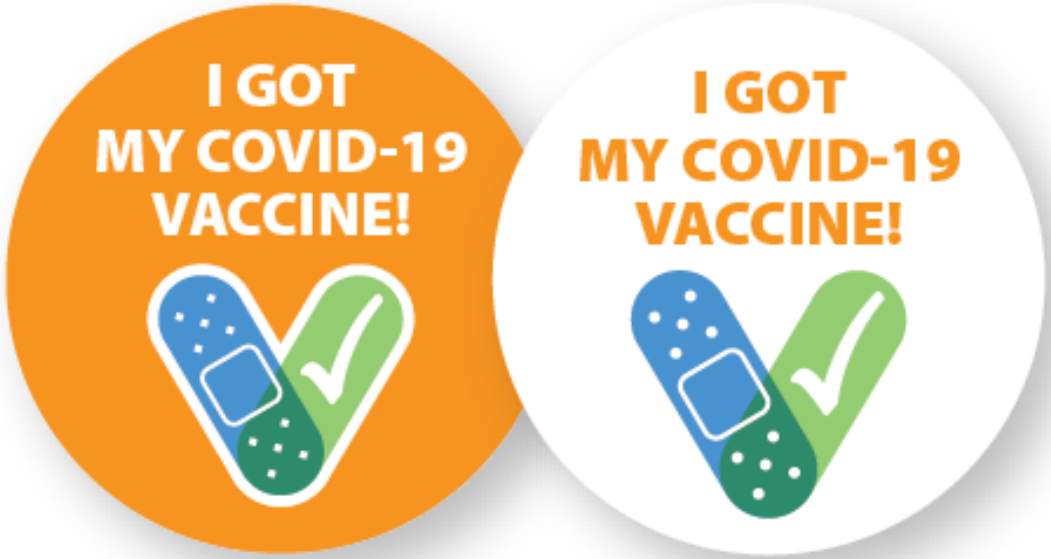
COVID-19 Vaccination: Should I?



Dr. Brian Wu, MD, FAAP

HMSA Medicaid Medical Director

Pediatric Pulmonologist

https://hawaiicovid19.com/vaccine/

Where Are **You** in the Vaccine Timeline?

In Progress Phase 1a

- Healthcare personnel **5% population**
- Long-term care facility residents **1%**

Essential Workers:
Workers who are in sectors essential to the functioning of society and are at substantially higher risk of getting COVID-19

In Progress Phase 1b

- First responders **11%**
- Frontline essential workers **9%**
- Adults 70+ years of age

In Progress Phase 1c

- Adults age 65 to 69 years **10%**
- Persons 16 to 64 years with high-risk medical conditions **30%***
- Essential workers not included in the previous group **7%**

May 2021 Phase 2

- Persons 16 years and older not in other categories

Details on vaccine distribution and supply are being regularly updated with new guidelines from the CDC and other authorities. Please keep informed by visiting ***HawaiiCOVID19.com/vaccine***

Rev. 3/12/21

PHASING INTO 1C

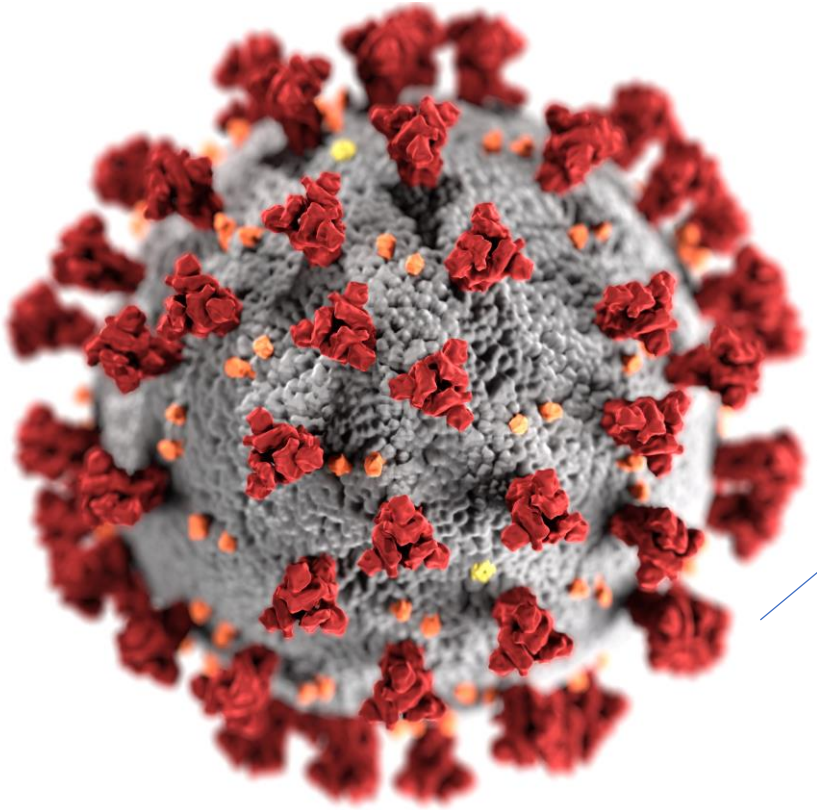
Medical conditions:

- Dialysis
- On oxygen
- Chemotherapy or other infusion therapy

Essential workers:

- Hotel
- Restaurant
- Bar

COVID19: How does your immune system work



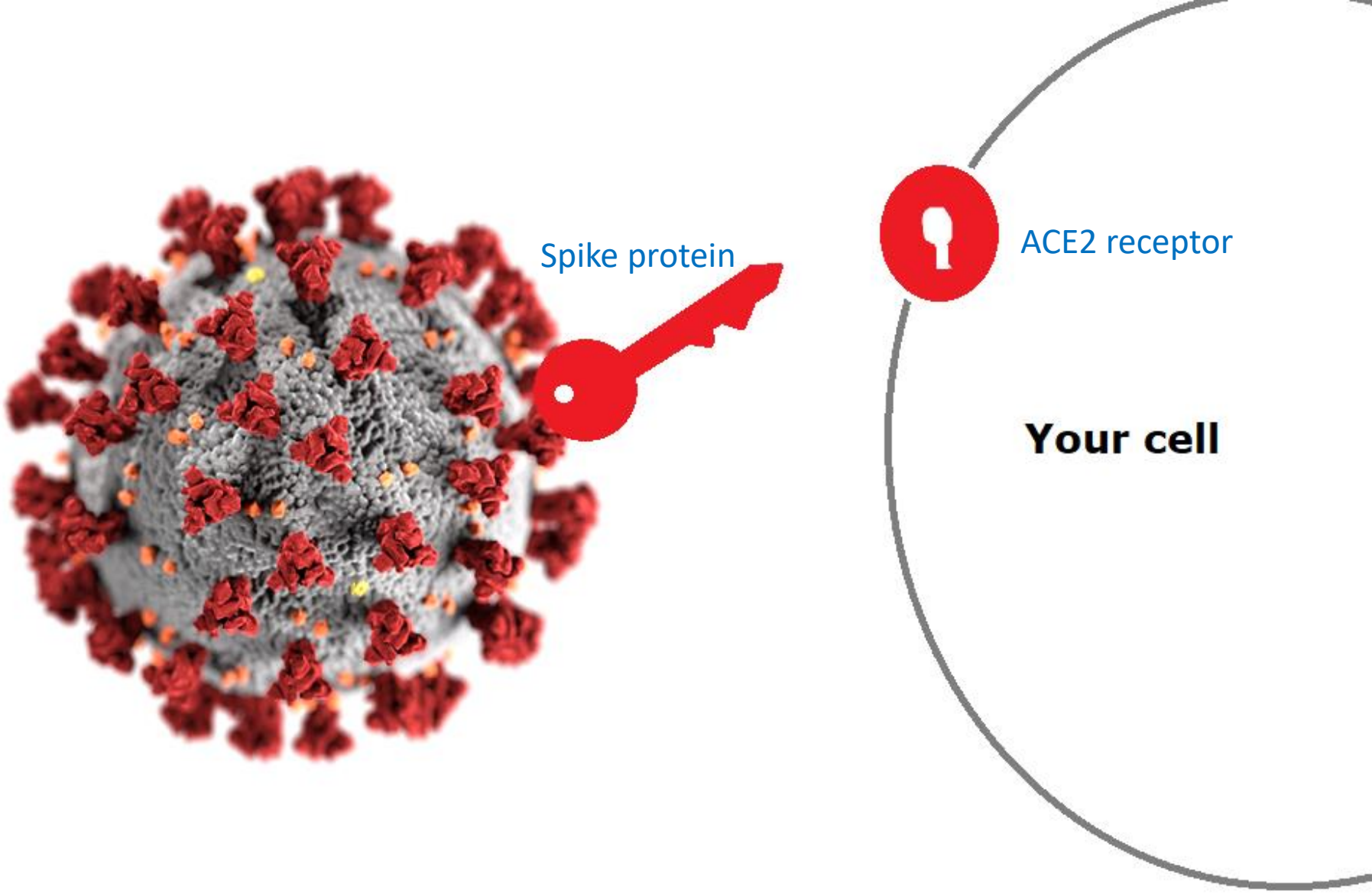
Protein “spikes”

Illustration of virus causing COVID-19 (SARS-CoV-2)

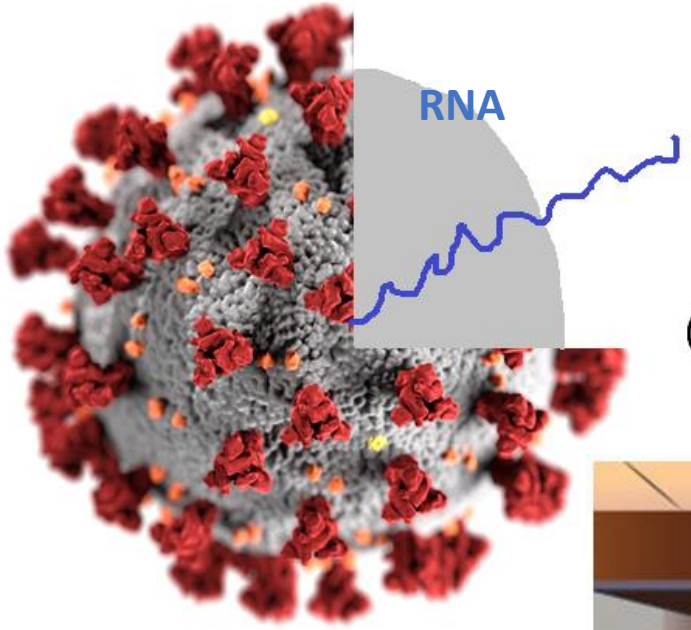
CDC Image Library

Importance of spike protein

1. “Key” to infecting our cells
2. Our immune system’s target to attack the virus
3. Variant strains
4. Focus of most vaccines



