



The Front Lines of the Fight Against COVID-19

# A TOWN HALL CONVERSATION XVII

We will begin at 10 a.m.



# COVID-19 and Vaccine Update

Marc L. Boom, MD  
September 2, 2021

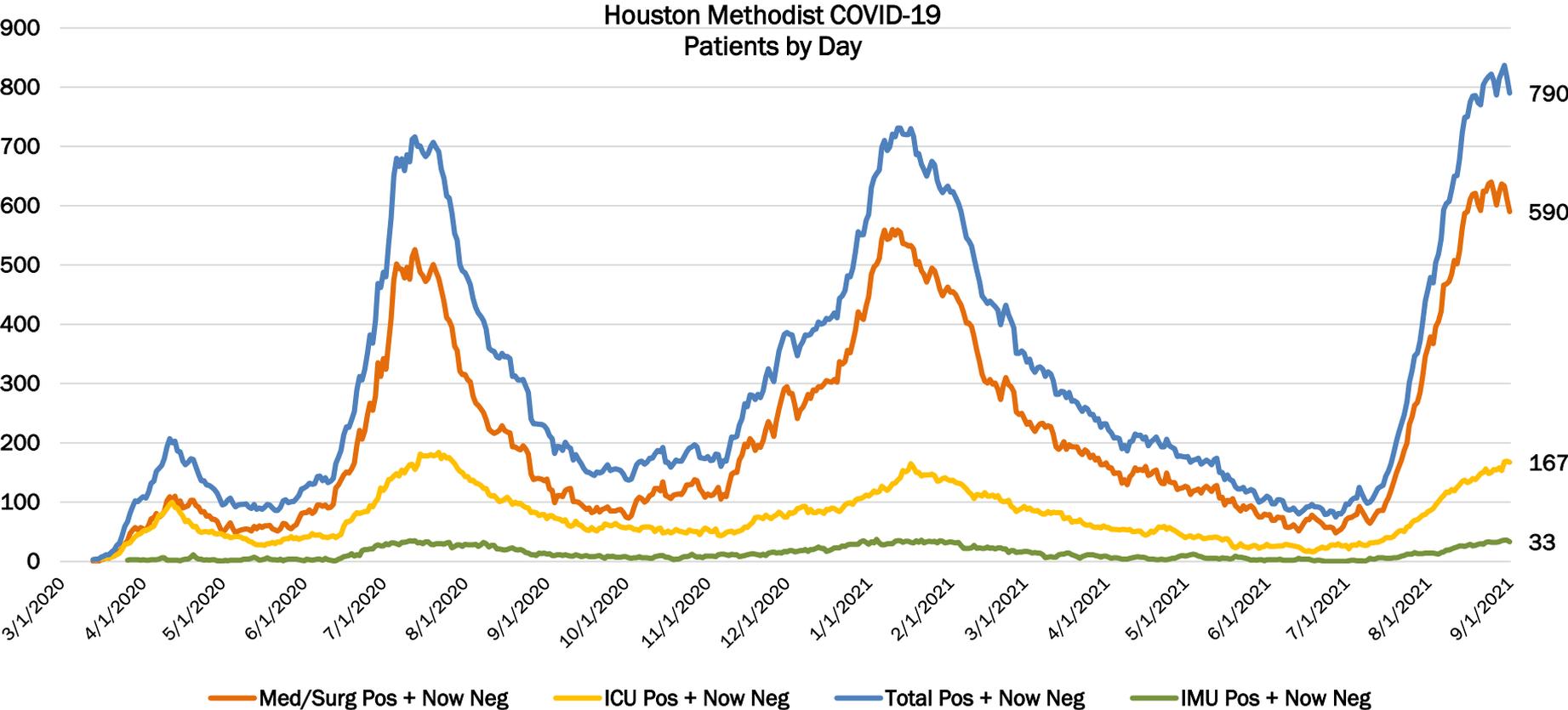
INCOMING!!



NEW  
COVID  
VARIANTS



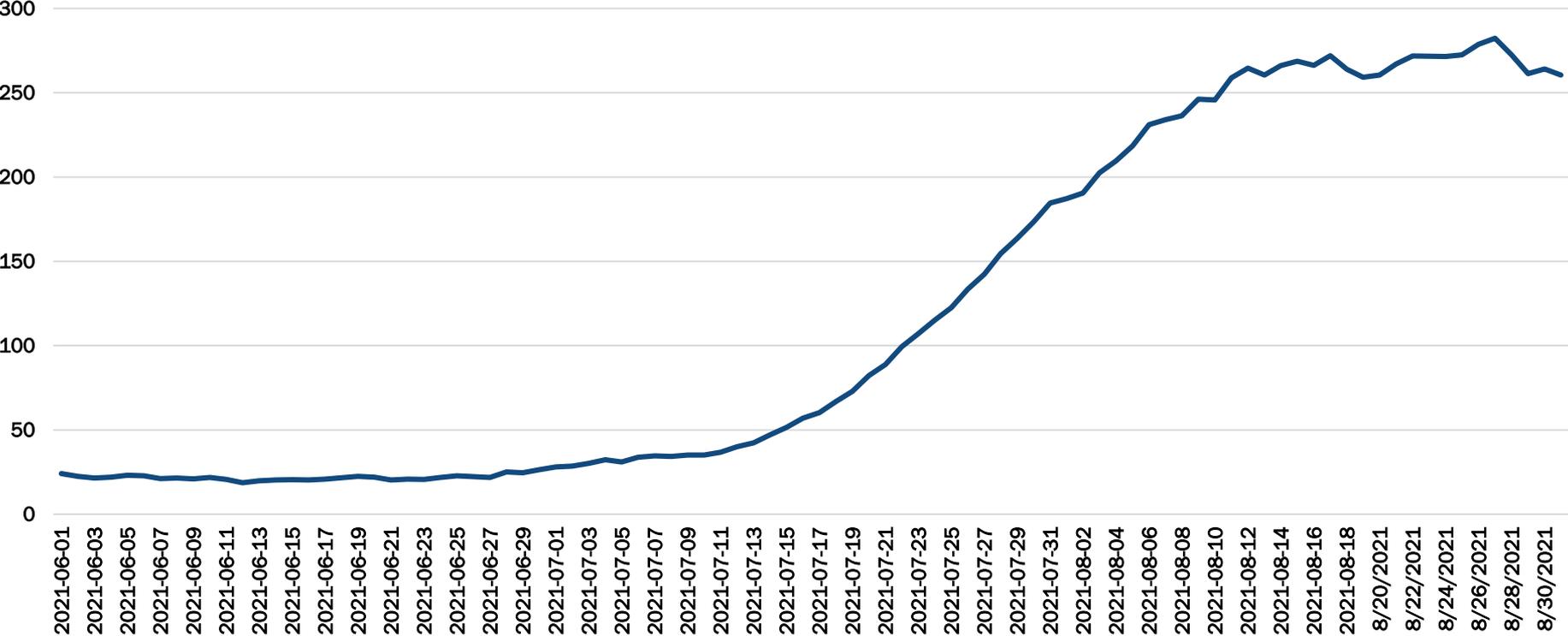
# Houston Methodist COVID-19 Cases by Day



Data as of September 1, 2021

# Houston Methodist COVID-19 7-Day Average Positive Tests

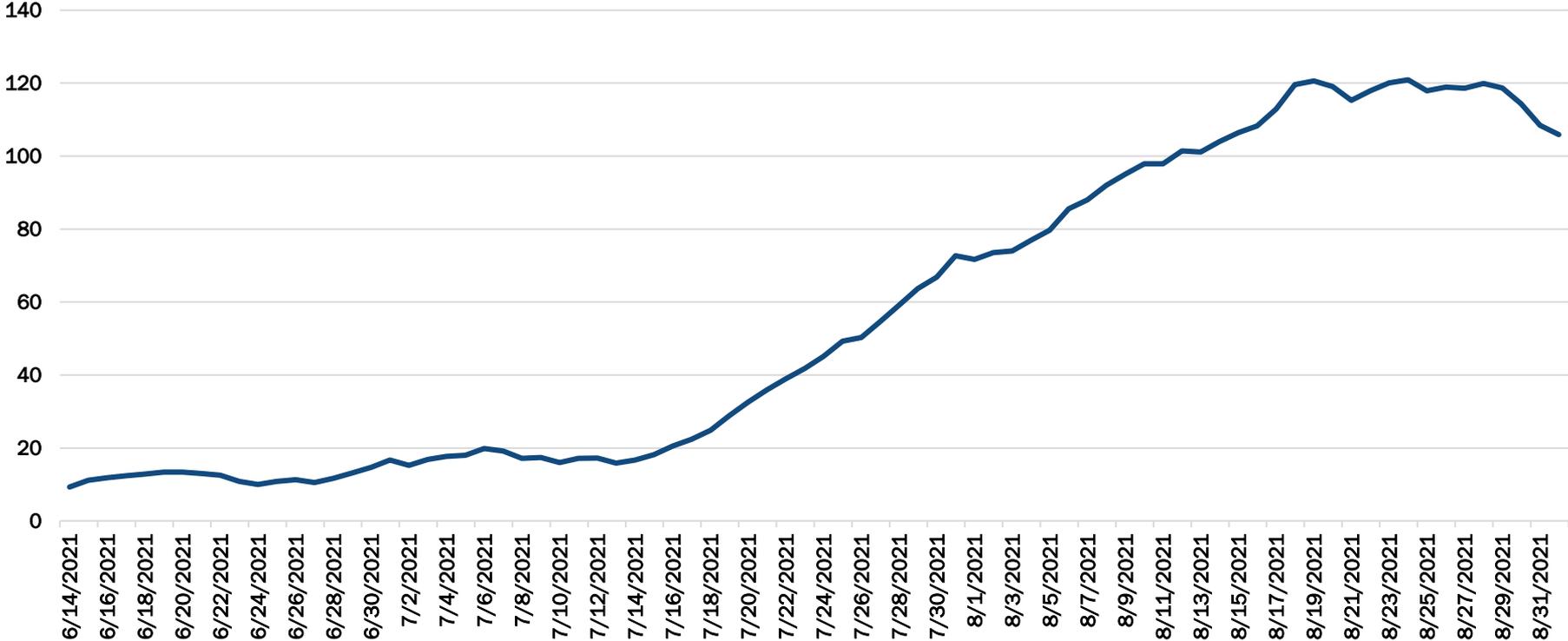
Seven Day Rolling Average Positive Tests



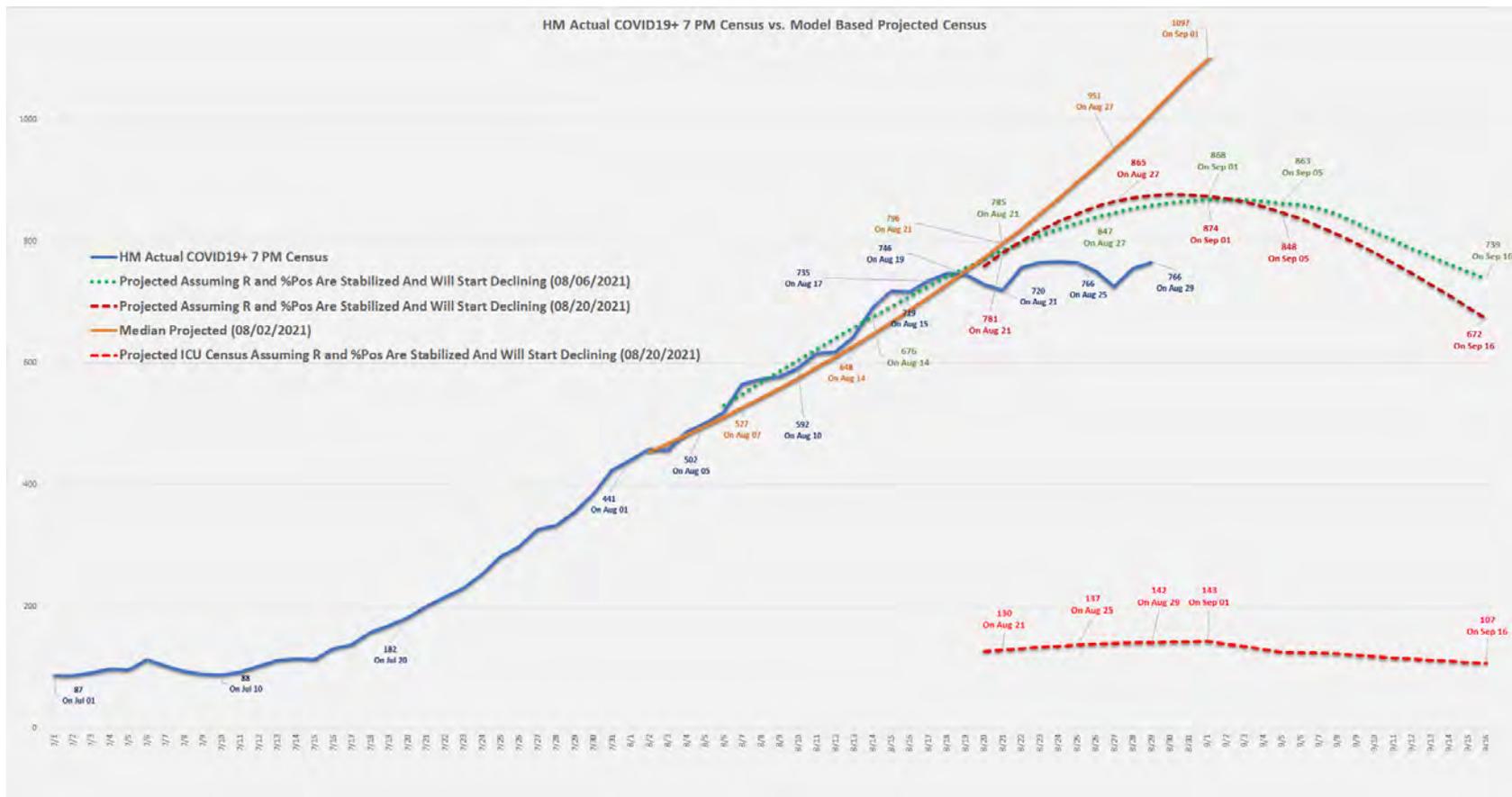
# Houston Methodist COVID-19 7-Day Average Admissions Per Day



7 Day Average Admissions per Day



# Houston Methodist COVID-19 Hospitalization Predictions



# TMC Hospitals Release Letter to Community

TMC

TEXAS  
MEDICAL  
CENTER



An Open Letter to the People of Houston,

As CEOs of large hospital systems serving the greater Houston region, we are constantly asked for advice regarding the return of our children to schools. Therefore, in the spirit of working together as a community to achieve a common goal of safely educating our children, we offer the following letter with scientifically and medically backed advice for schools, parents, and the broader Houston community.

In ordinary times, back-to-school season is a time of hopeful anticipation. Milestones are celebrated. New shoes and backpacks acquired. Children look forward to reconnecting with old friends and meeting new ones. The new school year is full of promise and possibilities.

These are not ordinary times.

In the second year of our great pandemic, for parents the start of this school year has become a disconcerting blend of guilt, anxiety, and apprehension. It is time to go back to school. Virtual options are less available than last year. The pandemic education experience to date has left many behind academically and has taken a social, emotional, and economic toll on children and families. This year, most families do not have the option of virtual learning. Parents cannot stay home from work to home school. They have little choice but to return their children to school, and in doing so are asking themselves: Am I putting my child's health at risk?

Even in the midst of the pandemic — and as the Delta variant surges — we have tools to provide a relatively safe school environment with an acceptable level of risk. However, creating safe schools will not occur by luck. It will require a thoughtful, unified collaboration between schools, parents, and our community. Each one of us has a role to play in ensuring a safe and healthy return to school for Houston students, even if you are not a parent, teacher, or student.

Let us start with the good news. We know children tend to have milder disease. We have experience across the country last year with safe school openings with appropriate safety protocols in place. Over the course of the entire pandemic, there have been just over 400 documented deaths in the United States of children under eighteen. One death is too many, and statistics are of little comfort if it is your child, but out of 73 million children in the US, the absolute risk is still very low.

However, if COVID-19 has taught us anything, it should be humility related to what we do not know. We cannot be complacent. Most of our documented, epidemiologically validated data to date comes from before the emergence of the Delta variant. Delta is clearly more infectious. Pediatric cases are on the rise, and in some areas of the country they are beginning to strain hospital ICU capacity. Although the risk to the overall pediatric population remains statistically low, some children do become critically ill. The Delta variant is different than its predecessors and needs to be taken seriously.

Another cause for caution. While the virus has changed, so have the schools. Where much of last school year was blended with lower than normal classroom density, there are less virtual options this year, and classroom density will almost certainly be higher, making effective distancing more difficult.

## Guidelines for schools and school systems:

- Strongly encourage vaccination of your faculty and staff. Require vaccination if you can. At a minimum, strongly encourage vaccination. This is our single most powerful tool to protect ourselves, our community, and our children. Vaccines are safe, effective, free, and available.
- Implement masking for all people in school buildings – faculty, staff, and students.
- Promote distancing. Maintain at least three feet of space between students, when possible, within the practical limits of your facilities.
- Limit or eliminate outside guests/visitors to school buildings.
- Do everything possible to discourage teachers and staff members from coming to work if they are sick (fever, cough, breathing difficulty, fatigue, body aches, sore throat, congestion, loss of taste or smell, diarrhea, headache), or if they test positive for COVID-19.

