverty
Anti-Racism
Access to care



Policy

Reproductive rights
LGBTQ rights
Criminal justice reform

SF City Clinic began offering doxy-PEP in November 2022

- SF City Clinic (SFCC) is a nationally-recognized center of excellence in sexual health services
- Offers integrated HIV, STI and reproductive health care grounded in a syndemic approach
- Drop-in and appointments available
- Serve a diverse population
 - 39% B/AA or Latino, 15% Asian
 - 40% <30 years
 - 50% LGBTQ

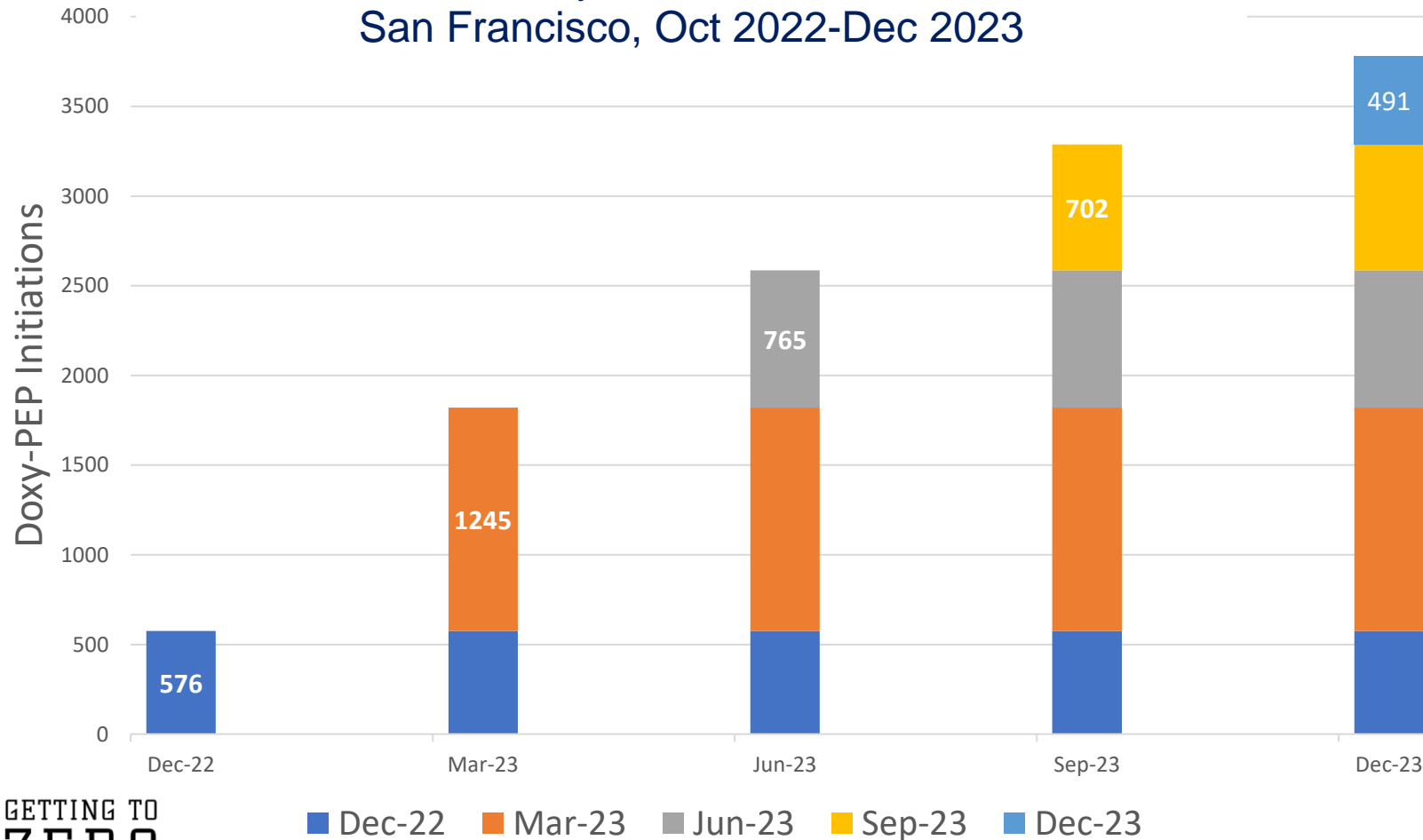


High uptake of doxy-PEP at SFCC

- At SF City Clinic, MSM and TGW are systematically informed about doxy-PEP at PrEP initiation or PrEP follow-up
- Between November 2022 and May 2023:
 - 74% of patients with GC, CT or syphilis in prior year started doxy-PEP
 - 60% of patients with ≥ 2 sex partners, but no STI history started doxy-PEP
 - Uptake was associated with having a higher # of sex partners in prior 3 months; not with demographic factors

