

# HHP/HPH COVID-19 Community Webinar Series

Thursday, May 20, 2021  
5:30pm – 6:30pm

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# Moderator – 05/20/21

**Andy Lee, MD**

Medical Director, Hawai'i Health Partners  
Chief of Staff, Pali Momi Medical Center  
Hawai'i Pacific Health

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- The following is intended as information resource only for HHP/HPH providers, clinicians, administrative and clinical leaders.
- Specific areas may not pertain directly to your clinical practice area and/or may not be applicable to your practice based on your existing workflows, infrastructure, software (e.g. EHR), and communications processes.

# Webinar Information

- You have been automatically muted. You cannot unmute yourself.
- You will be able to submit questions via the Q&A section.
  - Due to time constraints, any unanswered questions will be addressed this week and posted on the HHP website
- A recording of the meeting will be available tomorrow on the HHP website and intranet.

# How to Claim CME Credit

## 1. Step 1: Confirm your attendance

- You should have completed a brief questionnaire before joining today's live webinar.

## 2. Step 2: HPH CME team will email you instructions

- Complete and submit evaluation survey that will be emailed to you within one week of the offering.
- Your CE certificate will be immediately available to you upon completion of your evaluation.
- Questions? Email [hphcontinuingeduc@hawaiiipacifichealth.org](mailto:hphcontinuingeduc@hawaiiipacifichealth.org)

# CME Accreditation Statement

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- Hawai'i Pacific Health designates this webinar activity for a maximum of 1.0 AMA PRA Category 1 Credit (s) <sup>TM</sup> for physicians. This activity is assigned 1.0 contact hour for attendance at the entire CE session.



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INTERPROFESSIONAL CONTINUING EDUCATION

# Disclosures

- The planners and presenters of this activity report no relationships with companies whose products or services (may) pertain to the subject matter of this meeting



# COVID-19 Updates

**Gerard Livaudais, MD, MPH**

Executive Vice President, Population  
Health and Provider Networks,  
Hawai'i Pacific Health

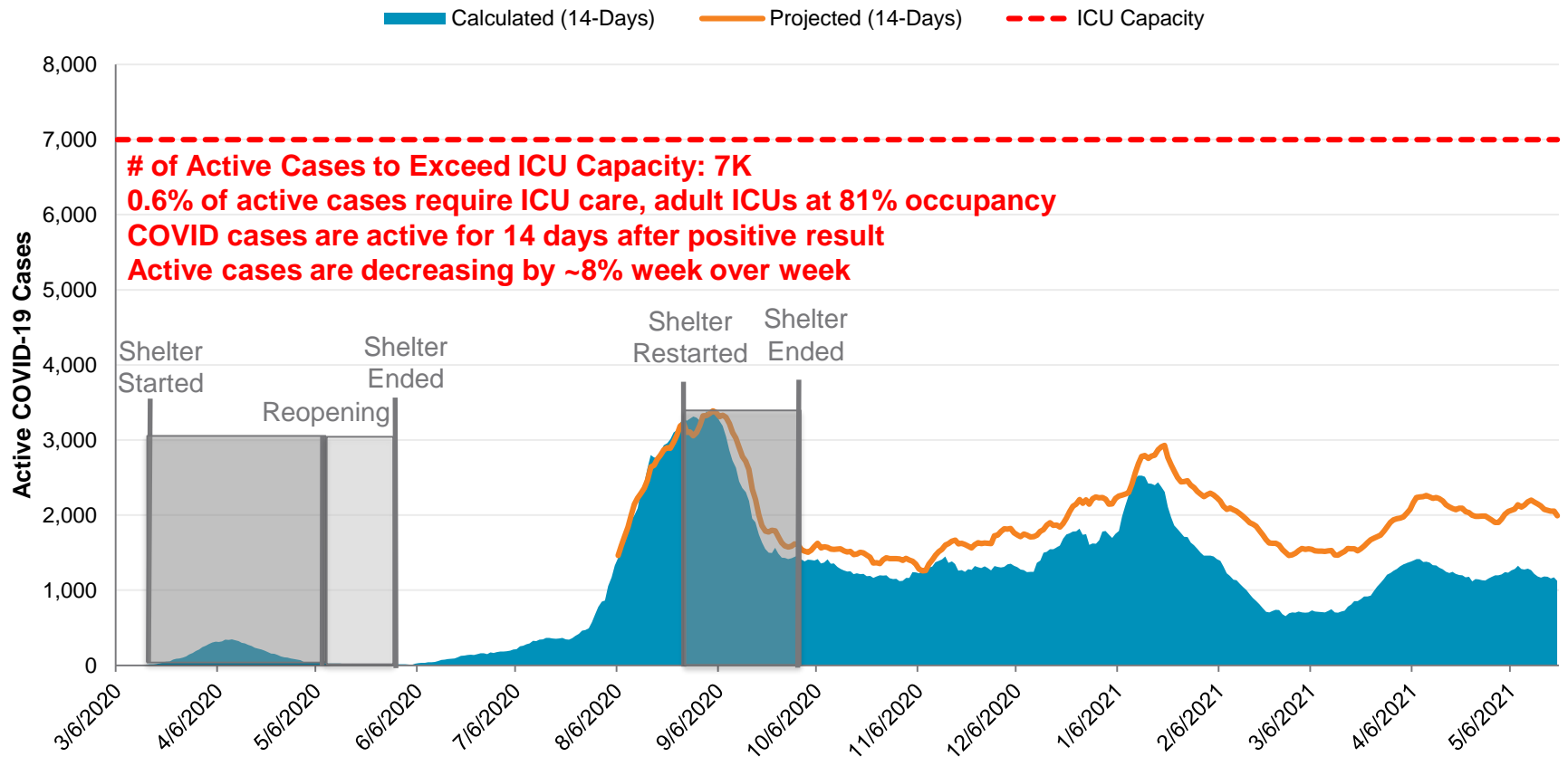
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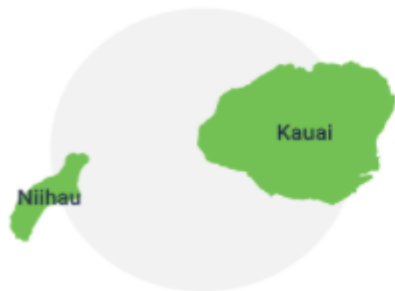


# Projected Active COVID-19 Cases

## Hawaii Actual v. Projected Active COVID-19 Cases Updated 5/20/2021



## County of Kaua'i



Current Status: Tier 4

## City & County of Honolulu



Current Status: Tier 3

## County of Maui



Current Status: Act with Care

## County of Hawai'i



Current Status: Act with Care

<https://recoverynavigator.hawaii.gov/reopening-status/#docs-procs>

### 7-Day Avg of New Cases

Region:

**81.0**

As of May 18



### Clusters Under Investigation (Top 3 In Last 14 Days)

Region:

Exposure Setting	Total Cases	Clusters
Travel, Lodging, & Tourism	98	4
Restaurants	81	5
Other Occupational Settings	47	4

As of May 11

### 7-Day Avg of % Tests Yielding Positive Results

Region:

**1.6%**

As of May 17

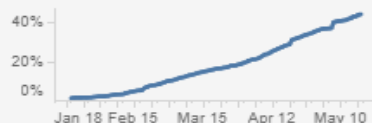


### % of Residents Fully Vaccinated

State Value

**44.2%**

As of May 18

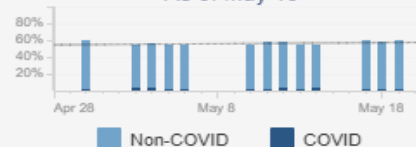


### ICU Occupancy Rate

State Value

**60%**

As of May 19

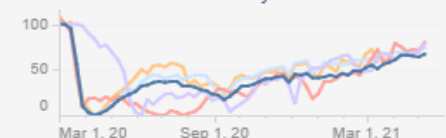


### UHERO Economic Pulse Index

State Value

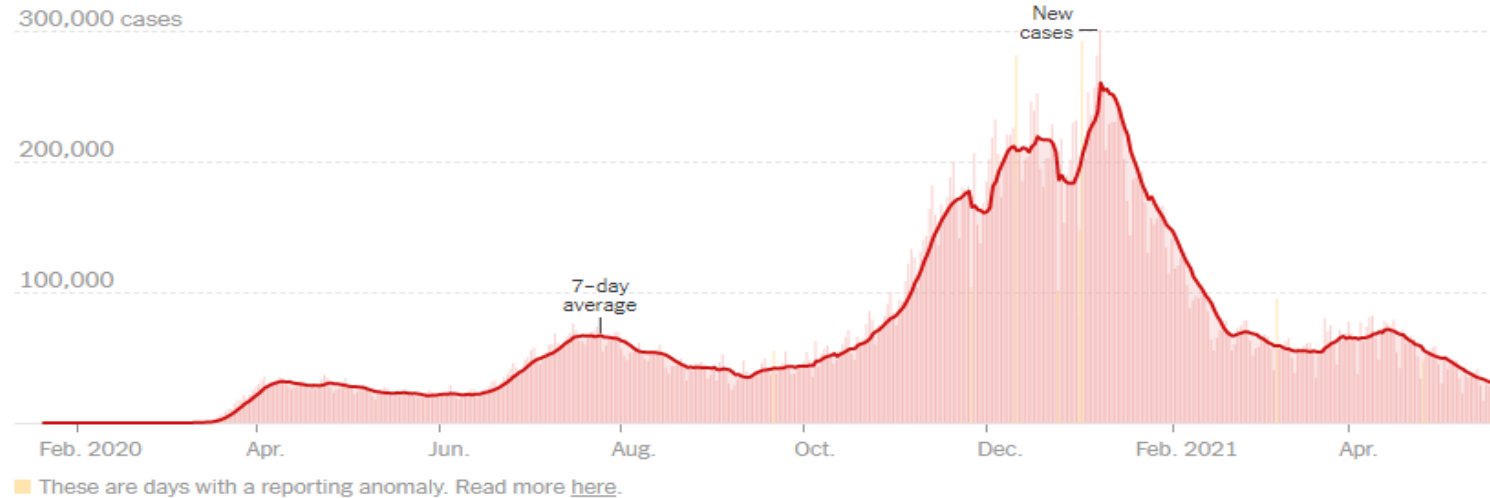
**67** ↑

As of May 8

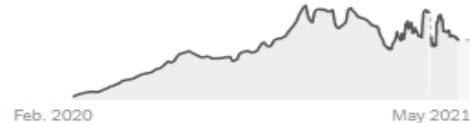


# United States

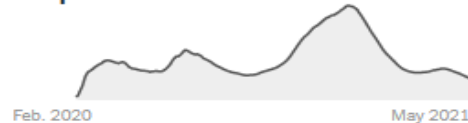
## New reported cases



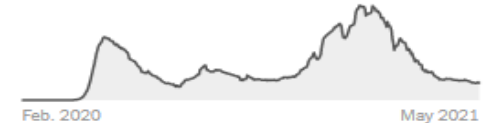
### Tests



### Hospitalized



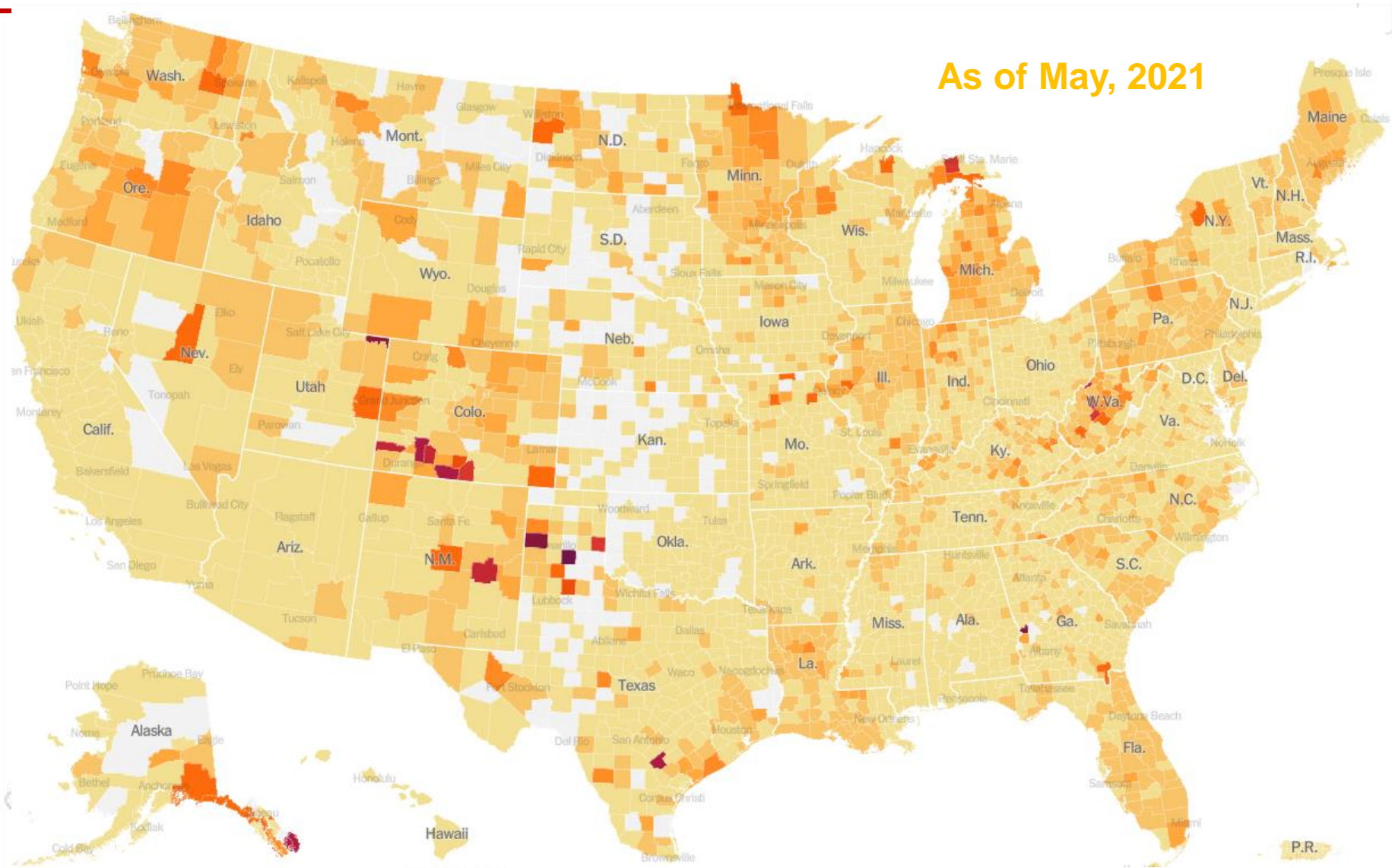
### Deaths



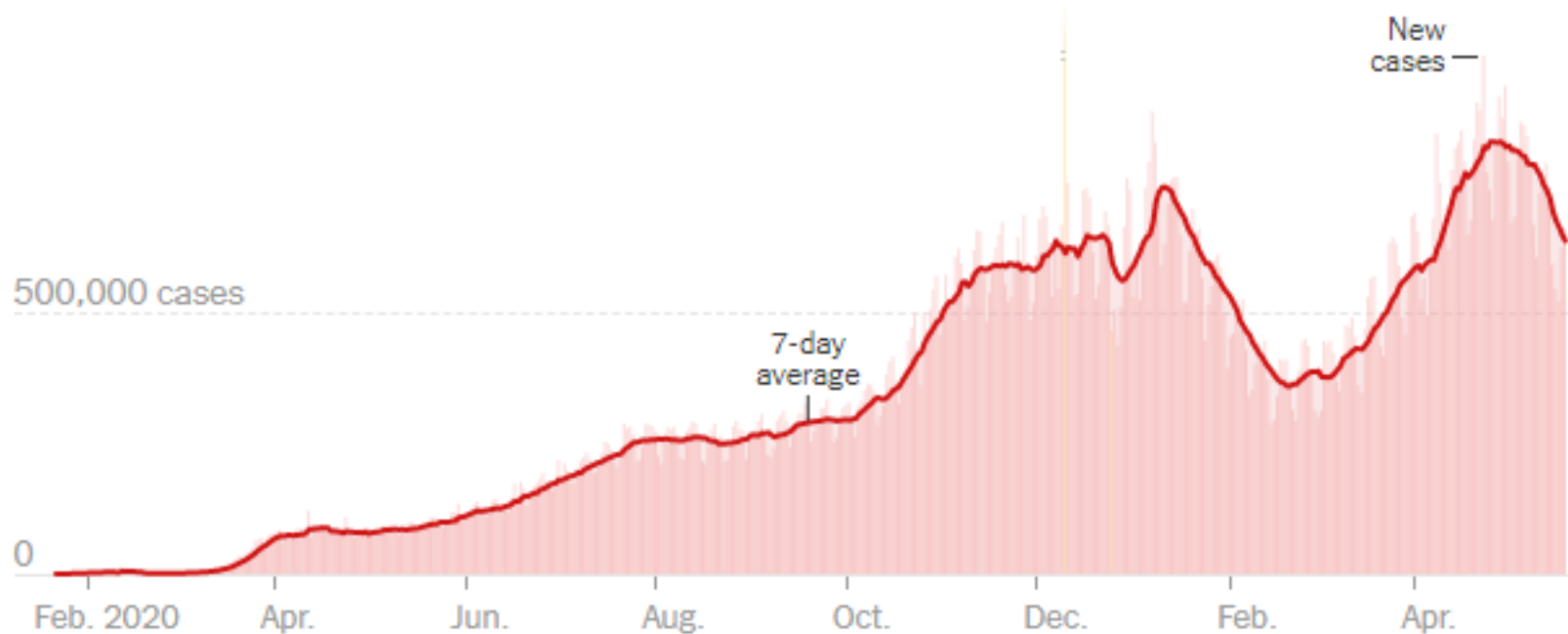
	AVG. ON MAY 19	14-DAY CHANGE	TOTAL REPORTED
Cases	30,206	-35%	33,074,842
Tests	841,660	—	—
Hospitalized	31,880	-21%	—
Deaths	613	-13%	588,023

<https://www.nytimes.com/interactive/2021/us/covid-cases.htm>

# Hotspots are cooling off...



# Worldwide



	TOTAL REPORTED	ON MAY 19	14-DAY CHANGE
<b>Cases</b>	164.8 million+	660,636	-20% →
<b>Deaths</b>	3.4 million+	13,647	-5% →

