FORT WAYNE **RICHARD M. FAIRBANKS SCHOOL OF PUBLIC HEALTH**

Contributions of the Indiana Prevalence Study to the Worldwide Fight against COVID-19:

Health and Business Implications for the Fort Wayne Community

Paul Halverson, DrPH, FACHE
Founding Dean and Professor

Nir Menachemi, PhD, MPH
Fairbanks Endowed Chair, Professor & Department Head

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History of Fairbanks School

- Founded in 2012 on IUPUI campus with generous gift from RMFF
  - Previous department in IUSM
  - Masters & Bachelors programs in Health Administration from SPEA
- Became part of IU Fort Wayne campus in 2019
  - Currently offer BS degrees and minors in:
    - Health Services Management
    - Community Health
    - Health Data Science
- Mission: Positively impact the health of Hoosiers

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What is Public Health

- Public health is **"the science and art of preventing disease, prolonging life and promoting health through the organized efforts and informed choices of society, organizations, public and private communities, and individuals."**

  Source: Winslow, 1920

- Public health is "**what we as a society do collectively to assure the conditions in which people can be healthy"**

  Source: *Institute of Medicine, 1988 report*

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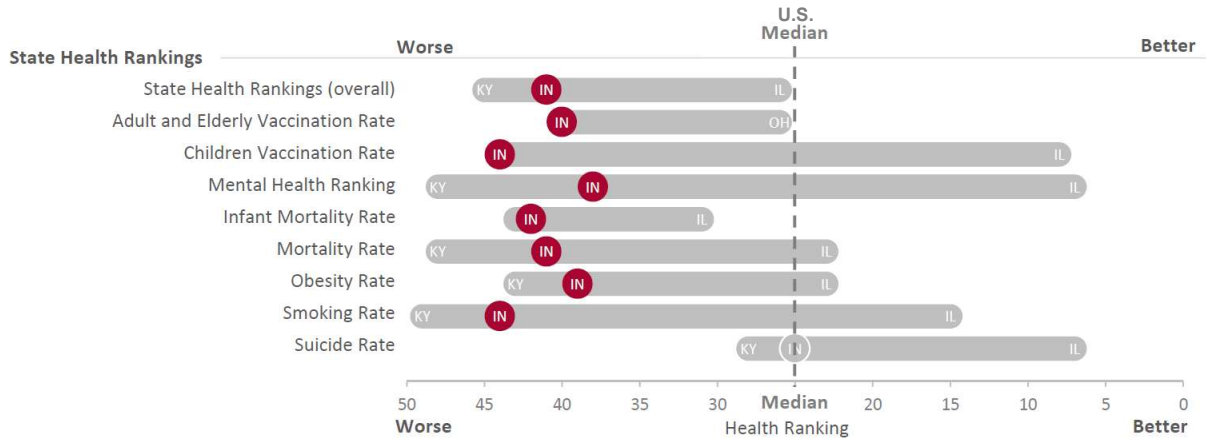
Rankings Compared to Surrounding States



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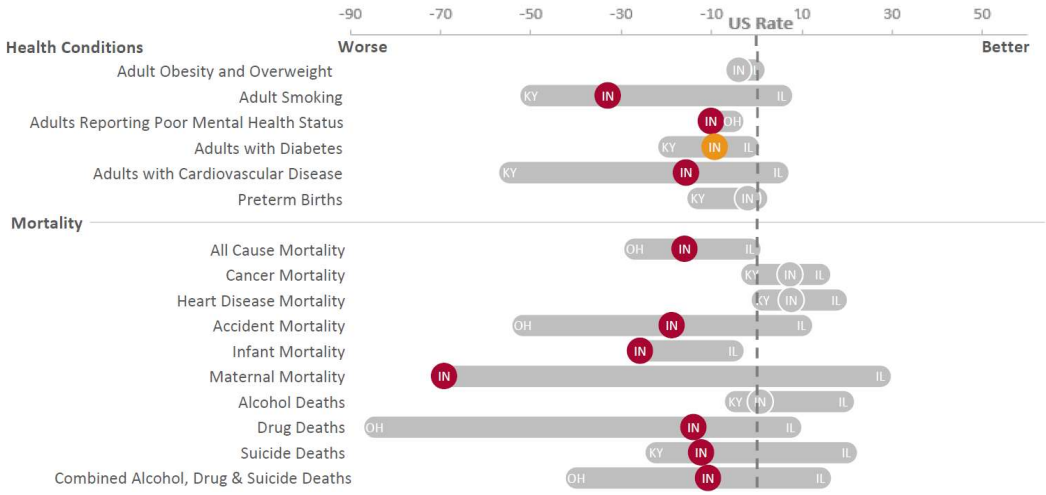
Rankings Compared to Surrounding States