Once virus is in your cell…



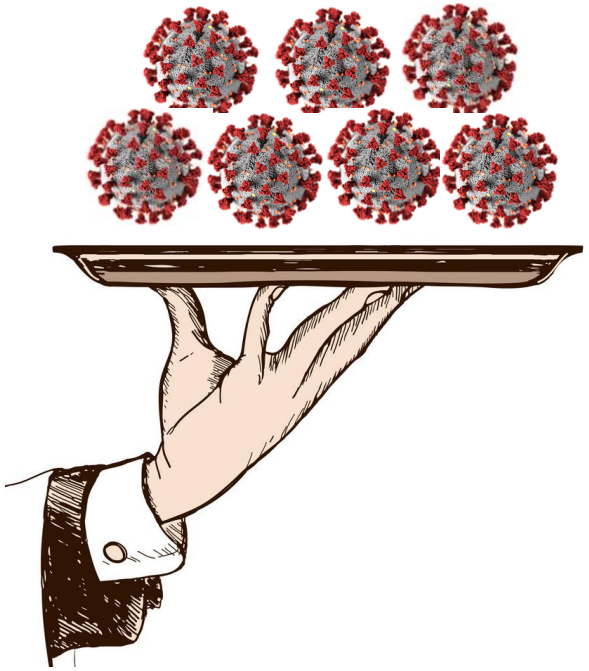
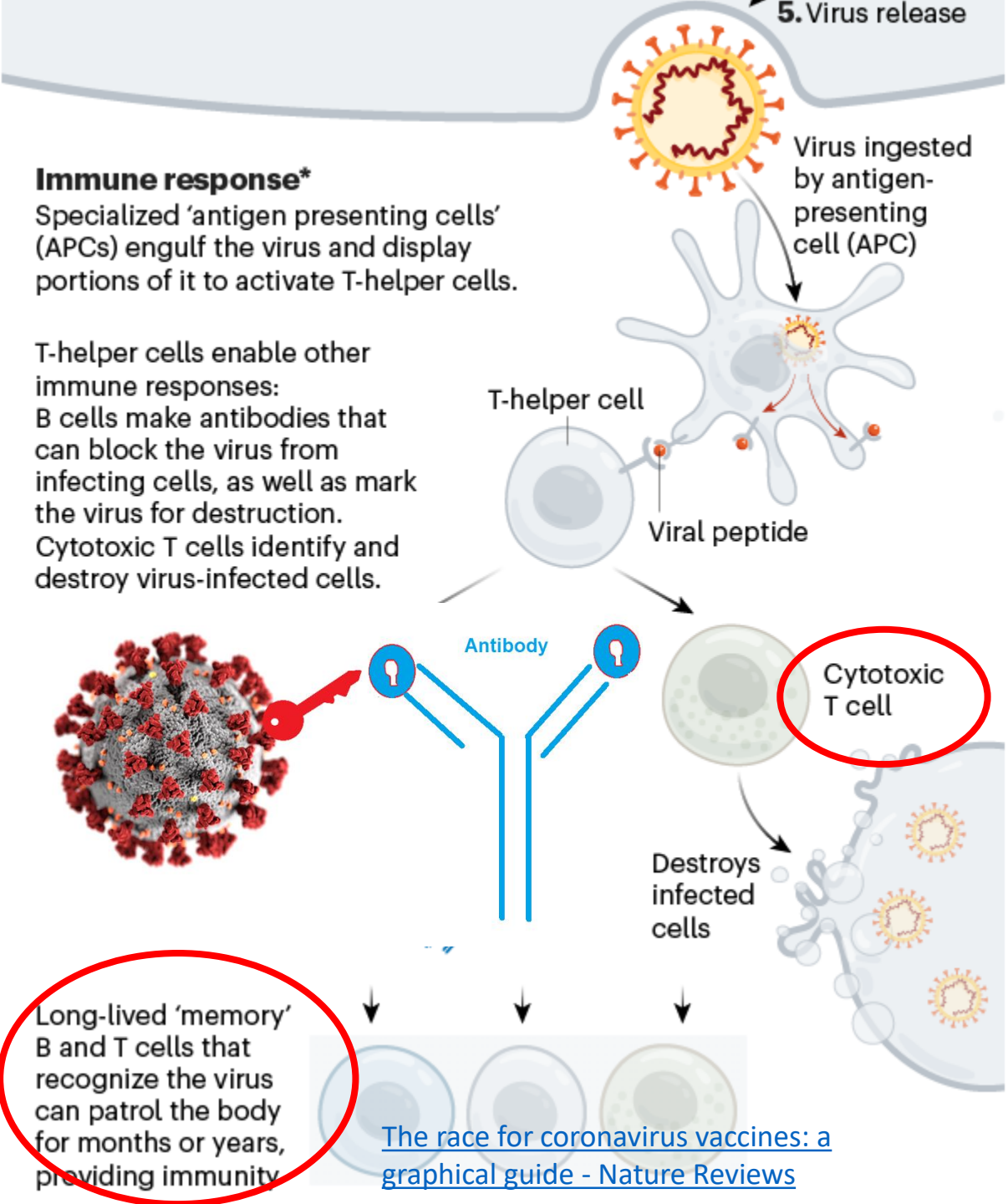


Image Source

Uses your cells "kitchen" to make more of itself

Image Source



The race for coronavirus vaccines: a graphical guide - Nature Reviews

How long will immunity last after COVID infection?

- Still to be determined…
- Studies suggest an antibody response for many (6+*) months, possibly longer
  - This will vary by individual, for example
    - Age
    - Immunocompromised
    - Possibly severity of initial infection
- T cell response affects the severity of the disease

Immunological memory to SARS-CoV-2 assessed for up to 8 months after infection - Science

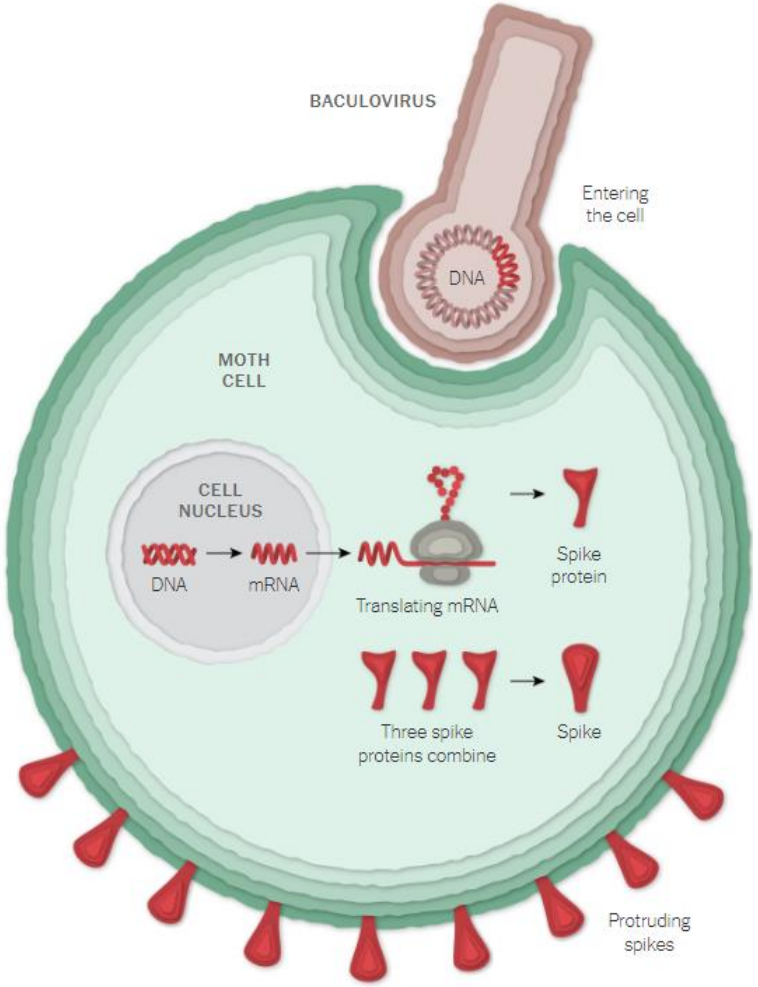
Vaccinations: the light *to* the end of the tunnel

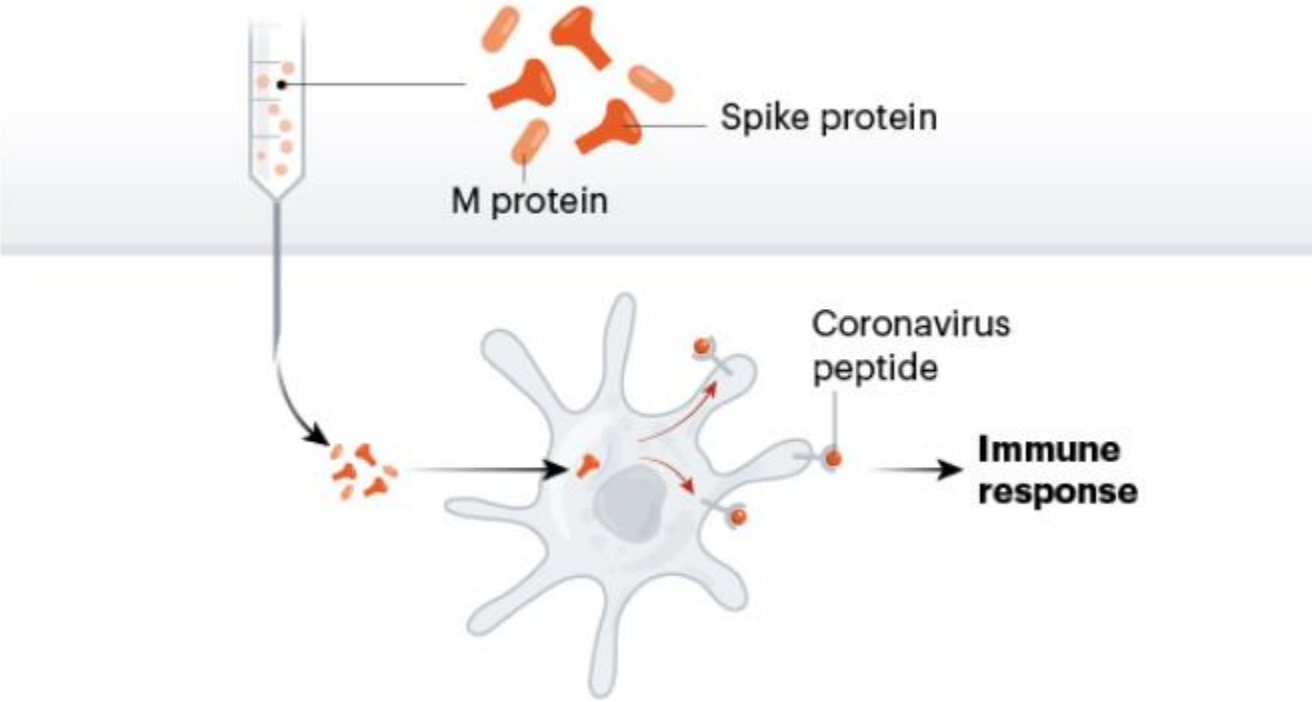
- All vaccines are trying to do the same thing:
  - Provide a safer way (than getting disease) to build a protective immune response
- There are different ways to do that. 2 major categories:
  1. Put in the vaccine part of the virus, a weakened/killed virus
     - This is the traditional ways vaccines have been developed

https://images.app.goo.gl/nhY5Q1r5NvcpGFxp7

Viral targets for vaccines against COVID-19 - Nature Reviews

Protein-based vaccine (Novavax)





- [How the Novavax Vaccine Works - NY Times]
- [The race for coronavirus vaccines: a graphical guide - Nature]