# CDC Warns of COVID-19 Outbreaks in Elementary Schools

## The Delta variant spreads easily in indoor spaces when people are unmasked and unvaccinated

Occasionally unmasked adult infected with Delta variant worked for 2 days

12 of 24 kids infected





[bit.ly/MMWR82721b](https://bit.ly/MMWR82721b)

**Schools can help stop spread by ensuring everyone:**

-  Wears masks **correctly** in indoor spaces
-  Gets vaccinated, if eligible
-  Stays home if having symptoms
-  Tests routinely

**MMWR**

# Five Difficult Lessons

1. Science, especially biological science, is messy in real time.

*Science is also our only real hope to conquer COVID-19*

3. Our political leaders must work together on society's "Sacred AND"

*Control COVID-19 AND protect the economy AND educate our children*

2. Hospitals together must work on their "Sacred AND"

*Care for COVID-19 patients AND care for traditional patients AND protect our staff and physicians*

4. Our social lives must take a backseat to the "Sacred AND"

- *No bars*
- *No large gatherings, including sporting events*
- *Limited social gatherings*

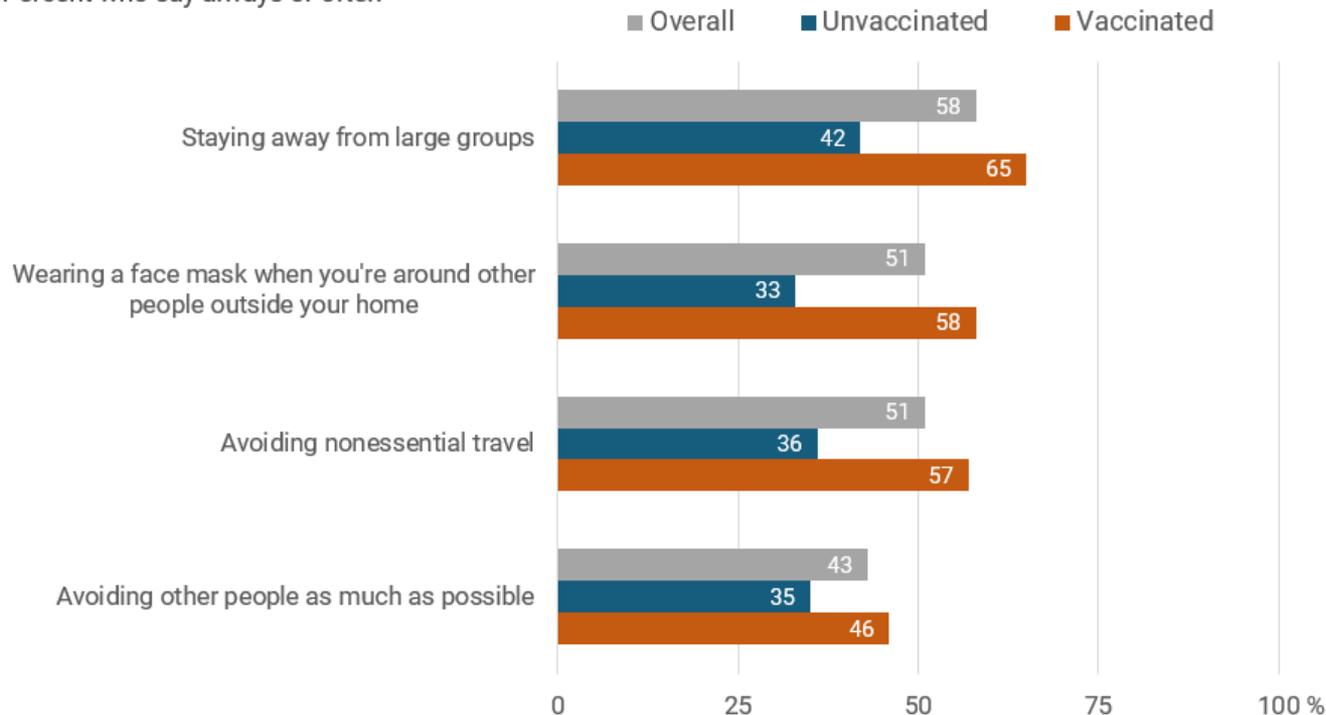
5. Masks are a means to accomplish the "Sacred AND"

- *We have proven to be incapable of accepting this on our own*
- *Masks must be mandatory until the virus is in control*

# Behaviors of Vaccinated vs. Unvaccinated

## Because of the pandemic, how often are you:

Percent who say always or often



**Question:** Because of the coronavirus, how often are you:

**Source:** AP-NORC poll conducted August 12-16, 2021 with 1,729 adults age 18 and older nationwide.



YOU DON'T  
HAVE *to*  
WEAR A MASK  
IF YOU'RE  
VACCINATED?

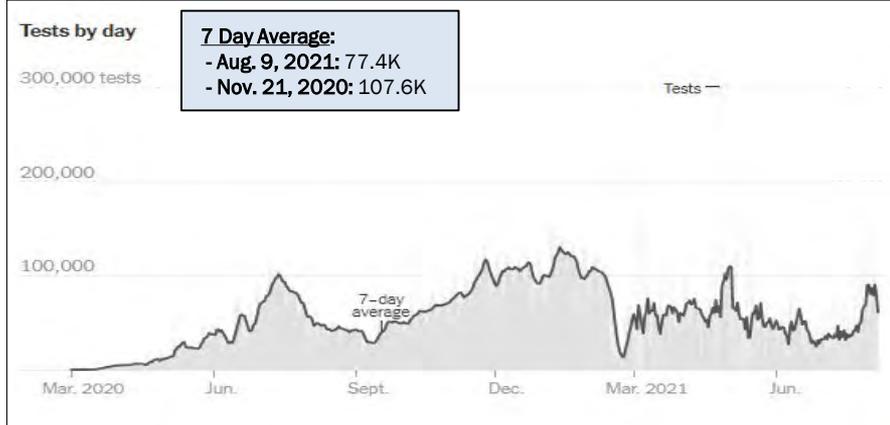
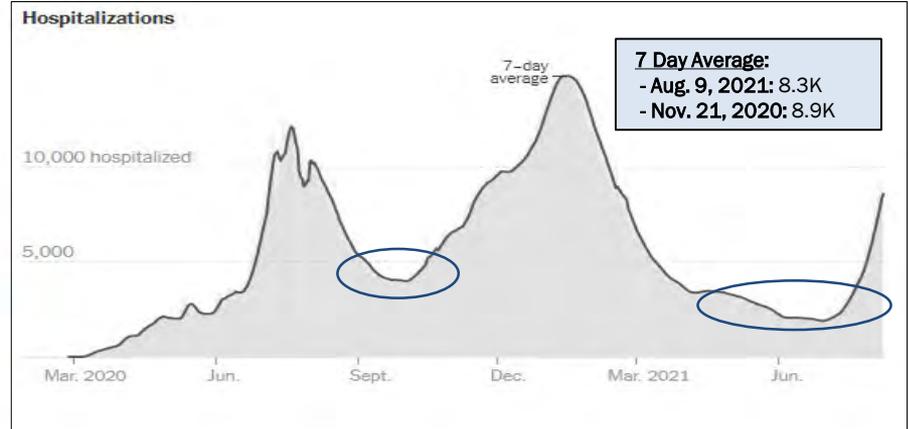
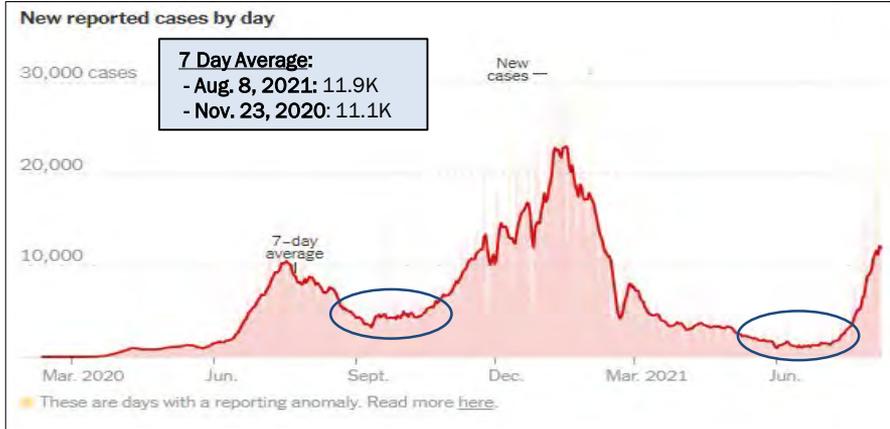
OF  
COURSE I'M  
VACCINATED.

LOVE  
YOU, GUYS.

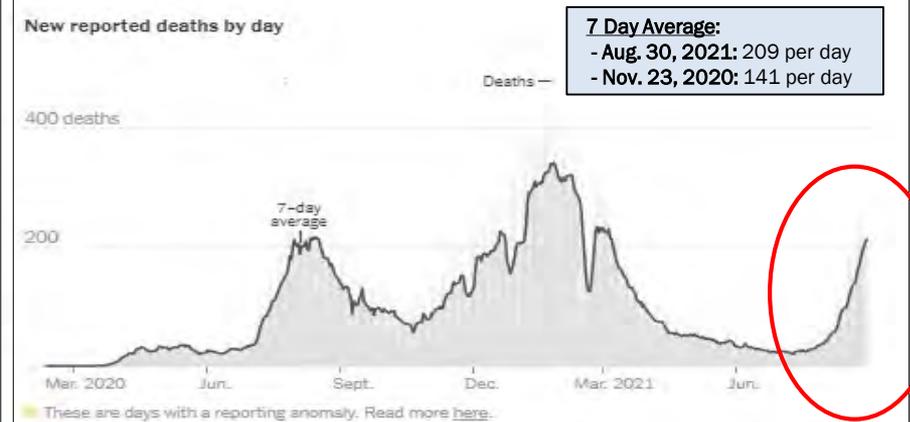
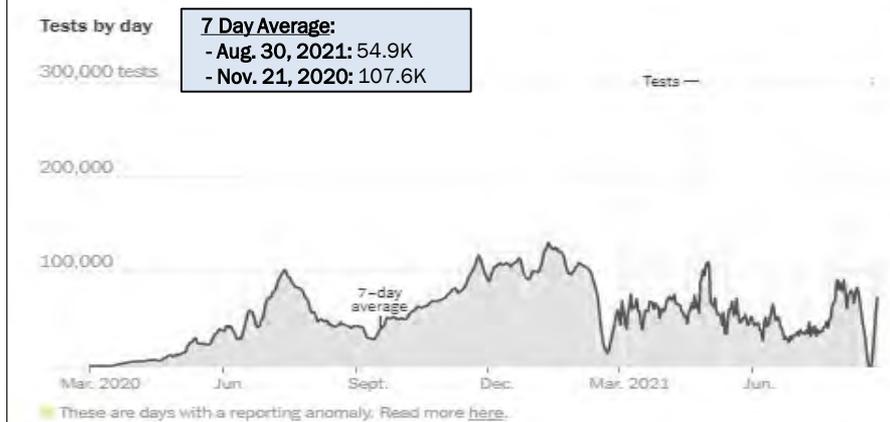
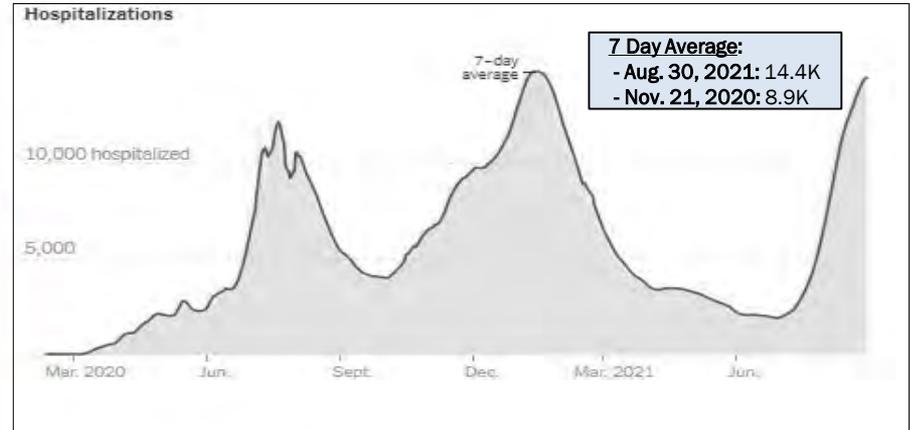
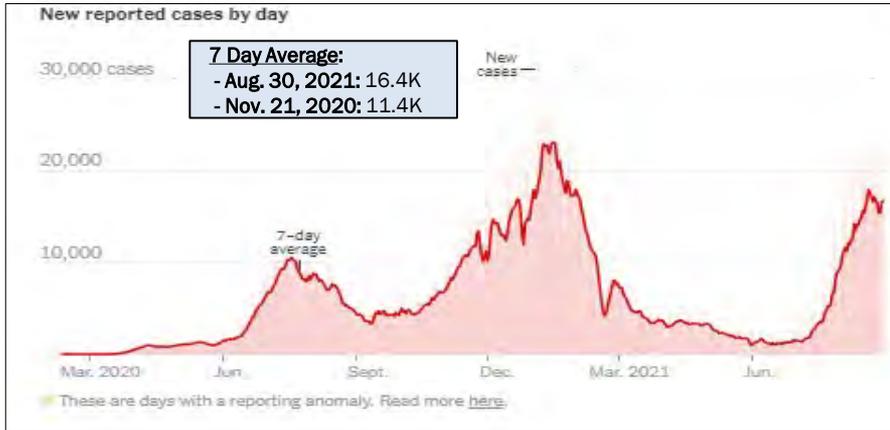


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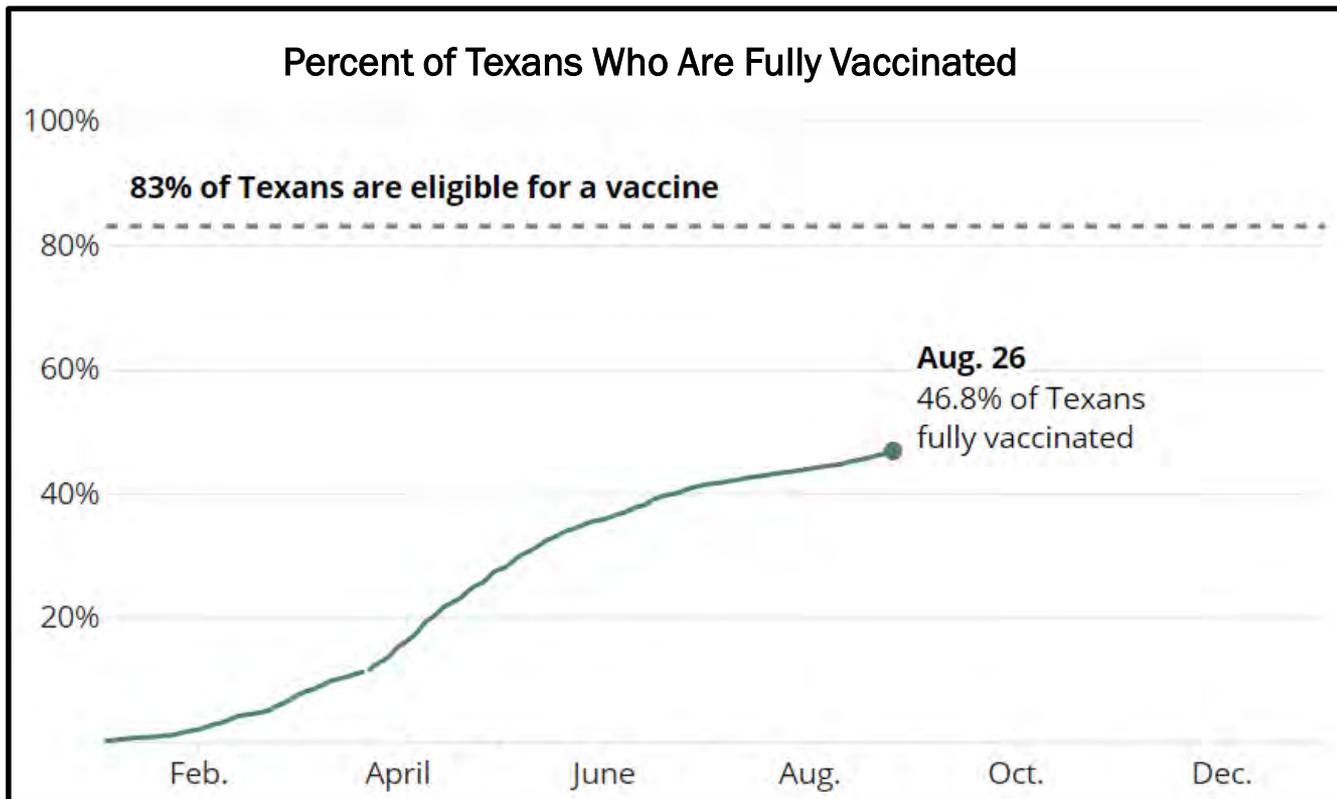
# Texas COVID-19 Trends



