

January 2026 AIDS Clinical Conference

Tuesday, January 20, 2026

The Latest in STI Prevention, Diagnosis, and Treatment

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Last Updated: 12/5/2025

Disclosures

No conflicts of interest or relationships to disclose

Disclaimer

Funding for this presentation was made possible by 1TR7HA53202-01-00 from the Human Resources and Services Administration HIV/AIDS Bureau. The views expressed do not necessarily reflect the official policies of the Department of Health and Human Services nor does mention of trade names, commercial practices, or organizations imply endorsement by the U.S. Government. *Any trade/brand names for products mentioned during this presentation are for training and identification purposes only.*

Acknowledgement

This Mountain West AIDS Education and Training (MWAETC) program is supported by the Health Resources and Services Administration (HRSA) of the U.S. Department of Health and Human Services (HHS) as part of an award totaling \$2,820,772 with 0% financed with non-governmental sources.

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Today's agenda

- Examine the most recent data on the use of doxycycline to prevent STI
- Consider the impacts of doxy PEP on antimicrobial resistance
- Discuss trends in mpox cases in Washington State and King County
- Explore the latest developments in testing and treatment for Mycoplasma genitalium
- Integrate BV partner treatment into your practice

Doxycycline for STI prevention

Poll: Doxycycline for STI prevention is most effective against which of the following STIs?

- Syphilis
- Chlamydia
- Gonorrhea
- Syphilis and chlamydia
- Syphilis and gonorrhea
- Chlamydia and gonorrhea
- All three equally!

Doxycycline as PRE-exposure prophylaxis (doxy PrEP): data from Canada and Japan

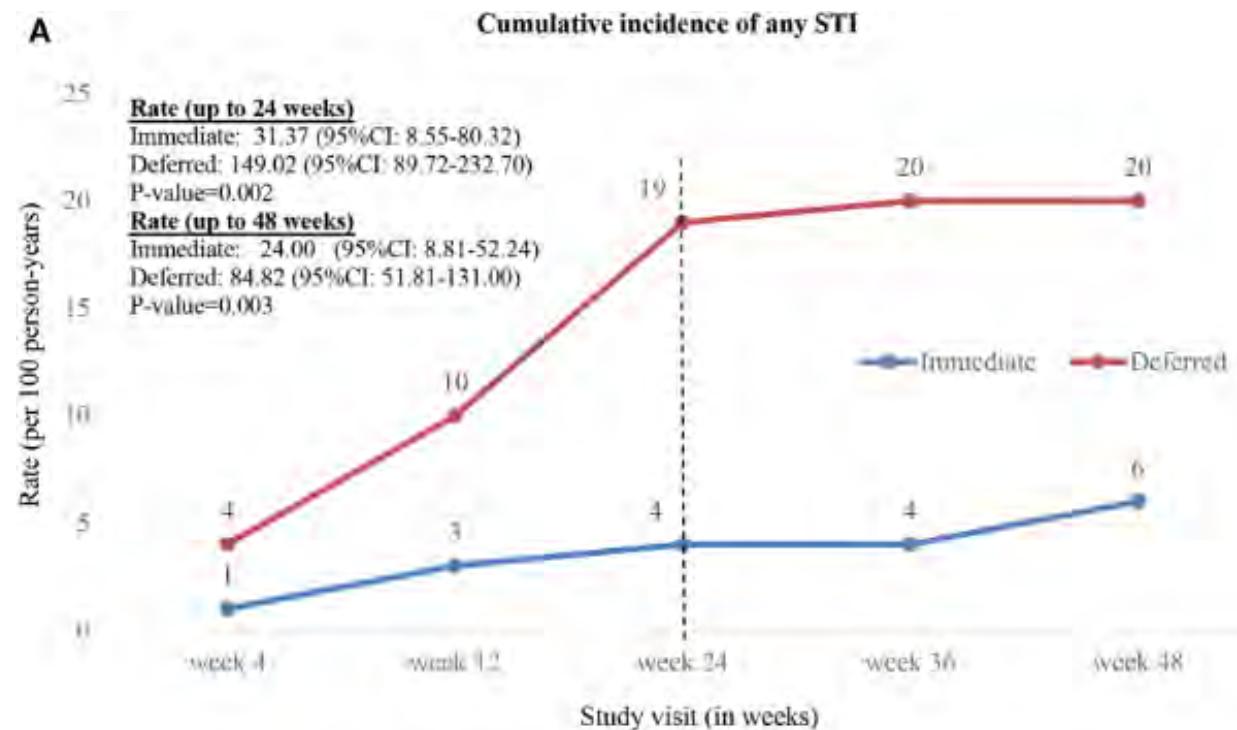
Daily doxycycline pre-exposure prophylaxis in men living with HIV for STI prevention (DaDHS)

- 52 men living with HIV who have male partners
- Vancouver, BC and Toronto, ON
- Recruitment from: 1/2020-1/2023
- Randomized 1:1 to take doxycycline 100 mg PO daily v placebo
- Median age = 43 (IQR 38-45)
- 21% Latinx
- Median years living with HIV = 8 (IQR 1-33)
- 87% with undetectable viral load
- Median sex partners in prior 3 months = 5 (IQR 5-15)
- 41/52 (79%) completed the 48-week protocol
- 70% took $\geq 90\%$ of their daily doxy
- One person stopped doxy due to worsening GERD

	Relative decrease in STI incidence (doxy v placebo)
Chlamydia	↓ 92%
Gonorrhea	↓ 68%
Syphilis	↓ 79%

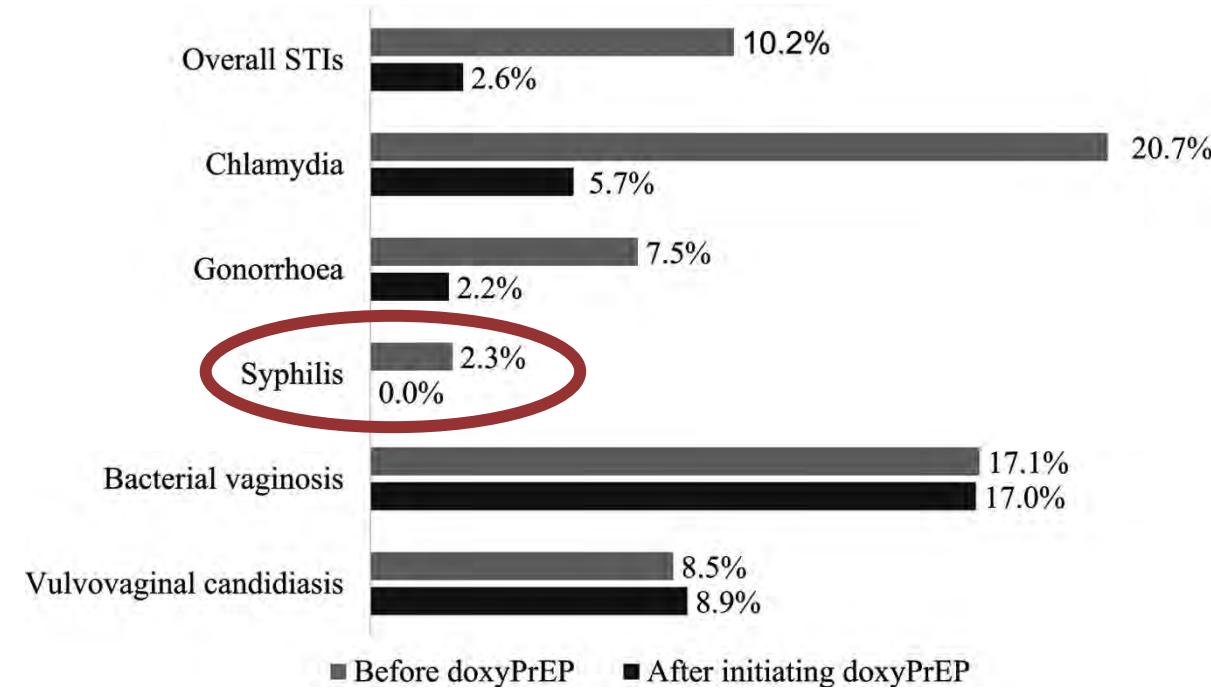
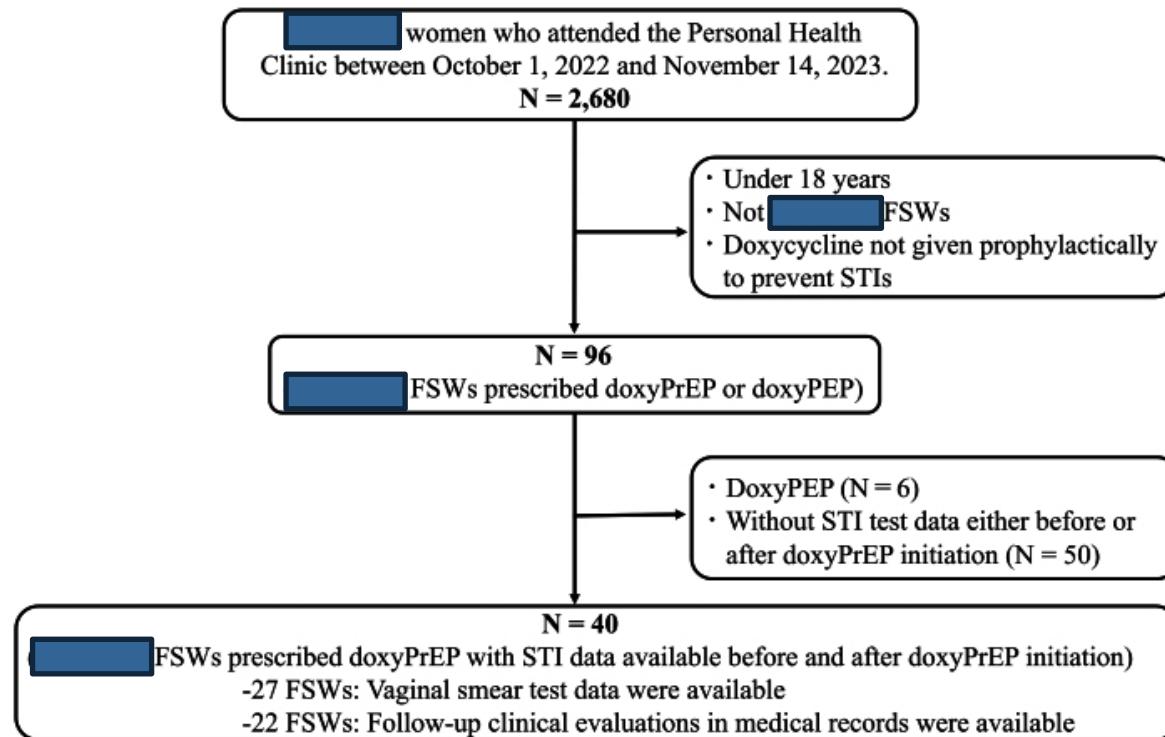
Dual daily HIV and STI pre-exposure prophylaxis (DuDHS)

- 52 men and women on PrEP
- Vancouver, BC
- Recruitment from: 2/2018-5/2019
- Follow-up = 48 weeks
- Randomized 1:1 to immediate or deferred doxy PrEP
- 45/52 (87%) completed the 48-week protocol
- At week 48, 71% (immediate) and 62% (deferred) took $\geq 95\%$ of their daily doxy



Cumulative STI cases	Immediate	Deferred
Chlamydia	0	10
Gonorrhea	6	9
Syphilis	0	1
HIV	0	0

