

# HHP/HPH COVID-19 Community Webinar Series

Monday, October 5, 2020  
5:30pm – 6:30pm



# Moderator – 10/05/20

**Andy Lee, MD**

Medical Director, *Hawai'i Health Partners*

Chief of Staff, *Pali Momi Medical Center*

Hawai'i Pacific Health

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# Disclaimer:

- 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

- In support of improving patient care, Hawai'i Pacific Health is jointly accredited by the Accreditation Council for Continuing Medical Education (ACCME), the Accreditation Council for Pharmacy Education (ACPE), and the American Nurses Credentialing Center (ANCC), to provide continuing education for the healthcare team.
- 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

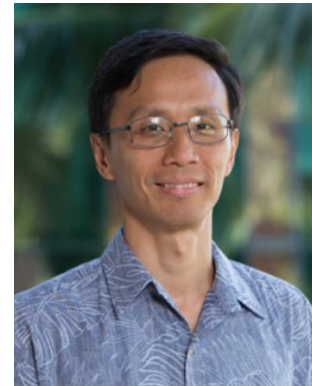
# COVID-19 Updates



**Melinda Ashton, MD**  
Executive Vice President  
and Chief Quality Officer  
Hawai'i Pacific Health



**Gerard Livaudais, MD, MPH**  
Executive Vice President,  
Population Health and  
Provider Networks  
Hawai'i Pacific Health