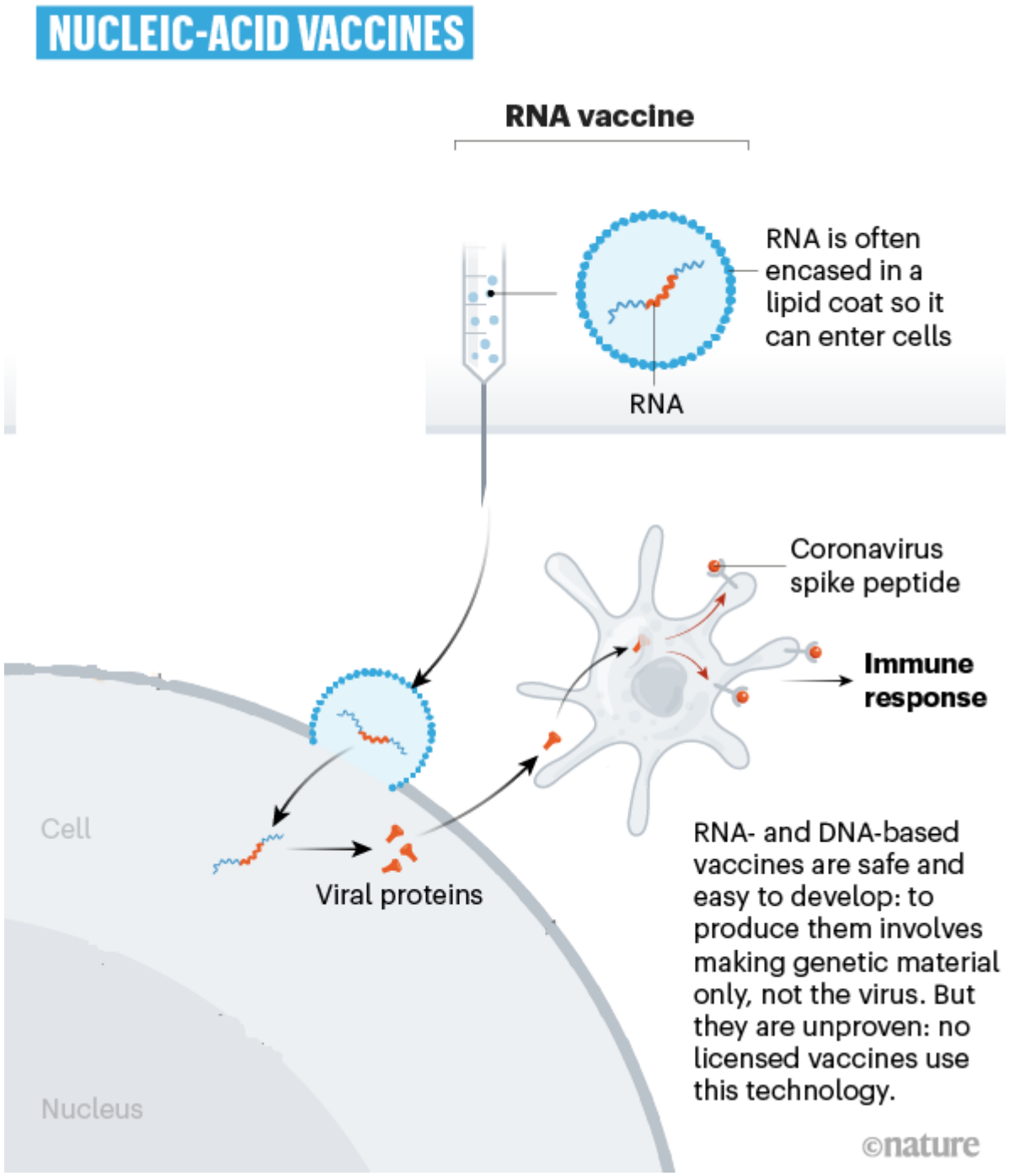
Why are the current COVID vaccines different from other vaccines?

- All vaccines are trying to do the same thing:
  - Provide a safer way (than getting disease) to build a protective immune response
- There are different ways to do that. 2 major categories:
  1. Put in the vaccine part of the virus, a weakened/killed virus
     - This is the traditional ways vaccines have been developed
  2. Put in the vaccine instructions for how to make a part of the virus so our own body can use it to produce that part

Viral targets for vaccines against COVID-19 - Nature Reviews

mRNA vaccines (Moderna, Pfizer)

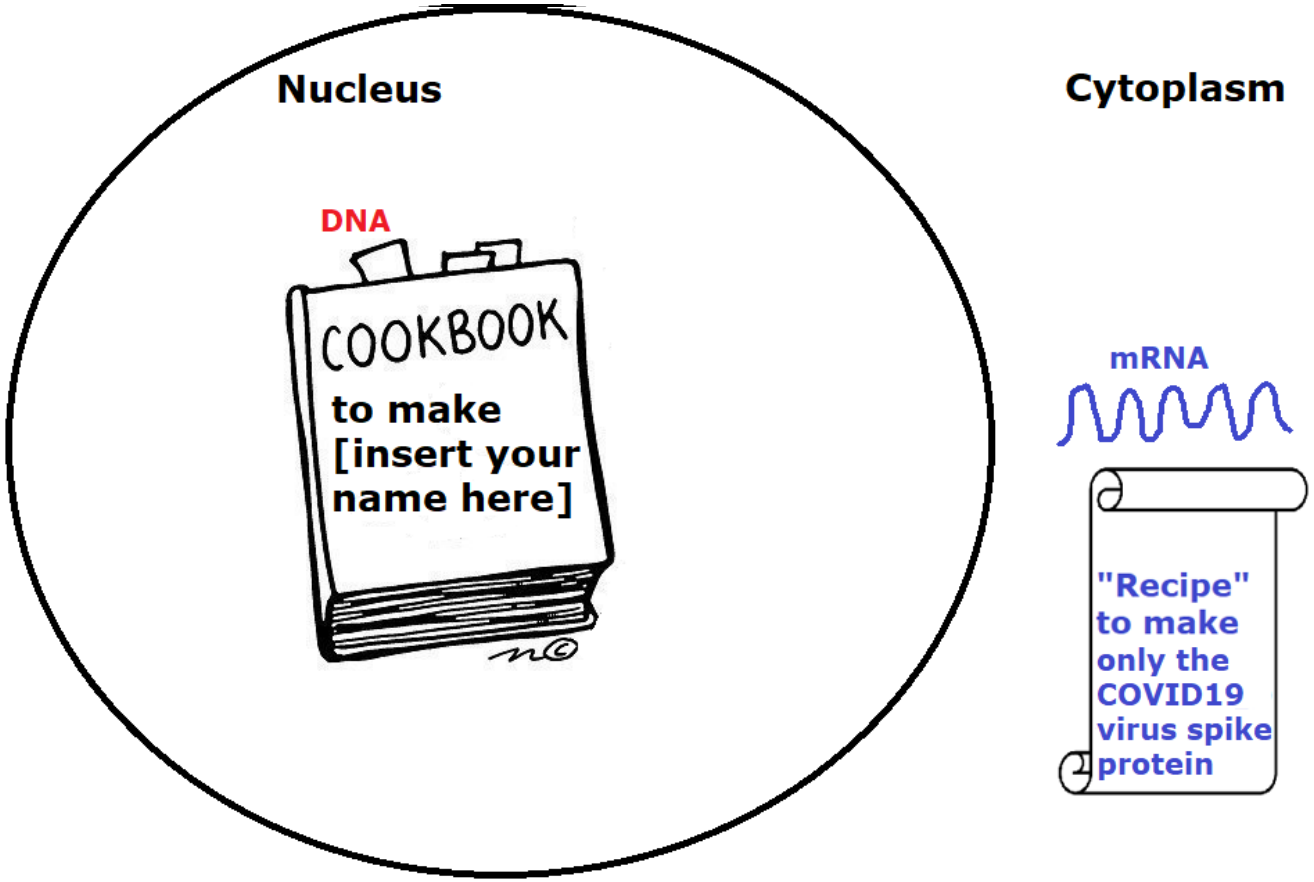
- First time used in humans BUT….
- Have been researched for **decades**
- Actively worked on for SARS, Zika, rabies, CMV, this work accelerated development of COVID-19 vaccines
- Ability to adjust easily (just need mRNA “recipe”)
- Injected mRNA does NOT stay in our body long, and it degrades quickly (typically within hours)



- [Viral targets for vaccines against COVID-19 - Nature Reviews]
- [Understanding mRNA COVID-19 Vaccines - CDC Website]

Can these mRNA vaccines change my DNA?

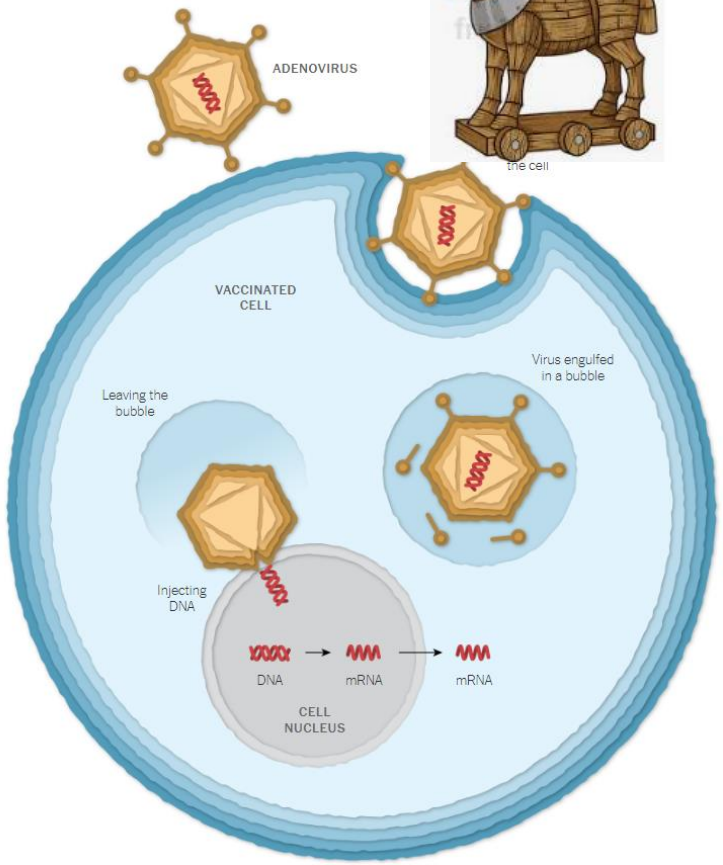
- mRNA is NOT the same as DNA
- mRNA does not go to part of cell (nucleus) where DNA is
- mRNA would not combine into the DNA
- Thus, mRNA vaccines **would not** cause any genetic changes.