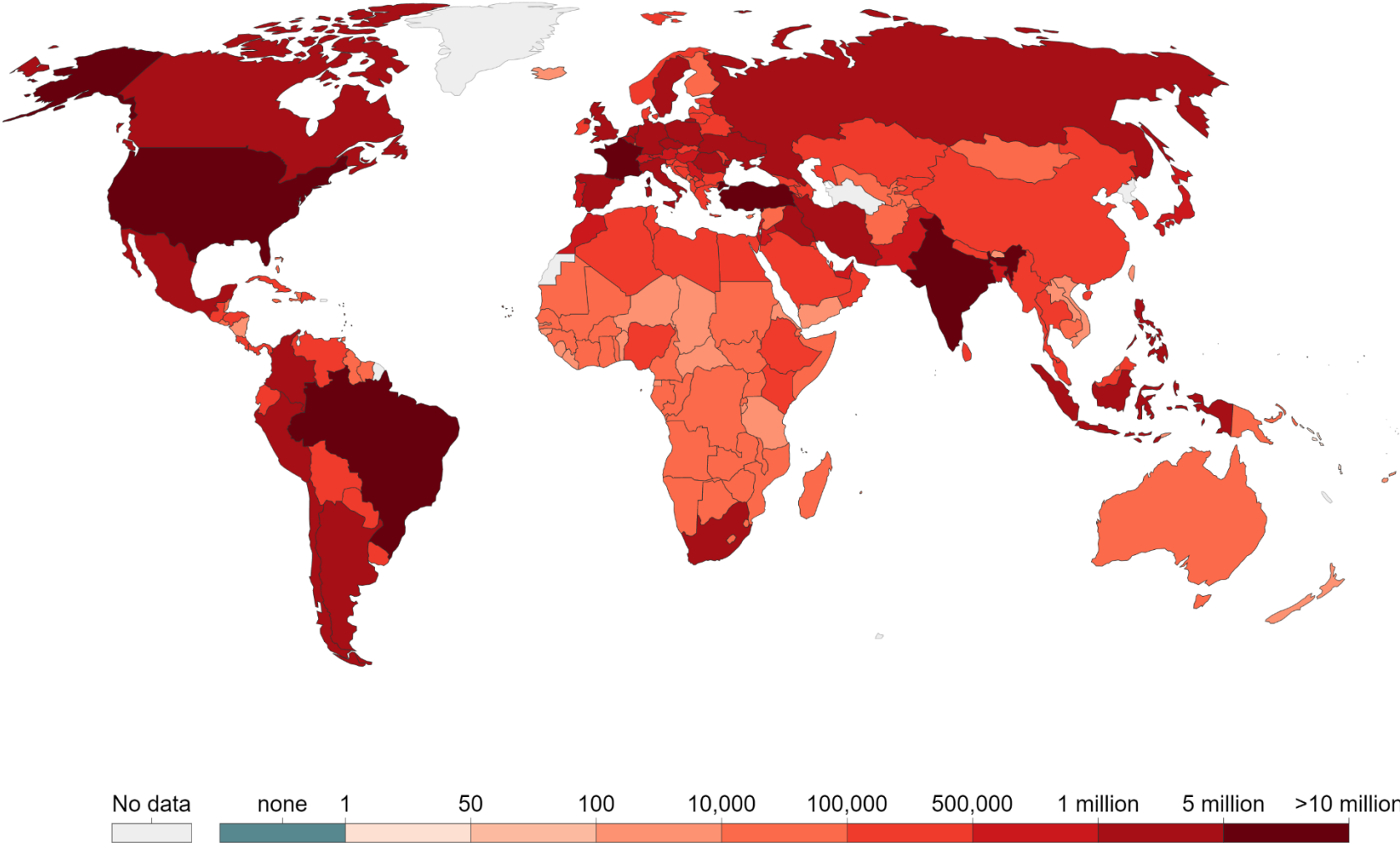
<https://www.nytimes.com/interactive/2020/world/coronavirus-maps.html>

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# Cumulative confirmed COVID-19 cases, May 18, 2021

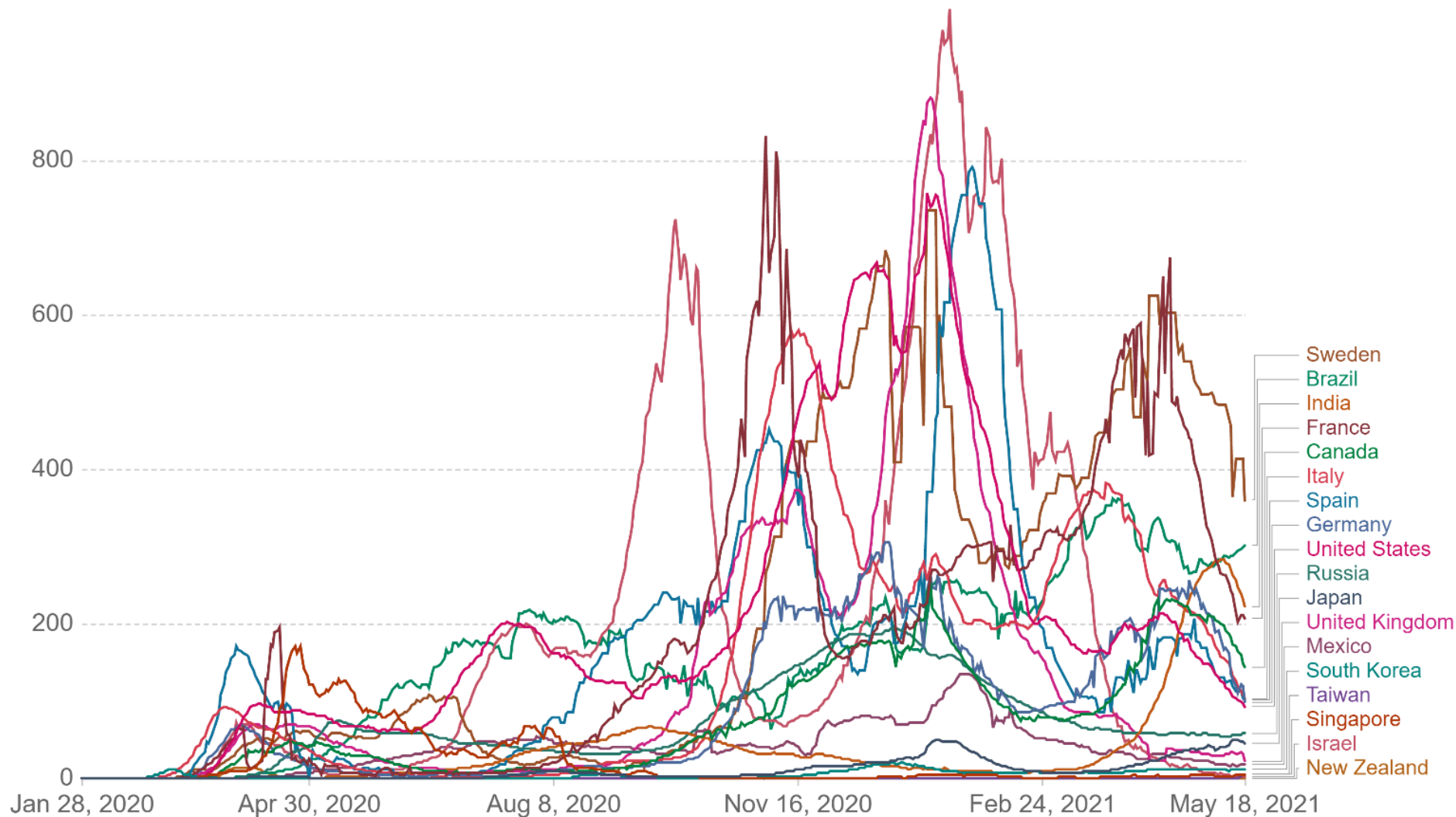
The number of confirmed cases is lower than the number of actual cases; the main reason for that is limited testing.



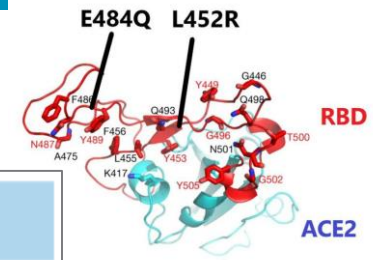


# Daily new confirmed COVID-19 cases per million people

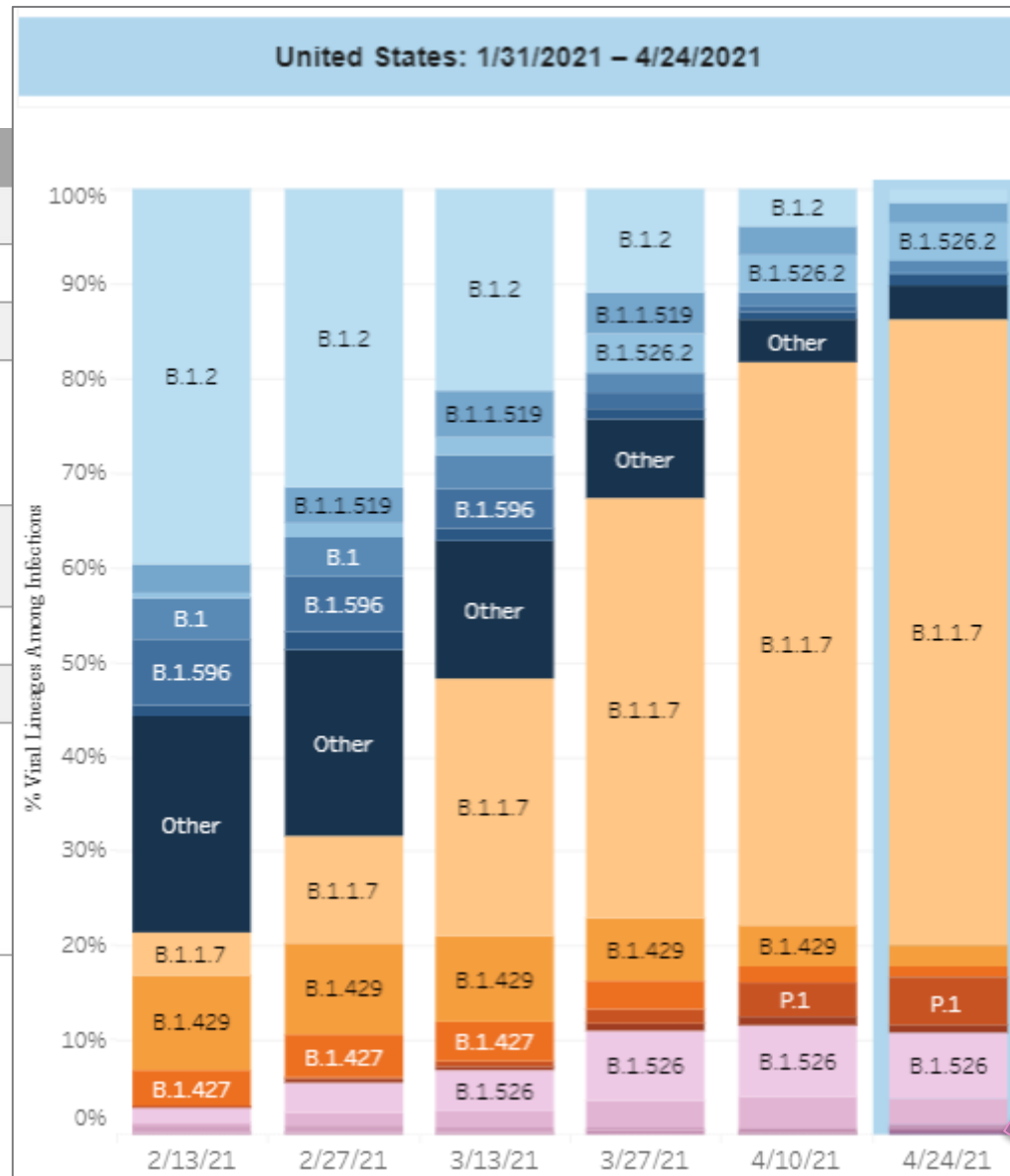
Shown is the rolling 7-day average. The number of confirmed cases is lower than the number of actual cases; the main reason for that is limited testing.



# Variants of Concern



Alternate name
Country identified
Spike mutations, N
Key mutations In Spike (others are also important)
Transmissibility $\Delta$ (vs ancestral)
Lethality increase
Immune evasion
Vaccine clinical trial efficacy, effectiveness and lab studies



B.1.617/617.2
21A/S
India
7
L452R, del 157-158, P681R , D950N (+) V382L, T478K
Increased ? > B.1.1.17
No evidence
Yes, < B.1.351
Lab studies w/ multiple vaccines support efficacy + outbreak in UK and Israel

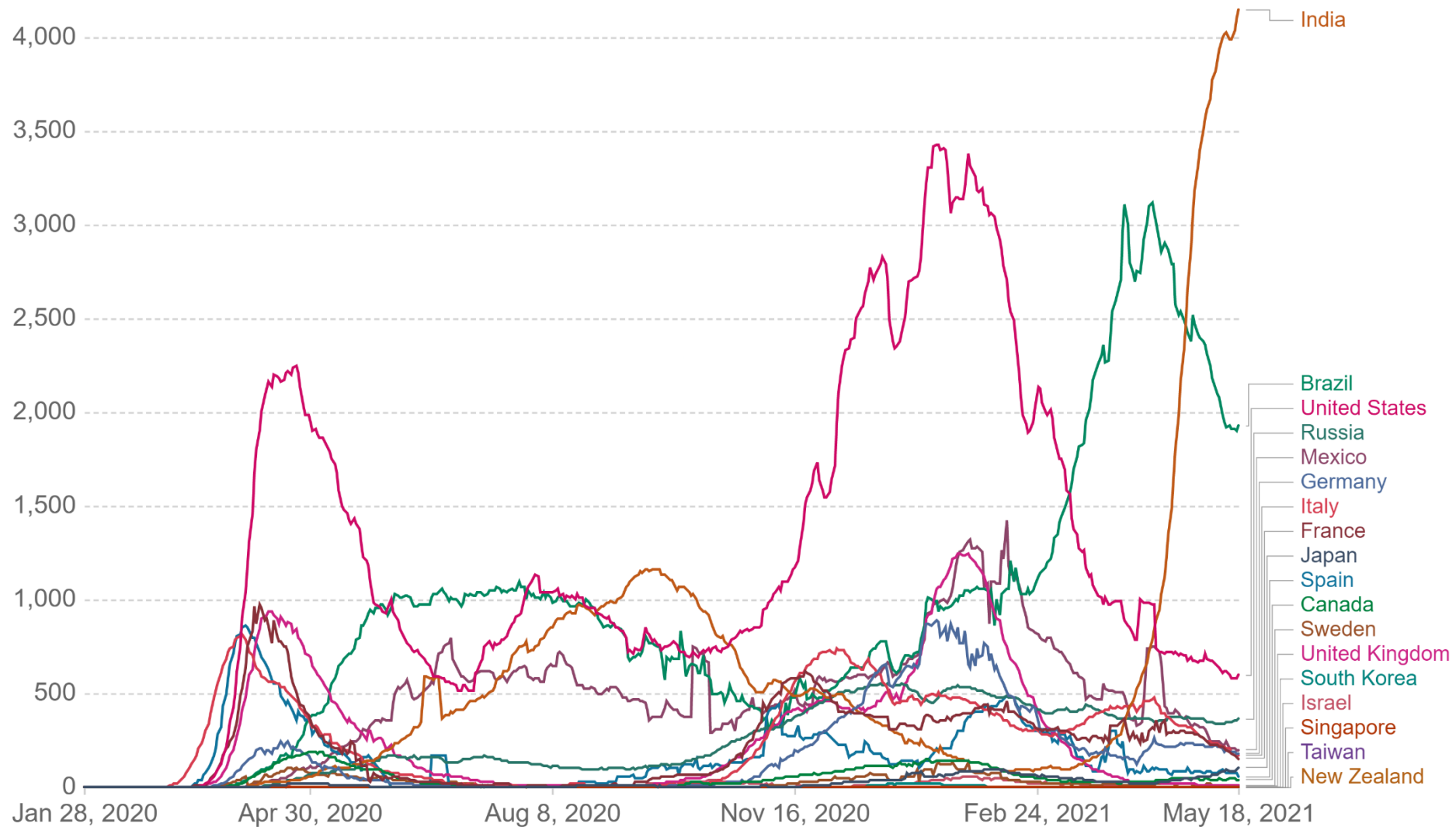
Type:	VOI
Lineage:	B.1.617.2
Two weeks ending:	4/24/21
Percent share:	0.5%
95% CI:	0.3-0.7%



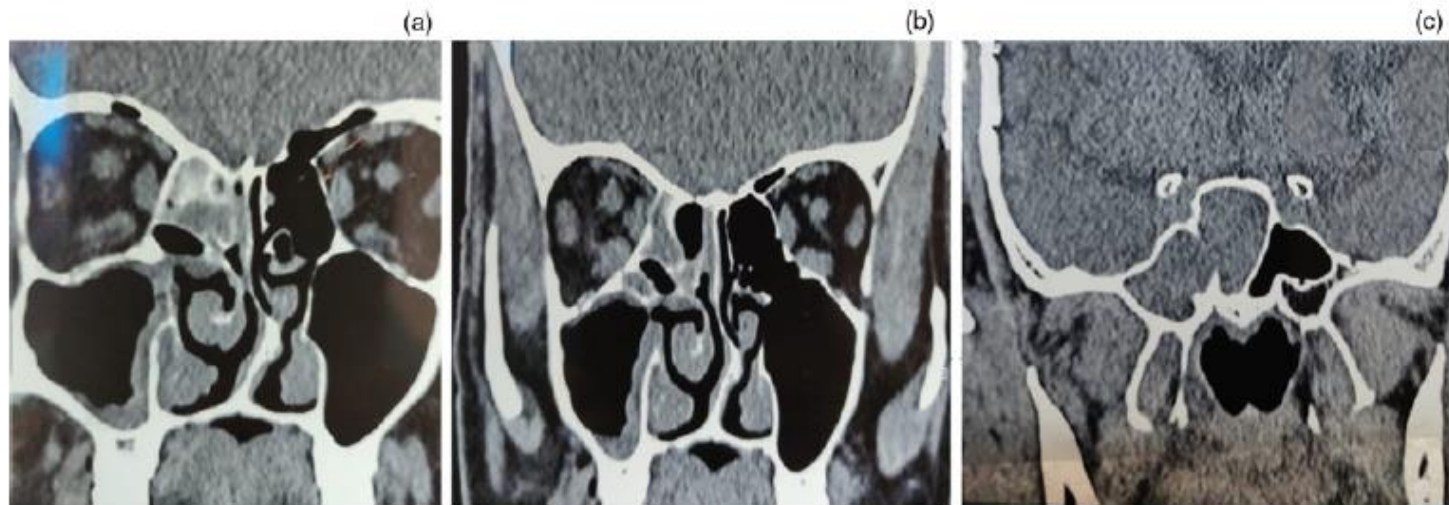
# Daily new confirmed COVID-19 deaths

Our World  
in Data

Shown is the rolling 7-day average. Limited testing and challenges in the attribution of the cause of death means that the number of confirmed deaths may not be an accurate count of the true number of deaths from COVID-19.