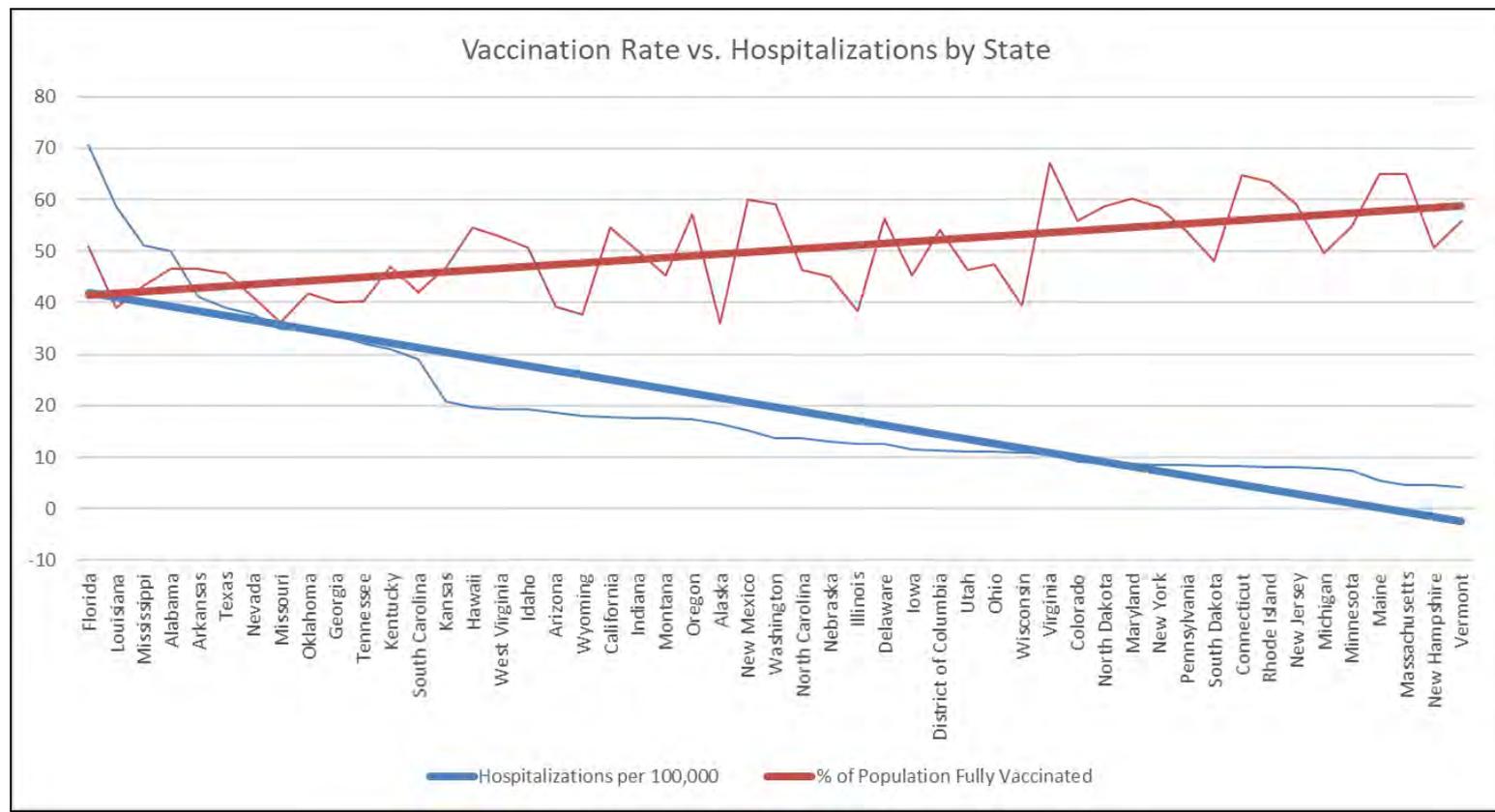
# Texas COVID-19 Trends



# Rate of Fully Vaccinated Texans



# Vaccination Rate vs. Hospitalizations by State

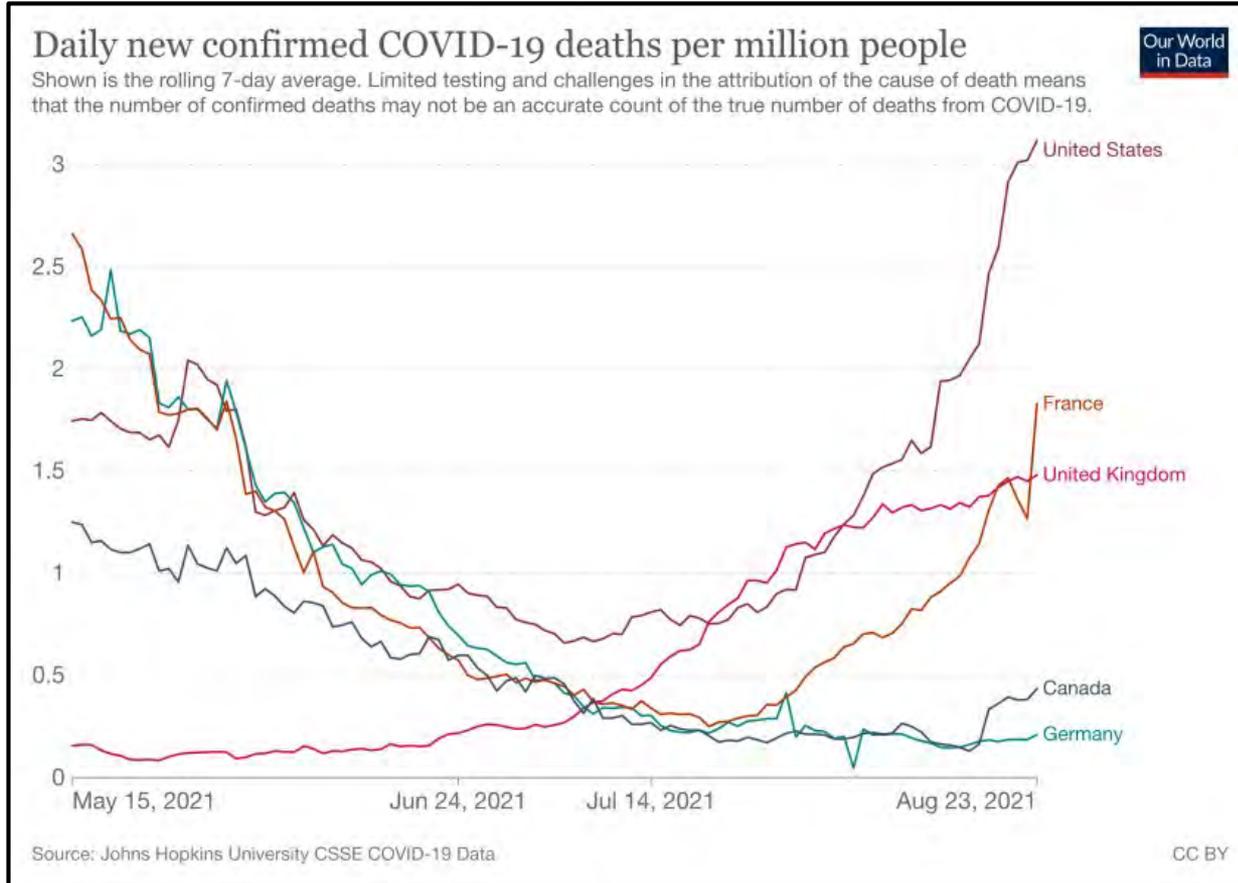


# Top 50 Most Vaccinated Countries

Rank	Country	Total Doses Given per 100k	% of Population Partially Vaccinated	% of Population Fully Vaccinated
1	Malta	180,354	93.70%	93.40%
2	Singapore	151,718	78.60%	75.70%
3	Qatar	157,284	82.00%	75.20%
4	Portugal	143,046	84.00%	73.10%
5	Iceland	145,981	77.30%	73.00%
6	Uruguay	161,405	77.00%	72.50%
7	Denmark	147,353	75.80%	72.40%
8	Chile	153,180	76.10%	72.10%
9	Seychelles	145,912	75.00%	70.90%
10	Belgium	141,046	73.30%	70.80%
11	Spain	139,502	77.40%	70.10%
12	Ireland	138,343	74.60%	68.40%
13	Canada	141,912	74.30%	67.60%
14	Mongolia	134,369	69.40%	64.90%
15	Britain	136,149	71.90%	64.20%
16	Bahrain	146,282	67.40%	64.00%
17	Bhutan	135,873	73.60%	62.30%
18	Netherlands	126,245	69.00%	61.70%
19	Italy	129,095	70.70%	60.80%
20	Germany	122,553	65.30%	60.70%
21	Israel	151,800	66.10%	60.60%
22	France	130,370	72.20%	59.70%
23	Austria	117,795	62.00%	58.60%
24	Greenland	129,104	70.90%	58.20%
25	Norway	130,013	72.30%	57.70%

Rank	Country	Total Doses Given per 100k	% of Population Partially Vaccinated	% of Population Fully Vaccinated
26	Luxembourg	123,139	65.70%	57.40%
27	Monaco	122,888	66.50%	56.30%
28	Maldives	126,715	70.90%	55.80%
29	Mauritius	118,234	62.60%	55.70%
30	Sweden	122,493	67.00%	55.50%
31	Lithuania	113,654	59.50%	54.10%
32	Liechtenstein	113,467	60.30%	53.90%
33	Czechia	107,557	55.70%	53.70%
34	Greece	106,460	56.50%	53.50%
35	Andorra	118,820	66.20%	52.70%
<b>36</b>	<b>U.S.</b>	<b>111,511</b>	<b>61.80%</b>	<b>52.40%</b>
37	Switzerland	112,118	58.10%	51.90%
38	Cambodia	115,767	65.50%	51.70%
39	Finland	123,671	72.90%	50.80%
40	Poland	95,564	50.80%	49.50%
41	Ecuador	110,862	61.60%	49.30%
42	Malaysia	108,772	61.80%	47.00%
43	Japan	103,671	57.30%	46.30%
44	Turkey	112,871	57.90%	44.50%
45	Saudi Arabia	108,359	64.80%	43.50%
46	Dominican Republic	103,847	54.20%	43.40%
47	Cyprus	91,308	47.90%	43.40%
48	Slovenia	90,866	47.50%	43.30%
49	El Salvador	97,595	54.90%	42.70%
50	Morocco	92,460	51.30%	41.20%

# Daily COVID-19 Deaths Comparison Across Countries

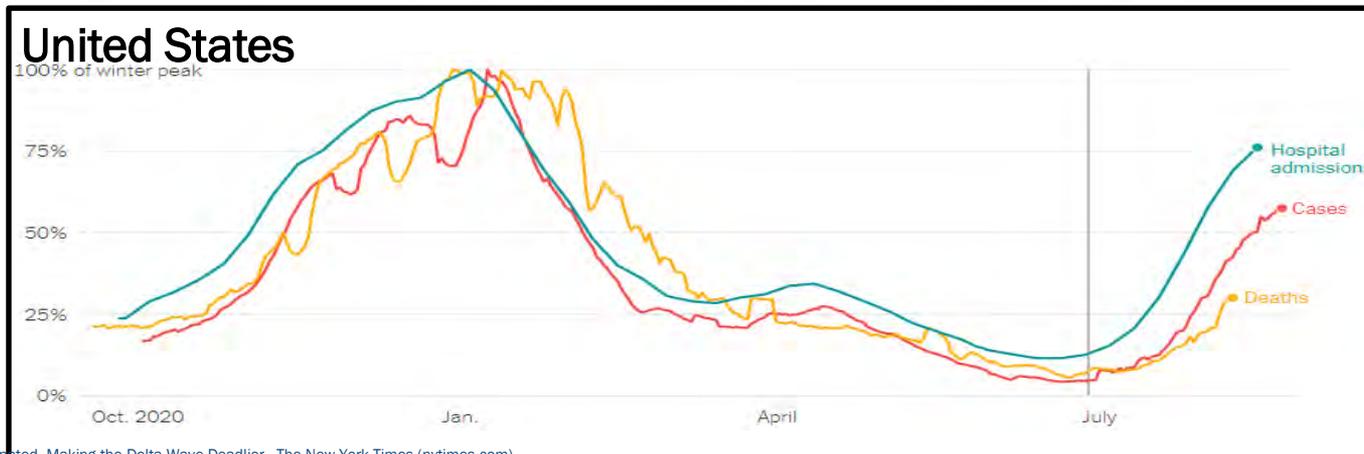
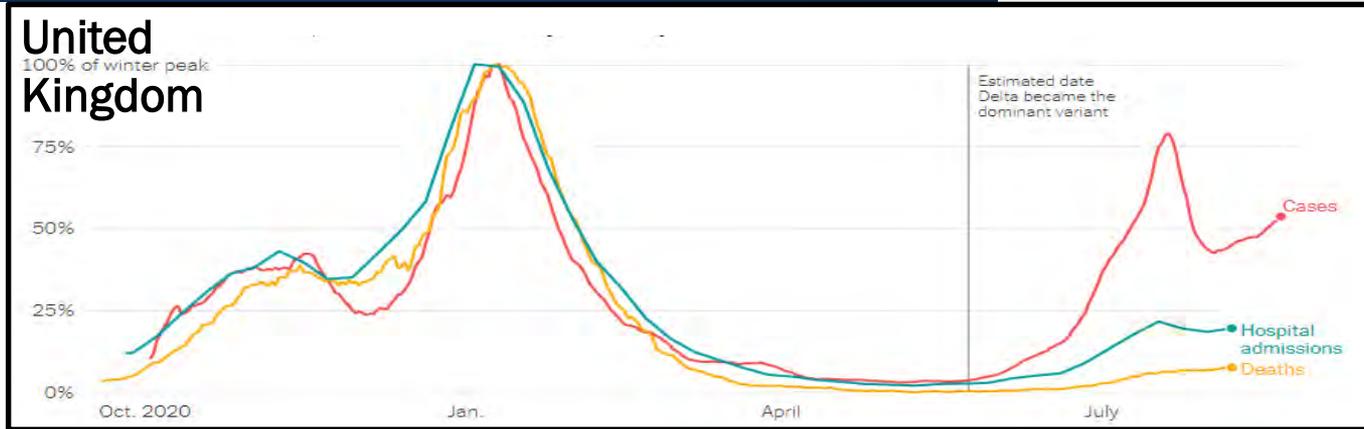




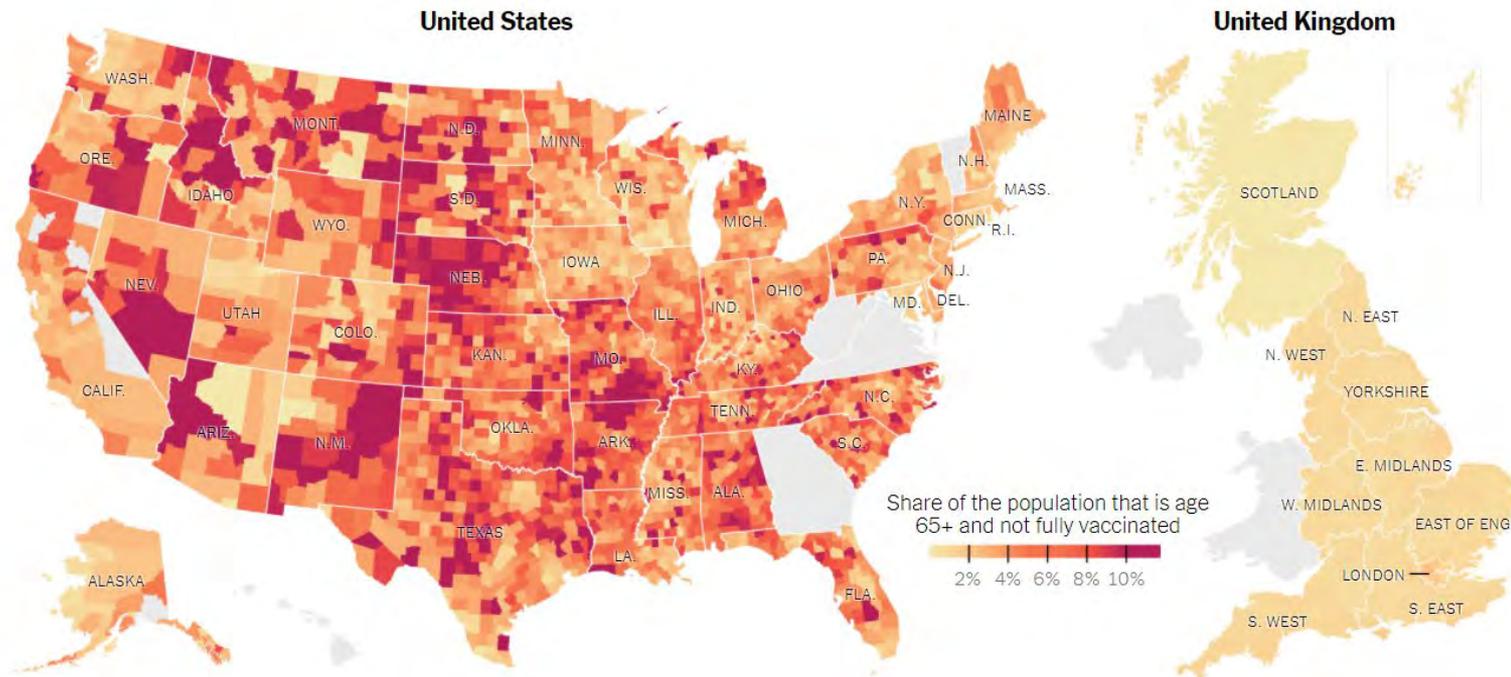
COVID-19  
DEATHS



# U.S. and U.K. Comparison of COVID-19 Cases, Hospitalizations, and Deaths



# U.S. and U.K. Comparison of Unvaccinated 65+



[https://www.nytimes.com/interactive/2021/08/24/world/vaccines-seniors.html?unlocked\\_article\\_code=AAAAAAAAAAAAACEIPuonUYyZ\\_tJ1Gw5CRWYsB4B991re1b-VnPsjgWX6IG-LQD1JzulYGM2b9kHMYrB4lsv2jDRDPiwDjgSft0ghOIOlx4qDAiuvpaekZ8Zljs47oviDj1sg8LAG000qmvMzfmDKJ1n-Gy-hvbYTTbuCqaPg3Vycx134scwLShc0nYczqrAEu5zy4M-ia9nXsYmMG9GMCqavPDoCwF8McGga3zf4goxXOJZXLIDLwQuJAIEgJVwwHD4o6n086dhfNocIK\\_6ShYrc8b6ir4VYXd6vatmpnGQ9rCK-MKQsdyhuQ&smid=em-share](https://www.nytimes.com/interactive/2021/08/24/world/vaccines-seniors.html?unlocked_article_code=AAAAAAAAAAAAACEIPuonUYyZ_tJ1Gw5CRWYsB4B991re1b-VnPsjgWX6IG-LQD1JzulYGM2b9kHMYrB4lsv2jDRDPiwDjgSft0ghOIOlx4qDAiuvpaekZ8Zljs47oviDj1sg8LAG000qmvMzfmDKJ1n-Gy-hvbYTTbuCqaPg3Vycx134scwLShc0nYczqrAEu5zy4M-ia9nXsYmMG9GMCqavPDoCwF8McGga3zf4goxXOJZXLIDLwQuJAIEgJVwwHD4o6n086dhfNocIK_6ShYrc8b6ir4VYXd6vatmpnGQ9rCK-MKQsdyhuQ&smid=em-share)



The 4.53 M dead around the world would stretch from the West Coast of the U.S. to London!



THE LIGHT AT THE END OF OUR TUNNEL

Herd Immunity

HONK!  
HONK!  
HONK!  
HONK!  
HONK!  
HONK!

BEEP!  
BEEP!  
BEEP!  
BEEP!

ANTI-VAX!



# FDA Approves Pfizer COVID-19 Vaccine – August 23, 2021

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## FDA Approves Pfizer-BioNTech Covid-19 Vaccine for People 16 and Older

Approval, based on six months of clinical data, comes less than four months after submission



Covid-19 Boosters Are Coming: Here's What to Know

The New York Times

### The F.D.A. grants full approval to the Pfizer-BioNTech Covid-19 vaccine.



FDA NEWS RELEASE

## FDA Approves First COVID-19 Vaccine

*Approval Signifies Key Achievement for Public Health*

Share Tweet LinkedIn Email Print

For Immediate Release: August 23, 2021

“The FDA’s approval of this vaccine is a milestone as we continue to battle the COVID-19 pandemic. While this and other vaccines have met the FDA’s rigorous, scientific standards for emergency use authorization, as the first FDA-approved COVID-19 vaccine, the public can be very confident that this vaccine meets the high standards for safety, effectiveness, and manufacturing quality the FDA requires of an approved product,” said Acting FDA Commissioner Janet Woodcock, M.D. “While millions of people have already safely received COVID-19 vaccines, we recognize that for some, the FDA approval of a vaccine may now instill additional confidence to get vaccinated. Today’s milestone puts us one step closer to altering the course of this pandemic in the U.S.”

## ★ OPINION

HOUSTON CHRONICLE • WEDNESDAY, AUGUST 25, 2021 • PAGE A14 ••

EDITORIAL

### No excuses with full Pfizer approval

It's a game-changer for all the holdouts whose hesitancy has nothing to do with politics.

Rash, nausea, vomiting, abdominal pain, neurological disorders and potentially severe hepatitis requiring hospitalization.

No, these are not symptoms associated with any coronavirus vaccine.

They are symptoms, according to the Associated Press, associated with ivermectin toxicity, a condition that Americans in some parts are developing in alarming numbers because they chose to treat their COVID-19 symptoms with a livestock deworming medication rather than get a vaccine that could have prevented the symptoms in the first place.

Last week, the Mississippi Department of Health said that more than two-thirds of calls to the state's poison control center were connected to "ingestion of livestock or animal formulations of ivermectin purchased at livestock supply centers." The Texas Poison Center Network told KXAN-TV Tuesday it took 55 calls about ivermectin exposure in the past month — more than it got all of last year.

Folks, the last 17 months have rendered useless the word "unprecedented," but there might be no better way to describe the response of the U.S. Food and Drug Administration in a tweet: "You are not a horse. You are not a cow. Seriously, y'all. Stop it."

Holy cow. The lengths some



Eva Marie Lizzitogoli / Bloomberg

**There's no good excuse now that the FDA granted full approval Monday to the Pfizer-BioNTech vaccine, a milestone expected to bolster the immunization drive amid a renewed surge.**

has nothing to do with politics and everything to do with fear and uncertainty about a vaccine that had, before this week, only received emergency authorization.

drives. "Many of these folks have stated, 'I will get the vaccine when it gets full FDA approval. Then I'll know it's safe,'" she said. Now we all know. No more

year but still an impressive rate. The scientists have done their due diligence, and now it's time for the rest of us to act, if we haven't already. And it's time for the private

zation."

That no longer includes Pfizer. We urge the governor, who apparently breezed through a COVID-19 infection last week after having been fully vaccinated, not to extend his order to fully approved vaccines. Instead, given his recent experience, he should be the biggest cheerleader to get unvaccinated people to protect themselves from severe illness, hospitalization and death.

The Pentagon said Monday it will require service members to get vaccinated now that Pfizer's vaccine is fully approved. Goldman Sachs, CVS Health, Chevron, Disney and a growing list of other major companies are mandating vaccinations for employees.

Even the LSU, Tulane, Oregon and Oregon State football programs announced in the last week they would require proof of vaccination or a recent negative test to attend games.