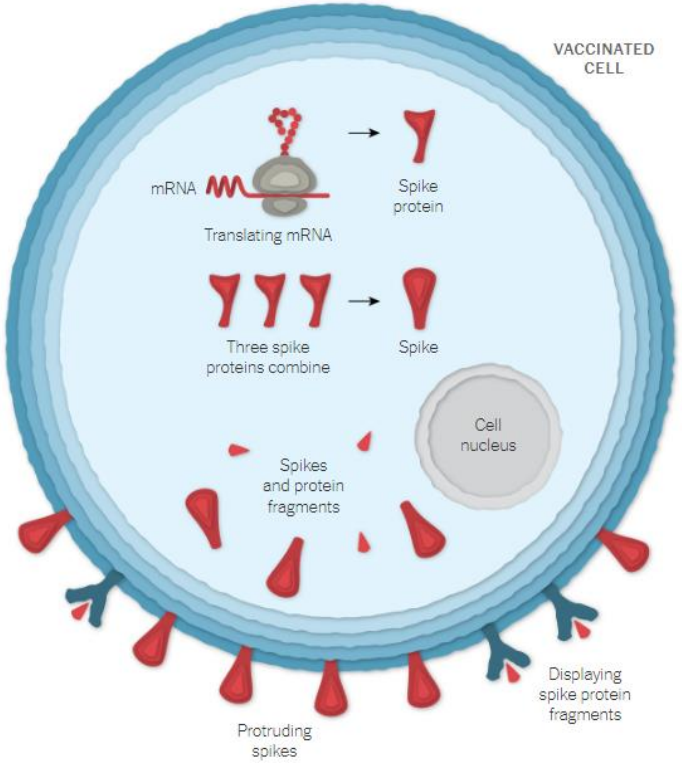


Viral-vector vaccines (J&J, AstraZeneca-Oxford)

- Non-disease causing non-replicating viral vector
- J&J adenovirus is cultured in PER.C6 fetal cell line
  - 36 years ago
  - Purified to remove all fetal cells from vaccine
- Ebola vaccine is a viral vector
- Long history in gene therapy

https://friendlystock.com/product/trojan-horse/





How the Johnson and Johnson Vaccine Works (New York Times)

Comparing Pfizer, Moderna, J&J

* Denotes for efficacy analysis

Vaccine	Pfizer-BioNtech	Moderna	J&J
FDA approved?	Yes (EUA)	Yes (EUA)	Yes (EUA)
Type	mRNA	mRNA	Viral vector
Doses	2 (21 days)	2 (28 days)	1
Cold storage	Ultra-cold (-94°F) but up to 2 weeks freezer (-13°F to 5°F)	Refrigerator (36-46°F) up to 30 days	Refrigerator (36-46°F)
Trial size (baseline COVID neg)	43,661	30,420	43,783
Age eligibility	**16+**	18+	18+
Participants < 65 years	26,420*	22,853*	35,222
Participants ≥ 65 years	9,287* (1,559 were >75 y)	7,135* (1,318 were >70 y)	8,561 (1,561 ≥75 y)
Race (non-White)	20.8%	17.8%	41%

- BNT162b2 Vaccine Candidate Against COVID-19 - William Gruber, MD, FAAP, FIDSA
- Overview of Janssen's Single-Dose COVID-19 Vaccine, Ad26.COV2.S

Comparing Pfizer, Moderna, J&J | Part 2

* Denotes for efficacy analysis

Vaccine	Pfizer-BioNtech	Moderna	J&J
FDA approved?	Yes (EUA)	Yes (EUA)	Yes (EUA)
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Comparing Pfizer, Moderna, J&J | Part 3

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Trial size (baseline COVID neg)	43,661	30,420	43,783
Age eligibility	**16+** (studying 12+ now)	18+ (studying 6 months+)	18+
Participants < 65 years	26,420*	22,853*	35,222
Participants ≥ 65 years	9,287* (1,559 were >75 y)	7,135* (1,318 were >70 y)	8,561 (1,561 ≥75 y)
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  - Overview of Janssen's Single-Dose COVID-19 Vaccine, Ad26.COV2.S

Comparing Pfizer, Moderna, J&J | Part 4

* Denotes for efficacy analysis

Vaccine	Pfizer-BioNtech	Moderna	J&J
FDA approved?	Yes (EUA)	Yes (EUA)	Yes (EUA)
Type	mRNA	mRNA	Viral vector
Doses	2 (21 days)	2 (28 days)	1
Cold storage	up to 2 weeks freezer (-13°F to 5°F)	Refrigerator (36-46°F) up to 30 days	Refrigerator (36-46°F)
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  - Overview of Janssen's Single-Dose COVID-19 Vaccine, Ad26.COV2.S

Comparing Pfizer, Moderna, J&J | Part 5

* Denotes for efficacy analysis

Vaccine	Pfizer-BioNtech	Moderna	J&J
FDA approved?	Yes (EUA)	Yes (EUA)	Yes (EUA)
Type	mRNA	mRNA	Viral vector
Doses	2 (21 days)	2 (28 days)	1
Cold storage	up to 2 weeks freezer (-13°F to 5°F)	Refrigerator (36-46°F) up to 30 days	Refrigerator (36-46°F)
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- Overview of Janssen's Single-Dose COVID-19 Vaccine, Ad26.COV2.S

How “effective” are the vaccines?

Vaccine	Hospitalizations - Vaccinated	Hospitalizations - Placebo	Deaths from COVID - Vaccinated	Deaths from COVID - Placebo
Pfizer/BioNTech	**0**	5	**0**	0
Moderna	**1**	9	**0**	1
J&J	**0**	6	**0**	5

- Safety and Efficacy of the BNT162b2 mRNA Covid-19 Vaccine -The New England Journal of Medicine
- Efficacy and Safety of the mRNA-1273 SARS-CoV-2 Vaccine - The New England Journal of Medicine
- Interim Results of a Phase 1–2a Trial of Ad26.COV2.S Covid-19 Vaccine - The New England Journal of Medicine

What about the 90ish (Moderna/Pfizer) vs 60ish% efficacy (J&J)??

- Difficult to compare the vaccines (need head-to-head trial)
  - Different demographics
  - Different definitions of efficacy used
  - Different point in time of pandemic
    - J&J done when more widespread, different viral strains
  - Different geographic areas

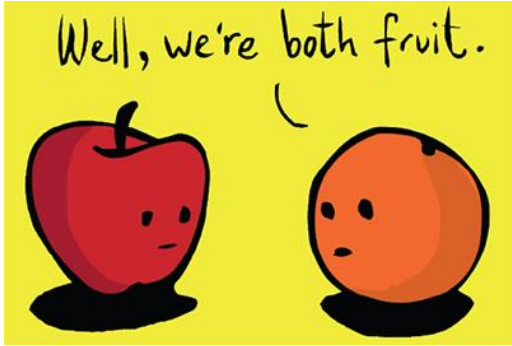
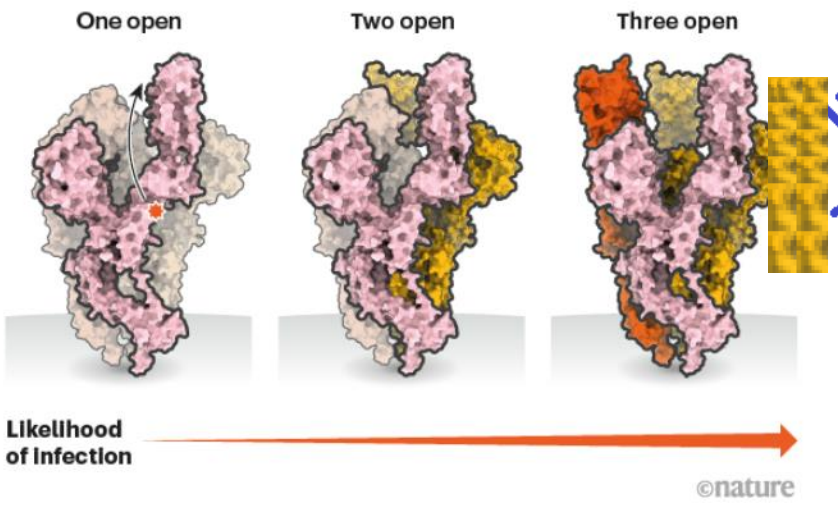


Image Source

- Take home:
  - All 3 are very very….very good at preventing deaths and hospitalizations from COVID

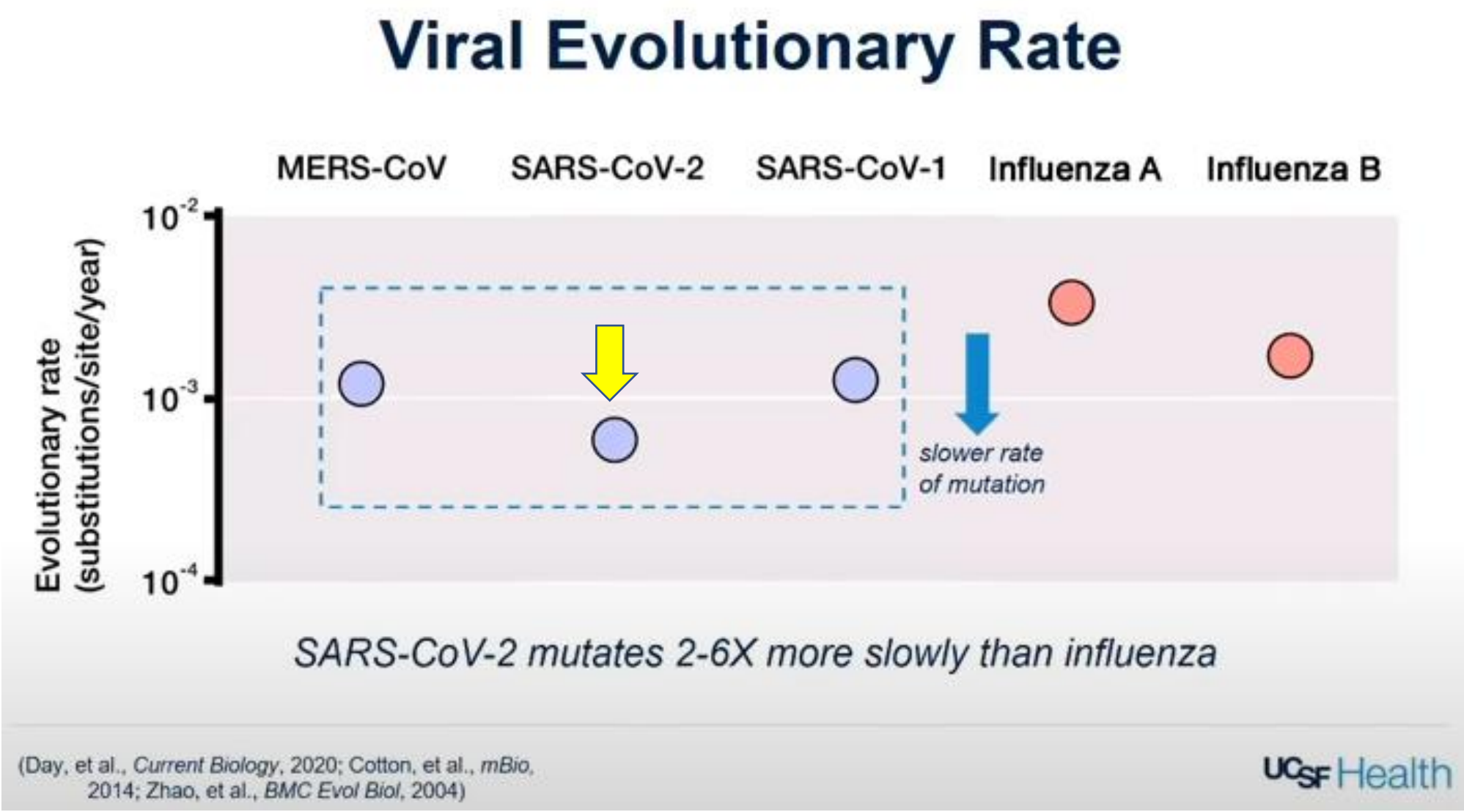
I want to wait, what about “mutant” strains?



