

HOT TOPICS IN INFECTIOUS DISEASES 2025 EDITION

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DISCLOSURES

- No relevant conflicts of interest

OUTLINE

- New world screw worm
- Measles resurgence
- H5N1 Avian Influenza
- Seasonal Influenza
- SARS-CoV-2
- Vaccine Confusion

NEW WORLD SCREW WORM

Exclusive: U.S. confirms nation's first travel-associated human screwworm case connected to Central American outbreak

By **Cassandra Garrison**, **Tom Polansek** and **Leah Douglas**

August 25, 2025 4:11 AM CDT · Updated August 25, 2025



Aa



NEW WORLD SCREW WORM (NWS)



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NEW WORLD SCREW WORM (NWS)



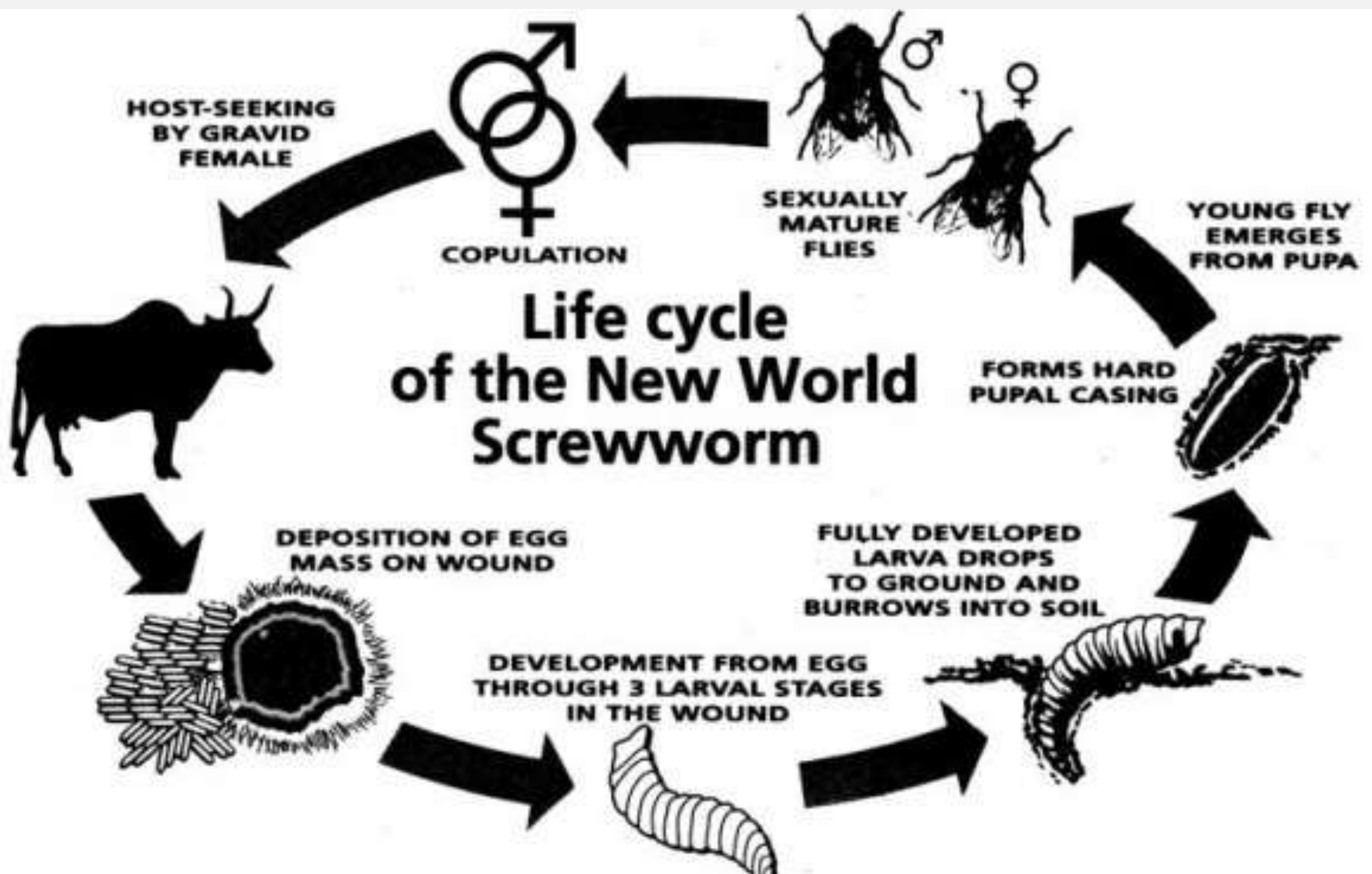
FIGURE 1. New World Screwworm Movement

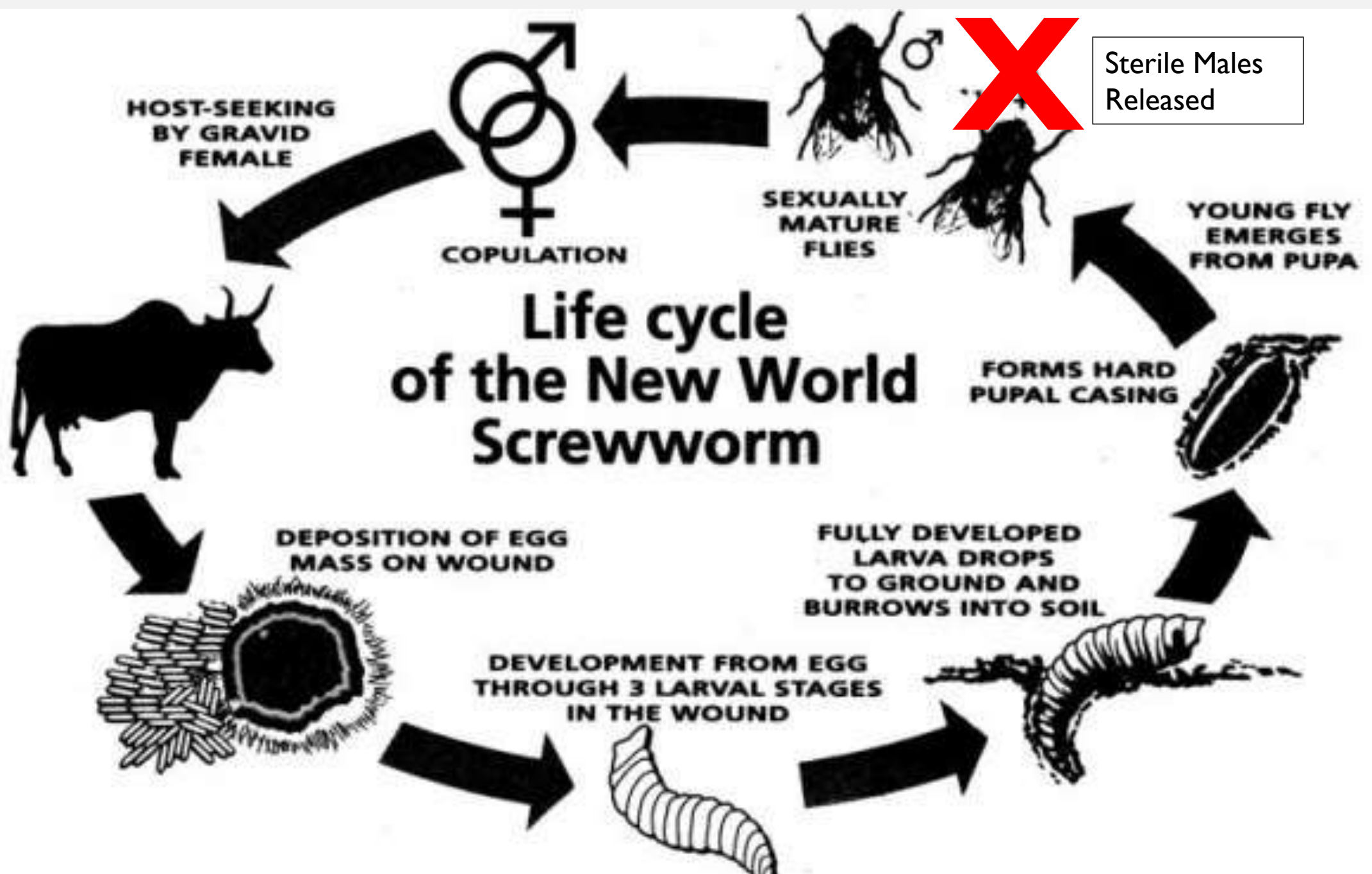


WHY IS THIS RELEVANT?