- Mucormycosis is a fungal infection with high mortality and rising incidence associated with coronavirus disease 2019 (Covid-19) affected or recovered patients
- The most common sinuses involved are the ethmoids followed by the maxillary sinus
- Diabetes mellitus is often associated with mucormycosis of the paranasal sinuses, as is coronavirus infection; uncontrolled diabetes further increases the risk
- Intra-orbital involvement is common, but intracranial involvement is rare
- Extensive steroid and broad-spectrum antibiotic use for Covid-19 management may cause or exacerbate fungal disease

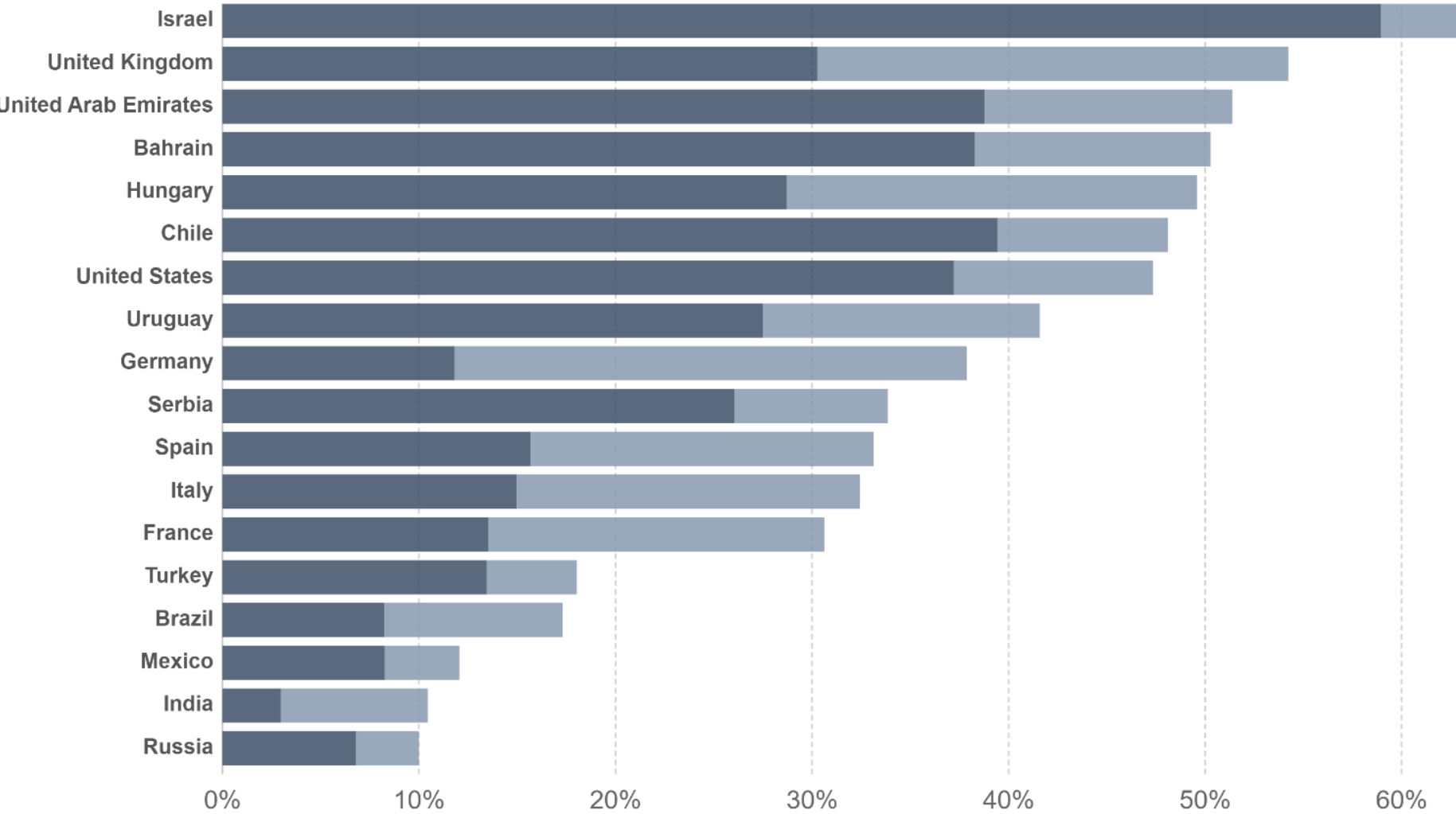


**Fig. 1.** (a–c) Coronal, non-contrast computed tomography scans of the paranasal sinuses, showing involvement of the sinuses with intracranial involvement.

# Share of people vaccinated against COVID-19, May 18, 2021

This data is only available for countries which report the breakdown of doses administered by first and second doses.

■ Share of people fully vaccinated against COVID-19   ■ Share of people only partly vaccinated against COVID-19



# Percent of People Receiving COVID-19 Vaccine by Age and Date Administered, United States



December 14, 2020 – May 20, 2021

	<12 yrs	12-15 yrs	16-17 yrs	18-24 yrs	25-39 yrs	40-49 yrs	50-64 yrs	65-74 yrs	75+ yrs
At Least One Dose	0.1%	8.9%	31.8%	40.0%	46.7%	56.4%	67.7%	86.4%	83.1%
Fully Vaccinated	0.0%	0.5%	19.3%	27.6%	35.1%	43.7%	55.0%	74.4%	72.0%

Age data were available for 99.0% of vaccinations.

Race

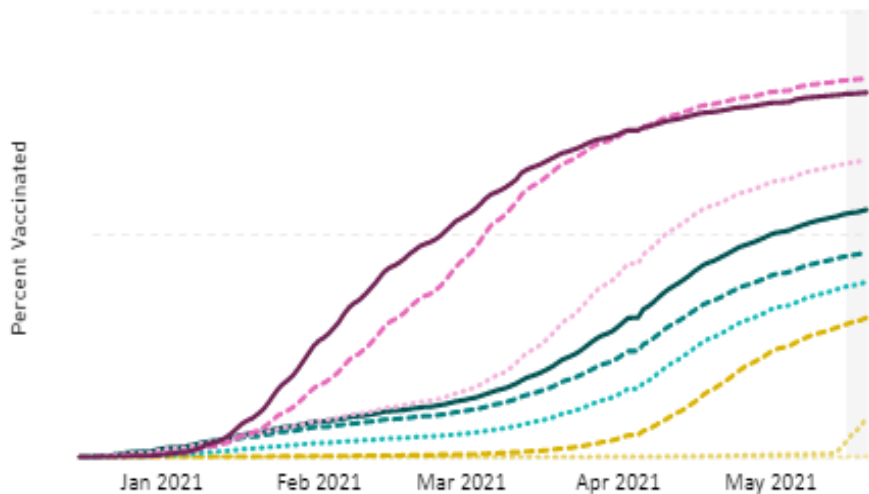
Sex

Age

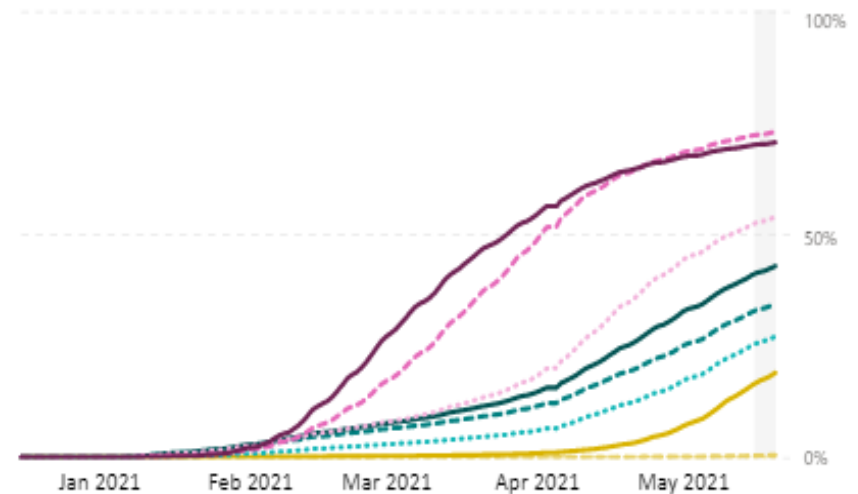
12/13/2020

5/20/2021

At Least One Dose



Fully Vaccinated



Date Administered



# Warp Speed: Have we stalled?

**Marian Melish, MD**

Pediatric Infectious Disease Division Chief

Medical Director of Infection Control

Kapi'olani Medical Center for Women and Children, Hawai'i Pacific Health

Professor of Pediatrics, Tropical Medicine and Medical Microbiology

University of Hawai'i, John A. Burns School of Medicine

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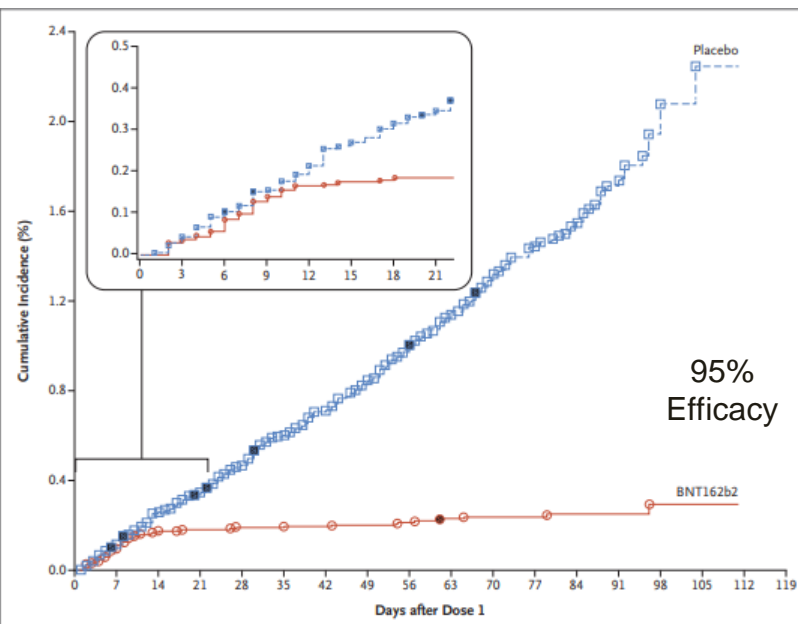
# WARP SPEED VACCINE DEVELOPMENT



## WITH CHILDREN LEFT IN NEUTRAL !

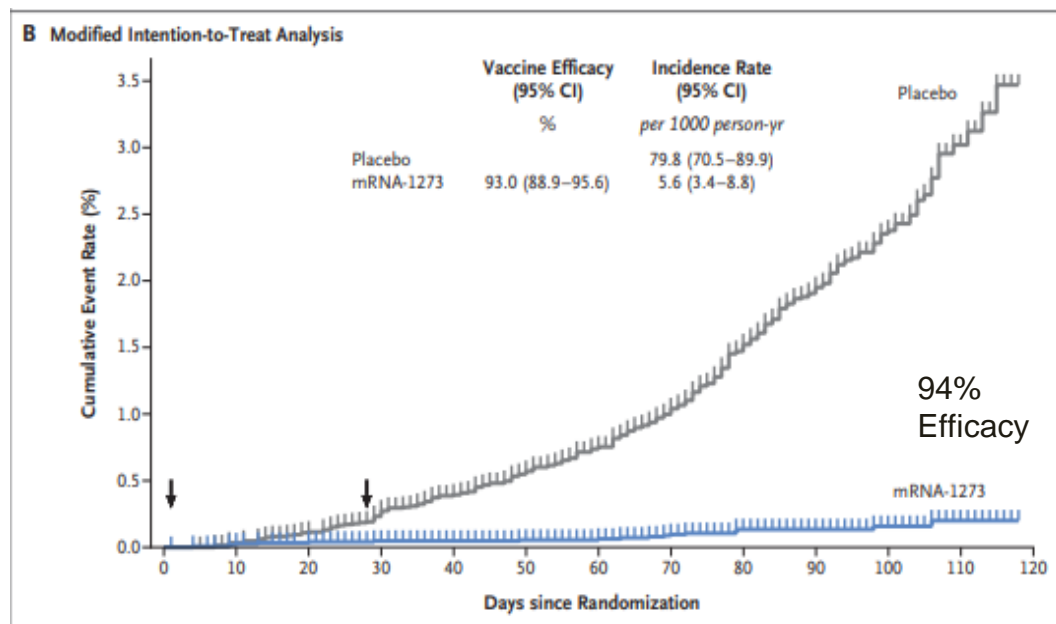
# mRNA Vaccines against COVID -19

## BioNtech PfizerBNT 162b2 Vaccine

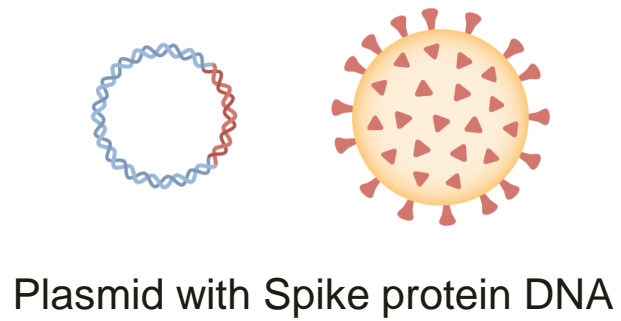


Polack FP *et al.* New Engl J Med 12/10/2020

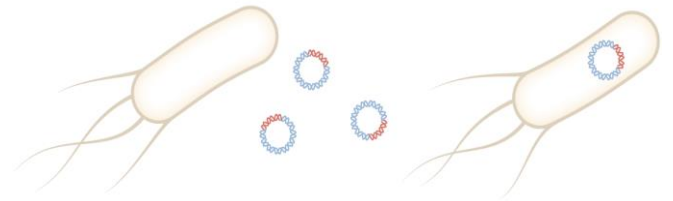
## Moderna mRNA-1273 Vaccine



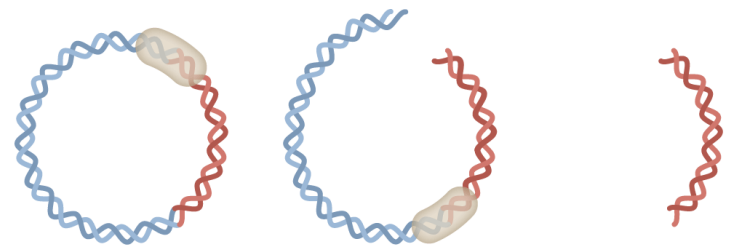
Baden LR *et al.* New Engl J Med 12/30/2020



Incubated with E coli

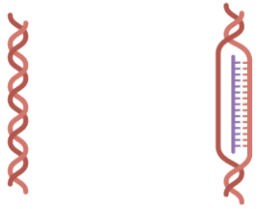


Plasmids purified

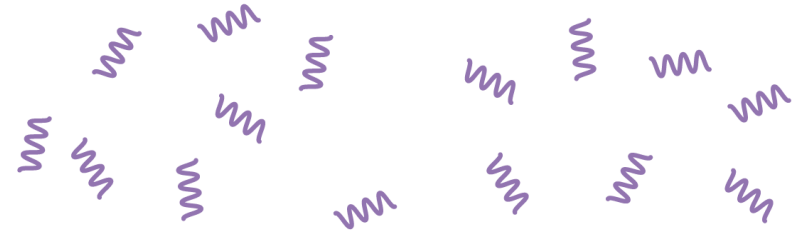


Plasmids Snipped, linearalized, purified

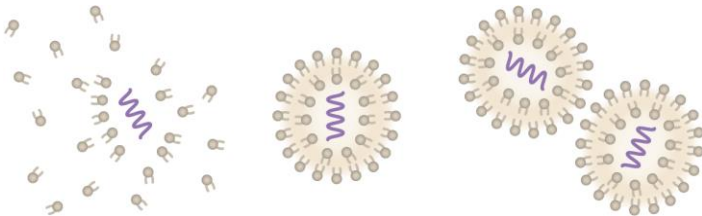




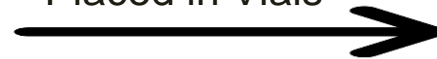
Enzymes transcribe  
DNA into mRNA



Kalamazoo MI



Placed in Vials

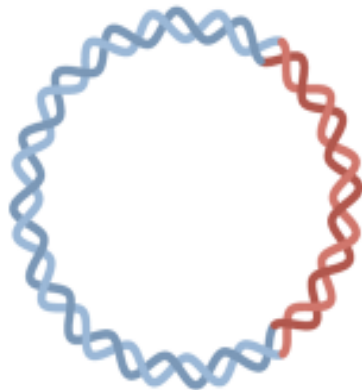


Lipid nano particles cover the mRNA

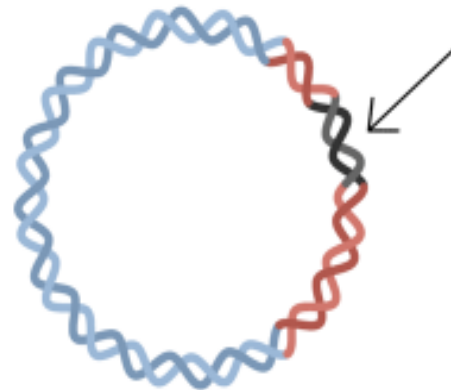
# Vaccines for Variants

- Current mRNA vaccines have slightly reduced efficacy against South African variant
- The mRNA platform can respond to variants in a nimble manner
  - Engineer the starting plasmid:

Current plasmid with original  
Spike protein gene



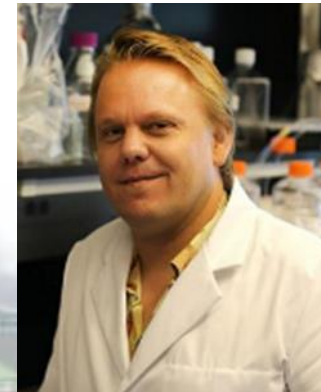
Plasmid with mutated  
spike protein gene





## **Dr. rer. nat. Axel T. Lehrer, Associate Professor**

Department of Tropical Medicine, Medical Microbiology and Pharmacology,  
John A. Burns School of Medicine  
University of Hawai'i at Manoa  
Honolulu, Hawaii





# COVID-19: Vaccine Durability

**20MAY2021**

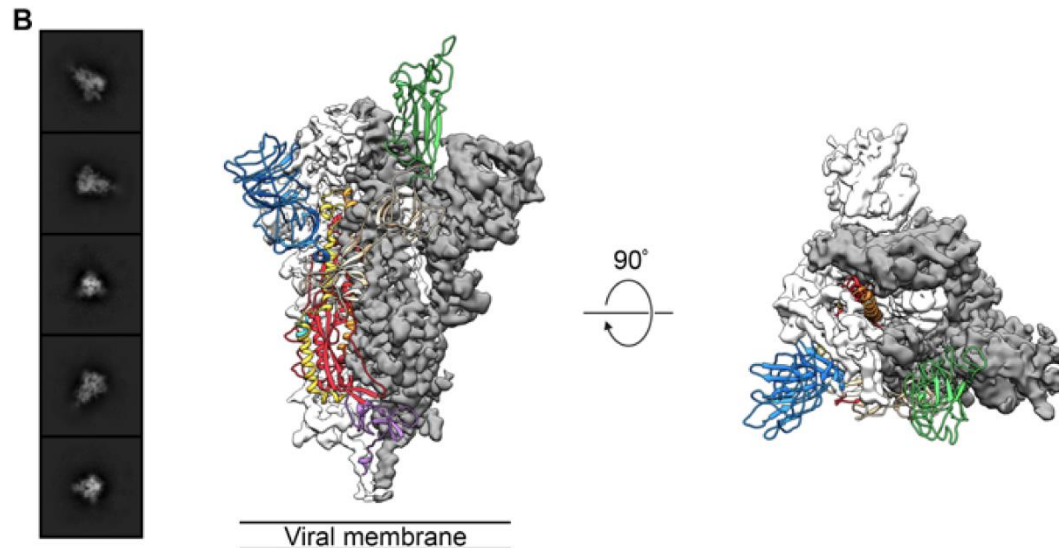
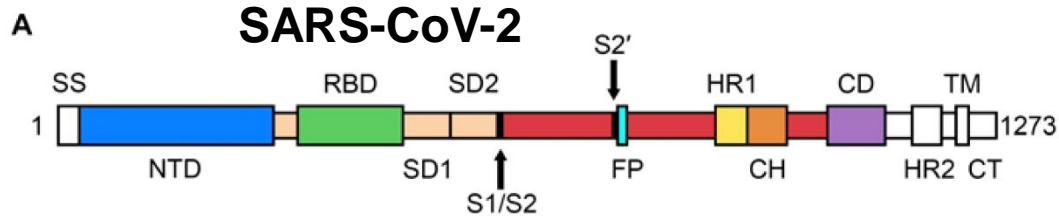
**Dr. rer. nat. Axel T. Lehrer, Associate Professor**

Department of Tropical Medicine, Medical Microbiology and Pharmacology,  
John A. Burns School of Medicine  
University of Hawai'i at Manoa  
Honolulu, Hawaii

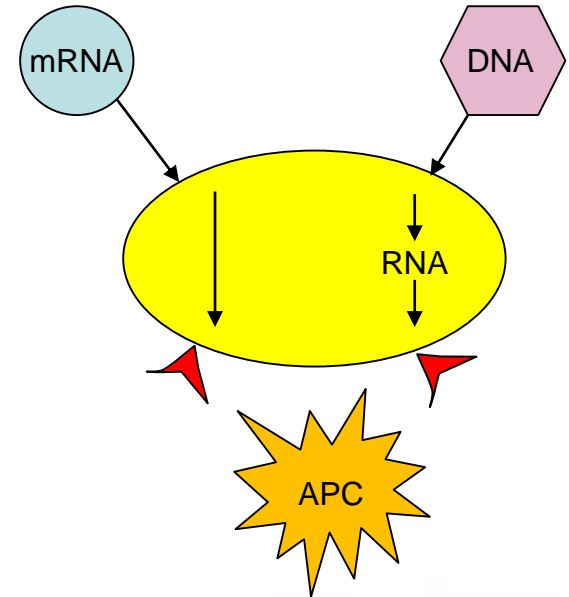




# All Vaccines use the Spike Protein



Wrapp and Wang et al. Science 2020





# What affects Durability?



- Antibody responses depend on sufficient long-lived plasmacytoid cells and B-cell memory
- In addition T-cell help maybe required to maintain and drive maturation of immunity
- Essentially both mRNA and Ad-vectored vaccines are “protein only” vaccines and the dose level is dependent on the individual
- None of these vaccines have a built-in adjuvant to control the level of immune response, dose ranging is the only we to drive immunity and that is of course affecting vaccine safety





# Moderna shows 6-month data



- Only 33 patients from a phase 1 trial

*The NEW ENGLAND JOURNAL of MEDICINE*

## CORRESPONDENCE

**Antibody Persistence through 6 Months after the  
Second Dose of mRNA-1273 Vaccine for Covid-19**

Doria-Rose et al. NEJM, 2021

This letter was published on April 6, 2021, and updated on May 12, 2021, at [NEJM.org](https://www.nejm.org).







# NHP data was used to identify COP



## ➤ Dose-ranging in rhesus macaques (0.3-100ug doses) – titers 4-weeks after boost

bioRxiv preprint doi: <https://doi.org/10.1101/2021.04.20.440647>; this version posted April 21, 2021. The copyright holder for this preprint (which was not certified by peer review) is the author/funder. All rights reserved. No reuse allowed without permission.

1 **Title: Immune Correlates of Protection by mRNA-1273 Immunization against**  
2 **SARS-CoV-2 Infection in Nonhuman Primates**

3  
4 **Authors:** Kizzmekia S. Corbett<sup>1#</sup>, Martha C. Nason<sup>2#</sup>, Britta Flach<sup>1</sup>, Matthew Gagne<sup>1</sup>, Sarah O'





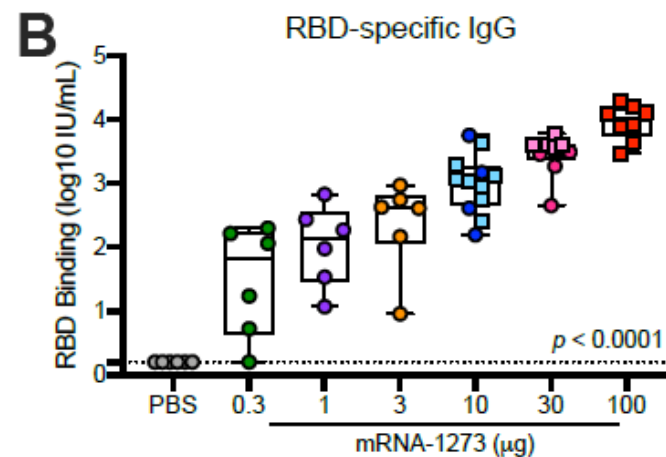
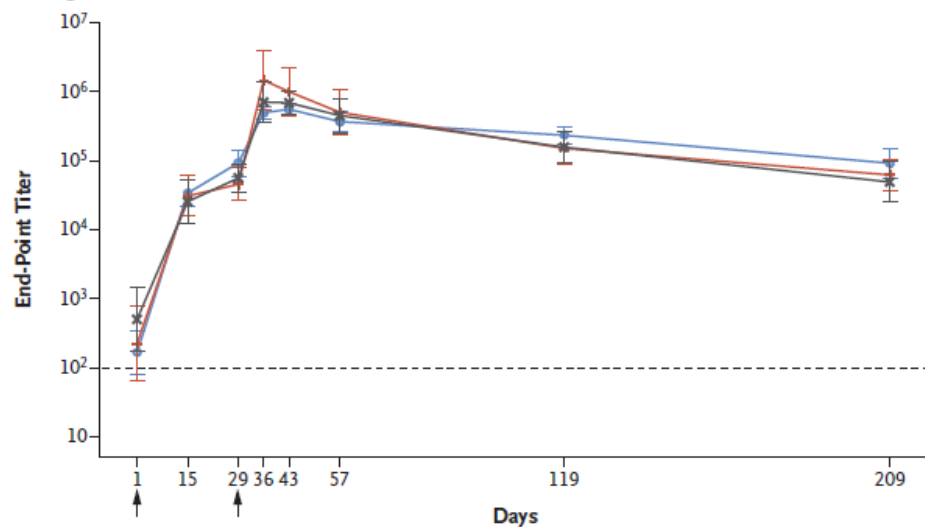


# RBD-binding IgG



◆ 18–55 yr of age    + 56–70 yr of age    \* ≥71 yr of age

## A Receptor-Binding Domain ELISA



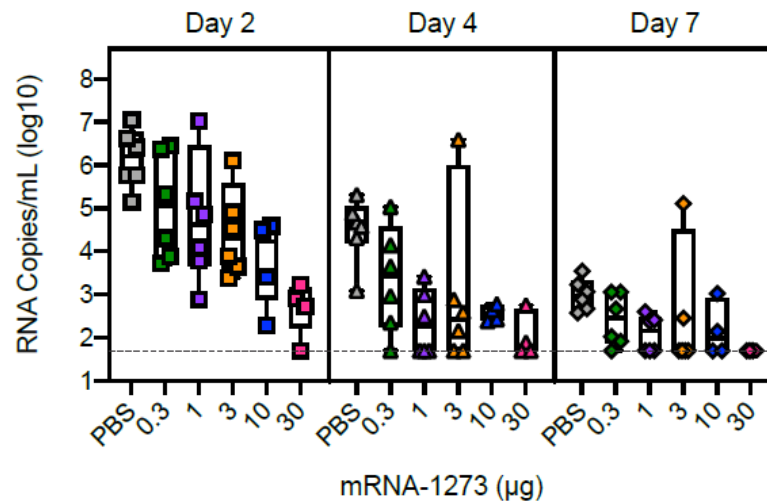


# NHP data: protection



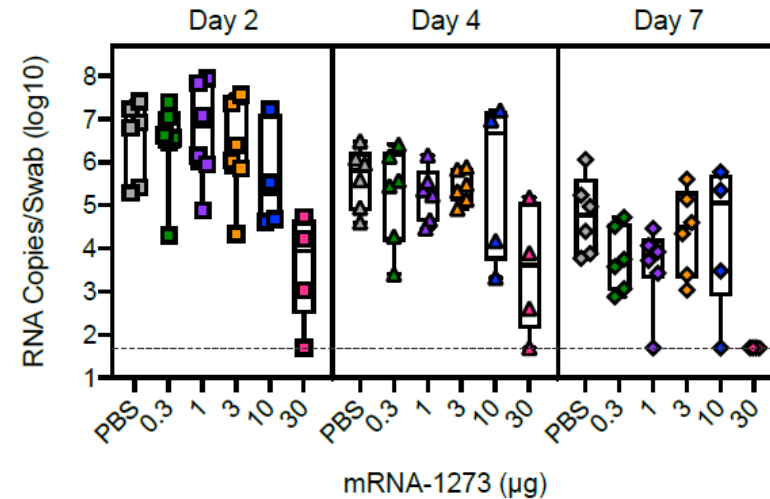
**A**

sgRNA\_N in BAL



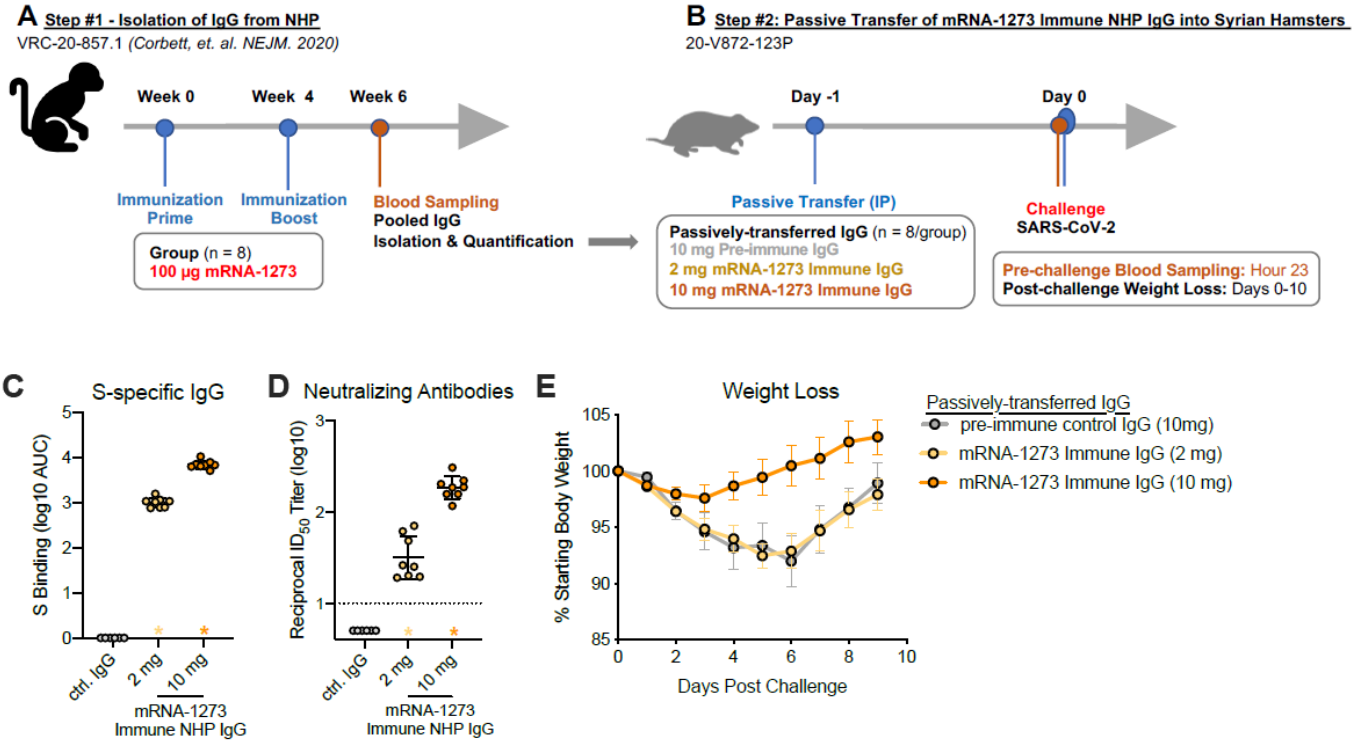
**B**

sgRNA\_N in Nasal Swabs





# Hamster model: confirms protection

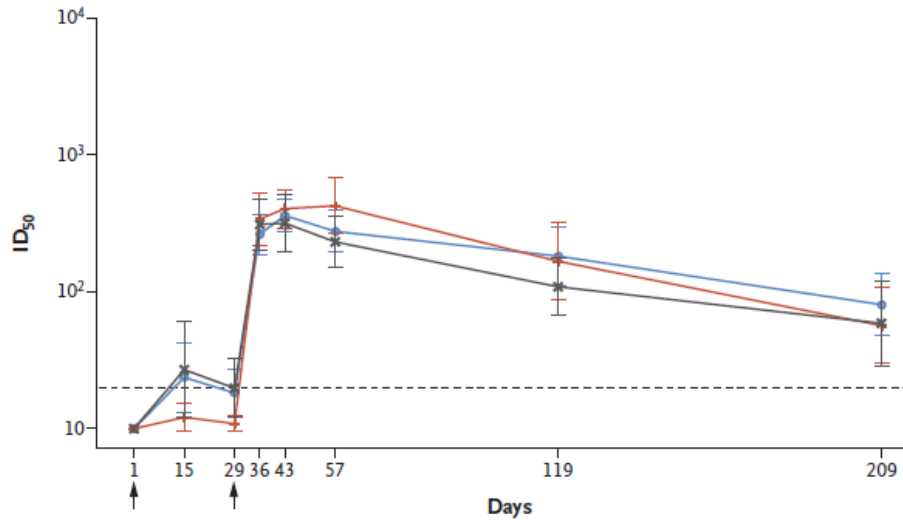




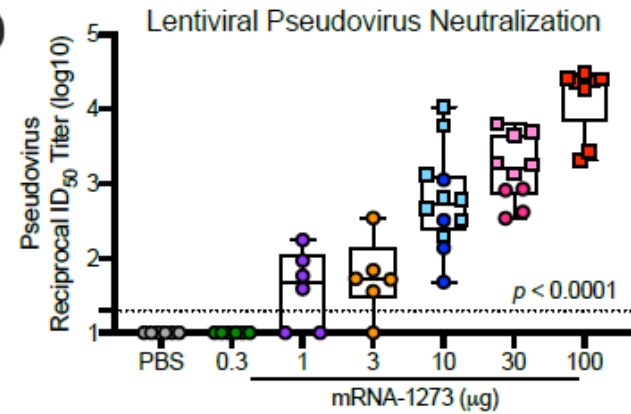
# Better marker: virus neutralization



**B** Pseudovirus Neutralization Assay



**D**

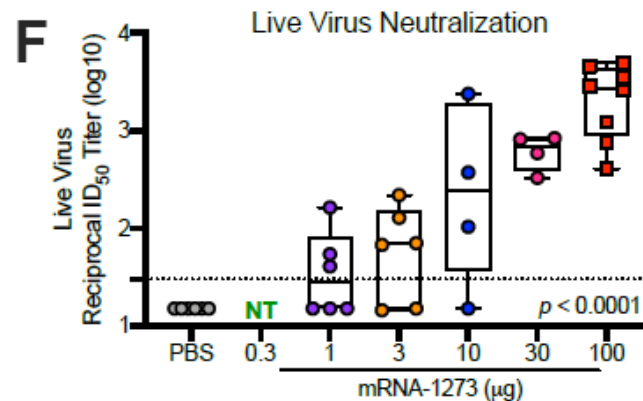
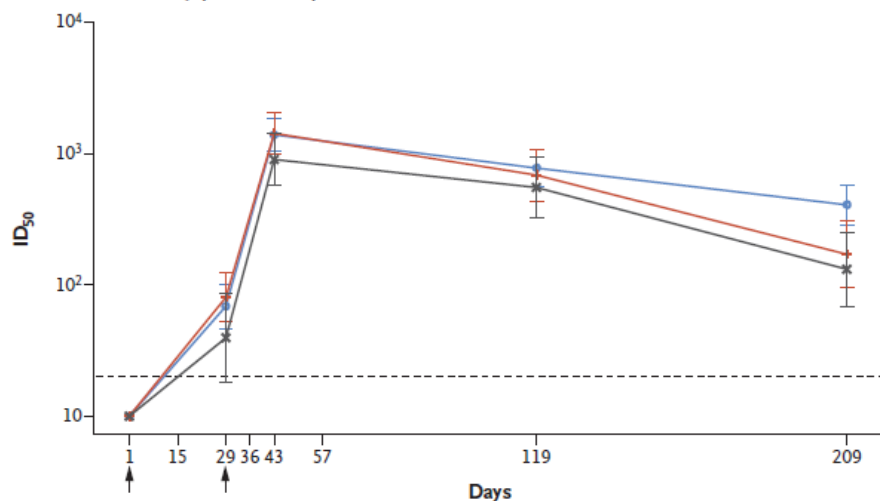




# Better marker: virus neutralization



C Live-Virus Neutralization Assay (FRNT-mNG)





# Estimated decay/half life



- For total IgG: 109 days (power law model)
- For virus neutralization: 69 (pseudovirus) and 68 (wt virus)
- When is it going to be too little to protect from illness???
- And Pfizer/BioNTech say:

## **Response duration from Pfizer BioNTech COVID-19 shot**

Updated analysis of Phase 3 clinical trial data, released by Pfizer and BioNTech last week, show the vaccine they codeveloped against COVID-19 (BNT162b2) has 91% efficacy for up to six months.