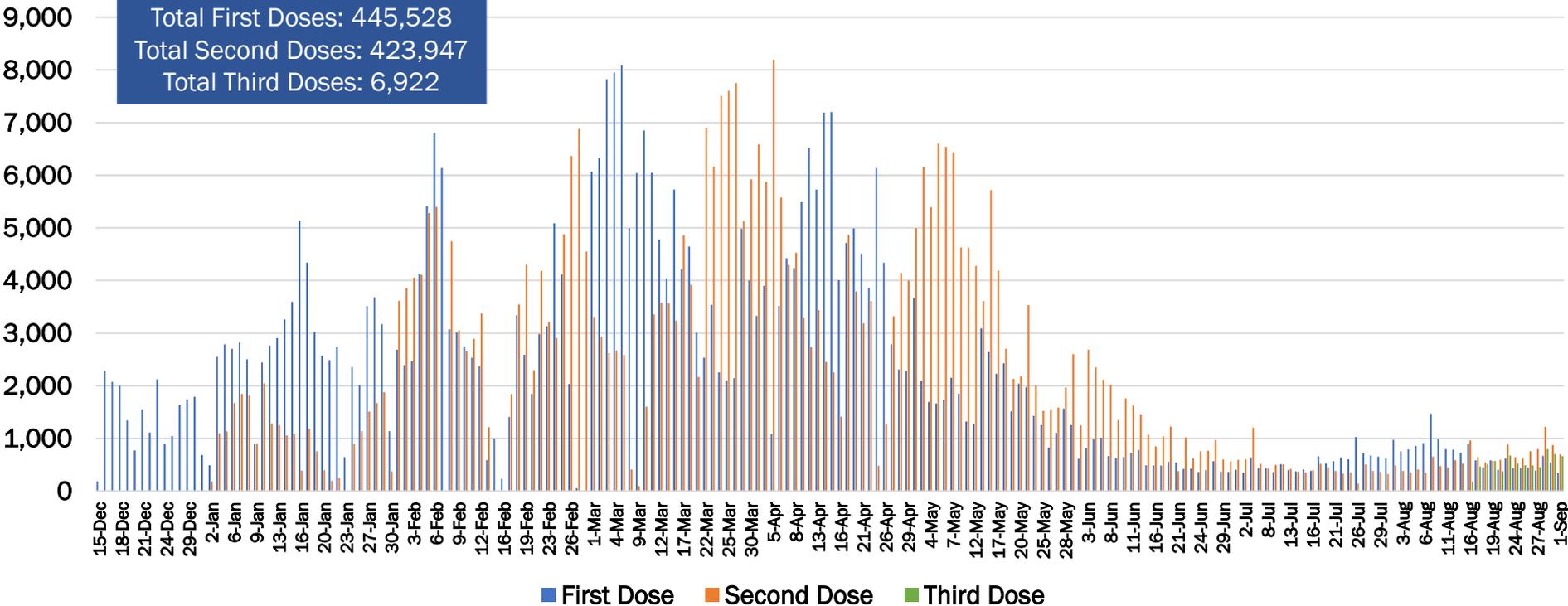
The welcome news of Pfizer's approval comes amid dire coronavirus reports on the ground.

The southeast Texas region surpassed 4,000 COVID-19 hospitalizations for the first time this week, and the Texas Medical Center set a new average daily hospitalization record, at 390. Some schools in the state have moved to virtual learning amid the virus' latest surge.

Still, we're encouraged that more people are doing the right thing: about 450,000 Americans per day are getting their first dose

# HM COVID-19 Vaccines Administered

## Individuals Vaccinated at HM by Day



# Infections and Hospitalizations Among Unvaccinated in Los Angeles

A July 2021 study of Los Angeles, CA  
public health records found...

Unvaccinated have

**5X**

more COVID-19 **infections**  
than fully vaccinated

Unvaccinated have

**29X**

more COVID-19 **hospitalizations**  
than fully vaccinated



J12911 AL

Get vaccinated to reduce spread and protect yourself

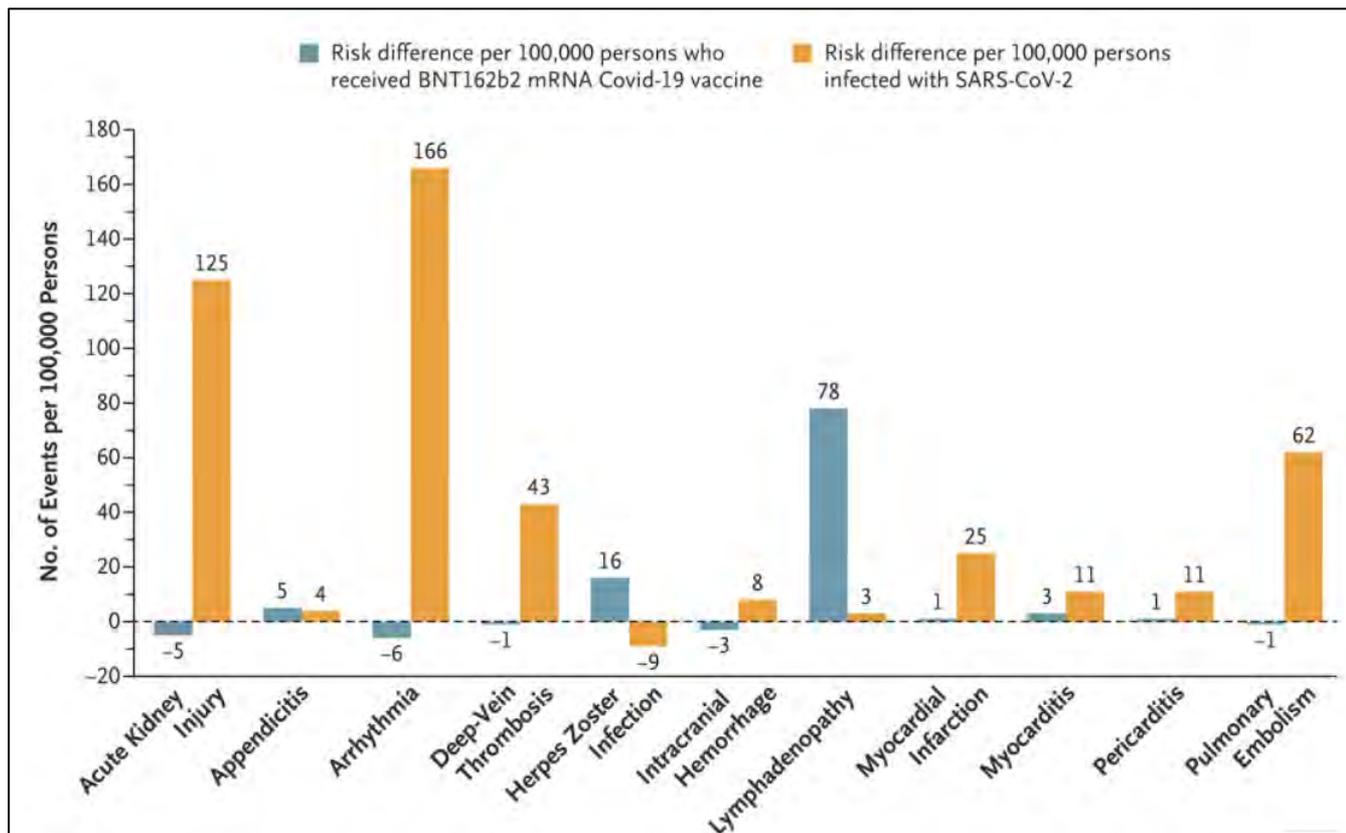
**MMWR**

# Effectiveness of COVID-19 Vaccines

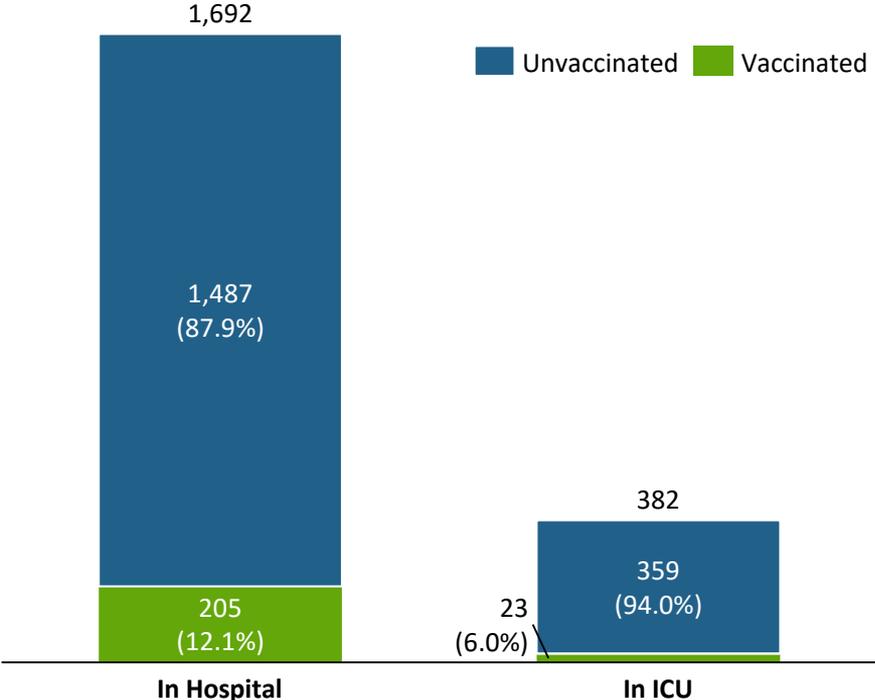
**TABLE. Effectiveness of COVID-19 vaccines against any SARS-CoV-2 infection among frontline workers, by B.1.617.2 (Delta) variant predominance and time since full vaccination — eight U.S. locations, December 2020–August 2021**

Period and vaccination status	No. of contributing participants*	Total no. of person-days	Median days (IQR)	No. of SARS-CoV-2 infections	Adjusted VE, <sup>†</sup> % (95% CI)
<b>Full cohort to date</b>					
Unvaccinated	4,136	181,357	20 (8–45)	194	N/A
Fully vaccinated <sup>§</sup>	2,976	454,832	177 (115–195)	34	80 (69–88)
14–119 days after full vaccination	2,923	284,617	106 (106–106)	13	85 (68–93)
120–149 days after full vaccination	2,369	66,006	30 (30–30)	3	81 (34–95)
≥150 days after full vaccination	2,129	104,174	52 (37–64)	18	73 (49–86)
<b>Pre-Delta variant predominance</b>					
Unvaccinated	4,137	156,626	19 (8–43)	175	N/A
Fully vaccinated	2,875	329,865	124 (95–149)	10	91 (81–96)
<b>Delta variant predominance</b>					
Unvaccinated	488	24,871	43 (37–69)	19	N/A
Fully vaccinated	2,352	119,218	49 (35–56)	24	66 (26–84)

# NEJM: Absolute Excess Risk of Adverse Events after Vaccination or COVID-19 Infection



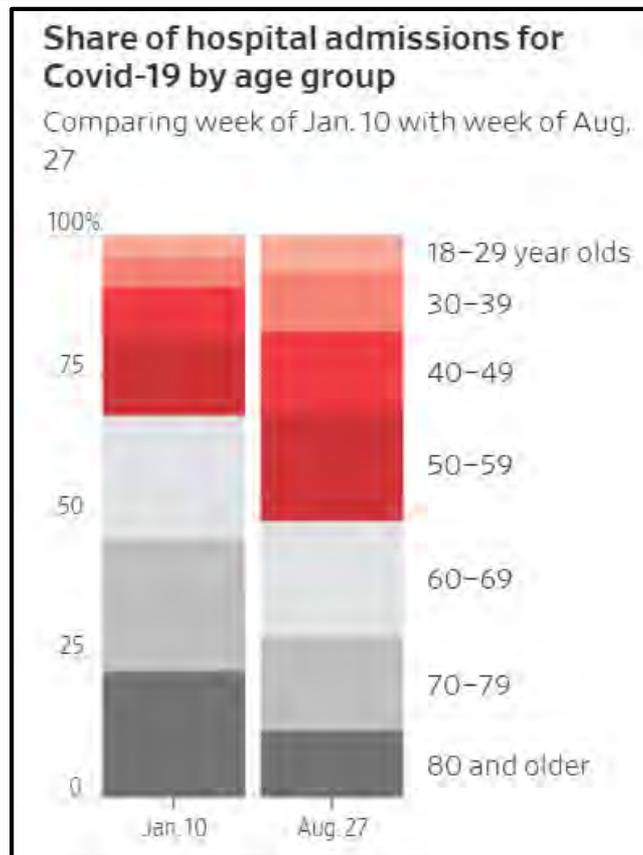
# TMC TOTAL HOSPITALIZATIONS BY VACCINATION STATUS<sup>1,2</sup>



- A significant majority of TMC total hospitalized and ICU patients are unvaccinated.

1. Includes: Harris Health System, Houston Methodist, MDA Cancer Center, St. Luke’s, Texas Children’s Hospital, and UTMB.  
2. Data is snapshot from 8/20/21 and will be updated daily as soon as daily reporting is finalized by all Institutions. This is in progress and should be completed week of September 1.

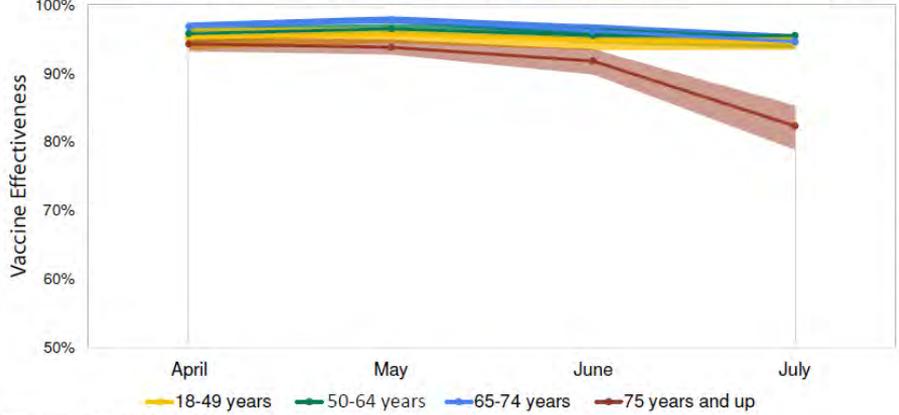
# COVID-19 Hospitalizations by Age Group



# CDC Estimate of Vaccine Efficacy During Delta Surge vs. “Back of the Envelope” Estimate

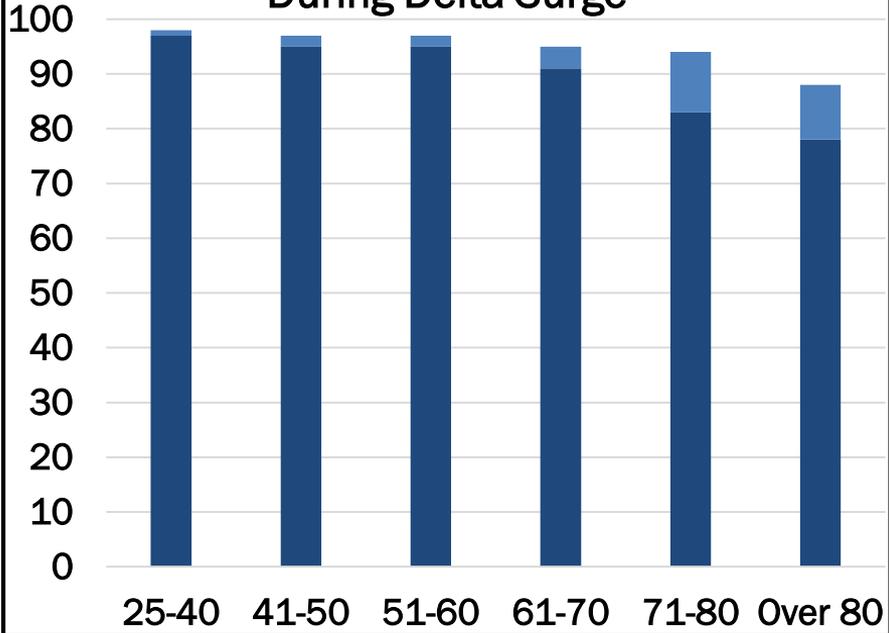
## Booster Doses of COVID-19 Vaccines: Adults Aged 65 or Below

Preliminary VE against COVID-19-associated **hospitalization** among fully vaccinated† patients aged ≥18 years, by age group and month — COVID-NET



Preliminary VE against COVID-19-associated **hospitalization** in adults less than 75 years of age decreased in July, but remains >80%

## Estimated COVID-19 Vaccine Efficacy at Houston Methodist During Delta Surge



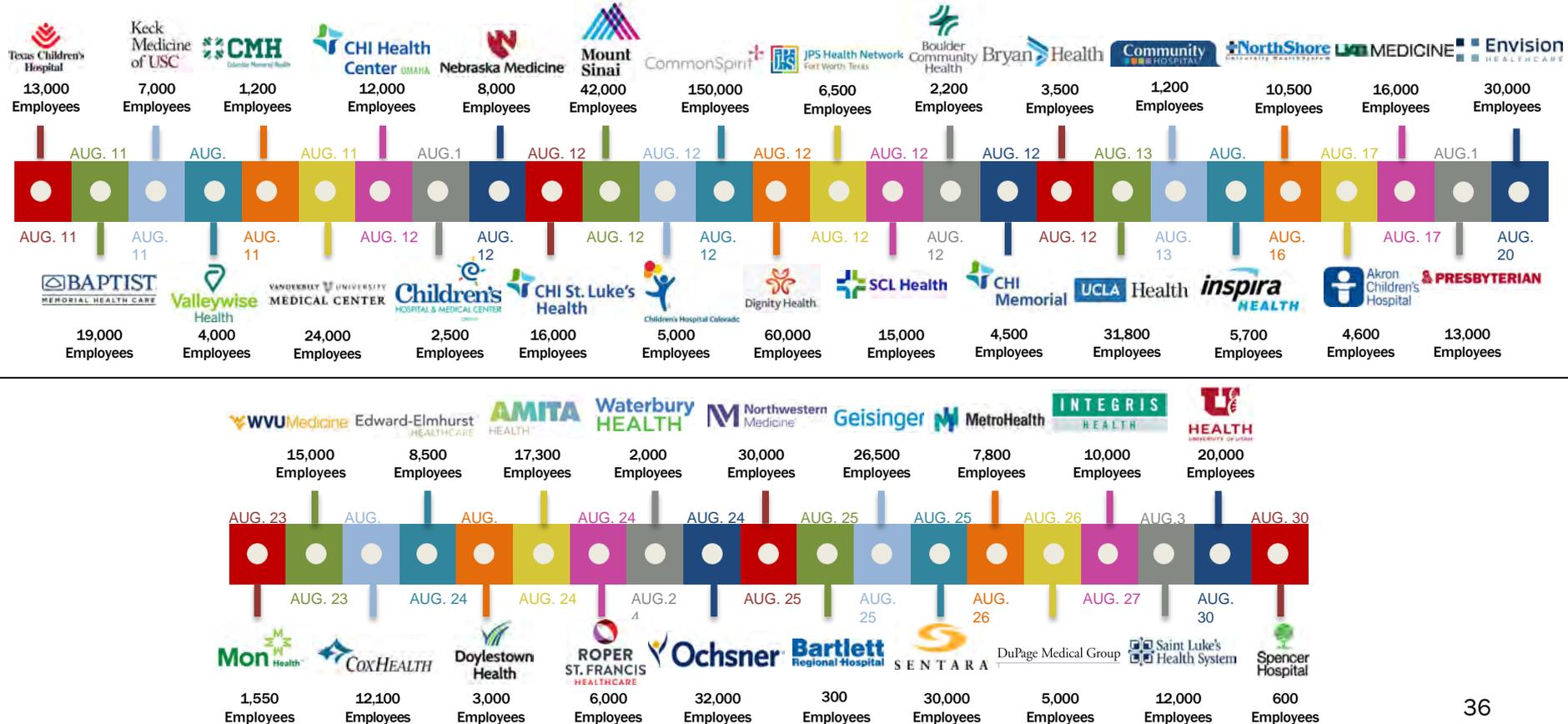
# Employers' Central Role in Vaccinating the Population

- Ethical responsibility to protect customers
- Ethical responsibility to create a safe workplace
- Maintenance of operations
- Economic stability
- Financial cost of employees with COVID

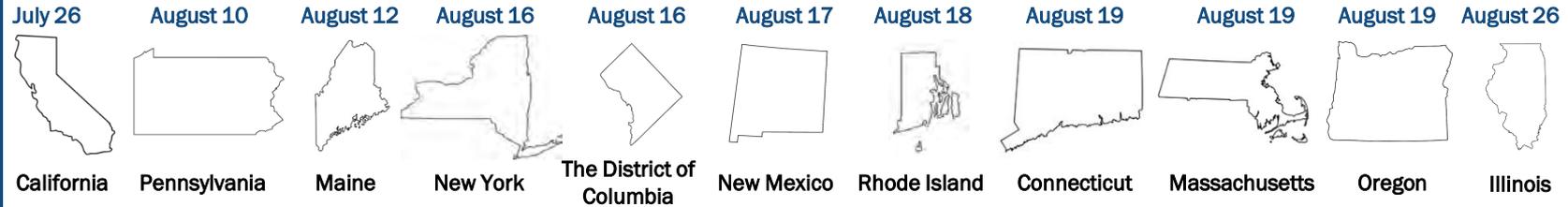
# The Employers' Job is Not Easy!