Among women who trade sex, doxyPREP may reduce STI incidence



Daily doxy PREP: 73% took 100% of doses

STI incidence:
232.2/100 p-y → 79.2/100 p-y
67% reduction in STI

Weekly DOT doxy likely prevents chlamydia among women

Incident chlamydia rate with **weekly doxycycline**: 11.2 per 100 person years
Incident chlamydia rate in **dPEP Kenya SOC group**: 29.6 per 100 person years

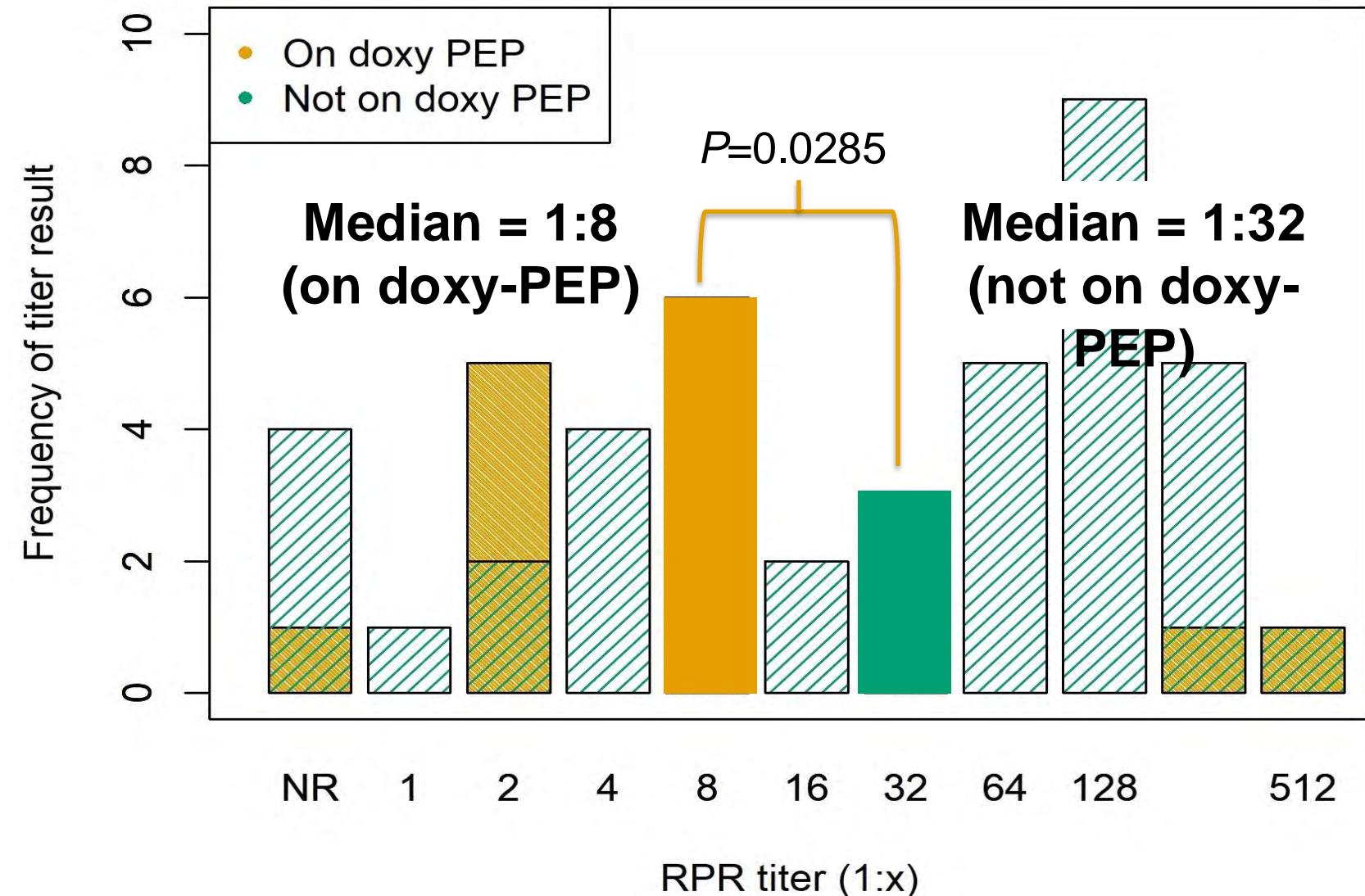
Analysis	Endpoint	Weekly DoxyDOT (N=60)	SOC dPEP Kenya (N=225)	RR	95% CI	P-value
GEE Censoring Clinical Hold Time	All STIs	6/57 (10.5%)	31/220 (14.1%)	0.73	0.28-1.91	0.52
	Chlamydia	3/57 (5.3%)	29/220 (13.2%)	0.39	0.12-1.25	0.11
	Gonorrhea	4/57 (7.0%)	5/220 (2.3%)	3.03	0.637-14.40	0.16

* Two additional cases of chlamydia and 3 additional gonorrhea cases among people on holds

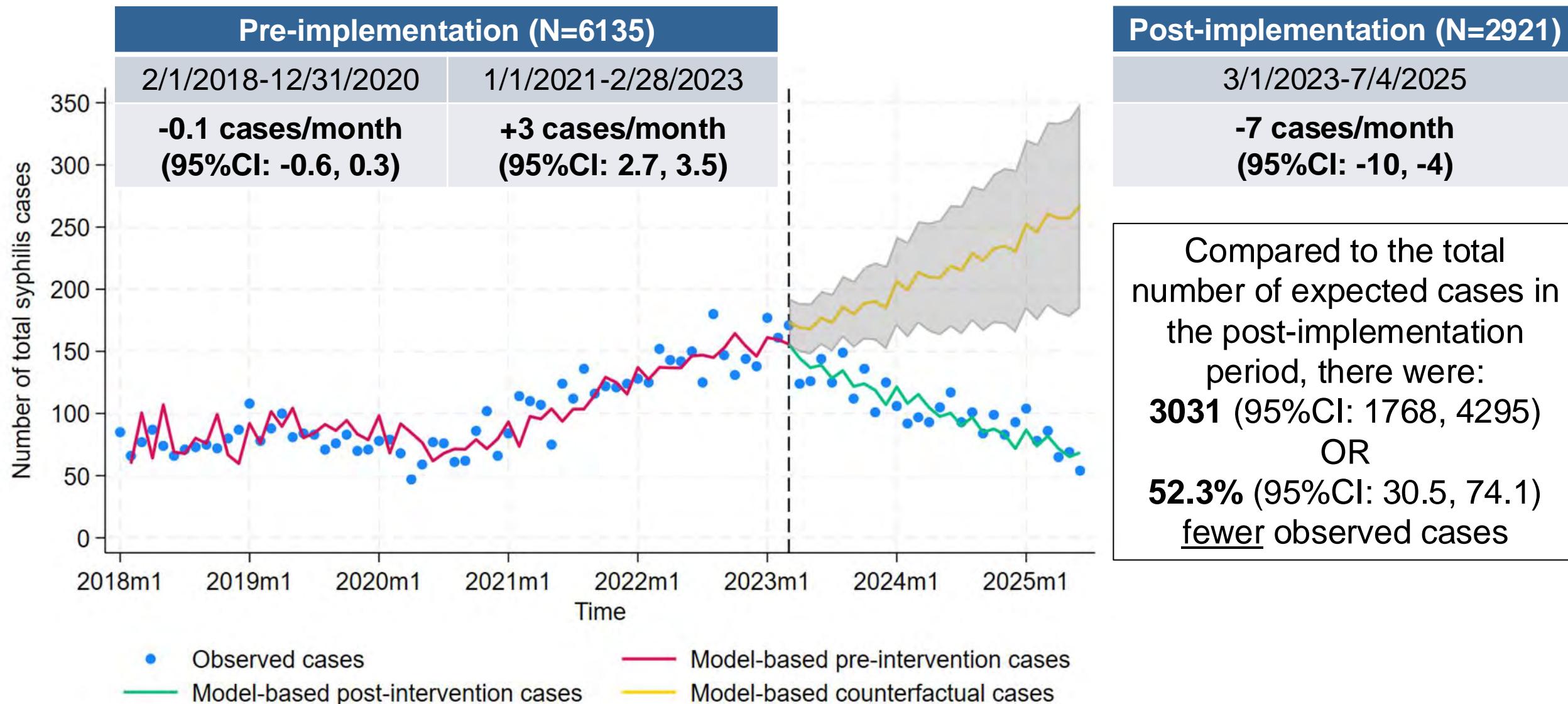
New data on doxycycline as POST-exposure prophylaxis (doxy PEP)

Early syphilis diagnoses among people on doxy PEP are more likely to be staged as early latent with lower RPR titers

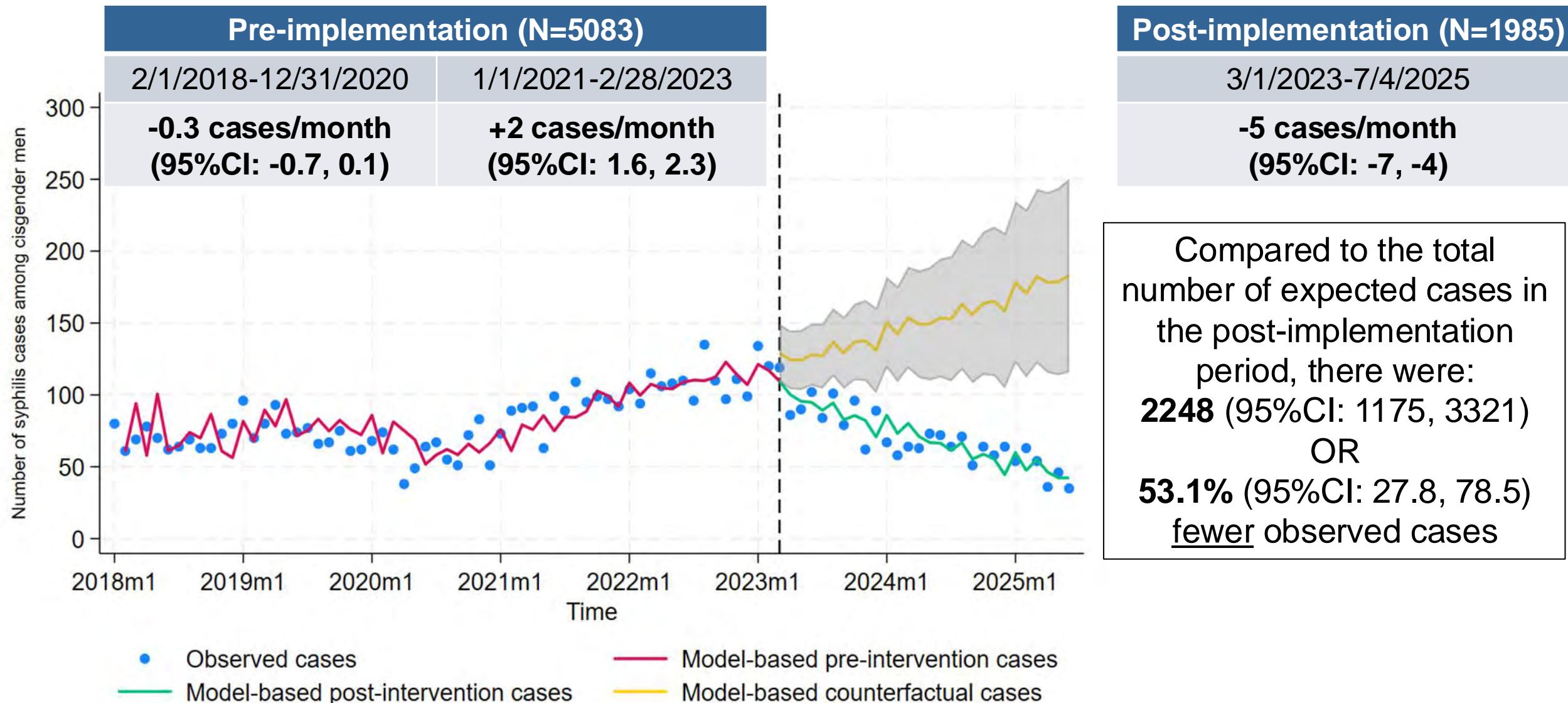
- 59 ES dx in 56 patients
 - 14 (24%) on doxy PEP
 - 42 (71%) not on doxy PEP
- Early latent was the most common stage (56%)
- 88% of ES in people not on doxy PEP was P&S v 12% in people on doxy PEP



