

Importance of Getting Vaccinated for COVID-19

Jennifer Morse, MD, MPH, FAAFP

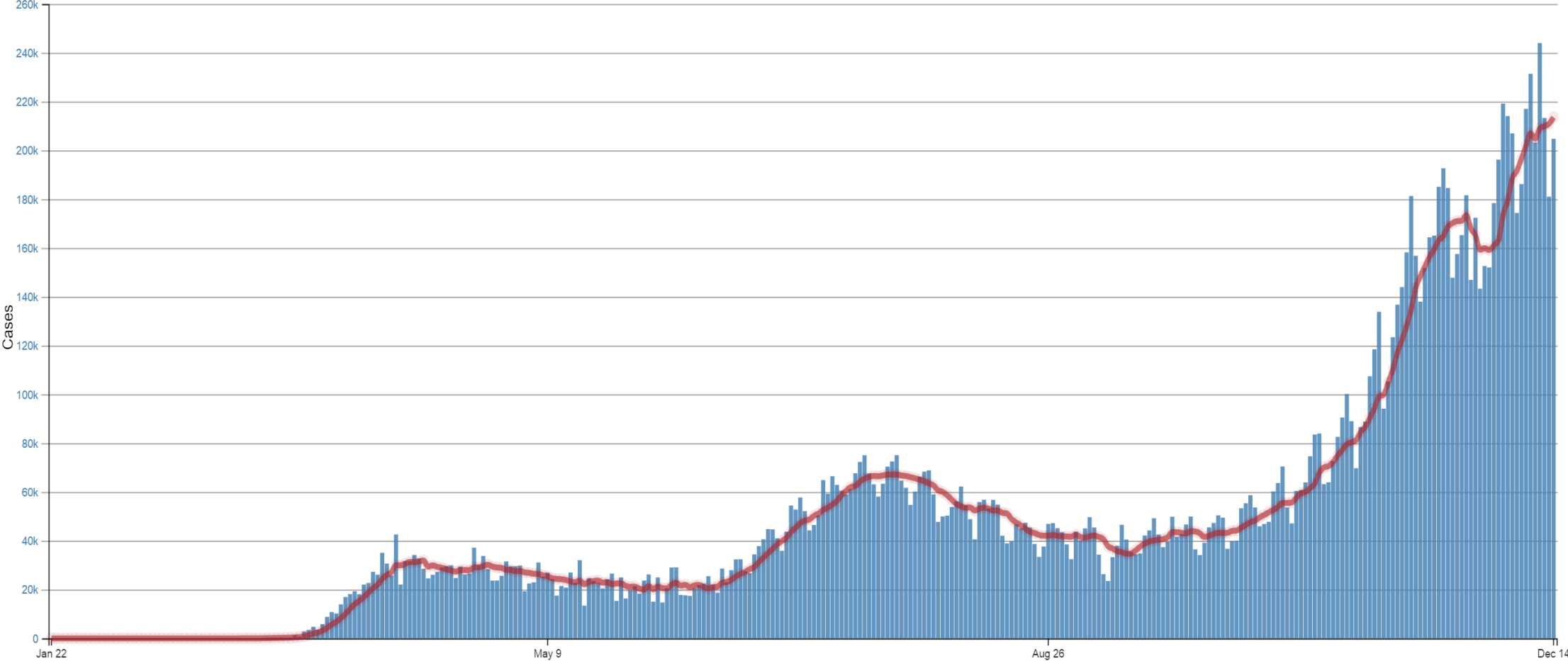
Medical Director

District Health Department #10

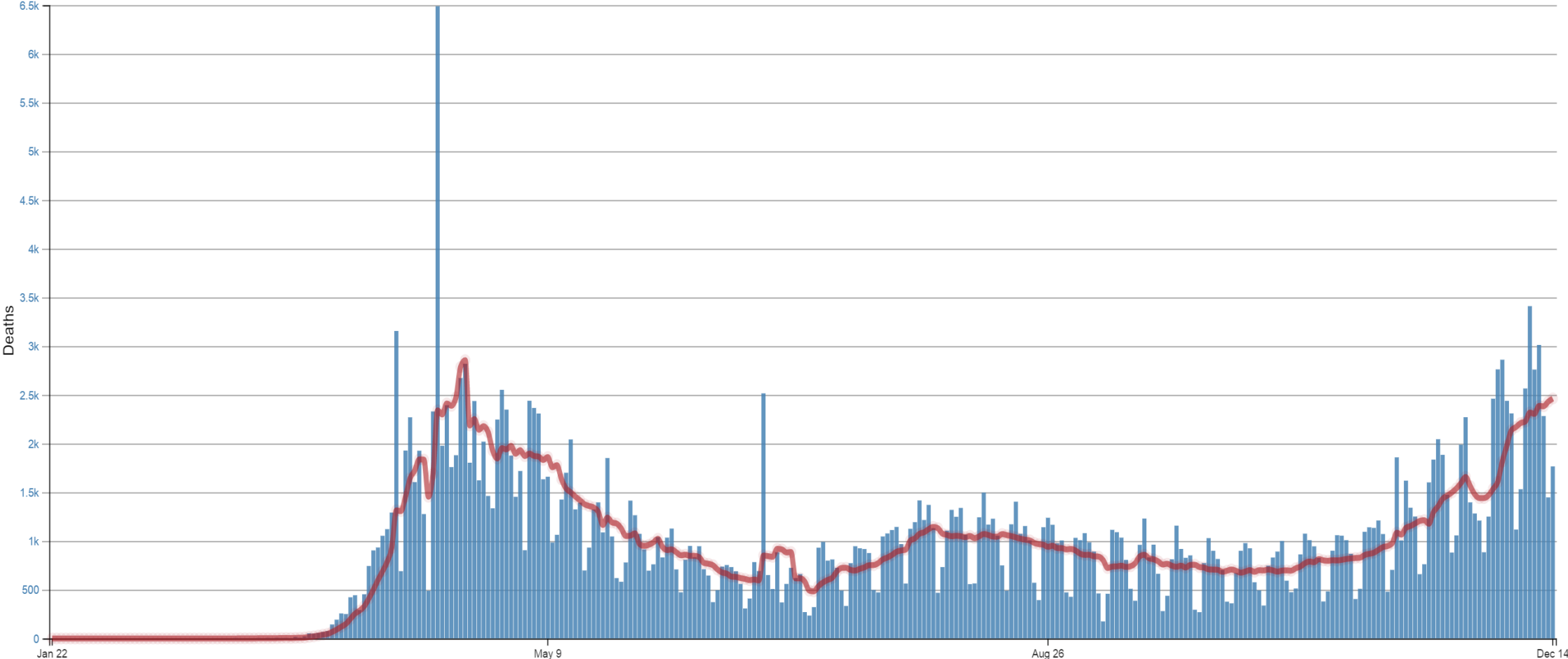
Central Michigan District Health Department