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Rankings Compared to Surrounding States

Richard M. Fairbanks School of Public Health at IUPUI

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IU IRB # 2003867531

Contents

- Statewide Informatio
  - Cases, Positivity, Hosp

Expert Opinion on Interpreting Data

- **Statewide and in AC cases are beginning to increase** post-holidays. We see a clear trend toward higher cases in the coming weeks.
  - In AC, younger populations are increasing slightly; others are stable
  - Testing volumes remain down; given high positivity we anticipate that expanded testing over the new few weeks will uncover more cases in the community

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Hospital Census for COVID-19 – District 3

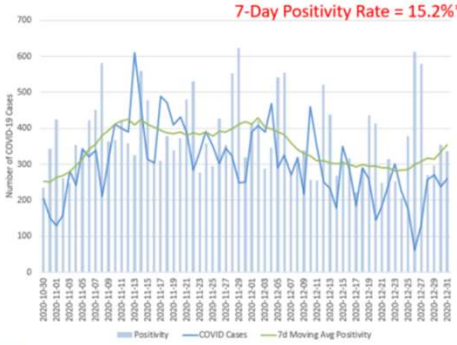
Hospitalizations

Census | Admissions

District 3 COVID-19 Hospital Census

Hospital census data provided by the Indiana Department of Health. of January 4, 2021. These hospitalizations represent individuals with COVID-19 or persons suspected of COVID-19 hospitalized.

7-Day Positivity Rate = 15.2%*



COVID+ Cases and Positivity since Oct 30, 2020

No. Cases and % Positivity, w/ 7 day Moving Avg

Allen County

Positive cases of COVID-19 since October 30, 2020 reported for residents of Allen County, Indiana. Green line represents the 7 day moving average of positivity thru 12/31/2020. Source: MPH (using new rates)
*Rate as of 12/31

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Indiana Prevalence Study- Testing Partners

