

# The Epidemiology of SARS CoV-2 (COVID-19)

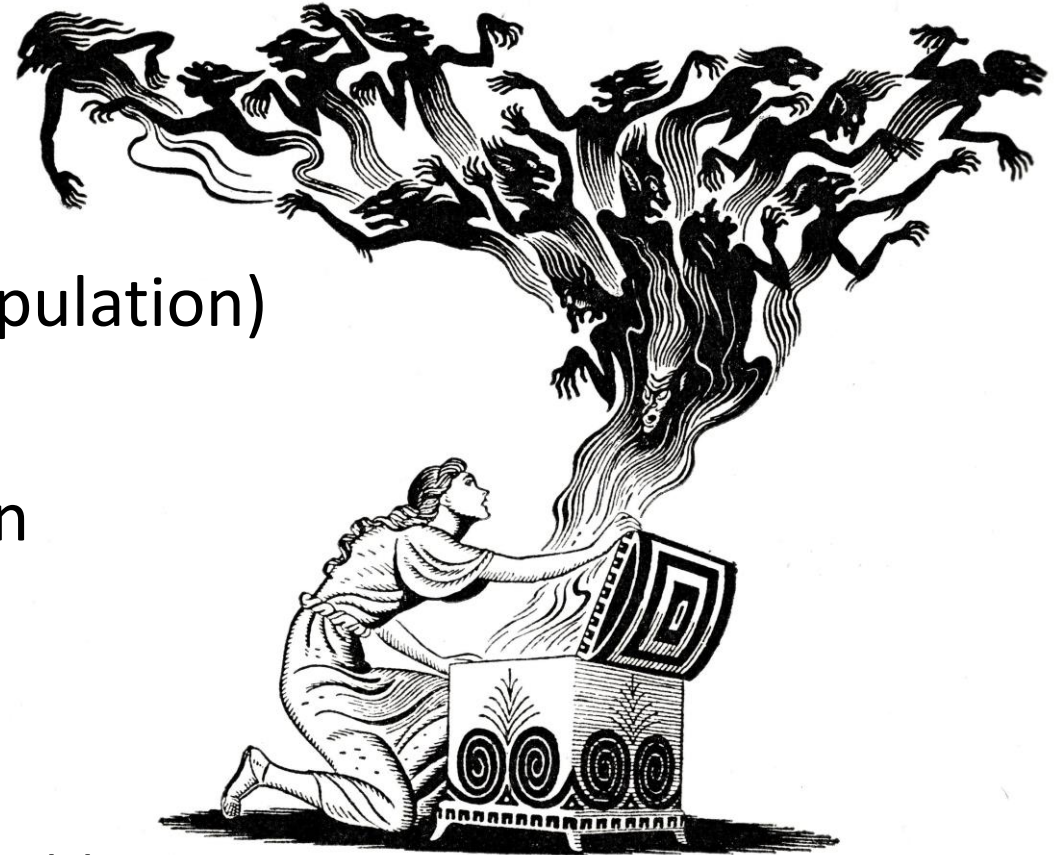
Thomas J. Duszynski MPH, PhD(c)  
Director of Epidemiology Education  
October 31, 2020



**IUPUI**  
RICHARD M. FAIRBANKS  
**SCHOOL OF PUBLIC HEALTH**

# Defining a Pandemic

- Novel pathogen (no immunity in the population)
- Increased morbidity and mortality
- Sustained person to person transmission
- Resulting in:
  - Expanded public health response
  - Social and economic disruption
  - Increased pressure on public health and healthcare communities
- More than 40 disease have emerged or re-emerged that have affected the human population since the 1970



**IUPUI**

RICHARD M. FAIRBANKS

**SCHOOL OF PUBLIC HEALTH**

# What is a Coronavirus?

- Coronaviruses are named for the crown-like spikes on their surface.
- Human coronaviruses were first identified in the mid-1960s.
- Coronaviruses cause diseases in animals and humans. Including: camels, cats, and bats, and people.
- In humans, the viruses can cause mild respiratory infections, like the common cold, but can lead to serious illnesses, like pneumonia.
- Other human coronaviruses
  - MERS-CoV (the beta coronavirus that causes Middle East Respiratory Syndrome)
  - SARS-CoV (the beta coronavirus that causes severe acute respiratory syndrome)
  - SARS-CoV-2 (the novel coronavirus that causes coronavirus disease 2019)