Mid-Michigan District Health Department

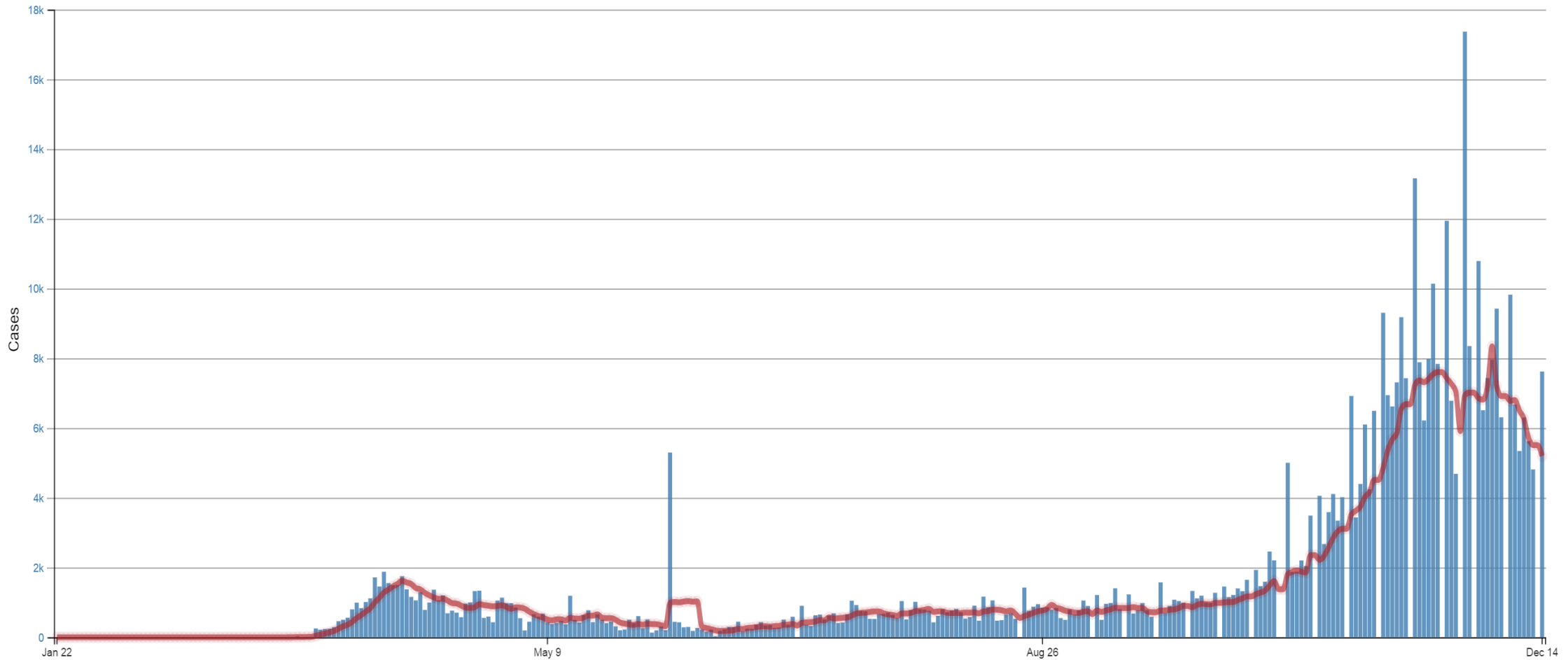
Daily Trends in Number of COVID-19 Cases in the United States Reported to CDC as of 12/14/20



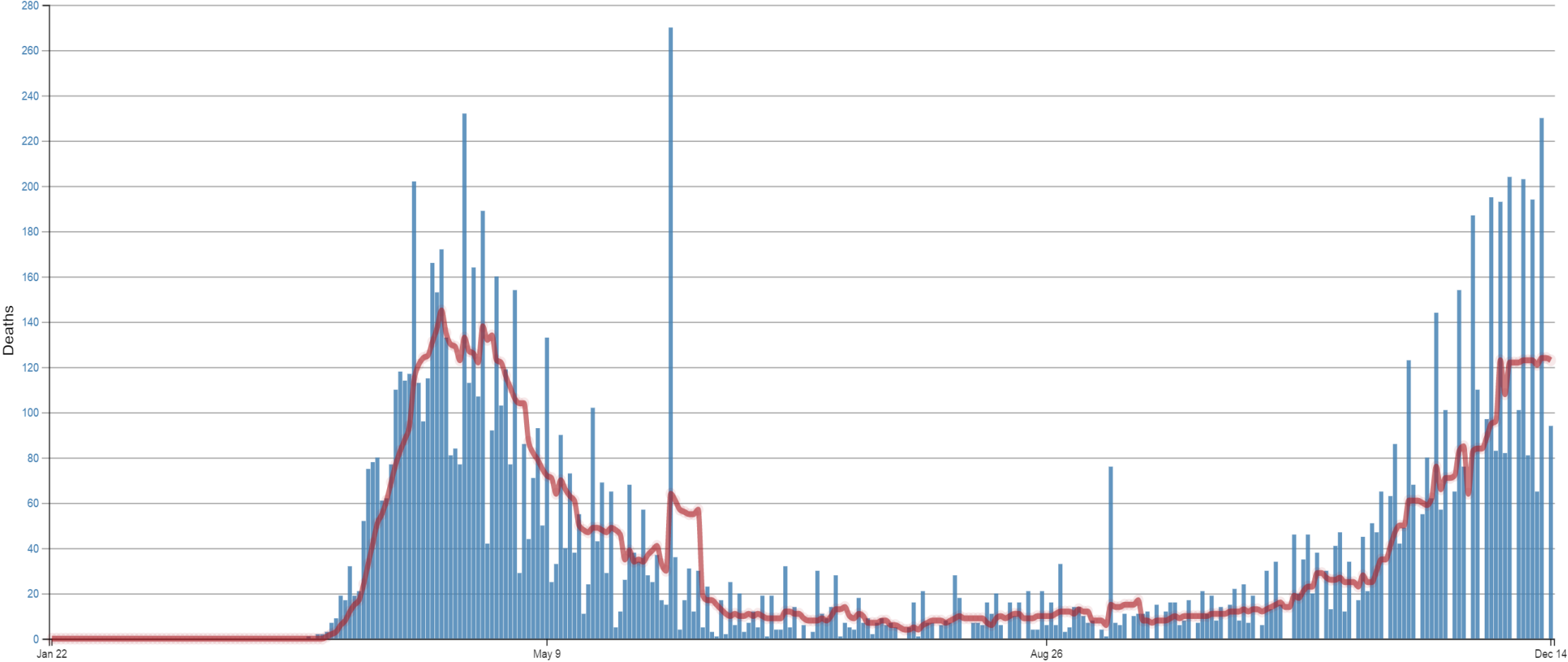
Daily Trends in Number of COVID-19 Deaths in the United States Reported to CDC as of 12/14/20



