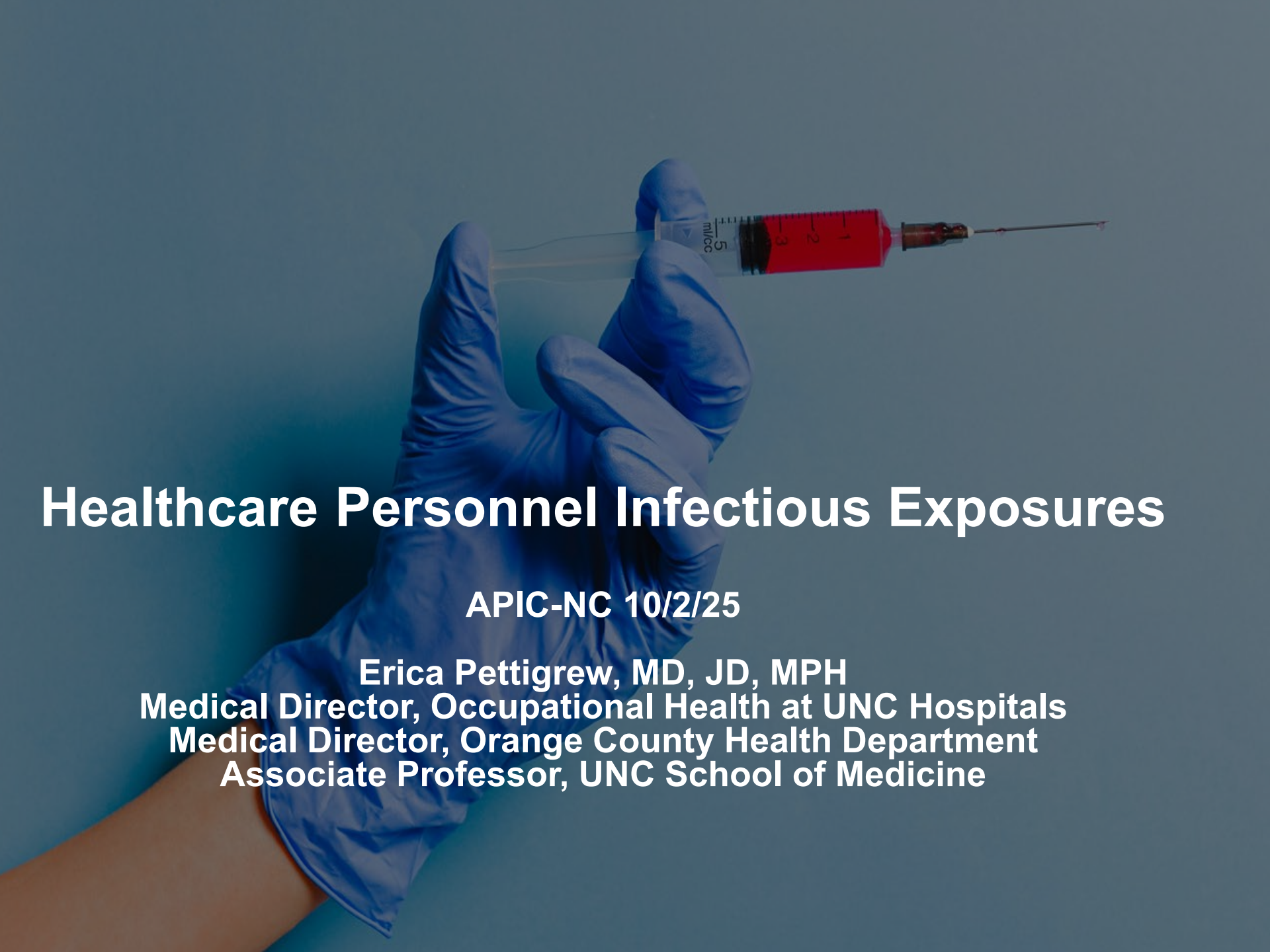


A hand wearing a blue nitrile glove is holding a syringe horizontally. The syringe has a red plunger and a needle. The background is a solid blue color.

Healthcare Personnel Infectious Exposures

APIC-NC 10/2/25

Erica Pettigrew, MD, JD, MPH
Medical Director, Occupational Health at UNC Hospitals
Medical Director, Orange County Health Department
Associate Professor, UNC School of Medicine