# Pneumonia of unknown cause – China



5 January 2020

- On 31 December 2019, the WHO China Country Office was informed of cases of pneumonia of unknown etiology detected in Wuhan City, Hubei Province of China.
- By 3 January 2020, a total of 44 patients, 11 are severely ill, with pneumonia have been reported to WHO by the national authorities in China.
- Some patients were operating dealers or vendors in the Huanan Seafood market.
- Based on the preliminary information no evidence of significant human-to-human transmission and no health care worker infections reported.

# Pandemic Threshold?



- **22 January 2020 WHO**

China issued a statement saying that there was evidence of human-to-human transmission in Wuhan but more investigation was needed to understand the full extent of transmission.

- Meeting the pandemic threshold?



**IUPUI**

RICHARD M. FAIRBANKS

**SCHOOL OF PUBLIC HEALTH**

# Arrival in the U.S.- January 21, 2020

- A Washington state resident becomes the first person in the United States with [a confirmed case](#) of the 2019 novel coronavirus, having returned from Wuhan on January 15
- Washington state reported the first death in the U.S. from the new coronavirus on **February 29th**
- **March 11 — WHO Declares COVID-19 a Pandemic**
- In declaring COVID-19 a pandemic, director general of WHO, said at a briefing in Geneva the agency is “***deeply concerned by the alarming levels of spread and severity***” of the outbreak. Also expressing concern about “***the alarming levels of inaction.***”



**IUPUI**

RICHARD M. FAIRBANKS

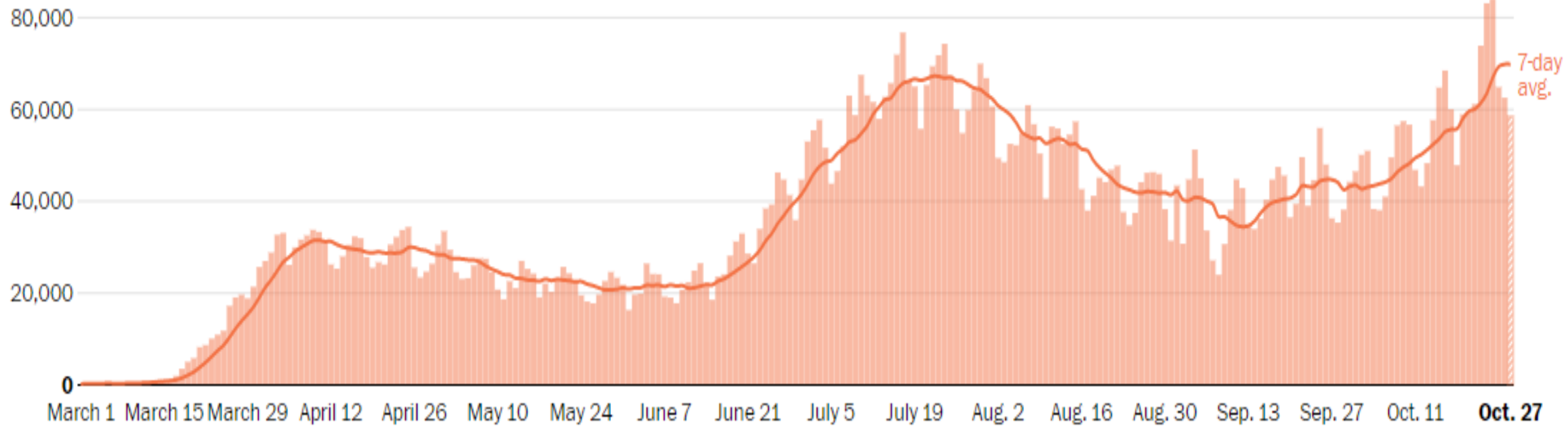
**SCHOOL OF PUBLIC HEALTH**

# U.S. Cases

At least 8,725,589 have been reported since Feb. 29.

