



Protected & Proactive: Bridging Immunization and Sexual Health

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Disclosure

I, **Kevin Ard**, have the following relationships with ineligible companies to disclose:

- Binx Health (in-kind research support)
- Roche (in-kind research support)
- Gilead Sciences (research support for an investigator-initiated study)
- McGraw-Hill and UpToDate (royalties)

All other planners for this educational activity have no relevant financial relationships with ineligible companies to disclose.

All planner and presenter financial relationships have been mitigated.

Learning objectives

1. Identify which patients will benefit from the viral hepatitis, human papillomavirus, meningococcal, and mpox vaccines based on their sexual health history.
2. Describe how to turn every routine sexual health visit into a quick, natural conversation about vaccination.
3. Apply lessons from a real-world case study to answer patient questions and improve vaccine confidence.

Outline

1. A case
2. Five vaccines
3. Implementation

A case

- A 27-year-old man would like to start oral HIV pre-exposure prophylaxis (PrEP).
- He has had condomless sex with two men in the past six months.
- He received all recommended childhood vaccinations, including the hepatitis B and human papillomavirus (HPV) vaccines.
- His baseline laboratory studies show:

HIV antibody/antigen: Negative	Hepatitis B surface antibody: Negative
Treponemal antibody: Negative	Hepatitis B core antibody: Negative
Hepatitis C antibody: Negative	Hepatitis B surface antigen: Negative
Estimated creatinine clearance: 120 mL/min	Urine/throat/rectal gonorrhea/chlamydia: Negative

Which vaccines would you recommend now for his sexual health?

- A. Mpox
- B. Hepatitis B and meningococcal
- C. Hepatitis A and HPV
- D. Hepatitis A and mpox
- E. Hepatitis A, hepatitis B, and mpox

Vaccines are part of an expanding toolkit of preventive sexual health interventions.

Condoms

Doxycycline prophylaxis

Contraception

Vaccination

Oral or injectable PrEP

Point-of-care and home
testing

Five vaccines

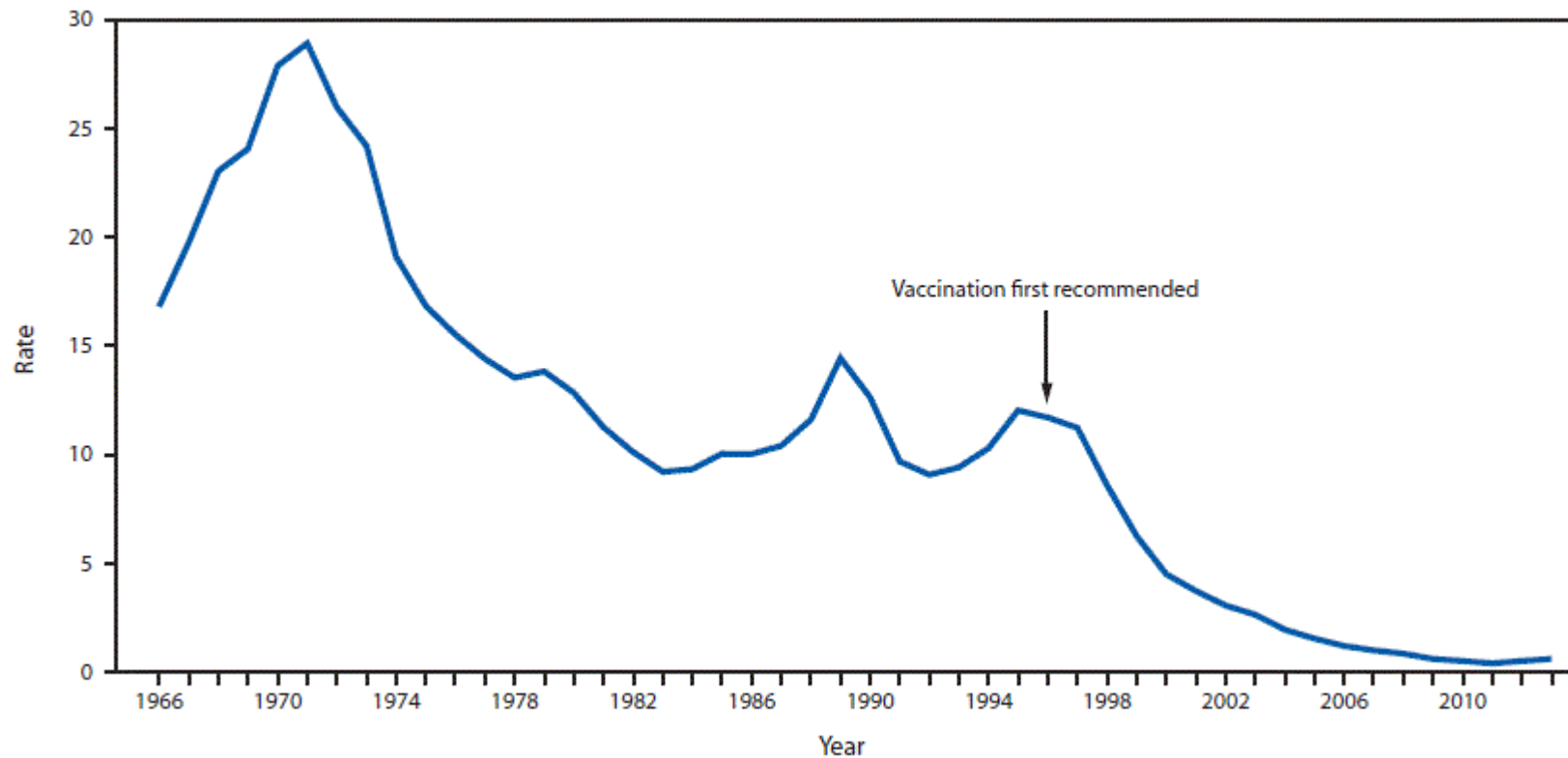
Vaccines with sexual health-related indications

Vaccine	Selected indications related to sexual health
Hepatitis A	MSM
Hepatitis B	MSM, seeking STI testing or treatment, multiple sex partners, sex partner with positive hepatitis B surface antigen
Human papillomavirus	All people through age 26 years, shared decision-making for adults 27-45 years of age
Mpox	MSM, transgender and non-binary people who have had, in the past 6 months, an STI, more than one sex partner, sex at a commercial venue or public event, or sex partners with the above
Meningococcal	MSM in outbreak settings

Hepatitis A vaccine

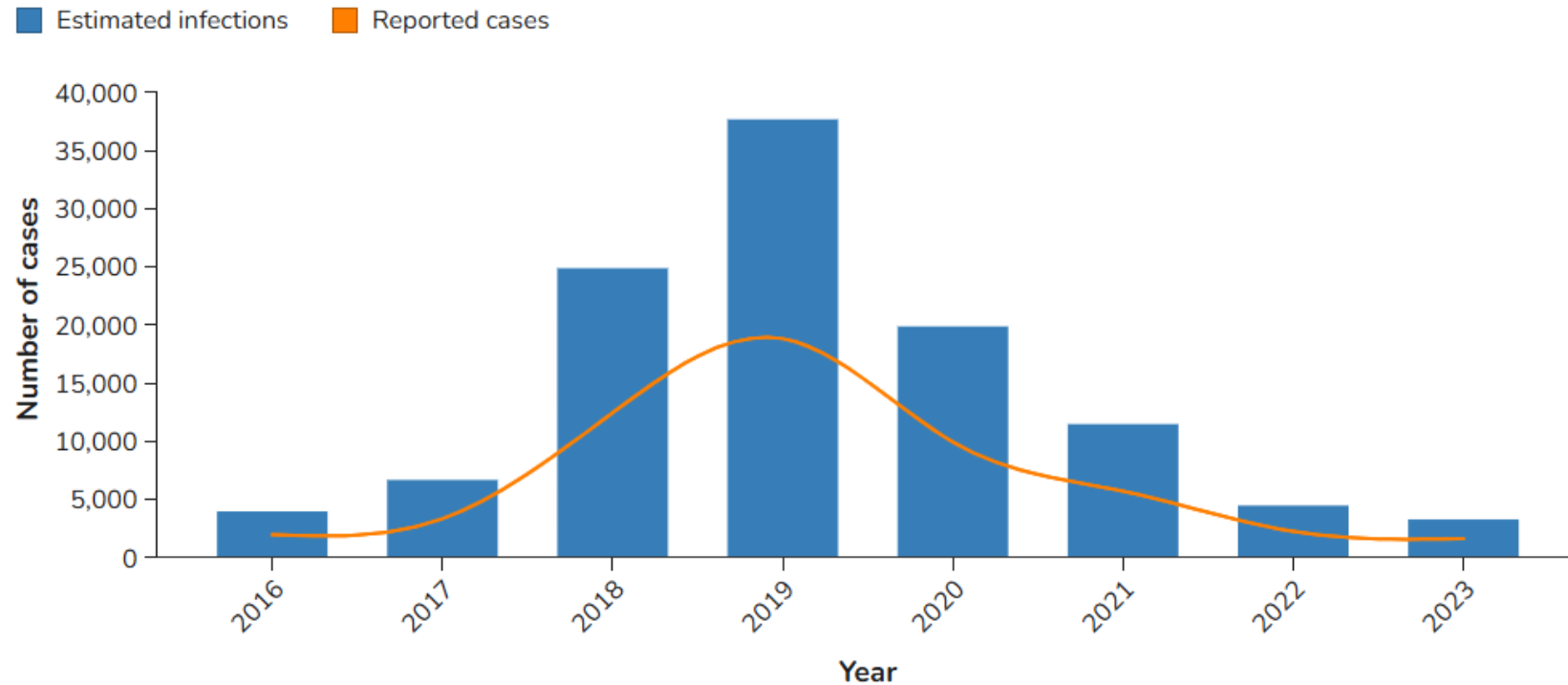
- **Schedule:** A 2- or 3-dose series
- **Sexual health-related indications:** Men who have sex with men