- Image Source
- SARS-CoV-2, the COVID-19 Virus, is Mutating, But So Far, Slowly (BioSpace)

1. So far, current and upcoming approved vaccines have been **very effective** in preventing **severe** COVID disease
2. Virus cannot mutate if it cannot replicate. Widespread vaccination prevents emergence of variants
3. Get vaccinated when your prioritization group is up, don’t have to give up your “spot in line”.

- About Variants of the Virus that Causes COVID-19 - CDC Website
  - The coronavirus is mutating — does it matter? (Nature)



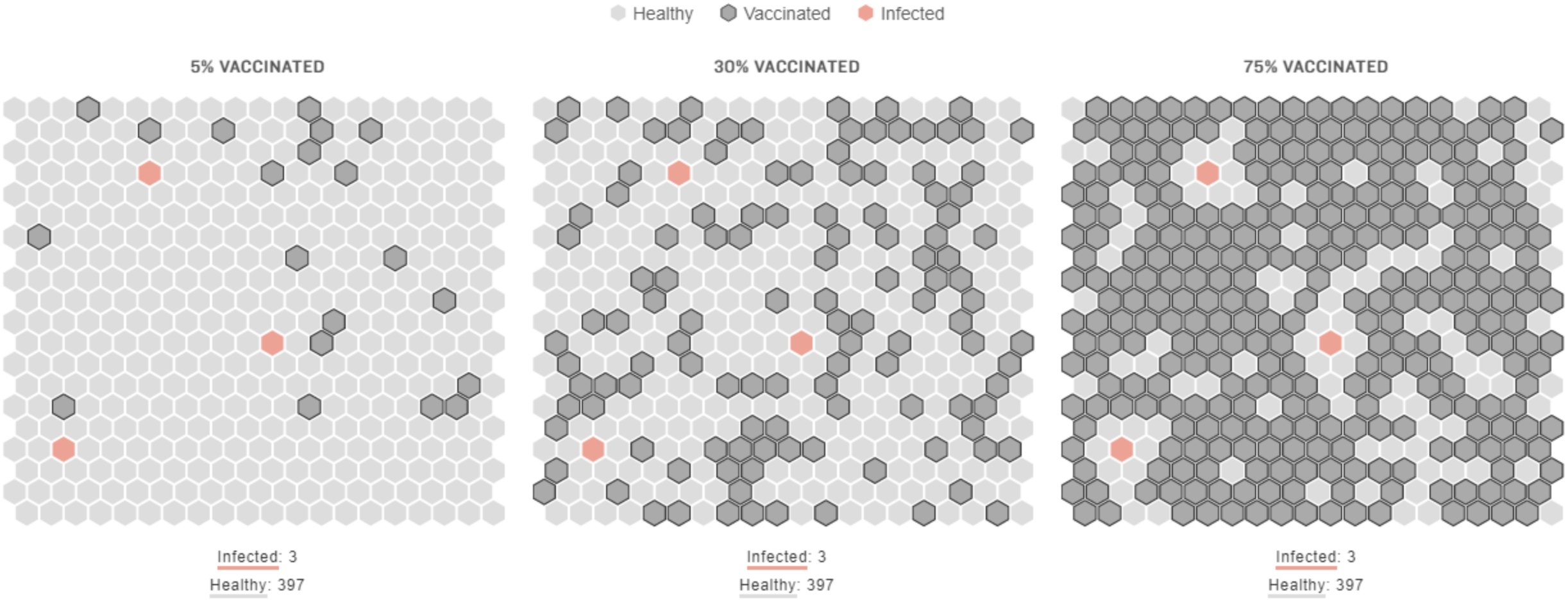
Covid-19: Update on Vaccines and Implications of the New Variants (Video)

Efficacy vaccines against emerging variants

VARIANT	FIRST FOUND	MORE TRANS-MISSIBLE?	DEADLIER?	EVADE VACCINES?	WHICH VACCINE EFFICACY **NOT** AFFECTED?
B.1.1.7	UK, Sept.	Yes: 50%-70%	Possibly	No	Pfizer, Moderna, J&J
B.1.351	South Africa, Oct.	More data needed	Possibly not?	Partially	N/A
P.1	Brazil, Dec.	Yes: 40%-120%	Possibly not?	Partially	Pfizer. Moderna unclear
B.1.526	NY, Nov.	More data needed	Possibly not?	More data needed	N/A
CAL.20C	CA, July	More data needed	Possibly not?	More data needed	N/A

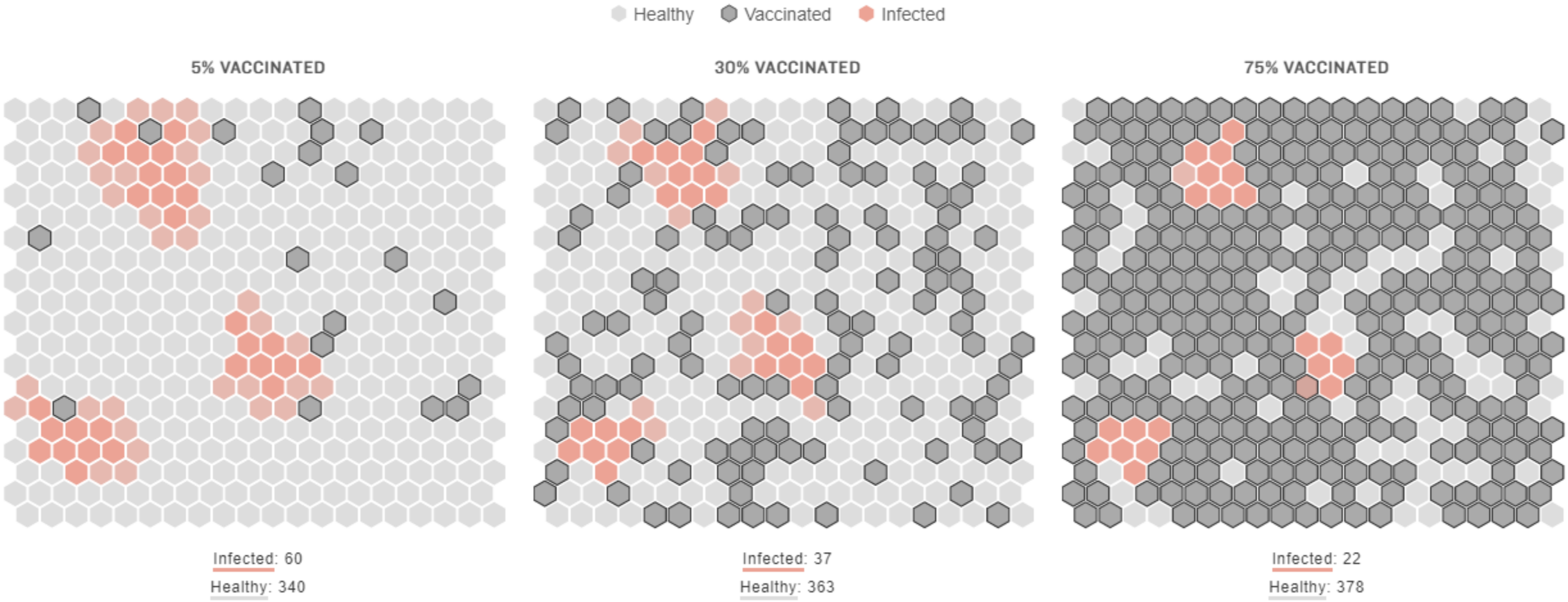
One chart shows how well COVID-19 vaccines work against the 3 most worrisome coronavirus variants (Insider)

Benefits of a community being vaccinated



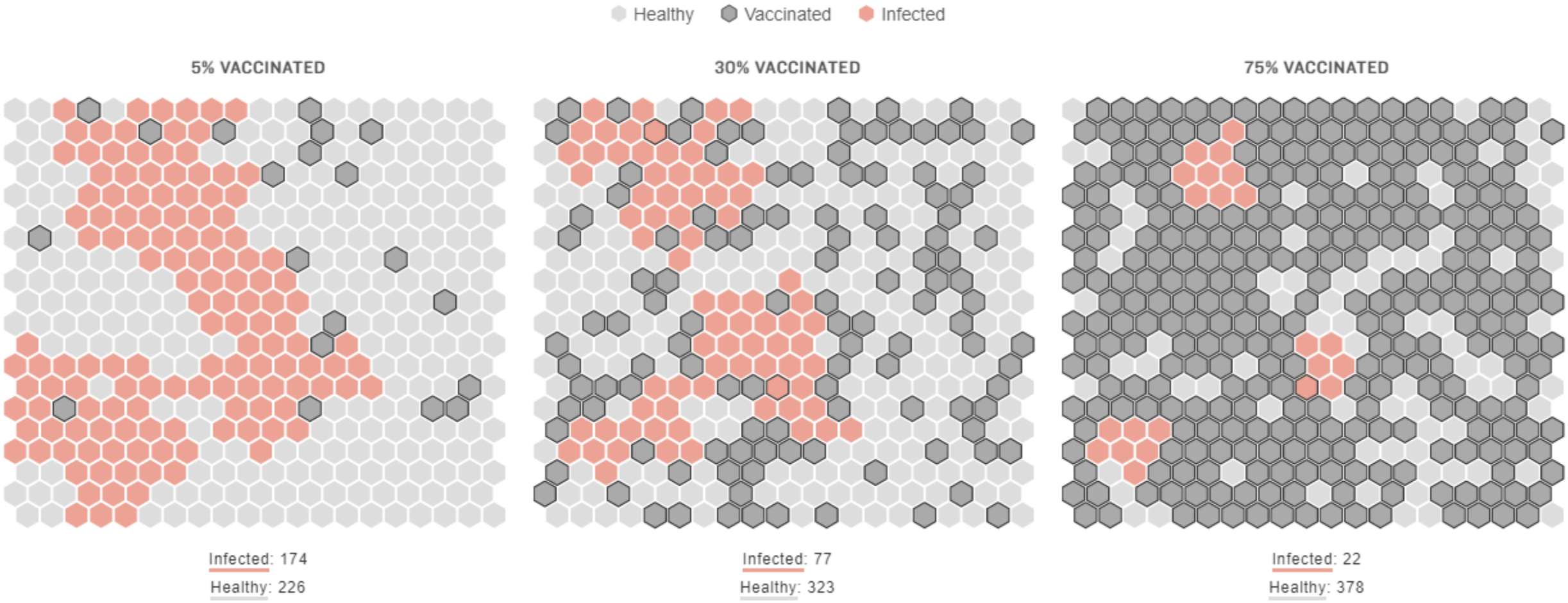
How Herd Immunity Works — And What Stands In Its Way (NPR)