IUPUI
RICHARD M. FAIRBANKS
SCHOOL OF PUBLIC HEALTH

Lilly

ZOTEC PARTNERS

MAXIMUS

MANAGEMENT PERFORMANCEHUB

DOR

Indiana
DEPARTMENT OF EDUCATION

IDEM

BMV

INDIANA STATE POLICE

PARKVIEW HEALTH

ARMY NATIONAL GUARD

WAL★MART

IVY TECH COMMUNITY COLLEGE

Teachers' Treasures

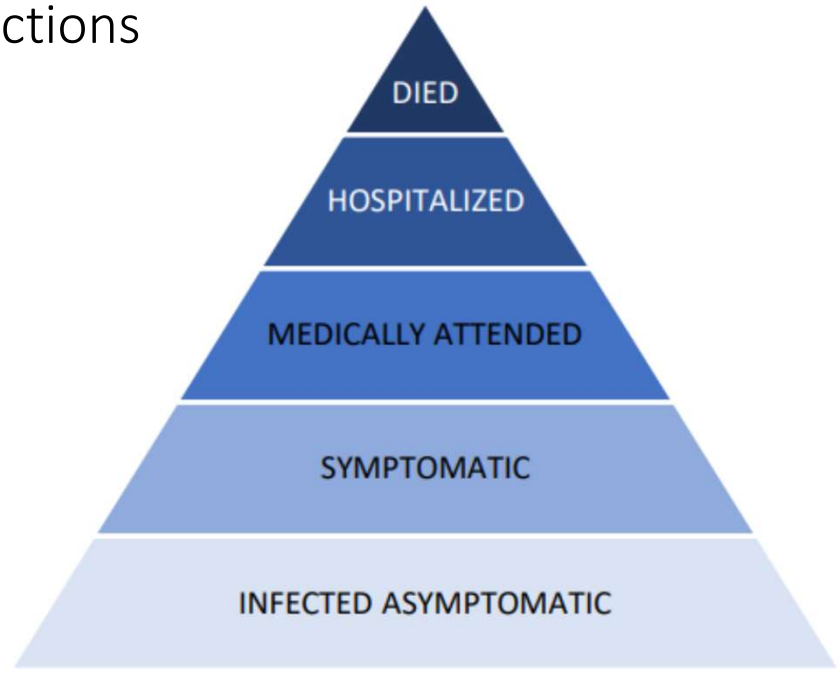
ECHD

Ascension St. Vincent

Indiana State Department of Health

9

All possible infections



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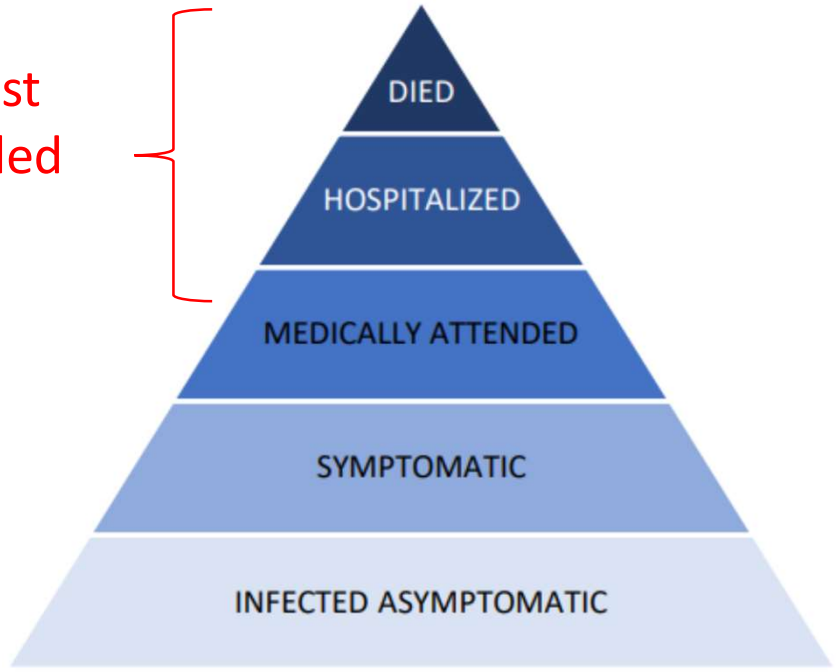
People who test positive are called **"Cases"**



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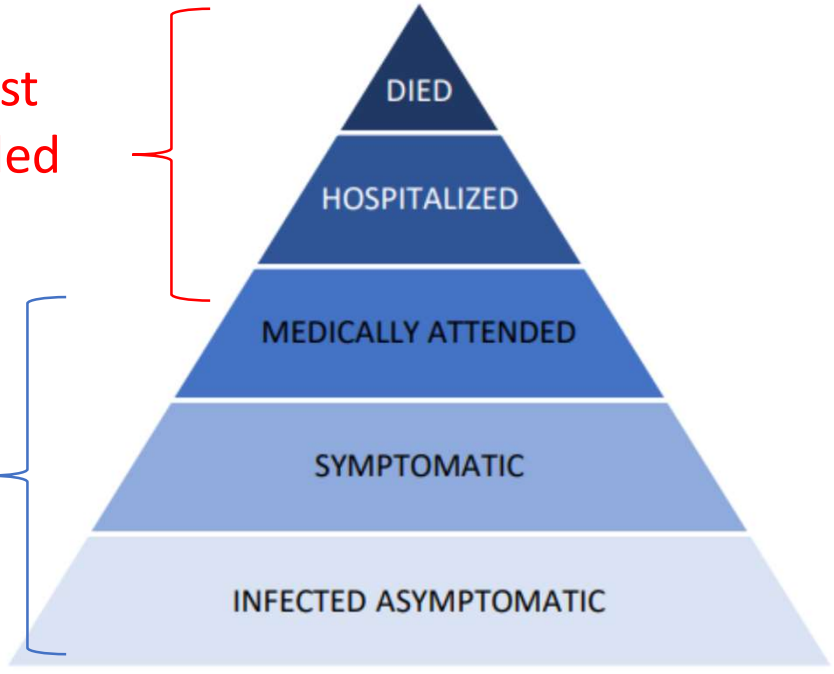
People who test positive are called **"Cases"**

This group is likely responsible for much community spread



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The New York Times

Opinion

If We Can't Test Everyone for Coronavirus, This Is the Next Best Thing

Random sampling is the quickest, most feasible and most effective means of assessing the U.S. population.

By Louis Kaplow

Mr. Kaplow is a professor of law and economics at Harvard.

April 24, 2020

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Indiana Prevalence Study

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Indiana Department of Health

- Determine the cumulative number of people EVER infected in Indiana at multiple time periods (not merely the cumulative number of cases!)

Provides a denominator!

(to calculate rate of outcomes)

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Indiana Prevalence Study

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Indiana Department of Health

- Determine the cumulative number of people <u>EVER</u> infected in Indiana at multiple time periods (not merely the cumulative number of cases!)
- How far from "herd immunity"?

  Enough people are no longer susceptible resulting in very low circulation of the virus and thus protection to those who are vulnerable

70%? 75%?