Brief Background and Lack of Disclosures

MD/JD at UNC, finished 2012
MPH at Portland State

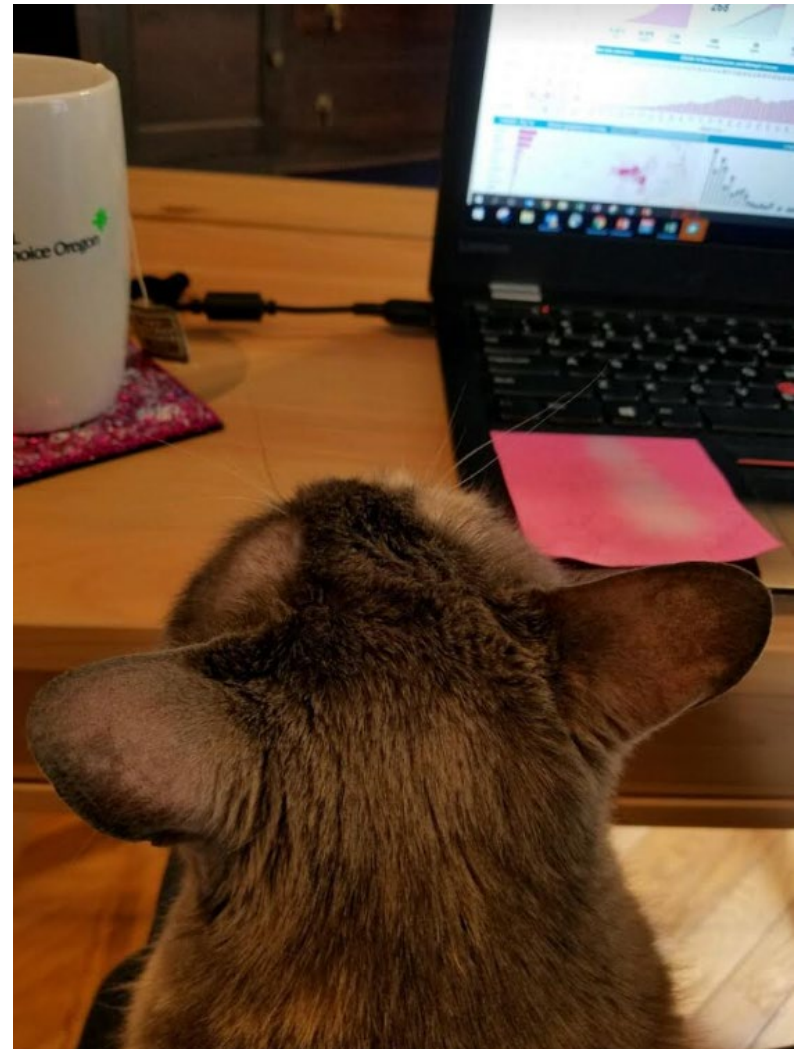
Dual residency at OHSU (Family
Medicine/Preventive Medicine)

UNC School of Medicine faculty since Nov
2016

Roles include:

- Orange County Health Dept
- Occupational Health
- Fam Medicine Clinic/Urgent Care

No Disclosures



Agenda

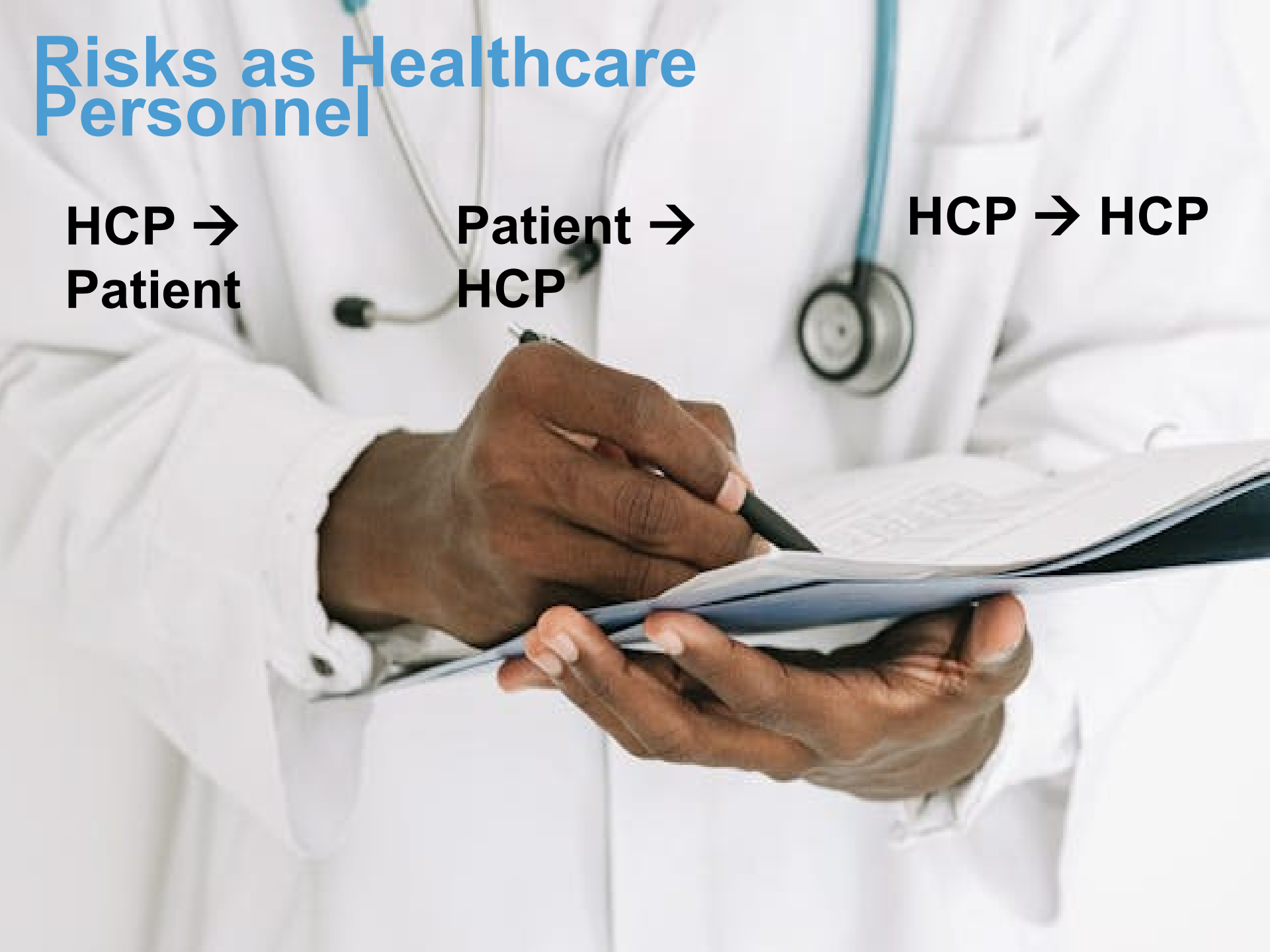
- Introduction to Exposure Risks for Healthcare Personnel
- Prevention
 - Vaccines for HCPs and TB screening
- Post-Exposure
 - Needlestick and other body fluid exposures (HIV, Hepatitis B and C)
 - Pertussis
 - *Neisseria meningitidis*
 - Measles
 - Varicella

Risks as Healthcare Personnel

**HCP →
Patient**

**Patient →
HCP**

HCP → HCP



What Are Ways To Protect Healthcare Personnel and Patients from Infections?