High uptake of doxy-PEP in San Francisco after release of guidelines

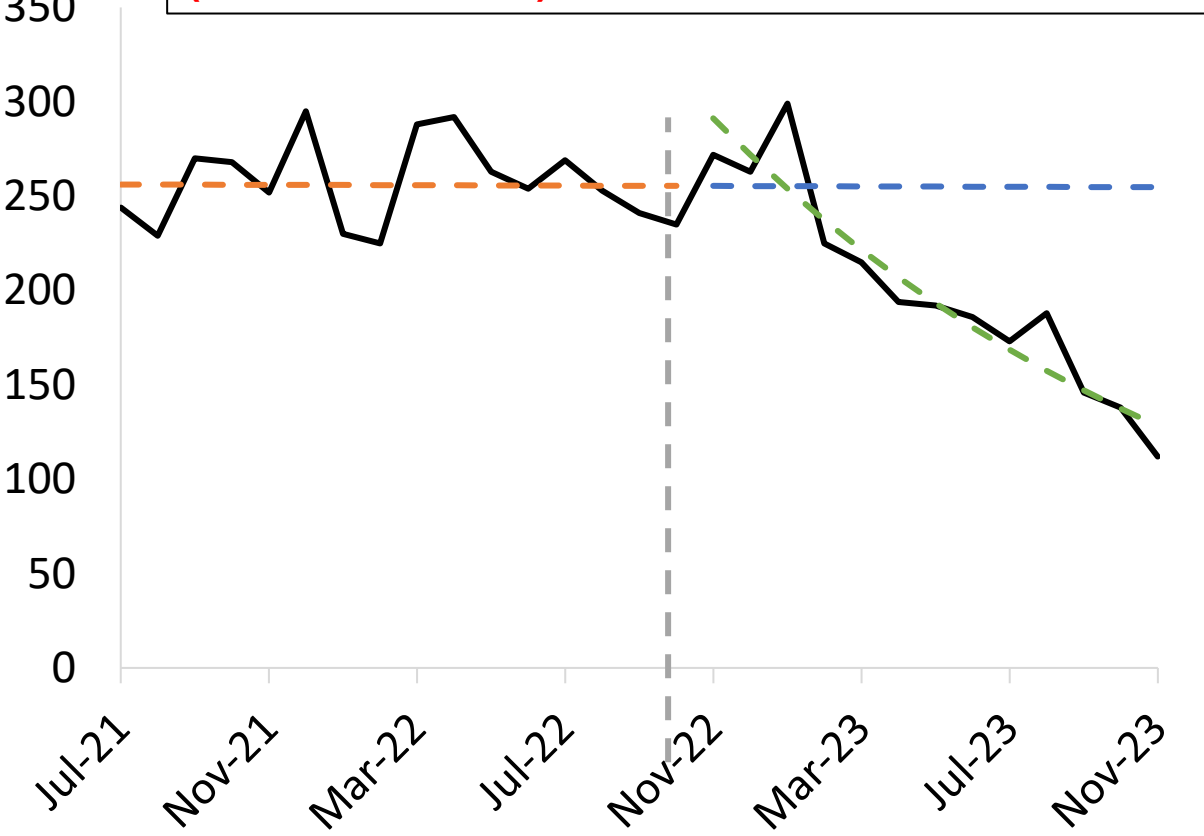
3779 Cumulative Doxy-PEP Initiations Across 3 Clinics, San Francisco, Oct 2022-Dec 2023