Hepatitis A incidence



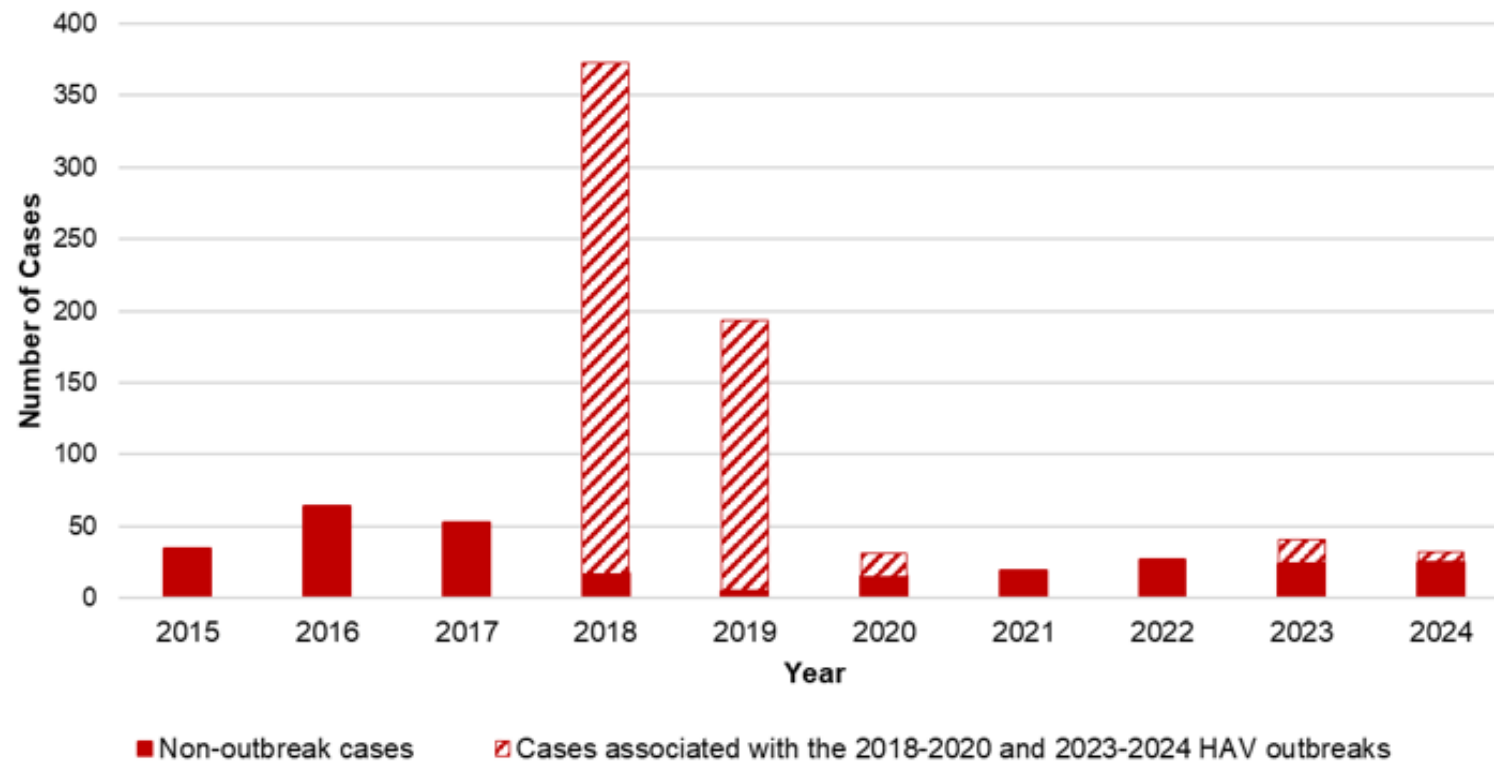
Hepatitis A cases and estimated infections, 2016-2023

Number of reported cases* and estimated infections† of hepatitis A — United States, 2016–2023



Recent outbreaks of hepatitis A have occurred in Massachusetts

Figure 1. Number of confirmed hepatitis A cases by outbreak status, MA, 2015-2024





Massachusetts Department of Public Health

Clinical Advisory – Hepatitis A Among Persons Experiencing Homelessness and Who Use Injection and Non-injection Drugs