**Owen Chan, MD**  
Laboratory Medical Director,  
Clinical Labs of Hawai'i  
Pali Momi Medical Center

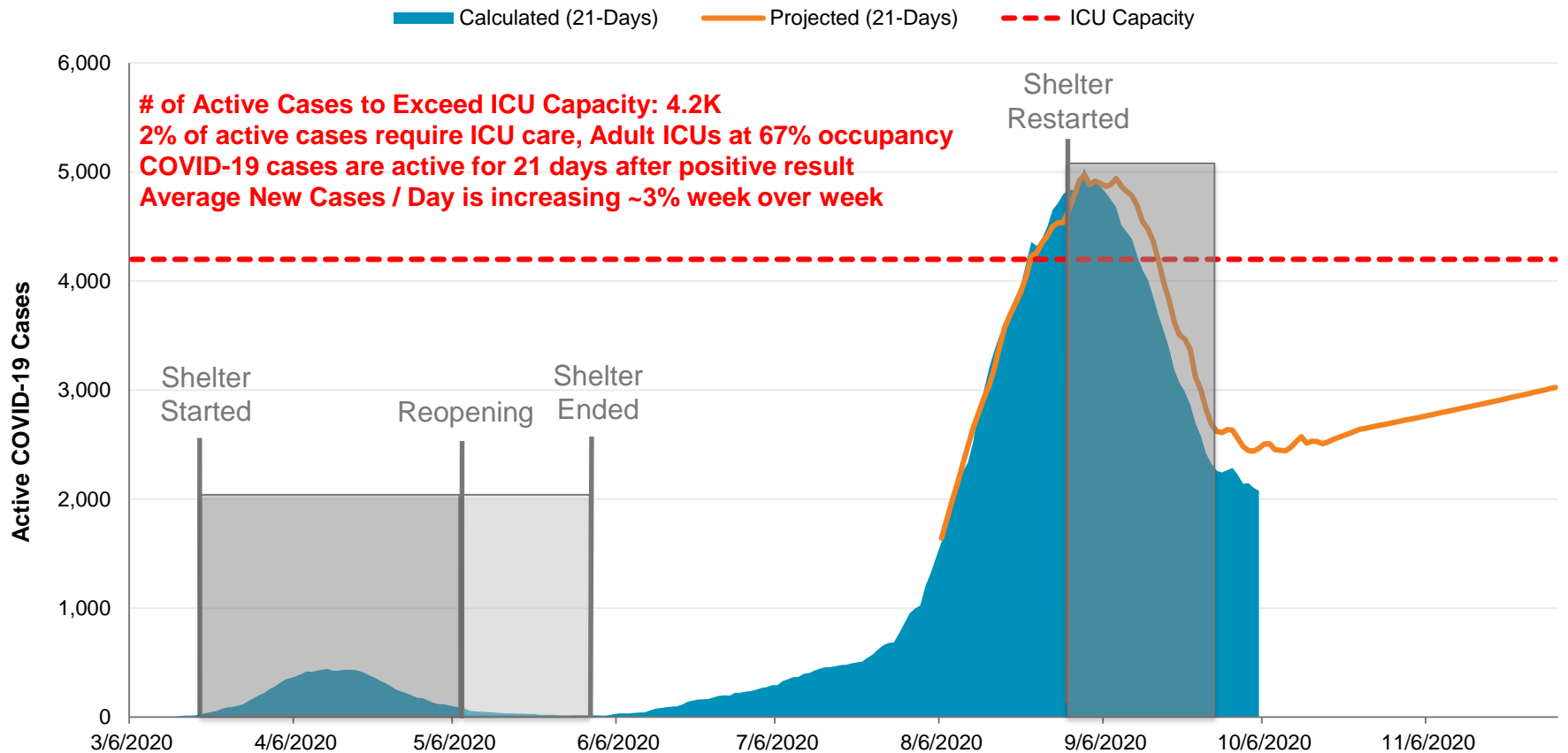


**Wade Kyono, MD**  
Medical Director,  
Hawai'i Pacific  
Health Research  
Institute



# Projected Active COVID-19 Cases

## Hawaii Actual v. Projected Active COVID-19 Cases Updated 10/5/2020



As of 10/05/20	Total Census	ICU beds occupied	# Ventilators in use	# New Admissions w/ COVID-19 screening	# New Admissions w/ positive COVID-19	# Patients currently hospitalized w/ suspect or confirmed COVID-19	# Patients currently on a ventilator w/ suspect or confirmed COVID-19	# Patients currently in ICU w/ suspect or confirmed COVID-19
KMCWC	147	AICU: 0 NICU: 67 PICU: 3	AICU: 0 NICU: 17 PICU: 2 Wilcox: 0	1	0	S: 1 C: 0	S: 0 C: 0	S: 0 C: 0
PMMC	69	12	6	1	0	S: 1 C: 8	S: 0 C: 2	S: 0 C: 0
SMC	122	11	11	4	0	S: 1 C: 15	S: 0 C: 4	S: 0 C: 0
WMC	42	3	1	1	0	S: 1 C: 0	S: 0 C: 0	S: 0 C: 0

S = Suspected; C= Confirmed

# R<sub>t</sub> COVID-19

These are up-to-date values for R<sub>t</sub>, a key measure of how fast the virus is growing. It's the average number of people who become infected by an infectious person. If R<sub>t</sub> is above 1.0, the virus will spread quickly. When R<sub>t</sub> is below 1.0, the virus will stop spreading. [Learn More](#).

[See details about the spread in Hawaii](#)

Data Last Updated: 10/5 at 4:08AM

Latest

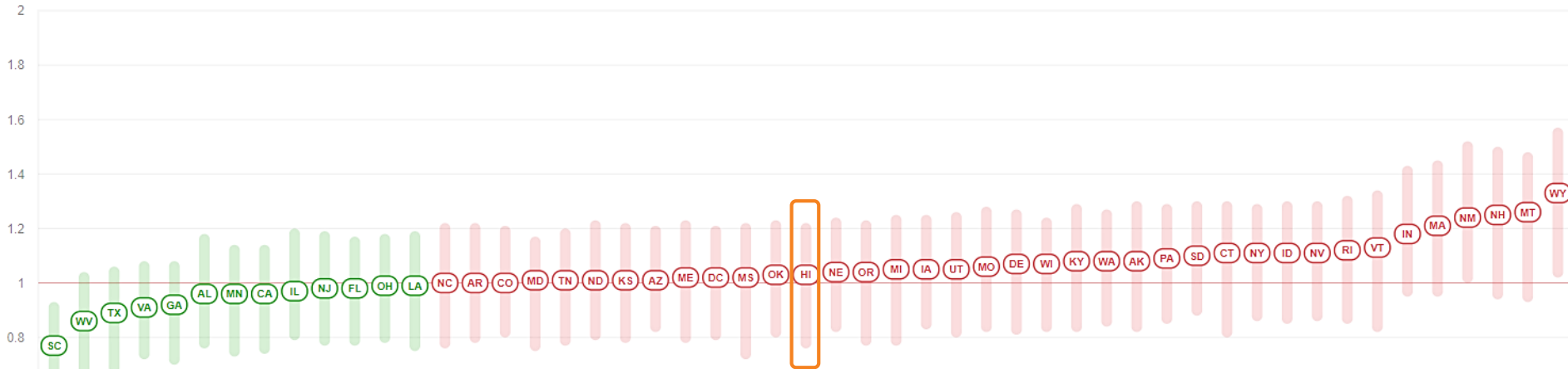
2 Weeks Ago

1 Month Ago

2 Months Ago

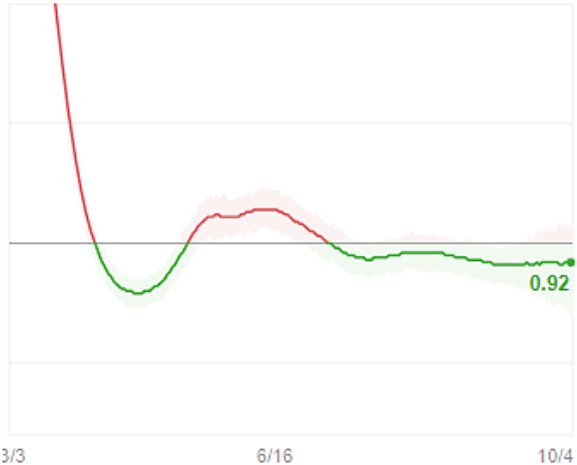
3 Months Ago

Filter



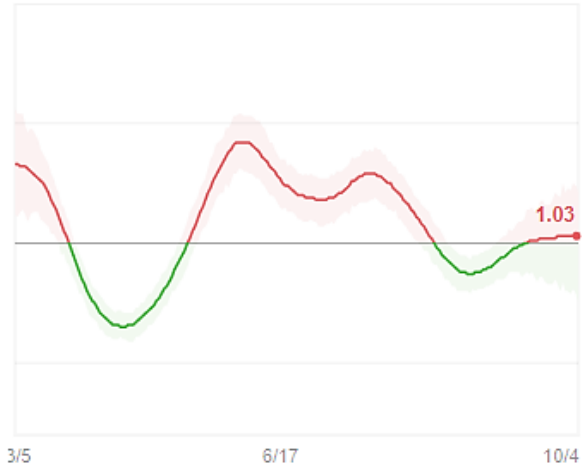
## Georgia

[Details >](#)



## Hawaii

[Details >](#)