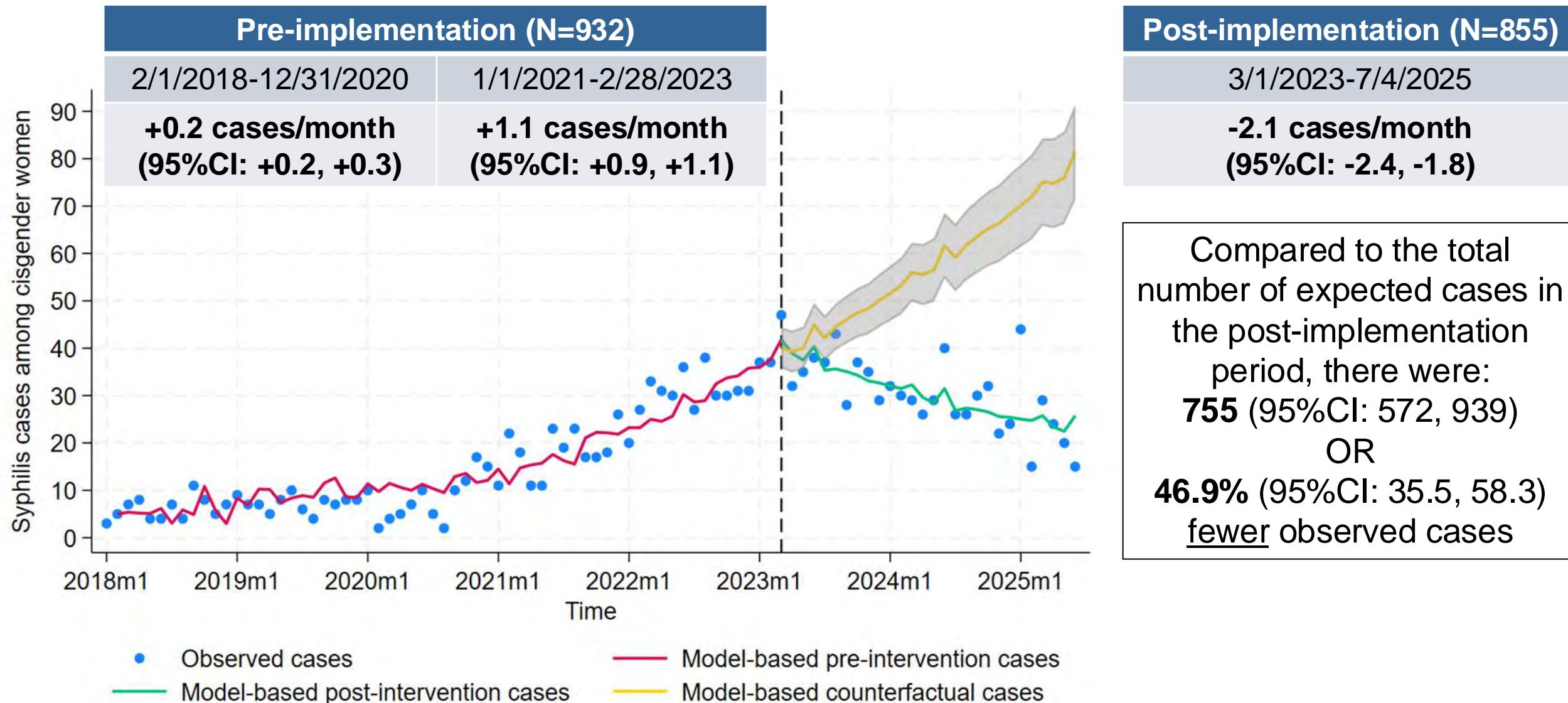
Trends in all stages of syphilis, King County, WA, 2021-2025



Trends in syphilis among men, King County, WA, 2021-2025



Trends in syphilis among women, King County, WA, 2021-2025

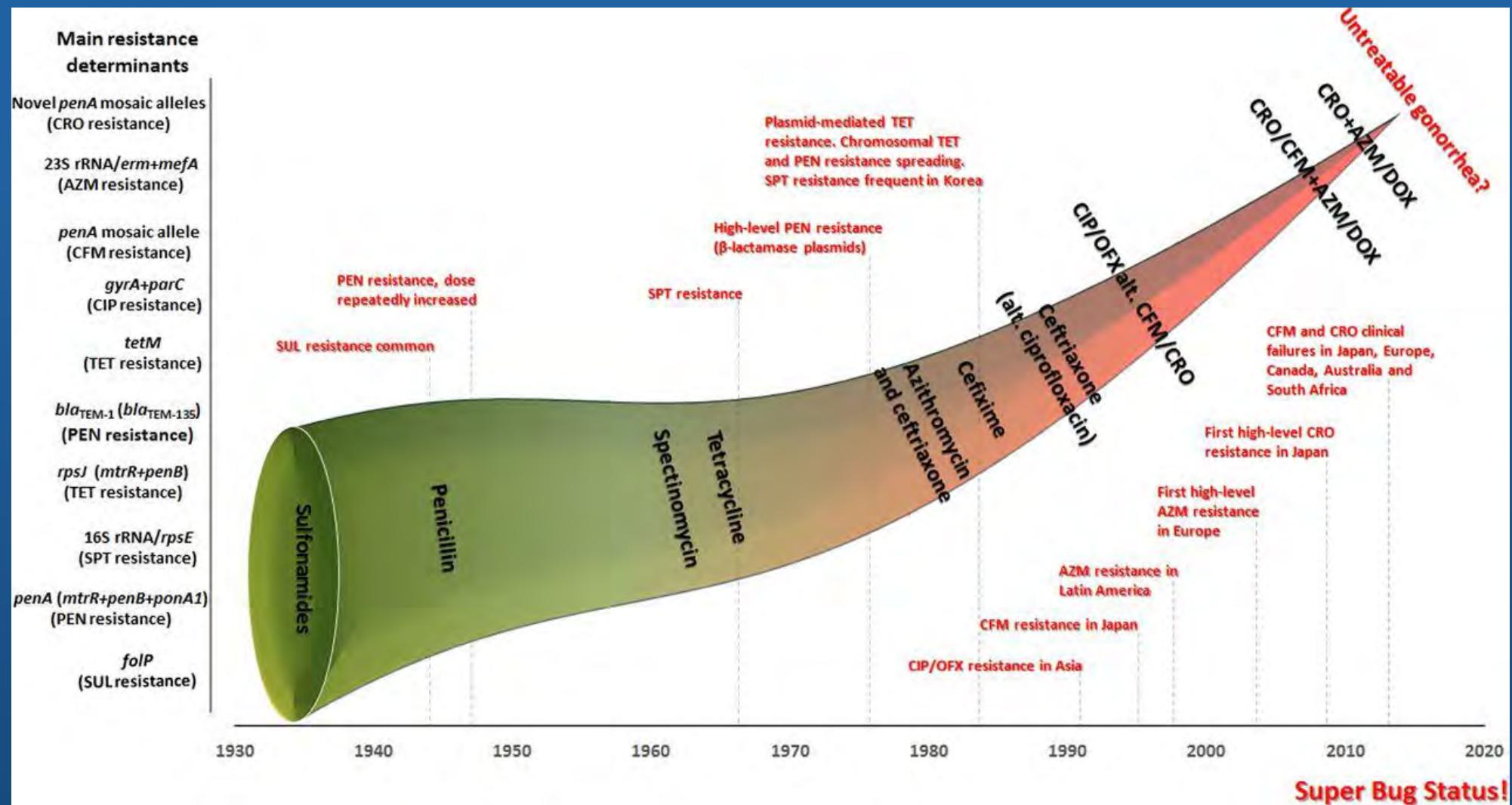


Takeaways: doxycycline for STI prevention

- In small pilot studies, daily doxycycline PrEP reduces the incidence of all STI
- Similar to doxyPEP, doxyPrEP is most effective for syphilis and chlamydia
- Daily doxy PrEP may be appropriate for people who have frequent sex (e.g., people who trade sex) and who may have another indication for daily doxy
- Weekly doxy likely prevents CT among women
- People who acquire *T pallidum* while on doxy PEP are more likely to be diagnosed with early latent syphilis with lower RPR titers
- At the population-level, doxycycline has significant impacts of syphilis, including among people who we don't think are receiving much doxy PEP

DoxyPEP and antimicrobial resistance

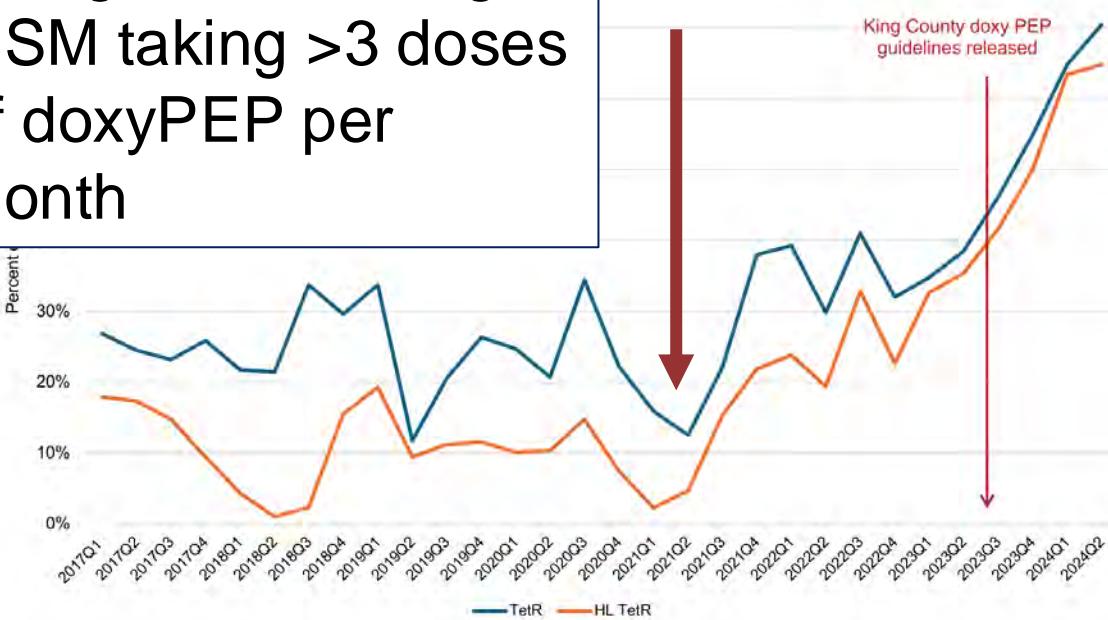
Gonorrhea as superbug



Tetracycline resistance in gonorrhea has been increasing in King County, WA, 2014-2024