Show by

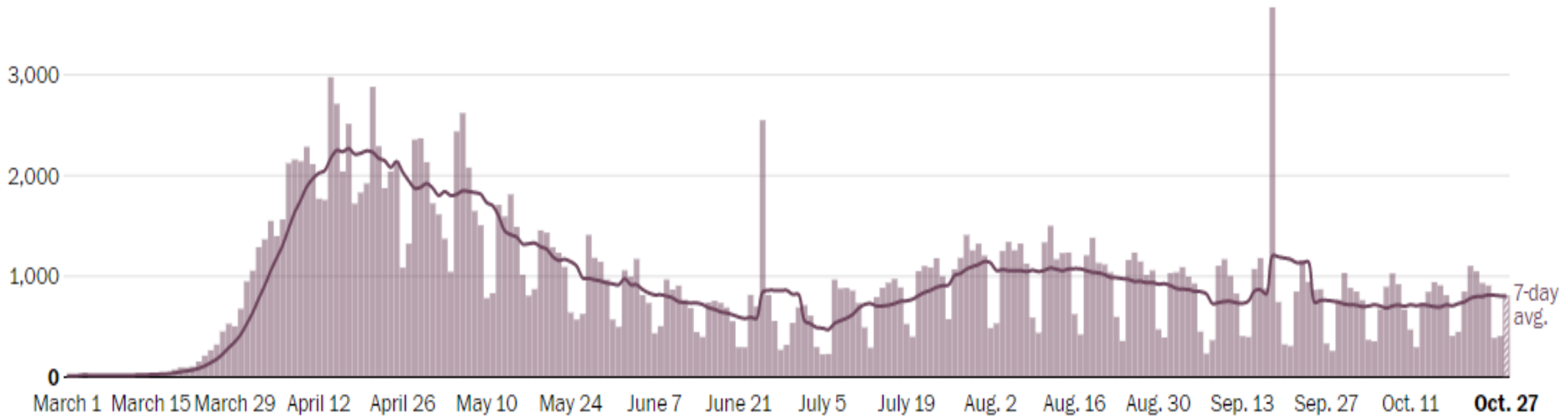
All U.S.



# U.S. Deaths

At least 225,904 have been reported since Feb. 29.