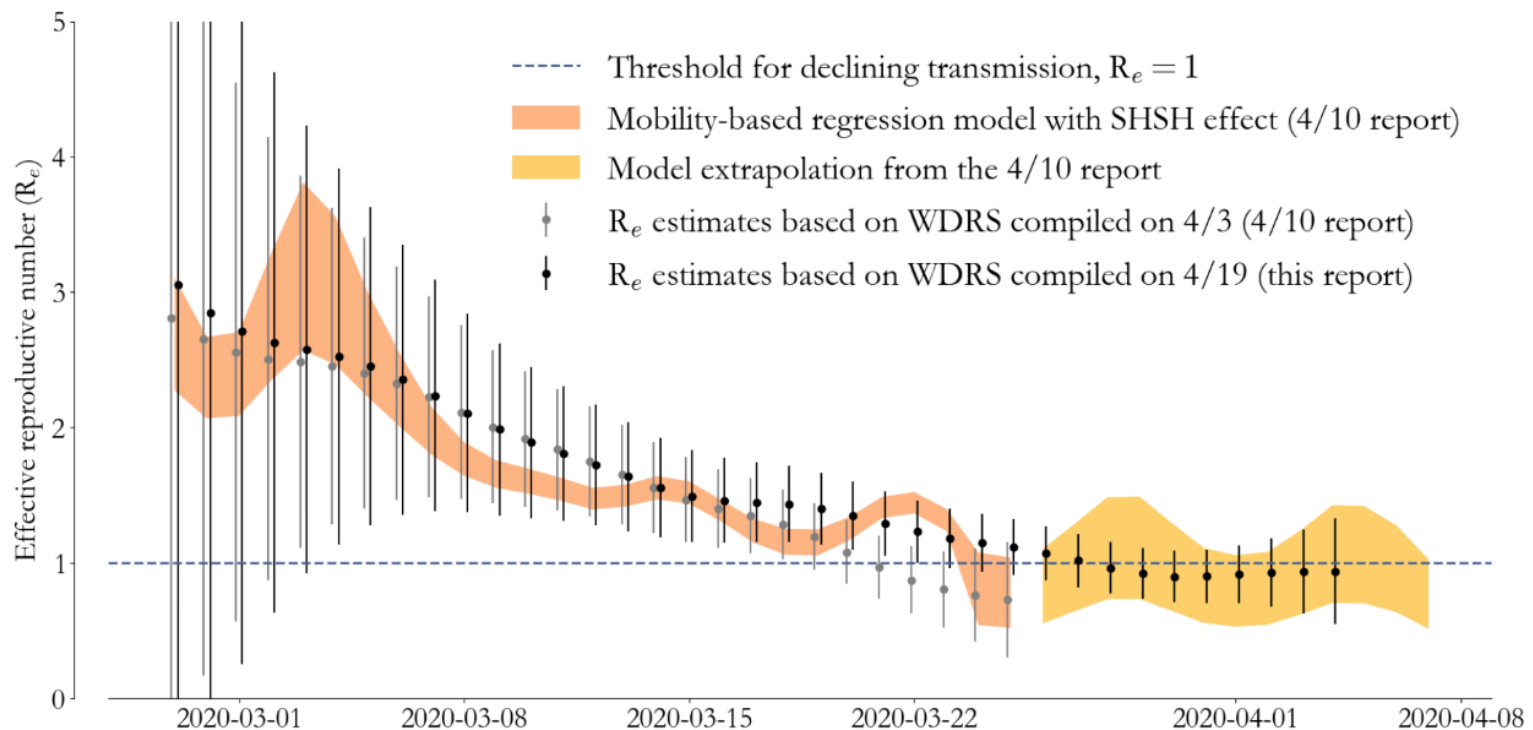
<https://rt.live/>

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$$R_t = R_0 \times \alpha \times \frac{S}{N}$$

Early in the epidemic, we saw strong correlation between mobility and  $R_t$



## HEALTH

## This Overlooked Variable Is the Key to the Pandemic

It's not R.

ZEYNEP TUFEKCI | SEPTEMBER 30, 2020



## COVID-19

HAWAII STATE DEPARTMENT OF HEALTH

MODE OF TRANSMISSION	CASES	CLUSTERS
UNKNOWN	2918	
COMMUNITY	2302	
TRAVEL/TRAVEL-ASSOCIATED	517	
CONGREGATE LIVING (PRISON, SHELTER, NURSING HOME)	416	30
BAR, CLUB, RESTAURANT	11	8
FIRE STATION	10	3
FUNERAL	75	2+
OFFICE	42	2
AUTO SERVICES	16	1
CONSTRUCTION	10	1
GYM	4	1
SCHOOL	43	1

Clusters under investigation as of 8/27.

Clusters prior to 8/27 are included in the community count.



## Key Concept:

- Overdispersion - the presence of greater variability (statistical dispersion) in a data set than would be expected based on a given statistical model.