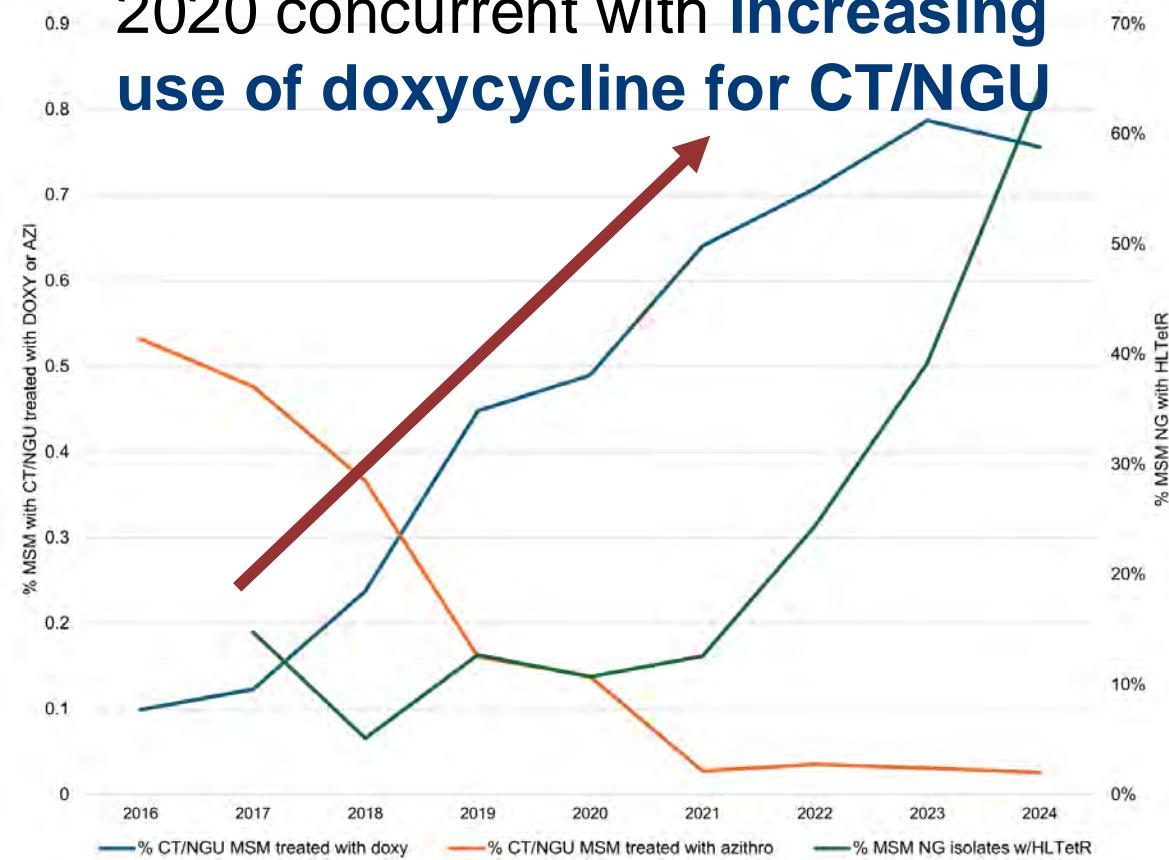
TetR increased more rapidly in 2023 with doxy PEP rollout

TetR and HL TetR was greater among MSM taking >3 doses of doxyPEP per month



TetR (MIC \geq 2ug/mL), **HL TetR** (MIC \geq 16ug/mL)

HL TetR increased starting in 2020 concurrent with **increasing use of doxycycline for CT/NGU**



Poll: A patient on doxy PEP presents with a skin and soft tissue infection, would you treat this infection with doxycycline?

- Yes, doxycycline will cover MRSA
- No, that doxyPEP might lead to resistance in skin bacteria

TetR Staph aureus and GAS are more common among people on doxy PEP

	Doxy PEP in last month (n=227)	No Doxy PEP in last month (n=602)	Difference
Staph aureus	27%	36%	↓
MRSA	1%	1%	↔
TetR Staph aureus	18%	8%	↑
TetR MRSA	1%	1%	↔
Group A strep	9%	4%	↑
TetR group A strep	8%	3%	↑

2 swabs: nasal and pharyngeal, pooled and inoculated onto growth media.

TetR >8 ug/mL; MRSA oxacillin MIC >2 ug/mL

Takeaways: AMR in gonorrhea and bystander bacteria

- TetR GC is increasing
 - This increase was likely driven by changes in treatment practices for CT/NGU to use doxycycline over azithromycin
 - This increase is now likely sustained by doxyPEP use in the community
- People who use doxyPEP are LESS likely to have SA on nasal/pharyngeal swabs
 - And more likely to have TetR SA
 - But not more likely to have MRSA or TetR MRSA
- People who use doxyPEP are MORE likely to have GAS, including tetR GAS, on nasal/pharyngeal swabs



ATLANTA



DETROIT



MIA MIAMI



SAN FRANCISCO



SEATTLE

Multi-city US longitudinal cohort to evaluate real-world effectiveness of doxycycline for STI prophylaxis and antimicrobial resistance

Aim 1: How well doxy prophy works

Subaim 1:
GC, CT and
syphilis rates
every 6 mo
& how people
use doxy

Subaim 2:
Qual work to
understand why
some continue
vs stop doxy or
use it selectively

Subaim 3:
Doxo-PEP to
need ratio: Is
doxy reaching
those who could
most benefit?

- Enrolling **2500 people** (500 per city) **who are newly initiating or continuing doxycycline for STI prevention** and:
 - Had sex with a man in past 3 months
 - Condomless sex with a man in past year
 - Recent GC, CT and syphilis testing in last 6 months
- Paid follow-up through 42 months, even if not using doxy
- Seeking new doxy initiators, gender and racial/ethnic diversity across all sites

Aim 2: Antimicrobial resistance (AMR)

- Gonorrhea
- Nasopharynx, skin: *Staph. aureus*, *Strep. pneumoniae* growth and resistance
- Skin, nose and rectal microbiome

Email shcresearch@uw.edu

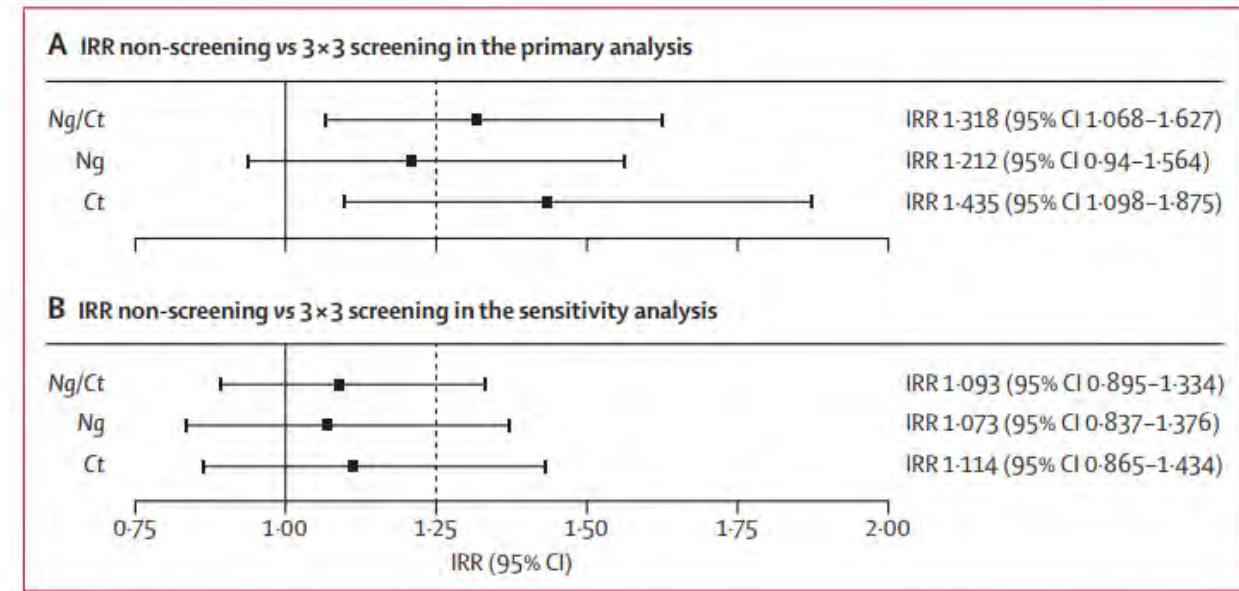
or Chase Cannon for info or referrals

Sexual Health Clinic: Cheryl Malinski

Madison Clinic: Carl Capili

Balancing the benefits of GC/CT screening and risks of antibiotic exposure (the Gonoscreen study)

- 1014 men who have sex with men
- Non-inferiority RCT (IRR = 1.25)
- 5 PrEP Centers in Belgium
- All patients screened 3 sites at baseline
 - Control: 3x3 testing, treating only symptomatic infections
 - Intervention: 3x3 testing, treating all infections
- Primary outcome: incidence of GC and CT
- Secondary outcome: antibiotic use



CT incidence was lower in the screening group; however, NG incidence was not different.

- NNS = 11 (1 asymptomatic case of CT)
- NNS = 26 (1 symptomatic case of CT)
- 2.34 more courses of doxy/symptomatic CT infection prevented

“We conclude that in the absence of symptoms, in high STI prevalence populations frequent STI screening should be limited to HIV and syphilis.”

Review

OPEN ACCESS

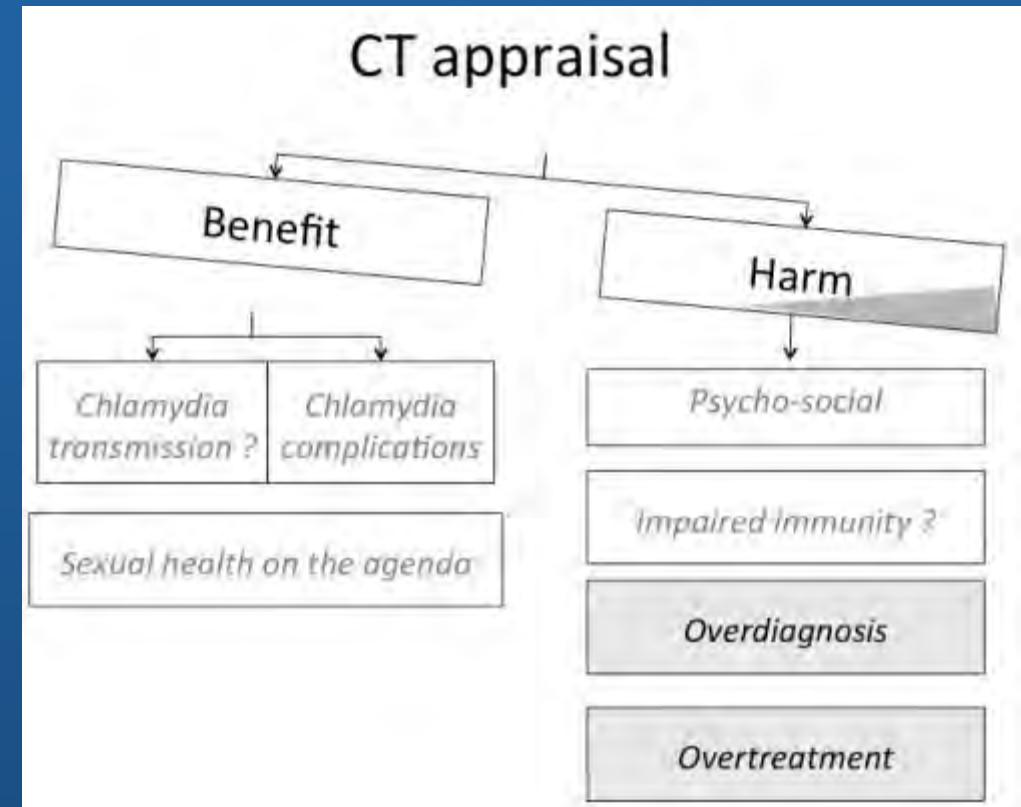
Where to go to in chlamydia control? From infection control towards infectious disease control