Daily Trends in Number of COVID-19 Cases in Michigan Reported to CDC as of 12/14/20



Daily Trends in Number of COVID-19 Deaths in Michigan Reported to CDC as of 12/14/20



Deadliest Days/Events in US History (as of 12/14/20)

1. Battle of Gettysburg: est. 10,000
2. Galveston Hurricane of 1900: 8,000
3. Battle of Antietam: 3,600
4. San Francisco earthquake of 1906: 3,400
5. COVID-19 deaths, confirmed/probable on 12/9/20: 3,164
6. COVID-19 deaths, confirmed/probable on 12/10/20: 3,115
7. COVID-19 deaths, confirmed/probable on 12/3/20: 2,825
8. COVID-19 deaths, confirmed/probable on 12/8/20: 2,703
9. D-Day invasion June 8, 1944: 2,501
10. Lake Okeechobee hurricane Sept. 1928: est. 2,500
11. September 11, 200: 2,977
12. Attack on Pearl Harbor: 2,403

Spanish Flu TOTAL: (3/1918 to 2/1919) 675,000 US (50 mil worldwide)

COVID-19 to date: 300,361 US (1.6 mil worldwide)

Number of deaths for leading causes of death per CDC :

1. Heart disease: 655,381
2. Cancer: 599,274
3. Accidents (unintentional injuries): 167,127

**COVID-19 to date:
300,361**

A decorative vertical bar on the left side of the slide, composed of numerous thin, vertical lines in shades of blue, teal, and gold, creating a shimmering, digital effect.

Other Consequences of COVID-19

Post-Acute and Chronic COVID-19

- Post-acute: presence of symptoms extending beyond 3 weeks from initial onset of symptoms
- Chronic: presence of symptoms extending beyond 12 weeks from onset of symptoms
- Can occur to any individual, regardless of pre-existing condition, severity of illness
- Most commonly reported symptoms are fatigue and dyspnea, other common symptoms: cough, joint pain and chest pain
- Different organ systems can be affected
 - Heart: Myocardial inflammation, myocarditis, cardiac arrhythmias
 - Lungs: Interstitial thickening, fibrosis, decreased diffusion capacity, diminished respiratory muscle strength
 - Neurologic: Headache, vertigo, anosmia, ageusia, stroke (uncommon), encephalitis, seizures, cognitive blunting (brain fog)
 - Psychiatric: depression, anxiety, changes in mood, hopelessness, stress

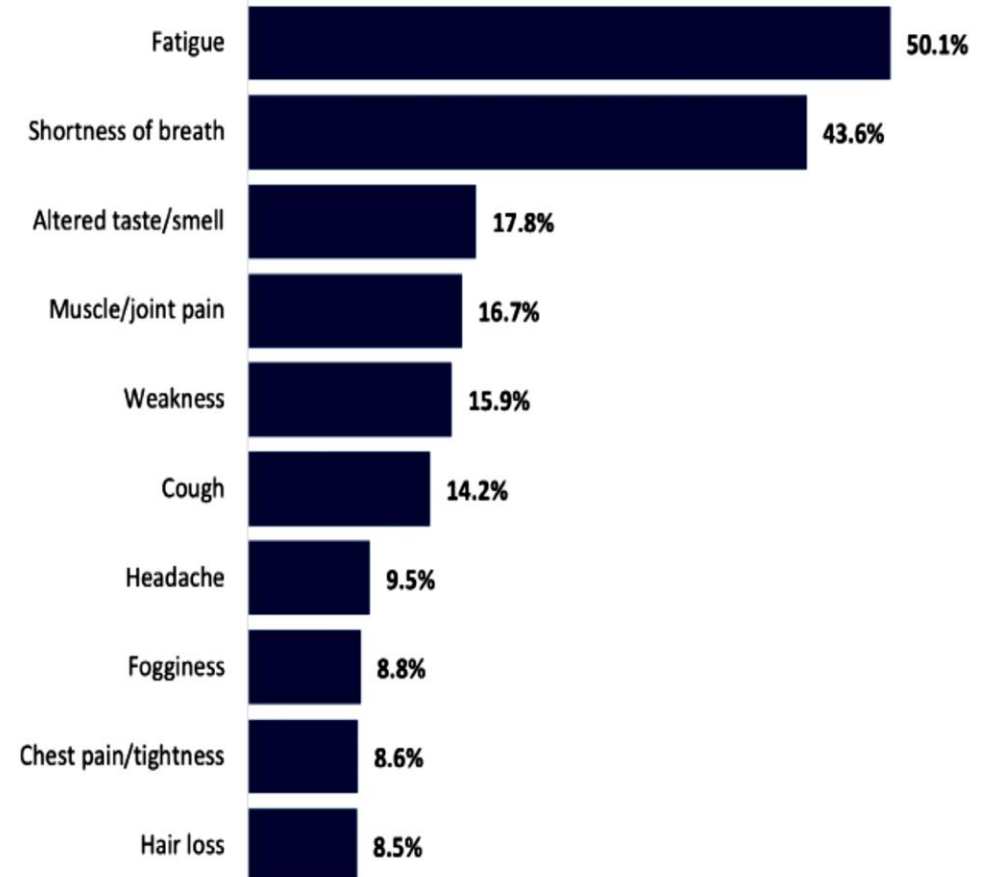
Del Rio, Carlos, Lauren F. Collins, and Preeti Malani. "Long-term health consequences of COVID-19." *Jama* 324.17 (2020): 1723-1724.