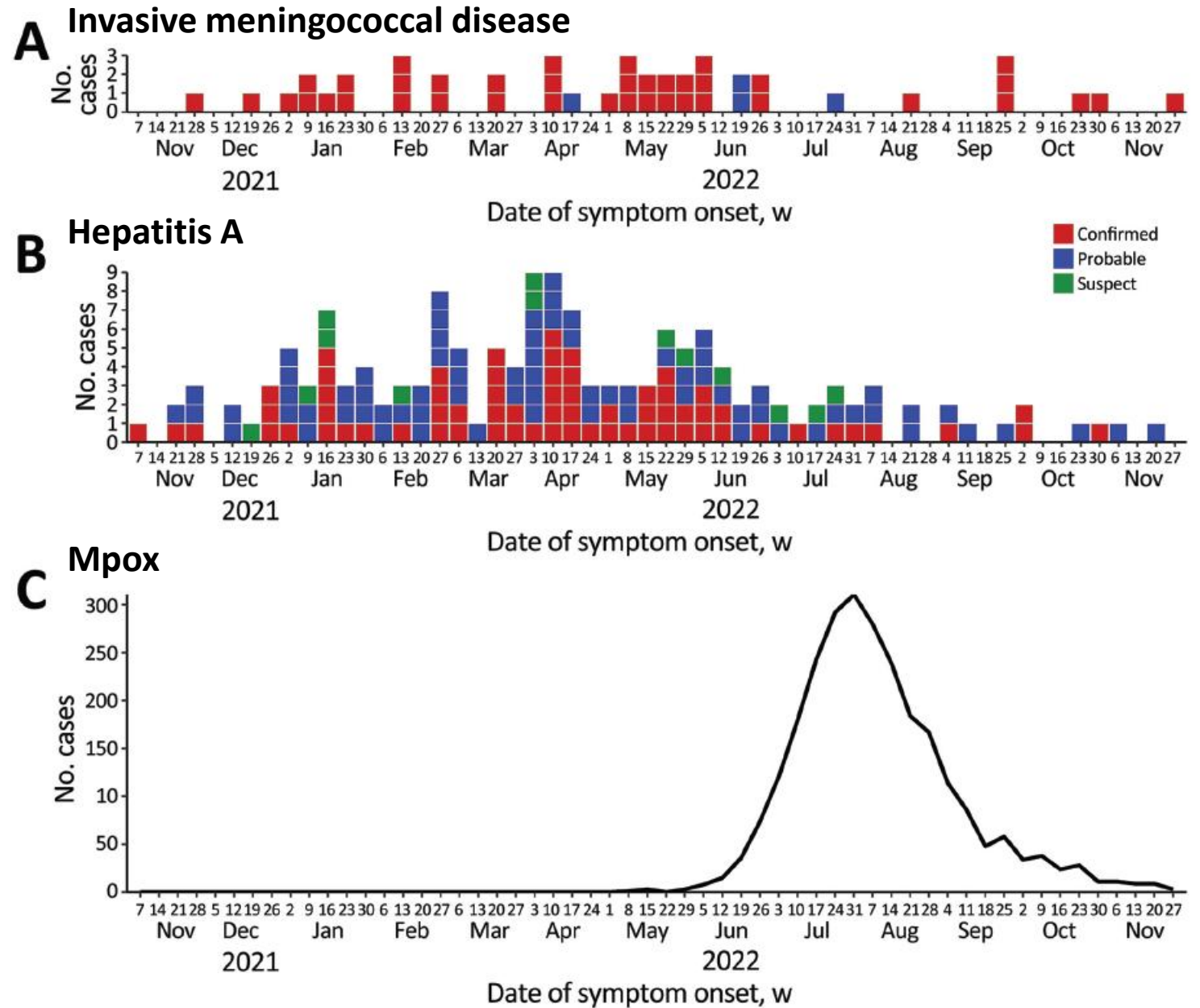
Outbreak

- At least 6 cases in November 2023
- 4 of 6 required hospitalization

Response

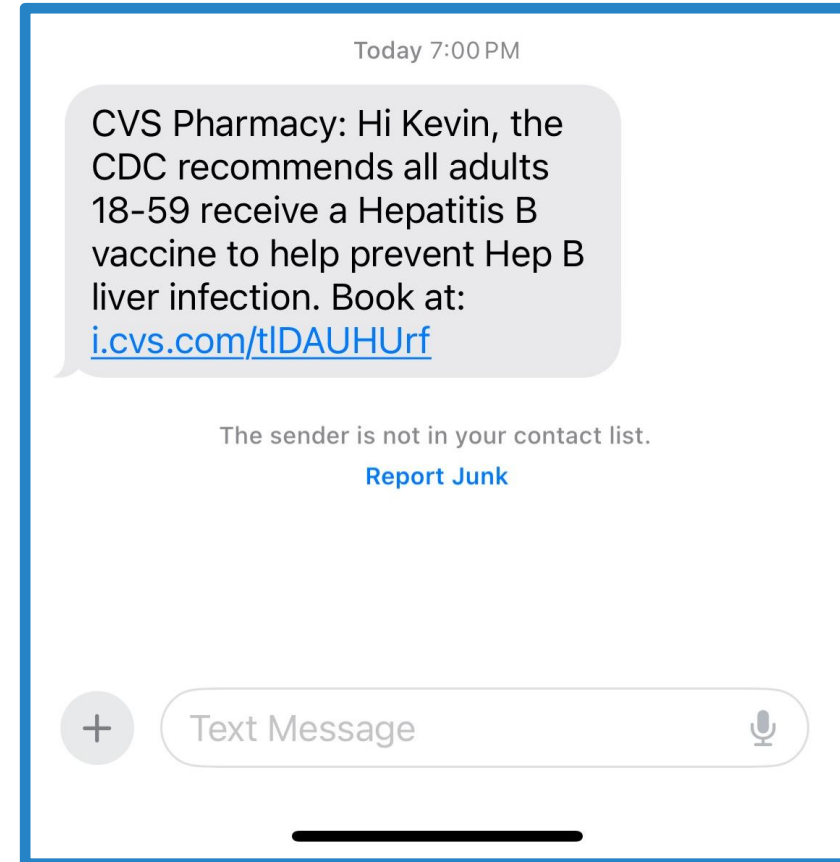
- Vaccinate people who inject drugs, people experiencing homelessness, those with chronic liver disease, and men who have sex with men
- Offer vaccination at the point of care, including in EDs and urgent care centers

Concurrent outbreaks of hepatitis A, meningococcal disease, and mpox affecting MSM

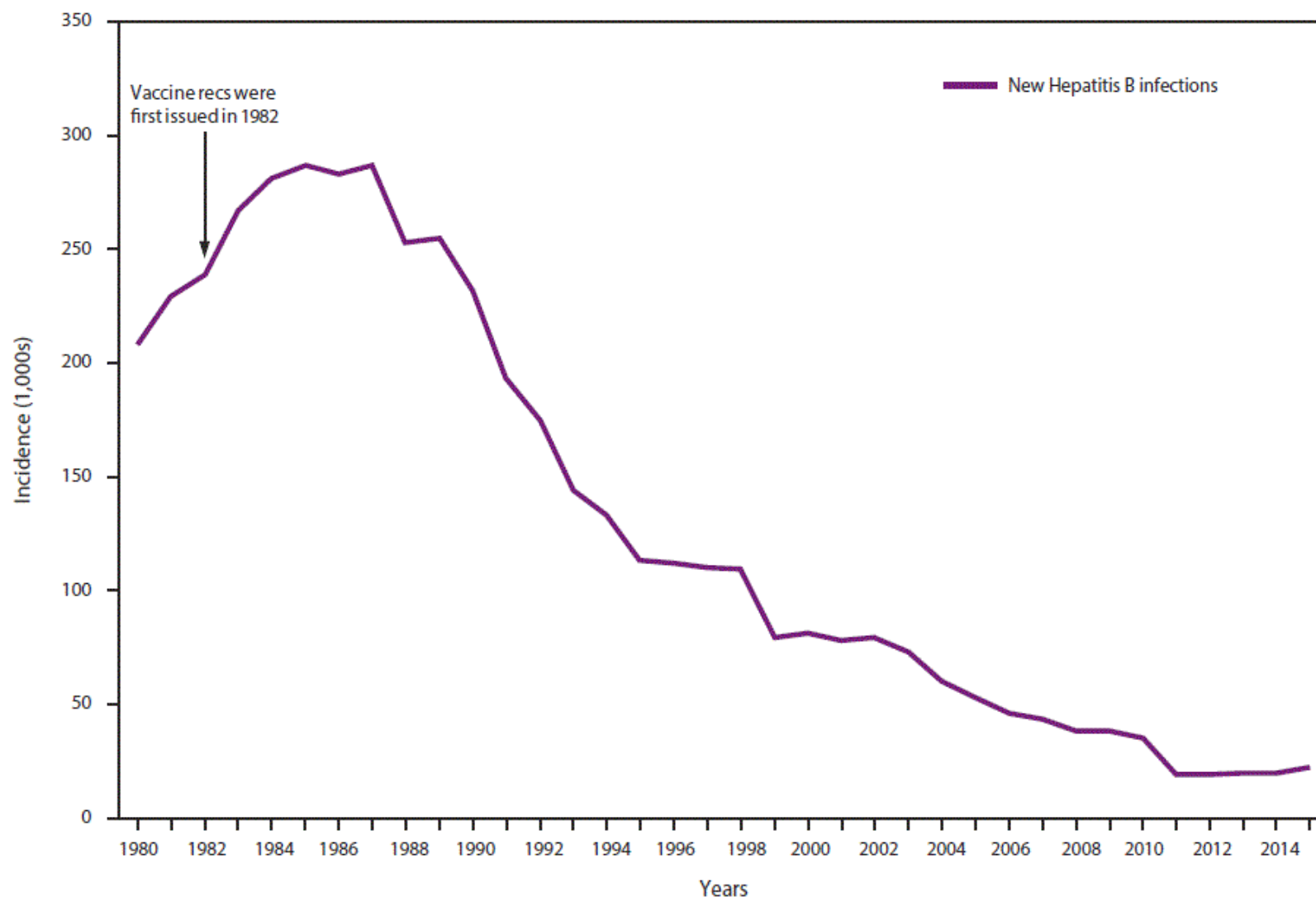


Hepatitis B vaccine

- **Schedule:** A 2-, 3-, or 4-dose series
- **Sexual health-related indications:**
 - Sex outside of a mutually monogamous relationship
 - Sex with someone who is positive for hepatitis B surface antigen
 - Seeking evaluation or treatment for sexually transmitted infections (STIs)
 - Men who have sex with men



**Hepatitis B
incidence has
declined
substantially in
the vaccine era.**



For which adults are post-vaccination hepatitis B antibody titers recommended?