Jan E A M van Bergen ^{1,2,3}, Bernice Maria Hoenderboom ⁴, Silke David, ³ Febe Deug, ² Janneke C M Heijne, ³ Fleur van Aar, ³ Christian J P A Hoebe ^{1,5}, Hanna Bos, ² Nicole H T M Dukers-Muijters ^{6,7}, Hannelore M Götz ^{8,9}, Nicola Low ⁹, Servaas Antonie Morré ^{10,11}, Björn Herrmann ¹², Marianne A B van der Sande ^{13,14}, Henry J C de Vries ^{10,15,16}, Helen Ward ¹⁴, Birgit H B van Benthem ³

Sexually Transmitted Infections

Management of asymptomatic sexually transmitted infections in Europe: towards a differentiated, evidence-based approach

Chris Kenyon,^{a,e} Björn Herrmann,^b Gwenda Hughes,^c and Henry J. C. de Vries^{d,e,f,g}



Updates to PHSKC guidance on asymptomatic screening for gonorrhea and chlamydia

Routine screening for asymptomatic GC and CT is no longer recommended in **people without a uterus who have sex with men**. Instead, PHSKC advises medical providers to use shared decision-making to decide whether and how often to screen for these infections. This recommendation is based on:

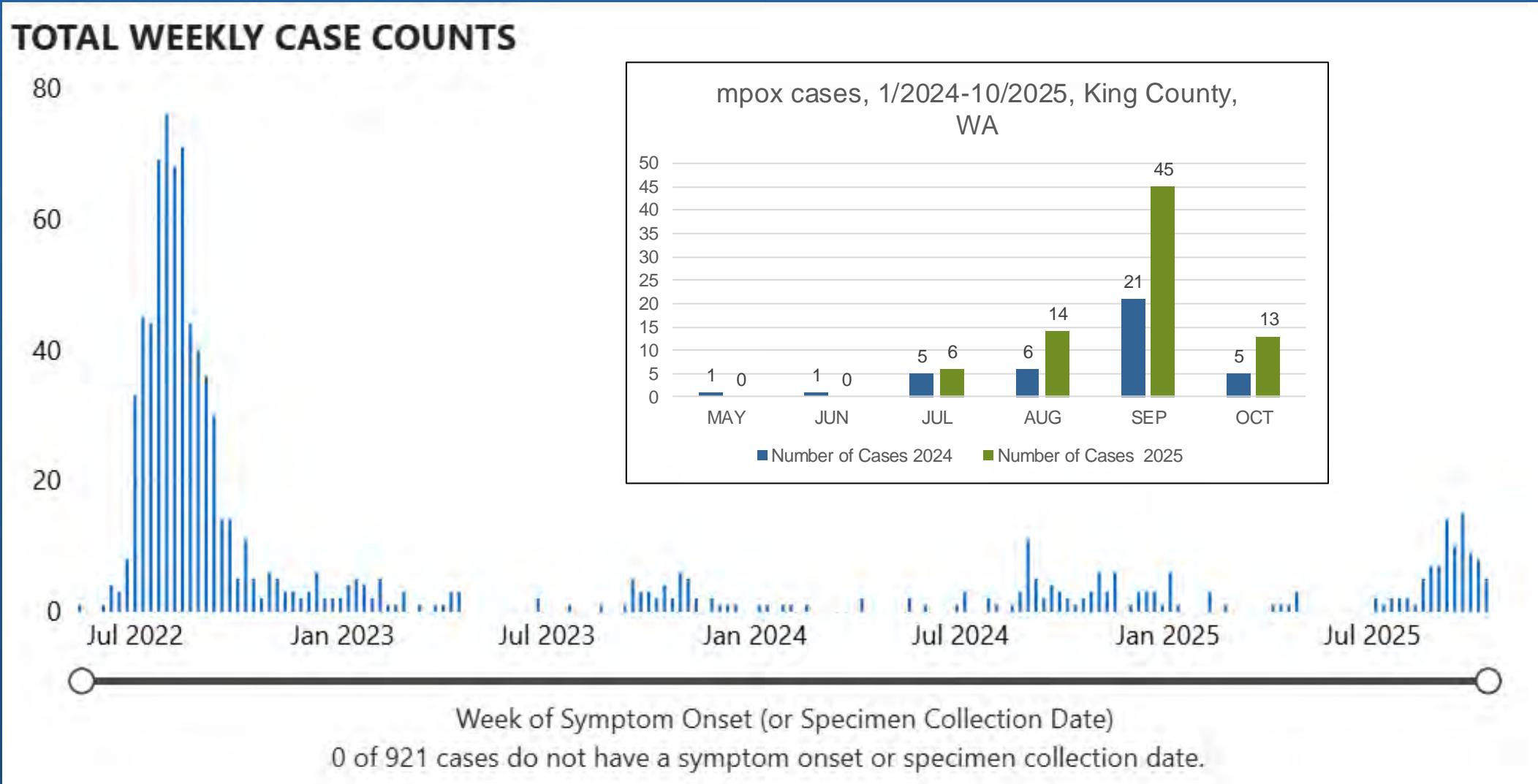
- The absence of known sequelae associated with asymptomatic infections
- The fact that these infections are self-limited in the absence of treatment
- The uncertain impact of screening on population-level STI incidence
- The need to avoid unnecessary antimicrobials
- The high cost of gonorrhea and chlamydia screening which is not always covered by insurance

mpox

POLL: Have you seen a case of mpox since the global outbreak in 2022?

- Yes
- No

mpox is an endemic, seasonal infection in Washington State and nationally

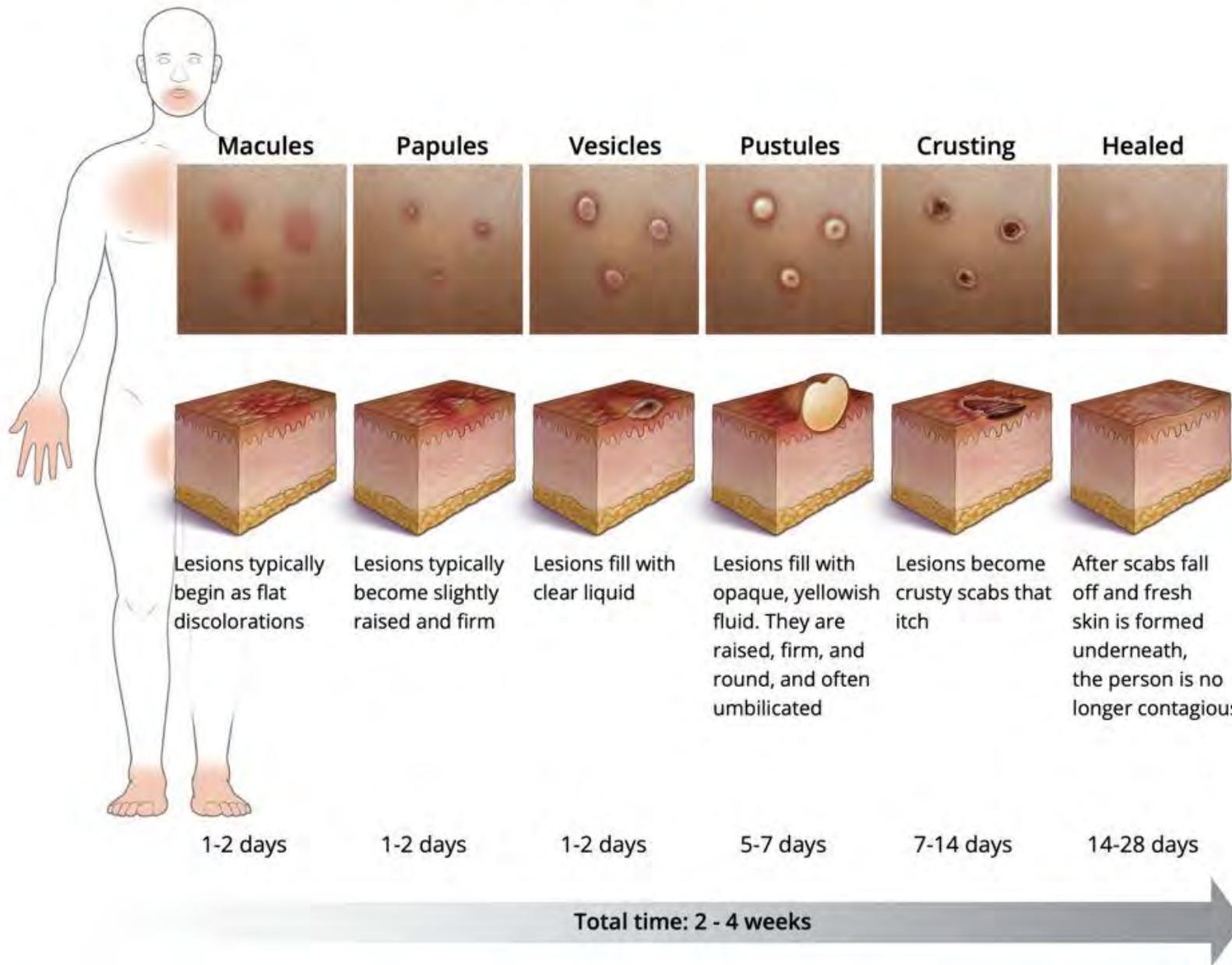


Clade I mpox is circulating in the United States

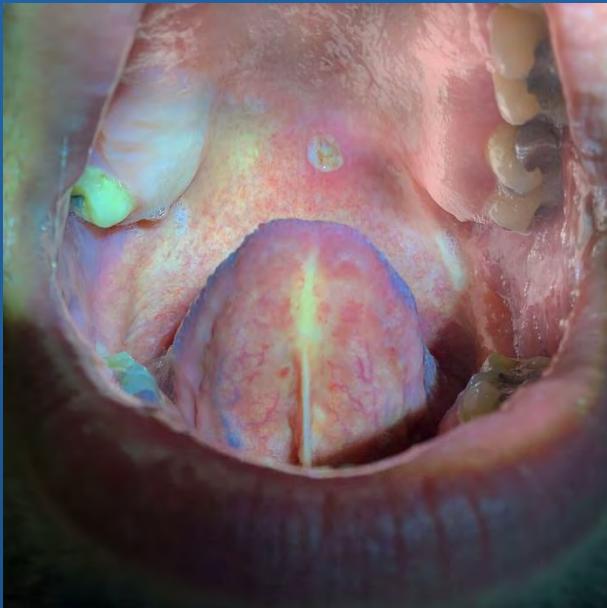
Three Cases of Mpox Tied to Severe Illness Worry Health Experts

None of the patients, all California residents, had traveled abroad, suggesting the Clade 1 form was transmitted locally.

MPOX LESION PROGRESSION DESCRIPTION AND TIMELINE



Exemplary mpox rash



The most effective mpox prevention tool is vaccination

Two doses 0.5 mL SQ 28 days apart

Table 2. Estimated Vaccine Effectiveness against Diagnosed Mpoxy among Persons Seeking Health Care, August 15 through November 19, 2022.*

Persons Seeking Health Care	Case Patients	Control Patients	Vaccine Effectiveness (95% CI)	
			Unadjusted	Adjusted†
			number	percent
Unvaccinated, reference population	2022	6984		
Partially vaccinated, 1 dose	146	1000	52.0 (42.3–60.1)	35.8 (22.1–47.1)
Fully vaccinated, 2 doses	25	335	77.2 (65.0–85.1)	66.0 (47.4–78.1)

* CI denotes confidence interval.