# Hospitals Announcing COVID-19 Mandates Since Last Town Hall Conversation



# Multiple States Announce COVID-19 Vaccine Mandate for Healthcare Workers





“

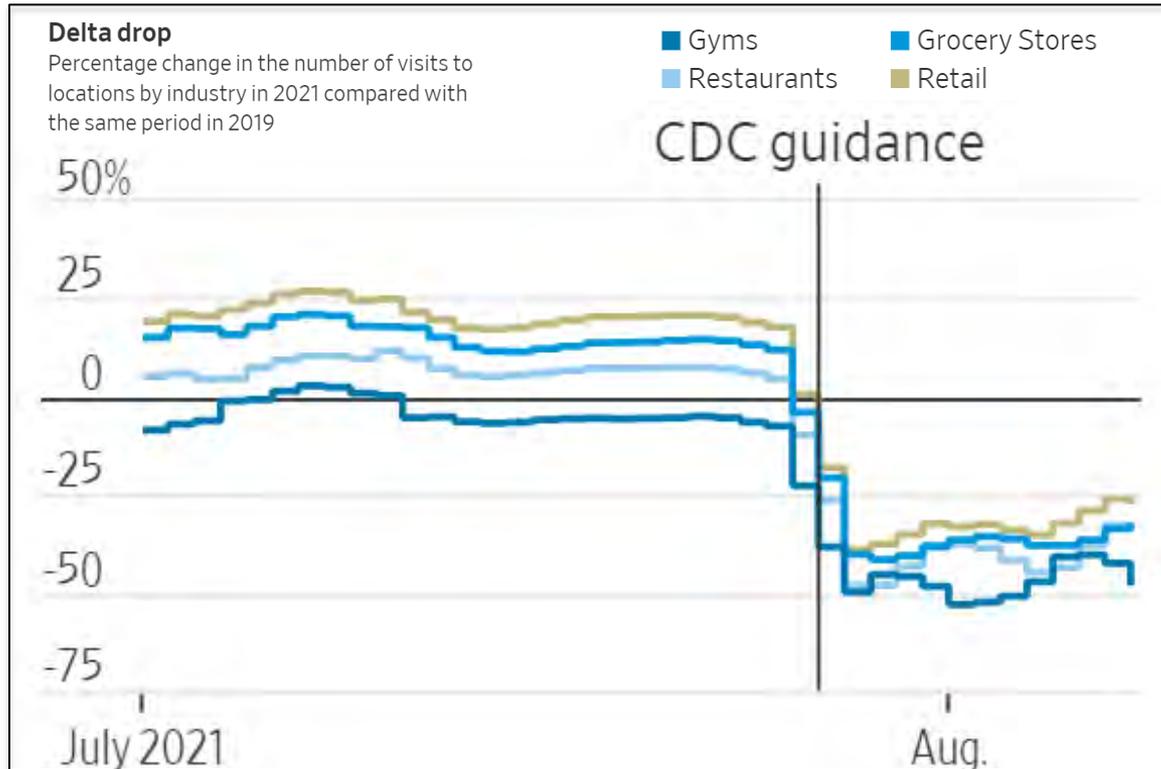
In the past month I've been writing one to three letters per week to families of employees who lost their life, all unvaccinated,” he said. “And so, to me, once you view the world through that prism, it seemed like no choice. It's about saving lives.

”



- *Scott Kirby*  
*CEO of United Airlines*

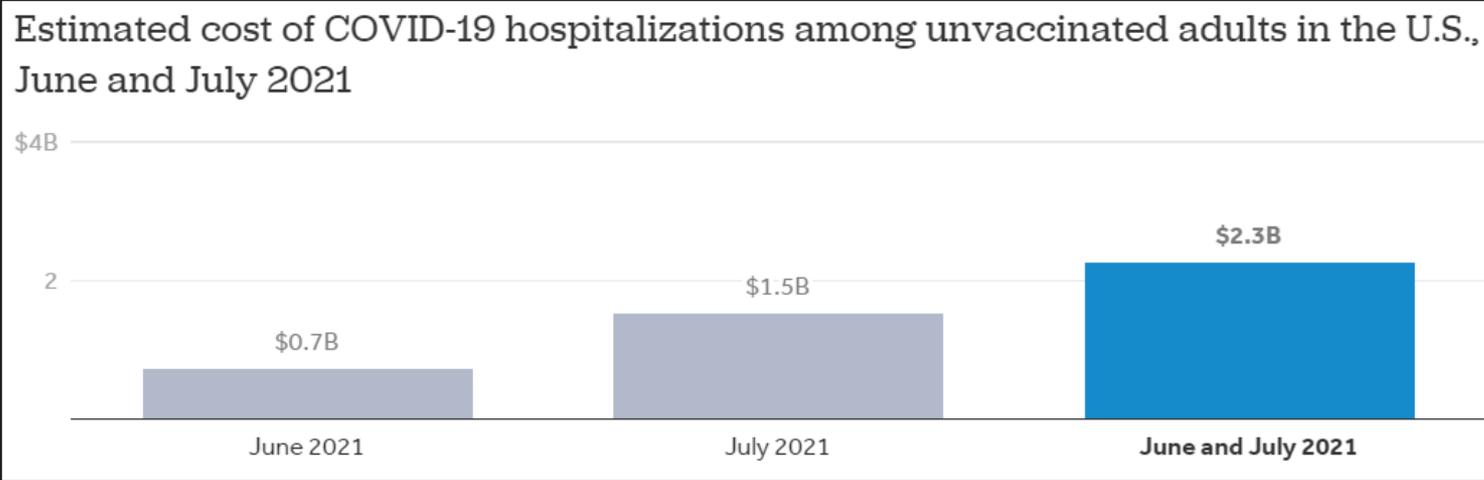
# Delta Variant's Mark on Businesses



Note: CDC updated guidance that even vaccinated Americans should wear masks indoors where infection rates are high.

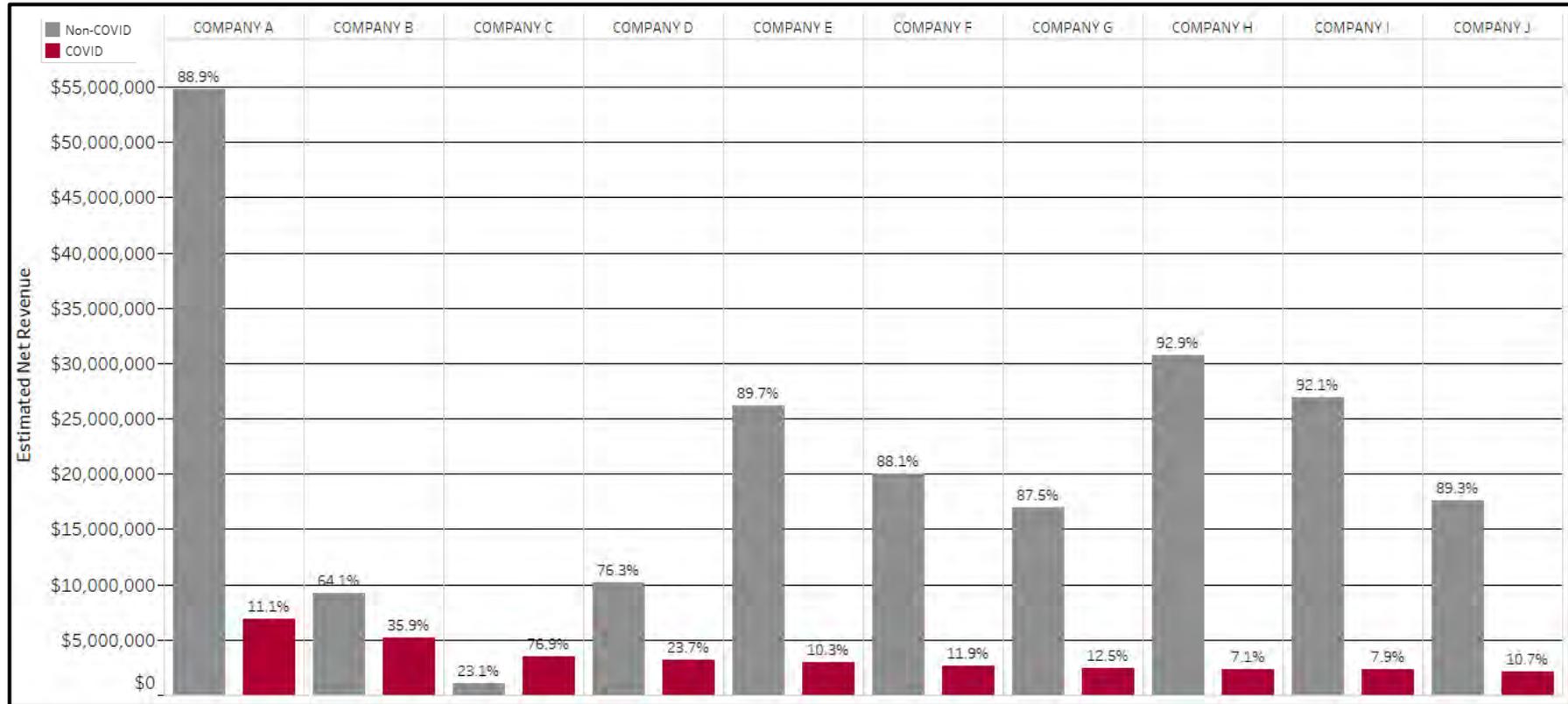
Source: SafeGraph

# Unvaccinated COVID-19 Hospitalization Cost to Society

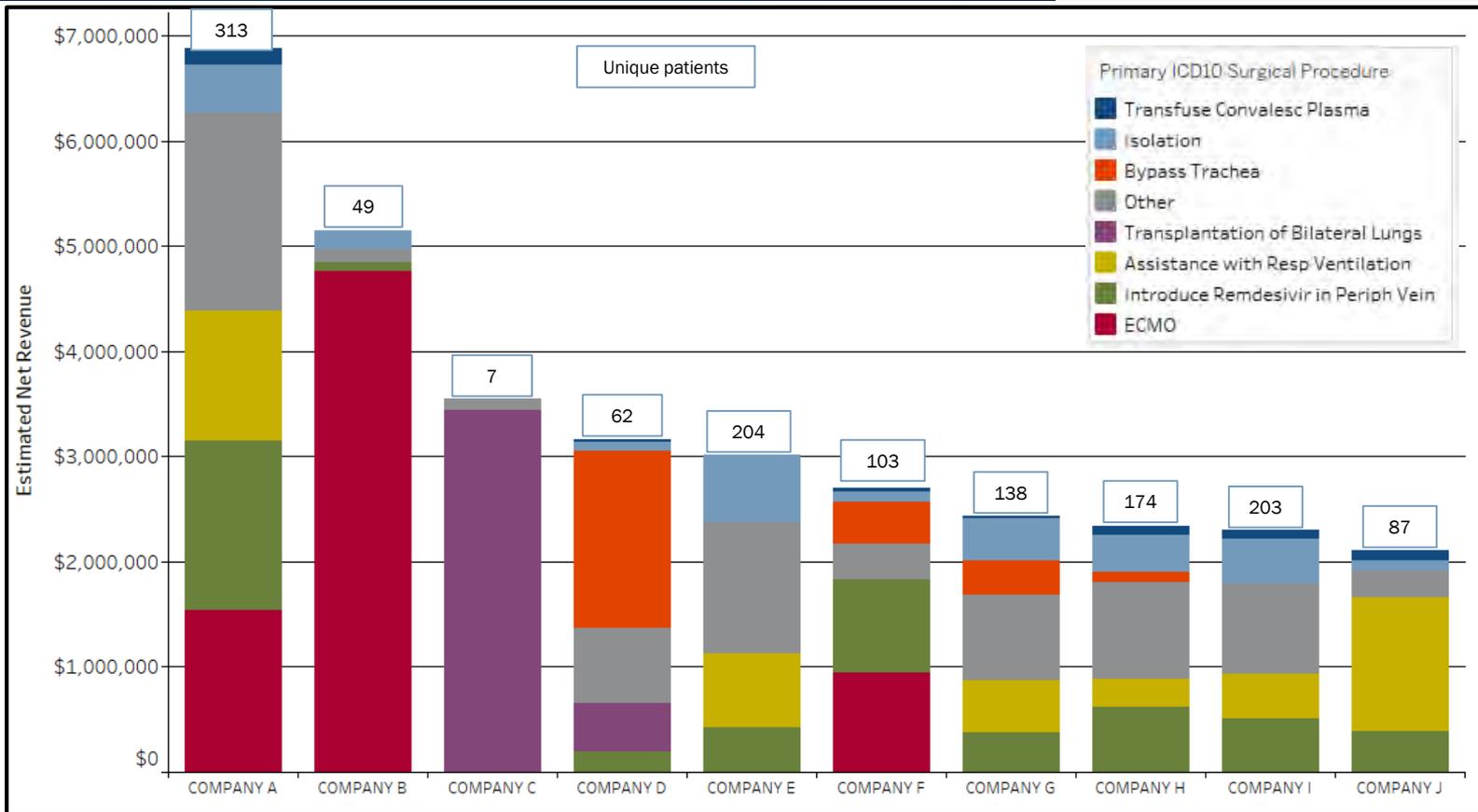


Source: <https://www.healthsystemtracker.org/brief/unvaccinated-covid-patients-cost-the-u-s-health-system-billions-of-dollars/>

# COVID-19 Cost Comparison Across Private Employers at Houston Methodist



# Private Employers with COVID-19 Costs >\$2 Million at Houston Methodist



# Delta CEO's Memo to Employees For COVID-19 Vaccination

The Washington Post  
*Democracy Dies in Darkness*

Transportation

## Delta Air Lines to require that employees be vaccinated or pay health insurance surcharge

The carrier is the latest major employer to push workers to get coronavirus shots, although the airline industry hasn't settled on a uniform approach

[Listen to article](#) 4 min



### Delta's robust actions to increase our vaccination rate:

- Effective immediately, unvaccinated employees are required to wear masks in all indoor Delta settings
- Starting **Sept. 12**, any U.S. employee who is not fully vaccinated will be required to take a COVID test each week
- Beginning **Nov. 1**, unvaccinated employees enrolled in Delta's account-based healthcare plan will be subject to a \$200 monthly surcharge.
  - The average hospital stay for COVID-19 has cost Delta \$50,000 per person. This surcharge will be necessary to address the financial risk the decision to not vaccinate is creating for our company.
- Effective **Sept. 30**, in compliance with state and local laws, COVID pay protection will only be provided to fully vaccinated individuals who are experiencing a breakthrough infection.

# Gallup: Workers Have Strong Views on Vaccine Mandates

## U.S. Employees' Views of Employer Vaccination Requirements

How would you feel about your employer requiring all employees (who do not have a medical exemption) to receive the coronavirus/COVID-19 vaccination?