Today we are going to focus on:

Prevention:

- Vaccines
- Tuberculosis screening upon hire

Post-Exposure Surveillance/Prophylaxis:

- HIV, hepatitis B and C from needlesticks and other body fluid exposures
- Meningococcal and Pertussis
- Measles
- Varicella

Prevention



Life expectancy

The period life expectancy at birth, in a given year.

Our World
in Data

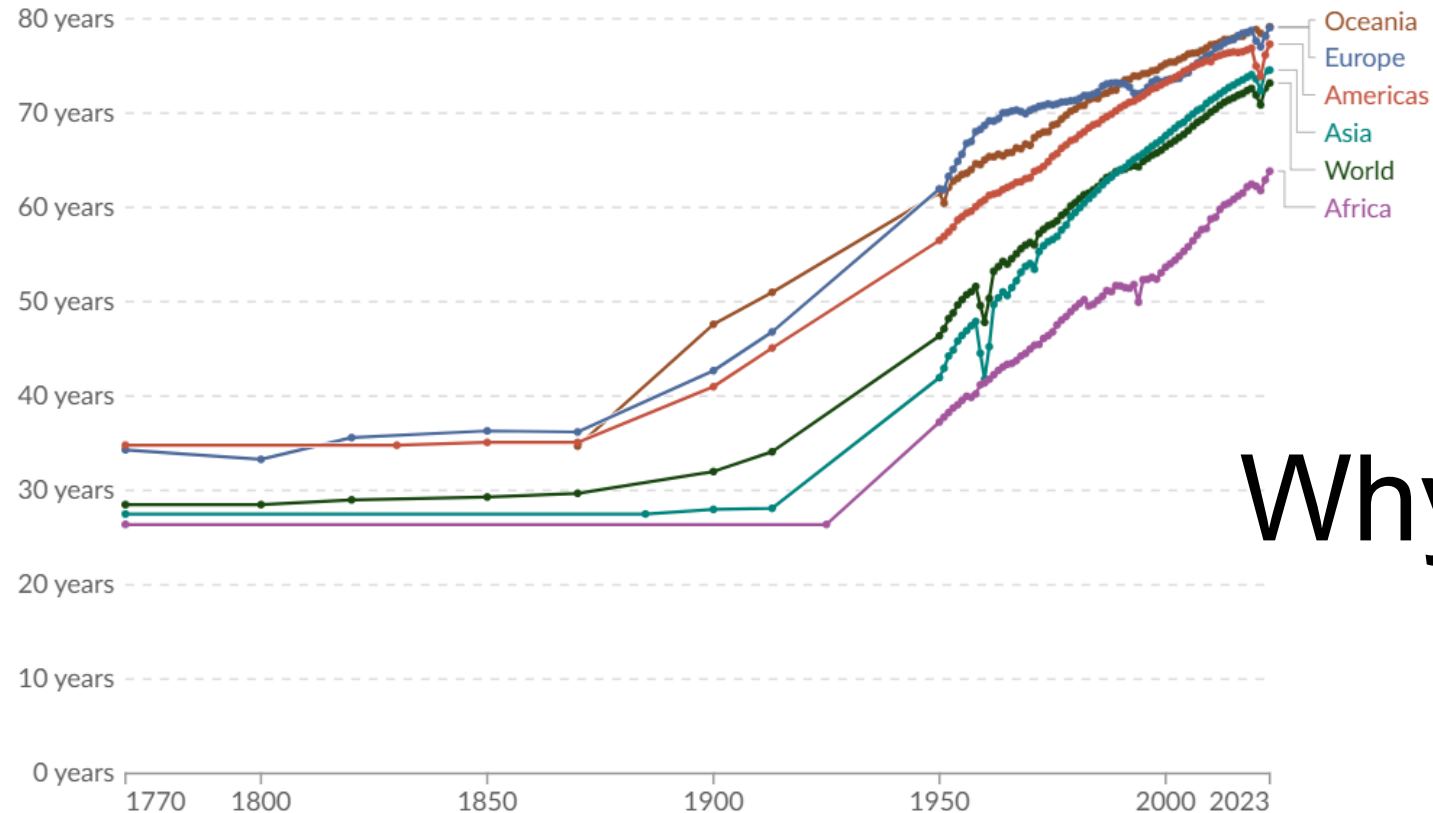
Table

Map

Chart

Edit countries and regions

Settings



Why?



1770



2023

Data source: UN WPP (2024); HMD (2024); Zijdeman et al. (2015); Riley (2005) - [Learn more about this data](#)

OurWorldinData.org/life-expectancy | CC BY



[Life Expectancy - Our World in Data](#)

UNC Health

Huge Increase in Life Expectancy Due To



Vaccines

Clean Water



How Do We Know Vaccines Really Work?