- Closing in on TX
- Beef cattle
- Risk ~\$1.8B

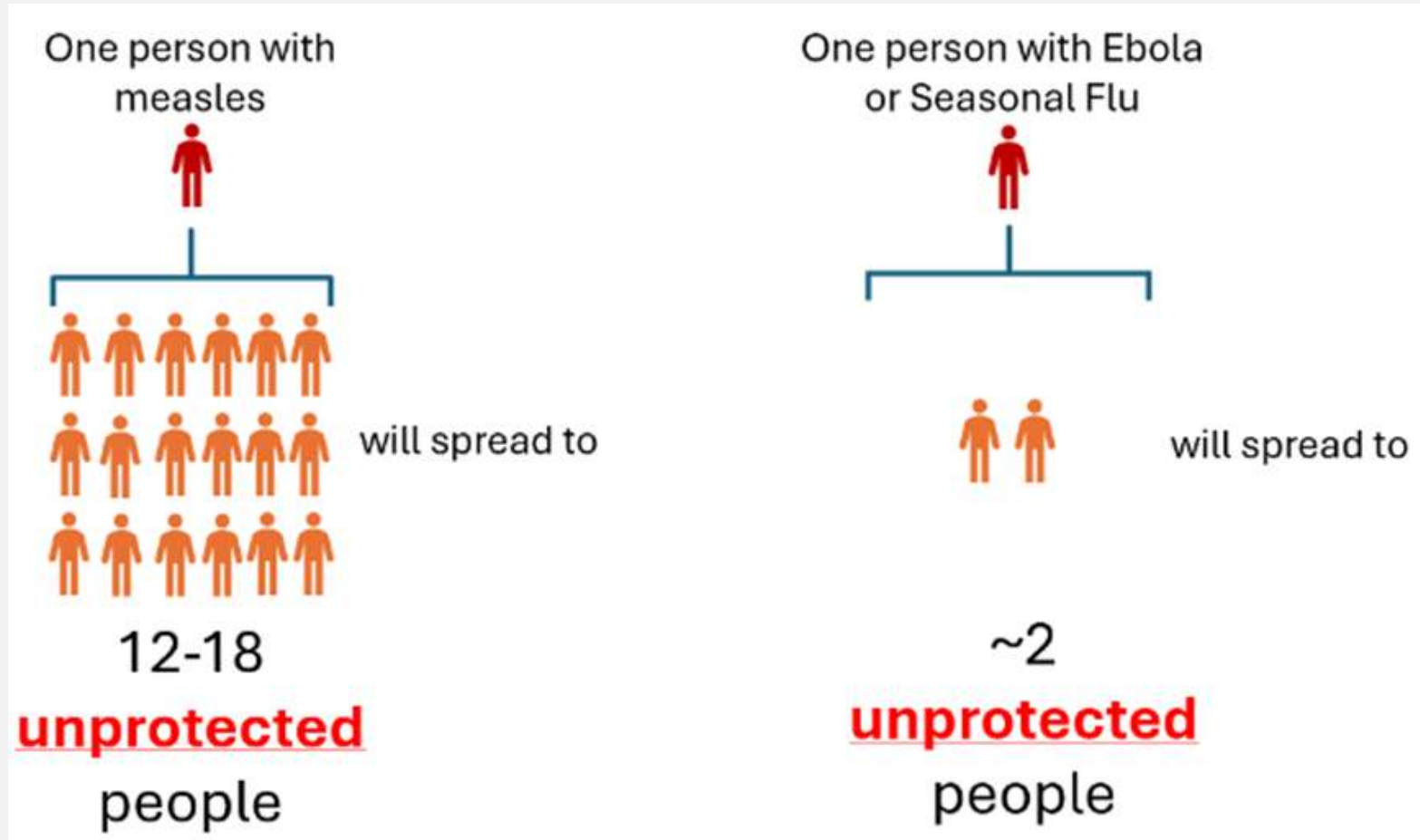




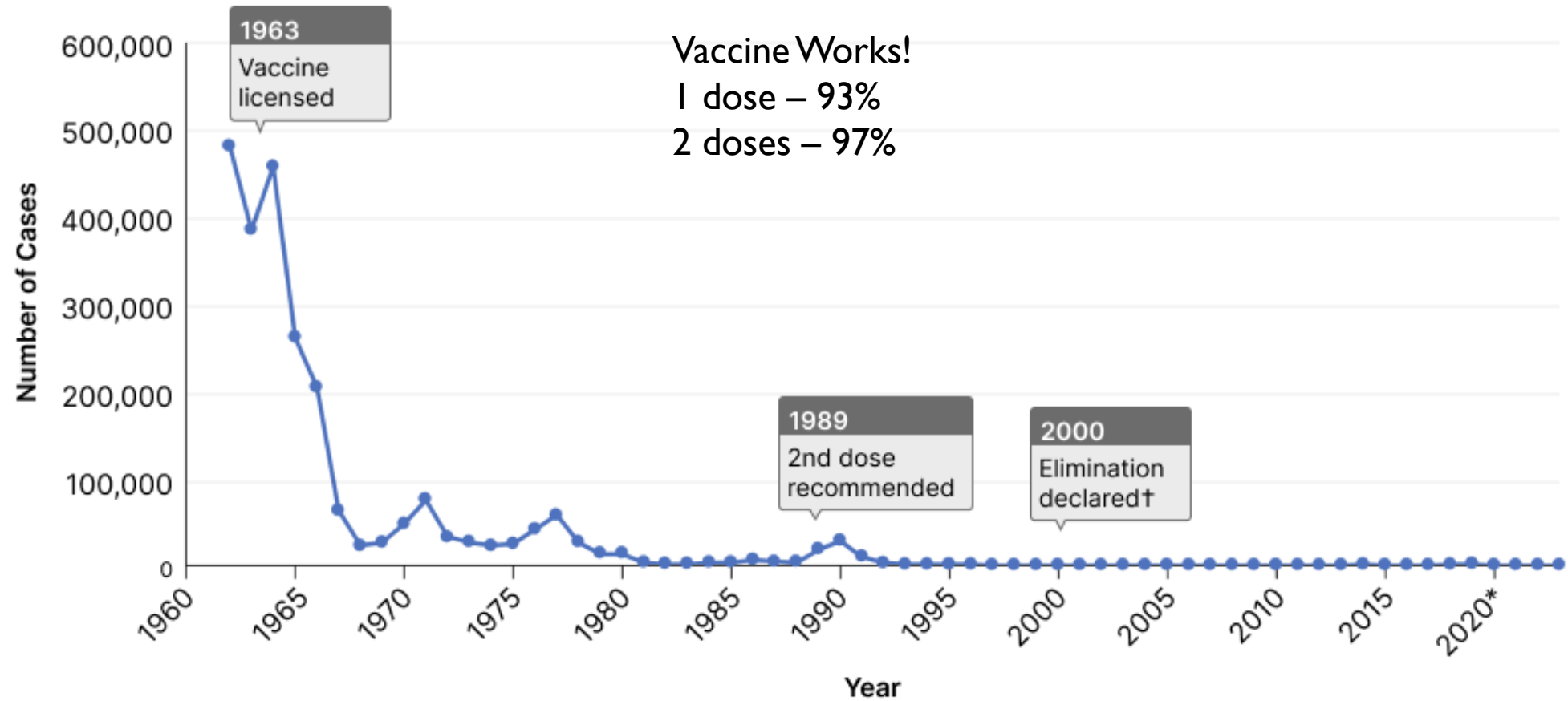


MEASLES

THE MOST CONTAGIOUS VIRUS



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

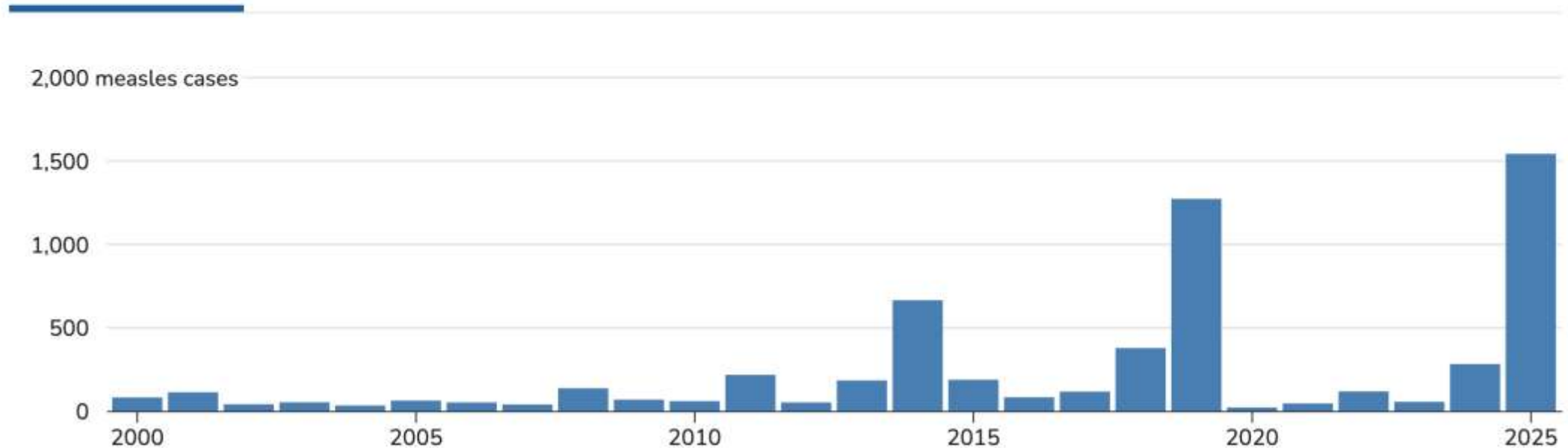


THE PAST 25 YEARS

Yearly measles cases

as of September 30, 2025

2000-Present* 1985-Present*



THE PAST 25 YEARS

Yearly measles cases

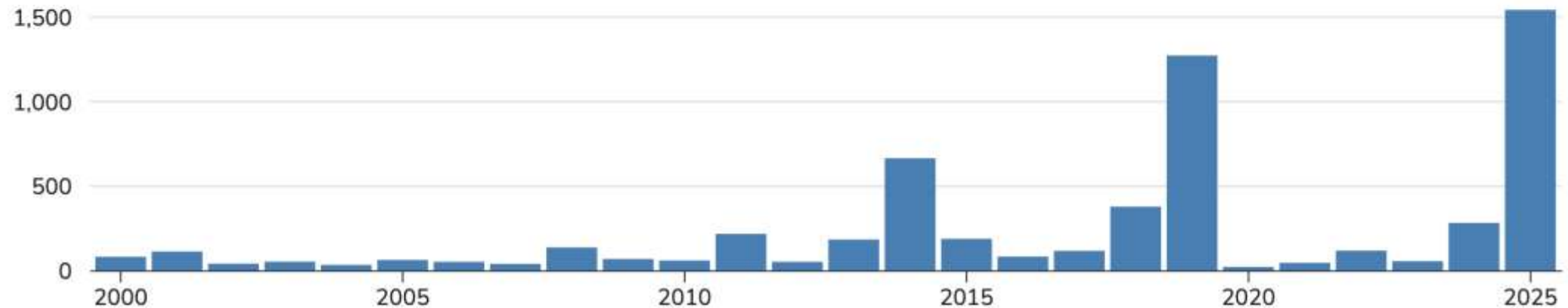
as of September 30, 2025

2000–Present*

1985–Present*

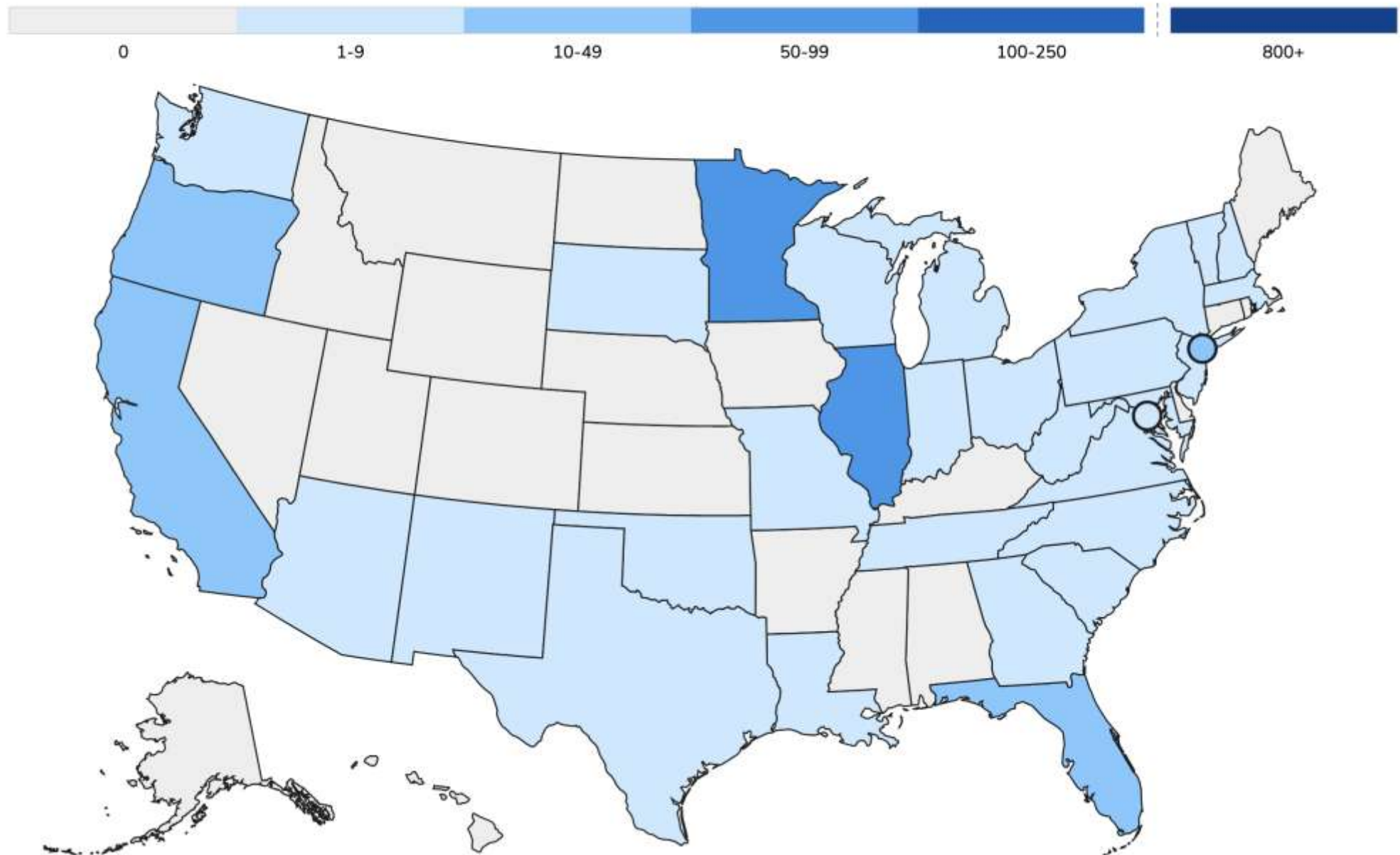