† Adjustment was for age group (18 to 35, 36 to 49, and ≥ 50 years), race or ethnic group (non-Hispanic White, non-Hispanic Black, and other non-Hispanic), Social Vulnerability Index quartile (quartile 1 to 4, or unknown), and the presence or absence of an immunocompromising condition.

Many people can still benefit from vaccination

- As of August 1, 2023, only **42% of eligible Washingtonians received 2 doses of JYNNEOS and 26% received 1 dose**
- People who were not sexually active during the outbreak may now be sexually active without the protection of the vaccine (greatest among young people)
- People who chose to change behavior over vaccination as a prevention strategy may have resumed their usual sexual activity
- Vaccine messaging has been less robust since the outbreak

Think mpox

- Report all cases of mpox to PHSKC
- Maintain a high index of suspicion for mpox for any patients with signs and symptoms of mpox even if:
 - Syphilis or HSV are considered more likely (co-infections are common)
 - The patient has been vaccinated (less severe, subtle proctitis, constitutional symptoms may be absent)
- Consider clade I if travel to Central or East Africa, areas of the US with community transmission of clade I, or contact with a case of clade I
- Test for mpox (PCR)
- Continue to vaccinate eligible individuals
- Provide PEP for people with recent exposure

Mycoplasma genitalium

Poll: Have you ever tested a patient for Mycoplasma genitalium?

- Yes
- No
- Mycoplasma genitalium is an STI?

MyGeniUS: Mgen surveillance study

- In 8 sexual health clinics in the United States in 2020, the prevalence of Mgen was **16.6%** (95%CI:14.9-18.5%)¹
 - Range: 9.9% [Seattle] – 23.5% [St Louis]
- Meta-analyses:
 - Urethritis (OR = 5.5)²
 - Cervicitis (OR = 1.7)^{3,4}
 - PID (OR = 2.1)^{3,4}
 - Preterm birth (OR = 1.9), SAB (OR = 1.8), infertility (OR = 2.4)^{3,4}
 - Proctitis (mixed results: PR = 2.14; OR = 0.8; risk difference +4.3%)⁴

Macrolide resistance mutations
[23S rRNA] = **59%**
(range: 51-71%)¹

FQ resistance globally [parC] =
13%
(range: 2.7%-37%)⁵

King County Sexual Health Clinic Mgen Testing Protocol

Testing upon initial presentation

People with a penis with non-gonococcal **urethritis (acute or chronic)**

People with a cervix with non-gonococcal **cervicitis (signs or symptoms, including post-coital bleeding)**

People with signs, symptoms of PID

Testing upon recurrent, persistent symptoms

People with signs, symptoms of recurrent or persistent proctitis

People with recurrent or persistent NGU or NGC

Contacts

Contact to a partner with confirmed M gen

Mgen first line treatment

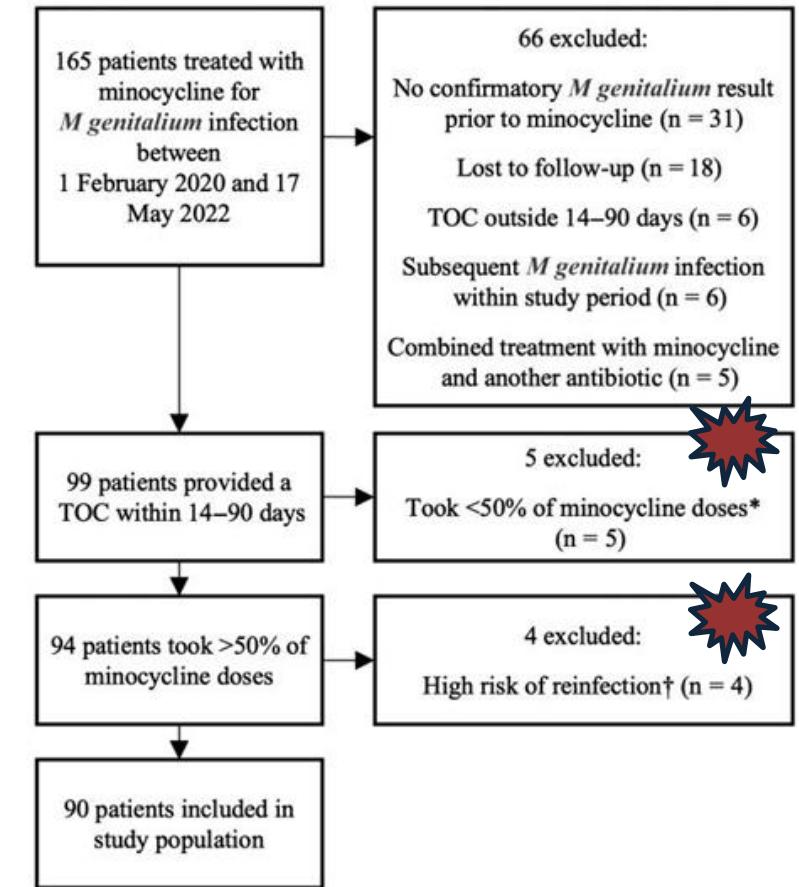
- In the absence of resistance testing:
 - Doxycycline 100 mg PO BID x 7 days FOLLOWED BY
 - Moxifloxacin 400 mg PO QD x **10 days**
- Counseling messages:
 - Abstain from sex for 7 days **following the end of treatment**
 - Treatment failure is not uncommon
 - Refer **regular** partners for treatment to prevent reinfection

When to suspect a treatment failure

- Patients who test positive for Mgen, complete treatment with doxy/moxi, and then return with signs or symptoms of recurrent or persistent NGU, cervicitis, or proctitis are re-tested.
- Ideally, re-testing occurs **at least 3 weeks after treatment** to avoid false positive results (due to residual Mgen genetic material) and false negatives (due to low organism load from antibiotics)
- In the absence of re-infection (sex with untreated partner) or re-exposure (resumed sex sooner than one week after treatment), suspect treatment failure

Suspected first-line treatment failure next steps

- Register patient with [Mycoplasma Genitalium Treatment Failure Registry](#)
- **Second line therapy: minocycline 100 mg PO BID x 14 days**
- Cure rate = 68% (95%CI: 58-76%) of macrolide resistant M gen infections (among people who took it and had low risk for reinfection)
- 96% took ALL of the minocycline
- Mild side effects: dizziness (9%), nausea (6%), headache (6%), fatigue (4%), “brain fog” (4%)



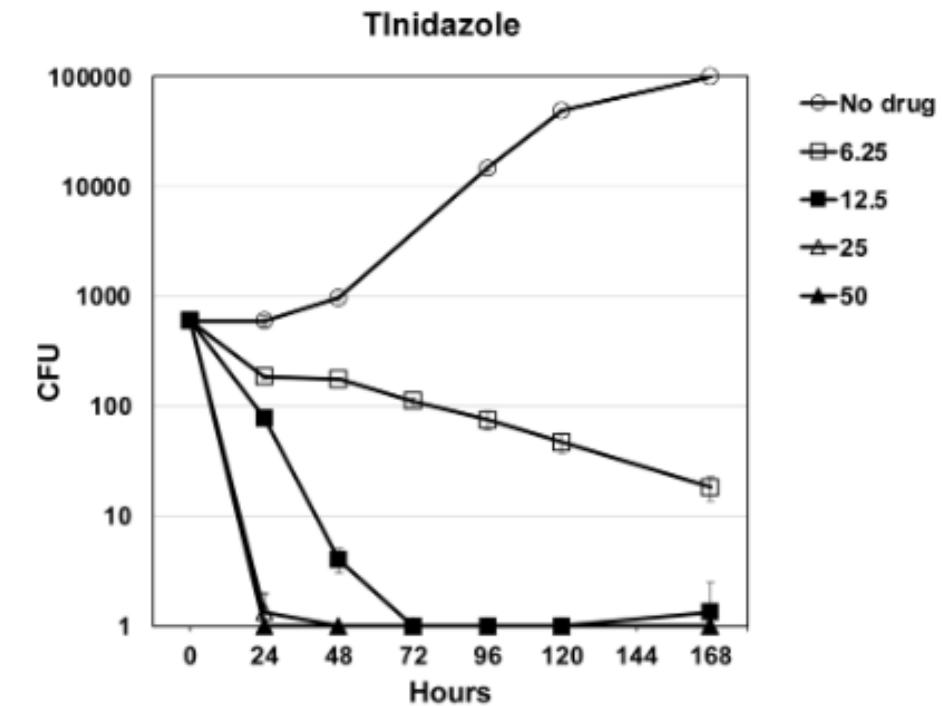
Therapies for first- and second-line treatment failures

Therapies for people failing first- and second-line Mgen treatment

Doxycycline 100 mg PO BID x 7 days FOLLOWED BY Tinidazole 2 grams PO daily for 10 days

Doxycycline 100 mg PO BID x 7 days FOLLOWED BY Minocycline 100 mg PO BID PLUS tinidazole 2 grams PO daily for 14 days

Minocycline 100 mg PO BID x 3-6 weeks



Takeaways: M gen testing and treatment

- M gen is a common STI associated with several sexual and reproductive health outcomes
- M gen is highly resistant to macrolides (eg, azithromycin)
- Screening recommendations vary
- First line therapy (in the absence of resistance testing) should include doxycycline followed by moxifloxacin
- Treatment failures are not uncommon, minocycline is a second-line regimen
- Tinidazole may be promising as an M gen active agent

Bacterial Vaginosis

Poll: Do you have patients who have experienced recurrent BV?

- No
- Yes
- Not sure

Bacterial vaginosis is common and recurs frequently

- BV affects 30% of women worldwide,¹ especially women with HIV (50-60%)²
- BV is associated with genital inflammation, HIV acquisition³, preterm birth⁴
- Current treatment (metronidazole, topical clindamycin) does not result in sustained cure as 50-70% of women experience a recurrence within 3 months^{5, 6}

¹Peebles et al, 2019; ²Taha et al, 2007; ³McKinnon et al, 2019; ⁴Fettweis et al, 2019; ⁵Sobel et al, 1993; ⁶Bradshaw et al, 2006; ⁷Muzny et al, 2019; ⁸Mehta et al, 2020; ⁹Mehta et al, 2012

Bacterial vaginosis has the epidemiologic profile of an STI

- Incident BV is associated with new partners and has an incubation period of 4 days⁷
- Recurrent BV is associated with a regular sex partner, inconsistent condom use⁶
- Penile microbiota is predictive of a woman's risk of BV⁸
- Male partner treatment trials of oral regimens did not result in reduced risk of recurrence in female partners⁹

¹Peebles et al, 2019; ²Taha et al, 2007; ³McKinnon et al, 2019; ⁴Fettweis et al, 2019; ⁵Sobel et al, 1993; ⁶Bradshaw et al, 2006; ⁷Muzny et al, 2019; ⁸Mehta et al, 2020; ⁹Mehta et al, 2012

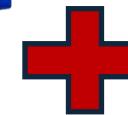
StepUp Trial: Male partner treatment to prevent BV recurrence

- April 2019-November 2023
- 2 sexual health and 3 family planning clinics in 3 Australian states
- Premenopausal women with
 - $\frac{3}{4}$ Amsel criteria
 - Nugent score 4-10
 - Regular male partner x 8+ weeks
 - Receiving standard BV treatment
- Referred regular male partner to the study

- Randomized 1:1 to receive:
 - No partner treatment (n=83)
 - Partner treatment to start within 7 days (n=81)