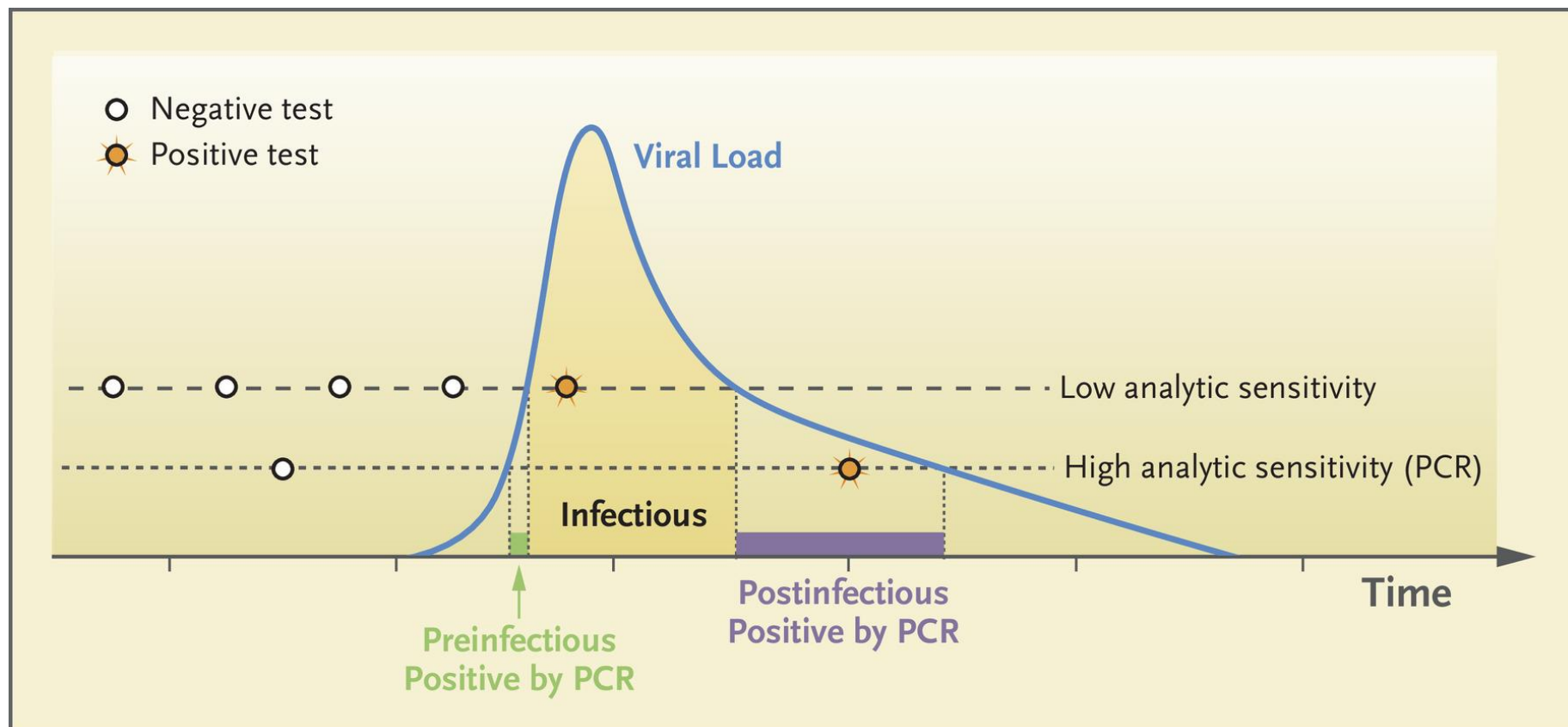
Ventilation



## Applied:

- Backward versus Forward Contact Tracing
- Testing for transmission, not diagnosis
- Cluster-busting- preventing one cluster from igniting another

# Surveillance Testing: rapid, home based



Rethinking Covid-19 Test Sensitivity — A Strategy for Containment. Michael J. Mina, M.D., Ph.D., Roy Parker, Ph.D., and Daniel B. Larremore, Ph.D.. September 30, 2020 DOI: 10.1056/NEJMp2025631



# Current Alert Level

Your Alert Level will depend on where you are in New Zealand.

## Auckland region is at Alert Level 2

Auckland region is at Alert Level 2. There are no extra restrictions on social gatherings, funerals and tangihanga.

You will need to wear a face covering when travelling into, from or through Auckland on public transport or aircraft.

### Alert Level 2

Auckland will move to Alert Level 1 at 11:59pm on Wednesday 7 October.

### Alert Level 1

## Rest of New Zealand is at Alert Level 1

The rest of New Zealand is at Alert Level 1.

You legally must wear a face covering when travelling into, from or through Auckland on public transport or aircraft.

### Alert Level 1

# Hawai'i Pacific Health Research Institute (HPHRI): COVID-19 Treatment Updates



## **Wade Kyono, MD**

*Medical Director, Hawai'i Pacific Health Research Institute  
Principal Investigator, Children's Oncology Group,  
Kapi'olani Medical Center for Women and Children  
Pediatric Hematology/Oncology, Hawai'i Pacific Health  
Assistant Professor of Pediatrics, University of Hawai'i,  
John A. Burns School of Medicine*

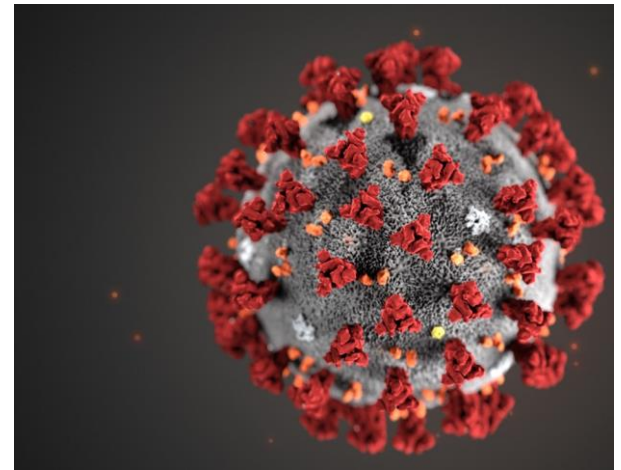
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# What We Are Doing . . .