The companies reported efficacy of 91.3% against any symptoms of the disease in participants assessed up to six months after their second shot. These data also provided the first clinical results that a vaccine can effectively protect against the variant prevalent in South Africa, said the partners.



# COVID-19 Vaccine Updates



**Melinda Ashton, MD**

Executive Vice President and  
Chief Quality Officer

Hawai'i Pacific Health



**Shilpa Patel, MD**

*Pediatric Hospitalist, Kapi'olani Medical  
Center for Women & Children*

*Physician Liaison, Quality & Patient Safety,  
Hawai'i Pacific Health Medical*

Associate Professor, Pediatrics, University of  
Hawai'i – John A. Burns School of Medicine

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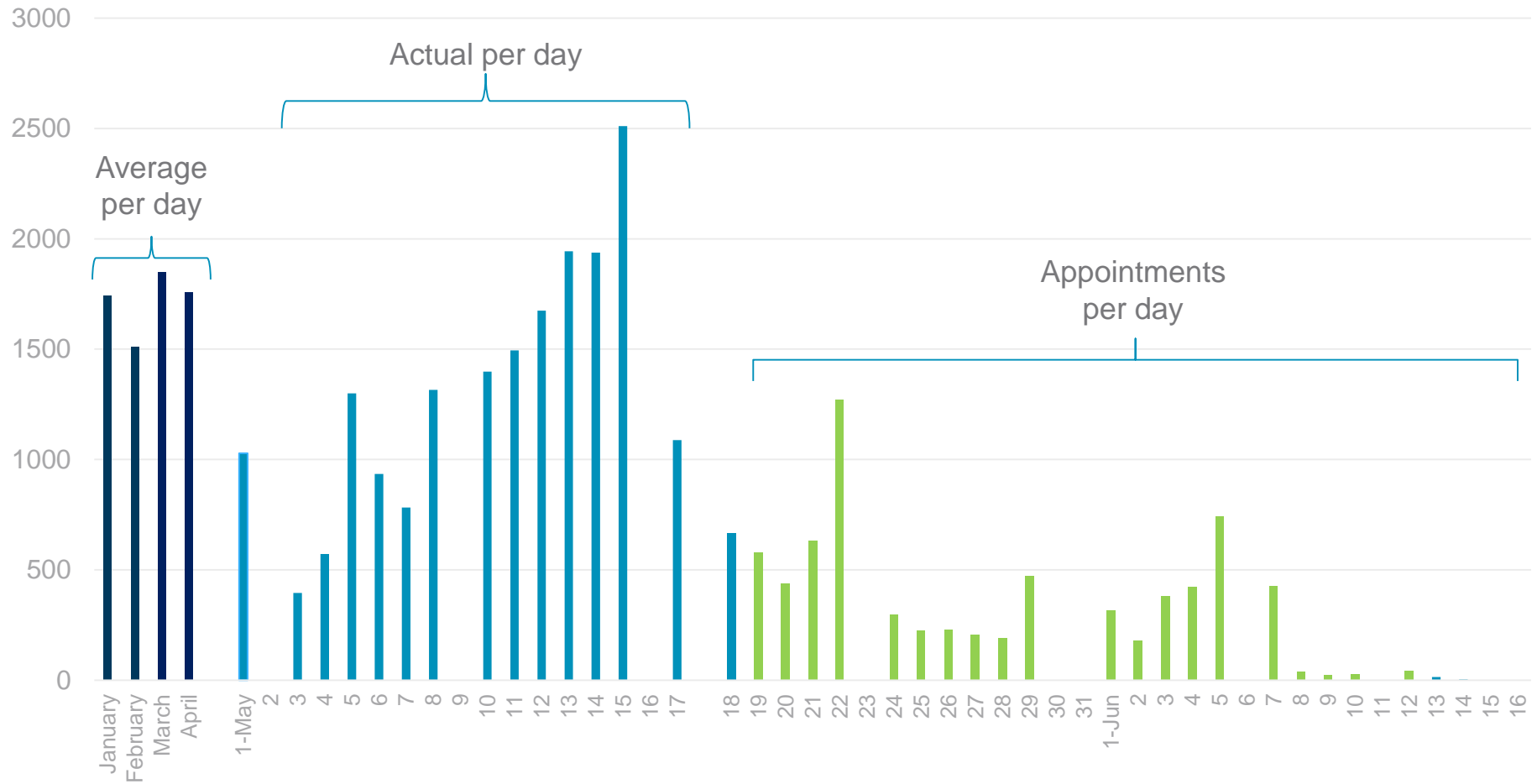
# Vaccination Update: 208,293 doses given at HPH as of May 18

	Pfizer	Moderna	J&J
Age	≥ 12 years	≥ 18 years	≥ 18 years
Dosing	2 doses, 17- 42 days apart	2 doses, 24 - 42 days apart	1 dose
Booster	?	?	?
Co-administration with other vaccines	allowed	allowed	allowed

- When will an EUA for younger children be available? Current information suggests September, 2021 for 2-12 year olds
- Efficacy against variants: mRNA vaccines appear to be effective under real world circumstances observed to date
- Duration of immunity: at least six months for the majority of recipients (likely longer but awaiting evidence)
- Immunocompromised patients may have lower rate of immunity and possibly shorter duration



# Pier 2 Activity



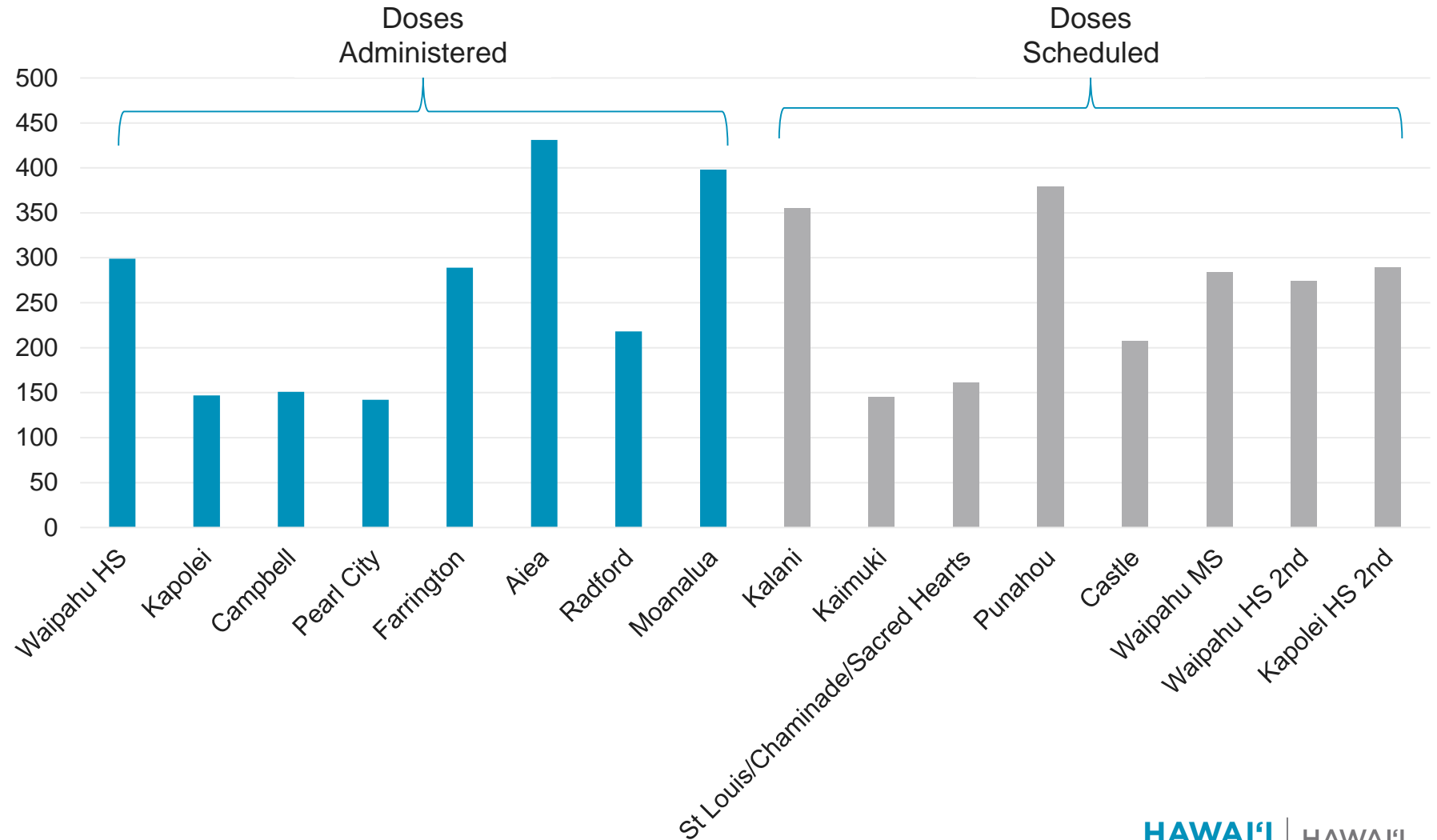


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# Vax Squad Activity



# Meet the Four Kinds of People Holding Us Back From Full Vaccination

By Sema Sgaier

May 18, 2021

## In the United States overall...

**8% are Watchful.** They're waiting to see what happens next.



**9% are Cost-Anxious.** They want the vaccine but can't afford the time or cost.



**4% are System Distrusters.** They feel the health care system doesn't treat them fairly.



**14% are Covid Skeptics.** They don't believe the threat.



## In Hawaii...

**12% are Watchful.** They're waiting to see what happens next.



**5% are Cost-Anxious.** They want the vaccine but can't afford the time or cost.



**1% are System Distrusters.** They feel the health care system doesn't treat them fairly.



**8% are Covid Skeptics.** They don't believe the threat.



# How to Move Those Who Are Hesitant to Vaccination

- Messaging from personal physician may be very helpful
- Convenience
- *Safety and cultural competence matter too*

OPINION

# Your Friend Doesn't Want the Vaccine. What Do You Say?

By Arnaud Gagneur and Karin Tamerius

May 20, 2021

## Opinion | Your Friend Doesn't Want the Vaccine. What Do You Say? - The New York Times

Hey! 🙋

I heard you just got vaccinated.

Aren't you scared?

I've heard a lot about it that makes me think it's a bad idea. 😞

Now it's your turn to respond. Choose one of the three following responses to interact with the bot:

SELECT YOUR REPLY

Wait, wait, wait 🙄 are you an anti-vaxxer?

Covid is scarier. It's killed more than three million people.

Oh 🙄 you've heard some things that make you worried and unsure?

Oh 🙄 you've heard some things that make you worried and unsure?



Dr. Tamerius

**Good choice!** When people are anxious about getting the vaccine, the first thing they need is for you to listen to their concerns without judgment and then offer compassion. They're more likely to trust you if they know you understand their fears, respect their perspective and care about their welfare.

Right.

I don't know what to do! 😞

I don't want to get Covid ...

But the vaccine might not be safe 🦠

HOW WOULD YOU REPLY?

The science is pretty clear. The vaccine is safer than Covid.

OK, so you're conflicted. You want to be safe from Covid, but you're worried about the shot and want reassurance?

Don't believe everything you read on Facebook. I'll send you some reliable articles.



Dr. Gagneur

**Good choice!** To reassure others about the vaccine, begin by reflecting their concerns — briefly summarizing what they said to show you are listening and understand why they're hesitant. When appropriate, it's also good to highlight their ambivalence, noting that a part of them wants the shot even though another part is wary.

Yes, exactly.

I want to be sure I'll be OK if I get the shot.

OK, so you're conflicted. You want to be safe from Covid, but you're worried about the shot and want reassurance?

HOW WOULD YOU REPLY?

You'll be fine. This kind of fear is what's keeping this pandemic going.

Look at me! I got vaccinated, and I'm fine. You'll be fine, too. 😊

Doubts are normal! What scares you exactly? What would make you feel better about it?

# Public Guidance:

## CDC Guidelines for Fully Vaccinated People

If you've been fully vaccinated: You can resume activities that you did prior to the pandemic.

- You can resume activities without wearing a mask or staying 6 feet apart, except where required by federal, state, local, tribal, or territorial laws, rules, and regulations, including local business and workplace guidance.
- If you travel in the United States, you do not need to get tested before or after travel or self-quarantine after travel.

<https://www.cdc.gov/coronavirus/2019-ncov/vaccines/fully-vaccinated.html> May 13, 2021.



- You need to pay close attention to the situation at your international destination before traveling outside the United States.
  - You do NOT need to get tested **before** leaving the United States unless your destination requires it.
  - You still need to show a negative test result or documentation of recovery from COVID-19 **before** boarding an international flight to the United States.
  - You should still get tested 3-5 days **after** international travel.
  - You do NOT need to self-quarantine **after** arriving in the United States.

- If you've been around someone who has COVID-19, you do not need to stay away from others or get tested unless you have symptoms.
  - However, if you live or work in a correctional or detention facility or a homeless shelter and are around someone who has COVID-19, you should still get tested, even if you don't have symptoms.
    - (Wait at least 5 days to increase testing result credibility)

<https://www.cdc.gov/coronavirus/2019-ncov/vaccines/fully-vaccinated.html> May 13, 2021.

# Have You Been Fully Vaccinated?

In general, people are considered fully vaccinated:

- 2 weeks after their second dose in a 2-dose series, such as the Pfizer or Moderna vaccines, or
- 2 weeks after a single-dose vaccine, such as Johnson & Johnson's Janssen vaccine
- If you don't meet these requirements, regardless of your age, you are NOT fully vaccinated. Keep taking all precautions until you are fully vaccinated.
- If you have a condition or are taking medications that weaken your immune system, you may NOT be fully protected even if you are fully vaccinated. Talk to your healthcare provider. Even after vaccination, you may need to continue taking all precautions.

<https://www.cdc.gov/coronavirus/2019-ncov/vaccines/fully-vaccinated.html> May 13, 2021.

## But Wait...How do These New Guidelines Apply to Hawai'i?

- The rules in effect in our counties and across Hawai'i do not allow us to follow these guidelines here. Additionally, the CDC did exclude health care facilities from these guidelines, so there will not be any change in our practices at this time.
- Our patients are very likely to be confused about all of this. Please be considerate as you let them know that the rules are different in health care settings.
- We expect that there will be growing pressure for Hawai'i to relax some of the rules in place, but until this occurs, the Hawai'i State and County guidance remains in effect and you can be subject to penalties if you don't follow them.

# How are we doing amongst HCWs?

- Vaccination amongst HCWs
  - (Full time and part time employees only)

Entity	Employee Count	Initial Shot	Booster	Initial Shot Compliance	Series Compliance
HPH Shared Services	966	809	790	83.75%	81.78%
HPHMG	632	584	583	92.41%	92.25%
HPHRI/Grants	61	51	51	83.61%	83.61%
KMC	142	115	109	80.99%	76.76%
KMCWC	1380	1110	1083	80.43%	78.48%
KMS	69	61	61	88.41%	88.41%
PMMC	899	741	723	82.42%	80.42%
SMC	1578	1240	1206	78.58%	76.43%
WMC	496	381	370	76.81%	74.60%
<b>Grand Total</b>	<b>6223</b>	<b>5092</b>	<b>4976</b>	<b>81.83%</b>	<b>79.96%</b>

# Pretty good but...

- Unvaccinated HCW ate lunch in close proximity with co-workers
- Tested positive for COVID-19
- No patients exposed due to vigilant PPE and infection prevention practices
- 4 HCWs exposed

# Does it matter?

## Good question!

- COVID-19 cases, hospitalizations, and deaths are down in US, likely due to vaccine and community immunity
- Those who test COVID+ post-vaccine get mild symptoms (headache, fever, loss of taste and smell)
- Breakthrough infections with occasional hospitalizations and deaths have occurred



# Hospitalized or fatal COVID-19 vaccine breakthrough cases reported to CDC as of May 10, 2021

As of May 10, 2021, [more than 115 million people](#) in the United States had been fully vaccinated against COVID-19. During the same time, CDC received reports from 46 U.S. states and territories of vaccine breakthrough cases in patients who were hospitalized or died.