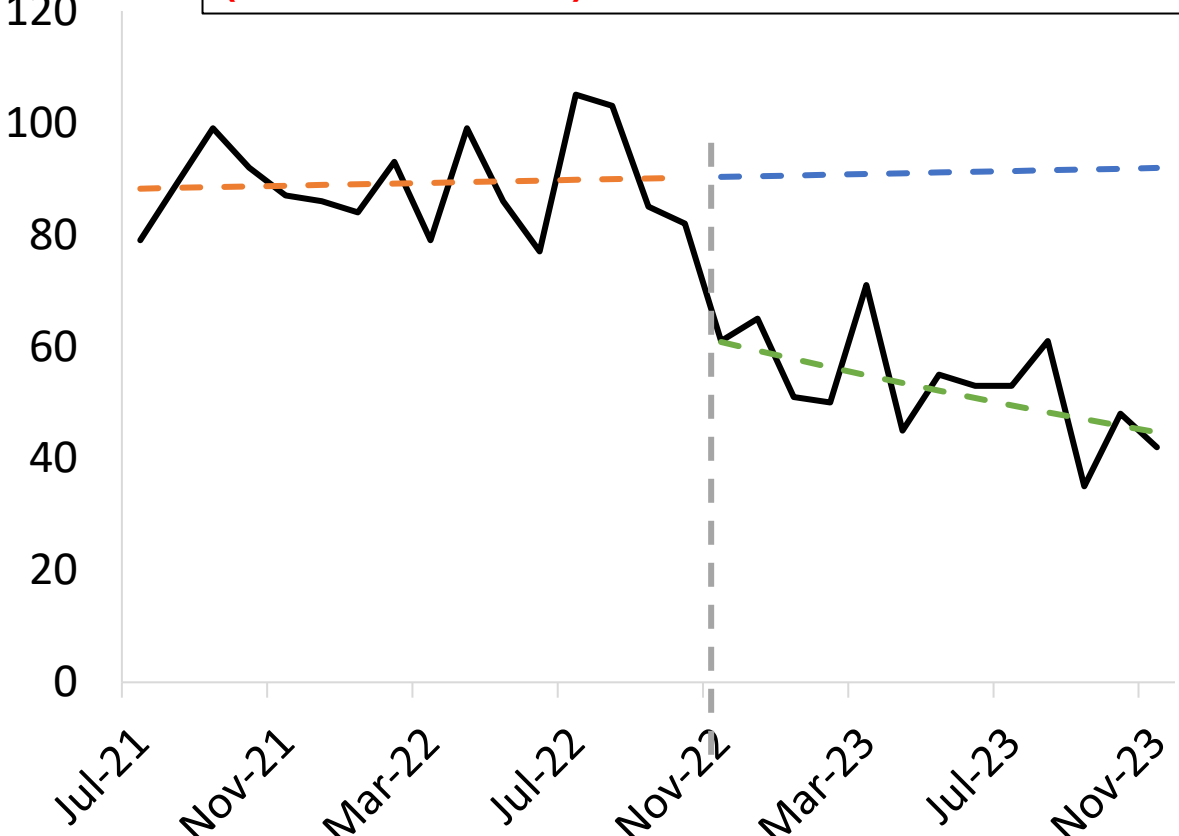
- Sentinel surveillance at 1 safety-net HIV clinic and 2 sexual health clinics
- High volume health maintenance organization and primary care clinics not included

Decline in **citywide** chlamydia and early syphilis cases in MSM in SF after release of doxy-PEP guidelines

In Nov 2023, observed **chlamydia** cases were **50%** (95% CI 38%-59%) lower than model forecasts



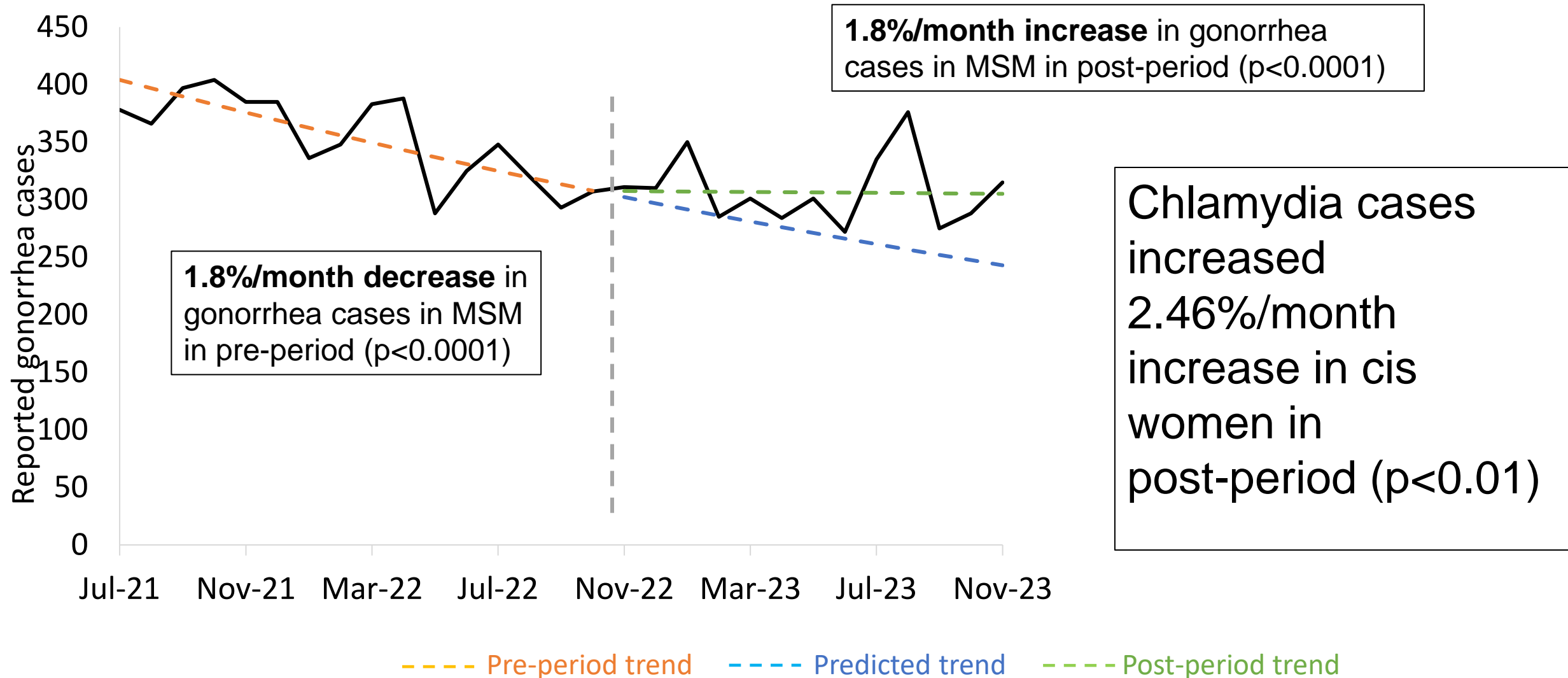
In Nov 2023, observed **syphilis** cases were **51%** (95% CI 43%-58%) lower than model forecasts