Michigan Study

Michigan COVID-19 Recovery Surveillance Study (MI CReSS)



- Joint study with U of M and MDHHS
- 2,000 random COVID-19 cases that had onset of illness prior to 4/16/20 were sampled from MDSS
 - 638 participated in survey that was conducted at some time between June 22 and Sept. 27
- 26.2% had not recovered by the time of their interview
 - Most common symptoms illustrated in bar graph to right
- Among the respondents who had recovered, the recovery process took four weeks on average



Other Long-Term Complications of COVID-19

- Study of young (average age 44 yrs.), low-risk individuals with ongoing symptoms found that almost 70% of 67 individuals have impairment in one or more organs **four months** after initial symptoms of COVID-19
- Prevalence of pre-existing conditions was low (obesity: 20%, hypertension: 6%; diabetes: 2%; heart disease: 4%)
- Only 18% of individuals had been hospitalized with COVID-19.
- Fatigue (98%), muscle aches (88%), breathlessness (87%), and headaches (83%) were the most frequently reported symptoms.
- Ongoing cardiorespiratory (92%) and gastrointestinal (73%) symptoms were common, and
- 42% of individuals had ten or more symptoms.
- There was evidence of mild organ impairment in heart (32%), lungs (33%), kidneys (12%), liver (10%), pancreas (17%), and spleen (6%).