Show by **All U.S.** ▾

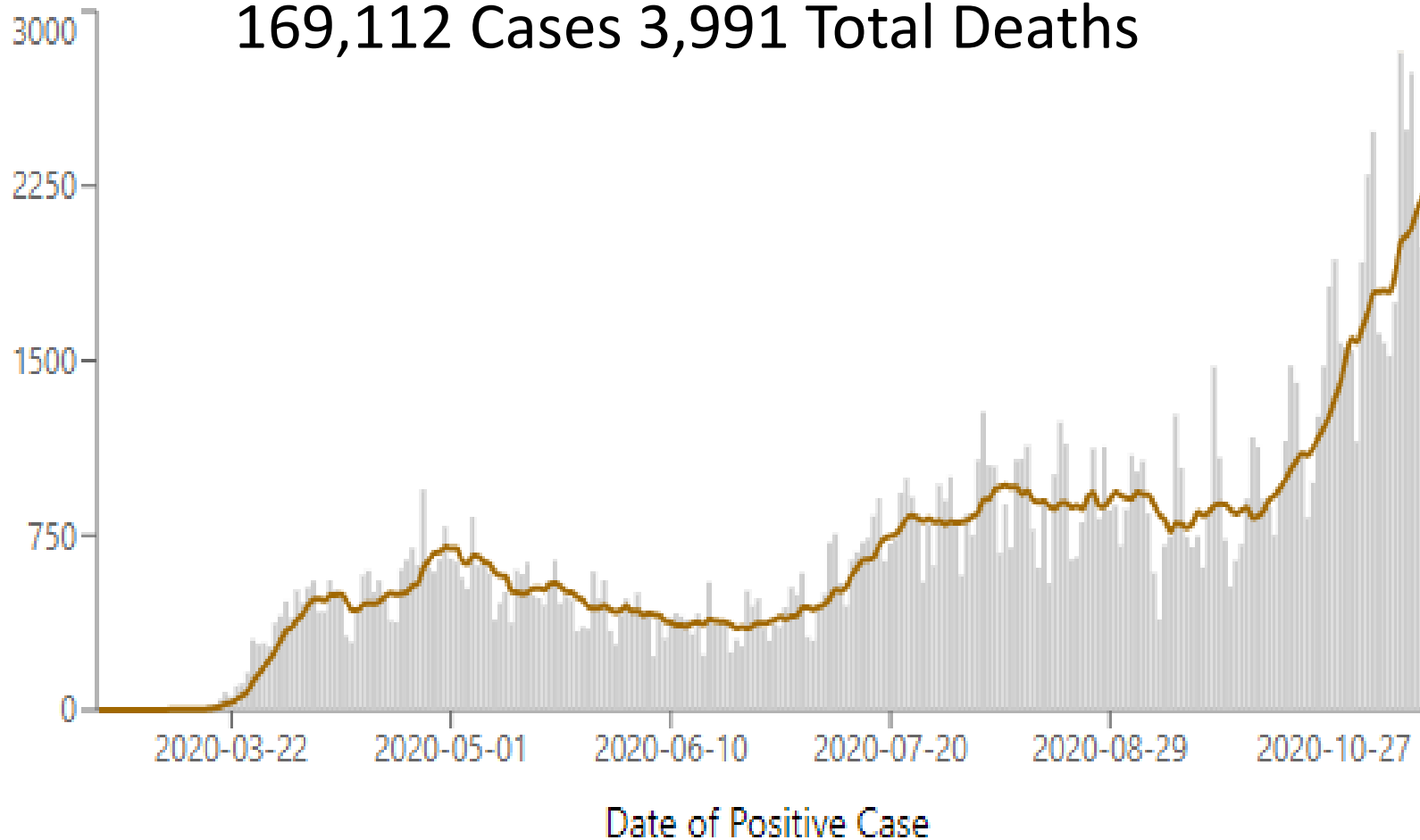


Note: As of Sept. 18, the Post has altered its methodology for reporting deaths in New York State, shifting to the confirmed death counts for Bronx, Kings, New York, Queen's, and