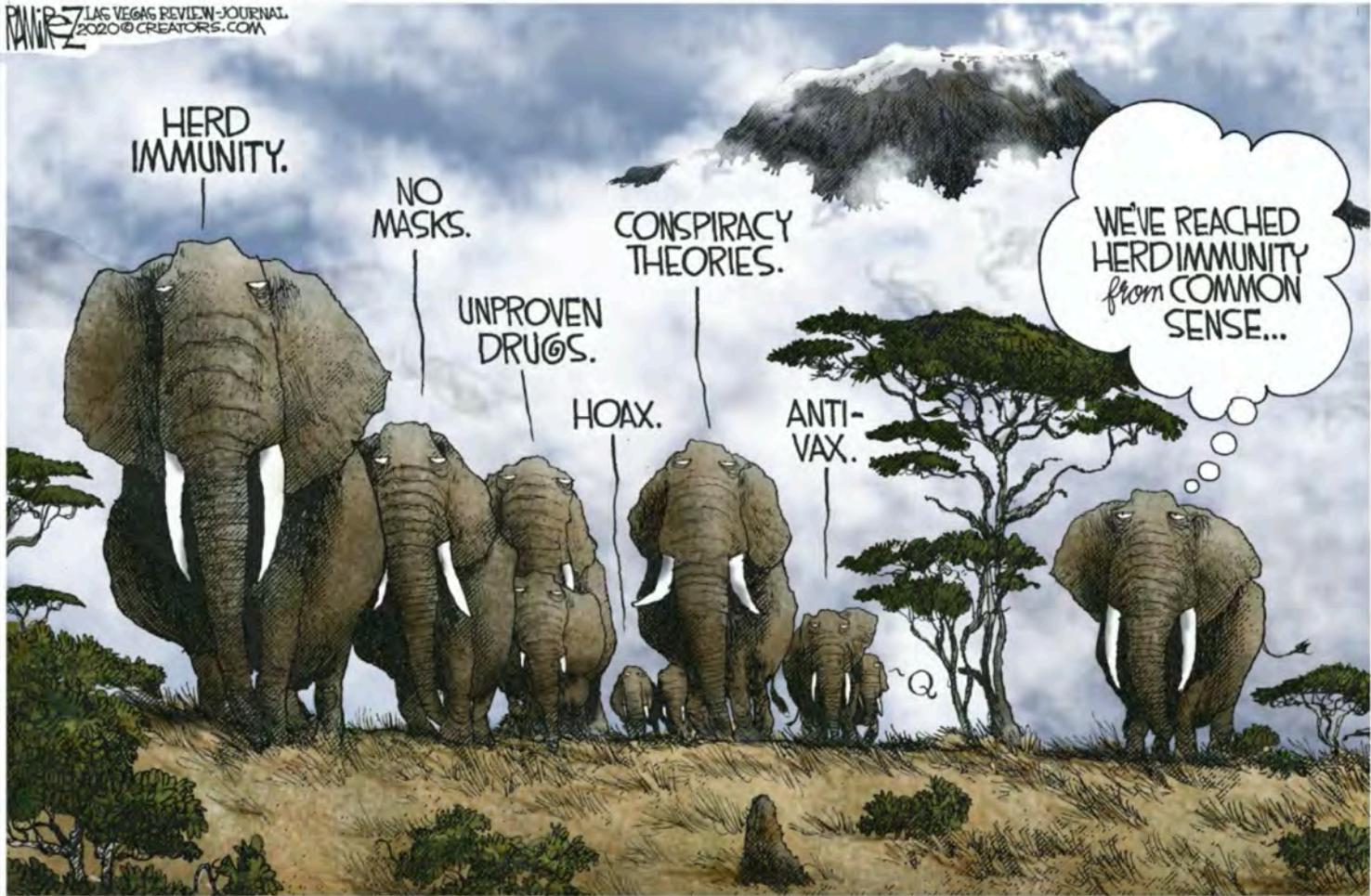


## U.S. Employees' Reports of Employer Vaccination Policy

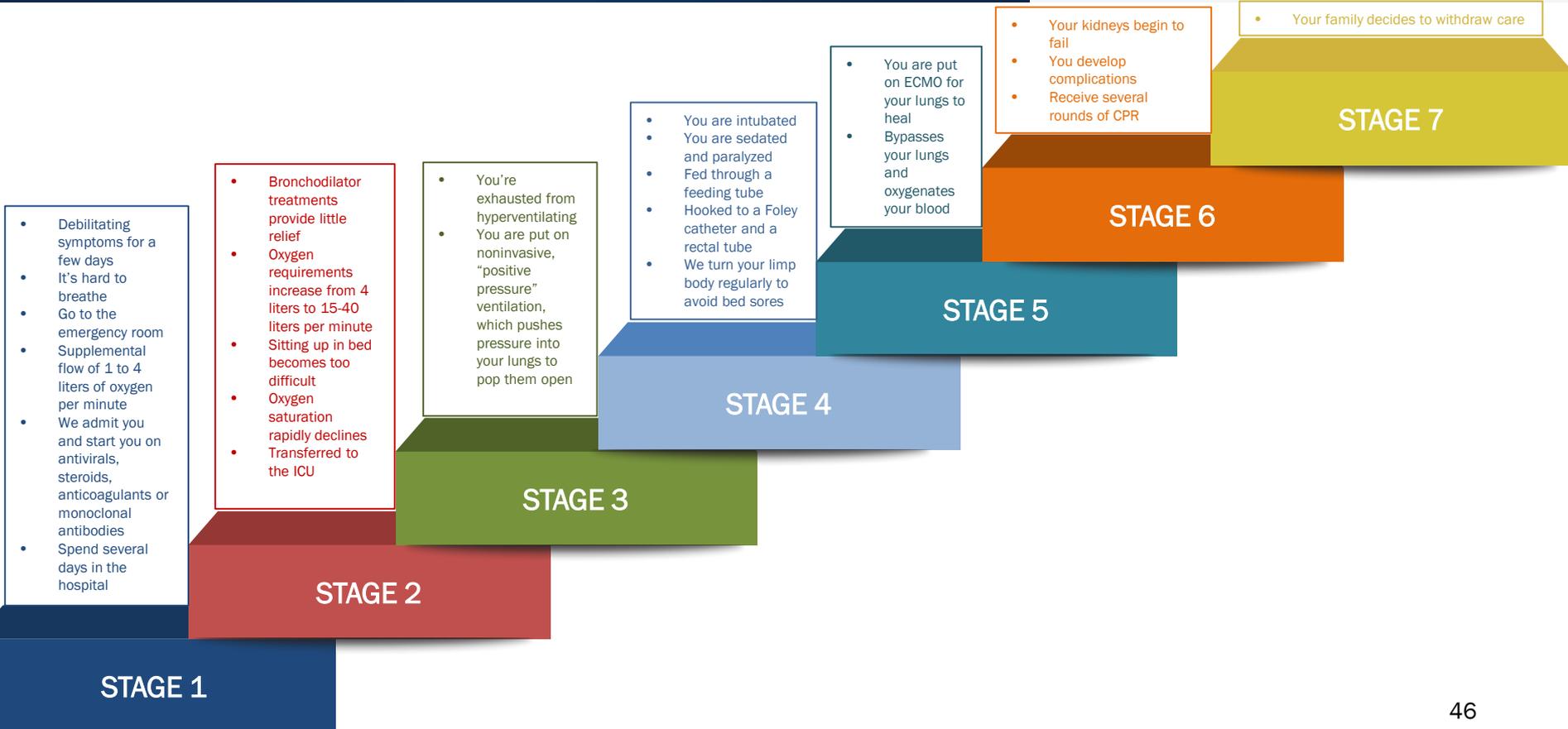
To the best of your knowledge, will your employer require or encourage employees to get vaccinated for coronavirus/COVID-19 in order to return to the workplace?



- **52%** favor their employer requiring all employees to receive the COVID-19 vaccine
- **45%** of individuals said that cash incentives and PTO would make them more likely to get the COVID-19 vaccine



# On the Front Lines: One Respiratory Therapist's Perspective on the Seven Stages of Severe COVID-19



# Real Conversations Between a Houston Physician and Her COVID Patients

***“When will my breathing get better?”***

“I don’t know. Every person is different.”

***“When will I get to go home?”***

“When your oxygen is better.”

***“When will my oxygen get better?”***

“It’s difficult to predict. A few days, a week, two or three weeks? Some patients have stayed for months.”

***“Am I getting better at all?”***

“Well, you’re not getting worse, so let’s try to focus on that.”

***“Am I going to be OK?”***

“We’re doing everything we can to get you better.”

***“But really, do you think I’ll be alright?”***

“It’s too early to say right now. We’re doing everything we can. Time will tell.”

***“Can I get the vaccine now?”***

“No, it’s too late.”

***“How soon can I get it?”***

“After you recover.”

***“When will that be?”***

“Again, I don’t know. COVID-19 takes time and is unpredictable.”

***“Doctor, am I going to die?”***

“You are very sick and that is a real possibility, but we are doing everything we can to get you through this. We have to take this one day at a time.”

***“What if I get worse?”***

“We’ll have to consider putting you on a ventilator.”

***“How long would I be on a ventilator?”***

“At least two to four weeks, maybe longer.”

***“What would be my chances of making it?”***

“If you’re sick enough to require a ventilator, the survival rate has been less than 20 percent.”

***“Can you check on my daughter? She’s in the ER right now.”***

“Yes, I can.”

***Can you check on my husband? He’s getting intubated in the ICU right now.”***

“Yes, I can do that.”

**“So, I urge everyone: If you trust us enough to rush to us when you’re sick, which means you trust us enough to try to save your life, then trust us now. Help us save your life now, before it may be too late.”  
– Nicole Zeisig, Hospitalist at Memorial Herman Sugar Land Hospital**

# COVID-19 Vaccine Myths



## MYTH #4



**The COVID-19 vaccine can affect my fertility**

**Why it's false:** There's no data to suggest that these vaccines pose a risk to someone who is pregnant or wants to become pregnant.

## MYTH #5

COVID-19  
**POSITIVE**



**I don't need the vaccine because I've already had COVID-19**

**Why it's false:** You may experience some level of immunity after having COVID-19, but it's unclear how long this protection might last.

## MYTH #1



**The vaccine can affect my DNA**

**Why it's false:** The genetic material in COVID-19 vaccines cannot interact with or change your DNA in any way.

## MYTH #6



**I don't need the vaccine because I'm young and healthy**

**Why it's false:** Even mild COVID-19 can cause uncomfortable and/or lingering symptoms. Plus, even those who are young and healthy must be vaccinated to achieve herd immunity.

## MYTH #2



**A vaccine developed so quickly can't be safe**

**Why it's false:** Available vaccines have undergone thorough testing and external review. These vaccines may seem new, but there's decades of research behind them.

## MYTH #7



**I don't need to wear a mask after being vaccinated**

**Why it's false:** Until herd immunity is reached, wearing a mask and social distancing continue to be important safety measures.

## MYTH #3



**The vaccine can give me COVID-19**

**Why it's false:** The mild side effects associated with the vaccines are a sign that your body is building immunity to the virus. These vaccines cannot give you COVID-19.

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It makes me wonder in these situations if the person(s) who refused to get vaccinated and spread it, do they feel guilt or remorse for being the catalyst for someone's life being cut short? Do they not understand that by not doing something, it can have a negative impact on someone else? The pandemic has brought out a lot of selfishness in people and it's completely disheartening. I became a nurse to help those in their time of need, but when will those same people realize that they need to help us (nurses, doctors, health care workers) in return?



- Nurse Practitioner at  
Houston Methodist



**CVICU  
SPLATTER | UNLEASH | CREATE**

**CPAM Splatter Paint Tent**

**WHO:** CVICU Staff

**WHERE:** CVICU Serenity Room

**WHEN:** September 9-16

**WHY:** To creatively unleash stress,  
with a cathartic experience, and  
as a team create something  
beautiful!



# Get your flu shot!



**GET YOURSELF AND YOUR FAMILY  
VACCINATED!**

A yearly flu vaccine is the first  
and most important step in  
protecting against flu viruses.

**#FIGHT FLU**

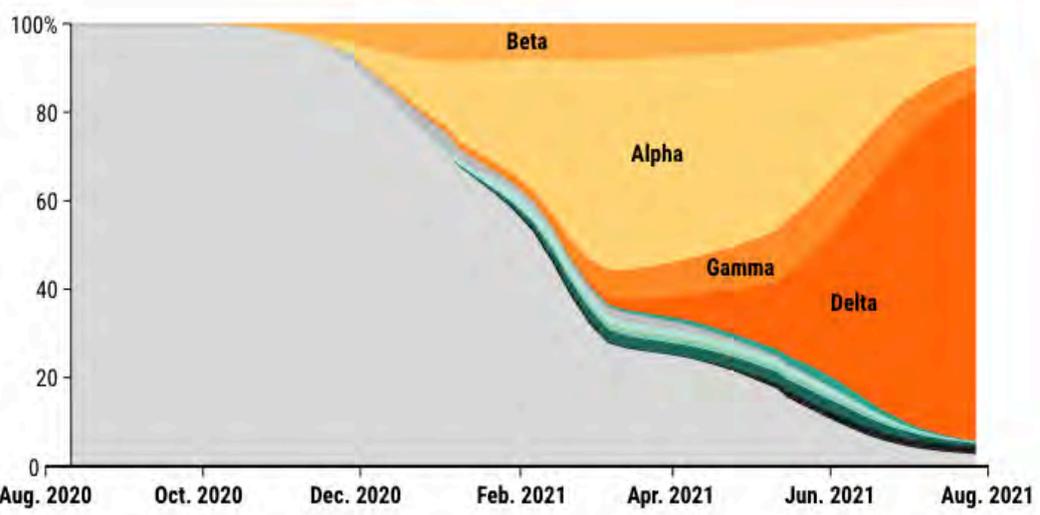


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GAINSEY ©CREATORS.COM 2021



"NO THANKS... I READ ON SOCIAL MEDIA IT MIGHT BE BAD."

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(GRAPHIC) N. DESAI/SCIENCE, (DATA) NEXTSTRAIN, GISAIID

# Vaccines, Variants and the “Pandoomerang”

Town Hall, September 2, 2021

H. Dirk Sostman, MD FACR  
Ernest Cockrell, Jr. Presidential Distinguished Chair  
EVP & Chief Academic Officer



# FDA Approves Pfizer Vaccine

August 23 2021

- **FDA approved the Pfizer vaccine for prevention of COVID-19 in individuals 16 and older**
  - Vaccine still available under EUA for
    - children 12-15 years old and
    - “third dose” in immunocompromised individuals
  - Vaccine will be marketed as Comirnaty (koe-mir’-na-tee) and can be prescribed by physicians now
- **FDA approval process**
  - Submission of a Biologics License Application by the manufacturer
  - BLA builds on the data and information that supported the EUA
    - preclinical and clinical trial data in (22,000 vaccinated people with 4-6 month follow-up)
    - long-term effects and potential for rare adverse events
    - how vaccine “efficacy” translates into real-world effectiveness
    - manufacturing quality control and consistency – process review and site inspections

# FDA Approves Pfizer Vaccine: FAQs

August 23 2021

- **Can physicians prescribe a booster shot now that the vaccine is fully approved?**
  - Yes. As with other FDA-approved medications, licensed health care providers can
    - prescribe the Pfizer vaccine as approved, or
    - use their judgement for off-label prescribing
- **What is an example of off-label?**
  - A licensed provider prescribing a booster shot outside of the FDA’s fully-approved uses
  - Uses covered by EUA are not considered off-label prescription
- **Will Houston Methodist vaccine clinics accept off-label prescriptions from a physician for vaccination of a patient who is outside of the FDA approval?**
  - Our vaccine clinics accept off-label prescriptions for patients 16 and older
- **What is the Difference Between “Booster” and “Third Dose”?**
  - “Third dose” is part of prime series for immune compromised people, given ~28 days after second dose
  - Booster is a third dose given to “top up” antibody levels, given ~6-8 months after second dose

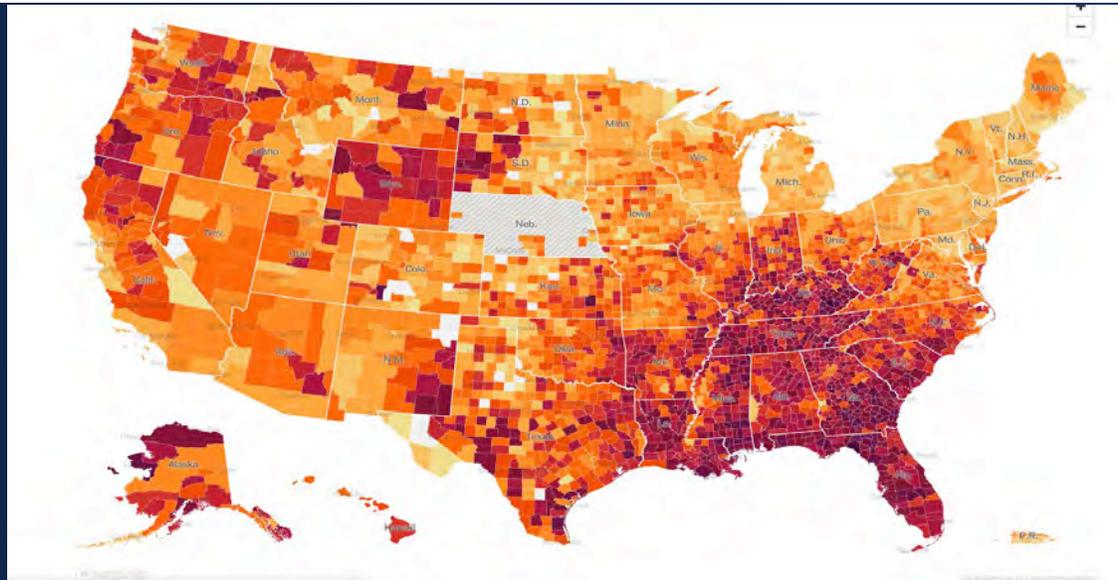
August 23 2021

- **Should patients be tested for antibody titers prior to third dose?**
  - Evidence that antibody titers are correlated with protection from COVID-19 is strong
  - Data not yet precise enough to standardize clinical management of individual patients
  - The CDC ACIP specifically recommends against use of antibody titers for clinical decision making
  - Accordingly, we do not require titers prior to a third dose
- **If someone has been tested and knows that they have a high titer, is a third dose still recommended?**
  - Serology may be ordered by the patient’s physician and interpreted in light of the patient’s medical history
  - Low titers have been used to justify the administration of additional vaccine doses
  - Less data regarding correlation of higher titers with individual protection
  - Therefore, we recommend a booster shot at 8 months even in the presence of high antibody titers
- **Do we recommend only homologous third doses or are heterologous third doses acceptable?**
  - Homologous (e.g., Pfizer – Pfizer) third doses are recommended, but heterologous (e.g., Moderna – Pfizer) third doses are acceptable

August 23 2021

- **If someone got a booster already, is another booster still recommended at 8 months?**
  - A booster should be administered > 6 months (recommended, 8 months) after the last dose of mRNA vaccine
  - Those who have already gotten a booster in that timeframe do not need an additional dose
- **If < 8 months since completing the prime series, what is the recommendation now?**
  - Eligible to receive a third dose as soon as 6 months since completing prime series
  - Recommended at 8 months
- **What about individuals who received one dose of J&J? Should they get a booster? If so, what kind? Also at 8 months?**
  - Data is limited and recommendations more tentative
  - J&J can produce durable antibody and cellular responses up to 8 months (239 days) after vaccination
  - So, it may be less important for individuals who received the J&J vaccine to have a booster now
  - However, mRNA vaccines produce a more robust early antibody response with higher initial clinical efficacy
  - Accordingly, if an individual wishes to have a booster with an mRNA vaccine in the same time frame after initial vaccination with J&J vaccine, the committee is comfortable with this

- As of now, we only have reached out to immunocompromised patients.
- We will continue to administer 3<sup>rd</sup> doses to those who are immunocompromised and attest to that via our consent process.
- In addition, we will administer 3<sup>rd</sup> dose boosters by provider order/prescription. If someone who is not immunocompromised wants a 3<sup>rd</sup> booster, they need a provider order/prescription.
- Until we get more clarity from CDC/ACIP on boosters later in September, we will not send proactive communications on 3<sup>rd</sup> dose boosters.
- Patients can self-schedule at any of our locations directly from our website for their 3<sup>rd</sup> dose.
- We will only be administering Pfizer at the vaccine clinics.
- We will update our processes as things develop.