Aka herd immunity through vaccinations



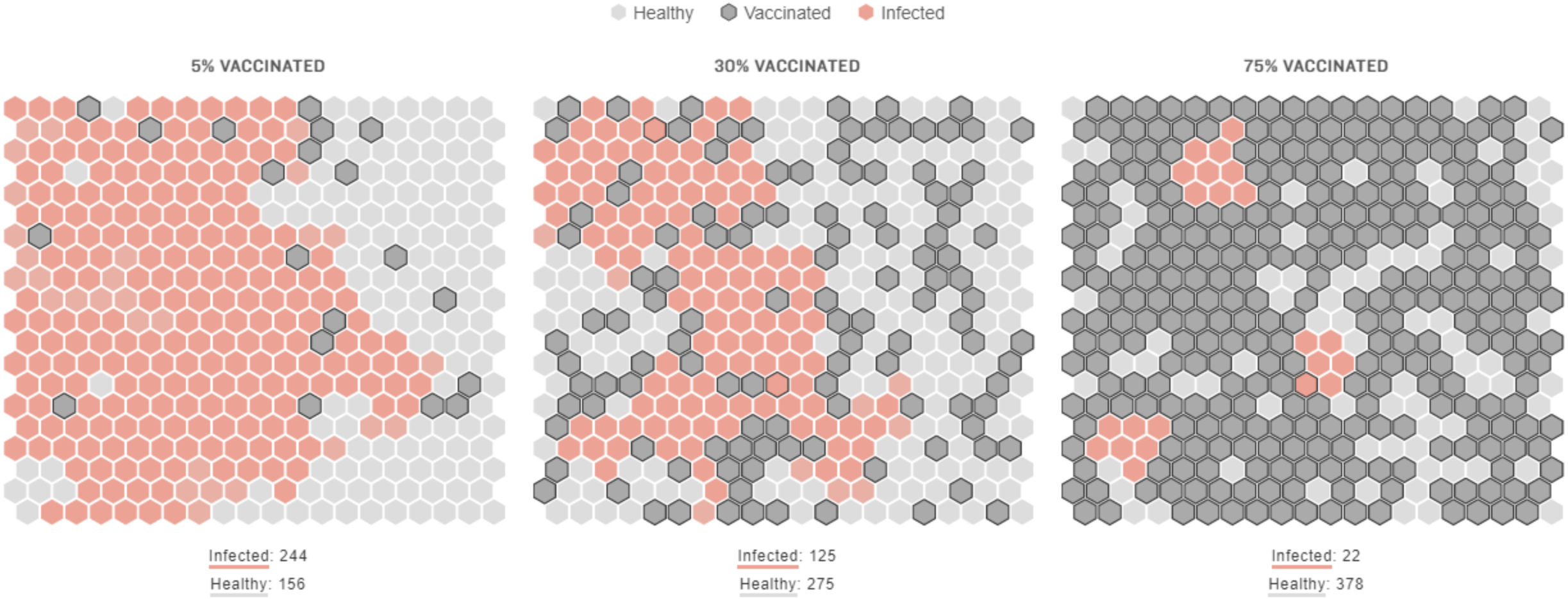
[How Herd Immunity Works — And What Stands In Its Way](#) (NPR)

The vaccination “wall” of protection



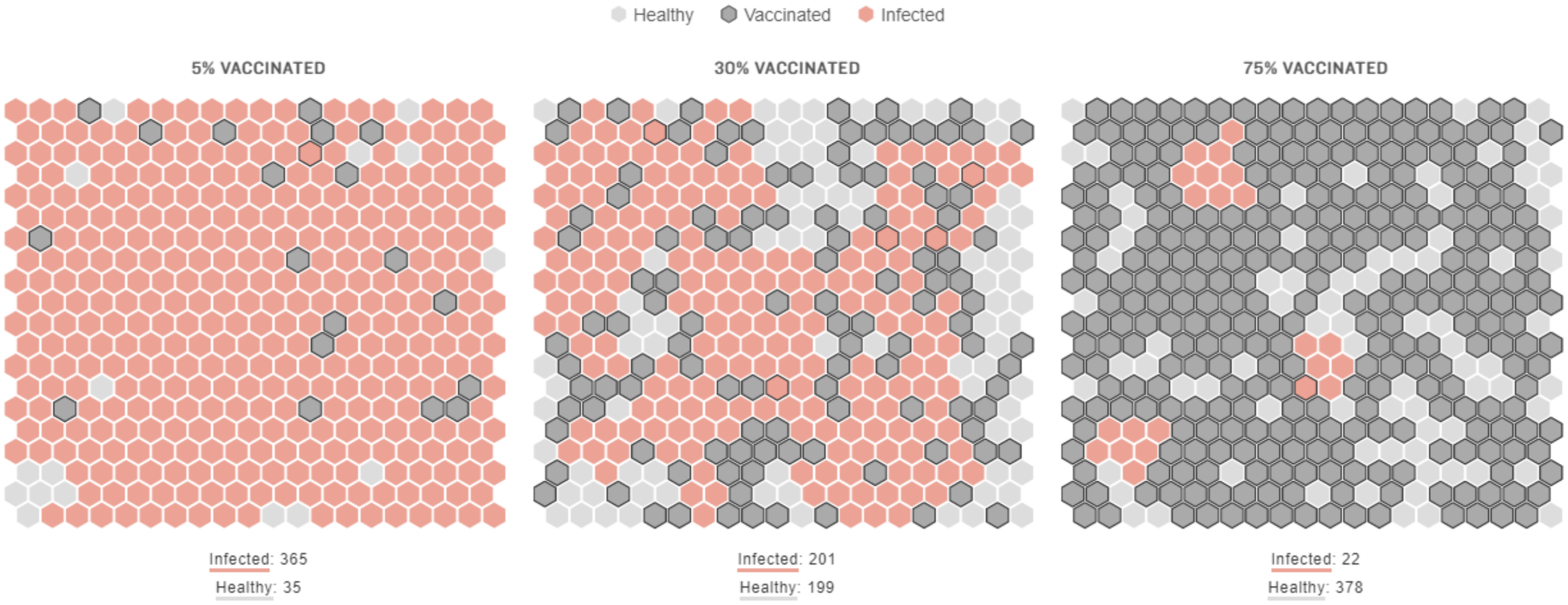
How Herd Immunity Works — And What Stands In Its Way (NPR)

The vaccination “wall” of protection | part 2



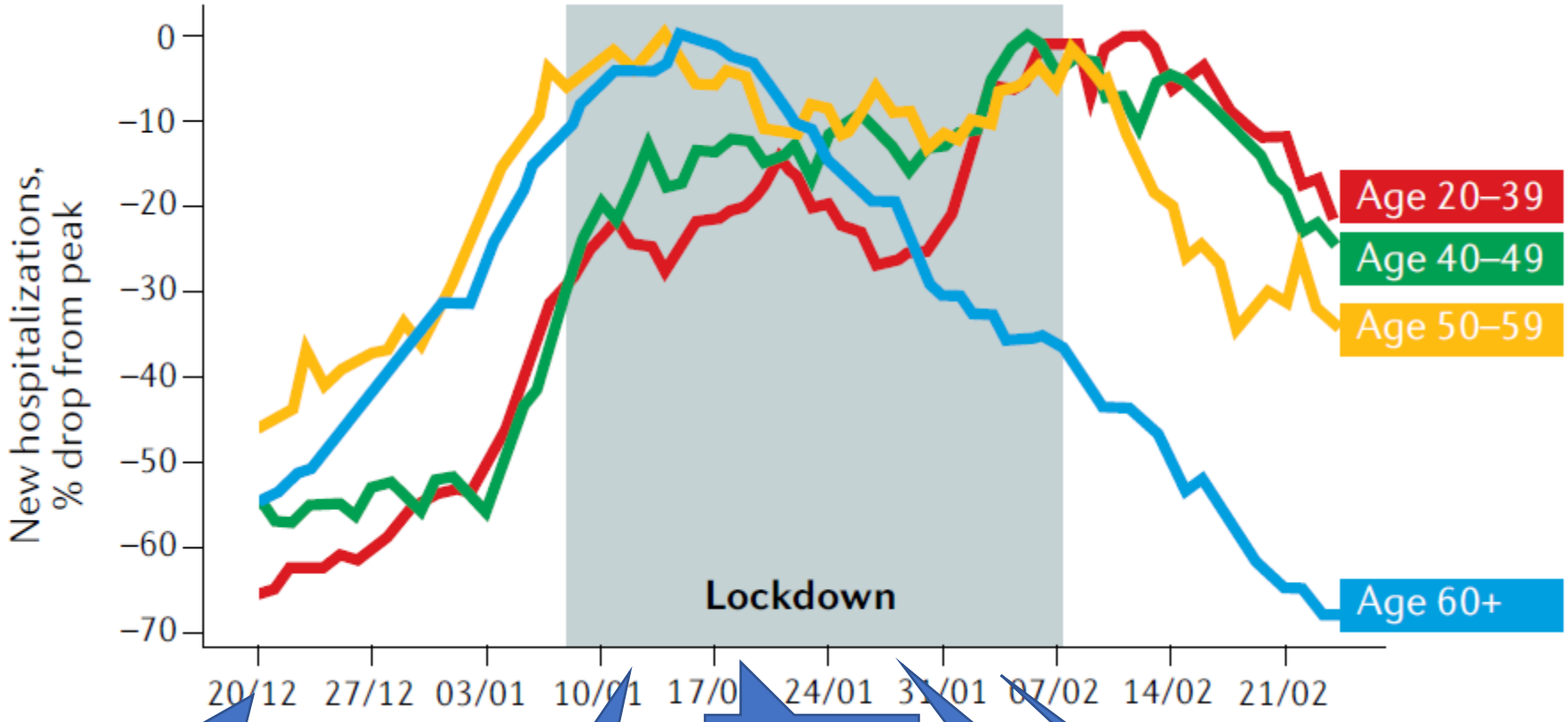
[How Herd Immunity Works — And What Stands In Its Way](#) (NPR)

The vaccination “wall” of protection | part 3



[How Herd Immunity Works — And What Stands In Its Way](#) (NPR)

Real-world vaccine efficacy (Israel, Pfizer)



12/20/20
60 y/o, ALF, healthcare, severe comorbidities

1/12/21
55 y/o

1/19/21
40 y/o
1/21/21
16-18 y/o

1/28/21
35 y/o

2/4/21
55 y/o

[Signals of hope: gauging the impact of a rapid national vaccination campaign](#) (Nature)

But what about side effects?