1544 cases
12% hosp
3 deaths

2,000 measles cases



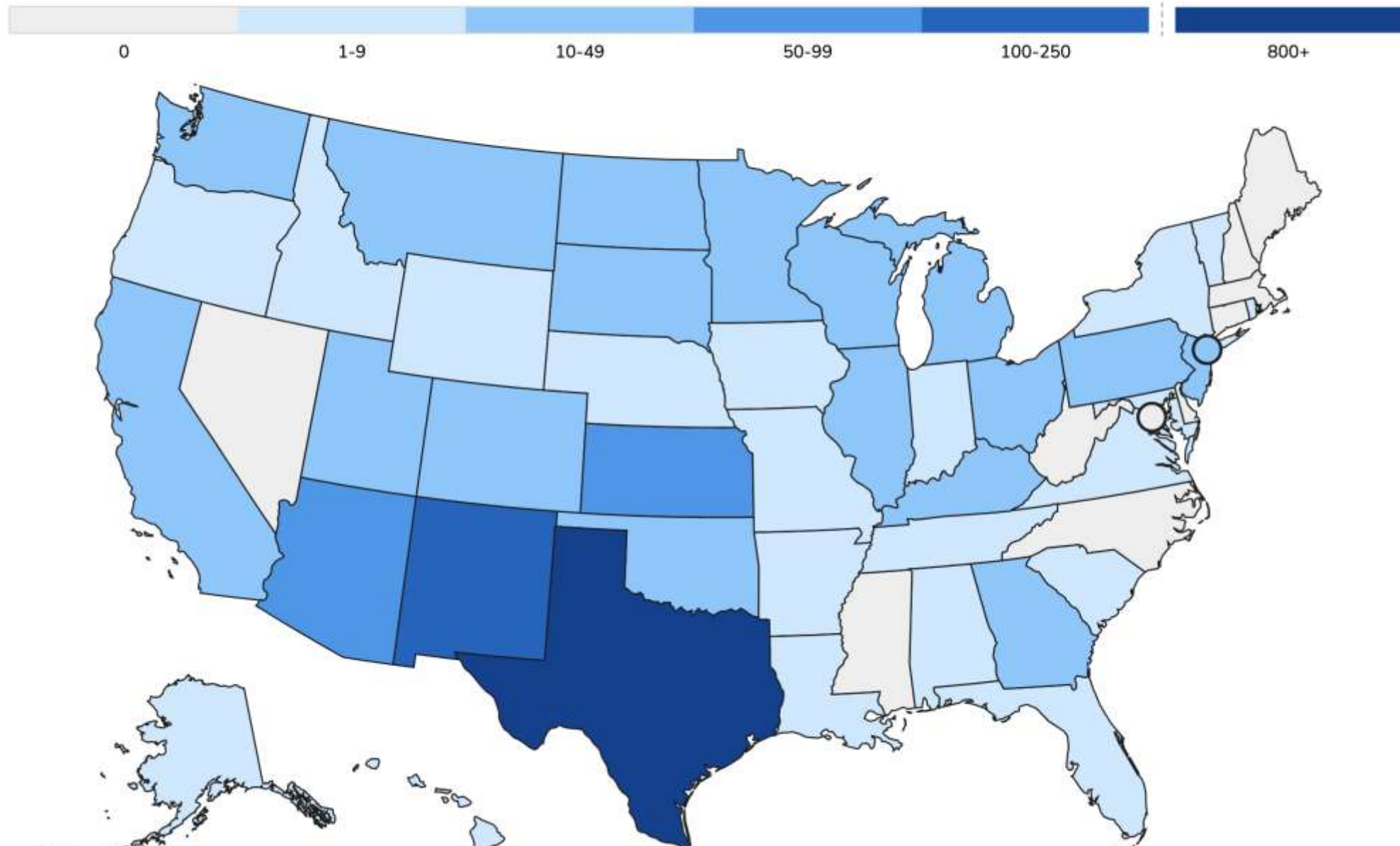
2025

2024

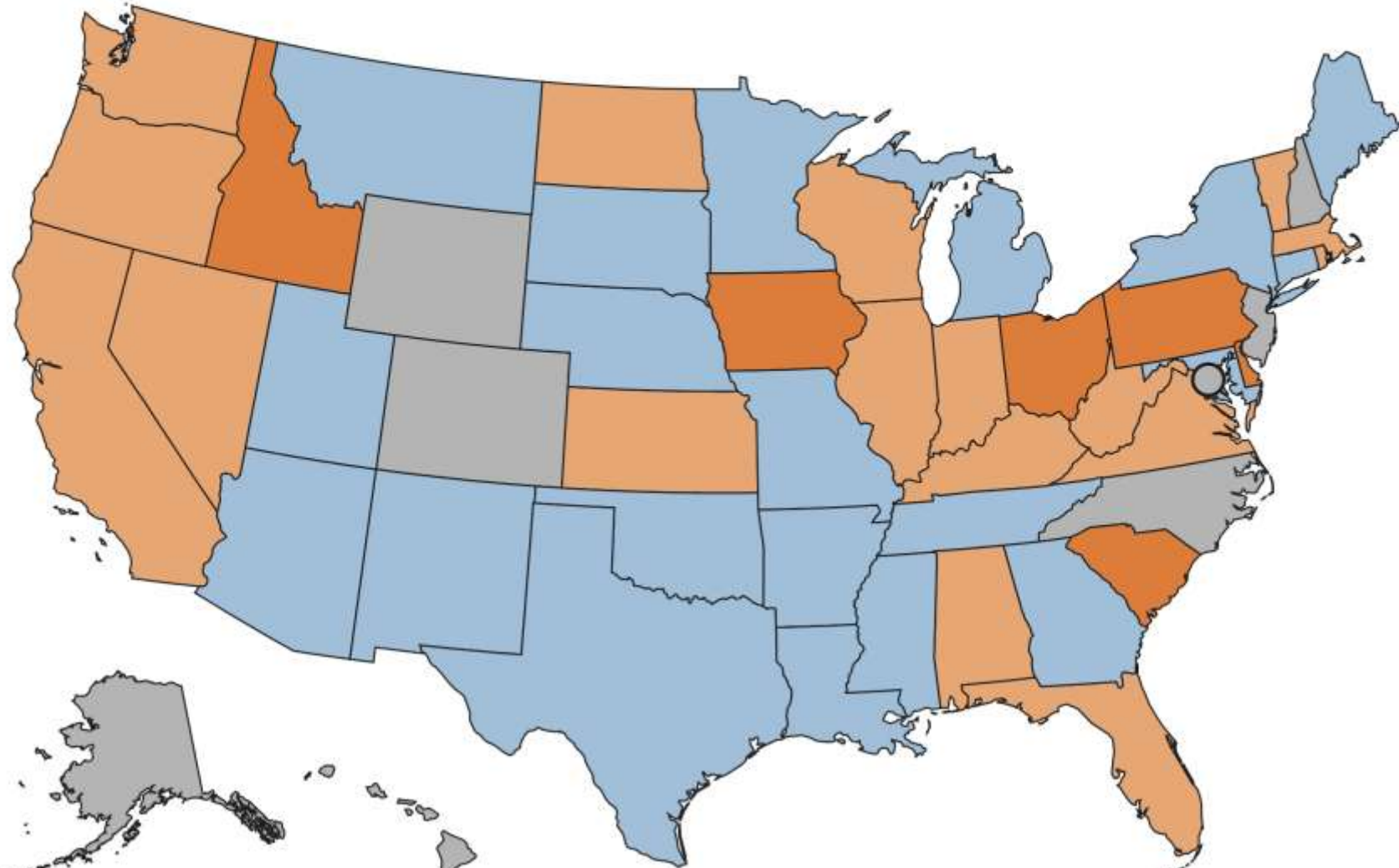


2025

2024



Herd Immunity

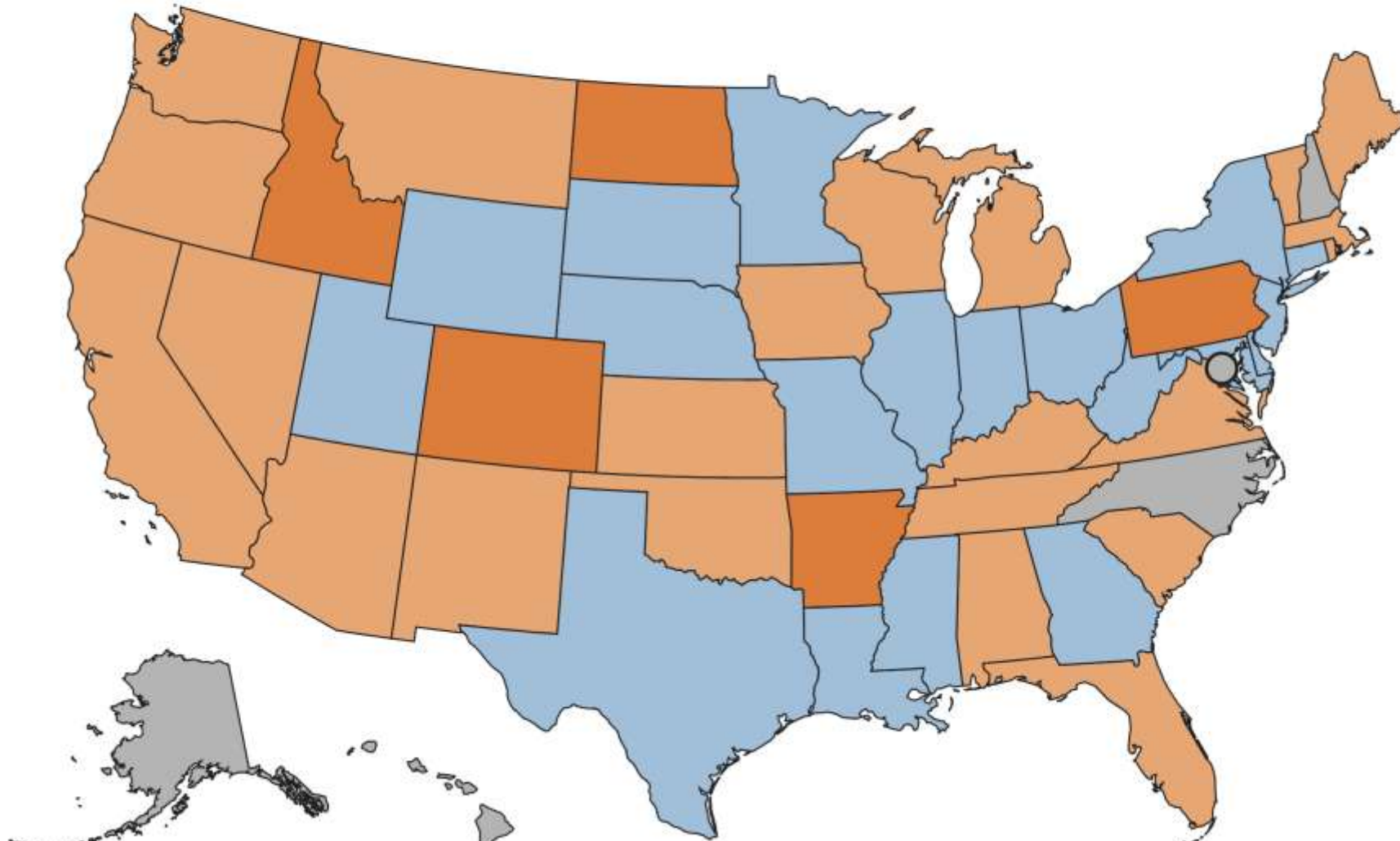


2012-13



Percent Vaccinated

Herd Immunity

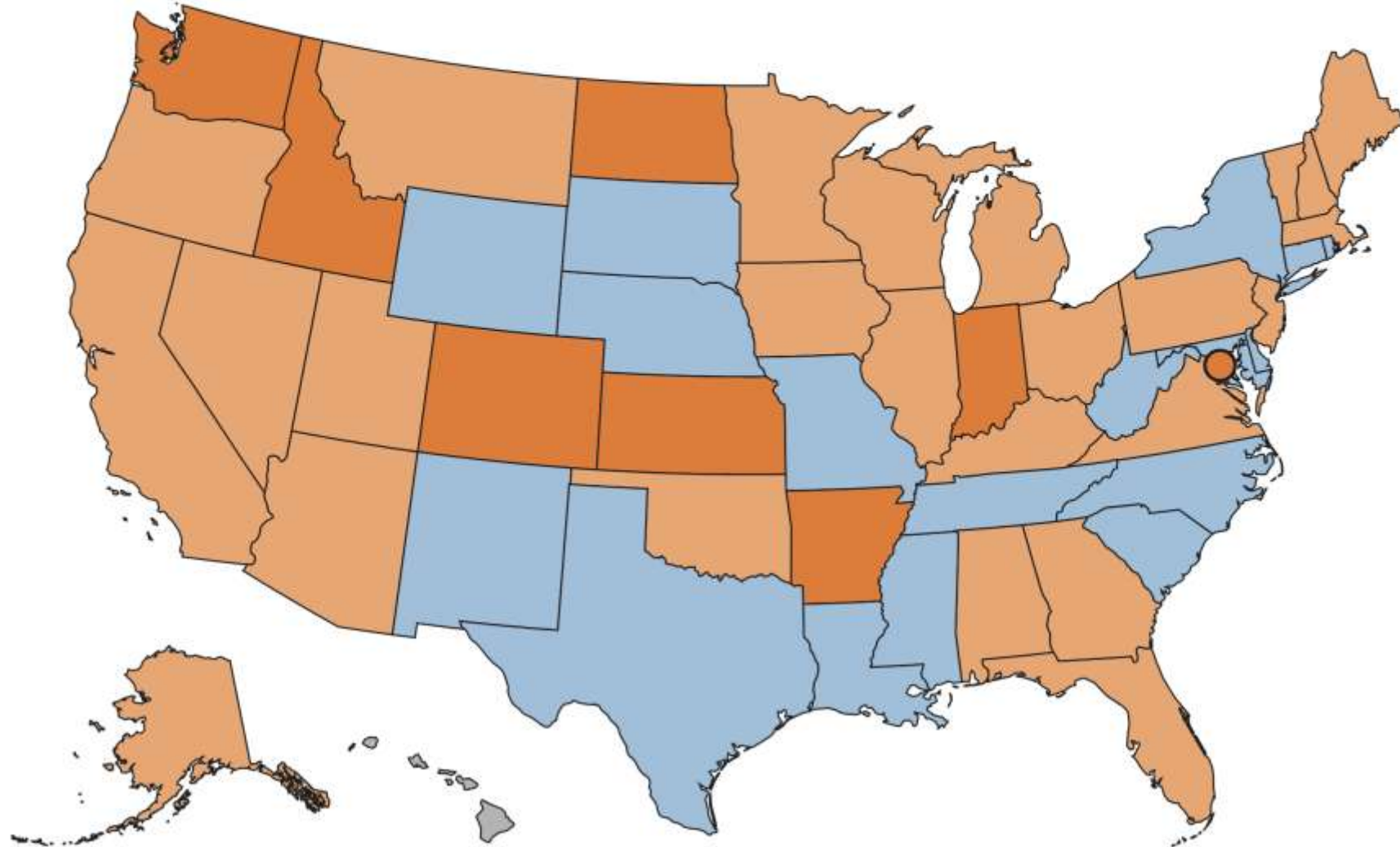


2014-15



Percent Vaccinated

Herd Immunity

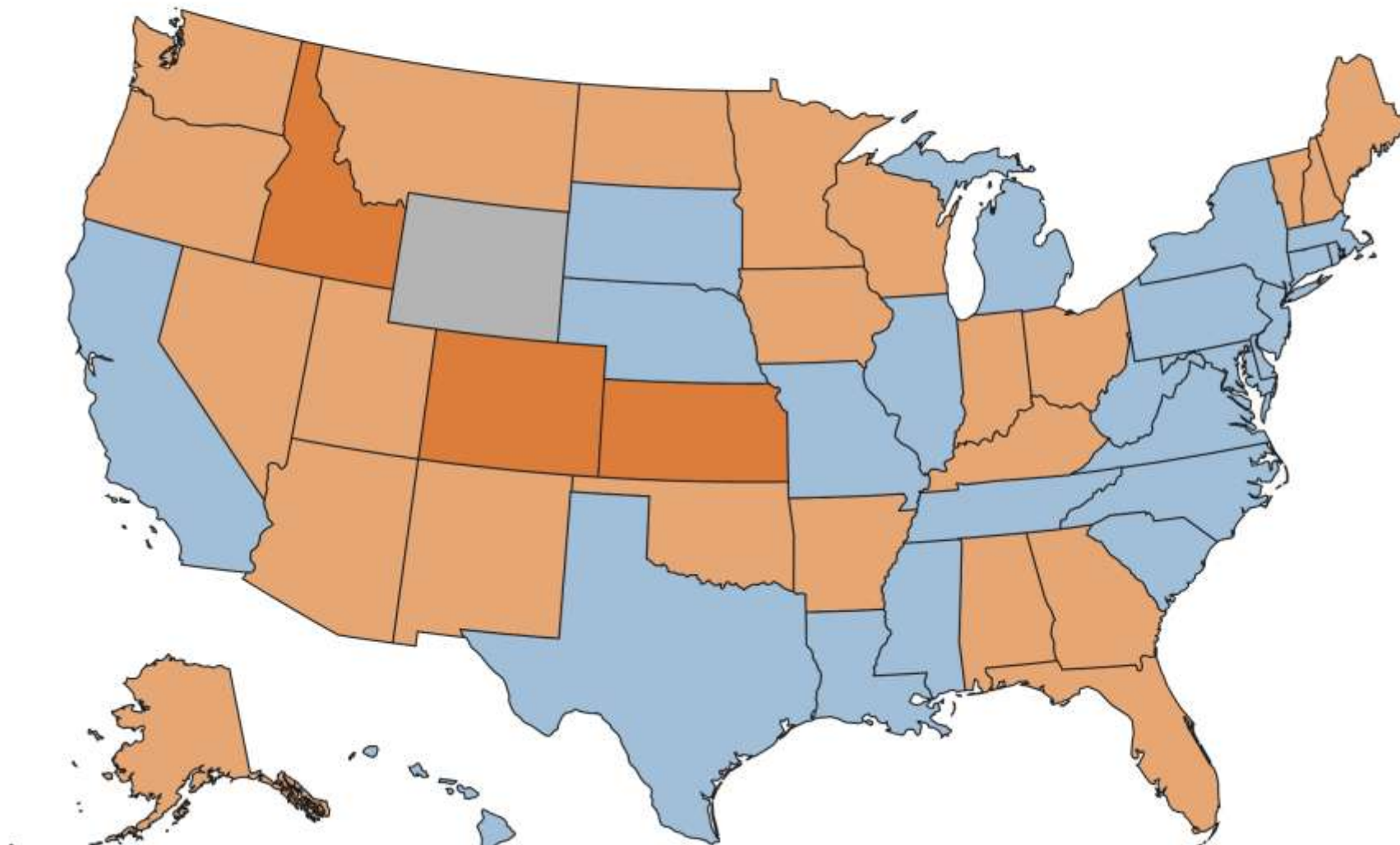


2017-18



Herd Immunity

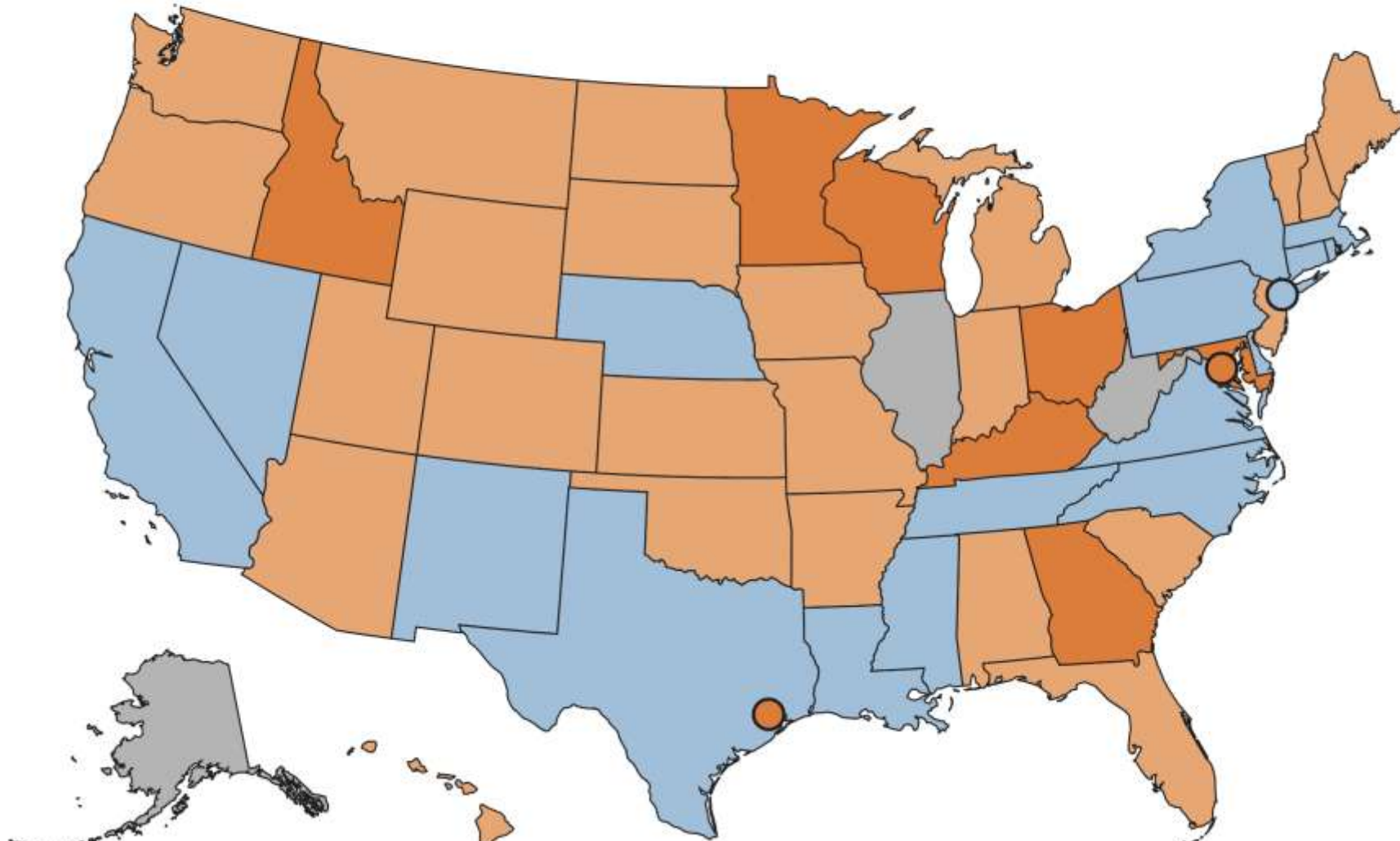
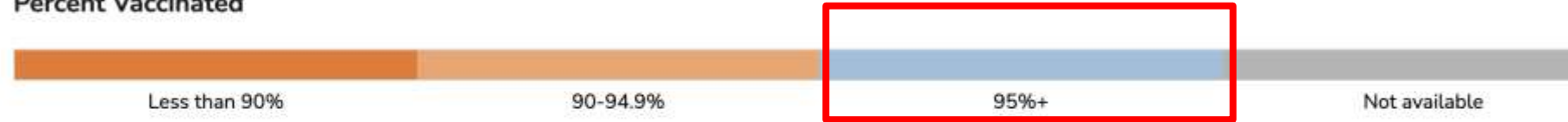