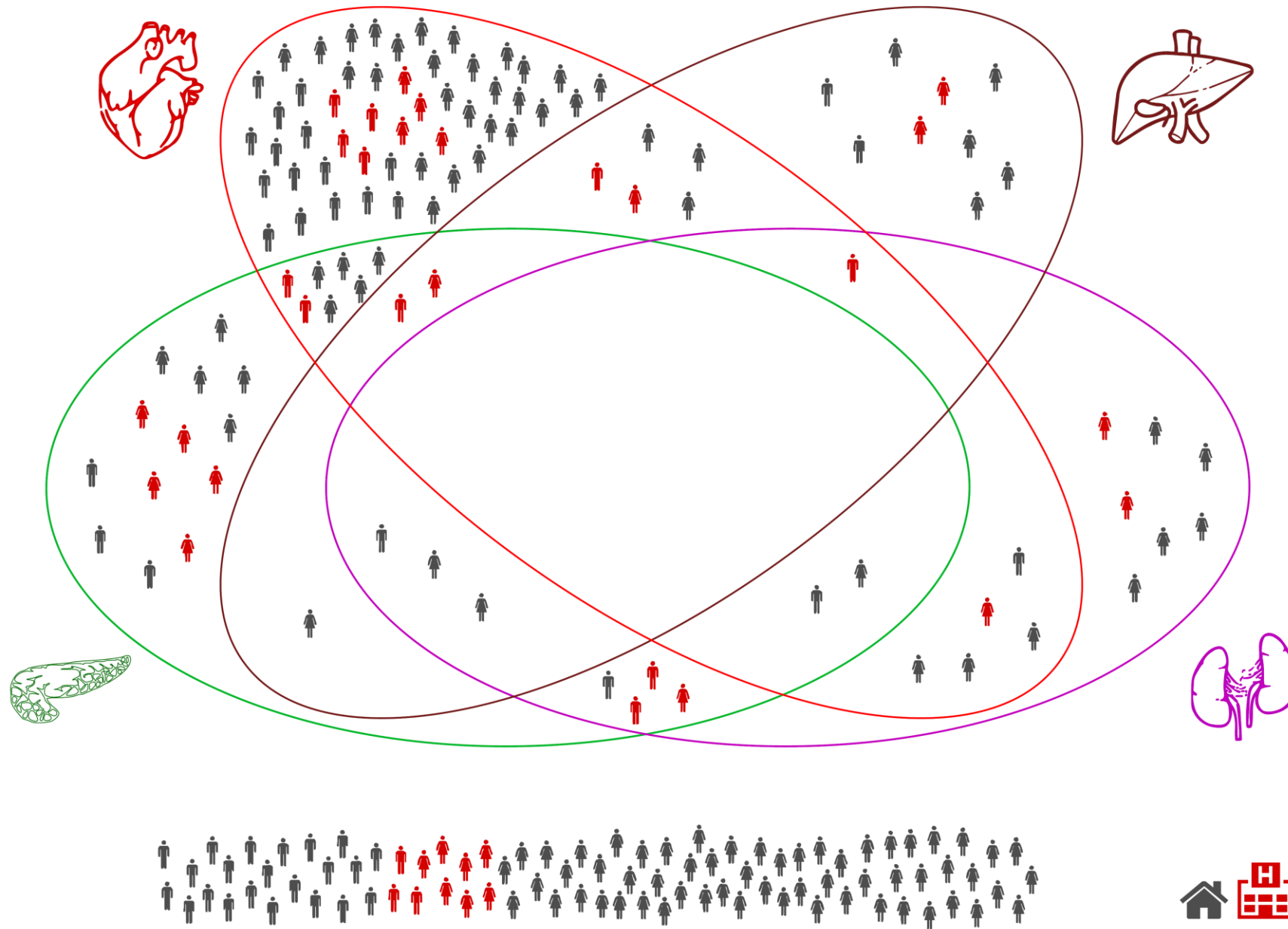


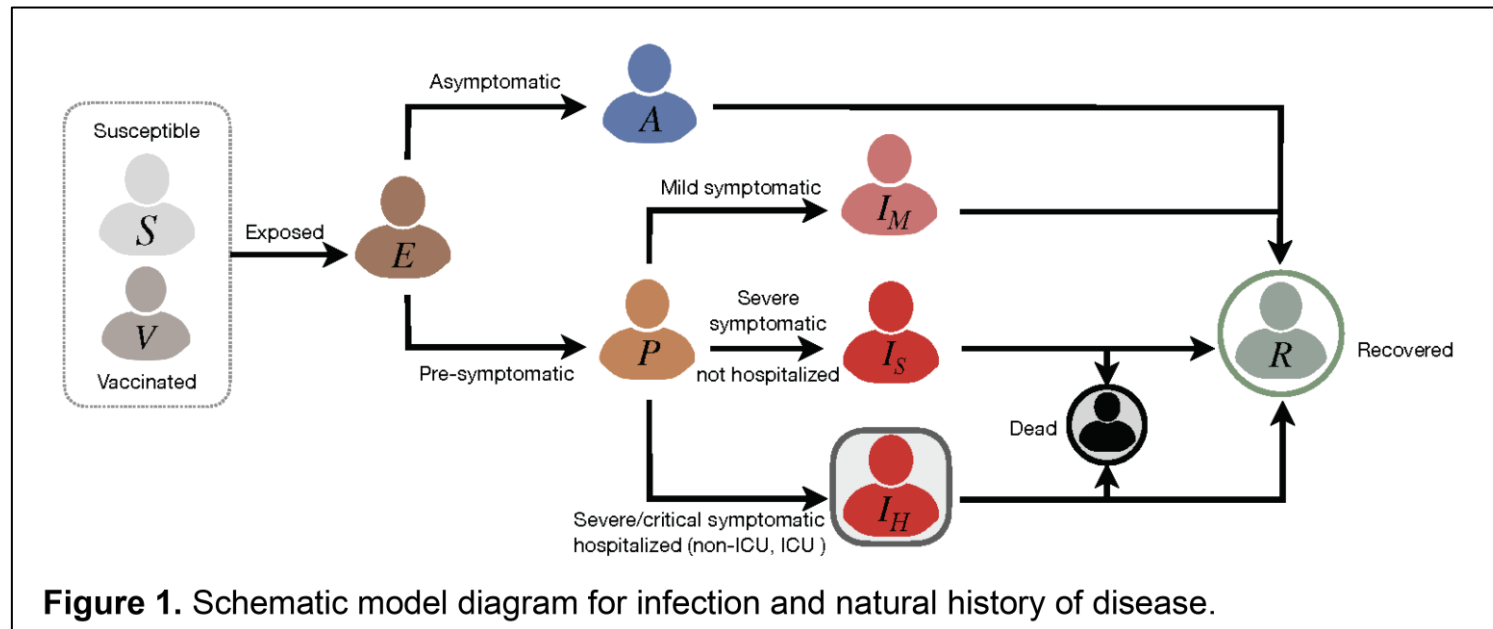
Figure 3 Multi-organ impairment in low-risk individuals with long COVID by gender and hospitalization (n=201).

“Vaccines to prevent SARS-CoV-2 infection are considered the most promising approach for controlling the COVID-19 pandemic.”

Edwards, K., Orenstein, W. Coronavirus disease 2019 (COVID-19): Vaccines to prevent SARS-CoV-2 infection. (2020). Hirsch, M., Bloom, A. (Eds) In: UpToDate, Post TW (Ed), UpToDate, Waltham, MA.

The impact of vaccination on COVID-19 outbreaks in the United States

- Study using COVID-19 transmission modeling factoring in vaccination
- Looked at numerous different groups:
 - susceptible, vaccinated, infected but not infectious, asymptomatic and infectious, presymptomatic and infectious, symptomatic, recovered, and dead
 - Age groups 0-4, 5-19, 20-49, 50-64, 65-79, and 80+



The impact of vaccination on COVID-19 outbreaks in the United States

- Modeled a two-dose vaccination series (28 days apart) covering 40% of population sequentially vaccinating:
 - Healthcare workers
 - Individuals with comorbidities
 - Individuals 65 years and older
 - Individuals 18 to 64
- Assumed 70% was maximum coverage that could be achieved in any age group and pre-existing immunity from infection was not a factor in vaccination
- The age specific coverage from this prioritization modeling over was
 - 18-19 yr. old: 38%
 - 20-49 yr. old: 46%
 - 50-64 yr. old: 49%
 - 65 yrs. and over: 70%
- Modeled that 80/10,000 people vaccinated per day, 6 days/weeks (which is equivalent to approx. 15.7 million vaccines per week for 15 weeks)
 - $15.7 \times 15 = 235.5$ million doses by end of March (and it is estimated that US will be able to fully vaccinate 100 mil by end of March (i.e., get 2 doses)

The impact of vaccination on COVID-19 outbreaks in the United States

- Estimated vaccine efficacy against COVID-19 infection 90% one week after 2 doses for healthy individuals
 - Estimated 45% efficacy 14 days after 1st dose
- Efficacy estimate was reduced based on estimated comorbidities and in people over 65 based on the reduced efficacy seen in influenza vaccine
- Assumed vaccination would reduce risk of severe illness (used same reduction calculation as reduction in influenza effectiveness)
- Immunity from vaccination assumed to last over one year
- Assumed 10% pre-existing immunity at onset of simulations (however did different scenarios)
- Used a reproduction number of COVID-19 infection of 1.5 (essentially accounting for compliance with current mitigation measures)

The impact of vaccination on COVID-19 outbreaks in the United States

Results::

- Vaccination would prevent over 556 infection per 10,000 people
 - If 100 million people vaccinated, it would prevent 5,560,000 infections
- The rate would be most reduced in those aged 65 and over (reduced by 83% to 90%)
- The rate would be decrease in children by at least 50% by indirect protection
- Non-ICU hospitalization and ICU hospitalization would each be reduced by 85%
- Deaths would be reduced by 88%
- Even if only 20% of people get vaccinated, they predict non-ICU hospitalization, ICU hospitalization and deaths decrease by 60%, 62%, and 64% respectively