- Voluntary sign up after receive vaccine
- V-safe was not designed to assess causality

Group	Pfizer-BioNTech	Moderna	Total
People receiving 1 or more doses in the United States*	28,374,410	26,738,383	55,220,364
Registrants completing at least 1 v-safe health check-in	1,776,960	2,121,022	3,897,982
Pregnancies reported to v-safe*	16,039	14,455	30,494

COVID-19 vaccine safety update (CDC)

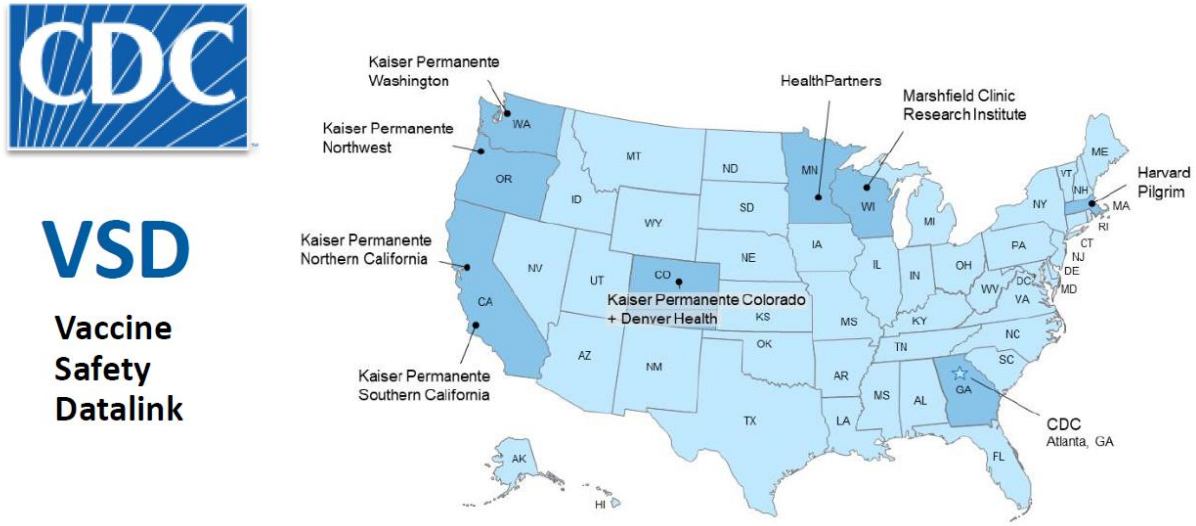
“Reactogenicity” (side effects) reported to V-safe

Percentage of v-safe enrollees who completed at least one survey (N = 1,602,065) with local and systemic reactions reported for day 0–7 and for day 1 after receiving Pfizer-BioNTech and Moderna COVID-19 vaccines — v-safe,* United States, December 14, 2020–January 13, 2021

	Percentage of v-safe enrollees reporting reactions			
	Both vaccines	Pfizer-BioNTech vaccine		Moderna vaccine
Local and systemic reaction	Day 0–7	Dose 1, day 1	Dose 2, day 1	Dose 1, day 1
Injection site pain	70.9	72.9	79.3	78.1
Fatigue	33.5	21.9	53.5	25.1
Headache	29.5	17.5	43.4	19.9
Myalgia	22.9	14.7	47.2	18.3
Chills	11.6	5.5	30.6	8.4
Fever	11.4	5.8	29.2	8.2
Injection site swelling	10.8	6.2	8.6	12.6
Joint pain	10.4	5.3	23.5	7.3
Nausea	8.9	4.2	14.0	5.5

First Month of COVID-19 Vaccine Safety Monitoring — United States, December 14, 2020–January 13, 2021

What about “serious” adverse effects?



- Data from 9 large healthcare organizations through 2/13/21
- N = 829,657 (200,134 were dose 2)
- **No statistically significant increased risks detected (compared to unvaccinated)**

COVID-19 vaccine safety update (CDC)

VSD Rapid Cycle Analysis prespecified outcomes for COVID-19 vaccines

Event	Concurrent comparator analysis	Risk interval	Events in vaccinated	Adjusted expected events in risk interval
Acute disseminated encephalomyelitis	Unvaccinated	1-21 days	0	0
Acute myocardial infarction	Unvaccinated	1-21 days	23	26.0
Acute respiratory distress syndrome	Unvaccinated	N/A	0	N/A
Anaphylaxis	Unvaccinated	0-1 days	20	N/A
Appendicitis	Unvaccinated	1-21 days	31	23.6
Bell's palsy	Unvaccinated	1-21 days	21	20.3
Convulsions/seizures	Unvaccinated	1-21 days	10	9.6
Disseminated intravascular coagulation	Unvaccinated	1-21 days	1	1.1
Encephalitis/myelitis/encephalomyelitis	Unvaccinated	1-21 days	1	.1
Guillain-Barré syndrome	Unvaccinated	1-21 days	1	.6
Thrombotic thrombocytopenic purpura	Unvaccinated	1-21 days	0	0
Immune thrombocytopenia	Unvaccinated	1-21 days	1	1
Kawasaki disease	Unvaccinated	1-21 days	0	0
MIS-C and MIS-A	Unvaccinated	N/A	0	N/A
Myocarditis/pericarditis	Unvaccinated	1-21 days	2	2.1
Narcolepsy and cataplexy	Unvaccinated	N/A	2	N/A
Stroke, hemorrhagic	Unvaccinated	1-21 days	8	10
Stroke, ischemic	Unvaccinated	1-21 days	41	38.8
Transverse myelitis	Unvaccinated	1-21 days	0	0
Venous thromboembolism	Unvaccinated	1-21 days	26	26.3
Pulmonary embolism (subset of VTE)	Unvaccinated	1-21 days	20	21.0

TRUE **contraindications** to COVID19 vaccines

CONTRAINDICATION TO VACCINATION

History of the following:

- Severe allergic reaction (e.g. anaphylaxis) after a previous dose or to component of COVID-19 vaccine
- Immediate allergic reaction of any severity after a previous dose or known (diagnosed) allergy to a component of the vaccine

Actions:

- Do not vaccinate
- Consider referral to allergist-immunologist
- Consider other vaccine alternative (J&J minimum 28 days after mRNA dose under supervision)

- immediate allergic reaction: any hypersensitivity related signs/symptoms consistent w/ urticaria, angioedema, respiratory distress (wheezing, stridor) that occur within **4 hours** following administration
- excludes subcutaneous immunotherapy (allergy shots)

- Vaccine Contraindications and precautions (CDC)
- What Clinicians Need to Know About Johnson & Johnson's Janssen COVID-19 Vaccine (CDC)

Precautions to getting COVID-19 vaccine

PRECAUTION TO VACCINATION

No contraindication but has history of:

- Any immediate allergic reaction to other vaccines or injectable therapies

Actions:

- Risk assessment
- Consider referral to allergist-immunologist
- 30-min observation period if vaccinated

- Vaccine Contraindications and precautions (CDC)
- What Clinicians Need to Know About Johnson & Johnson's Janssen COVID-19 Vaccine

NOT contraindications nor precautions

MAY PROCEED WITH VACCINATION

No contraindication/precaution but has history of:

- Allergy to oral meds
- Allergies to food, pet, insect, venom, environmental, latex, etc.
- Family history of allergies

Actions:

- 30-min observation period: persons with history of anaphylaxis (any cause)
- 15-min observation period: all other persons

- Vaccine Contraindications and precautions (CDC)

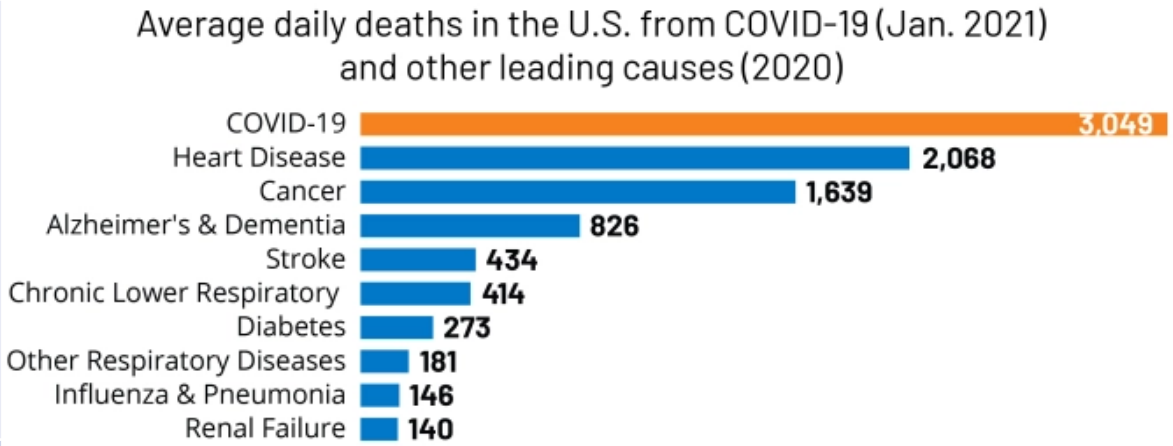
Reminders

- All vaccine providers to have available appropriate medical treatment to manage immediate allergic reactions
- **Pre**treatment with antipyretics (e.g. Tylenol, ibuprofen, etc) NOT recommended (ok right after if symptoms)
- **Pre**treatment antihistamines NOT recommended
  - Do not prevent anaphylaxis
  - May mask skin symptoms (e.g. hives) which could delay diagnosis/management of anaphylaxis

Rate ratio of COVID death or hospitalization by age

Age[1]	Hawaii census data 2019[1]	Rate ratio cases[2]	Rate ratio hospitalization[2]	Rate ratio death[2]	Rate ratio hospitalization[3]	Rate ratio death[3]
Total	1,415,872	N/A	N/A	N/A	N/A	N/A
<5 y	85,219	<1	2x	2x	0.29x	0.13x
5-9 y	86,710	Age 5-17 y/o reference group			0.14x	0.07x
10 -14 y	80,876					
15-19 y	77,287					
20-24 y	88,650	18-29 y/o: 3x	18-29 y/o: 7x	18-29 y/o: 15x	18-29 y/o reference group	
25-29 y	101,864					
30-34 y	98,131	2x	10x	45x	1.4x	3x
35-39 y	96,871					
40-44 y	84,932	2x	15x	130x	2.1x	8.7x
45-49 y	84,135					
50 -54 years	83,612	2x	25x	400x	3.6x	26.7x
55-59 y	89,958					
60-64 y	89,179					
65-69 y	83,038	2x	35x	1100x	5x	73.3x
70-74 y	69,054					
75-79 y	45,499	2x	55x	2800x	7.9x	186.7x
80-84 y	29,189					
85+ y	41,668	2x	80x	7900x	11.4x	526.7x

Risks of COVID vaccine vs disease vs other

Risk	COVID vaccine	COVID disease	Other
Risk of anaphylaxis	Pfizer: 4.7 per million* Moderna: 2.5 per mil	N/A	• Flu shot: 1.3 per million • Penicillin: 200-400 per million
Risk of death	None reported		
Long-term complications	None reported	"Long COVID" unclear, 1 in 10 symptoms after 3 weeks	

*as of 1/18/21 (9.94 million Pfizer & 7.58 million Moderna doses)

- COVID-19 vaccine safety update (CDC)
- COVID-19 Now Leading Cause of Death in the United States
- COVID-19 as the Leading Cause of Death in the United States (JAMA Network)

U.S. life expectancy fell by a year in the first half of 2020, CDC report finds

By Rebecca Sohn Feb. 18, 2021 Reprints

The Covid-19 pandemic is likely responsible for "the majority of the decline," said Elizabeth Arias, a health scientist at the Mortality Statistics Branch of the NCHS and the lead author of the report.

Life expectancy for non-Hispanic Black people decreased by 2.7 years (74.7 to 72); for Hispanic individuals, 1.9 years (81.8 to 79.9); and for non-Hispanic white people, 0.8 years (78.8 to 78).