Percent Vaccinated



2020-21

Percent Vaccinated

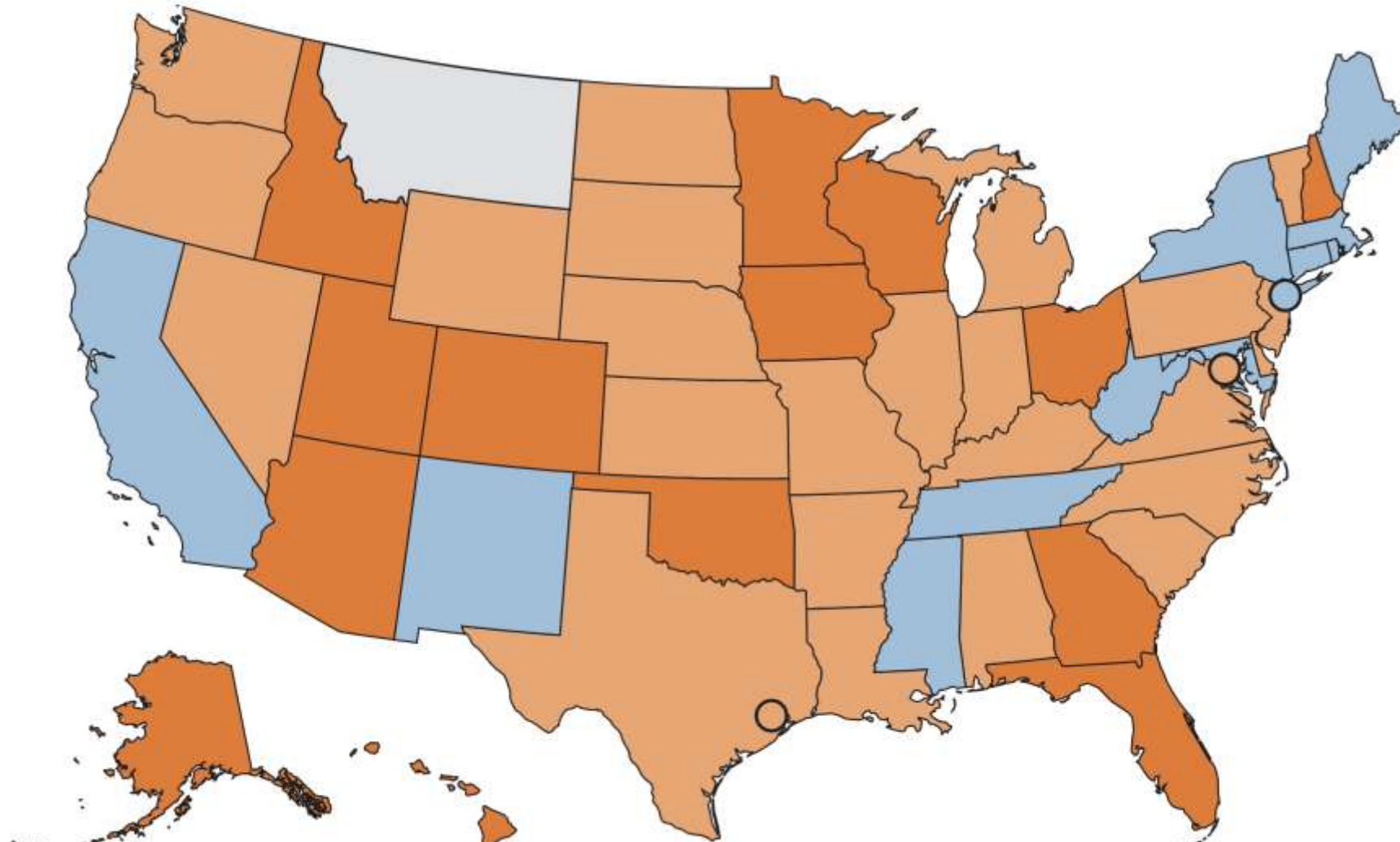
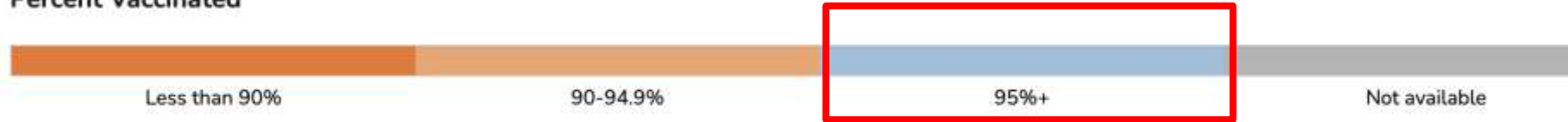
Herd Immunity



2023-24 ▾

Percent Vaccinated

Herd Immunity



WHY IS THIS RELEVANT?

- Vaccination rates continuously decline
 - 2019-20 school year – 95.2% kindergartners
 - 2023-24 school year – 92.7%
- Very likely more, bigger outbreaks
 - Even if successful getting rates back up will take time to catch up
- Especially vulnerable
 - Unvaccinated
 - Immunocompromised



SEASONAL INFLUENZA