Hospitalized or fatal vaccine breakthrough cases reported to CDC	1,359	
Female	704	(52%)
People aged ≥65 years	1,080	(79%)
Asymptomatic infections	282	(21%)
Hospitalizations*	1,136	(84%)
Deaths†	223	(16%)

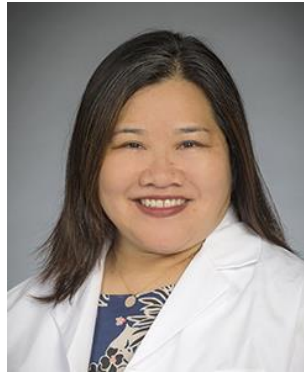
\*342 (30%) of 1,136 hospitalizations reported as asymptomatic or not related to COVID-19.

†42 (18%) of 223 fatal cases reported as asymptomatic or not related to COVID-19.

# We Need to Keep Pushing Vaccinations

- Among us
- Among our patients
- Out in the community at large

# Multisystem Inflammatory Syndrome in Children (MIS-C) associated with COVID-19



**Natascha Ching, MD, FAAP**

Pediatric Infections Diseases, Kapi'olani Medical Center for Women and Children, Hawai'i Pacific Health Medical Group

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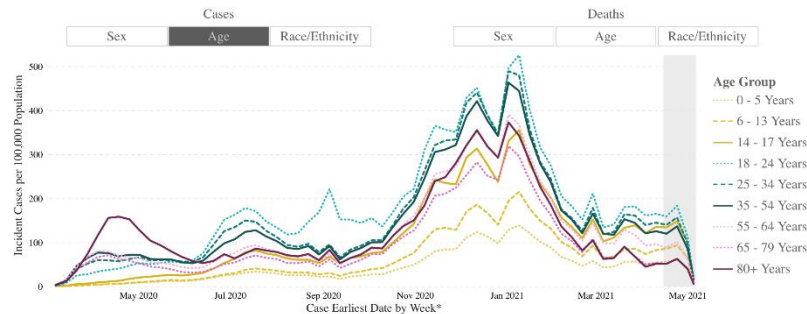
HAWAI'I  
HEALTH  
PARTNERS

# Pediatric COVID-19

- As of May 13, 2021 in the US, over 3.9 million children have tested positive for COVID-19 since the onset of the pandemic.
  - Children represented 14% of all cases
  - 5,187 cases per 100,000 children in the population
- As of May 17, 2021 in Hawaii: 4,180 cases age 0-17 years out of 32,648 = **12.8% of HI Cases**

COVID-19 Weekly Cases per 100,000 Population by Age Group, United States

March 1, 2020 - May 5, 2021



Percentage of records reporting: Age = 99.31%  
 US territories are included in case and death counts but not in population counts. Potential two-week delay in case reporting to CDC detected by gray box.  
 \*Case Earliest Date is the earliest of the clinical date (related to illness or specimen collection and chosen by a defined hierarchy) and the Date Received by CDC.  
 Source: CDC COVID-19 Case Line-Level Data, 2019 US Census, HHS Project; Visualization: Data Analytics & Visualization Task Force and CDC COVID-19 Situation Awareness Public  
 Last Updated: May 07, 2021



Weekly New COVID-19 Cases\*, Hawaii 2021

Last updated Monday, May 17, 2021 (updated weekly)

State Average Weekly New Cases per 100,000 Population

0-17 years

18-44 years

45-64 years

65+ years

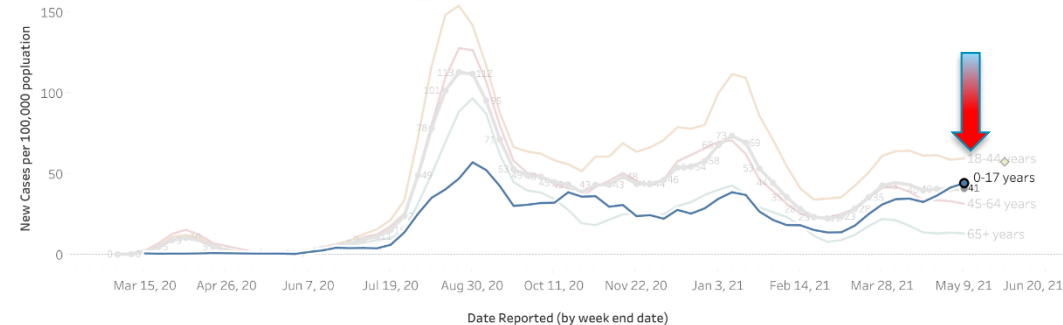
40.9

44

59

31

13



Date Filter

From 3/5/2020  
 and Null values

\* Uses a 3-week moving average

<https://www.aappublications.org>

# COVID-19 Pandemic: Evolving Clinical Information

- April 24, 2020: United Kingdom National Health Service issued alert for emerging pediatric inflammatory multisystem syndrome – temporally associated with SARS-CoV2 (**PIMS-TS**)
- May 4, 2020: NYC Health Alert - 15 cases
- May 5, 2020: UK Royal College of Pediatrics and Child Health
- May 6, 2020: Riphagen reported Hyperinflammatory shock in 8 children during COVID-19 pandemic over 10 days in mid April 2020 in London, UK.<sup>1</sup>
- May 13, 2020: Verdoni reported 10 cases of KD like features from Feb 18 to April 20 in Lombardi, Italy.<sup>2</sup>
- May 14, 2020: CDC Health Alert Network: **Multisystem Inflammatory Syndrome in Children (MIS-C) associated with COVID-19**



NEWS RELEASE 13-MAY-2020

The Lancet: COVID-19 may be linked to rare inflammatory disorder in young children, first detailed reports on 10 patients from Italy suggests

*Detailed analysis from the epicentre of the Italian COVID-19 outbreak describe increase in cases of rare Kawasaki-like disease in young children, adding to reports of similar cases from New York, USA and South East England, UK*

THE LANCET



## 2020 Health Alert #13: Pediatric Multi-System Inflammatory Syndrome Potentially Associated with COVID-19

- Fifteen cases compatible with multi-system inflammatory syndrome have been identified in children in New York City hospitals.
- Characterized by persistent fever and features of Kawasaki disease and/or toxic shock syndrome; abdominal symptoms common
- Cases may require intensive care unit admission for cardiac and/or respiratory support
- Polymerase chain reaction testing for SARS-CoV-2 may be positive or negative
- Early recognition and specialist referral are essential, including to critical care if warranted
- Immediately report cases to the New York City Health Department's Provider Access Line: 866-692-3641

May 4, 2020

## Multisystem Inflammatory Syndrome in Children (MIS-C) Associated with Coronavirus Disease 2019 (COVID-19)



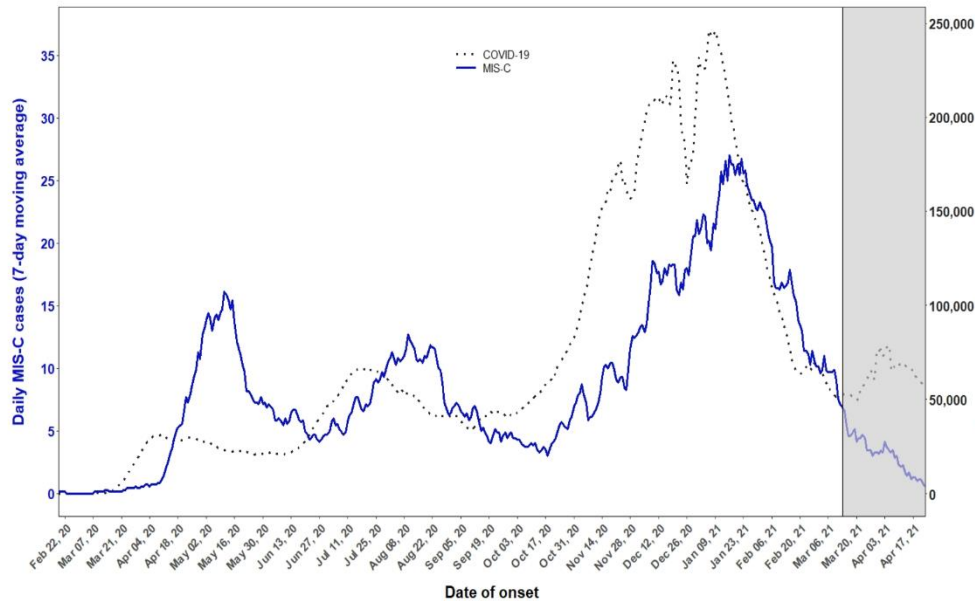
Distributed via the CDC Health Alert Network  
May 14, 2020, 4:45 PM ET  
CDCHAN-00432

1. Riphagen, S et al. Lancet May 6, 2020. Hyperinflammatory shock in children during COVID-19 pandemic
2. Verdoni, L. et al. Lancet 2020;395:1771–78 Published Online May 13, 2020.
3. <https://www.rcpch.ac.uk/sites/default/files/2020-05/COVID-19-Paediatric-multisystem-inflammatory-syndrome-20200501.pdf>

# MIS-C Confirmed Cases in US (as of May 3, 2021)

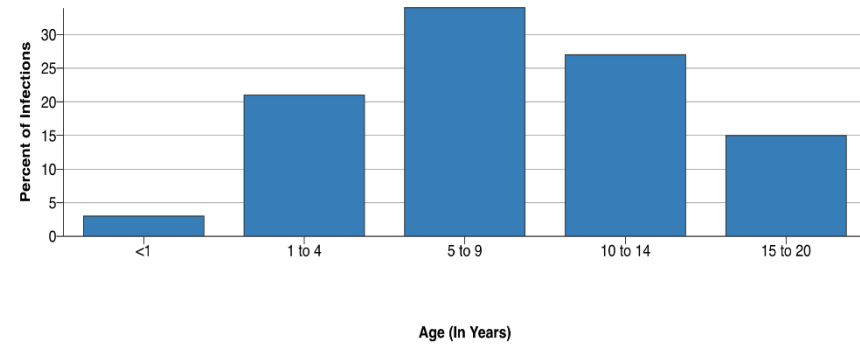
- Total Confirmed Cases: 3742 (Up from 1097 Oct 2020)
- Total Deaths: 35 (Up from 20 Oct 2020)

Daily MIS-C Cases and COVID-19 Cases Reported to CDC (7-Day Moving Average)

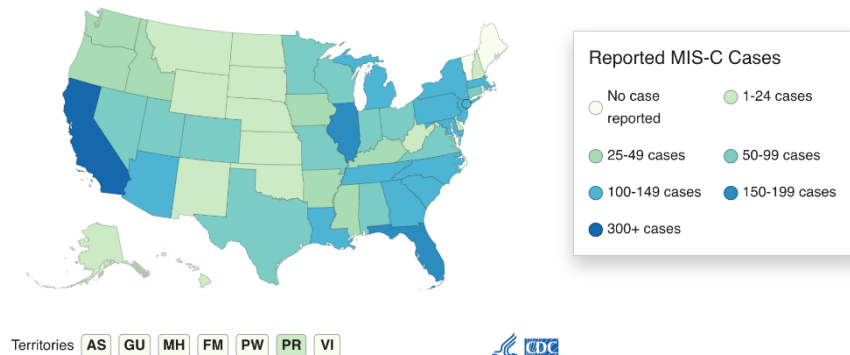


The graph shows the 7-day moving average number of COVID-19 patients and MIS-C patients with date of onset between February 19, 2020 and April 23, 2021.

MIS-C Patients by Age Group

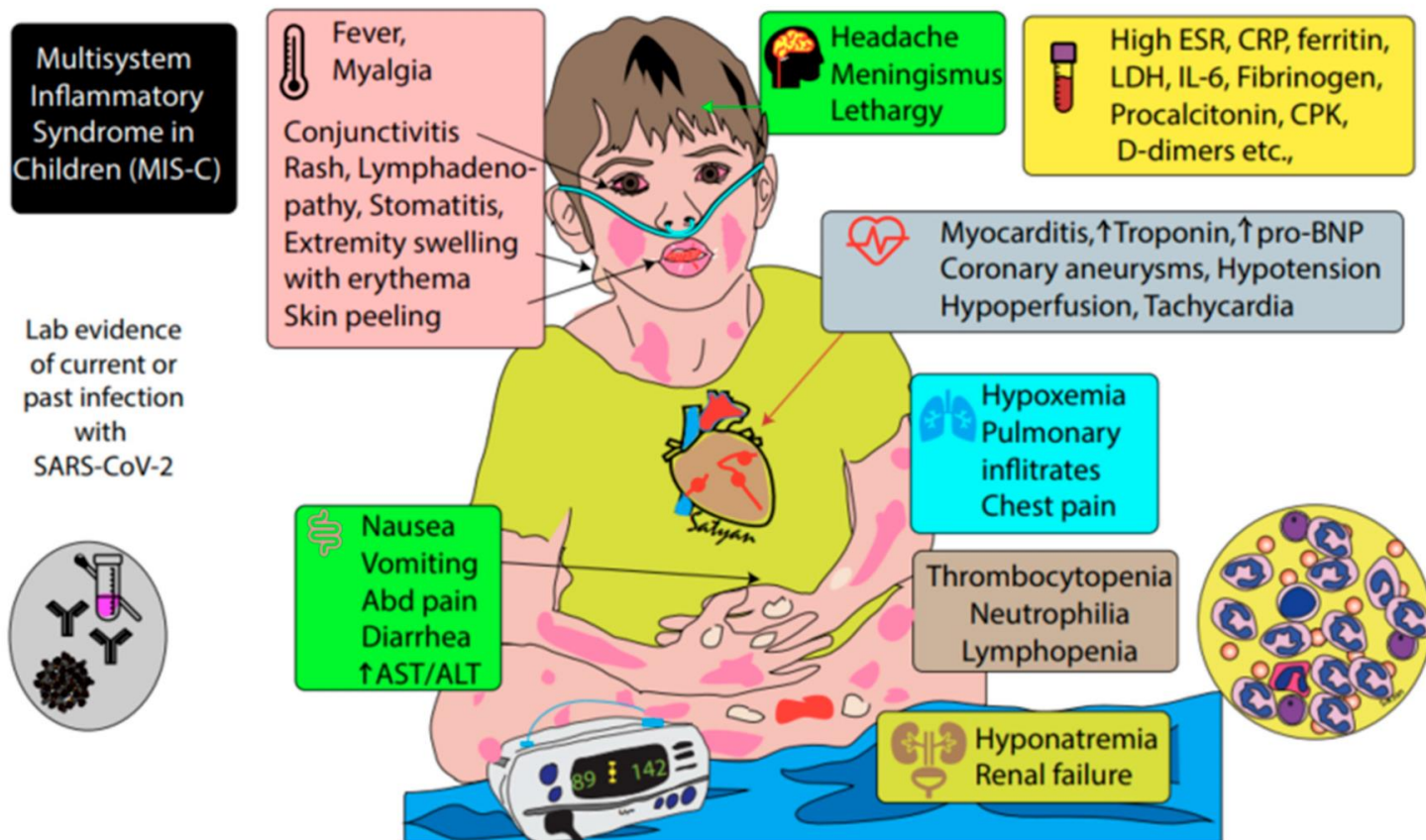


Reported MIS-C Case Ranges by Jurisdiction, on or before May 3, 2021\*



<https://www.cdc.gov/mis-c/cases/index.html>





**Figure 1.** Infographic showing CDC criteria for the diagnosis of MIS-C. A combination of fever, evidence of inflammation, involvement of at least two organ systems, and prior evidence of SARS-CoV-2 infection are required to establish the diagnosis.

Nakra, N et al. MIS-C Following SARS-CoV2 Infection: Review of Clinical Presentation, Hypothetical Pathogenesis, and Proposed Management. Children 2020, 7, 69; doi:10.3390/children7070069



# CDC Case Definition

## Multisystem Inflammatory Syndrome in Children (MIS-C)

### Associated with Coronavirus Disease 2019 (COVID-19)

An individual aged <21 years presenting with fever\*, laboratory evidence of inflammation\*\*

AND

evidence of clinically severe illness requiring hospitalization, with multisystem ( $\geq 2$ ) organ involvement (cardiac, renal, respiratory, hematologic, gastrointestinal, dermatologic or neurological);

AND

•No alternative plausible diagnoses

AND

•Positive for current or recent SARS-CoV-2 infection by RT-PCR, serology, or antigen test; or exposure to a suspected or confirmed COVID-19 case within the 4 weeks prior to the onset of symptoms.