Healthcare and public safety workers

People on hemodialysis

People with HIV

Immunocompromised people

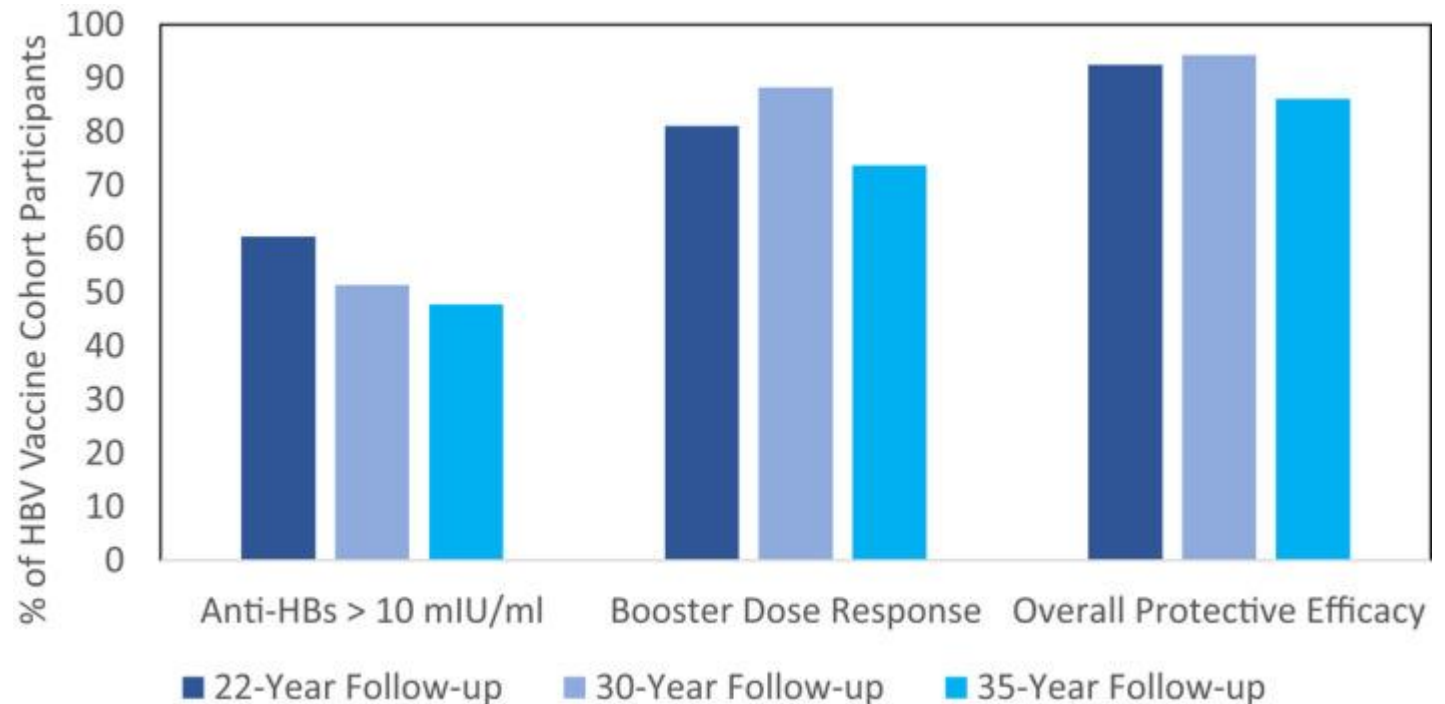
People whose sex partners are positive for hepatitis B surface antigen

Testing should be performed 1-2 months after the final vaccine dose.

Should patients such as ours receive additional hepatitis B vaccines?

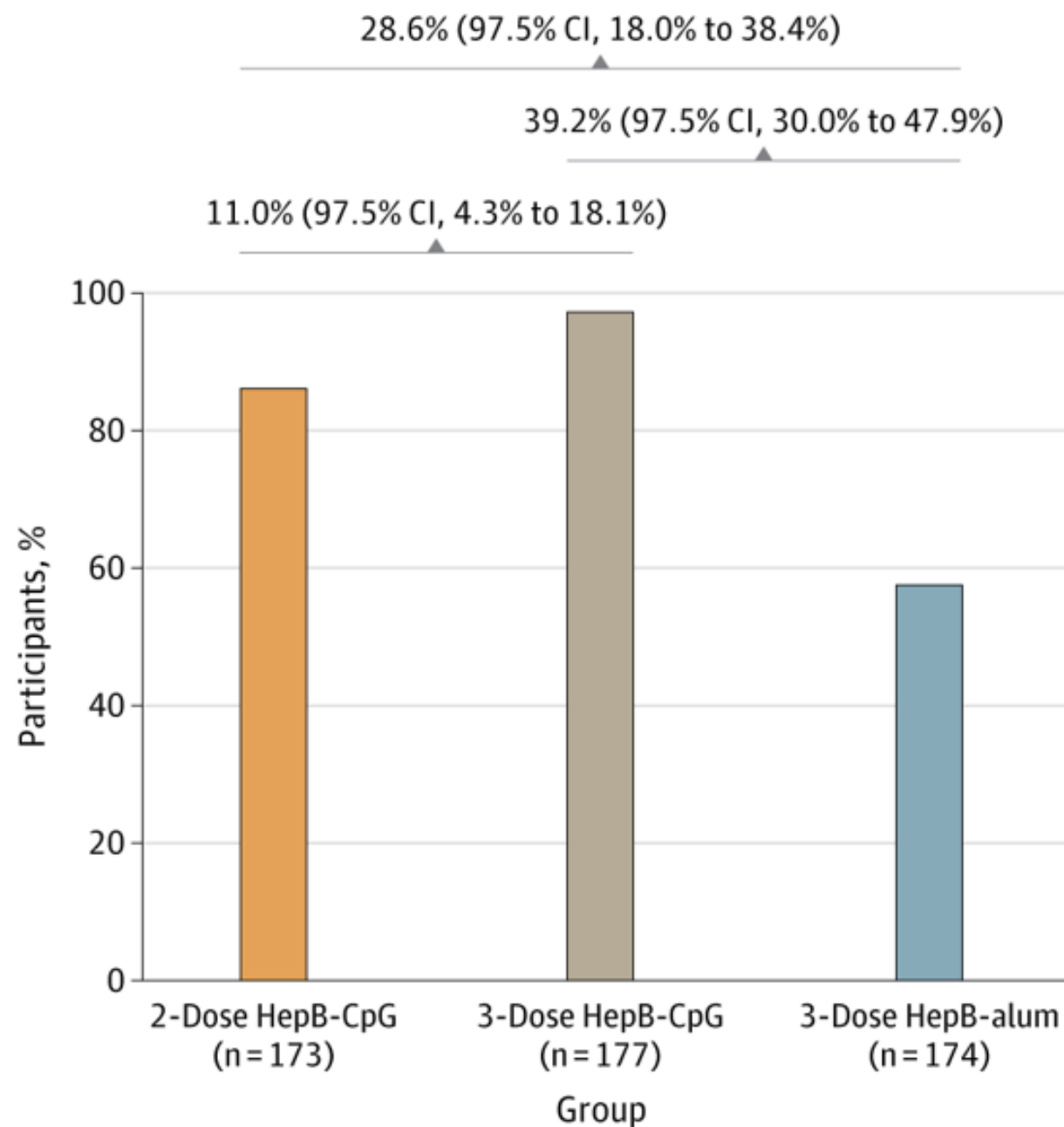
Generally, no. Studies suggest that people such as our patient are immune and would mount an immunologic response if exposed to hepatitis B.

Protective efficacy of 3-dose hepatitis B vaccine among Alaska Natives



The hepatitis B CpG vaccine achieves superior responses in people with HIV and prior non-response to conventional hepatitis B vaccines.