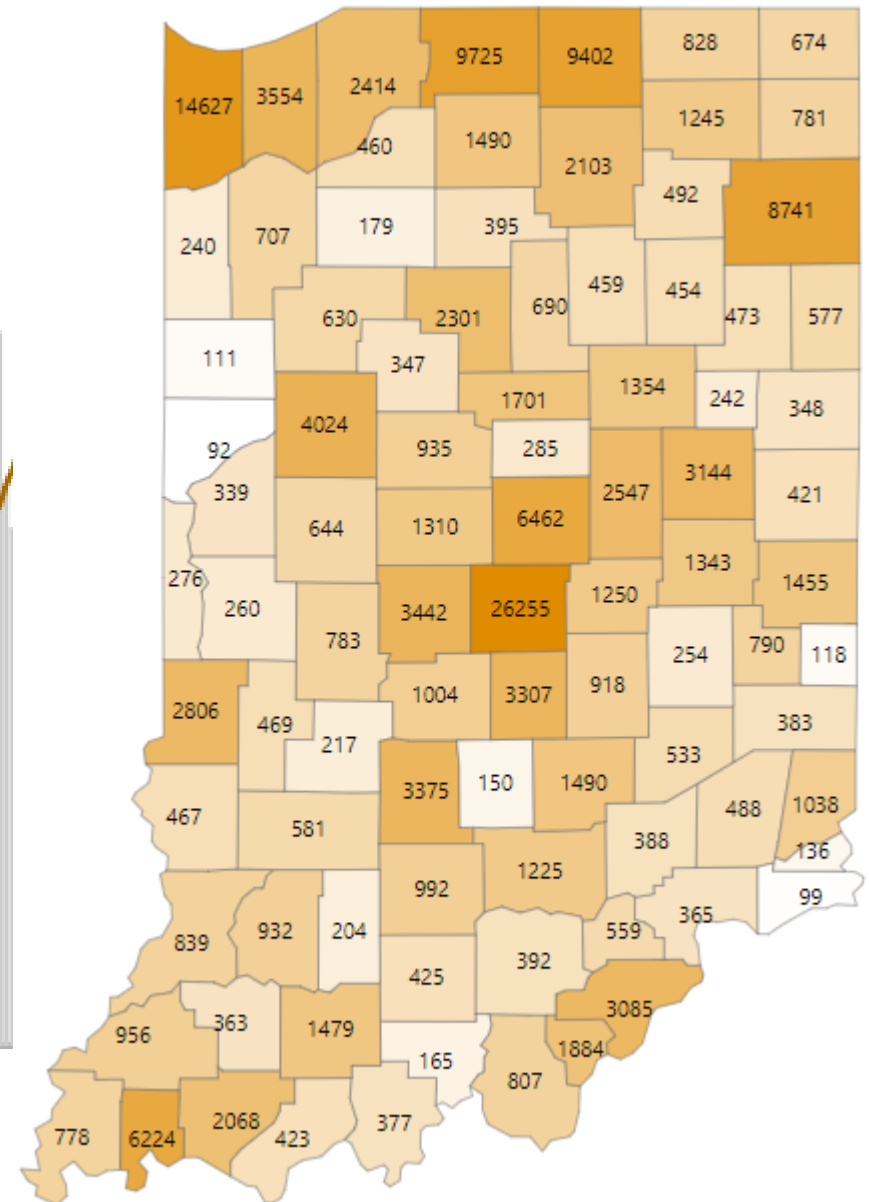


# Indiana Specific numbers

169,112 Cases 3,991 Total Deaths



Positive Cases by Day — 7-Day Moving Avg (Positive Cases) — Newly Reported Positive Cases