--- Pre-period trend --- Predicted trend --- Post-period trend

Sankaran M, CROI 2024 (abstract #127)

No decline in **citywide** gonorrhea cases in MSM, and continued increases in chlamydia in cis women in SF after release of doxy-PEP guidelines



Conclusions

- SFDPH moved quickly to translate evidence from a research study into services for our community
- Remarkable citywide collaboration and our engaged community facilitated early adoption of this new tool
- Early evidence of a population-level impact of doxy-PEP on chlamydia and syphilis rates, but not gonorrhea
 - Longer follow-up and to replicate findings in other jurisdictions
 - Information about antimicrobial resistance
- Providers should support their patients in assessing their need for, interest in, and use of doxy-PEP
- Guidelines for doxy-PEP can and should evolve as evidence emerges, informed by community input

THANK YOU!

SF City Clinic Patients & Study Participants



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Dave Glidden
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Trang Nguyen
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Franco Chevalier
Judith Sansone
Montica Levy
Christopher Ruiz
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SF Getting to Zero
DoxyPEP study team
Susan Philip
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Extra Slides



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Timeline of Doxy-PEP in San Francisco

- 2017:
 - Results of Ipergay study showing efficacy of doxy-PEP released
 - Early adopters begin using doxy-PEP in SF and interest grows
- November 2019:
 - US DoxyPEP study launched in San Francisco and Seattle
- May 2022:
 - At planned interim analysis, DSMB instructed investigators to stop randomization as pre-specified efficacy endpoint had been met
- July 2022:
 - Doxy-PEP results presented at International AIDS Conference

Readable, concise, non-stigmatizing patient and provider facing education in multiple languages

About Doxy-PEP



What is doxy-PEP?

- Doxy-PEP means taking the antibiotic doxycycline after sex, to prevent getting an STI. It is like a morning-after pill but for STIs. Taking doxy-PEP reduces your chance of acquiring syphilis, gonorrhea, and chlamydia by about two-thirds.

When should I take doxy-PEP?

- Two 100 mg pills of doxycycline should be taken after condomless sex. Condomless sex means isn't used for the entire time.

What about when I have sex again?

- If you have sex again within 24 hours of taking last dose. You can take doxycycline as often as you don't take more than 200 mg (two 100 mg pills).

How should I take doxy-PEP?

- Take doxycycline with plenty of water or some you swallow. If your stomach is upset by doxy-PEP, you can take it with food.
- Some people are more sensitive to the sun when taking doxycycline.
- Please do not share doxycycline with others.
- Avoid dairy products, calcium, antacids, or iron supplements.

What are we still learning about doxy-PEP?

- Does it affect normal ("good") bacteria in our bodies?
- Could it increase or decrease the bacteria that cause STIs (for example, chlamydia, gonorrhea, and syphilis)?
- Will doxy-PEP increase doxycycline resistance?
 - Although doxycycline has been used for decades to treat STIs, there is growing concern about doxycycline resistance in some strains of gonorrhea in the US and other countries.
 - The DoxyPEP study and other studies are looking at whether doxy-PEP changes resistance in gonorrhea.

Reminders

- Call us at 628-217-6692 if you run out of doxy-PEP or think you may have an STI.
- Please continue to get tested for STIs every 3 months.
- Doxy-PEP doesn't protect against MPX (monkeypox).



Acerca de Doxy-PEP



¿Qué es doxy-PEP?