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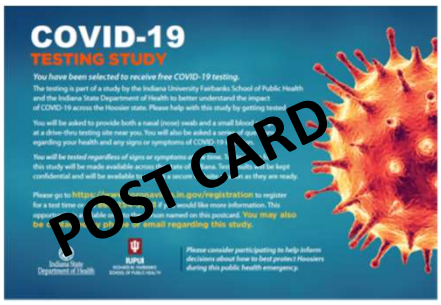
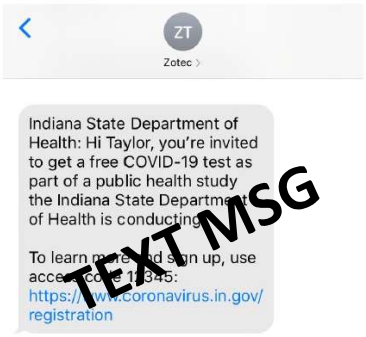
Outreach

- Postcard, text messages, email, telephone call
- 68 testing sites, statewide





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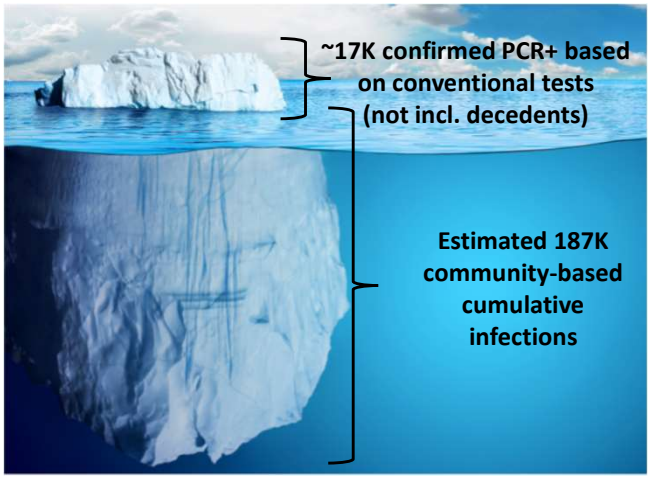
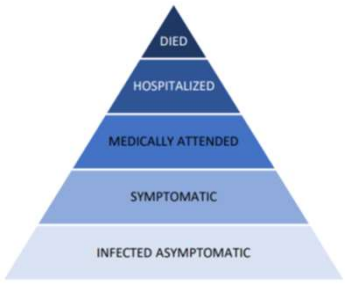
Wave 1 Findings (end of April 2020)

- General Pop. Prevalence of 2.79% = 187,378 living Hoosiers





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Probability of Death from COVID-19 by Age

Age Group	Infection Fatality Ratio	Observed Death Rate
Total	0.58%	1 in 171 infected

But 46.5% of Deaths were in Nursing Homes

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Probability of Death from COVID-19 by Age

Excluding Nursing Home Deaths

Age Group	Infection Fatality Ratio	Observed Death Rate
Total	0.26%	1 in 384 infected

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Probability of Death from COVID-19 by Age

Excluding Nursing Home Deaths

Age Group	Infection Fatality Ratio	Observed Death Rate
Less than 30 years	0.005%	1 in 19,531 infected
30-49 years	0.04%	1 in 2,471 infected
50-64 years	0.44%	1 in 224 infected
65+ years	2.31%	1 in 43 infected
Total	0.26%	1 in 384 infected

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Probability of Death from COVID-19 by Age

Excluding Nursing Home Deaths

Age Group	Infection Fatality Ratio	Observed Death Rate	# of Deaths (as of 10/1/20 excl. LTC)
Less than 30 years	0.005%	1 in 19,531 infected	11
30-49 years	0.04%	1 in 2,471 infected	79
50-64 years	0.44%	1 in 224 infected	293
65+ years	2.31%	1 in 43 infected	1,033
Total	0.26%	1 in 384 infected	1,416

24

Probability of Death from COVID-19 by Age

Excluding Nursing Home Deaths

Age Group	Infection Fatality Ratio	Observed Death Rate	# of Deaths (as of 10/1/20 excl. LTC)	Derived Number of Infections (not in nursing homes)
Less than 30 years	0.005%	1 in 19,531 infected	11	214,844
30-49 years	0.04%	1 in 2,471 infected	79	195,255
50-64 years	0.44%	1 in 224 infected	293	65,756
65+ years	2.31%	1 in 43 infected	1,033	44,688
Total	0.26%	1 in 384 infected	1,416	520,542

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Probability of Death from COVID-19 by Age