# The “Pandoomerang”: What Happened?

# Social Developments: 5 Steps to Renewed Crisis

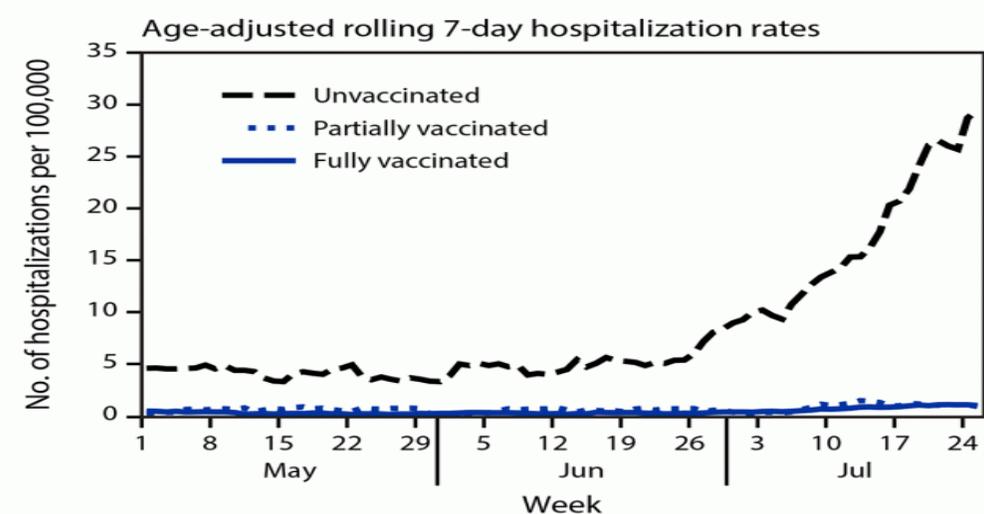
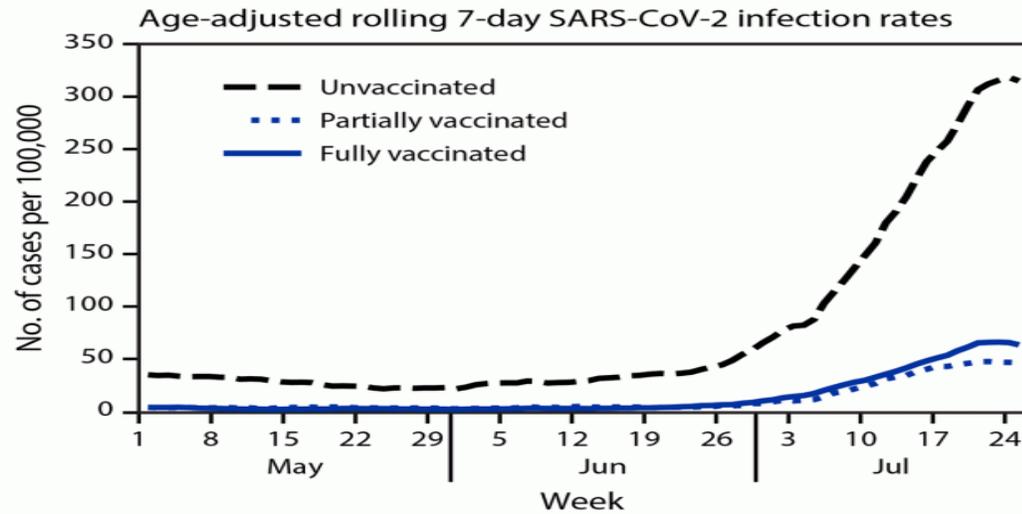
1. Vaccinations stalled at ~60% of eligible
2. CDC announced that vaccinated people do not need masks indoors
  - Correct based on short term data
  - Announced without longer term data
  - Utterly naïve about human behavior
3. The entire USA stopped wearing masks
  - Many people headed for the beach or the bar
  - Air travel and vacations took off
4. Some politicians forbade sensible public health measures
5. Delta variant got the opening it needed
  - Infections disseminated widely



# CDC: Vaccine Efficacy Versus Delta Variant

Reduced Effectiveness for Infection, Still Highly Effective Against Severe Disease

	USA – Nursing Homes (Pfizer) MMWR August 18 2021	USA – Nursing Homes (Moderna) MMWR August 18 2021	USA – Health Workers MMWR August 24 2021
Pre-Delta	74%	75%	91%
Delta	52%	51%	66%



MMWR August 24 2021

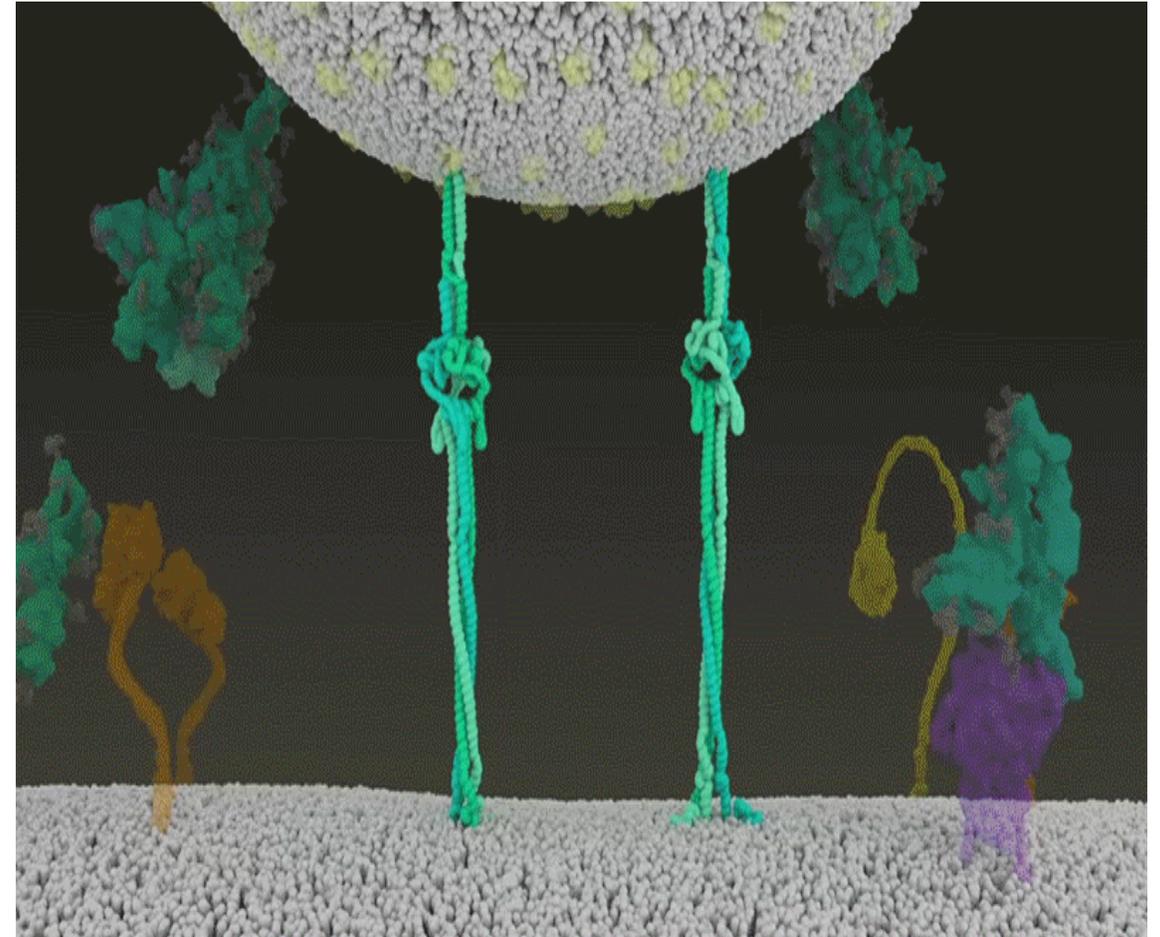
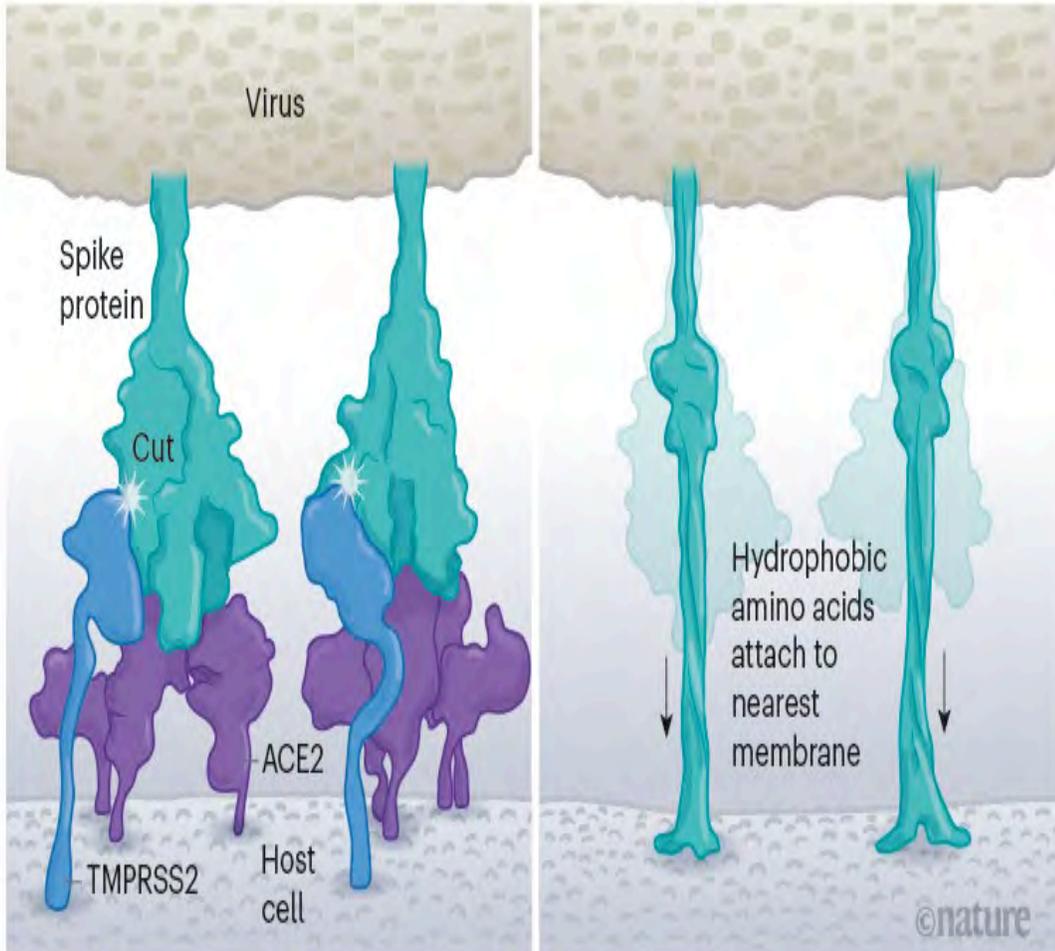
# Why is Delta So Hard to Control?

And Why the Disconnect Between Infection and Severe Disease?

- Host factors
  - Some people develop lower antibody response to immunization (vaccination or infection)
  - All antibody levels decline with time after immunization
  - Although immunized cells mount a rapid response to re-infection, it is not instantaneous
  - People with breakthrough infections have only 10-35% neutralizing antibody levels as controls
- Virus factors
  - Delta is 3x less sensitive to neutralization by antibodies against previous strains
  - Delta 2x more infectious
    - present at high levels in nasopharynx → gives high dose of virus
    - more efficient at infecting cells
- High dose of more infectious virus temporarily overwhelms immune defenses
  - Decoupling between infection and severe disease likely due to immune response “catching up”
- Delta may be associated with more severe disease

# Why is Delta More Contagious?

Spike Protein Function Modification is One Reason



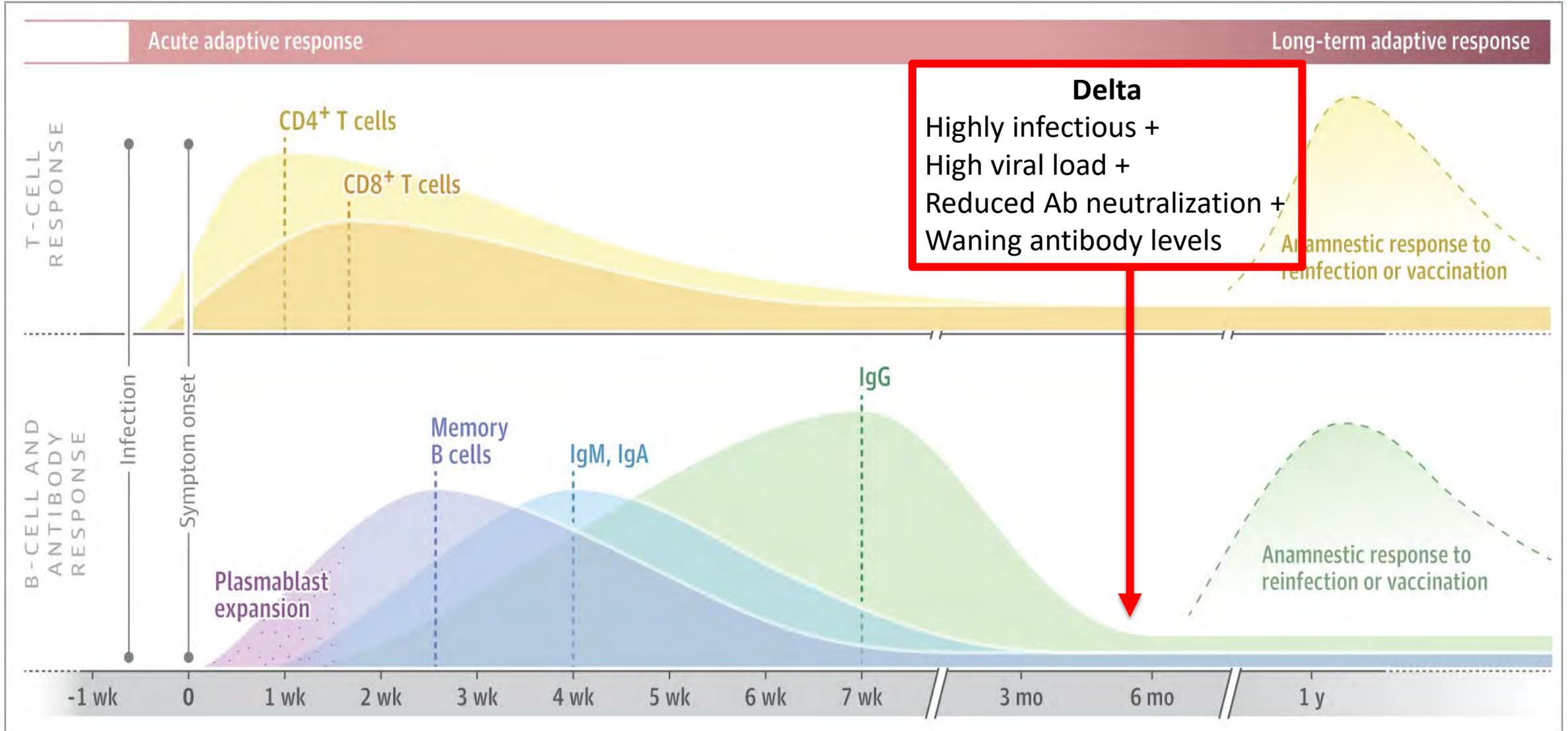
Source: Janet Iwasa, Univ. Utah; Graphic: Nik Spencer/Nature

An animation of the way SARS-CoV-2 fuses with cells.

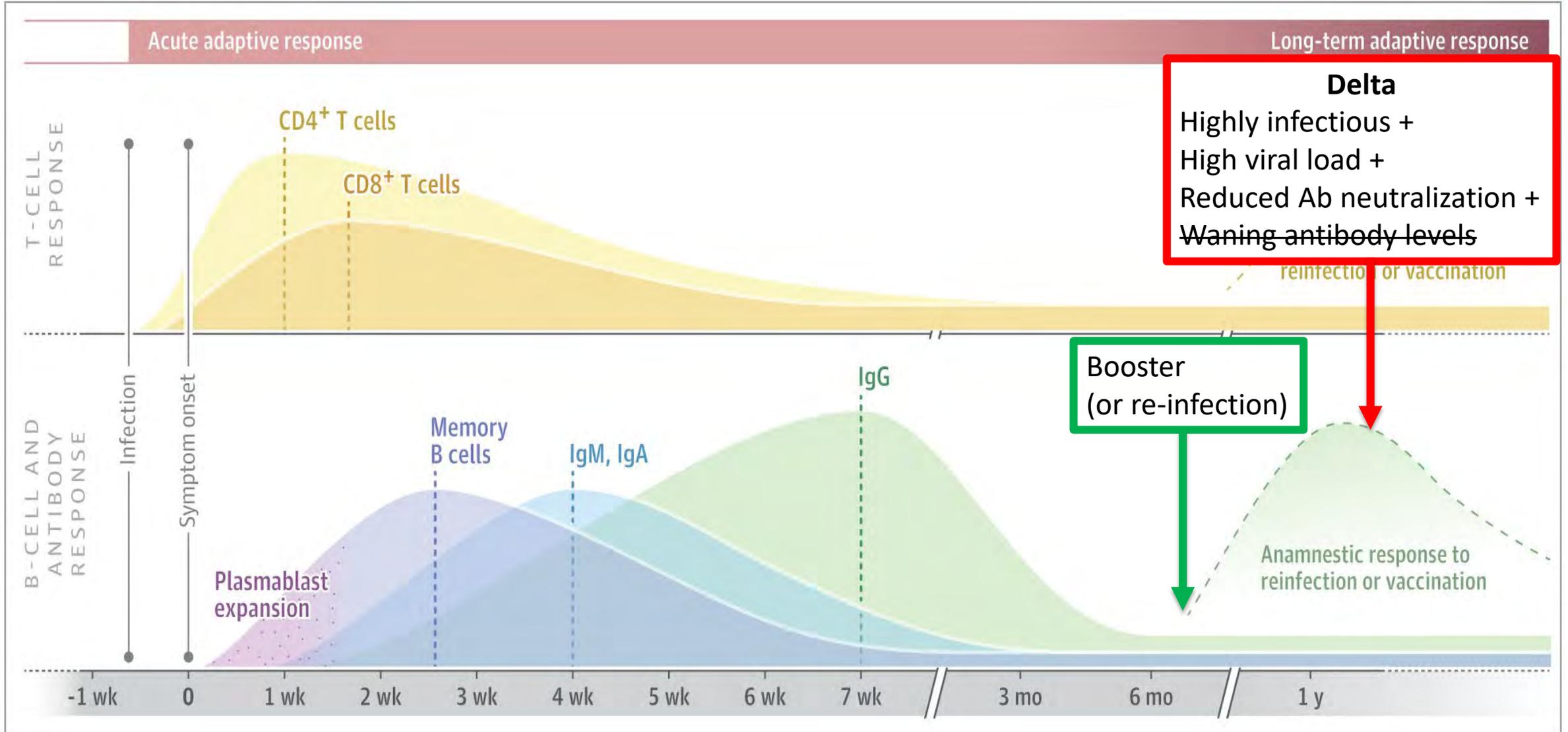
Credit: [Janet Iwasa, University of Utah](https://www.nature.com/articles/d41586-021-02039-y#ref-CR24)

<https://www.nature.com/articles/d41586-021-02039-y#ref-CR24>

# Delta Breakthrough Infections: Putting It All Together



# Delta Breakthrough Infections: Rationale for Boosters

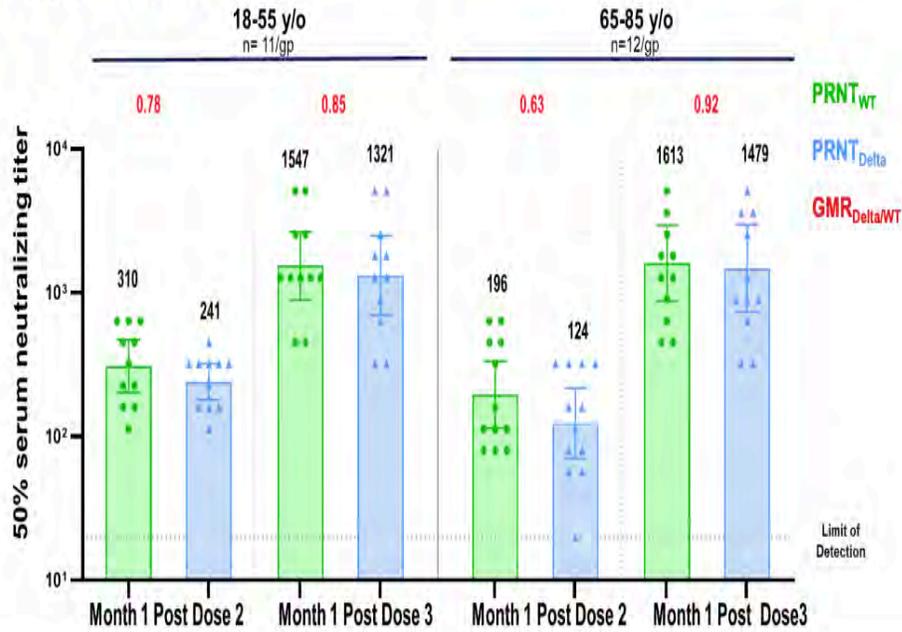


# Booster Shots

What do they do? Who needs them? How will we deliver them?