- Severe COVID-19
  - Dexamethasone
  - Remdesivir
  - COVID-19 Convalescent Plasma (CCP)



# COVID-19 Cytokine Storm

Immune response over time:  
Self-limiting in 80%  
Severe in 15%–20%  
Fatal in 1%–2%

## Stage 1

Asymptomatic

### Innate immune activation

Viral engagement of PAMPs  
Low type 1 IFN

## Stage 2

Nonsevere symptomatic

### Adaptive immune activation

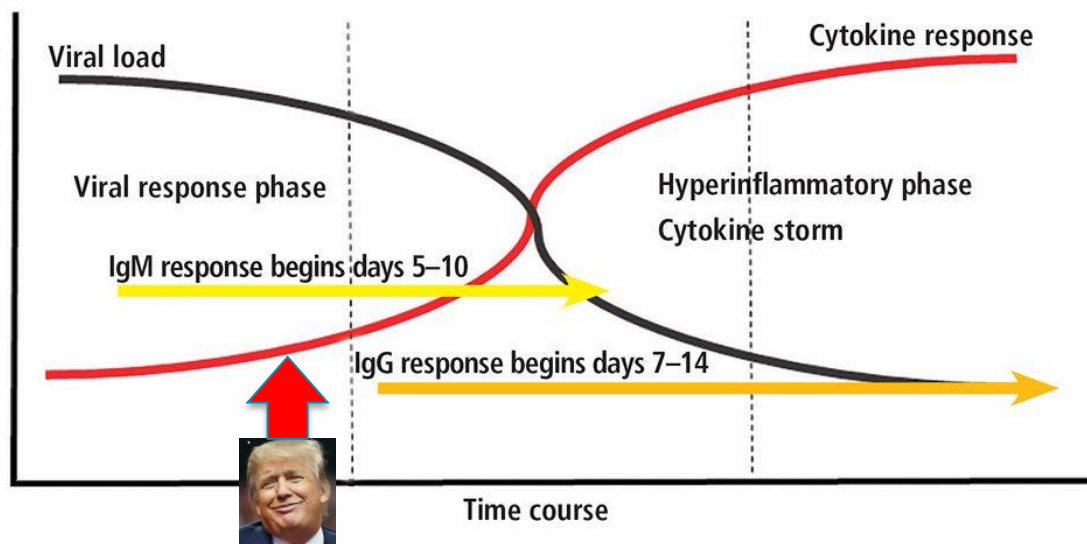
Generation of specific antibodies and T-cell response  
Release of DAMPs

## Stage 3

Severe respiratory-inflammatory

### Cytokine release syndrome

IL-1, IL-6, TNF, GM-CSF, IFN-gamma, others  
Coagulopathy  
Complement

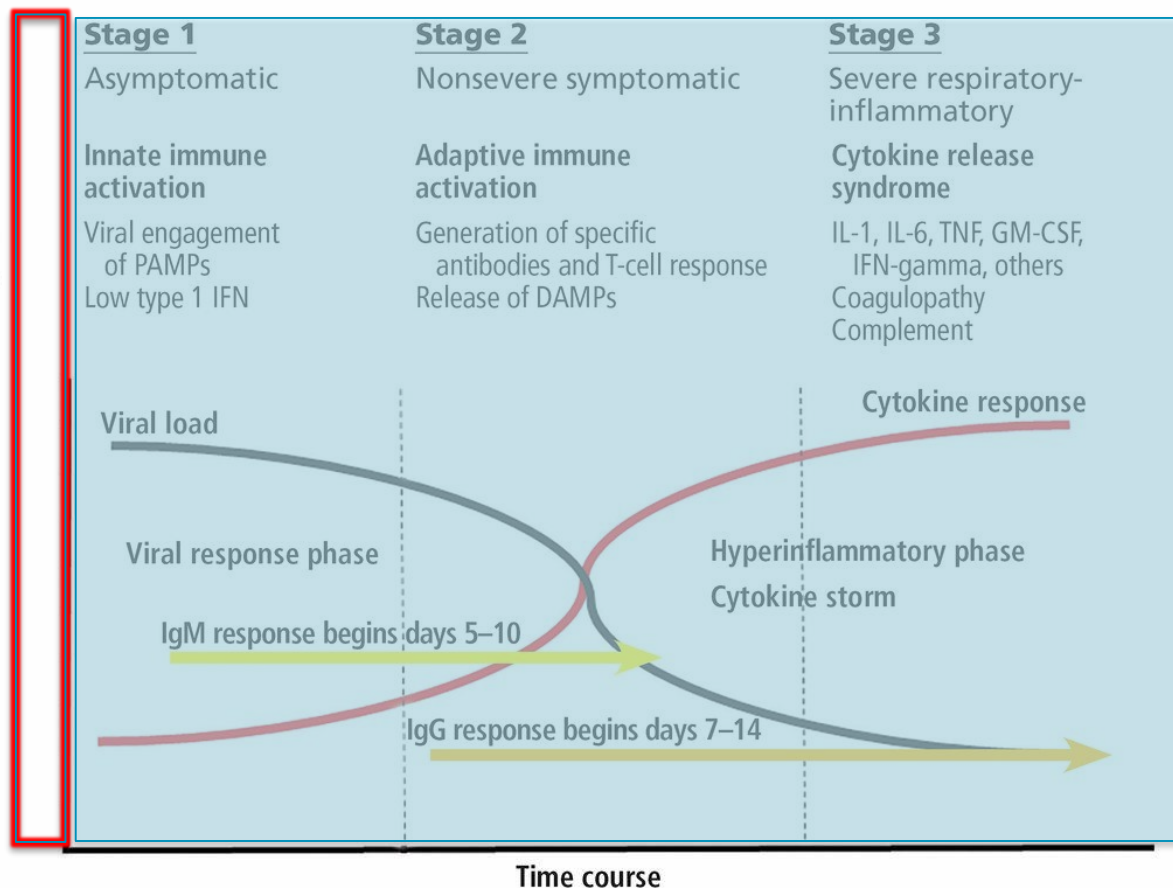


DAMPs= damage-associated molecular patterns; GM-CSF = granulocyte macrophage colony-stimulating factor; IFN = interferon; IgM = immunoglobulin M; IL-1 = interleukin 1; IL-6 = interleukin 6; PAMPs = pathogen-associated molecular patterns; TNF = tumor necrosis factor