DISEASE	PRE-VACCINE ERA ESTIMATED ANNUAL MORBIDITY ¹	MOST RECENT REPORTS OR ESTIMATES OF U.S. CASES	PERCENT DECREASE
Diphtheria	21,053	2 ²	>99%
<i>H. influenzae</i> serotype B (invasive, <5 years of age)	20,000	18 ²	>99%
Hepatitis A	117,333	(est) 37,700 ³	68%
Hepatitis B (acute)	66,232	(est) 20,700 ³	69%
Measles	530,217	1,275 ²	>99%
Meningococcal disease (all serotypes)	2,886 ⁴	371 ²	87%
Mumps	162,344	3,780 ²	98%
Pertussis	200,752	18,617 ²	91%
Pneumococcal disease (invasive, <5 years of age)	16,069	1,700 ⁵	89%
Polio (paralytic)	16,316	0 ²	100%
Rotavirus (hospitalizations, <3 years of age)	62,500 ⁶	30,625 ⁷	51%
Rubella	47,745	6 ²	>99%
Congenital Rubella Syndrome	152	1 ²	>99%
Smallpox	29,005	0 ²	100%
Tetanus	580	26 ²	96%
Varicella	4,085,120	8,297 ⁸	>99%

Unfortunately, in the US vaccine rates are declining and we are seeing a rise in vaccine-preventable diseases.



HCP Vaccination Recommendations

Vaccination	Recommendation
COVID-19	Everyone 6 months+ should get one dose of newest formulation
Hepatitis B	If no prior dose, either 2 doses of Heplisav-B or 3-dose series of either Engerix or Recombivax Obtain serology 1-2 months after final dose
Influenza	Give 1 dose annually
MMR	HCP born in 1957 or later need 2-doses of MMR, 4 weeks apart if no prior immunity or vaccination. Before 1957, consider serology testing and dosing if needed
Varicella	If no prior infection, serologic immunity, prior vaccination, give 2 doses of varicella vaccine 4 weeks apart
Polio	One lifetime booster dose for fully vaccinated HCPs (3 previous doses); catch up to complete vaccine series if partially or unvaccinated
Meningococcal	Microbiologists exposed to isolates of <i>N. Meningitidis</i> (<i>Men ACWY and Men B</i>)

<https://www.cdc.gov/vaccines/adults/rec-vac/hcw.html>, original (with Tdap instead of Polio) no longer available as of 9/2025

Tuberculosis Testing/ Treatment

Baseline (preplacement) screening and testing. All U.S. health care personnel should have baseline TB screening, including an individual risk assessment, which is necessary for interpreting any test result. IGRAs (quant gold or T spot) or tb skin tests can be used. Follow CDC algorithm for interpretation.

Serial screening and testing for health care personnel without LTBI is NOT indicated. In the absence of known exposure or evidence of ongoing TB transmission, U.S. health care personnel (as identified in the 2005 guidelines) without LTBI should not undergo routine serial TB screening or testing at any interval after baseline (e.g., annually.) Could consider annual screening with high risk groups like respiratory therapists.

Health care personnel with LTBI and no prior treatment should be offered, and strongly encouraged to complete treatment with a recommended regimen, including short-course treatments, unless a contraindication exists

Sosa LE, Njie GJ, Lobato MN, et al. Tuberculosis Screening, Testing, and Treatment of U.S. Health Care Personnel: Recommendations from the National Tuberculosis Controllers Association and CDC, 2019. MMWR Morb Mortal Wkly Rep 2019;68:439–443. DOI: <http://dx.doi.org/10.15585/mmwr.mm6819a3external icon>.

Post-Exposure Surveillance and Prophylaxis



Formula For All Exposures Before Deciding on PEP and/or Quarantine

Is this a true exposure?

Contact Spread:

- a) What infections could be carried in the body fluid involved?
- b) If that body fluid has potential to spread infection, did it come into contact with mucous membranes or non-intact skin? (May be unnecessary in situations like scabies, lice, etc)

Respiratory/Airborne

- a) Was the infected patient contagious when the HCP interacted with them?
- b) If yes, does the interaction meet the infection's particular definition of exposure by proximity, time, and lack of PPE?

The background of the slide is a close-up photograph of a white surface covered with numerous red blood splatters. The splatters vary in size and shape, including small droplets, elongated streaks, and larger, more complex blotches. The red color is vibrant against the stark white background.

Bloodborne Pathogen Exposures

Basics of Blood/Body Fluid Exposures



- 1) Exposure occurs
- 2) Pause clinical activity (scrub out of surgery ideally)
- 3) Wash site of exposure thoroughly with soap and water
- 4) Ensure source patient stays in facility
- 5) Call needlestick hotline immediately. Do not wait until end of clinic day or end of case.
- 6) Occupational Health evaluates situation, and if exposure occurred (remember, must have infectious fluid + nonintact skin or mucus membranes) then Source Patient labs (HIV, Hepatitis B and Hepatitis C, generally) ordered.
- 7) HIV (4th gen), Hepatitis B and Hepatitis C (antibody) labs ideally result within a few hours. HCV viral load should also be ordered on all source patients but typically takes longer.
- 8) If all three infection results are negative, the results are conveyed to the stuck employee. Nothing further is needed. No blood work is indicated for the employee. (Some facilities may do this slightly differently.)

Lab Results and Next Steps

Source Patient Triple Negative:

- No further actions are necessary. Employee blood draw is not indicated.