U.S. life expectancy fell by a year in the first half of 2020, CDC report finds

Pregnancy and breastfeeding

- Available data suggest that symptomatic **pregnant patients with COVID-19** are at **increased risk of more severe illness** compared with nonpregnant peers, might be increase risk of adverse pregnancy outcomes
- **COVID-19 vaccines should not be withheld from pregnant individuals** who meet criteria for vaccination based on ACIP-recommended priority groups.
- COVID-19 vaccines **should be offered to lactating individuals** similar to non-lactating individuals
- Vaccines currently available under EUA have not been tested in pregnant women. Therefore, there are no safety data specific to use in pregnancy.
- Pregnancy testing should not be a requirement prior to receiving any EUA-approved COVID-19 vaccine.

Vaccinating Pregnant and Lactating Patients Against COVID-19 (ACOG)
The Moderna COVID-19 (mRNA-1273) vaccine: what you need to know (WHO)
ACOG and SMFM Joint Statement on WHO Recommendations Regarding COVID-19 Vaccines and Pregnant Individuals

Protective antibodies to fetus or breastfed

KGO-TV

COVID-19 antibodies detected in newborns and breast milk after moms are vaccinated

SAN FRANCISCO (KGO) -- There's reassuring news for pregnant women who are unsure if they should get the vaccine. A partially vaccinated mother gave birth ...

2 hours ago

CBS News

First baby in U.S. born with antibodies against COVID-19 after mom receives dose of Moderna vaccine while pregnant

"It really starts aligning the COVID vaccine with those vaccines that we already use in pregnant women like the flu vaccine," Dr. Neeta Ogden, ...

22 hours ago

Let me wait and see what happens to others…

COVID-19 Vaccinations in the United States

Overall US COVID-19 Vaccine | Deliveries and Administration; Maps, charts, and data provided by CDC, updated daily by 8 pm ET†
Represents all vaccine partners including jurisdictional partner clinics, retail pharmacies, long-term care facilities, Federal Emergency Management Agency and Health Resources and Services Administration partner sites, and federal entity facilities.

Total Vaccine Doses

Delivered	151,108,445
Administered	115,730,008

Learn more about the distribution of vaccines.

People Vaccinated	At Least One Dose	Fully Vaccinated
Total	75,495,716	40,981,464
% of Total Population	22.7%	12.3%
Population ≥ 18 Years of Age	75,325,687	40,927,810
% of Population ≥ 18 Years of Age	29.2%	15.9%
Population ≥ 65 Years of Age	36,258,687	21,119,619
% of Population ≥ 65 Years of Age	66.3%	38.6%

Read more about how these data are reported.

CDC | Data as of: Mar 18 2021 6:00am ET | Posted: Mar 18 2021 3:11PM ET

[COVID-19 Vaccinations in the United States - Dashboard]

Public health recommendations for vaccinated persons (nonhealthcare setting):

- **Fully vaccinated people can:**
  - Visit with other fully vaccinated people indoors without wearing masks or physical distancing
  - Visit with unvaccinated people from a single household who are at low risk for severe COVID-19 disease indoors without wearing masks or physical distancing
  - Refrain from quarantine and testing following a known exposure if asymptomatic
- **Should still continue to:**
  - Take precautions in public

https://www.cnn.com/2021/03/12/us/grandparents-hug-grandkids-covid-vaccine-trnd/index.html

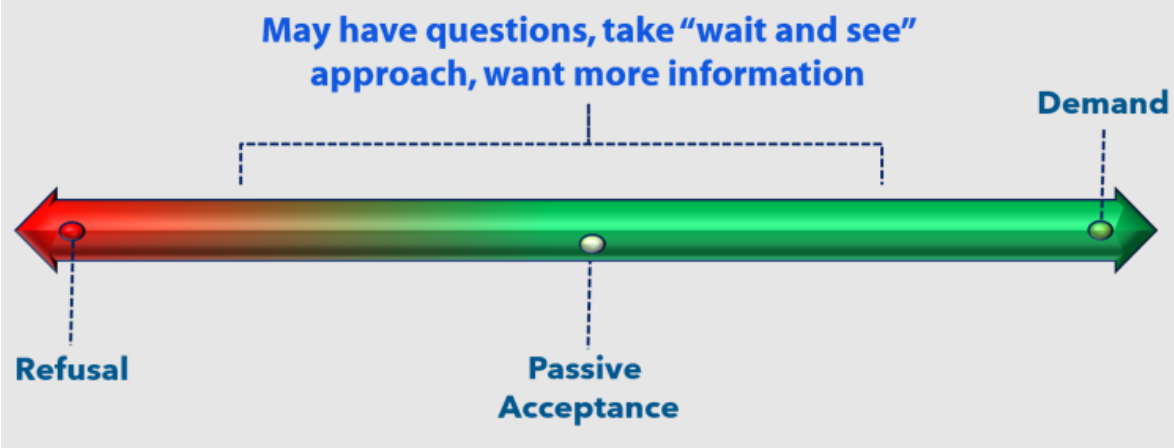
Interim Public Health Recommendations for Fully Vaccinated People (CDC)

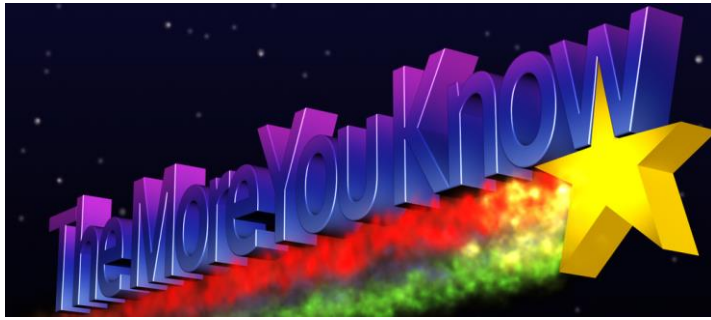
Still need to:

1. wear mask, social distance outside household
2. Avoid crowds and poorly ventilated
3. Avoid travel, if have to, follow CDC/local guidance

Because benefits outweighed risks…

- Help you from getting COVID-19
- Safer way to help build protection
- Protect yourself, friends, family, coworkers, your community





[Where Are You On The Dunning-Kruger Wiggle?]

Where to go to get accurate information

- Caution with social media, one individual's experience
- CDC vaccine website is updated frequently, has accurate information for public (including healthcare workers)
- Hawaii DOH COVID website

"No snowflake in an avalanche ever feels responsible."
~ **Voltaire**

Cartoonist’s Take | Listen to the master Dr. Fauci

Hawaii COVID-19 Vaccine Summary

LAST UPDATED ON Thursday, March 18, 2021
(includes all doses entered in the Vaccine Administration Management System, VAMS)

Click info icon for notes on this data

Phases (mobile)

Phase 1a | Phase 1b | Phase 1c | Phase 2

We are currently in Phase 1c

Hover over arrow for prioritization groups in that phase

78%
of vaccines received in Hawaii have been **administered.**

22%
of the total population in Hawaii has received **at least 1 dose.**

Public vaccines shown are reported in VAMS

VACCINE TRACKING | HOVER FOR DETAILS

78% administered

ORDERED | Vaccines awarded

660,160

RECEIVED | Shipments arrived

649,080

ADMINISTERED | Vaccines given to individuals

21.6% with at least 1 dose

TOTAL VACCINES ADMINISTERED

504,891

PUBLIC VACCINES | Counted in Vams

480,326

FEDERAL PHARMACY

24,565

NAVIGATE TO OTHER VIEWS

Click buttons to navigate to other views

DOSE TRACKING | VACCINES BY COUNTY | AGE | RACE

[Hawaii COVID-19 Summary Metrics](#) (DOH Website)

Hawaii COVID-19 Vaccine Summary

LAST UPDATED ON Thursday, March 18, 2021
(includes all doses entered in the Vaccine Administration Management System, VAMS)

Click info icon for notes on this data

Phase 1a → Phase 1b → Phase 1c → Phase 2

We are currently in Phase 1c

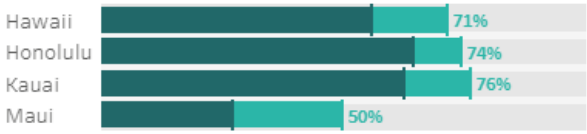
Hover over arrow for prioritization groups in that phase

SELECT COUNTY

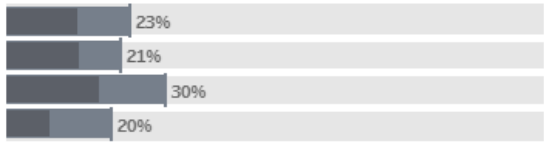
- All
- Hawaii
- Honolulu
- Kauai
- Maui

All

Vaccination Progress for 75+ yr



Vaccination Progress 60+ yr and older



PERCENT OF VACCINES ADMINSTERED

60+ years	50%
59 or younger	50%

75+ *This percentage does not include doses from Federal Pharmacy Programs for long term care facilities and nursing homes.*

PERCENT OF THE POPULATION OVER 60

50%

60+ Population	708,798
Total Population	1,415,786

60+ *Percentage includes essential workers eligible in Phase 1a/1b.*

NAVIGATE TO OTHER VIEWS

Click buttons to navigate to other views

DOSE TRACKING | VACCINES BY COUNTY | AGE | RACE

Ingredients included in Pfizer and Moderna mRNA COVID-19 Vaccines

Description	Pfizer-BioNTech COVID-19 vaccine	Moderna COVID-19 vaccine
mRNA	Nucleoside-modified mRNA encoding the viral spike (S) glycoprotein of SARS-CoV-2	Nucleoside-modified mRNA encoding the viral spike (S) glycoprotein of SARS-CoV-2
Lipids	2[(polyethylene glycol)-2000]-N,N-ditetradecylacetamide	PEG2000-DMG: 1,2-dimyristoyl-rac-glycerol, methoxypolyethylene glycol
	1,2-distearoyl-sn-glycero-3-phosphocholine	1,2-distearoyl-sn-glycero-3-phosphocholine
	Cholesterol	Cholesterol
	(4-hydroxybutyl)azanediyl)bis(hexane-6,1-diyl)bis(2-hexyldecanoate)	SM-102: heptadecan-9-yl 8-((2-hydroxyethyl) (6-oxo-6-(undecyloxy) hexyl) amino) octanoate
Salts, sugars, buffers	Potassium chloride	Tromethamine
	Monobasic potassium phosphate	Tromethamine hydrochloride
	Sodium chloride	Acetic acid
	Dibasic sodium phosphate dihydrate	Sodium acetate
	Sucrose	Sucrose

Appendix C: Ingredients included in COVID-19 vaccines (CDC)

Vaccine Contraindications and precautions (CDC)

How am I supposed to know if I'm allergic to these ingredients?

- Information on whether a medication contains PEG, a PEG derivative, or polysorbates can be found in the package insert
- NIH DailyMed database may also be used as a resource:
  - https://dailymed.nlm.nih.gov/dailymed/
- Stone, CA et al. Immediate Hypersensitivity to Polyethylene Glycols and Polysorbates: More Common Than We Have Recognized. J Allergy Clin Immunol Pract. 2019 May-Jun;7(5):1533-1540.e8.
  - Free access: https://pubmed.ncbi.nlm.nih.gov/30557713/
  - Supplemental Material table E1 and E2

COVID-19 Vaccines: Update on Allergic Reactions, Contraindications, and Precautions