- El doxy-PEP significa tomar el antibiótico doxiciclina después de las relaciones para prevenir contraer una infección de transmisión sexual (ITS). Es como una pastilla del día después pero para las ITS. Tomar doxy-PEP reduce la probabilidad de contraer sífilis, gonorrea y clamidia en aproximadamente dos tercios.

¿Cuándo debo tomar doxy-PEP?

- Se toma dos pastillas de doxiciclina de 100 mg dentro de las 24 horas, pero a más tardar 72 horas después de tener relaciones sexuales sin condón. Las relaciones sin condón significa las relaciones orales, anales o vaginales/con agujero delantero, en las que no se usa un condón todo el rato.

¿Y qué pasa si vuelvo a tener relaciones?

- Si vuelve a tener relaciones dentro de las 24 horas después de tomar doxiciclina, tome otra dosis 24 horas después de la última dosis. Puede tomar doxiciclina tan frecuentemente como todos los días cuando esté teniendo relaciones sin condón, pero no tome más de 200 mg (dos pastillas de 100 mg) cada 24 horas.

¿Cómo debo tomar doxy-PEP?

- Tome la doxiciclina con abundante agua o algo más para beber para que no se atase al tragar. Si la doxiciclina le produce malestar estomacal, puede ser útil tomarla con alimentos.
- Algunas personas son más sensibles al sol cuando toman doxiciclina, así que use protector solar.
- No comparta la doxiciclina con otras personas.
- Evite los productos lácteos, el calcio, los antácidos o las multivitaminas dentro de las 2 horas antes o 2 horas después de tomar doxiciclina para una absorción óptima de doxiciclina en el cuerpo.

¿Qué estamos aprendiendo todavía sobre doxy-PEP?

- ¿Afecta las bacterias normales ("buenas") en nuestros intestinos?
- ¿Podría aumentar o disminuir las bacterias que viven en nuestra piel, o hacerlas resistentes a la doxiciclina?
- ¿Doxy-PEP aumentará la resistencia a la doxiciclina en las bacterias que causan las ITS?
 - Aunque la doxiciclina se ha utilizado durante décadas, no parece haber resistencia a la doxiciclina en la clamidia ni en la sífilis.
 - Alrededor del 25% de la gonorrea en los EE. UU. ya es resistente a doxy-PEP, pero doxy-PEP puede no funcionar contra estas cepas. El estudio DoxyPEP, y otros estudios científicos, nos ayudarán a comprender si el uso de doxy-PEP cambia la resistencia en la gonorrea.

Recordatorios

- Llámenos al 628-217-6692 si se le acaba la doxiciclina, si tiene algún efecto secundario o si cree que puede tener una ITS.
- El doxy-PEP reduce la posibilidad de contraer sífilis, gonorrea y clamidia, pero estas ITS aún pueden ocurrir. Continúe haciéndose la prueba a intervalos regulares y si tiene síntomas.
- Doxy-PEP no protege contra MPX (viruela del mono), VIH u otras infecciones virales.



Doxy-PEP fact sheet for healthcare providers in San Francisco

What is doxy-PEP?

Doxycycline post-exposure prophylaxis (doxy-PEP) is using **doxycycline 200 mg within 72 hours after oral, anal, or vaginal sex to prevent the acquisition of chlamydia, gonorrhea, and syphilis.**

A recent study showed doxy-PEP was effective among men who have sex with men (MSM) and trans women living with HIV (62% reduction in acquisition) or taking HIV PrEP (65% reduction).¹ Efficacy against other bacterial sexually transmitted infections (STIs) is not known, and doxy-PEP does not prevent HIV, monkeypox (mpox), or other viral infections.

Who can take doxy-PEP?

Recommend doxy-PEP to **gay, bisexual, and other MSM and trans women who:**

- have had condomless sex with ≥ 1 cis man or trans woman in the past year, and
- have had an STI in the past year.

Offer doxy-PEP using shared decision-making to **cis men, trans women, trans men, and other gender diverse patients who:**

- have had condomless sex in the past year with ≥ 2 cis men or trans women regardless of STI history.

More data is needed on the efficacy of doxy-PEP in cis women.

The only study to date among cis women did not find doxy-PEP effective at preventing STIs, possibly due to adherence.² If prescribing doxy-PEP to cis women due to STI risk factors like multiple STIs or sex work, discuss lack of efficacy data and advise not to use when pregnant.

Dosing and prescribing guidance

- 200 mg of doxycycline taken as soon as possible** after condomless oral or anal sex, but **no later than 72 hours afterward.**
- Doxycycline can be taken every day** depending on frequency of sexual activity, but **no more than 200 mg within a 24-hour period.**
- Acceptable formulations:**
 - Doxycycline hyclate or monohydrate **immediate release 100 mg** (2 tabs taken together)
 - Doxycycline hyclate **delayed release 200 mg** (1 tab), but typically much costlier
- Example Rx:** doxycycline 100 mg, #60, 1 refill, take 2 capsules (200 mg) by mouth as needed ASAP after condomless sex, and no later than 72 hours after. Do not take more than 200 mg in a 24-hour period.
- ICD-10 diagnosis code Z20.2** (Contact with and (suspected) exposure to infections with a predominantly sexual mode of transmission).