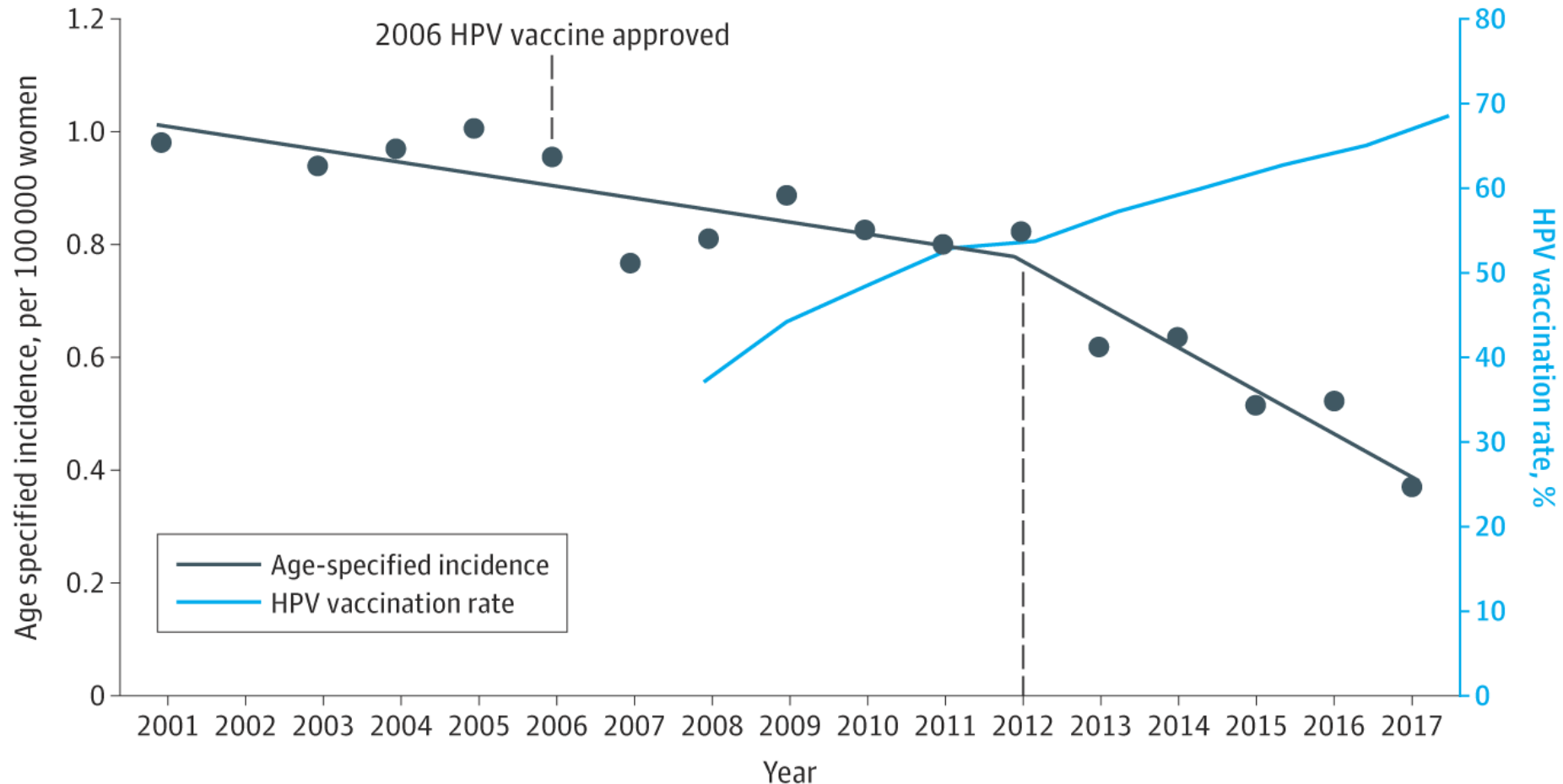
B End-of-study SPR



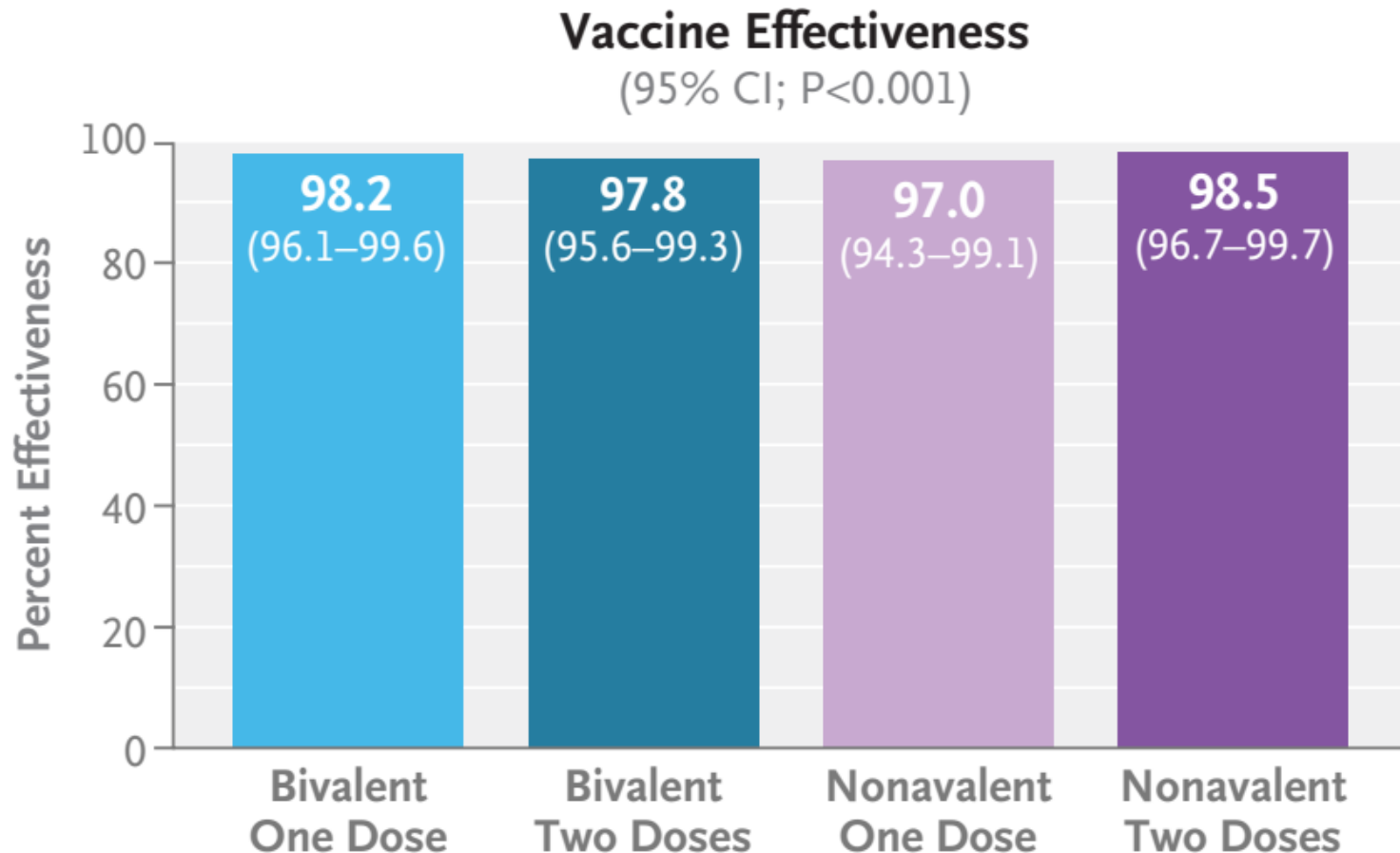
Human papillomavirus (HPV) vaccine

- **Schedule:** A 2- or 3-dose series, depending upon age and underlying conditions
- **Recommendations:**
 - All people through age 26 years
 - People ages 27-45 through shared decision-making

Increasing HPV vaccination is associated with declining cervical cancer incidence.



A single dose of HPV vaccine is as effective as two among young women.



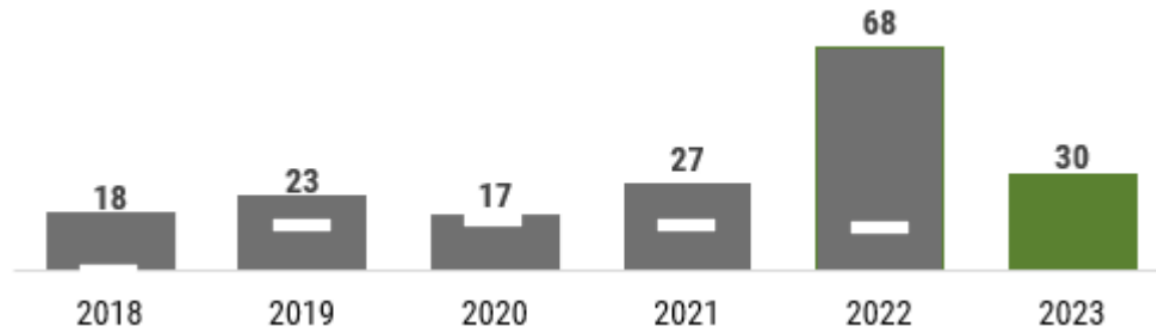
- The World Health Organization recommends single-dose HPV vaccination as an alternative strategy for girls and women ages 9–20 years.
- The single dose strategy is not recommended for men, people older than 20 years, or immunocompromised individuals.

Meningococcal vaccine

- **Schedule:** 1 or 2 doses, depending upon the context and product used
- **Sexual health related indications:**
 - For MenACWY: MSM in outbreak settings
 - For MenB: Others (e.g. MSM) in outbreak settings

2022 outbreak in Florida

Meningococcal disease cases in Florida, by year



*The white bars indicate the total number of cases as of August for each year

- Outbreak involved serogroup C and predominantly affected gay, bisexual, and other MSM, some with HIV.
- About half of cases were among Hispanic/Latino men.
- Most affected individuals lived in Florida, but some had traveled to the state.