# Booster Shot In Vitro Data

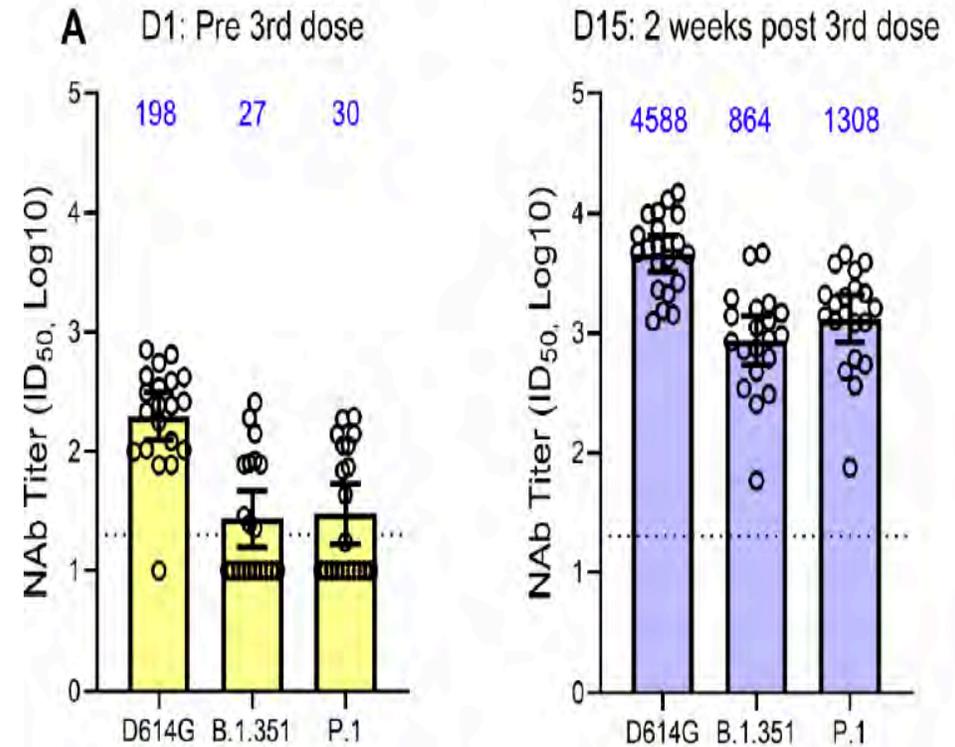
## COVID-19 Vaccine: 3<sup>rd</sup> Dose Strongly Boosts Neutralizing Titers Against Delta Strain<sup>1,2</sup>



Post dose 3 titers vs. the Delta variant are **>5-fold post dose 2 titers** in 18-55 y/o & **>11-fold post dose 2 titers** in 65-85 y/o  
 Estimated potential for up to **100-fold increase in Delta neutralization post-dose three** compared to pre-dose three

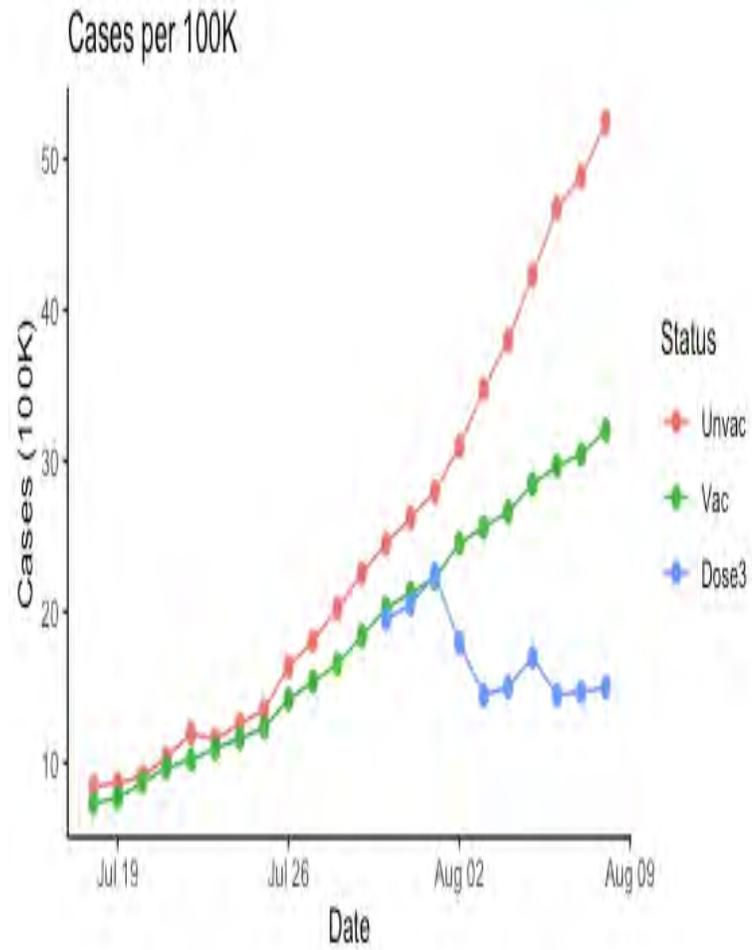
1. Initial data; 2. Samples were tested against each variant separately; PRNT: Plaque Reduction Neutralizing Test; Wt: Wild Type; GMR: Geometric Mean Ratio

## Immunogenicity After Boosting with Booster Dose of 50 µg of mRNA-1273



# Do Booster Shots Reduce Infections?

## Country of Israel Data



### Maccabi Health Services Data

824,774 over 60 yo

Booster →

86% effective in preventing infection

### Israeli Ministry of Health Data

1,144,690 over 60 yo

Booster →

11-fold decrease in rate of infection

10 fold decrease in rate of severe disease

# Who Might Benefit from a COVID-19 Booster?

Biden administration aims to offer boosters starting September

- Older (> 65) age
  - Antibody response lower and wanes faster in older people
  - Older people have more comorbidities and higher risk of severe disease
- Health care workers and other essential frontline workers
- Immunocompromised people
  - Multiple studies show reduced or absent antibody response to vaccination
  - Response to third dose in a substantial minority
- Completed vaccine series longer ago
  - Antibody titers from natural infection or vaccination decline with time
  - Not everyone agrees with this use!
    - Vaccine protection against “any infection” will wane, but against severe infection may be durable
- CDC ACIP meeting (August 30) discouraged boosters without more data
  - CDC will use risk-based criteria used for Prime Series

# On the Other Hand: Boosters Around the World

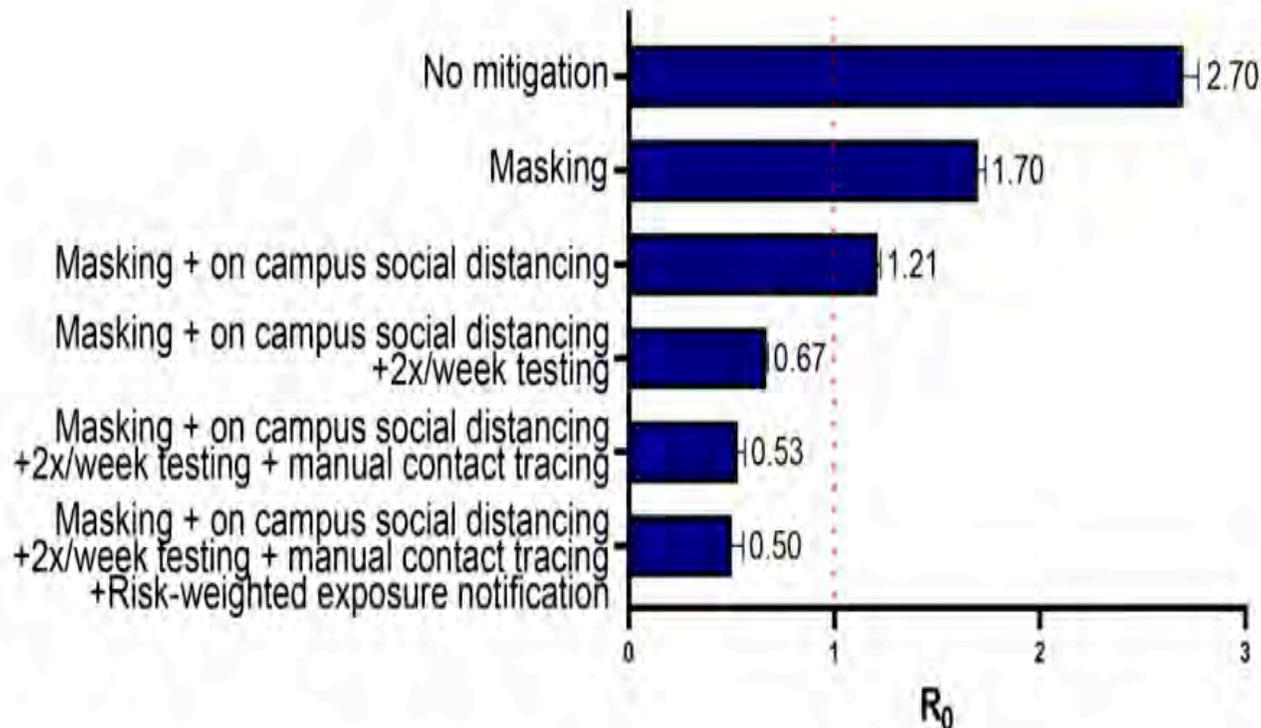
CDC ACIP meeting (August 30) discourages boosters without more data

- Israel started given 3<sup>rd</sup> dose of Pfizer-BioNTech to persons over 60 who had completed their second dose 5 months ago or longer on 7/30/21; gradually expanded to include entire population.
- Hungary started offering 3<sup>rd</sup> dose to anyone who had completed full vaccination 4 months ago or longer beginning 8/1/2021. Physician choice on vaccine type.
- Germany has stated it will give boosters in September 2021 with Pfizer-BioNTech or Moderna to older people, residents of care homes and persons with compromised immune systems. Also offering mRNA boosters to persons previously vaccinated with AZ or Janssen.
- France has stated it will give third booster to “the elderly and vulnerable” starting in September 2021.
- UK plans to offer third booster to those at highest risk (elderly, clinically extremely vulnerable and frontline healthcare workers) starting in September 2021.

# Beyond Boosters – Protect Yourself in Other Ways

# Mitigation Works! Effects in School Settings

**University of Illinois (Comparable results with similar programs at Cornell University and Northeastern University)** medRxiv 2021.08.03.21261548

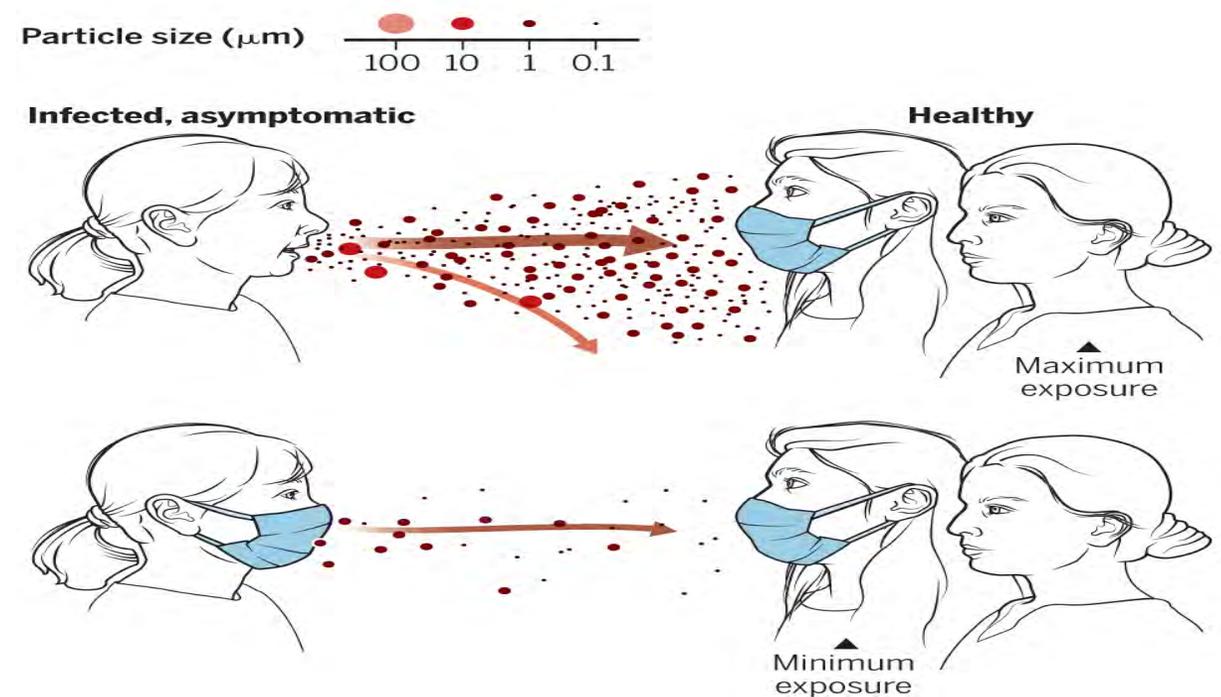


## CDC Analyses of K-12 Schools (MMWR March 26, 2021)

- **Springfield, MO**
  - Masks, distancing, ventilation, contact tracing
  - Effective in reducing in-school transmission
  - Low in-school transmission despite high community transmission
- **Salt Lake County, UT**
  - Low in-school transmission despite high community transmission
  - High mask adherence but separation only ~3 feet

# Mask Misconceptions

- **Masks do not work**
  - Masks protect healthy people from infected people!
  - Reduce egress/ingress of infected droplets and aerosols
- **The virus is smaller than the pores in the mask**
  - Droplets are larger than pores
  - Aerosols are trapped by other mechanisms
- **Masks restrict oxygen supply**
  - Measurements show **no effect** on oxygen or carbon dioxide
- **Masks are not needed with social distancing**
  - Wrong! Sneezes and coughs can travel 30 feet
- **Masks are not needed outdoors**
  - Risks much lower outdoors
  - But transmission still possible (e.g., crowds)
  - Use your judgement
- **Masks not needed after vaccination**
  - Vaccines not 100% protective
  - Reducing the dose of virus is important
  - Possibility of transmission to vulnerable people



100 micron droplet settles in 5 sec  
1 micron aerosol takes 12 hours

# Masks

## Types of Masks That Work Best



N95



KF94

<https://www.who.int/emergencies/diseases/novel-coronavirus-2019/advice-for-public/when-and-how-to-use-masks>



Surgical  
ASTM Level 3  
+/-  
Cloth mask



KN95

<https://www.fda.gov/medical-devices/coronavirus-covid-19-and-medical-devices/face-masks-including-surgical-masks-and-respirators-covid-19>

# Should You Take Precautions?

## Common Sense Approach

- How susceptible are you?
  - Vaccinated?
  - Risk factors for severe disease?
  - Immune suppression?
- How prevalent is infection in the community?
  - Prevalence of variants of concern
- What exposure are you envisioning?
  - Vaccinated family gathering vs. movie theater, Costco, airport, etc.
  - Indoors vs. outdoors
  - Quiet (watching TV) vs. aerosol generating (choir practice)
  - Brief vs. extended
- What's the downside of being cautious?

# The Future

“We’re better at explaining the past than at predicting the future”  
– Andrew Read, viral evolutionary biologist

- What could happen next?

- Lesser, endemic surges if delta is at “optimum fitness” for the virus

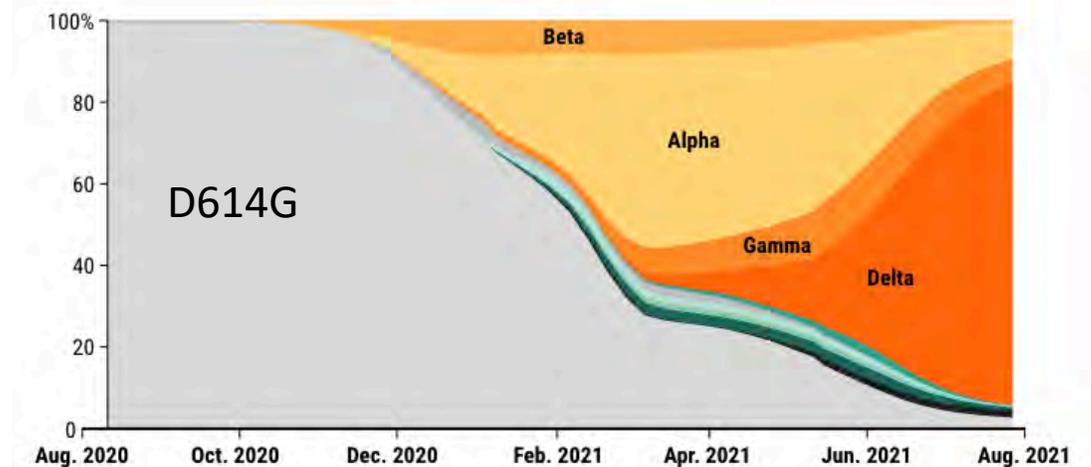
- possible, but not the way to bet

- Mutations

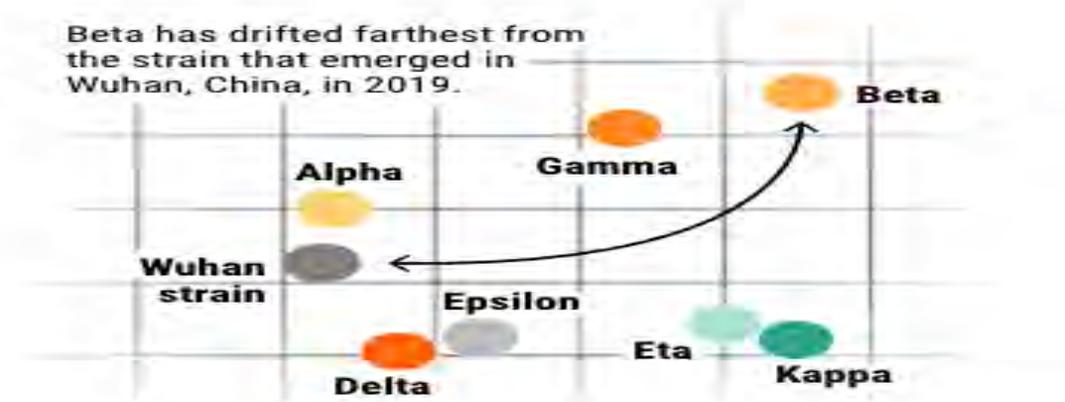
- leading to increased or decreased severity of illness
- leading to increased viral “fitness” for infection and/or transmission
- gradual immune escape under selective pressure of population immunity
- limited correlation between these effects

- Sudden immune escape due to viral recombination

- very challenging scenario requiring emergency deployment of updated vaccines



(GRAPHIC) N. DESAI/SCIENCE; (DATA) NEXTSTRAIN; GISAIID



(GRAPHIC) N. DESAI/SCIENCE; (DATA) DEREK SMITH/UNIVERSITY OF CAMBRIDGE; DAVID MONTEFIORI/DUKE UNIVERSITY

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# THANK YOU FOR ATTENDING OUR TOWN HALL CONVERSATION

If you'd like more information about the topics discussed today, or would like to support the COVID-19 Front-Line Heroes Appreciation Initiative, please contact us at [foundation@houstonmethodist.org](mailto:foundation@houstonmethodist.org).

*Take care and be well*