Healthcare providers in San Francisco

How should I monitor patients taking doxy-PEP?

Screen for gonorrhea and chlamydia at all anatomic sites of exposure, and HIV (if not known to be living with HIV).

If a patient is **diagnosed with an STI while using doxy-PEP**, they should be treated according to standard CDC STI treatment guidelines (www.bit.ly/STI_guides).

When utilizing doxy-PEP reports:

- Report to a sexual partner with syphilis:** epi-treat for syphilis per standard of care.
- Report to a sexual partner with gonorrhea or chlamydia:** consider waiting on treatment until test results are back using shared decision-making with patient.

How should I counsel patients taking doxy-PEP?

Take doxycycline with fluids and remain upright for 30 minutes after the dose to reduce dyspepsia. Taking doxycycline with food may increase tolerability.

Be aware of **photosensitivity.** Patients should be counseled to wear sunscreen and/or avoid prolonged sun exposure while taking doxycycline.

Advise patients on **doxycycline during pregnancy.** Patients who could get pregnant should receive counseling about the risks of doxy-PEP and be counseled to stop doxycycline if they become pregnant.

Be aware of a rare risk of benign intracranial hypertension and other serious side effects.

Discuss the **unknown risks** of doxy-PEP related to the microbiome and antibiotic resistance.

For more information in our patient-facing counseling handout and dosing instructions.

How do I refer patients to comprehensive sexual health services?

Refer patients to **PrEP to all sexually active people** if they are not already taking it. Options include oral PrEP, 2-1-1 PrEP, and injectable PrEP.

Advise **people living with HIV are in care** and inform patients that maintaining an undetectable HIV viral load eliminates the risk of transmitting HIV to sexual partners.

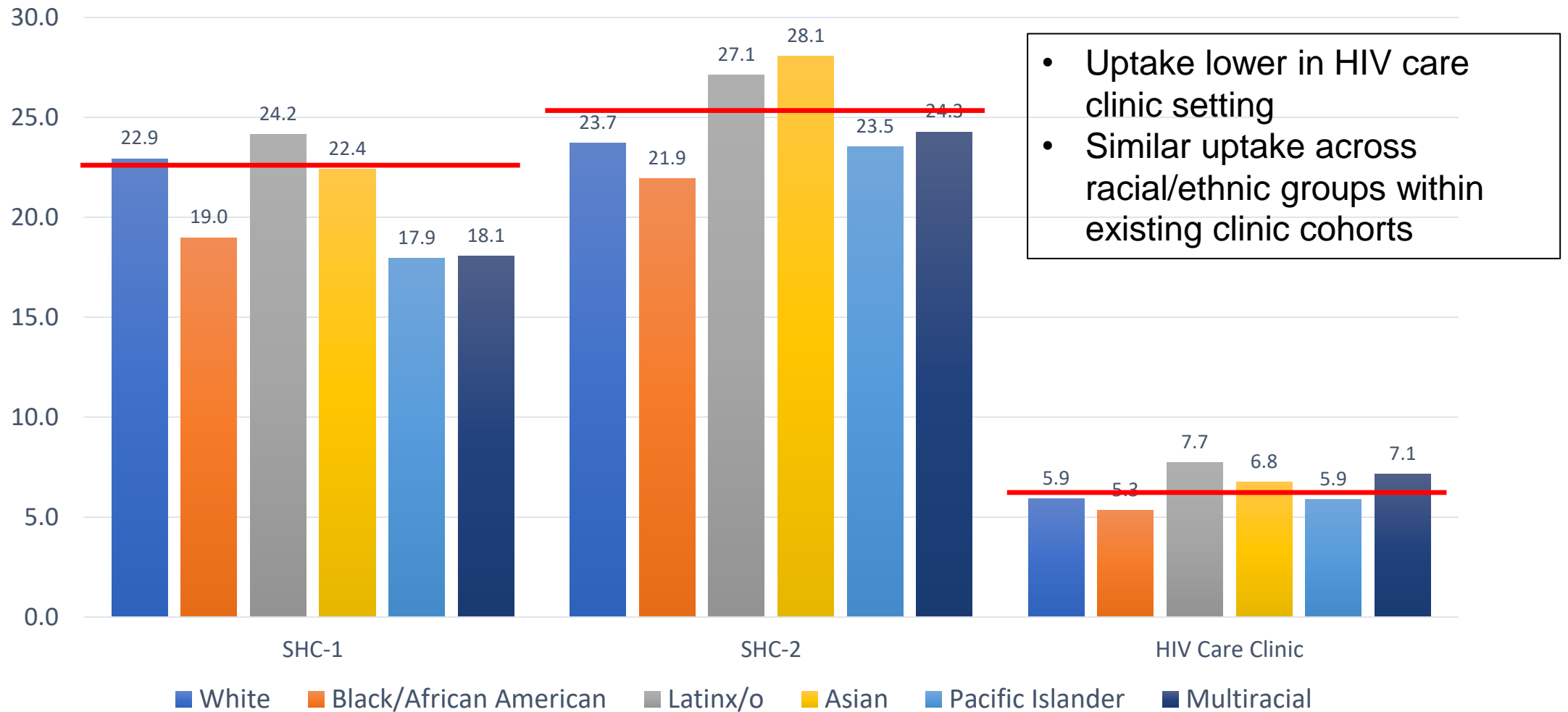
Screen for gonorrhea and chlamydia (using urine, pharyngeal, and rectal swabs) and syphilis, regardless of HIV serostatus.