\*Fever  $\geq 38.0^{\circ}\text{C}$  for  $\geq 24$  hours, or report of subjective fever lasting  $\geq 24$  hours

\*\*Including, but not limited to, one or more of the following: an elevated C-reactive protein (CRP), erythrocyte sedimentation rate (ESR), fibrinogen, procalcitonin, d-dimer, ferritin, lactic acid dehydrogenase (LDH), or interleukin 6 (IL-6), elevated neutrophils, reduced lymphocytes and low albumin

#### Clinical/Historical Features

**Rash:** Polymorphic, petechial, not vesicular

**GI symptoms:** diarrhea, abdominal pain vomiting

**Extremity changes:** erythema and edema of the hands and feet in acute phase

**Oral Mucosal Changes:** erythema and cracking of the lips, strawberry tongue, and/or erythema of oral and pharyngeal mucosa

**Conjunctivitis:** bilateral bulbar conjunctival injection without exudate

**Lymphadenopathy:** cervical > 1.5 cm, unilateral

**Neurological symptoms:** Headache, irritability, lethargy and altered mental status

- Epidemiological Link to COVID-19: Patient with history of COVID-19 disease, preceding illness resembling COVID-19, + PCR, serology, close contact with known positive COVID-19 case in past 4 weeks or person with suspected or placed in quarantine.
- Report possible cases of MIS-C to local Hawaii State DOH/CDC

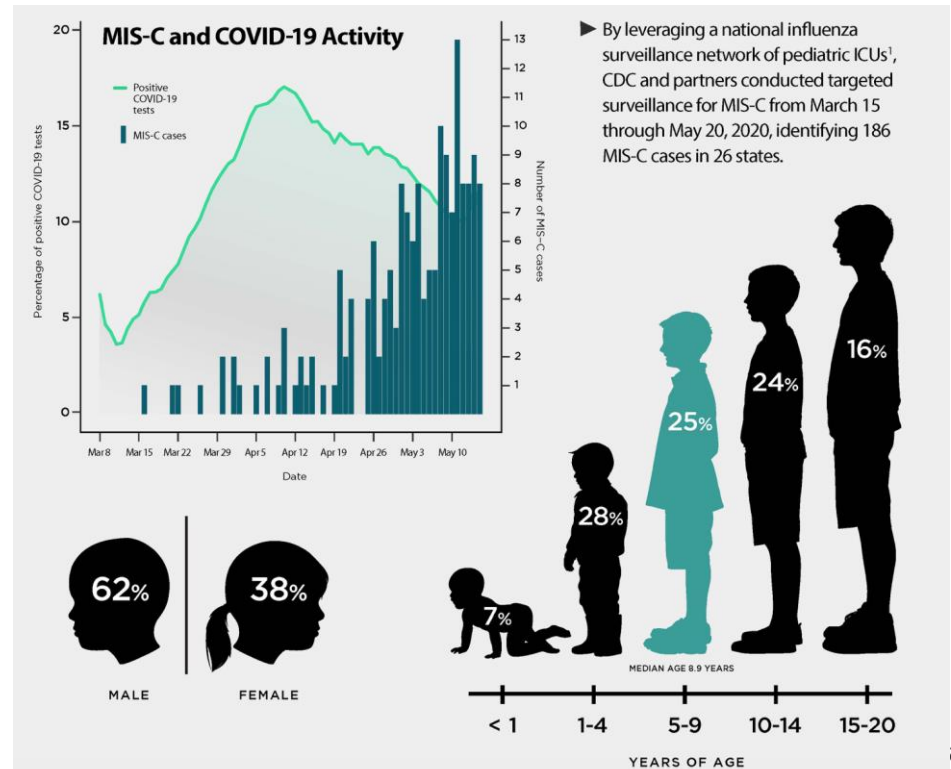
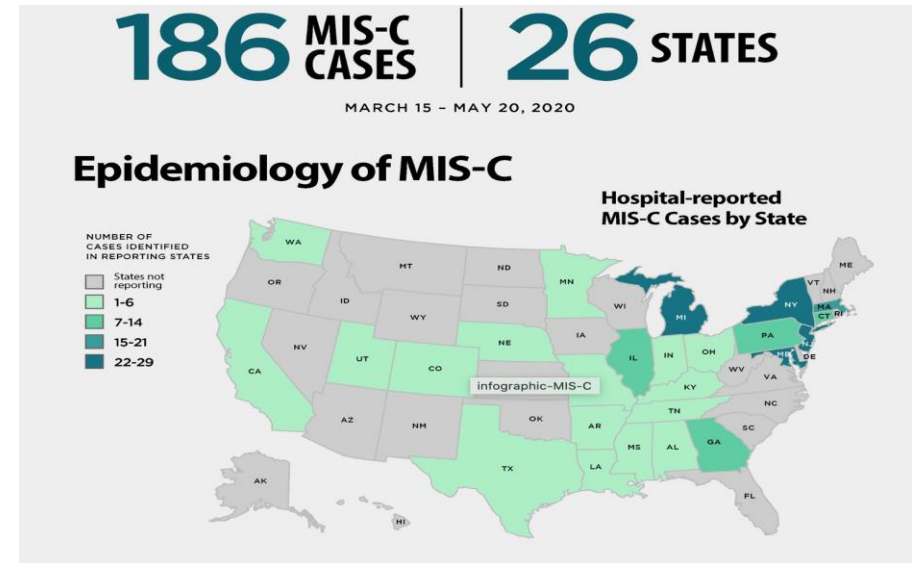
# Feldstein March to May 2020

- n= 186 patients in 26 states
- 131/186 (70%) positive by SARS-Cov2 PCR or Antibody testing
- Rx: IVIG 77%, steroids 49%, IL-6 or 1RA inhibitors in 20%
- 148 patients (80%) ICU
- 90 (48%) vasoactive support
- 37 (20%) mechanical ventilation
- 4 deaths

<https://www.cdc.gov/coronavirus/2019-ncov/covid-data/infographic-mis-c.html>

Feldstein LR, et al. N Engl J Med 2020;383:334-46. DOI: 10.1056/NEJMoa2021680

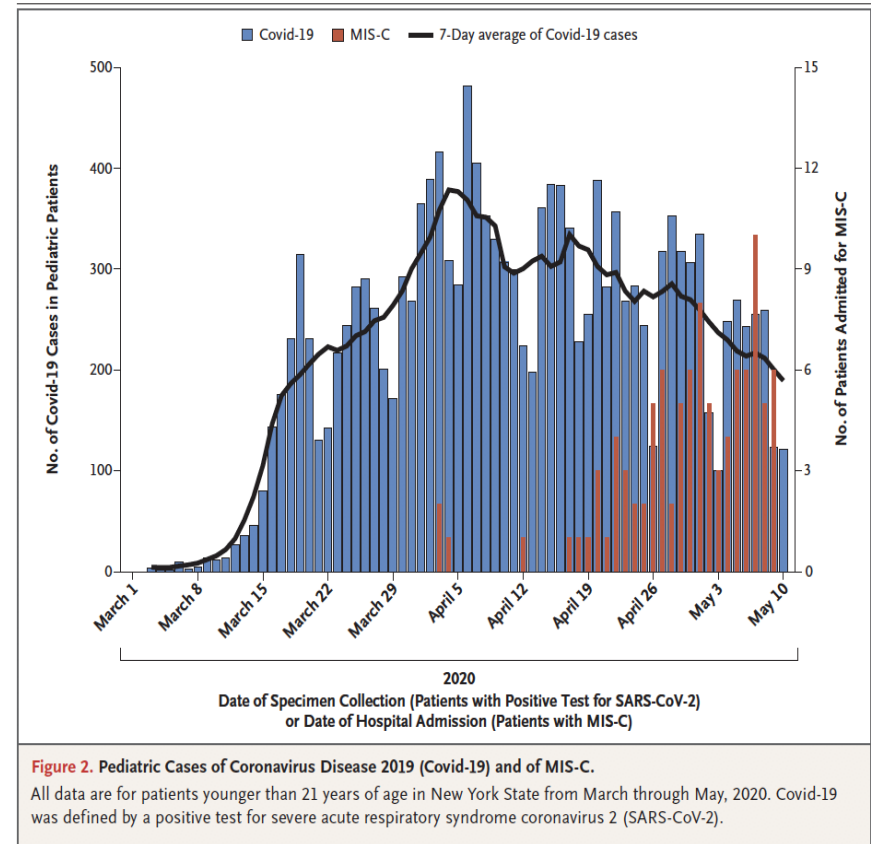
Dufort, EM et al, NEJM June 29, 2020. DOI: 10.1056/NEJMoa2021756



# Dufort March to May 2020

- n=99 (95 confirmed + 4 suspected) out of 191 potential MIS-C in New York State
- Hyperinflammatory syndrome with dermatological, mucocutaneous and GI manifestations with cardiac dysfunction
  - 24% had COVID compatible illness 10-31d
  - 60% rash, 56% conjunctival injection, 27% mucosal changes
  - 80% ICU
  - 62% vasopressor support
  - 53% myocarditis
  - 2 deaths

Peak of MIS-C followed peak of SARS-CoV2 infection by 31 days



# MIS-C and COVID-19: March 2020 to October 2020

- Case series of 1116 patients with MIS-C or COVID-19 diagnosed in 31 states, from 66 hospitals
  - 539 (48%) with MIS-C and 577 (52%) with COVID-19
  - 10 (1.9%) MIS-C died and 8 (1.4%) COVID-19 died
  - MIS-C
    - 6-12 years, non-Hispanic black, severe cardiovascular or mucocutaneous involvement and more extreme inflammation
    - Cardiac involvement with ventricular dysfunction and coronary artery aneurysms, resolved w/in 30 days
      - LV dysfunction likely results from severe systemic inflammation and acute stress more than ischemia or direct virus-mediated myocardial damage.
  - COVID-19 severe respiratory involvement

Feldstein LR et al. Characteristics and Outcomes of US Children and Adolescents With Multisystem Inflammatory Syndrome in Children (MIS-C) Compared With Severe Acute COVID-19. *JAMA*. 2021;325(11):1074-1087. doi:10.1001/jama.2021.2091

# MIS-C at KMCWC

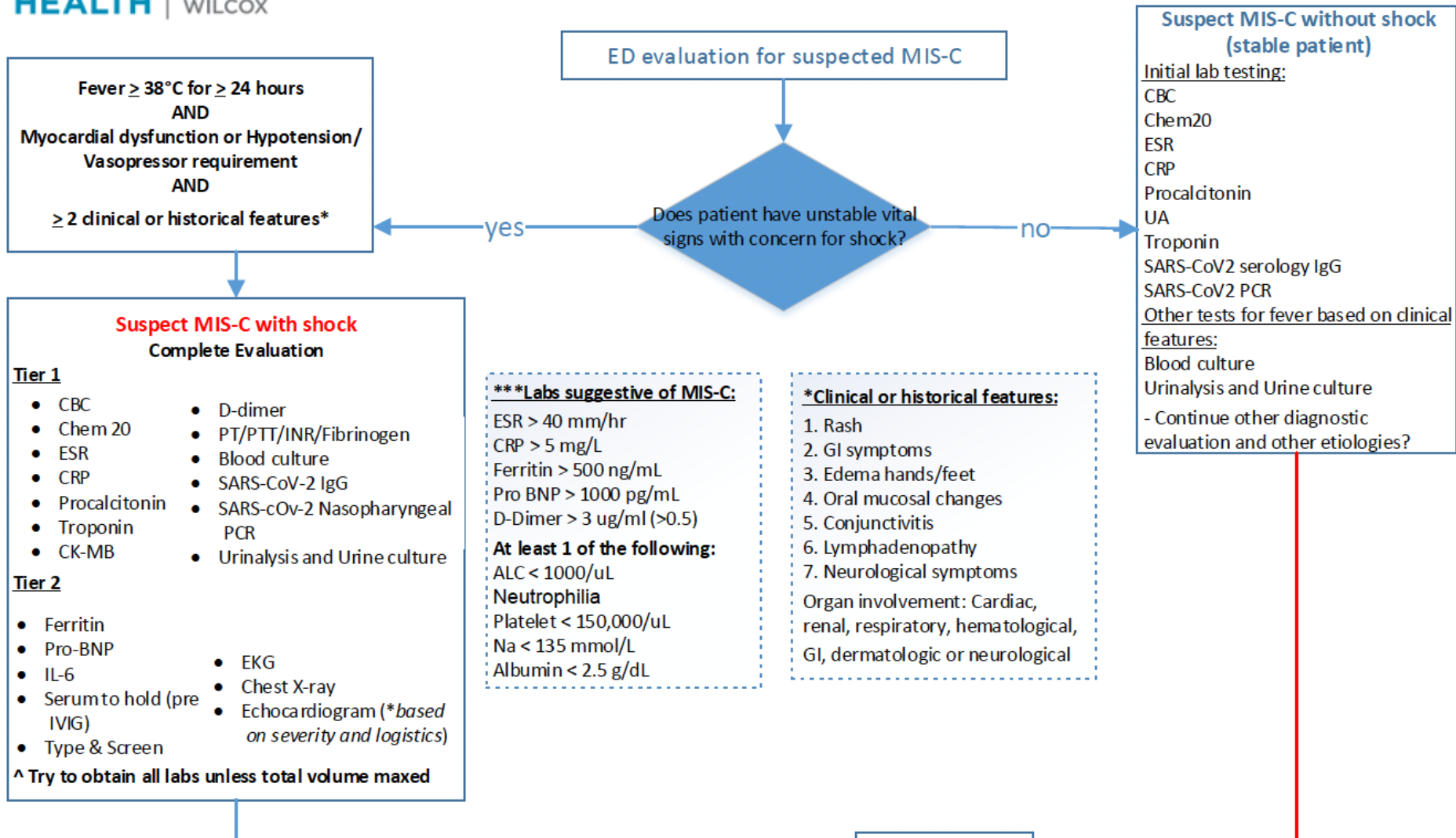
- 9 suspected; 7 confirmed MIS-C by CDC Criteria
- Age: 8 months to 16 years
- 4 Males: 3 Females
- All treated with IVIG, steroids and aspirin
- All 7 had SARS-CoV2 IgG
  - 1 patient had positive SARS-CoV2 IgG and + Molecular test
- 1 patient had escalation of steroid dosing due to persistent fevers
- 1 had late finding of coronary artery dilation at 3 months (presented day 18 fevers)
- Of the 2 with no confirmed MIS-C, 1 had severe myocardial dysfunction and 1 had shock requiring vasopressor support and coronary artery dilation



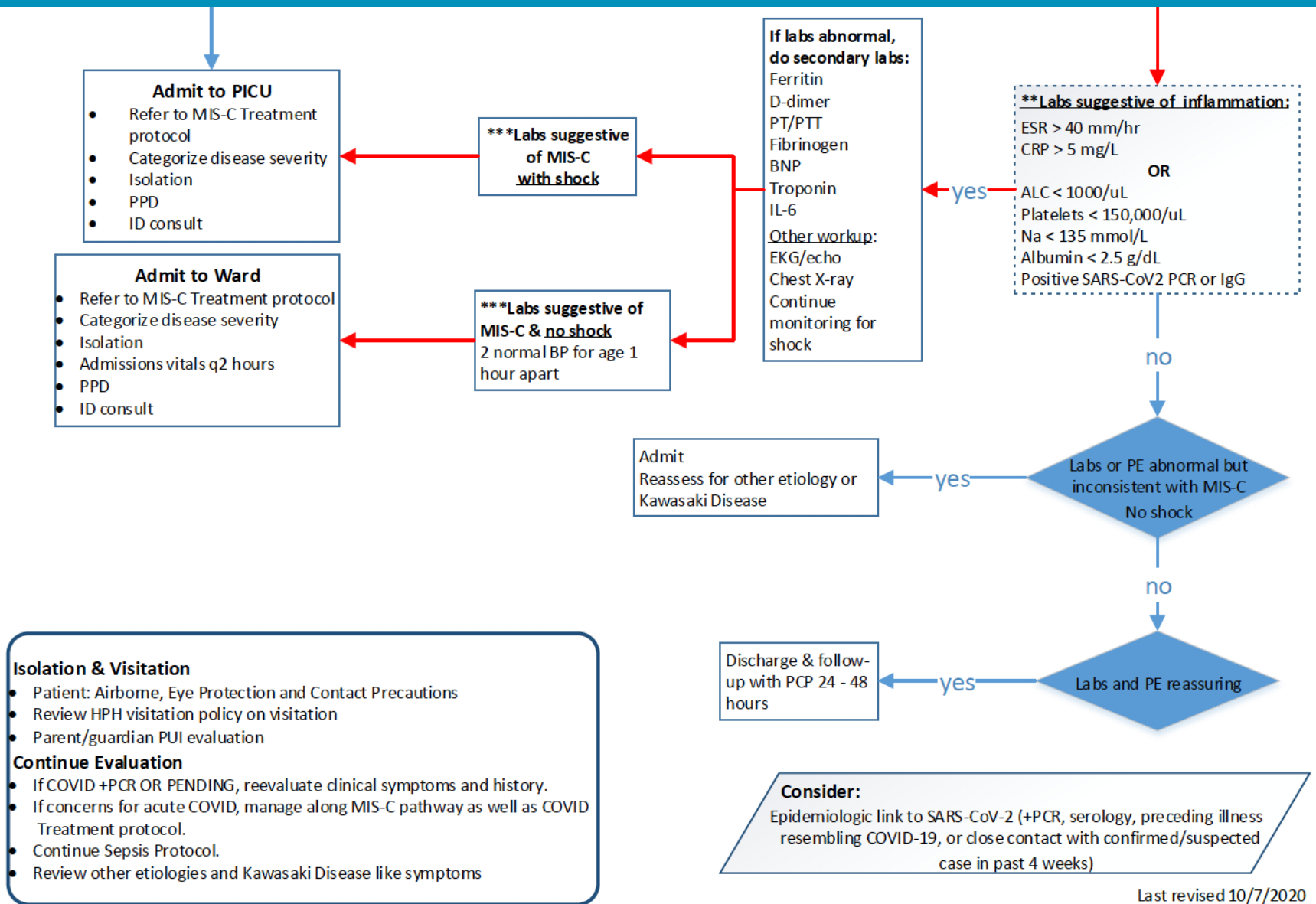
- 4-year-old male presented with 4 days of fevers, rash and red swollen tongue
- Labs significant for elevated ESR, CRP, Procalcitonin, lymphopenia, mild thrombocytopenia but normal D-Dimer
- Admitted Day 4: Mild MIS-C
  - Treatment: IVIG, low dose Steroids but no vasopressor support
- Day 5 persistent fevers, red swollen lips with increased intensity of red purple rash
  - Hands and Feet were swollen with red palms and soles
- Day 6: Continued fevers but no hypotension
  - Steroids increased 10 mg/kg/day for 3 days
- Day 7: Afebrile
- Echo normal: day 4, day 6 and day 10
- Dx: SARS-CoV2 IgG positive (3.6)
- Hx of + SARS-CoV2 PCR 4 weeks prior and family history of COVID-19