Vaccination was key to outbreak response.

- CDC encouraged MSM living in Florida to receive vaccination with the MenACWY vaccine.
- The vaccine was available free of charge at health department clinics.
- CDC also encouraged MSM to discuss vaccination with their clinicians if they intended to travel to Florida.
- **Reminder:** CDC recommends routine meningococcal vaccination for all people with HIV.



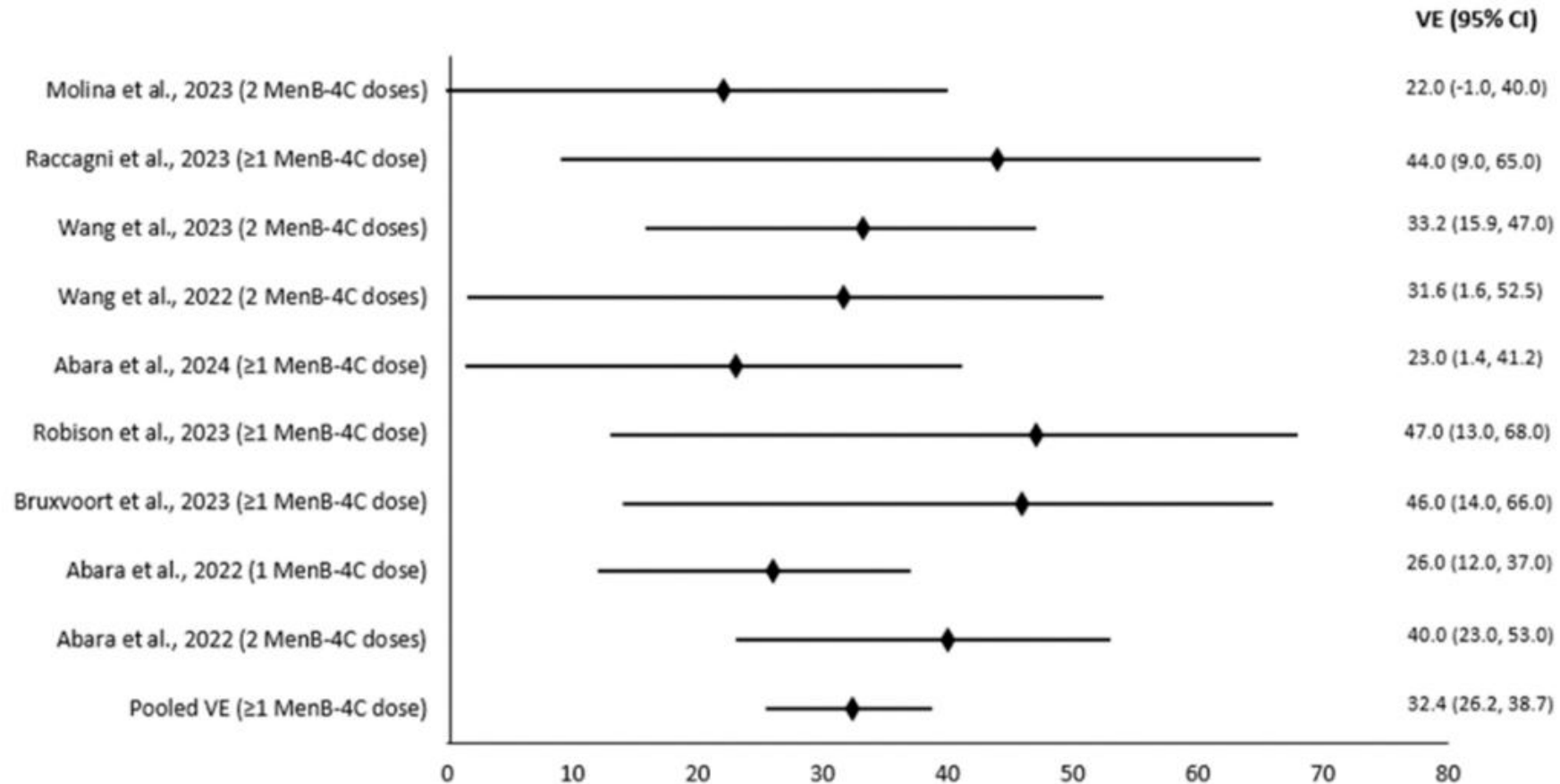
Does the meningococcal group B vaccine prevent gonorrhea?

A. Yes

B. No

C. I don't know.

Multiple observational studies suggest the meningitis B vaccine prevents gonorrhea.



The U.K. recommends meningitis B vaccine for MSM for gonorrhea prevention.



Guidance

A guide to the Meningococcal B vaccine for protection against Gonorrhoea

Updated 28 July 2025

Applies to England

Contents

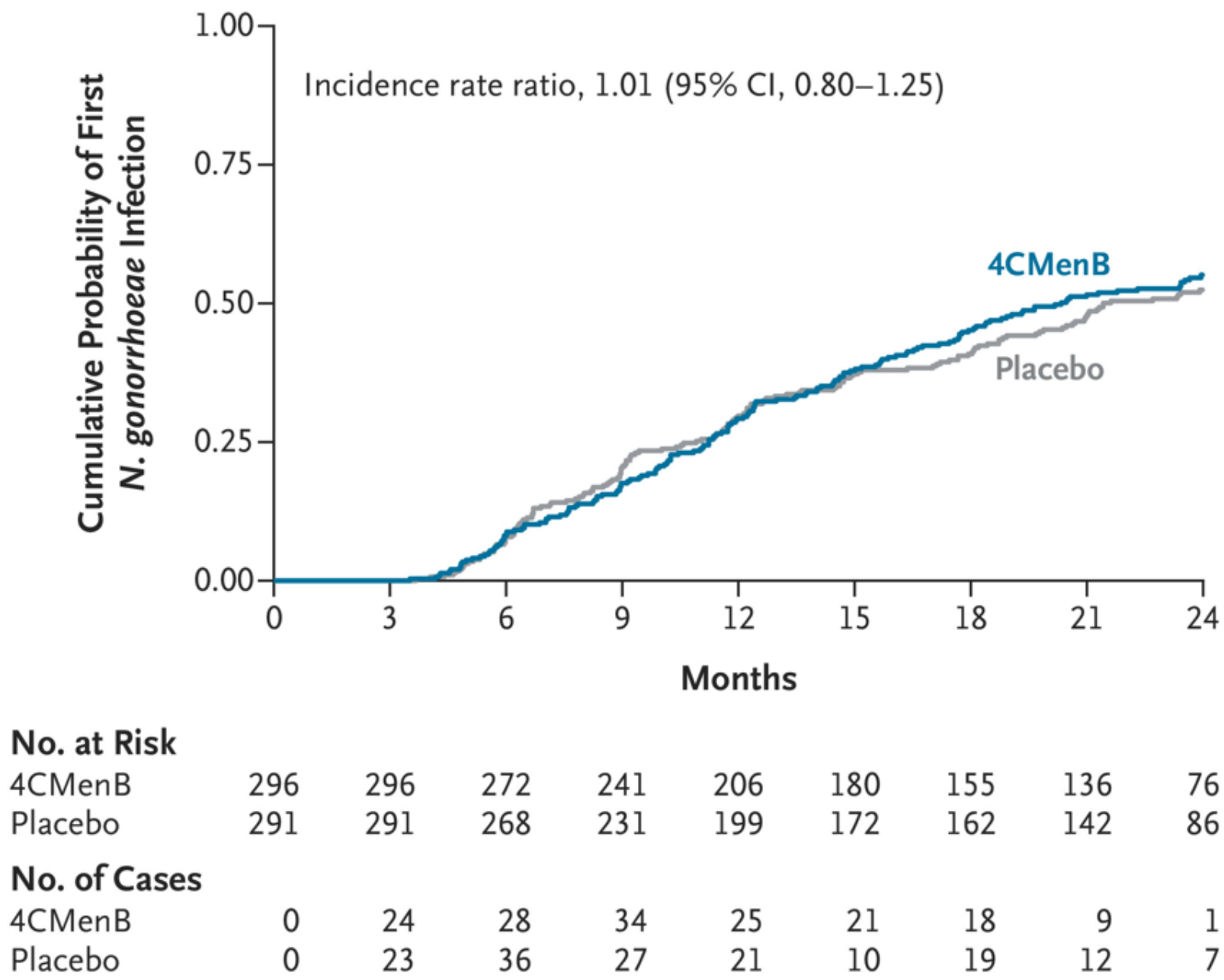
[Reducing your risk of infection](#)

[The Bexsero vaccine](#)

[How Bexsero helps protect](#)

This guidance is for gay, bisexual and other men who have sex with men.