Excluding Nursing Home Deaths

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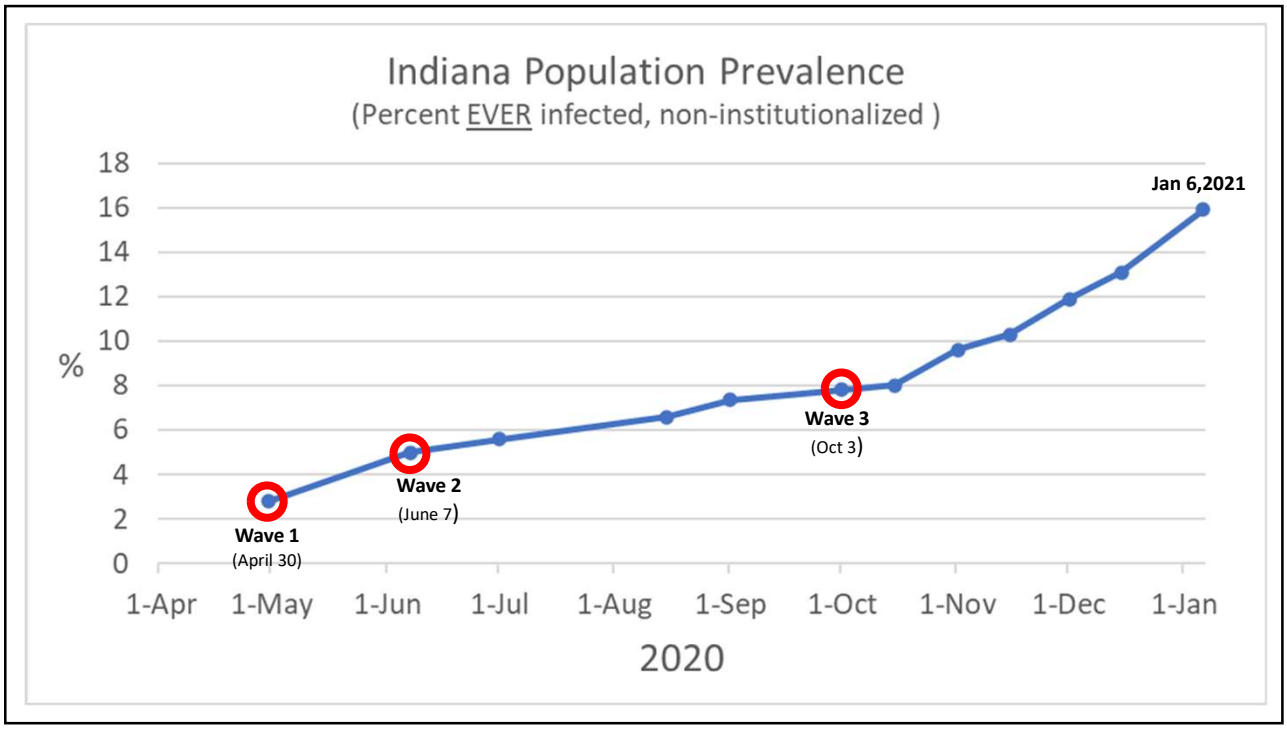
26


Indiana Population Prevalence
(Percent EVER infected, non-institutionalized)
18
16
14
12
10
8
6
4
2
0
%
Jan 6,2021
Wave 3
(Oct 3)
Wave 2
(June 7)
Wave 1
(April 30)
1-Apr
1-May
1-Jun
1-Jul
1-Aug
1-Sep
1-Oct
1-Nov
1-Dec
1-Jan
2020