# Therapeutic Windows

Immune response  
over time:  
Self-limiting in 80%  
Severe in 15%–20%  
Fatal in 1%–2%

**Vaccination**



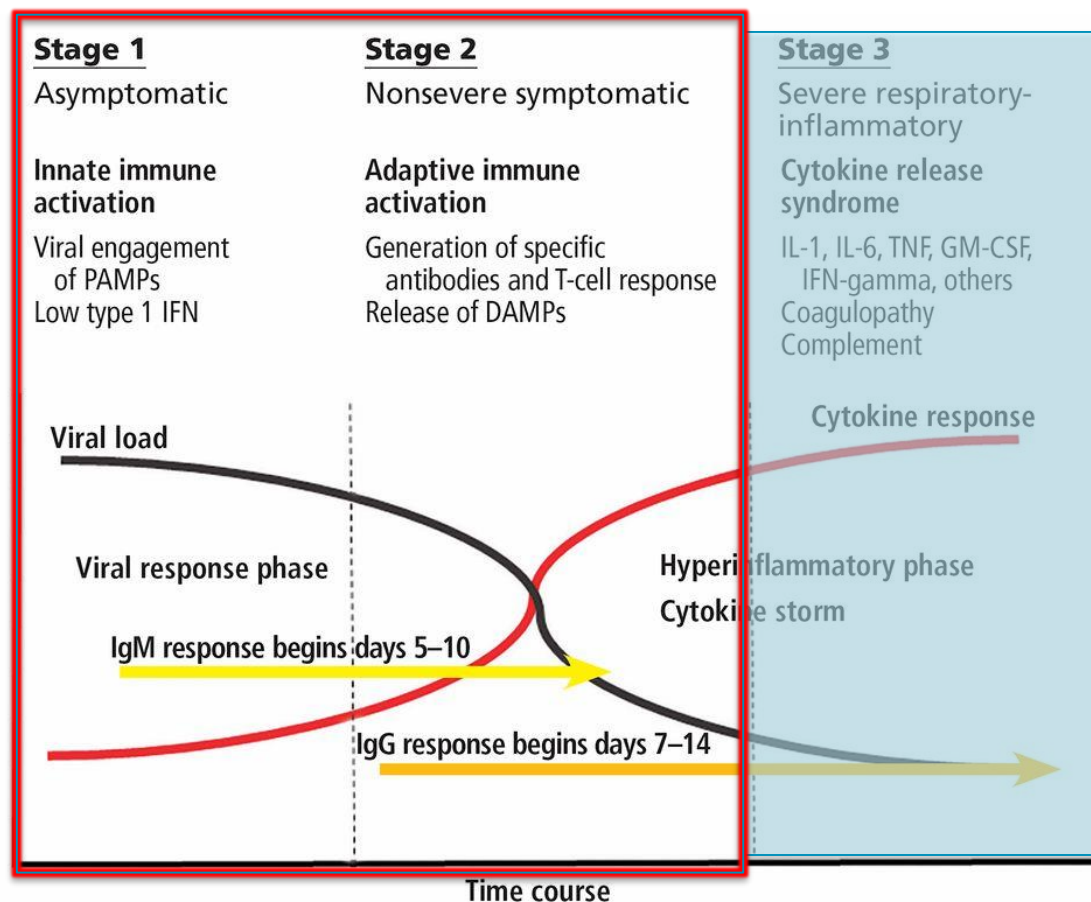
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# Therapeutic Windows

Immune response  
over time:  
Self-limiting in 80%  
Severe in 15%–20%  
Fatal in 1%–2%

**ANTIVIRALS**  
Hydroxychloroquine  
**Remdesivir**  
Lopinavir/Ritonavir

**IMMUNE-BASED**  
**Convalescent Plasma**  
Monoclonal Antibodies

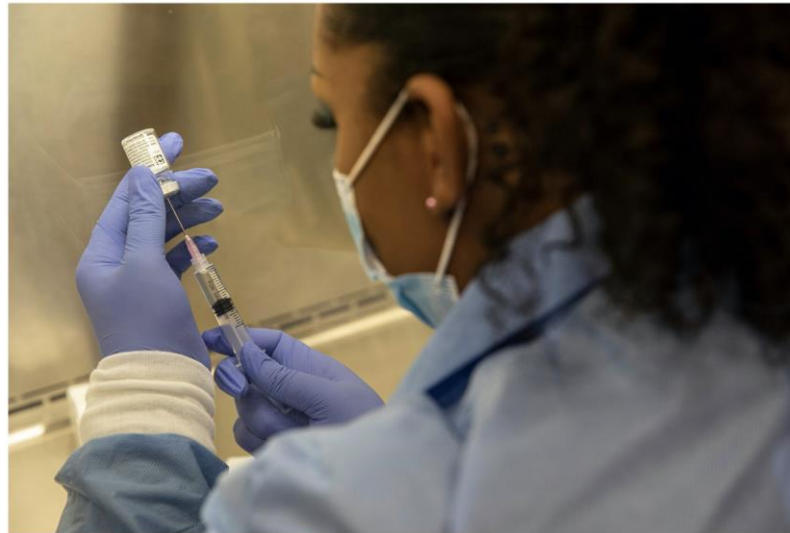


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# The New York Times

## *President Trump Received Experimental Antibody Treatment*

Mr. Trump received a single dose of an antibody cocktail made by the biotech company Regeneron. The company's C.E.O. has known the president for years.