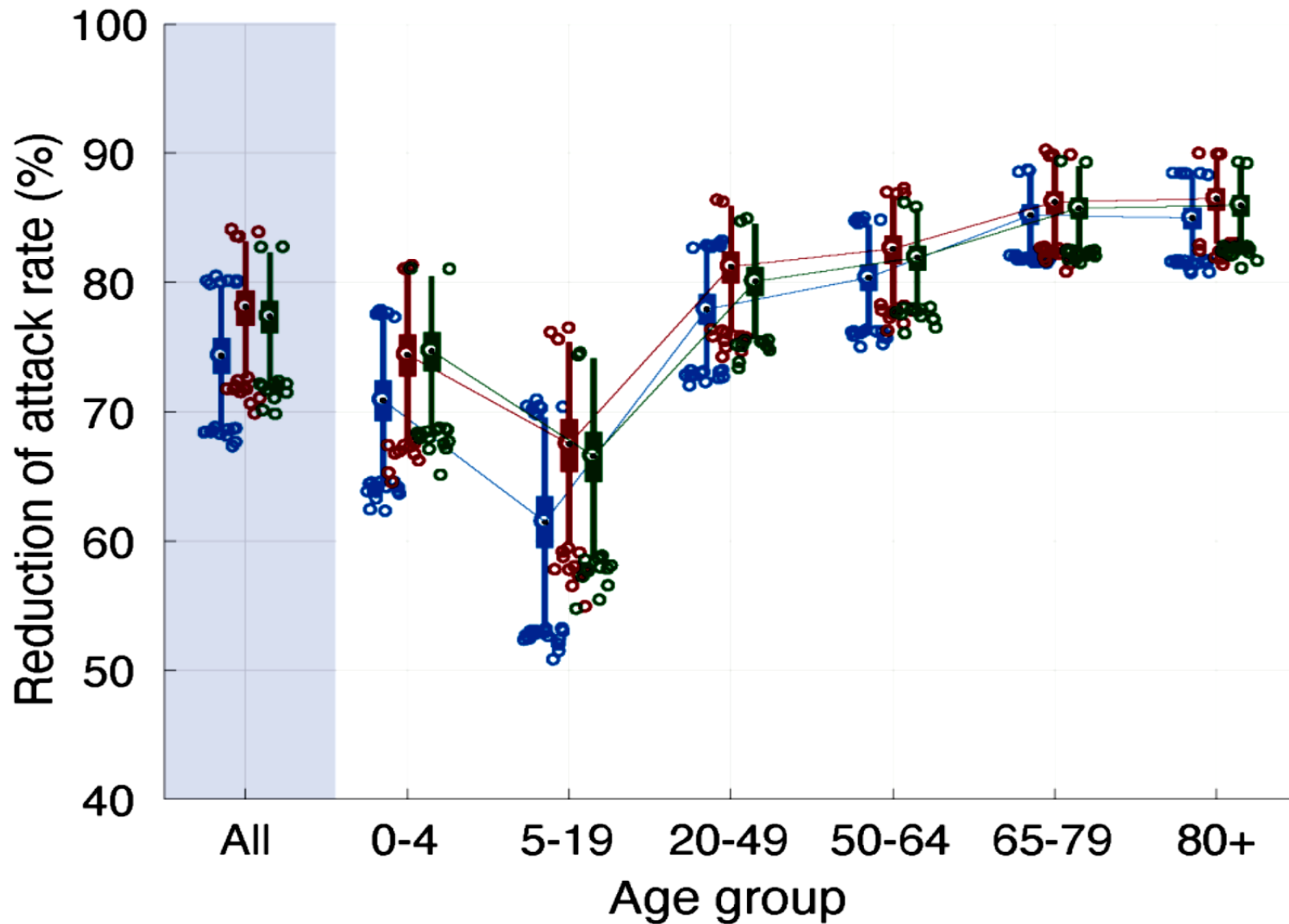


Figure 2. Overall and age-specific relative reduction of mean attack rates with vaccination, as compared to the outbreak scenario in the absence of vaccination, with 5% (blue), 10% (red), and 20% (green) levels of pre-existing immunity.