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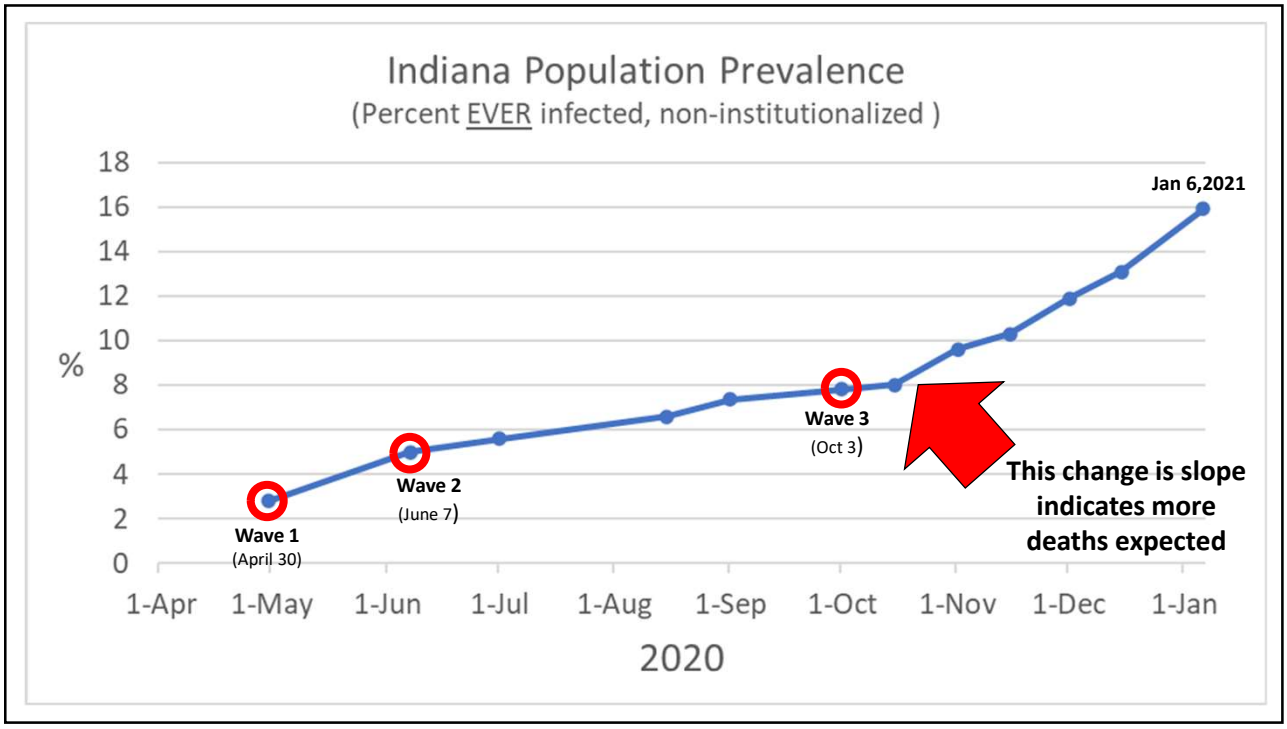
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4
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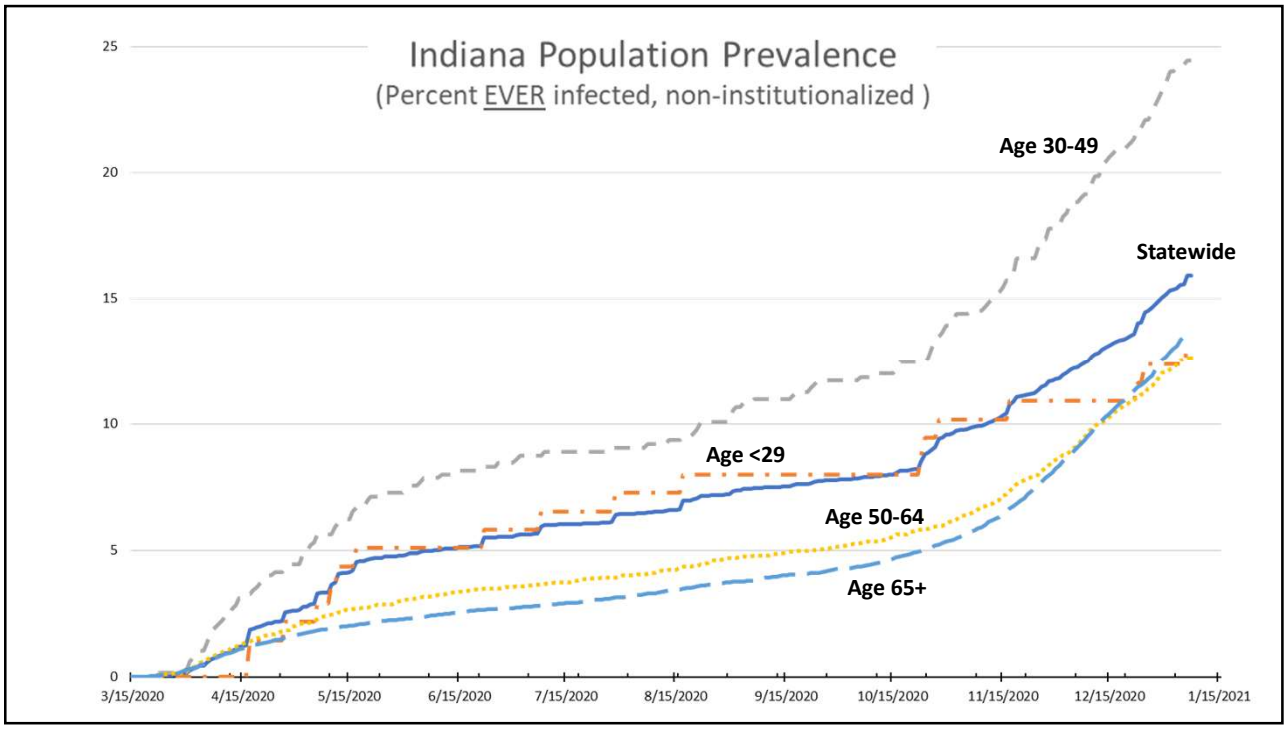
0
%
Jan 6,2021
Wave 3
(Oct 3)
Wave 2
(June 7)
Wave 1
(April 30)
This change is slope indicates more deaths expected
1-Apr
1-May
1-Jun
1-Jul
1-Aug
1-Sep
1-Oct
1-Nov
1-Dec
1-Jan
2020

28



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What have we learned so far?