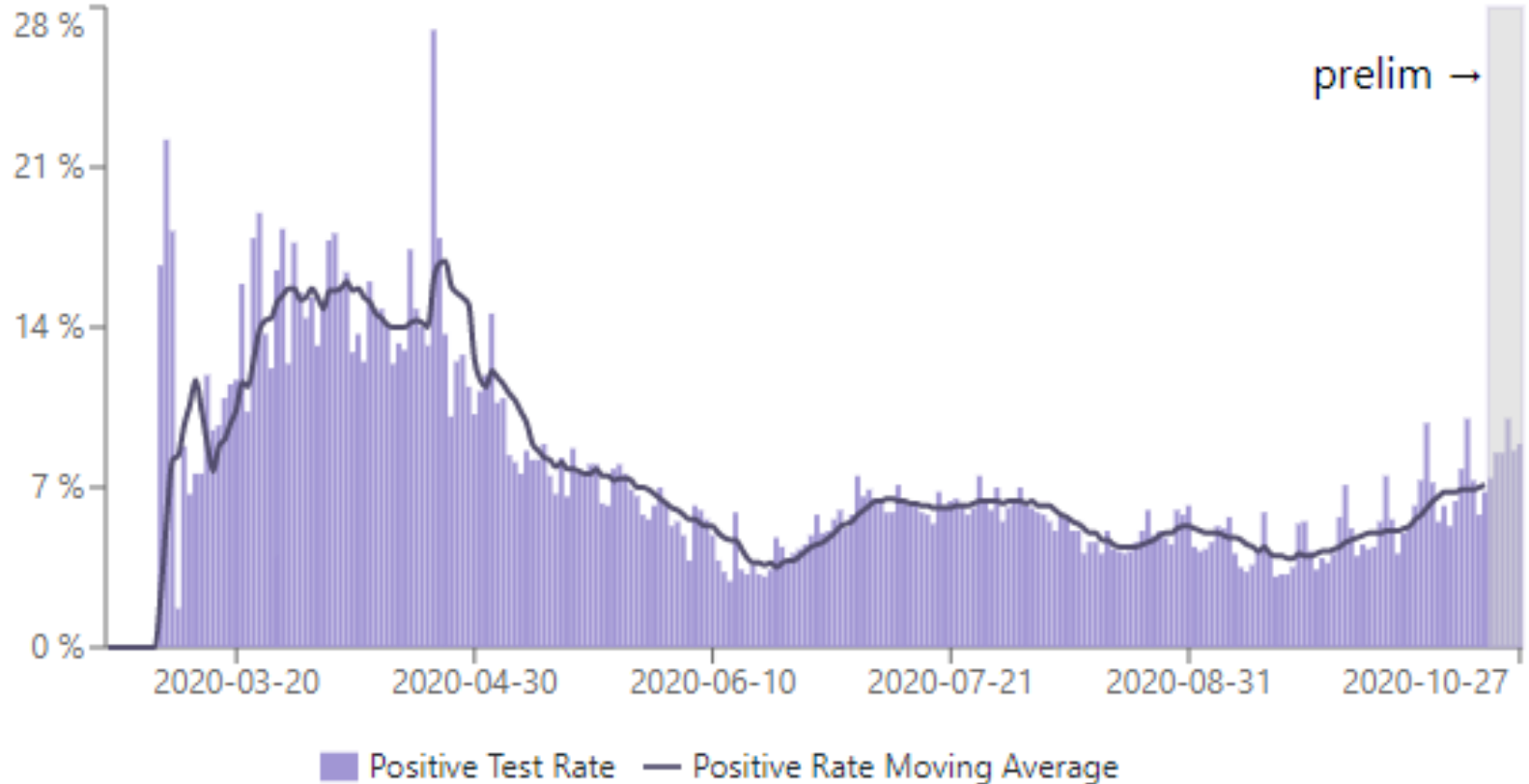
# Positivity

## Statewide Daily Positive Test Rate i

All Tests

Individuals

[What does prelim mean?](#)



The Importance of Positivity.

The number of positives/the number of tests \* 100 = Positivity Rate



**IUPUI**

RICHARD M. FAIRBANKS

**SCHOOL OF PUBLIC HEALTH**

# Influenza Season and COVID-19

- Serious concerns about overlapping infectious events.
- Influenza and Covid-19 co-infections are possible
- Those with co-morbid conditions, especially any lung deficiency, are at greatest risk for severe outcomes
  
- The Good News:
  - We have a influenza vaccine!
  - Reduce the noise around Covid-19
  - Public health precautions for Covid-19 work for influenza as well
  - Wear a mask, stay physically distant (including sheltering in place), and wash your hands frequently



**IUPUI**

RICHARD M. FAIRBANKS

**SCHOOL OF PUBLIC HEALTH**

# Protecting yourself

- In the absence of a vaccine
- In the absence of a treatment
  
- Wear a mask properly
- Maintain physical distancing
- Good hand hygiene
- Get your Flu Shot ( *you can't get the flu from the flu shot*)



**IUPUI**

RICHARD M. FAIRBANKS

**SCHOOL OF PUBLIC HEALTH**

# Covid-19 Vaccine Clinical Trials

- The World Health Organization recognizes that, as of June 22, there are [over 140 vaccines](#) in various stages of development.
- Of those >140 vaccines, [13 are now in human clinical trials](#). They are testing to explore their safety, efficacy and correct dosage in **humans**.

Only upon completion of such phases can a vaccine be considered as suitable for approval by authorities such as the [Food and Drug Administration \(FDA\)](#) or the [Europeans Medicine Agency \(EMA\)](#).



**IUPUI**

RICHARD M. FAIRBANKS

**SCHOOL OF PUBLIC HEALTH**

# Questions

Thomas J. Duszynski, MPH, PhD(c)  
Director of Epidemiology Education, Department of Epidemiology

**Indiana University**  
**Richard M. Fairbanks School of Public Health**  
Health Sciences Building

1050 Wishard Blvd, RG 5105

Indianapolis, IN 46202-2872

317-274-4319

[tduszyns@iu.edu](mailto:tduszyns@iu.edu)