However, a recent RCT showed no benefit.



Why the differences between the observational and RCT data?

1. The observational studies are limited by residual confounding.
2. The vaccine is not effective at preventing mucosal carriage of *Neisseria gonorrhoeae*, and gonorrhea is primarily a mucosal infection.
3. Prior gonorrhea may impair the effectiveness of the vaccine; the vaccine may be worthwhile in populations with minimal prior exposure to gonorrhea.

Multiple other RCTs of the meningitis vaccine are underway.

MAGI: Multisite international RCT of meningitis B vaccine versus placebo for men and women ages 18-50 years who are “vulnerable to *N. gonorrhoeae* infection”

BIYELA: RCT of the meningitis B vaccine for women ages 18-45 years in South Africa with recent PrEP use, a history of STIs in the past 12 months, and/or multiple sex partners in the past 12 months

UNC CHIM: RCT of meningitis B vaccine versus comparator (influenza or Td booster) with urethral challenge with *N. gonorrhoeae*, among men ages 18-36 years

Mpox vaccine

- **Schedule:** 2-dose series
- **Sexual health-related indications (Massachusetts):**
 - People with known or suspected exposure to mpox
 - Gay, bisexual, and other MSM and transgender and non-binary people who, in the past 6 months, have had
 - An STI diagnosis
 - More than one sex partner
 - People who, in the past 6 months, have had
 - Sex at a commercial sex venue or large public event where mpox transmission was occurring
 - Sex in exchange for money or other items
 - People whose sex partners have any of the above characteristics
 - People who anticipate experiencing any of the above scenarios
 - People traveling to an area with a clade I mpox outbreak or new clade II outbreak who anticipate sex with a new partner during travel.

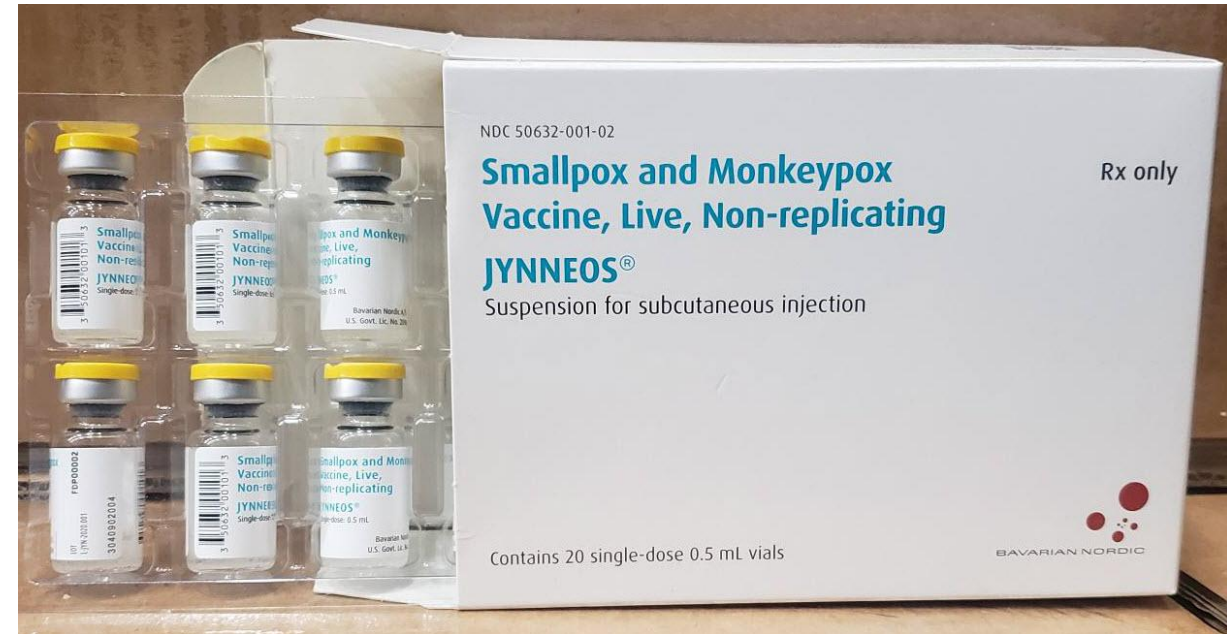
True or false: The MVA-BN mpox vaccine is contraindicated for immunocompromised people.

A. True

B. False

The MVA-BN vaccine

- Replication-deficient *Vaccinia* virus
- The only contraindication is severe allergy to a vaccine component (ciprofloxacin, gentamicin, egg).
- Side effects include injection site reactions; serious side effects are rare.
- The vaccine is safe in people with HIV and immunogenic in people with CD4 counts > 100.



ACAM2000 versus MVA-BN

TABLE 3. Contraindication to administration of ACAM2000 and JYNNEOS to recipients or their household contacts with certain conditions — United States, 2022

Clinical characteristic	Contraindication to receipt of ACAM2000			Contraindication to receipt of JYNNEOS
	Vaccine recipient with condition		Household contact with condition*	
	Primary vaccination	Revaccination		
History or presence of atopic dermatitis	Y	Y	Y	—
Other active exfoliative skin conditions [†]	Y	Y	Y	—
Immunosuppression [§]	Y	Y	Y	—
Pregnancy [¶]	Y	Y	Y	—
Age <1 year**	Y	Y	Y	—
Breastfeeding ^{††}	Y	Y	—	—
Serious vaccine component allergy	Y	Y	—	Y
Known underlying heart disease (e.g., coronary artery disease or cardiomyopathy)	Y	Y	—	—
≥3 known major cardiac risk factors ^{§§}	Y	—	—	—

The vaccine is effective, and two doses are better than one.

TABLE 2. JYNNEOS vaccination history and estimated vaccine effectiveness among case-patients with mpox and control patients with sexually transmitted infections — New York,* July 24, 2022–October 31, 2022

Vaccination status	Mpox case-patients (n = 252)	All STI controls (n = 255)	
	No. (%)	No. (%)	VE (95% CI)
Unvaccinated	230 (91.3)	204 (80.0)	Ref
0–13 days after first dose	10 (4.0)	9 (3.5)	–36.2 (<–100 to 56.3)
≥14 days after first dose	10 (4.0)	23 (9.0)	68.1 (24.9 to 86.5)
≥0 days after second dose	2 (0.8)	19 (7.5)	88.5 (44.1 to 97.6)
≥14 days after first dose or ≥0 days after second dose	12 (4.8)	42 (16.5)	75.7 (48.5 to 88.5)

Abbreviations: Mpox = monkeypox; Ref = referent group; STI = sexually transmitted infection; VE = vaccine effectiveness.

* Outside of New York City.

Vaccination reduces the odds of hospitalization, even if infection occurs.

TABLE 2. Mpox hospitalizations, by JYNNEOS vaccination status (N = 4,611) — California, May 12, 2022–May 18, 2023

JYNNEOS vaccination status	Hospitalization status, no. (%)		Total, no.	OR (95% CI)
	Hospitalized n = 250	Not hospitalized n = 4,361		
Received 1 dose*	4 (1.7)	226 (98.3)	230	0.27 (0.08–0.65)
Received 2 doses†	1 (1.3)	78 (98.7)	79	0.20 (0.01–0.90)
Received PEP§	12 (2.6)	445 (97.4)	457	0.42 (0.22–0.72)
Unvaccinated¶	233 (6.1)	3,612 (93.9)	3,845	Ref

Prior smallpox vaccination reduced the likelihood of mpox among military personnel.

- 2.6 million military personnel received smallpox vaccination between 2002 and 2017
- Case-control study among military personnel with medically-evaluated mpox symptoms to assess vaccine effectiveness (odds ratio of previous vaccination and positive test)
- 1,014 subjects, of whom 293 tested positive for mpox
- Median time from vaccination to mpox diagnosis was 13 years

Table 1. Risk of Human Mpox Diagnosis, According to Subgroup.

Variable	Odds Ratio (95% CI)	
	Unadjusted	Adjusted*
Vaccine type		
ACAM2000	0.44 (0.26–0.70)	0.25 (0.15–0.42)
Dryvax	0.39 (0.19–0.75)	0.28 (0.13–0.58)
Age group		
35–44 yr	0.96 (0.67–1.37)	0.84 (0.55–1.28)
45–64 yr	0.50 (0.36–0.70)	0.34 (0.23–0.49)
≥65 yr	0.05 (0.02–0.11)	0.04 (0.01–0.08)
Race or ethnic group†		
Black	1.73 (1.26–2.40)	1.29 (0.90–1.87)
Hispanic	1.24 (0.83–1.85)	1.00 (0.64–1.55)
Other or unknown	1.34 (0.74–2.36)	0.90 (0.46–1.66)
Male sex	7.39 (3.28–21.18)	6.83 (2.95–19.89)
HIV diagnosis	2.89 (2.15–3.89)	2.34 (1.65–3.35)

* The logistic regression model was adjusted for age, race, sex, and HIV status.