Source Patient HIV Positive:

- Baseline and serial employee labs ordered and drawn by Occupational Health
- Post-exposure prophylaxis is provided immediately to the employee

Source Patient Hepatitis B Positive:

- Employee's immunity status is reviewed by Occupational Health.
 - If employee is not immune,
 - Baseline employee labs are drawn
 - Post-exposure prophylaxis is administered and employee is followed with serial testing.
 - If employee is immune (titer is positive), no action necessary.

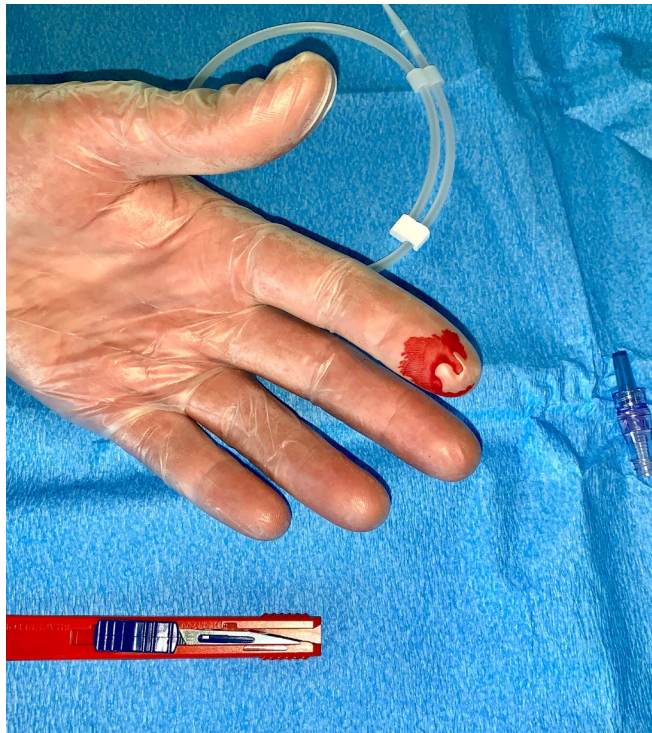
Source Patient Hepatitis C:

- Baseline and serial employee labs ordered and drawn by Occupational Health. No PEP available.



Unknown/Unavailable Source Patient

- Decision to administer HIV post-exposure prophylaxis is based on source patient risk factors, prevalence in local community, and shared decision-making w/ exposed HCP
- Employee's hepatitis B immune status is reviewed and if non-immune, post-exposure prophylaxis with HBIG +/- vaccination is considered, again based on above
- Baseline and serial employee labs are ordered, drawn and followed by Occupational Health