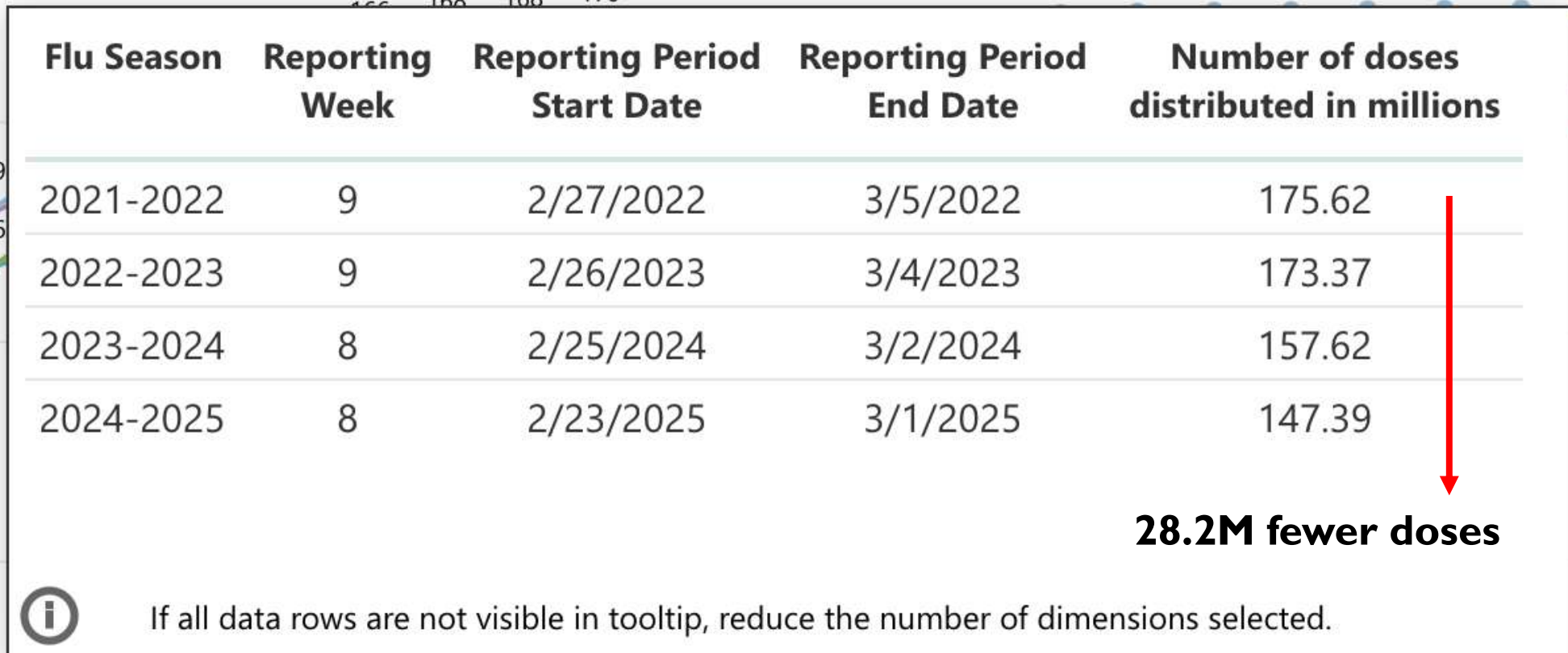
INFLUENZA ON ITS WAY

- Not here yet
- Australia's season
 - Early onset
 - H1N1 dominant
 - Moderate-severe intensity
- 2025 vaccine effectiveness in S. Hemisphere
 - ~50% reduction outpatient visits/hospitalizations

2025-26 VACCINE RECOMMENDATIONS


- New
 - No more multi-use vials (thimerosal preservative)
- Who – everyone over 6M
- All vaccines trivalent
- Ideally give in October
- Enhanced vaccines for age 65+
 - Can also consider for transplant recipients

WHY IS THIS RELEVANT?