The impact of vaccination on COVID-19 outbreaks in the United States

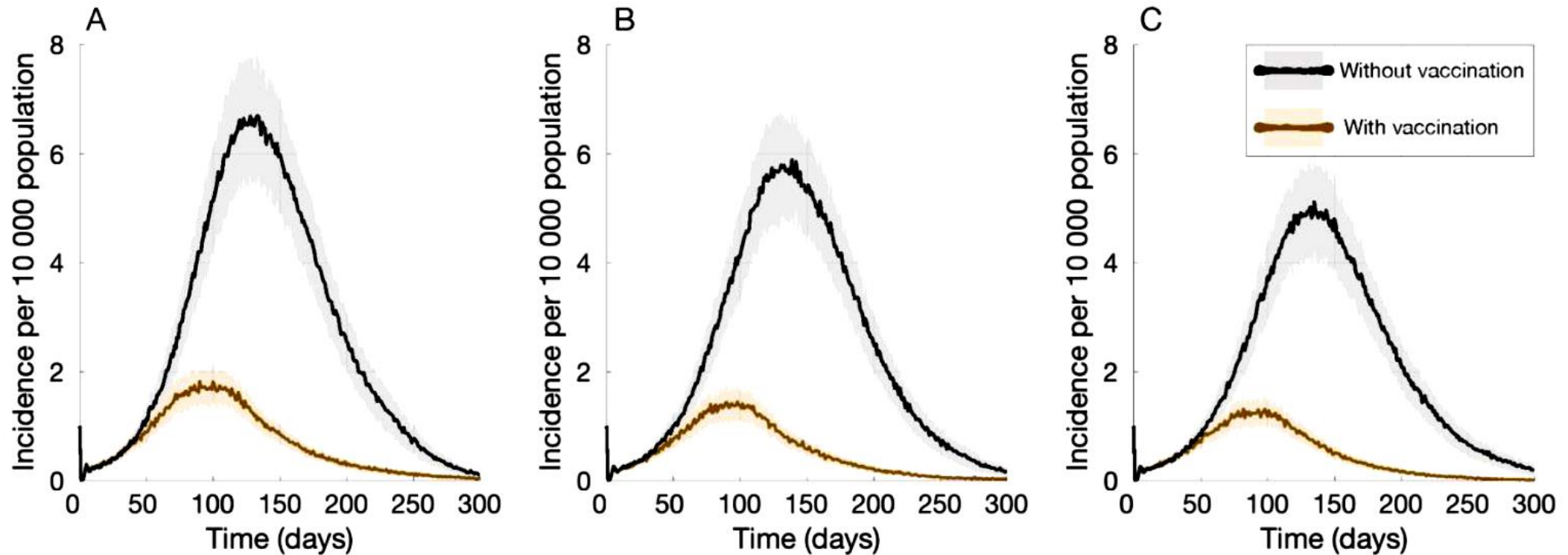


Figure 3. Projected daily incidence of COVID-19 per 10,000 population with 5% (A), 10% (B), and 20% (C) levels of pre-existing immunity.

The impact of vaccination on COVID-19 outbreaks in the United States

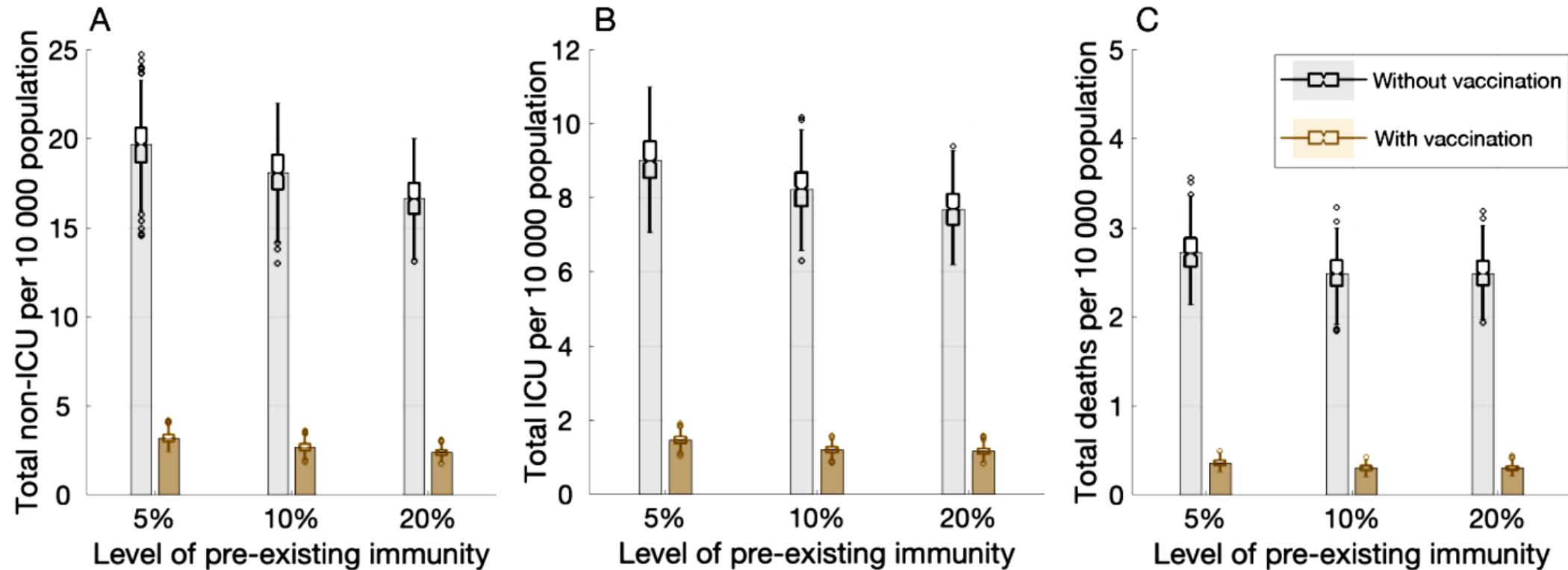
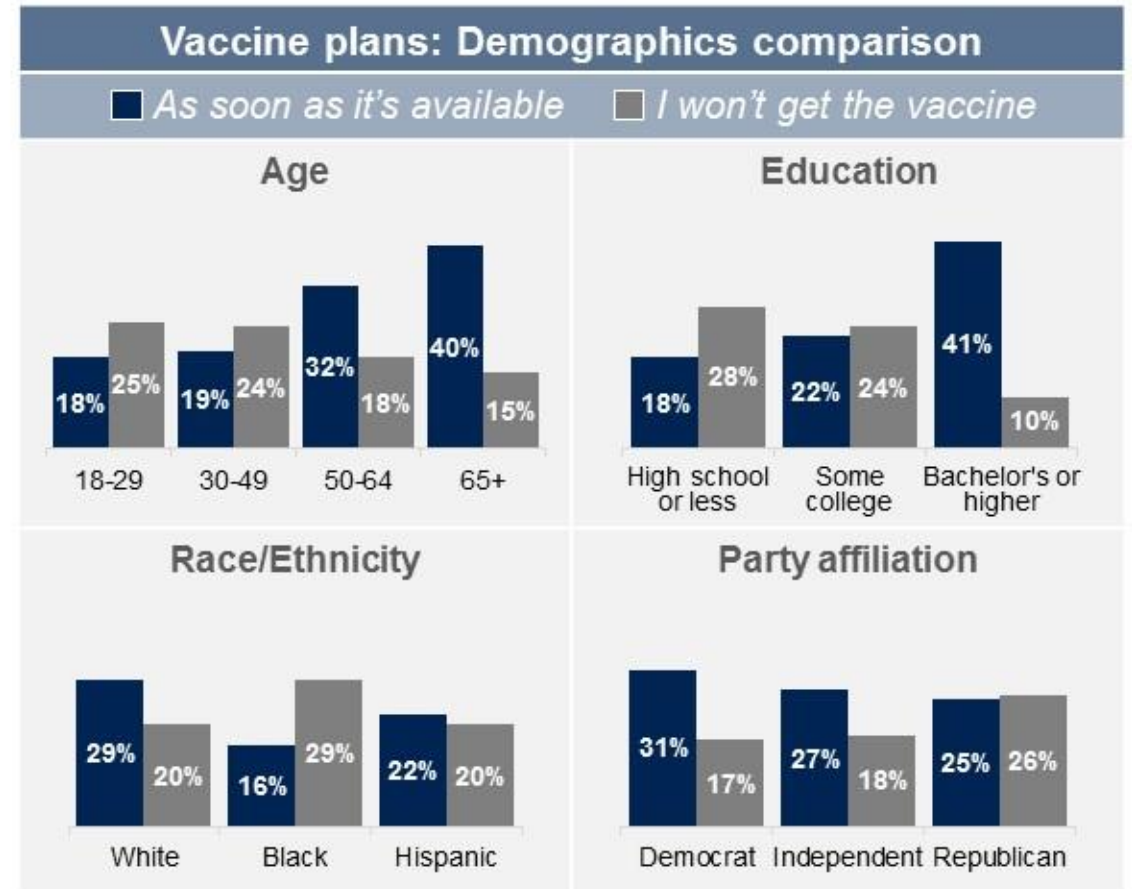
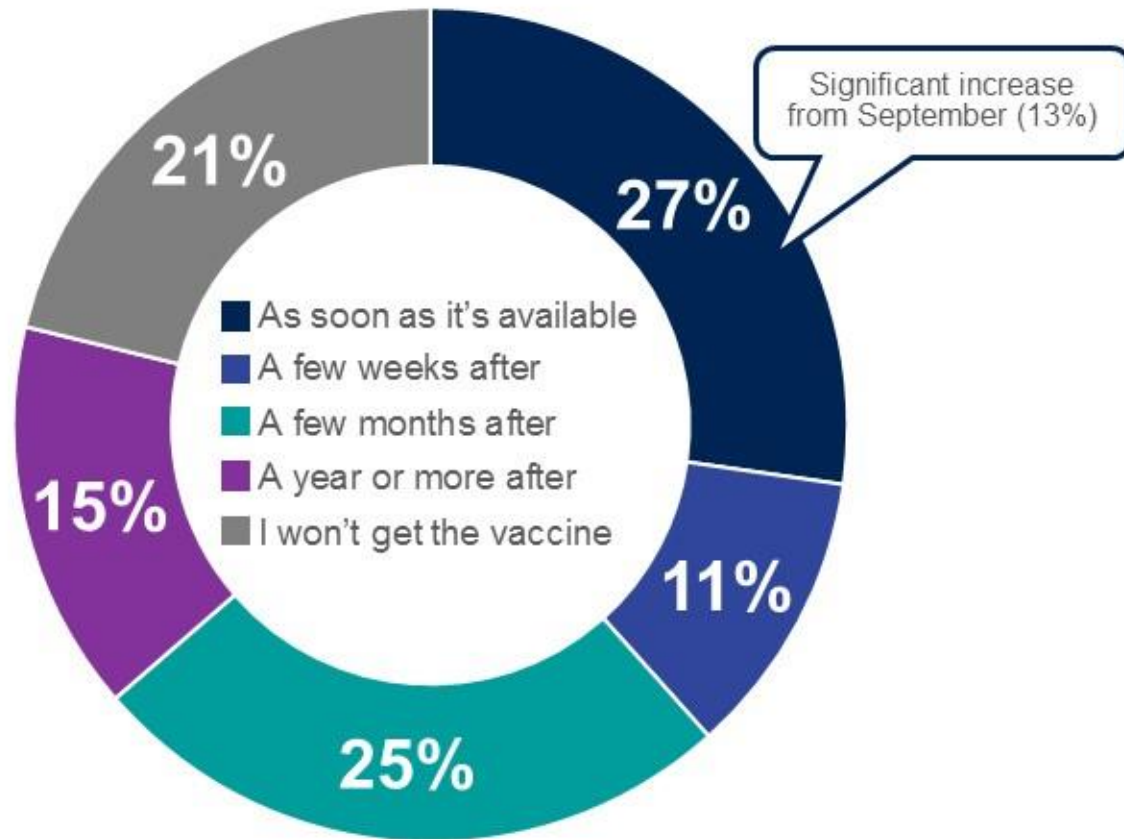