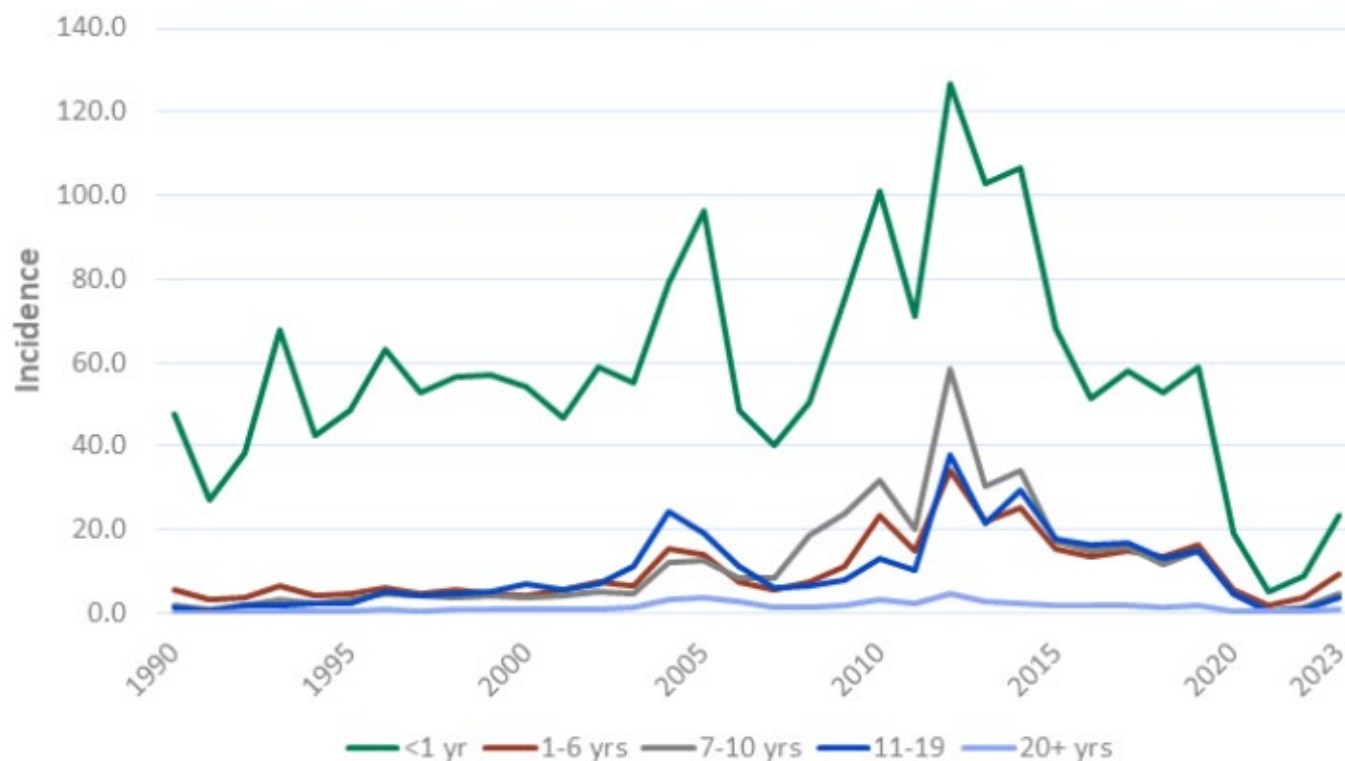


Respiratory Post-Exposure



Pertussis is on the rise again

Reported pertussis incidence by age group: 1990-2023



SOURCE: CDC, National Notifiable Diseases Surveillance System

Pertussis PEP Recs From CDC

1. For asymptomatic healthcare personnel, regardless of vaccination status, who have an exposure to pertussis and are likely to interact with persons at increased risk for severe pertussis:
 - Administer postexposure prophylaxis.
 - If not receiving postexposure prophylaxis, restrict from contact (e.g., furlough, duty restriction, or reassignment) with patients and other persons at increased risk for severe pertussis for 21 days after the last exposure.
2. For asymptomatic healthcare personnel, regardless of vaccination status, who have an exposure to pertussis and are not likely to interact with persons at increased risk for severe pertussis:
 - Administer postexposure prophylaxis, OR
 - Implement daily monitoring for 21 days after the last exposure for development of signs and symptoms of pertussis.

Pertussis PEP Recs From CDC

3. For asymptomatic healthcare personnel, regardless of vaccination status, who have an exposure to pertussis and who have preexisting health conditions that may be exacerbated by a pertussis infection:
 - Administer postexposure prophylaxis.
 4. Exclude symptomatic healthcare personnel with known or suspected pertussis from work for 21 days from the onset of cough, or until 5 days after the start of effective antimicrobial therapy.
-
5. Work restrictions are not necessary for asymptomatic healthcare personnel who have an exposure to pertussis and receive postexposure prophylaxis, regardless of their risk for interaction with persons at increased risk for severe pertussis.

What antibiotic?
Most use azithromycin (Z-pak dosing) but can also use clarithromycin, erythromycin, and (less preferred) trimethoprim-sulfamethoxazole

Meningococcal Disease (e.g. bacteremia, meningitis) from *Neisseria meningitidis*

Definition of Exposure:

N. meningitidis can be transmitted person-to-person through unprotected direct contact with the respiratory secretions or saliva of a person with clinical disease, such as meningitis or bacteremia [\[11\]](#) [\[12\]](#). Exposures in healthcare may include mucous membrane contact with infectious secretions from close, face-to-face contact during activities such as mouth-to-mouth resuscitation, endotracheal tube placement or management, or open airway suctioning while not wearing or correctly using recommended personal protective equipment (PPE) [\[3\]](#) [\[6\]](#) [\[12\]](#) [\[13\]](#).

Brief, non-face-to-face contact, such as standing in the doorway of a patient's room, cleaning a patient's room, delivering a medication or food tray, starting an IV, or performing a routine physical exam, is generally not considered an exposure [\[14\]](#). Unprotected direct contact with the respiratory secretions or saliva of a person colonized with *N. meningitidis*, without clinical disease, is not considered an exposure.

CDC Recs for *N. meningitidis* Exposure

1. Administer antimicrobial prophylaxis to healthcare personnel, regardless of vaccination status, who have an exposure to *N. meningitidis*.
2. Exclude healthcare personnel with invasive *N. meningitidis* disease from work until 24 hours after the start of effective antimicrobial therapy.
3. Work restrictions are not necessary for healthcare personnel who only have nasopharyngeal carriage of *N. meningitidis*.

Which Antibiotics for *Neisseria meningitidis* PEP?

Normally ciprofloxacin is the go-to, with rifampin and ceftriaxone as other options.

However...



NC DEPARTMENT OF
**HEALTH AND
HUMAN SERVICES**

ROY COOPER • Governor

KODY H. KINSLEY • Secretary

MARK BENTON • Deputy Secretary for Health

SUSAN KANSAGRA MD, MBA • Assistant Secretary for Public Health

Division of Public Health

From: Erica Wilson, MD, MPH, Medical Epidemiologist
To: North Carolina Clinicians
Subject: Increase in Ciprofloxacin- and Penicillin-Resistant Meningococcal Disease
Date: February 21, 2024

Summary

The North Carolina Division of Public Health (NC DPH) is alerting clinicians in North Carolina to an increase in ciprofloxacin- and penicillin-resistant strains of invasive meningococcal disease caused by *Neisseria meningitidis* serogroup Y (NmY) in the Charlotte Metropolitan region.

Providers in the Charlotte Metropolitan region including Cabarrus, Gaston, Iredell, Lincoln, Mecklenburg, Rowan, and Union Counties should discontinue the use of ciprofloxacin for prophylaxis of close contacts of invasive meningococcal disease cases and prescribe rifampin, ceftriaxone, or azithromycin instead. Providers treating residents from Chester, Lancaster, or York counties in South Carolina should also follow this guidance for patients being treated in North Carolina medical facilities.

Turning to Measles & Varicella



Measles Transmission



One of the most contagious infections –
90% of susceptible people exposed will contract it

Droplet, airborne, contact
(coughing, sneezing, breathing infected air,
touching infected surfaces)

Incubation period: 7-21 days

Infectious period: 4 days prior to rash
through 4 days after rash

[CDC Public Health Image library ID 11162](#)

Symptoms

7-21 days after exposure: Fever, cough/coryza/conjunctivitis

2-3 days after symptoms start: Koplik spots

3-5 days after symptoms start: rash



Complications

Measles Complications

Diarrhea	8%
Otitis media	7%
Pneumonia	6%
Encephalitis	0.1%
Seizures	0.6-0.7%
Death	0.2%

CDC Pink
Book

 The Conversation

Child dies from complications
of measles years after
infection – SSPE explained

12 hours ago



 Contagion Live

California Child Dies From Rare Measles
Neurological Complication

3 hours ago

 ABC7 Los Angeles

The mystery behind a rare
measles-related killer, SSPE,
plus 3 strategies to protect...