A pharmacist in Chandler, Ariz. prepares an injection during a trial for Regeneron's antibody treatment in August. Adriana Zehbrauskas for The New York Times

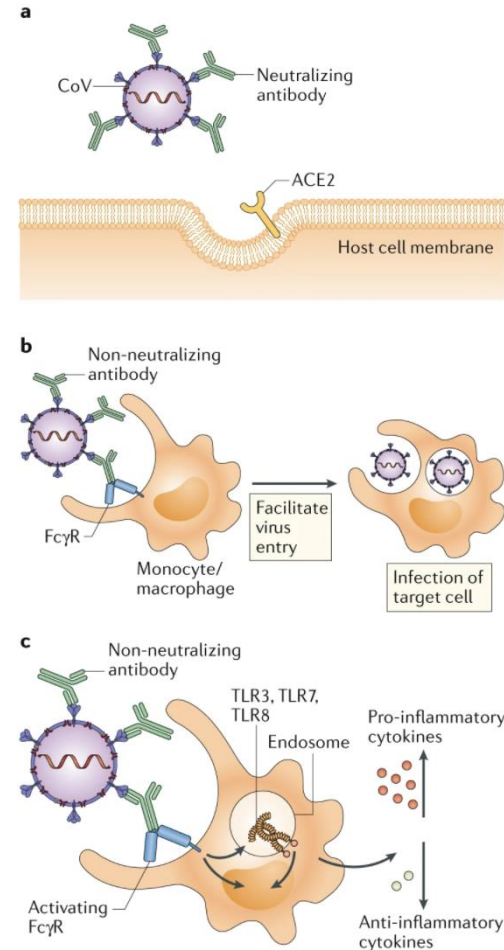
By Katie Thomas and Gina Kolata

Published Oct. 2, 2020 Updated Oct. 4, 2020



# Monoclonal Antibodies

- Want neutralizing antibody
  - High titer convalescent plasma
  - Manufactured monoclonal antibodies
    - Eli Lilly
    - Regeneron
- Non-neutralizing antibody may enhance infection or inflammation



Cite as: J. Hansen *et al.*, *Science*  
10.1126/science.abd0827 (2020).

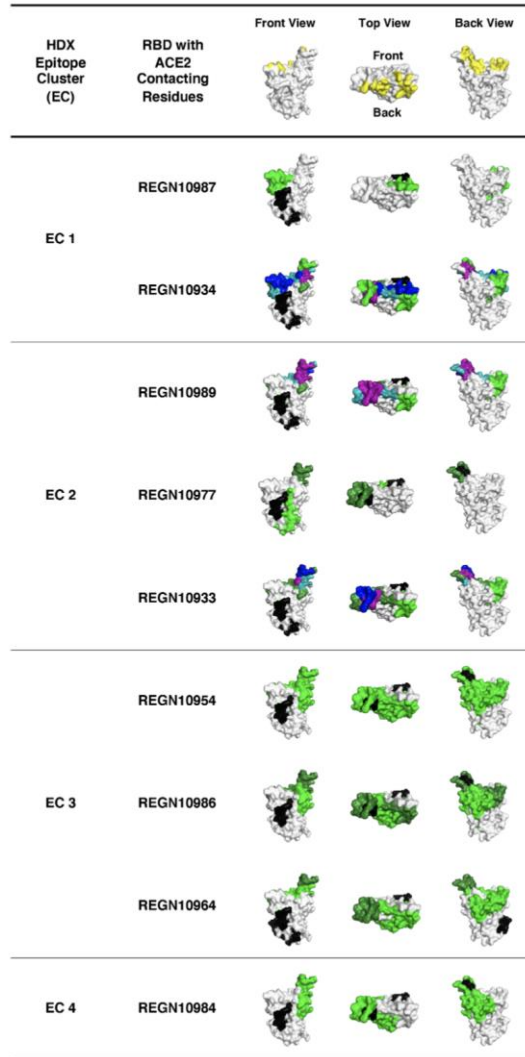
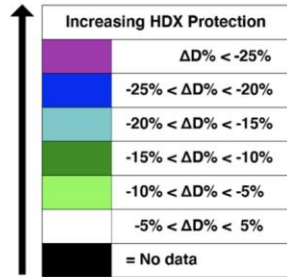
# Studies in humanized mice and convalescent humans yield a SARS-CoV-2 antibody cocktail



# REGN-COV2

- Combination of 2 monoclonal antibodies (REGN10933 and REGN10987)
- Antibody Candidates Screened
  - Mice genetically modified with a human immune system immunized with the spike protein
  - Humans recovered from COVID-19
- 2 potent, virus neutralizing antibodies
  - Bind non-competitively to the receptor binding domain (RBD) of the spike protein
  - Decreases chance of escape of spike variants