Figure 4. Projected daily number of non-ICU hospitalizations (A), ICU hospitalizations (B), and deaths (C) with 5%, 10%, and 20% levels of pre-existing immunity.

Many Americans plan to get COVID-19 vaccine in the near term

Large demographic differences between those who want the vaccine immediately and those who will not get the vaccine

After the COVID-19 vaccine becomes available, when do you plan to get it?



More Americans looking to get COVID-19 vaccine in the near term Dec. 15, 2020
https://www.ipsos.com/sites/default/files/inline-images/axios_covid-19_w33.jpg

Resources/Guides to Help Talk to Patients and Your Community

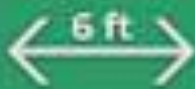
- <https://www.cdc.gov/coronavirus/2019-ncov/vaccines/index.html>
- <https://www.cdc.gov/vaccines/covid-19/info-by-product/pfizer/>
- <https://www.cdc.gov/vaccines/covid-19/index.html>
- www.mi.gov/COVIDvaccine
- <https://www.idsociety.org/covid-19-real-time-learning-network/vaccines/Pfizer-BioNTech-COVID-19-Vaccine/>

The COVID-19 pandemic is surging

Act now to slow the spread and speed up economic recovery



Wear
Masks



Maintain
Distance/
Limit Contacts



Avoid
Gatherings



Identify &
Isolate Cases



Protect
Health Care
Workers

Lives saved
Economy recovered
Community life restored



Protect
High-Risk
Groups



Conduct
Contact Tracing
& Quarantine



Postpone
Travel



Wash
Hands



Vaccinate
Widely