2 days ago



 CIDRAP

LA County confirms child's
death from late measles
complication

3 days ago



Prior to 1963 in US

3-4 million cases of measles/year

48,000 hospitalizations

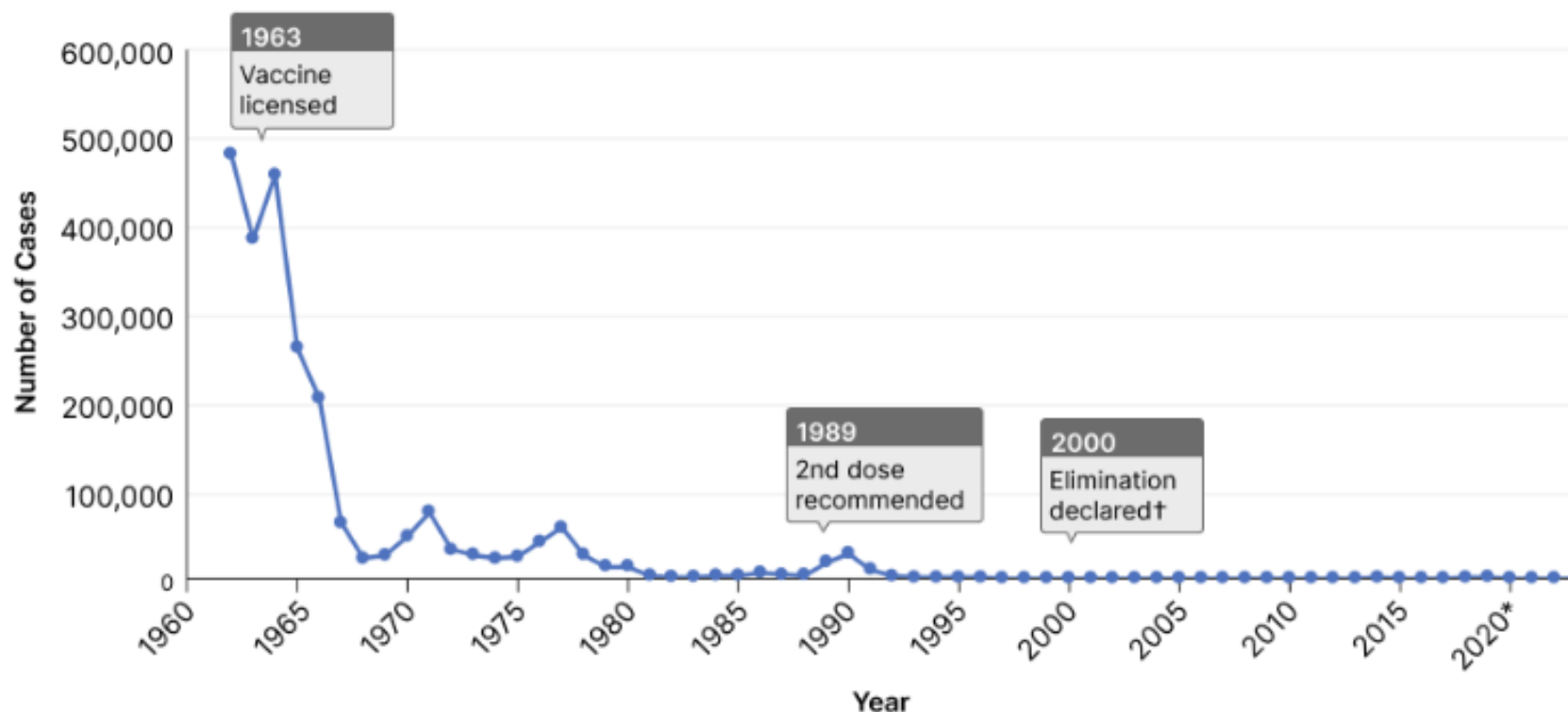
1,000 chronic disability

500 annual deaths

After 1963

95% decrease in incidence

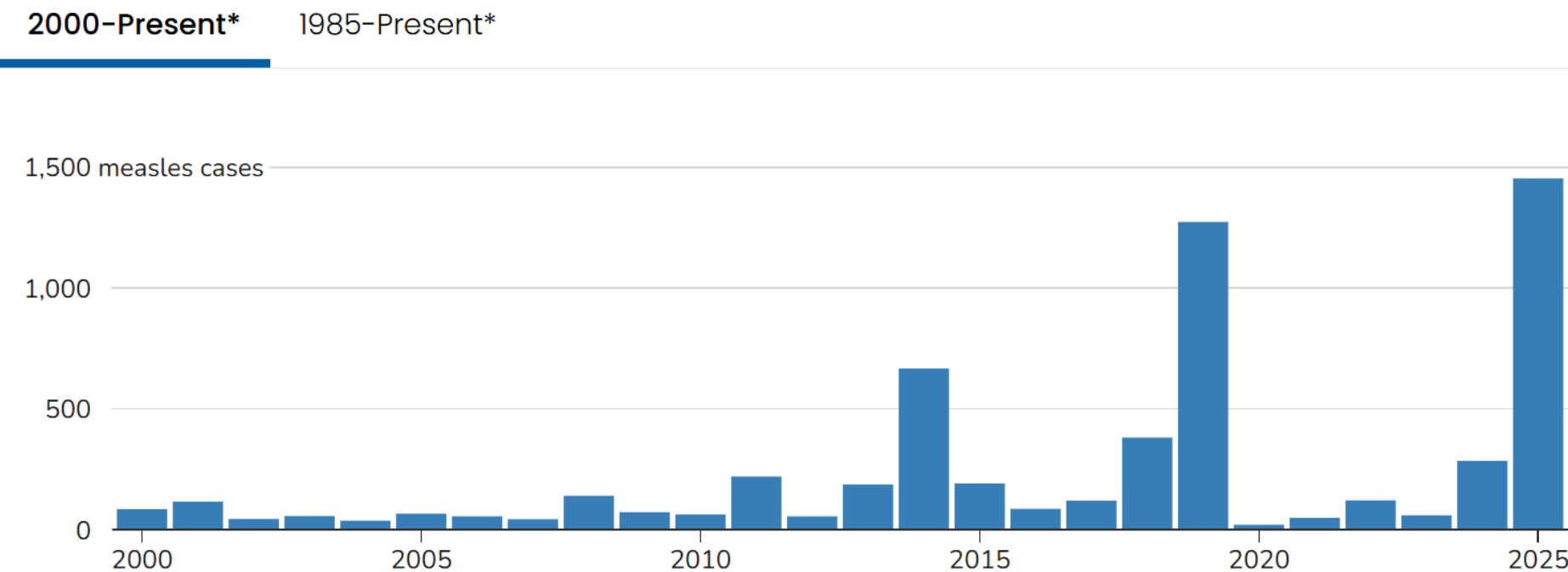
Reported Measles Cases in the United States from 1962 – 2023*



Unfortunately, Measles is Making a Comeback

Yearly measles cases

as of September 9, 2025



<https://www.cdc.gov/measles/data-research/index.html> accessed 9/15/25

Measles Exposure in Healthcare Personnel – CDC Recs

No work restrictions or PEP for HCPs who have presumptive evidence of immunity. Still need daily monitoring.

Health-care personnel[†]

- (1) Documentation of vaccination with 2 doses of live measles virus-containing vaccine,[§] or
- (2) Laboratory evidence of immunity,[¶] or
- (3) Laboratory confirmation of disease, or
- (4) Born before 1957^{††}

^{††} For unvaccinated personnel born before 1957 who lack laboratory evidence of measles, rubella, or mumps immunity or laboratory confirmation of disease, health-care facilities should consider vaccinating personnel with 2 doses of MMR vaccine at the appropriate interval (for measles and mumps) and 1 dose of MMR vaccine (for rubella), respectively.

<https://www.cdc.gov/mmwr/preview/mmwrhtml/r6204a1.htm#Tab3> accessed 9/15/25

2. For asymptomatic healthcare personnel **without** presumptive evidence of immunity to measles who have an exposure to measles:

- Administer postexposure prophylaxis in accordance with CDC and ACIP recommendations (<https://www.cdc.gov/vaccines/hcp/acip-recs/vacc-specific/mmr.html>).²
- Exclude from work from the 5th day after their first exposure through the 21st day after their last exposure, regardless of receipt of postexposure prophylaxis.

3. For healthcare personnel with known or suspected measles, exclude from work for 4 days after the rash appears.

4. For immunocompromised healthcare personnel with known or suspected measles, exclude from work for the duration of their illness.