Flu Season	Reporting Week	Reporting Period Start Date	Reporting Period End Date	Number of doses distributed in millions
2021-2022	9	2/27/2022	3/5/2022	175.62
2022-2023	9	2/26/2023	3/4/2023	173.37
2023-2024	8	2/25/2024	3/2/2024	157.62
2024-2025	8	2/23/2025	3/1/2025	147.39

28.2M fewer doses

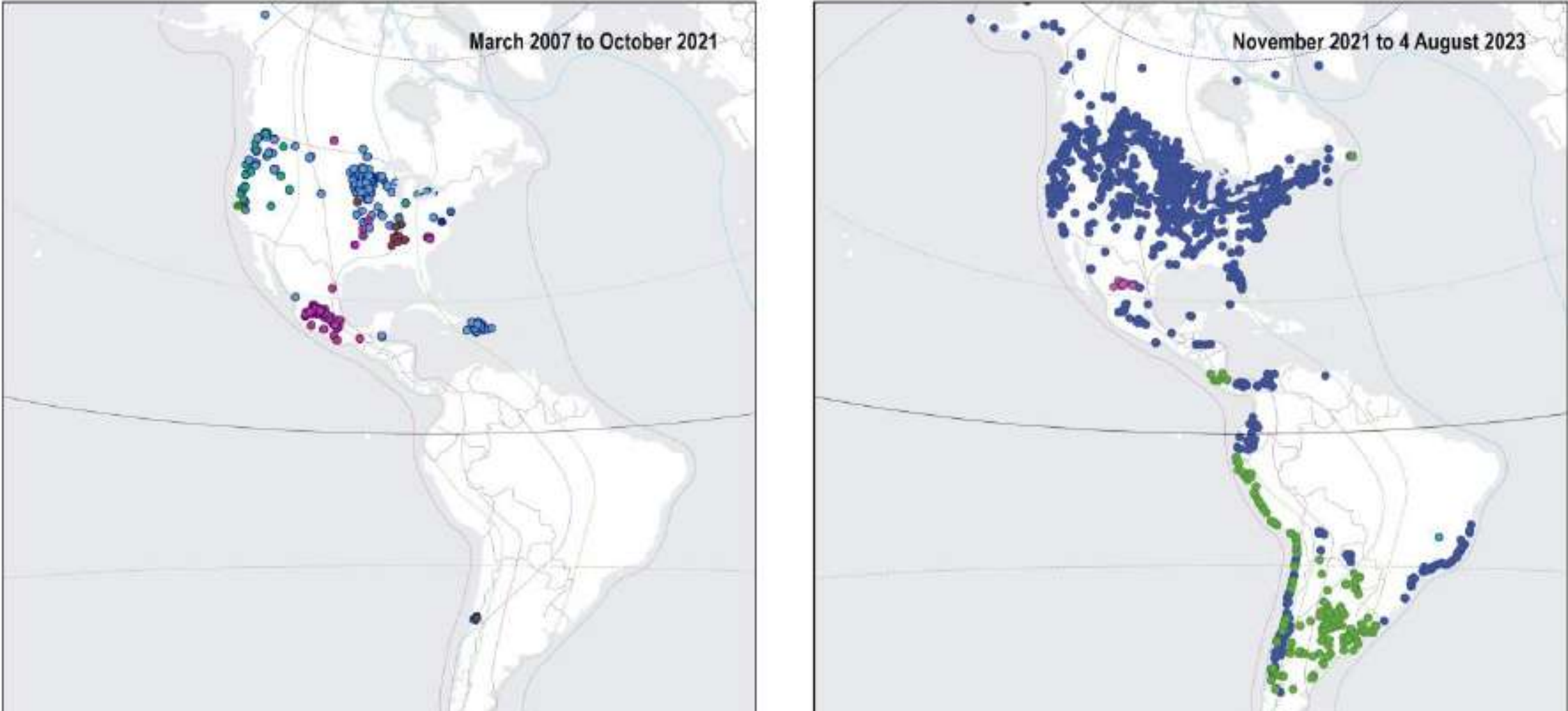
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AVIAN INFLUENZA

CURRENT H5N1 PANZOOTIC

- Resurgence started 2021
- Clade 2.3.4.4b H5N1
- Most significant AI outbreak so far
- Lacks ability for easy human-human transmission (so far)

Figure 2. Avian influenza outbreaks and major wild bird migration routes. Region of the Americas, March 2007 to October 2021 and November 2021 to 4 August 2023.



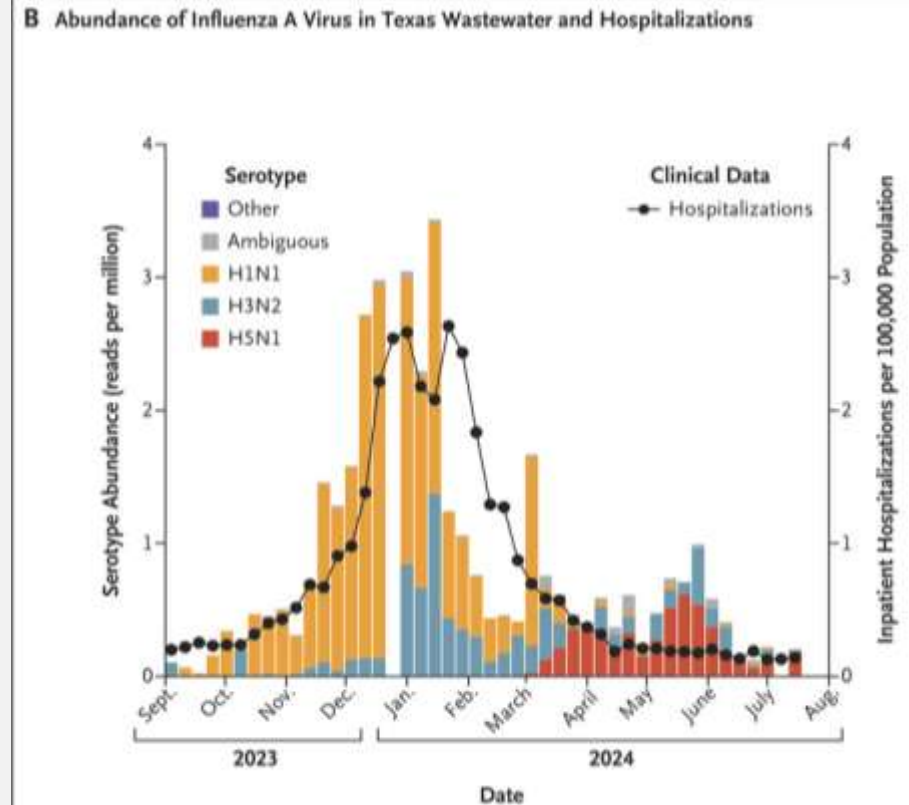
SPILOVER TO MAMMALS

- How occurs
 - Consume
 - Exposed
- Why concern
 - Closer to us – genetically and proximity
 - More opportunity for reassortment or drift
 - Some drift already identified
 - Spillback to birds
 - Perpetuates the epizootic cycle



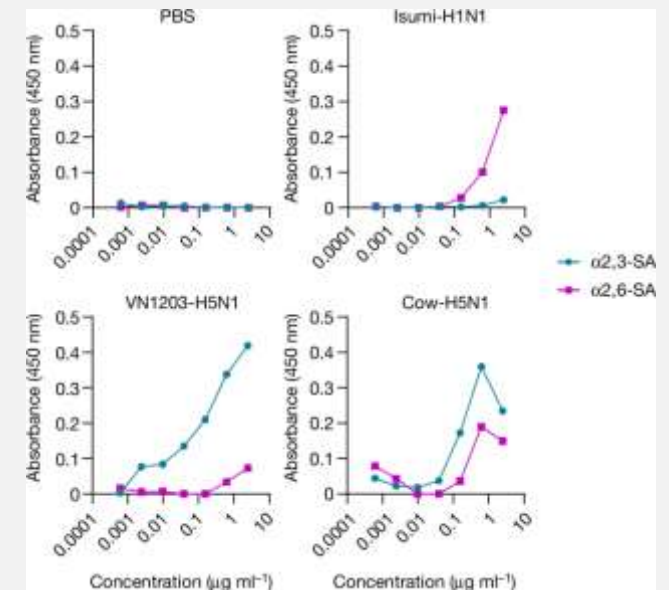
H5N1 EMERGENCE IN US 2024

- Wastewater (TX) since March 2024
 - Widespread detection clade 2.3.4.4b
 - 10/10 cities across Texas
- No rise in human illness
- Hypothesis large burden in animals
 - Cattle



PATHOGENIC FEATURES OF NEW H5N1

- Clade 2.3.4.4b
- Infects mammary glands, virus in milk, transmissible
- Can bind to alpha-2,6 sialic acid residues (in human upper airway)
- Rare respiratory transmission in ferrets
- Serious concern
 - Closer to pandemic potential



H5N1 HUMAN CASES

- 1997+ - 909 cases (52% case fatality rate)
- US cases since early 2024
 - 70 human (24 bird, 41 cattle, 2 other, 3 unknown)
 - From birds or cattle – mild, conjunctivitis
 - MO case – no known contact, investigation ongoing
- Much less activity in 2025 so far...

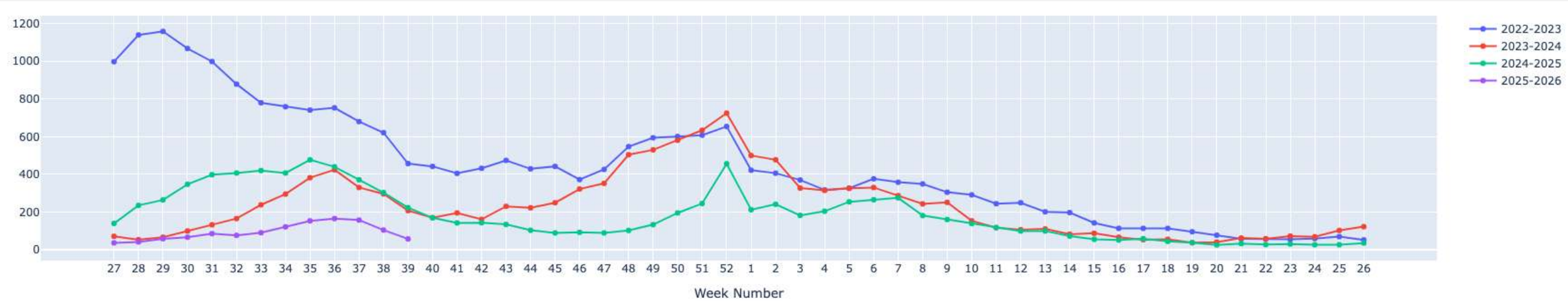
WHY IS THIS RELEVANT?