STI **services should be offered for eligible individuals.** These could include mpox (monkeypox), meningococcal (MenACWY), hepatitis A, hepatitis B, and HPV.

For **additional guidance**, visit our website (sfccityclinic.org): www.bit.ly/doxy-PEPupdate or contact Alyson Decker: alyson.decker@sfdph.org

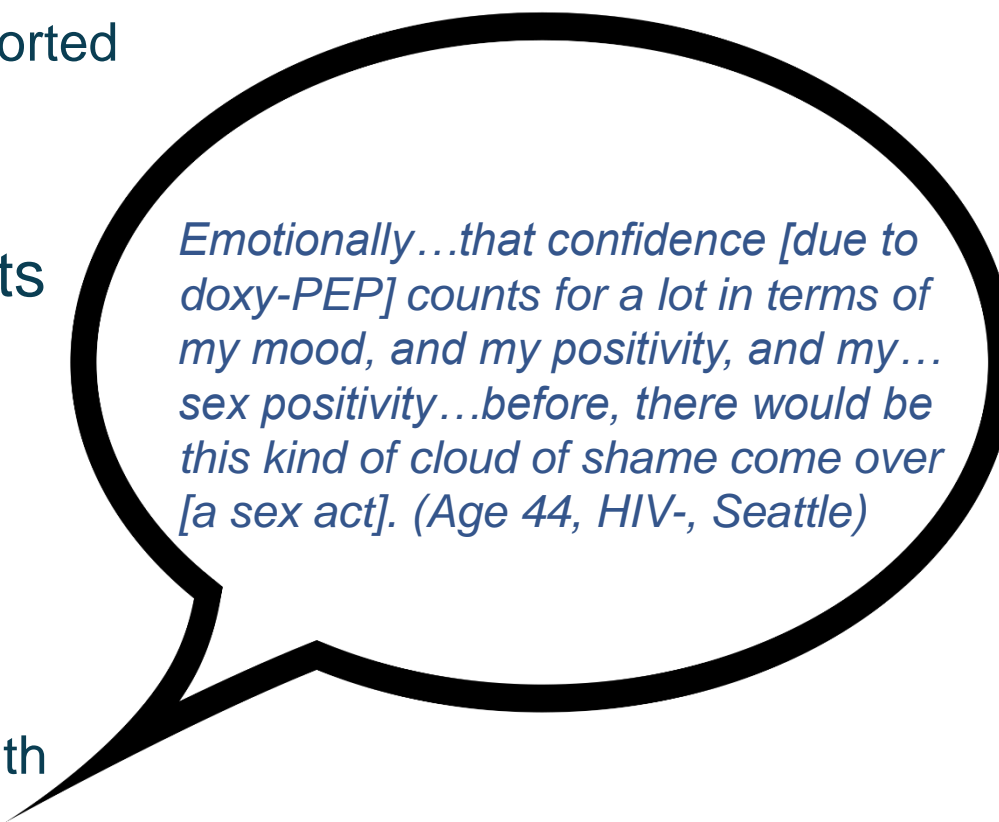
1. AF, et al. Postexposure Doxycycline to Prevent Bacterial Sexually Transmitted Infections. *N Engl J Med*. 2023; 388:1296-1306.
2. Doxycycline Prophylaxis to Prevent Bacterial Sexually Transmitted Infections in Women. *N Engl J Med*. 2023; 389(25):2331-2340.