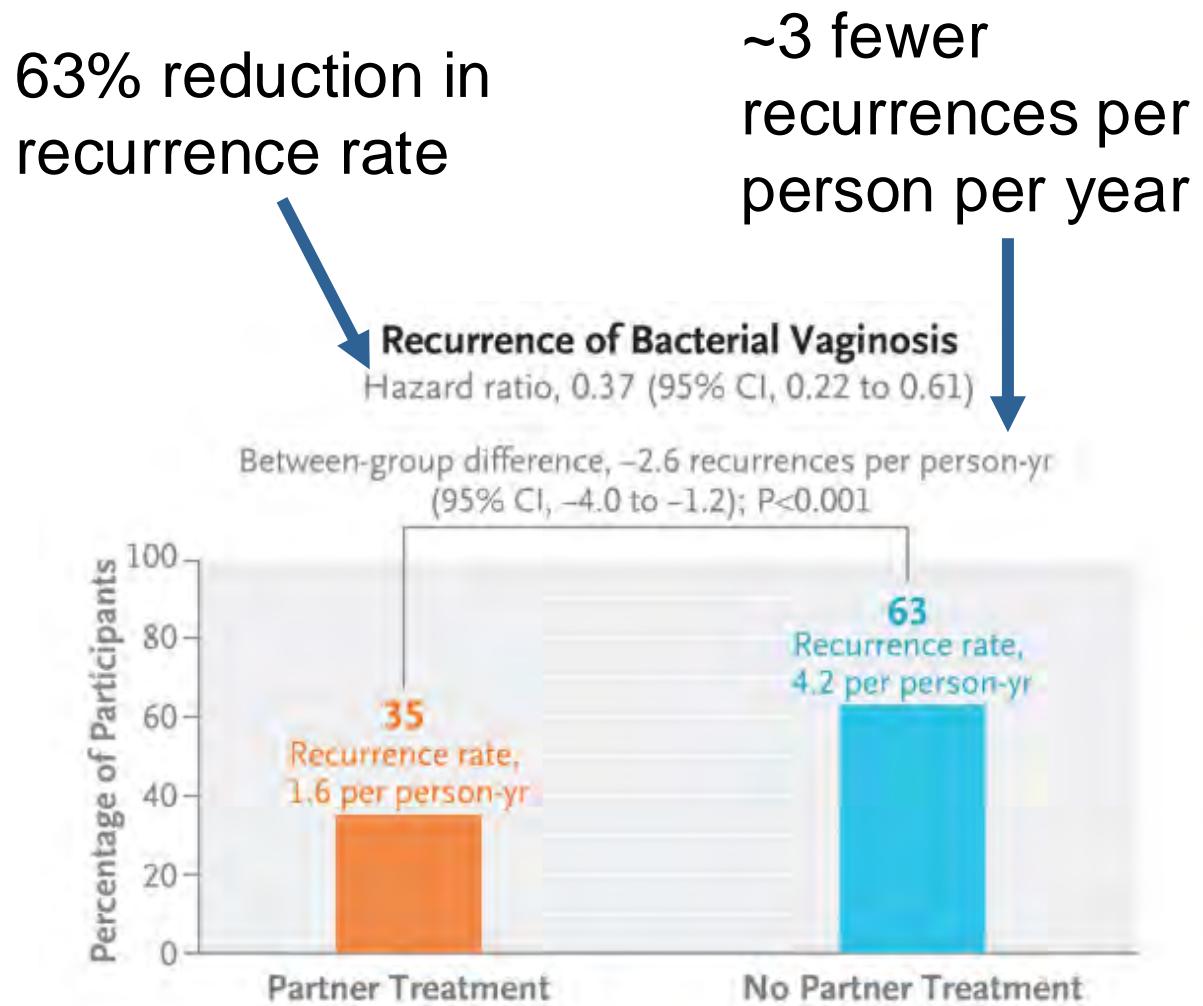
400 mg PO
BID x 7 days



2-cm diameter
volume BID x
7 days

StepUp Trial: Male partner treatment prevents BV recurrence

- Modified intention to treat analysis included 69 couples in the partner treatment arm and 68 couples in the no partner treatment arm
- At 12 weeks:
- **24/69 (35%)** experienced recurrence in the partner treatment arm
- **43/68 (63%)** experienced recurrence in the no partner treatment arm
- Nausea (14%), headache (12%), metallic taste (7%) in treated men



Takeaways: practical steps to preventing BV recurrence

- Treat BV in women with metronidazole 500 mg PO BID x 7 days
 - Alternative regimen is clindamycin 2% cream PV BID x 7 days
- For women with a regular partner with a penis, offer to prescribe:
 - Metronidazole 500 mg PO BID x 7 days
 - PLUS clindamycin 2% cream TP BID x 7 days
 - Start within 7 days of the start of treatment in women

Thank you!
menza@uw.edu

Poll: During the mpox outbreak in the summer of 2022, did you find that tpoxx helped patients?

- Yes, for sure, people felt much better
- I didn't really notice much of a difference
- I'm not sure

ACTG A5418



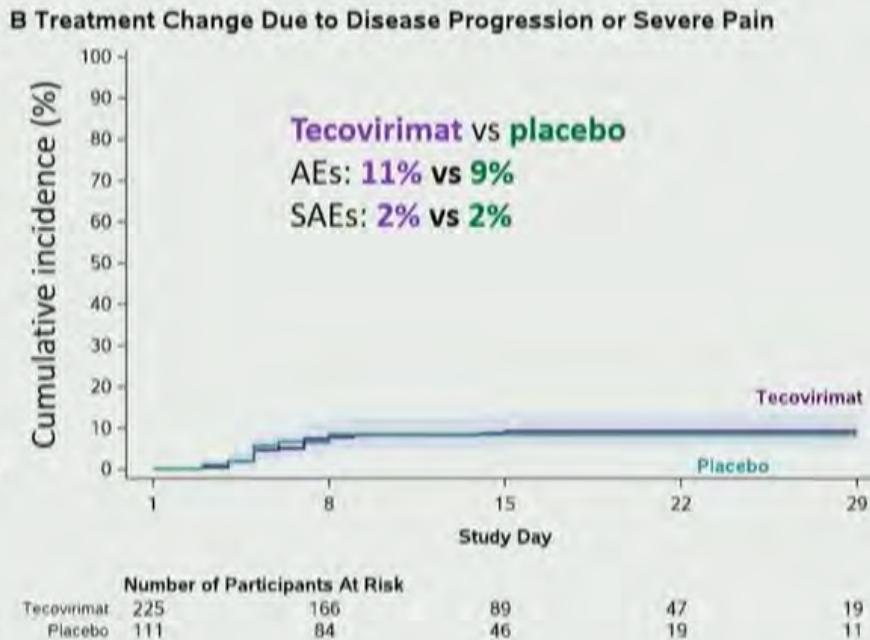
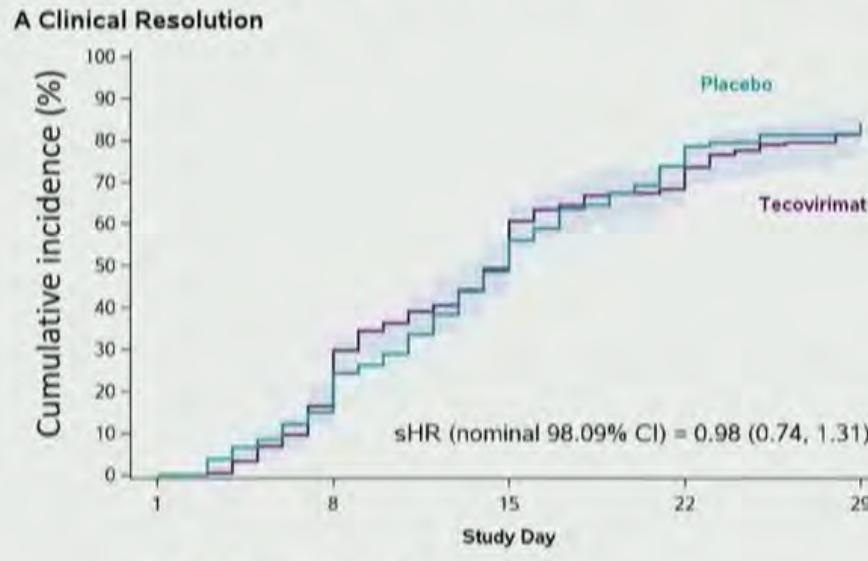
Design and Sample Size	2:1 Randomized, Blinded, Placebo-controlled (n=530) Open label for children, persons with pregnancy or severe disease, severe immune suppression or severe skin disease (n \geq 250)
Study Population	Symptomatic mpox
Design	Superiority; randomized participants allowed open label tecovirimat for disease progression or severe pain at day 5
1^o Outcome	Time to clinical resolution (all skin lesions scabbed or epithelialized; all visible mucosal lesions healed)
2^o Outcomes	Daily pain score, HMPXV detection in various compartments, Pt reported outcomes
Duration	57 days (in person or fully remote enrollment)
Agent	Weight based oral Tecovirimat

12 March 2025



STOMP: Tecovirimat did not improve clinical outcomes

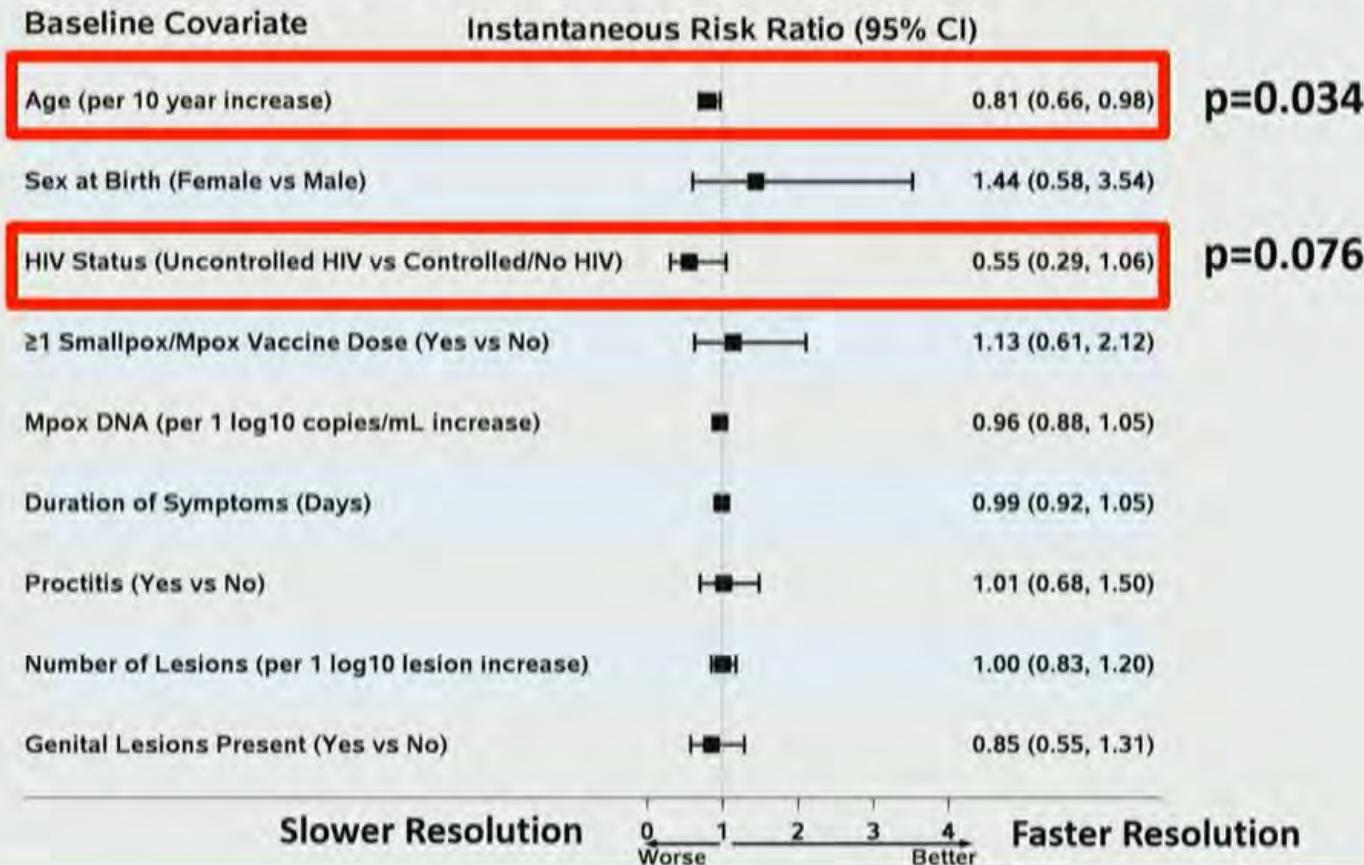
Primary endpoint: time to clinical resolution