- Asymptomatic rate steady at ~40%
- ~10x (in April) to ~3x (in November) more infections than cases
- Most scientifically accurate infection-fatality ratios (IFRs) by age
  - Quantifying extent of COVID-19 deadlier than influenza
- Loss of taste/smell among key symptoms specific to SARS-CoV-2
- Hunkering down in March-April reduced community infections
  - Within household (vs. community-based) positivity was much higher
- Minority populations have higher infection burden

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Centers for Disease Control and Prevention
MMWR
Morbidity and Mortali
Early Release / Vol. 69
Population Point Prevalence of SARS-CoV-2 Infection Based or
Random Sample — Indiana, April 25–29, 2020
Nir Menachemi, PhD[1,2]; Constantin T. Yiannoutsos, PhD[1]; Brian E. Dixon, PhD[1,2]; Thomas J. Duszynski, MPH[1]; W
Kara K. Wools-Kaloustian, MD[3]; Nadia Unruh Needleman, MS[1]; Kristina Box, MD[4]; Virginia Caine, MD[5]; Conne
Lindsay Weaver, MD[4]; Paul K. Halverson, DrPH[1]
Annals of Internal Medicine
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Letters | 2 September 2020
Infection Fatality Ratios for COVID-19 Among Noninstitutionalized Persons 12 and Older: Results of a Random-Sample Prevalence Study
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Paul K. Halverson, DrPH, Nir Menachemi, PhD, MPH View fewer authors
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https://doi.org/10.7326/M20-5352
PNAS
Proceedings of the National Academy of Sciences of the United States of America
Bayesian estimation of SARS-CoV-
Indiana by random testing
Constantin T. Yiannoutsos[a,1], Paul Halverson[b], and Nir Menachemi[b,c]
[a]Department of Biostatistics, Indiana University Fairbanks School of Public Health; [b]Department of Health Policy and M
Public Health; [c]Regenstrief Institute, Inc.
JPHMP JOURNAL OF
Public Health Management & Practice
How many SARS-CoV-2 infected people require hospitalization?
Using random sample testing to better inform preparedness efforts
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Paul K. Halverson, DrPH

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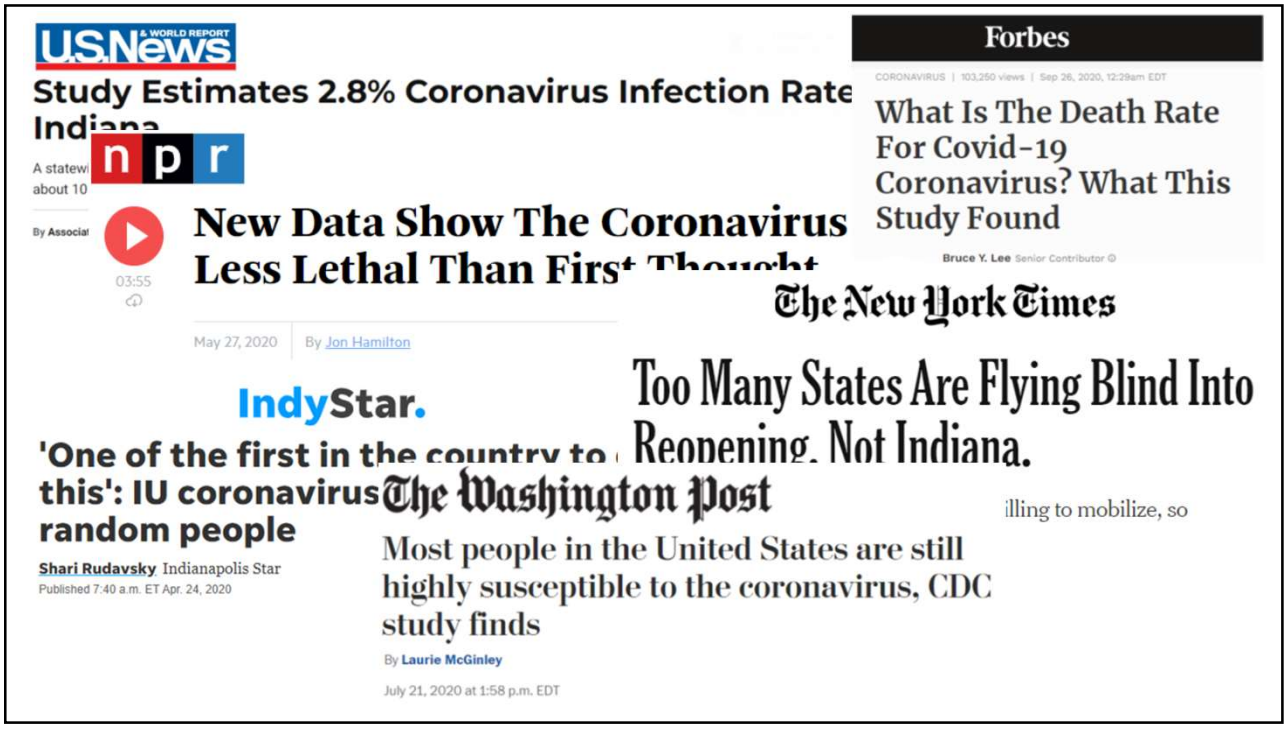
U.S.News & WORLD REPORT
Study Estimates 2.8% Coronavirus Infection Rate
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By Associat
npr
New Data Show The Coronavirus
Less Lethal Than First Thought
03:55
May 27, 2020 | By Jon Hamilton
Forbes
CORONAVIRUS | 103,250 views | Sep 26, 2020, 12:29am EDT
What Is The Death Rate For Covid-19 Coronavirus? What This Study Found
Bruce Y. Lee Senior Contributor
The New York Times
Too Many States Are Flying Blind Into Reopening. Not Indiana.
IndyStar.
'One of the first in the country to
this': IU coronavirus
random people
Shari Rudavsky Indianapolis Star
Published 7:40 a.m. ET Apr. 24, 2020
The Washington Post
illing to mobilize, so
Most people in the United States are still highly susceptible to the coronavirus, CDC study finds
By Laurie McGinley
July 21, 2020 at 1:58 p.m. EDT