- Current H5N1 AI panzootic is concerning
 - Broad geographic spread
 - Spillover to new mammal species
 - Increased risk human exposures
- Overall threat/risk assessment
 - Thus far sequencing reassuring
 - Extremely low on individual event, but ongoing cumulative increases risk
- Ongoing response activities critical



SARS-COV-2

MILD SEASON SO FAR



LIFE CYCLE OF COVID-19 PANDEMIC

- Stage 1: FEAR
- Stage 2: HOPE
- Stage 3: ANGER
- Stage 4: FATIGUE
- Stage 5: ACCEPTANCE
- Stage 6: INDIFFERENCE
- Stage 7: UNCERTAINTY

ANGER

MASK MANDATES

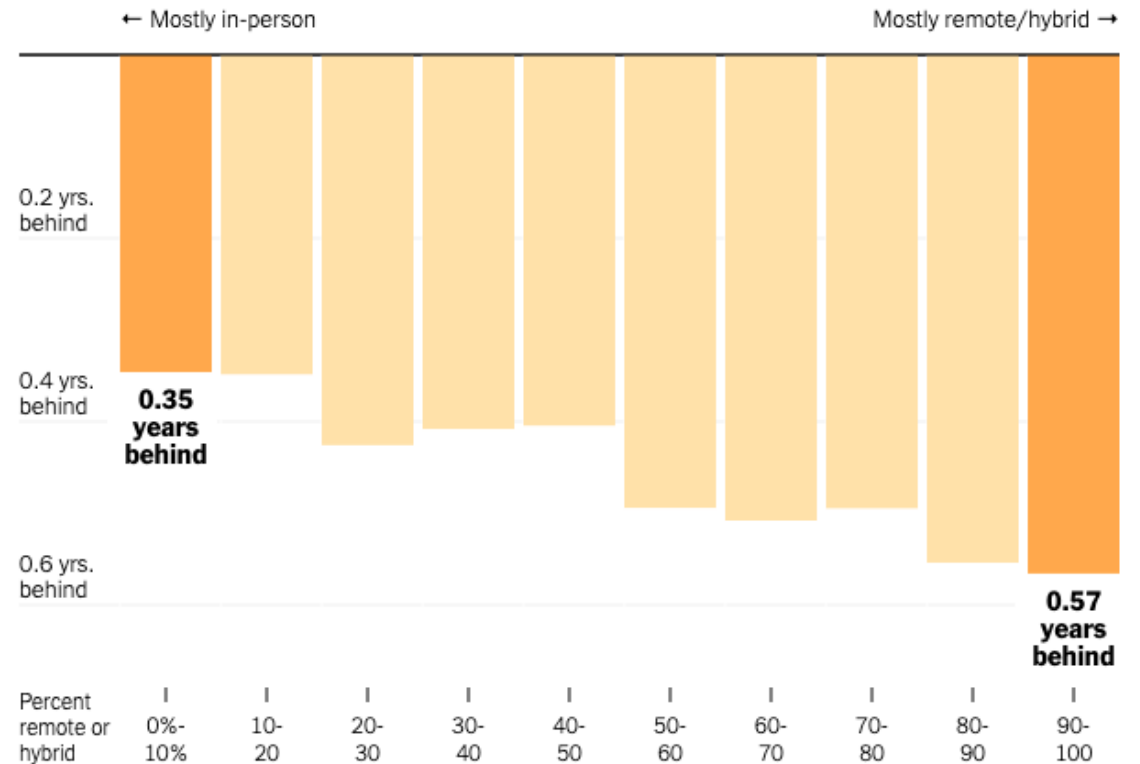


SCHOOL CLOSURES – VARIED RESPONSES



“Our schools will be open” despite surge in COVID infections.

For districts that spent 2020-21...



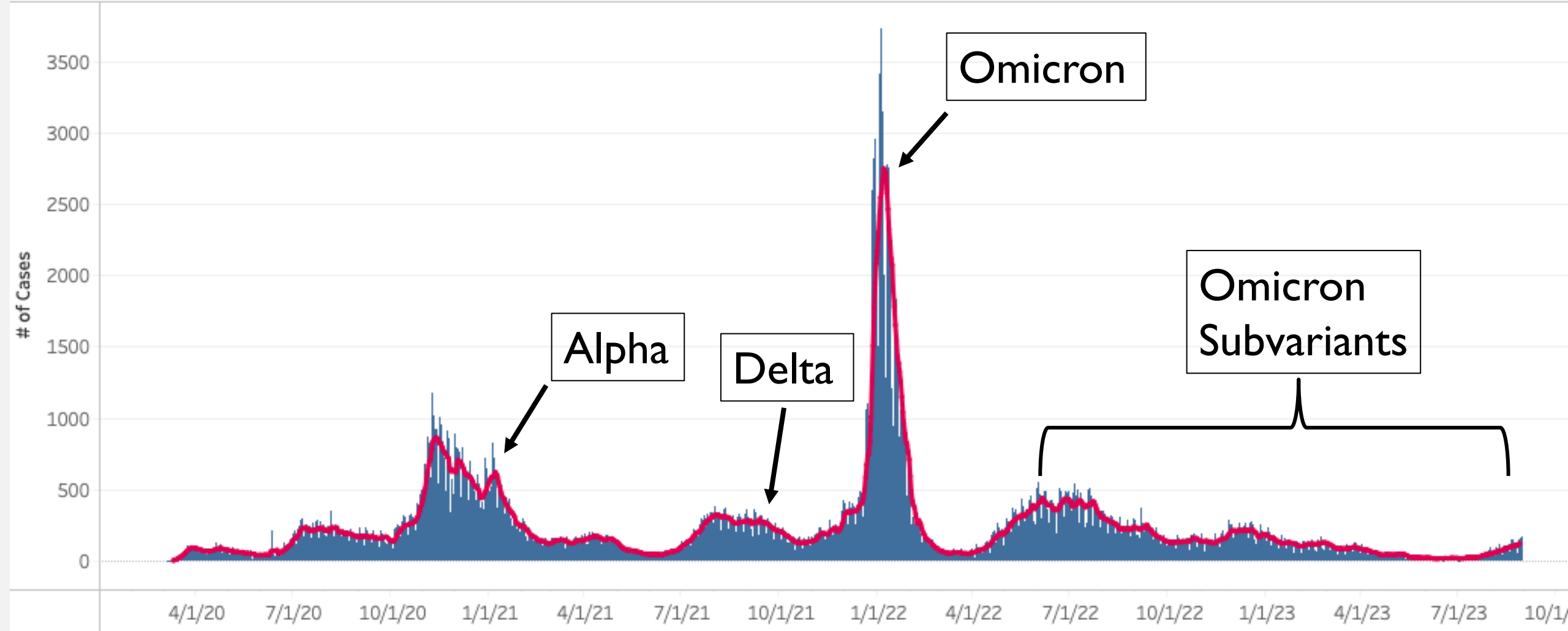
Source: Fahle, Kane, Patterson, Reardon, Staiger and Stuart, “[School District and Community Factors Associated With Learning Loss During the COVID-19 Pandemic](#).” Score changes are measured from 2019 to 2022. In-person means a district offered traditional in-person learning, even if not all students were in-person.

ACCEPTANCE

OMICRON INCREASED TRANSMISSIBILITY

- Replaced delta within weeks
- Reproduction # (R) ~6-8
 - Flu 2-3
 - Chickenpox 8-9
 - Measles 12-18
- 2° Attack Rate (SAR) 81%
 - Delta ~58%

New COVID-19 Cases by Diagnosis Date

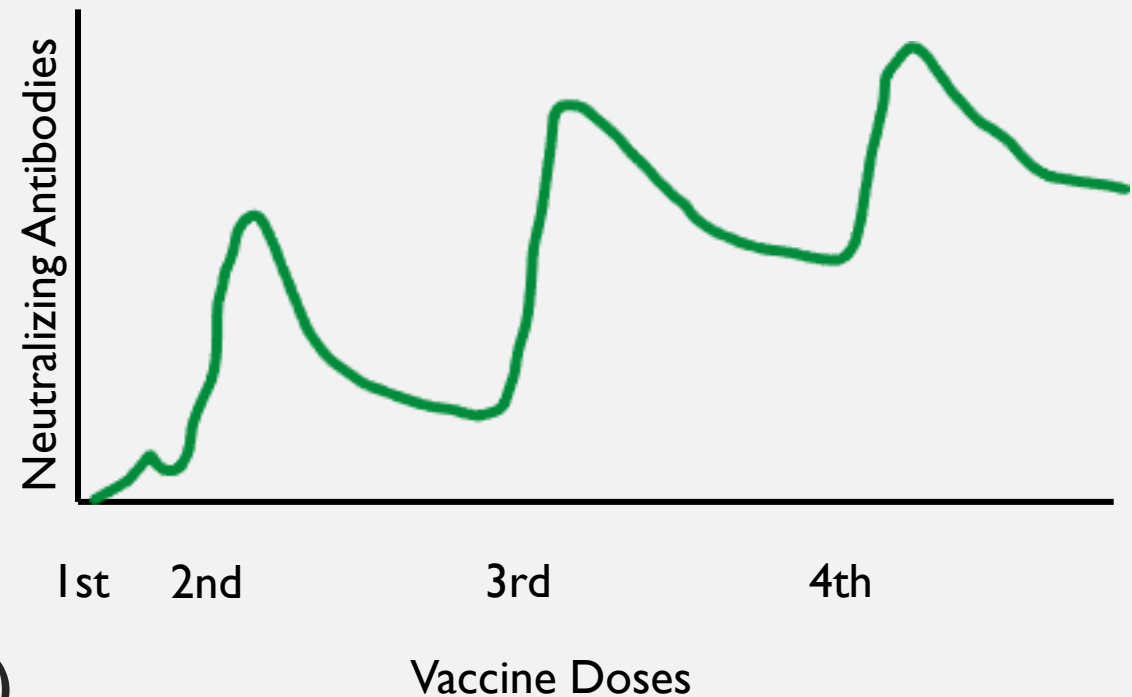


OMICRON'S SILVER LINING

- Individual mortality risk dropped
 - Rising population-level immunity
 - Increased vaccine uptake
 - Less virulent virus
- Updated vaccines readily available
- Treatments are effective and readily available
- Testing relatively easy