<https://www.cdc.gov/infection-control/hcp/healthcare-personnel-epidemiology-control/measles.html> accessed 9/15/25

What Can Occupational Health / Infection Prevention Do To Prepare for Measles?

- **Start/maintain conversations with your local health department and the state DHHS**
- **Review employee health records now**
- **Offer MMR doses to those out of compliance**
- **Maintain list of those with approved exemptions (key since CDC recommends only immune HCPs provide measles care). Do they get paid administrative leave after an exposure?**
- **Discuss how to address immunocompromised HCPs who want to opt out**
- **Educational campaigns aimed at HCPs on early recognition - every minute that goes by with an undiagnosed measles patient in your facility is exposing more and more people**
- **Fast-paced contact investigations. Coordination between OHS, IP, Plant Engineering and health dept along with immediate availability of immunoglobulin and MMR (window for post-exposure ppx in most cases is 72 hours)**
- **Practice drills at all entry points (outpatient, ED, urgent care) after protocols are developed (isolate suspected pt in neg pressure room, call IP/Epi-On-Call, etc)**



Varicella

Chickenpox is also on the rise.

Similar CDC definitions of presumptive immunity, ideally checked at hire.

PEP with vaccine or immunoglobulin for non-immune HCPs with exposure

Lengthy quarantine

Don't forget exposures with shingles

The End!

Take aways:

- Thoroughly assessing and enforcing vaccination requirements/recommendations **upon hire** is a critical way to protect HCPs as well as patients. Even if not a condition of employment, make vaccines readily available for your HCPs.
 - It also saves headaches down the road:
 - Chasing after non-immune HCPs after measles or varicella exposures
 - Avoiding unnecessary work restrictions
 - Opportunity to immunize against hepatitis B if titer is negative upon hire
- We are seeing a rise in multiple vaccine-preventable diseases. Occupational Health and Infection Prevention's roles as contact investigators are only going to increase. Pertussis, measles, etc. Prepare now, particularly with up-to-date lists of non-immune employees.
- Questions?