Doxy-PEP Uptake by Race/Ethnicity at 2 Sexual Health Clinics (SHC) and 1 HIV Care Clinic San Francisco, Oct 2022 – Dec 2023



Patient Experience and Adverse Events

- Patients report using doxy-PEP selectively
 - At follow-up visits, 89% of those prescribed doxy-PEP reported using it, but not with every condomless sex act
- Occasional discontinuations related to GI side effects
- Sex-positive and person-first intervention
 - Improved peace of mind and sexual pleasure
 - Decreased stigma around STI diagnosis and disclosure
 - Increased self-awareness about sexual behavior
 - Facilitates communication with partners about sexual health



Emotionally...that confidence [due to doxy-PEP] counts for a lot in terms of my mood, and my positivity, and my... sex positivity...before, there would be this kind of cloud of shame come over [a sex act]. (Age 44, HIV-, Seattle)

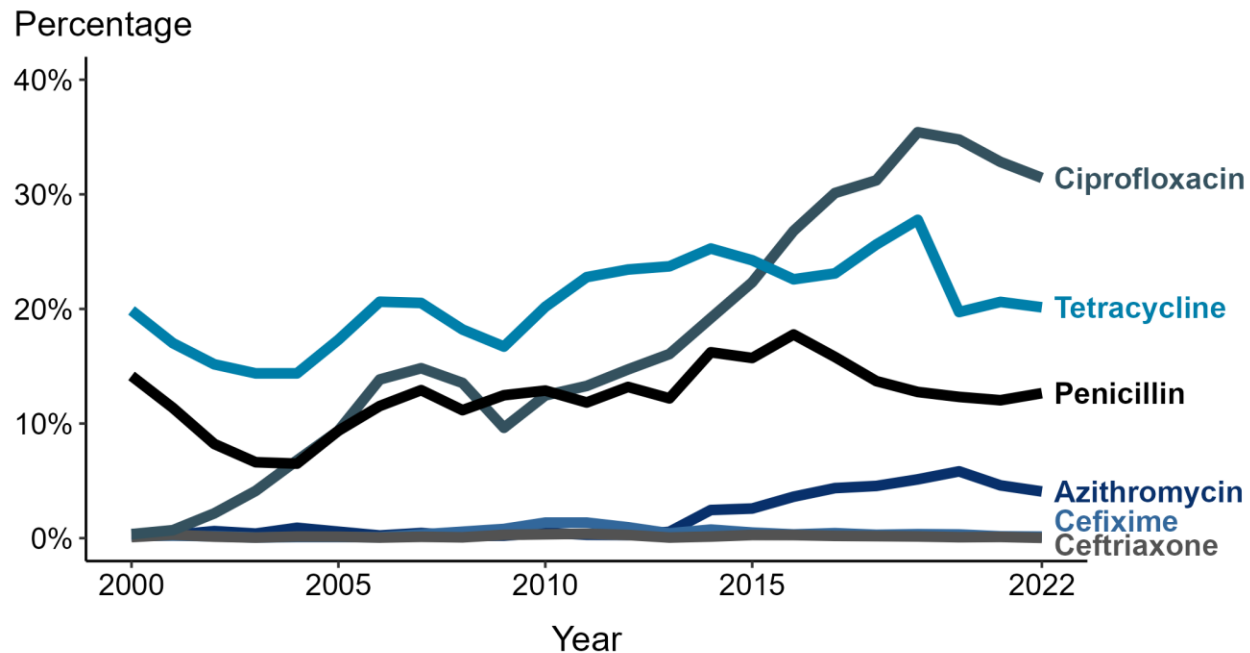
Decline in chlamydia and syphilis among PrEP patients receiving doxy-PEP at sexual health clinics in SF

	CBO-run sexual health clinic 6/1/22-9/1/23	Municipal sexual health clinic 11/3/21-10/30/23
Chlamydia	67% decrease [IRR: 0.33, 95% CI: 0.23-0.46]	90% decrease [RR: 0.10, 95% CI: 0.05-0.21]
Syphilis	78% decrease [IRR 0.22, 95% CI: 0.09-0.54]	56% decrease [RR 0.44, 95% CI 0.21-0.92]
Gonorrhea	11% decrease [IRR 0.89, 95% CI 0.69-1.15]	23% decrease [RR 0.77, 95% CI 0.58–1.02]



Surveillance systems to monitor for anti-microbial resistance

Neisseria gonorrhoeae — Prevalence of Tetracycline, Penicillin, or Ciprofloxacin Resistance* or Elevated Cefixime, Ceftriaxone, or Azithromycin Minimum Inhibitory Concentrations (MICs)†, by Year — Gonococcal Isolate Surveillance Project (GISP), 2000–2022



- CDC supports sentinel surveillance for culture-based GC antibiotic susceptibility testing
- Need systems for monitoring non-STI pathogens, including staph aureus, strep pneumo and E. coli
- Challenging to discern specific impacts of doxy-PEP in context of overall doxycycline use in medicine and agriculture