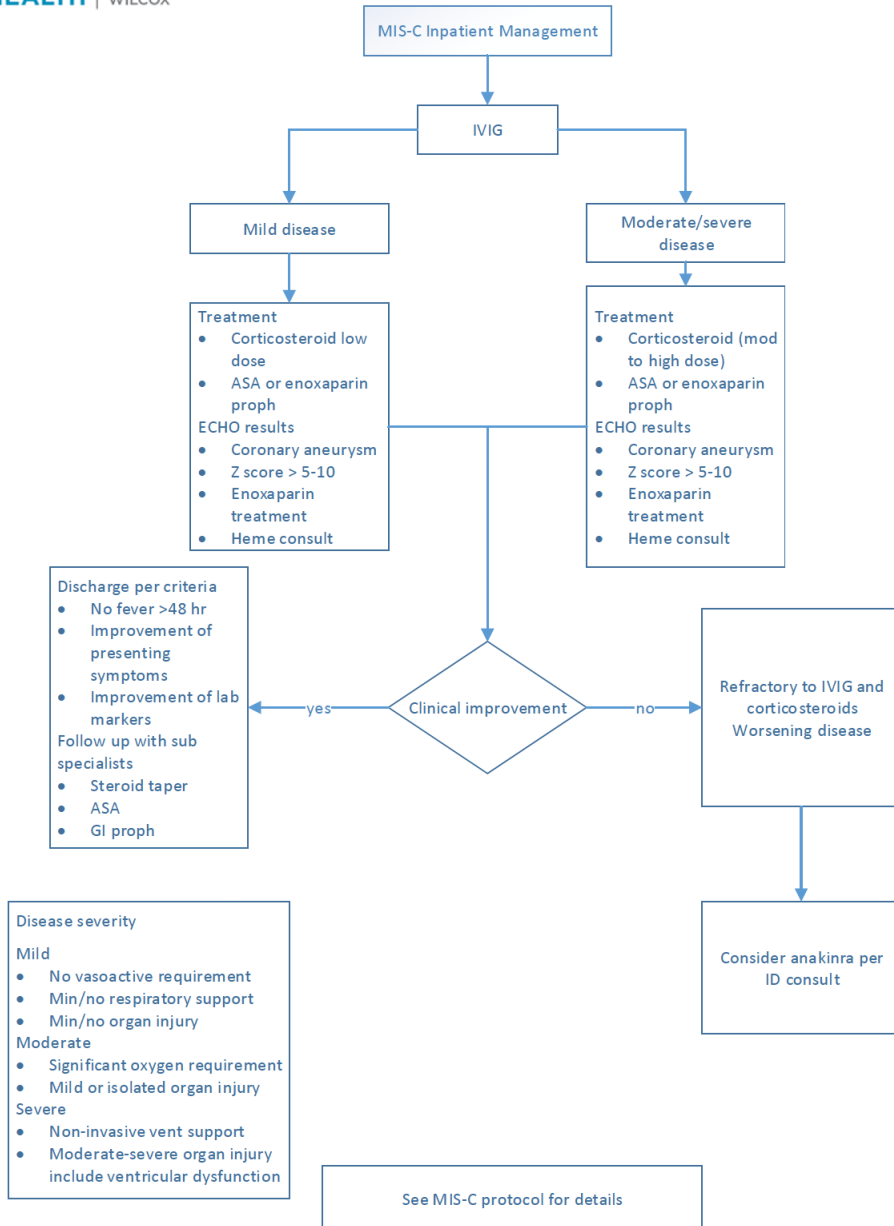
# Multisystem Inflammatory Syndrome in Children (MIS-C) Associated COVID-19 Evaluation Protocol







## Multisystem Inflammatory Syndrome in Children (MIS-C) Associated COVID-19 Treatment Algorithm



- Currently no known optimal or published CDC guidelines or recommendations for the treatment of MIS-C
- Supportive care measures
  - Fluid resuscitation
  - Inotropic support
  - Respiratory support
  - Extracorporeal membranous oxygenation (ECMO)
- Antimicrobial Treatment
  - Empiric coverage to treat sepsis
  - Sepsis protocol - guidelines

# Characterization of Multisystem Inflammatory Syndrome in Children (CHARMS) and its relationship to Kawasaki disease (KD)

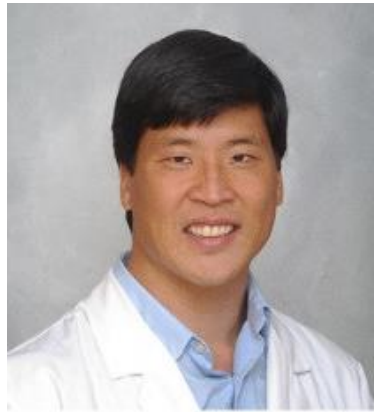
- To gain a further understanding of the relationship between the conditions of MIS-C and KD given shared clinical symptoms
- We are a clinical site with study based at Rady Children's Hospital in San Diego and 30 clinical sites
- Evaluation of clinical signs and symptoms, gene expression, cytokine patterns and SARS-CoV2 antibodies

# Summary MIS-C

- Affects children, adolescents and young adults up to 21 years of age
- Median age 9 years, 50% cases 5-13 years old
- Most children developed MIS-C 2 to 4 weeks after infection with SARS-CoV-2
- Persistent Fever and Hyperinflammatory syndrome w/ varied shock
- Distinguishing MIS-C from other severe infectious or inflammatory conditions poses a challenge.
  - Kawasaki Disease like symptoms or incomplete Kawasaki Disease
  - Bacterial Infection: Sepsis, Toxic Shock Syndrome, Rickettsia Disease
- Treatment supportive: IVF, vasopressors, IVIG, steroids, aspirin, and empiric antibiotics
- Echocardiogram, EKG and long-term monitoring

# Selected References

- Dufort, EM et al, Multisystem Inflammatory Syndrome in Children in New York State. *N Engl J Med* 2020; 383:347-358. DOI: 10.1056/NEJMoa2021756
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- Feldstein LR et al. Characteristics and Outcomes of US Children and Adolescents With Multisystem Inflammatory Syndrome in Children (MIS-C) Compared With Severe Acute COVID-19. *JAMA*. 2021;325(11):1074-1087. doi:10.1001/jama.2021.2091
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- Nakra, N et al. MIS-C Following SARS-CoV2 Infection: Review of Clinical Presentation, Hypothetical Pathogenesis, and Proposed Management. *Children* 2020, 7, 69; doi:10.3390/children7070069
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- Vinner RM et al. Kawasaki-like disease: emerging complication during the COVID-19 pandemic. *Lancet*. 2020 6-12 June; 395(10239): 1741–1743.
- Verdoni, L. et al. *Lancet* 2020;395:1771–78 Published Online May 13, 2020. [https://doi.org/10.1016/S0140-6736\(20\)31103-X](https://doi.org/10.1016/S0140-6736(20)31103-X)



# Epic Updates and Information Sharing

**James Lin, MD**

Vice President, Information Technology

Pediatric Hospitalist, Kapi'olani Medical Center

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HEALTH**

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# Epic Update – Sunday, May 23

- Letters combined with Communications (Management)
- Sexual Orientation / Gender Identify (SOGI) SmartForm
- Ambulatory clinic home page replaced with Schedule
- E-cigarette / Vaping documentation
- COVID Vaccination auto-reconciliation
- Mobile devices: E-prescribe noncontrolled meds and outpatient orders



**Communications**

Search all contacts **Add** 1 PCP 2 Referring 3 Patient 4 Print For Patient 5 Care Team 6 OB Providers 7 Previous 8 Last 9 Free Text

To: No recipient selected

Letter: No letter selected

Attachments:

From: TRAINING, PHYSICIAN

Schedule In Basket Chart Hospital Chart Patient Lists Encounter Telephone Call Remind Me Personalize

Zztest, Eddirocco

**Sexual Orientation and Gender Identity SmartForm**

Inform the patient that anything entered here will be visible to anyone with access to this legal medical record.

**Sexuality**

Patient's sexual orientation:

**Legal Information**

Legal first name:

Legal last name:

Legal sex:

**Gender Identity**

Autofill with default responses for:

Patient's gender identity:

**EZ**  
**Zztest, Eddirocco**  
 Female, 32 yr old, 11/5/1988  
 MRN: 33051519  
 Bed: 01  
 Code: Not on file (no ACP docs)  
  
  
 Care Team: No PCP  
 Self-Referral  
 Allergies: Not on file  
 Coverage: None  
 Adj Risk: None  
 Risk Scores:  
 0 General Risk Score  
 11:15 AM OFFICE VISIT



This document [or video, or image, or file – as appropriate] contains Confidential HPH Information and should not be shared without HPH's prior written consent.

CREATING A HEALTHIER HAWAII

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HEALTH**

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# Information Sharing

- Clinical areas defaulting to 'Share with Patient'
  - Emergency Department
  - Pediatrics
  - Family Practice
  - Geriatrics
  - OB/GYN



# Information Sharing

- Additional Outpatient Encounter Types
  - Immunization
  - Outside Procedure
  - Mobile
  - Nurse/MA visit
  - Patient Navigator
  - Group Visit
- Hospital areas
  - ED Provider, Triage, Note
  - L&D Delivery Note
  - Procedure Note
  - Anesthesia Procedure Note
  - Pre-Procedure Instructions
  - Asthma Action Plan

# Do Not Share

My Note



**Reason for Blocking** [X]

Please select a reason of not sharing this note with patient.

- ☐ Access to this note by the patient is reasonably likely to cause physical harm to the patient (e.g., self-harm)
- ☐ Access to this note by the patient's legal representative (e.g., parent or guardian) is reasonably likely to result in substantial harm to the patient
- ☐ Access to this note by the patient is reasonably likely to result in substantial harm to another person
- ☒ Information in this note relates to confidential teen (14-17 years old) services protected under HI State law
- ☐ The patient (adult/emancipated minor) has requested to restrict access to this note

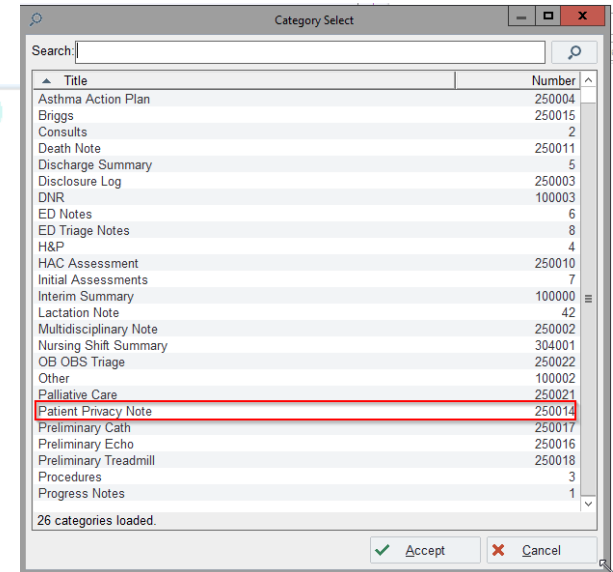
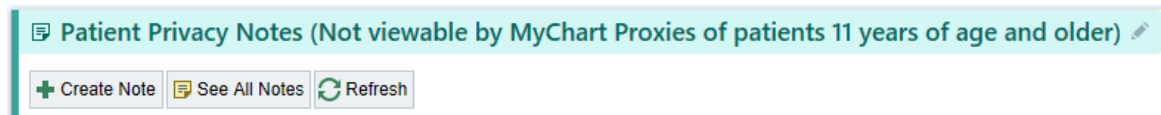
Comments

☒ Accept ☐ Cancel

- Selecting this icon will bring up a pop-up list of reasons for blocking the sharing of the note with the patient.

# Patient Privacy Note

- Patient Privacy Note is a new type of note that is visible under the *patient's* MyChart account, however is **not** visible under the proxy MyChart account



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# MyChart Proxy Access

## Proxy MyChart access:

- **≤10 years old**

✓ Full access      ✓ Patient Privacy Note

- **11 – 13 years old**

✓ Full access      ✗ Patient Privacy Note

- **14 – 17 years old**

⚠ Limited access      ✗ Patient Privacy Note

- **≥18 years old**

✓ Full access      ✗ Patient Privacy Note

Proxy MyChart Access	≤10 years old	11 – 13 years old	14 – 17 years old	≥18 years old
Appointment scheduling	✓	✓	✓	✓
Demographics	✓	✓	✓	✓
Growth Chart	✓	✓	✓	✓
Immunization Records	✓	✓	✓	✓
Send/Receive Messages ("on behalf of")	✓	✓	✓	✓
Allergies	✓	✓	✗	✓
E-Visits	✓	✓	✗	✓
Future Appointments*	✓	✓	✗	✓
Letters	✓	✓	✗	✓
Medical History	✓	✓	✗	✓
Medications	✓	✓	✗	✓
Past Visits/Notes	✓	✓	✗	✓
Patient Privacy Note	✓	✗	✗	✗
Refill Requests	✓	✓	✗	✓
Test Results	✓	✓	✗	✓

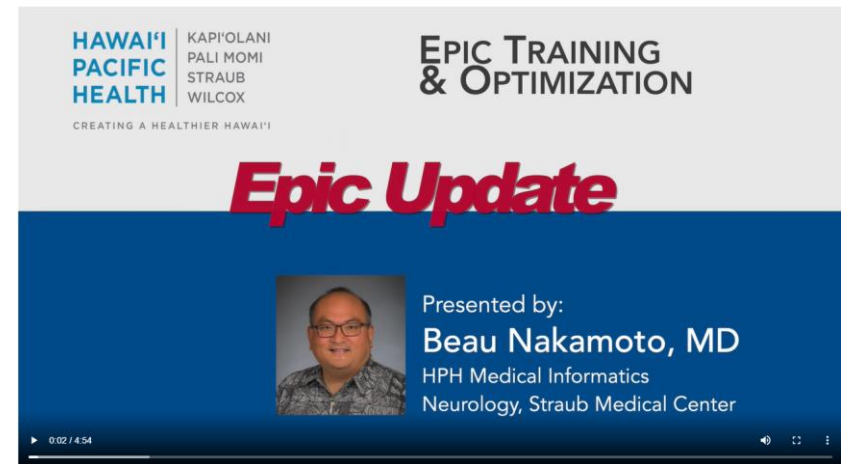
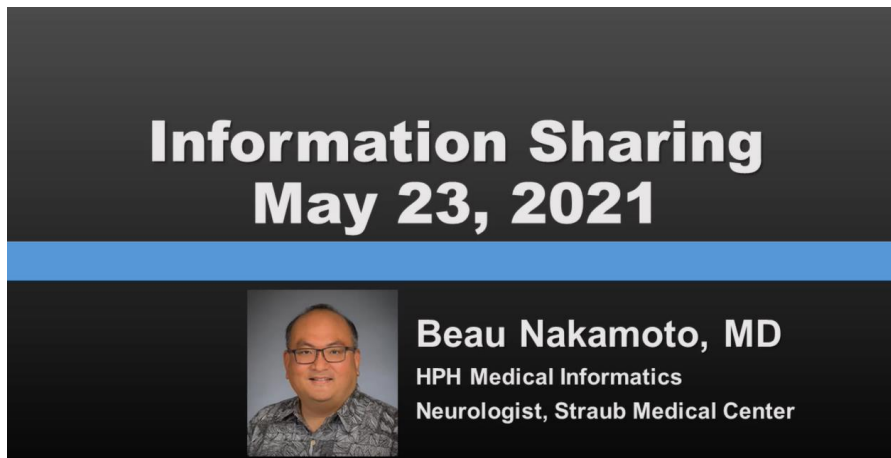
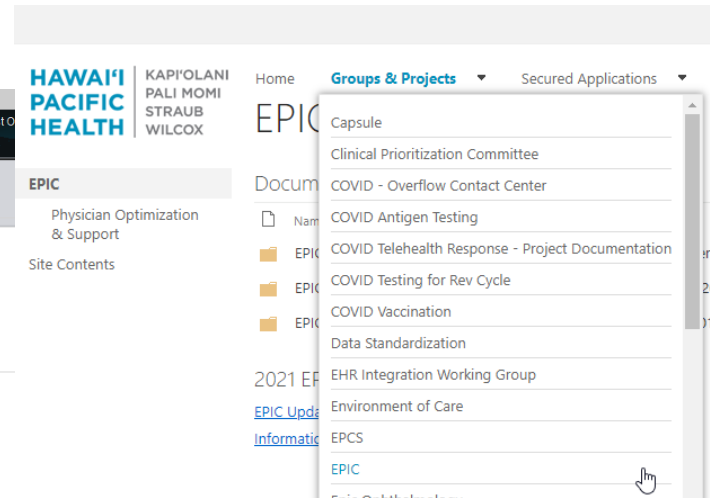
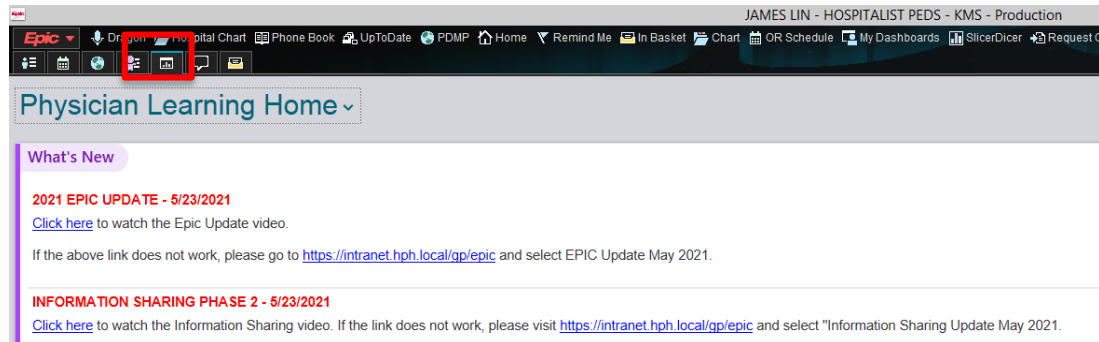
\* Scheduled Video Visits are viewable with proxy :

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# Consent for Minor Privacy Verbal Contract

- Patients who are 11 years of age and older can have a level of physician / patient privacy that is agreed upon with their guardian, the provider, and the patient.
- A 3 way verbal privacy consent is sufficient, and it is recommended **to place this verbal contract in the note that is shared.**
- This can be accessed by typing **.3WAYMINORCONSENT**
- **.3WAYMINORCONSENT** “I have obtained verbal consent from the legal guardian and the patient who agrees that certain information considered private by the patient will not be immediately available to the legal guardian as proxy in the patient portal”

# Want to learn more? 5 min videos



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# Q&A

CREATING A HEALTHIER HAWAI'I

**HAWAI'I  
PACIFIC  
HEALTH**

HAWAI'I  
HEALTH  
PARTNERS



## Next Webinar:

HHP Care Model and Disease Management Webinar:

### Mental Health/Community Resources

**Dr. Shaylin Chock**

**Thursday, May 27, 2021**

**5:30pm – 6:30 pm**

Please note: webinar topic is subject to change

# Thank you!

- A recording of the meeting will be available afterwards.
- Unanswered question?
  - Contact us at [Covid19Bulletin@hawaiiipacifichealth.org](mailto:Covid19Bulletin@hawaiiipacifichealth.org)