- Cumulative probability of clinical resolution by 28 days: 87% (95% CI: 80-92)
- Arm C: median time to clinical resolution from treatment initiation: 14 days (95% CI: 13-16)

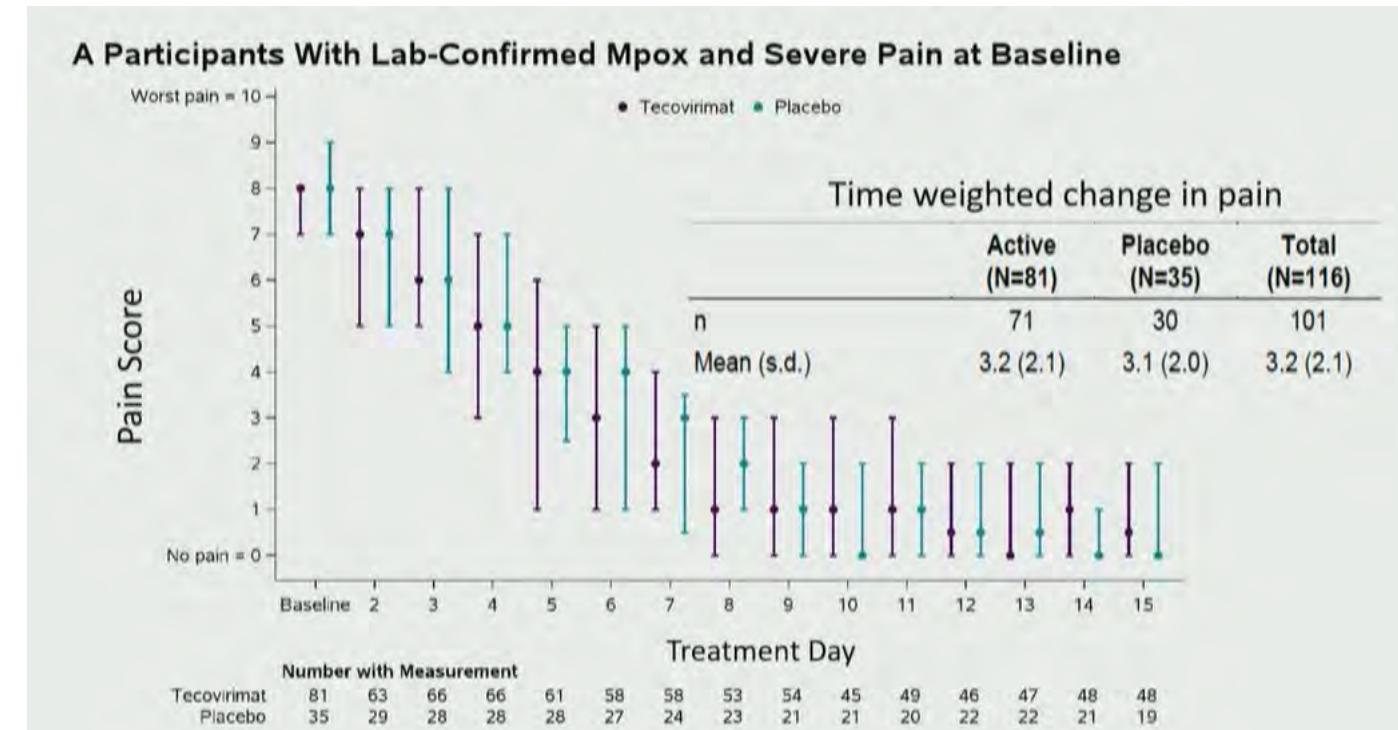
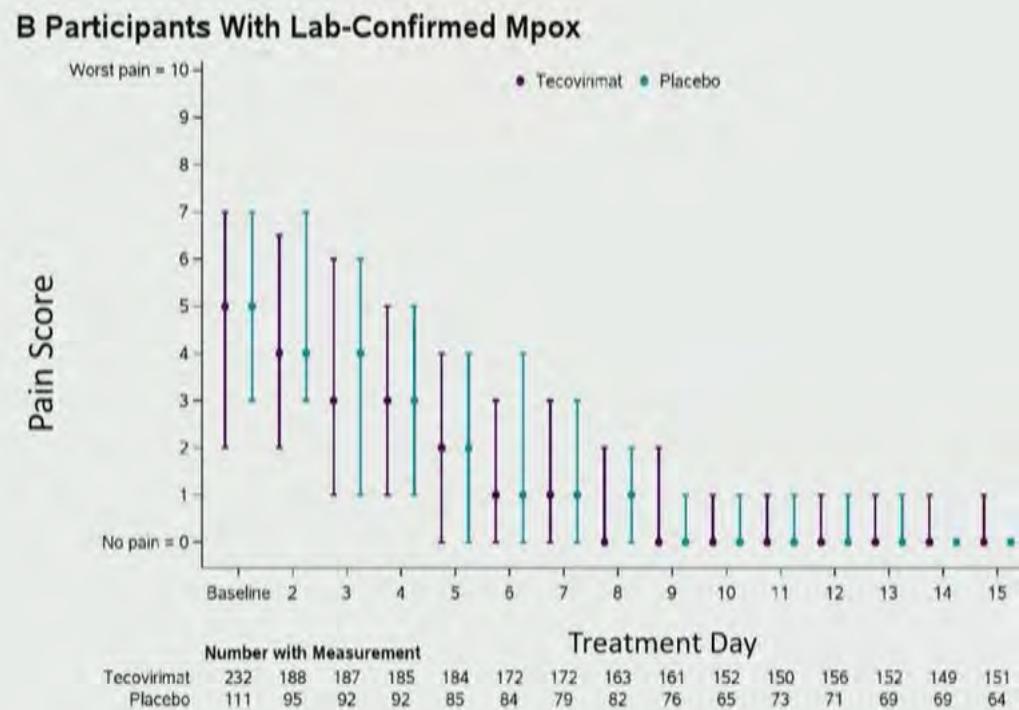
Clinical resolution slower with older age and uncontrolled HIV

Host and Disease Factors Associated with Clinical Resolution



STOMP: Tecovirimat did not impact pain outcomes

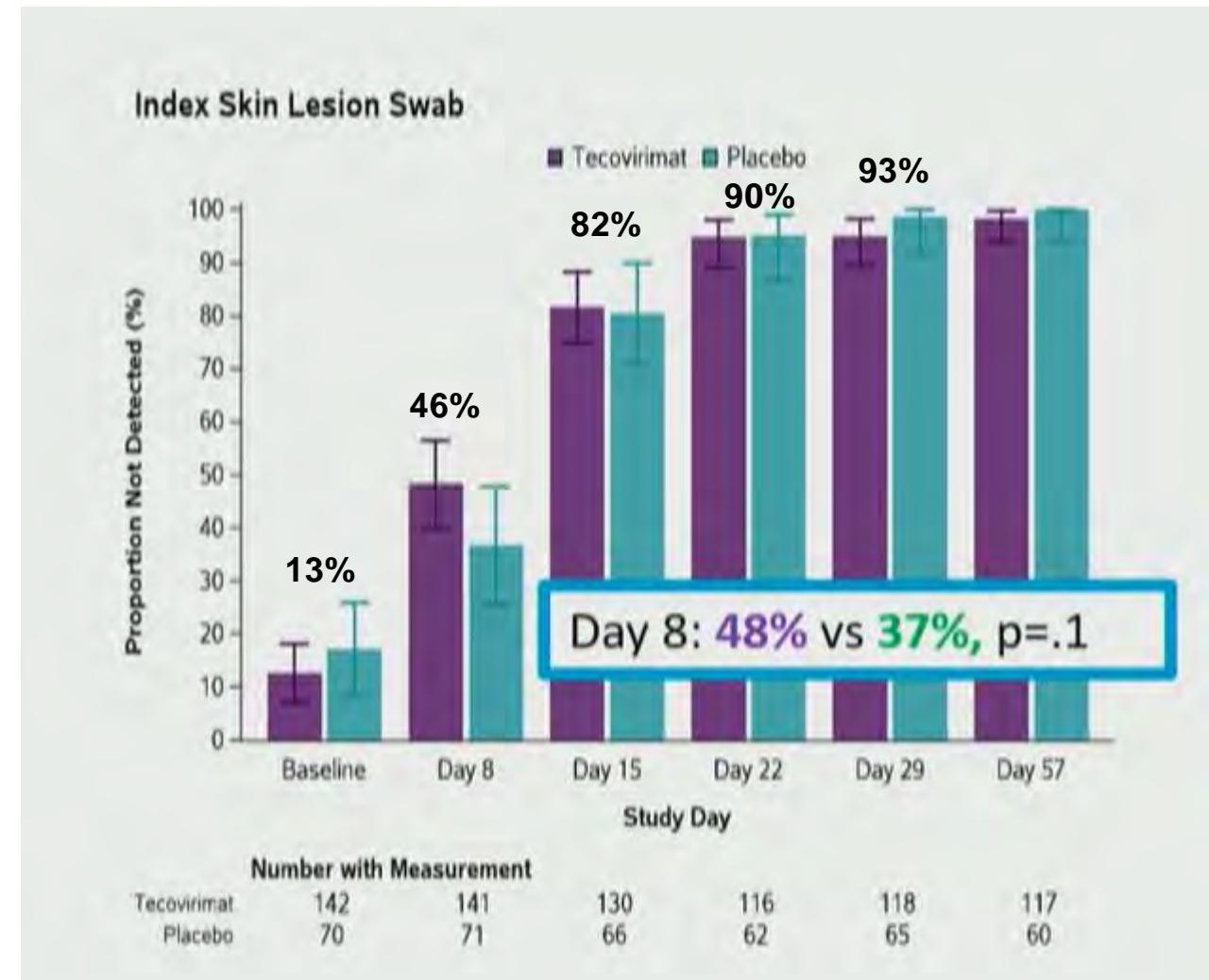
- No difference in pain scores (11-point scale) over time in either group with severe pain at baseline



- Equivalent pain scores for all patients with lab-confirmed mpox

STOMP: Tecovirimat did not change lesion viral clearance

- Serial samples of index skin lesion and rectal swabs for study duration
- 10-15% had hMPXV-negative lesion at baseline; most negative by day 22
- Only trend toward difference was day 8 skin lesion results
 - 48% in tecovirimat cleared vs 37% in placebo
 - No difference for rectal samples



Takeaways: tecovirimat for mpox

- Tecovirimat was safe but did not improve clinical outcomes
 - No faster resolution of mpox skin lesions or improved pain control (median 14d)
 - No significant reduction in hMPXV detection (trend toward ↓ at day 8)
- Now 2 negative clinical trials (PALM-007, clade I mpox), three more pending



- Alternative agents and likely combination therapy should be used for mpox (e.g., brincidofovir + tecovirimat + VIG) for immunocompromised people