VACCINATION STRATEGIES TO REACH GOALS

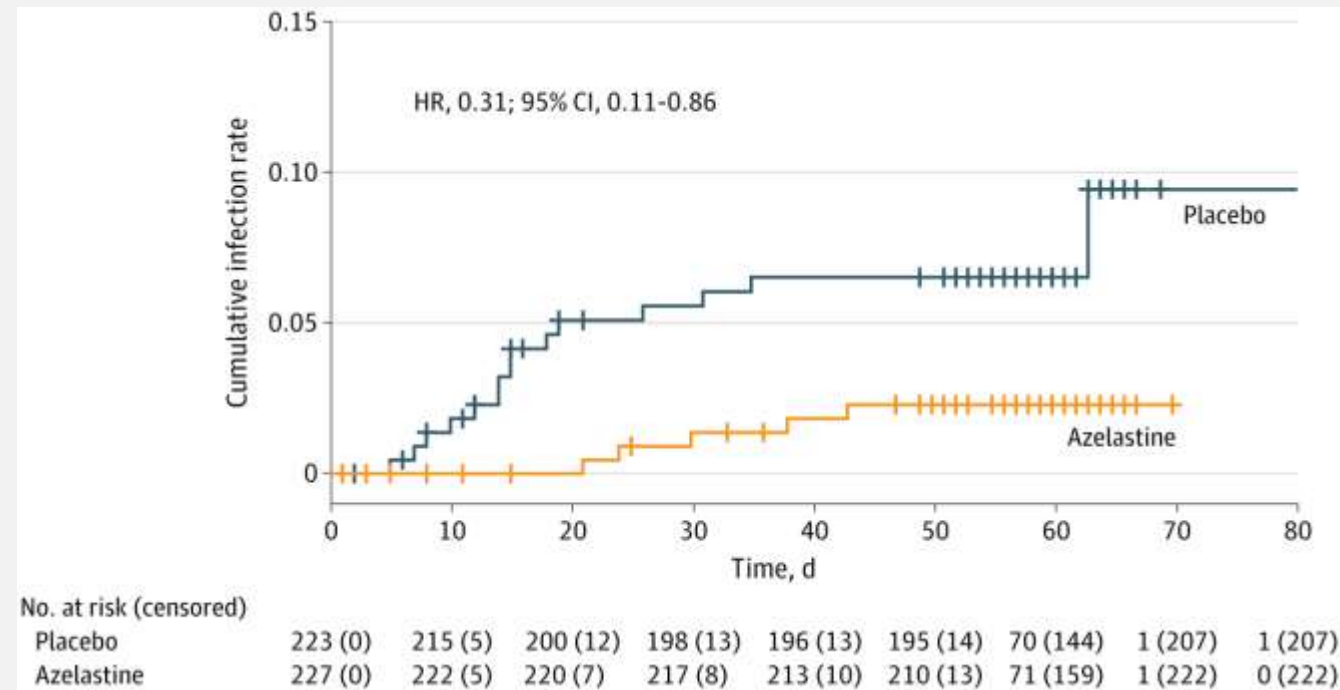
- Boosting to “top off” immunity
 - Stronger
 - Broader
 - Increases durability
- Updating antigen
 - Moving toward annual
- Combination vaccines (with flu)



INTERESTING NEW DATA

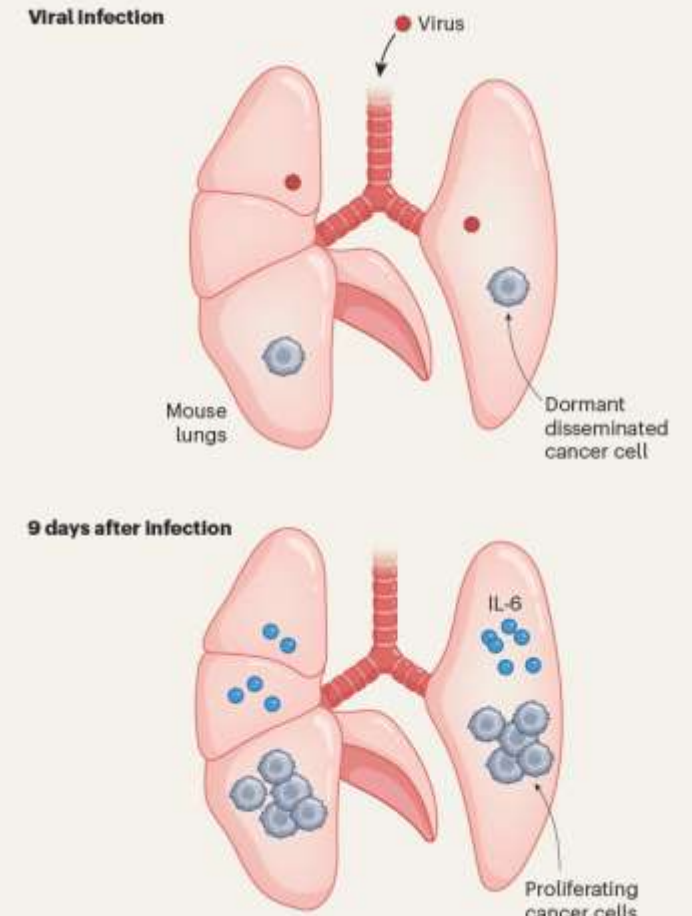
COVID-19 TREATMENT/PREVENTION

- Nirmaltrevir/ritonavir
 - Reduce risk progress severe disease
 - Benefit mostly in older patients
 - Most post-marketing studies
 - Real-world effectiveness
- Azelastine
 - Intranasal antihistamine
 - 3 times/day x 8 weeks
 - ~3-fold lower risk of COVID-19 and rhinovirus



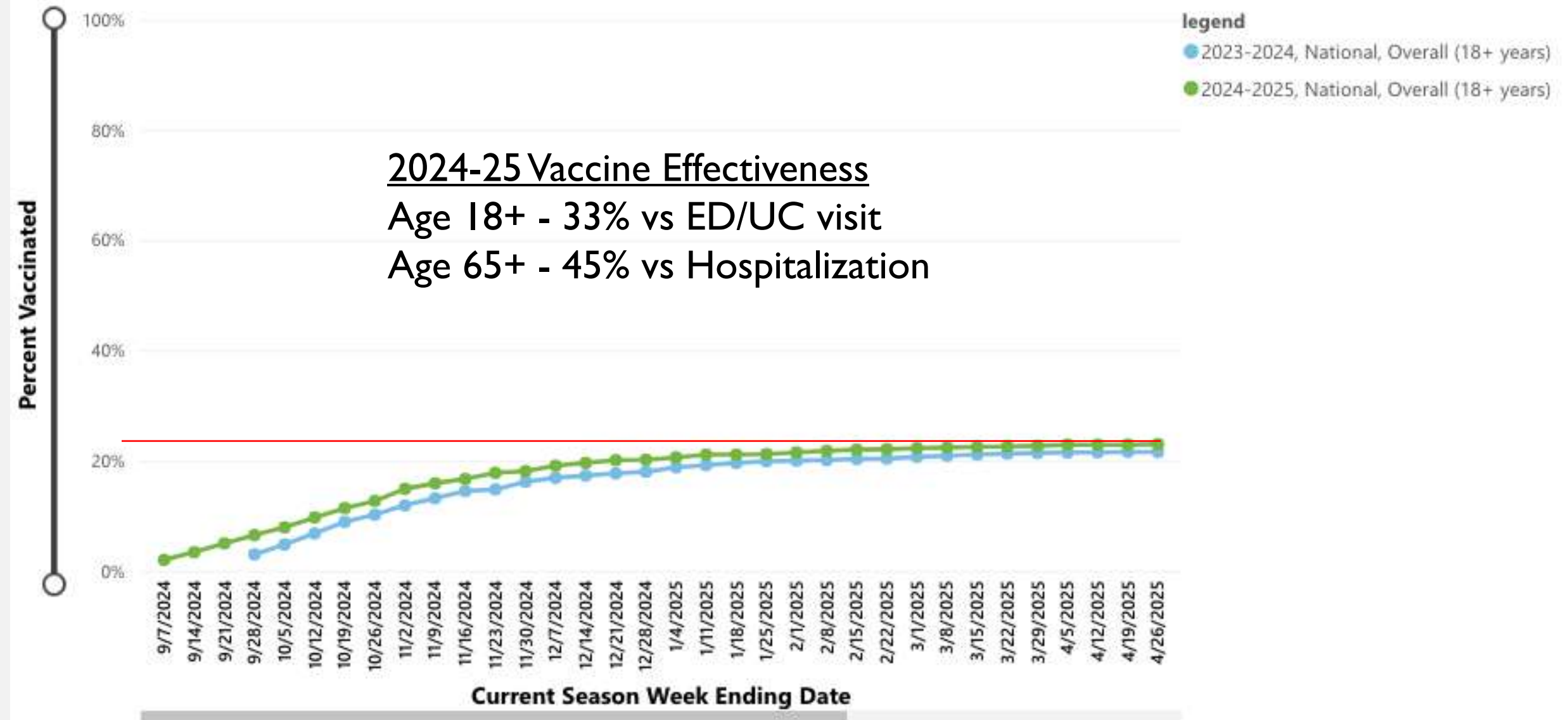
COVID LINK TO BREAST CANCER RECURRENCE

- Breast cancer cells go dormant
- SARS-CoV-2 and flu can “reawaken” in mice
- Increased metastatic breast CA after covid wave



WHY IS THIS RELEVANT?

- Despite no longer pandemic lot of “hidden” impacts
- Important to continue to prevent for highest risk and those who want to



VACCINE CONFUSION

IDEAL POLICY MAKING BY LEADERS

- Identify the principles – what trying to accomplish
- With the help of scientific/medical/public health experts:
 - Use available data and knowledge base to develop range of scenarios
- Policy makers weigh many items beyond med/PH
 - School – enrollment/donations
 - Employer – tough labor market
 - Business – customer anger
- Communicate what, why, how

NORMAL ANNUAL FLU/COVID VACCINE PROCESS

- Manufacturers → update antigen, demonstrates lot consistency
- FDA → approves
 - Not feasible to do RCTs every year
 - Couldn't stay current
 - Too expensive
- ACIP → makes recommendations based on data
- CDC director → signs off
- Insurance plans → cover
- Pharmacies → can administer

THIS YEAR'S COVID VACCINE PROCESS

- Manufacturers → update antigen, demonstrates lot consistency
- FDA → approves (but only for 65+ or high-risk)
- ACIP → makes recommendations (not clearly based on data)
 - Everybody 6M+
 - Shared decision making with clinician
- CDC director → has not signed off yet
- Insurance plans → likely will cover if CDC signs off
 - Some states independently require coverage
- Pharmacies → unclear if prescription needed, state variability

VACCINE CONFUSION AT STATE LEVEL

FOX NEWS FLASH

Florida surgeon general defends unprecedented plan to dismantle school vaccine mandates

State could become first in nation to drop requirements for hepatitis B, chickenpox and other vaccines

States break with FDA restrictions on COVID vaccines, ensuring broader access

Several states say pharmacists must continue providing shots.

BY: **SHALINA CHATLANI** - SEPTEMBER 5, 2025 2:58 PM



WHY IS THIS RELEVANT?

- Unsettled time where clinicians also confused
- Where to go for trusted sources of information?
 - Societies
 - AAP
 - AAFP
 - ACOG
 - Vaccine Integrity Project

BUILDING/MAINTAINING TRUST

- What/where/how we communicate matters
- Be humble
 - Acknowledge uncertainty
 - Acknowledge when prior assertions wrong – science evolves
- Provide accurate easily understood references
- Be professional
- Remember our obligation to society

QUESTIONS?