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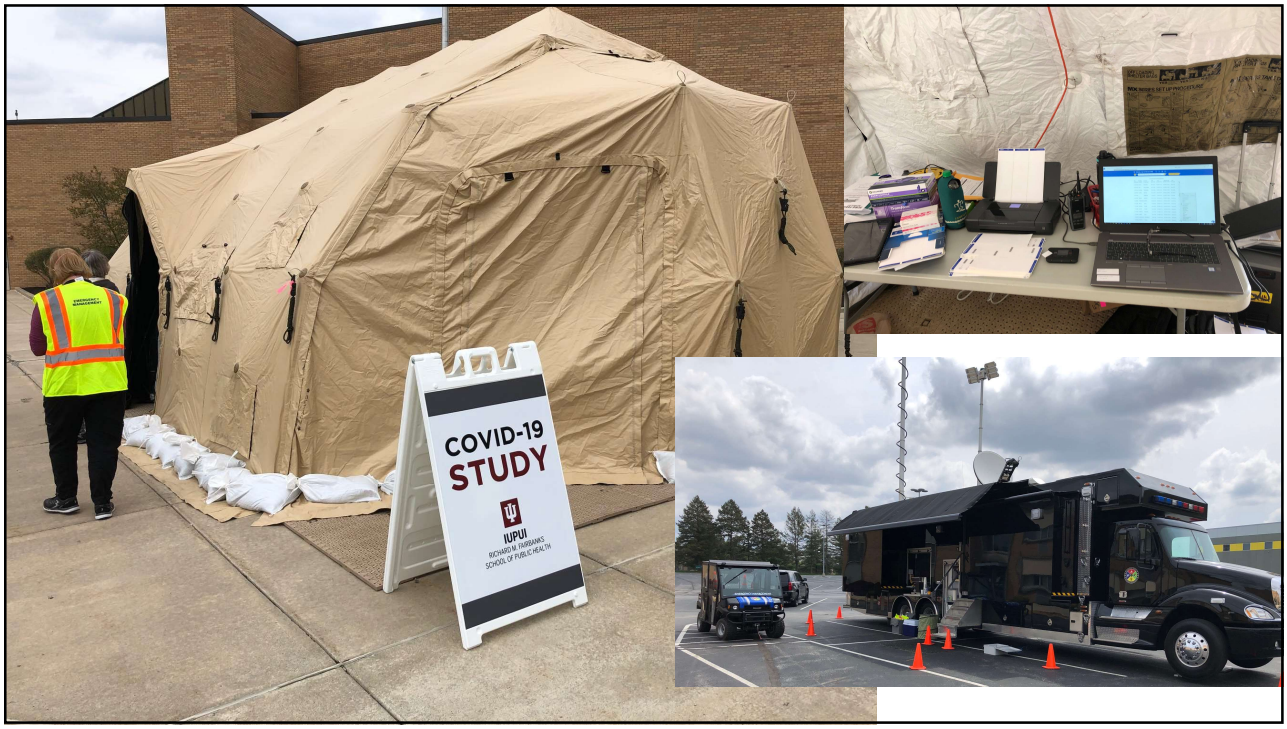
COVID-19
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