† Race or ethnic group was reported by the participants. White race was used as the reference group in this analysis.

Implementation

1. Elicit a sexual history

“Men who have sex with men”

“Sex in exchange for money”

“Sex with multiple partners”

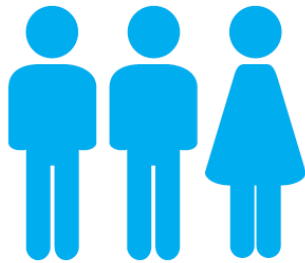
“Sex at a commercial sex venue”

“Seeking testing or treatment for sexually transmitted infections”

“Sex partners positive for hepatitis B surface antigen”

Tips for eliciting a sexual history

1. Explain why the information is important, but do not single out the sexual history as uniquely sensitive.
2. Avoid assumptions about sexual orientation, partner number, condom use, partner gender and anatomy.



2. Minimize the impact of stigma on vaccine access and uptake.

When an individual at risk requests vaccine, they will not be asked which of these criteria applies. It is sufficient to say that they consider themselves to be at risk for mpox.

www.mass.gov/info-details/mpox-vaccination#eligibility-
www.statnews.com/2022/08/04/with-monkeypox-vaccine-in-high-demand-nih-to-test-approaches-to-stretch-supplies/



3. Routinely assess for vaccine indications at healthcare encounters for other purposes.

Relevant Vaccination History:

Hepatitis A	☐ Completed series	☐ Partial	☐ Unsure	☐ No	☐ History of infection
Hepatitis B	☐ Completed series	☐ Partial	☐ Unsure	☐ No	☐ History of infection
HPV	☐ Completed series	☐ Partial	☐ Unsure	☐ No	
Mpox	☐ Completed series	☐ Partial	☐ Unsure	☐ No	☐ History of infection

Sexual History:

Date of last contact:

Gender of partner:	☐ Male	☐ Female	☐ Trans/other
Condoms	☐ yes	☐ no	

Date of prior contact with different person:

Gender of partner	☐ Male	☐ Female	☐ Trans/other
Condoms	☐ yes	☐ no	

Sites of contact: ☐ Mouth ☐ Penis ☐ Vagina Rectum - ☐ receptive ☐ insertive

Overall condom use comments:

Number of sexual partners in last year:

Recommend indicated vaccines when people seek care for other purposes.

Characteristics of individuals receiving mpox vaccination at a specialized sexual health clinic stratified by vaccine visit type.

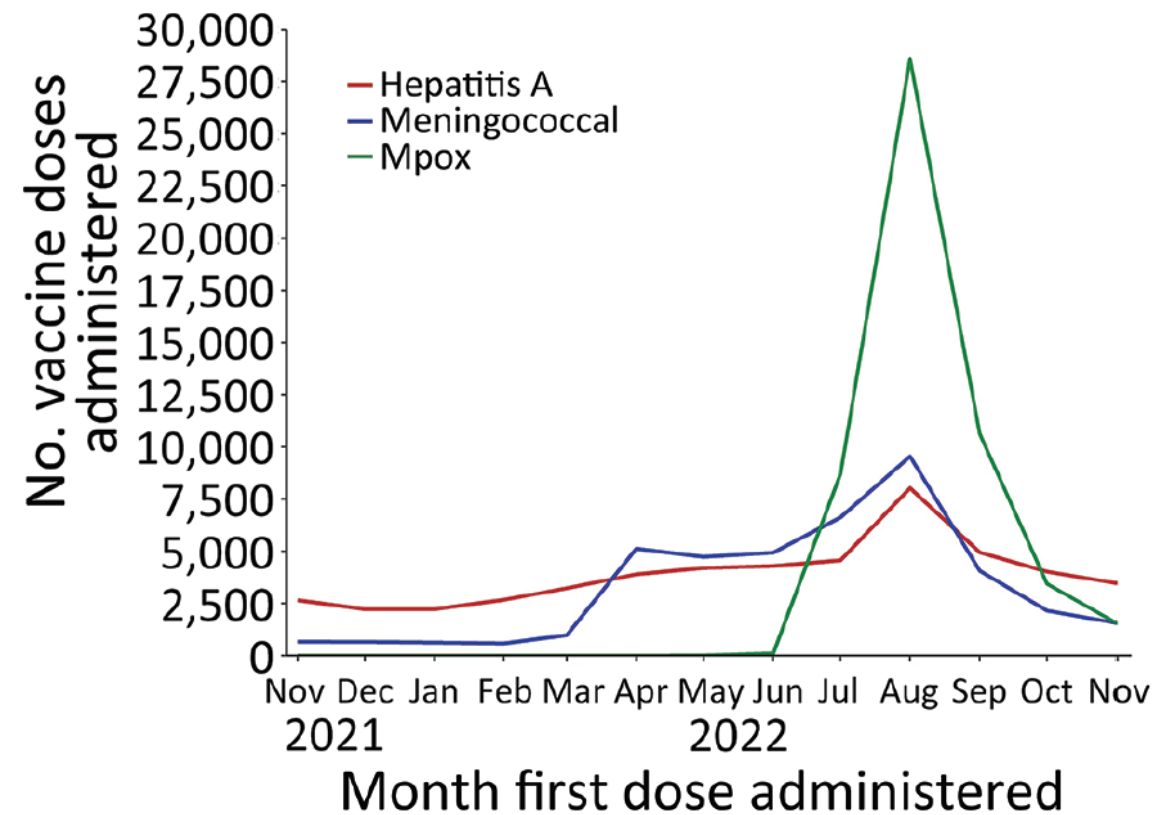
	Total (n = 3291)	Vaccine-only visit (n = 2768)	Vaccine during regular clinic visit (n = 523)	p-value
	n(%) or median [IQR]			
New patient at clinic	2736 (83.1%)	2464 (89.0%)	272 (52.0%)	<0.0001
Age	34 [28, 45]	34 [28, 47]	30 [25, 38]	<0.0001
Race, n=2951				<0.0001
White	2102 (71.2%)	1810 (72.6%)	292 (62.8%)	
Asian	301 (10.2%)	241 (9.7%)	60 (12.9%)	
Black	197 (6.7%)	164 (6.5%)	33 (7.1%)	
Other	351 (11.9%)	279 (11.2%)	80 (17.2%)	
Hispanic ethnicity, n=2821	436 (15.5%)	315 (13.4%)	121 (25.9%)	<0.0001
Gender Identity, n=3264				0.037
Cisgender Male	2,985 (91.4%)	2504 (91.3%)	481 (92.3%)	
Cisgender Female	163 (5.0%)	147 (5.3%)	16 (3.1%)	
Transgender/Nonbinary/Other	116 (3.6%)	92 (3.4%)	24 (4.6%)	
Social Vulnerability Index in First Quintile*, n=3286	1699 (51.7%)	1464 (53.0%)	235 (45.1%)	0.001

Younger

More likely to identify as Hispanic

More socially vulnerable

4. Bundle syndemic vaccines and other interventions.



5. Provide vaccines in non-traditional locations, in addition to on-site at clinical locations.



Strategies to improve vaccine confidence and uptake

1. **Recommend vaccination when indicated:** Clinicians' recommendations are strong predictors of vaccine uptake.
2. **Communicate in a presumptive manner:** "You are due for the mpox vaccine today, and I recommend you receive it." instead of "Would you like the mpox vaccine?"
3. **Engage in empathic conversation:**
 - Ask patients to share their concerns
 - Share medical knowledge about vaccines, including side effects
 - Reframe the discussion to focus on disease severity
 - Address cost and access barriers
 - Suggest ongoing discussion if the patient is not initially amenable to vaccination

Summary

- Five currently available vaccines have sexual health-related indications and benefits: HAV, HBV, HPV, mpox, and meningococcal.
- Steps to improve access to and uptake of vaccines include eliciting a sexual history, minimizing the effects of sexual stigma on access, routinely assessing vaccine history at health care visits for other purposes, bundling vaccines for syndemic conditions, offering vaccines at non-traditional sites, and engaging in empathic communication.
- A gonococcal vaccine may be on the horizon; vaccines for other STIs are not yet available.