# SARS-CoV-2 Monoclonal Antibody

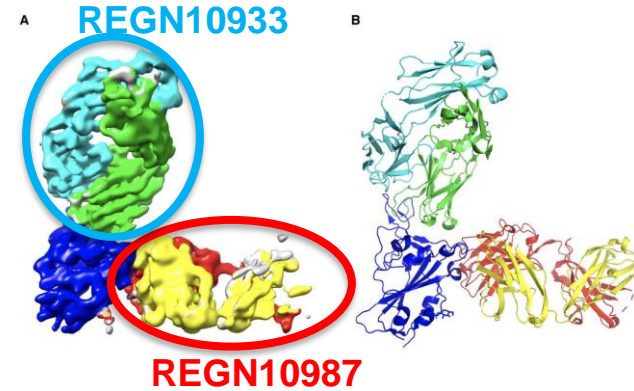


Fig. 4. Complex of REGN10933 and REGN10987 with the SARS-CoV-2 RBD. (A) 3.9 Å cryoEM map of REGN10933 + RBD + REGN10987 complex, colored according to the chains in the refined model (B). RBD is colored dark blue, REGN10933 heavy and light chains are green and cyan, and REGN10987 heavy and light chains are yellow and red, respectively.



Science. 2020 Aug 21;369(6506):1010-1014.

CREATING A HEALTHIER HAWAII

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Science

REPORTS

Cite as: A. Baum *et al.*, *Science*  
10.1126/science.abd0831 (2020).

# Antibody cocktail to SARS-CoV-2 spike protein prevents rapid mutational escape seen with individual antibodies

# Regeneron (REGN10933+REGN10987)

- Ongoing Regeneron Trials
  - Safety, Tolerability, and Efficacy of Anti-Spike (S) SARS-CoV-2 Monoclonal Antibodies for the Treatment of Ambulatory Adult Patients With COVID-19
  - Safety, Tolerability, and Efficacy of Anti-Spike (S) SARS-CoV-2 Monoclonal Antibodies for Hospitalized Adult Patients With COVID-19



September 29, 2020 at 4:01 PM EDT

# **REGENERON'S REGN-COV2 ANTIBODY COCKTAIL REDUCED VIRAL LEVELS AND IMPROVED SYMPTOMS IN NON-HOSPITALIZED COVID-19 PATIENTS**

TARRYTOWN, N.Y., Sept. 29, 2020 /PRNewswire/ --

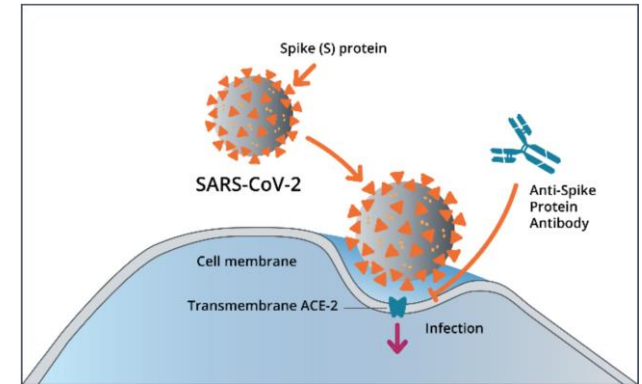
**Greatest improvements in patients who had not mounted their own effective immune response prior to treatment**

**Plan rapidly to discuss results with regulatory authorities**

**Regeneron to host investor and media webcast to discuss results at 4:30 pm ET today**

# RGEN-COV2 Antibody Cocktail

- Phase 1/2/3 Trial
  - Non-Hospitalized COVID-19 patients
    - Reduced viral load
    - Faster alleviation of symptoms
    - Decreased need for medical visits
  - Ongoing randomized double-blind placebo controlled study
- Greatest benefit in those who did not mount an effective immune response (seronegative patients)
- Well tolerated
- Supports further antibody trials and vaccines against the SARS-CoV-2 spike protein



# RGEN-COV2 Antibody Cocktail – Initial Data

- 275 patients
- IV High Dose (8g) vs Low Dose (2.4g) vs Placebo
- COVID-19 being treated in the outpatient setting
- Serology prior to treatment
  - Seronegative – 41% . . . Inadequate immune response
  - Seropositive – 45% . . . Adequate immune response
  - Unknown – 14%
- Viral load measured

# RGEN-COV2 Antibody Cocktail - Findings

- Serologic status highly correlated with baseline viral load
  - Seropositive patients with much lower levels of virus and cleared rapidly
  - Seronegative with higher levels of virus and slower to clear without treatment
- Serological status at baseline predicted how rapidly patients had alleviation of their symptoms
  - Untreated (placebo) group – **seropositives** had a median time to resolve symptoms of 7 days vs **seronegatives** who had a median time to resolve symptoms in 13 days

# REGN-COV2 Antibody Cocktail - Findings

- REGN-COV2 rapidly reduced viral load through Day 7 in seronegative pts (key virologic endpoint)
  - 0.51-0.60 log<sup>10</sup> copies/mL greater reduction vs placebo
- Pts with increasingly higher baseline viral levels had correspondingly greater reductions in viral load at Day 7 with REGN-COV2 treatment
  - Load >10<sup>5</sup> copies/mL = 50-60% reduction
  - >10<sup>6</sup> copies/mL = 95% reduction
  - >10<sup>7</sup> copies/mL = 99% reduction
- Pts who were seronegative and/or had higher baseline viral levels also had greater benefits in symptom alleviation
  - Placebo – 13d, High Dose – 8d, Low Dose – 6d



# Is that enough data for monoclonal antibodies?

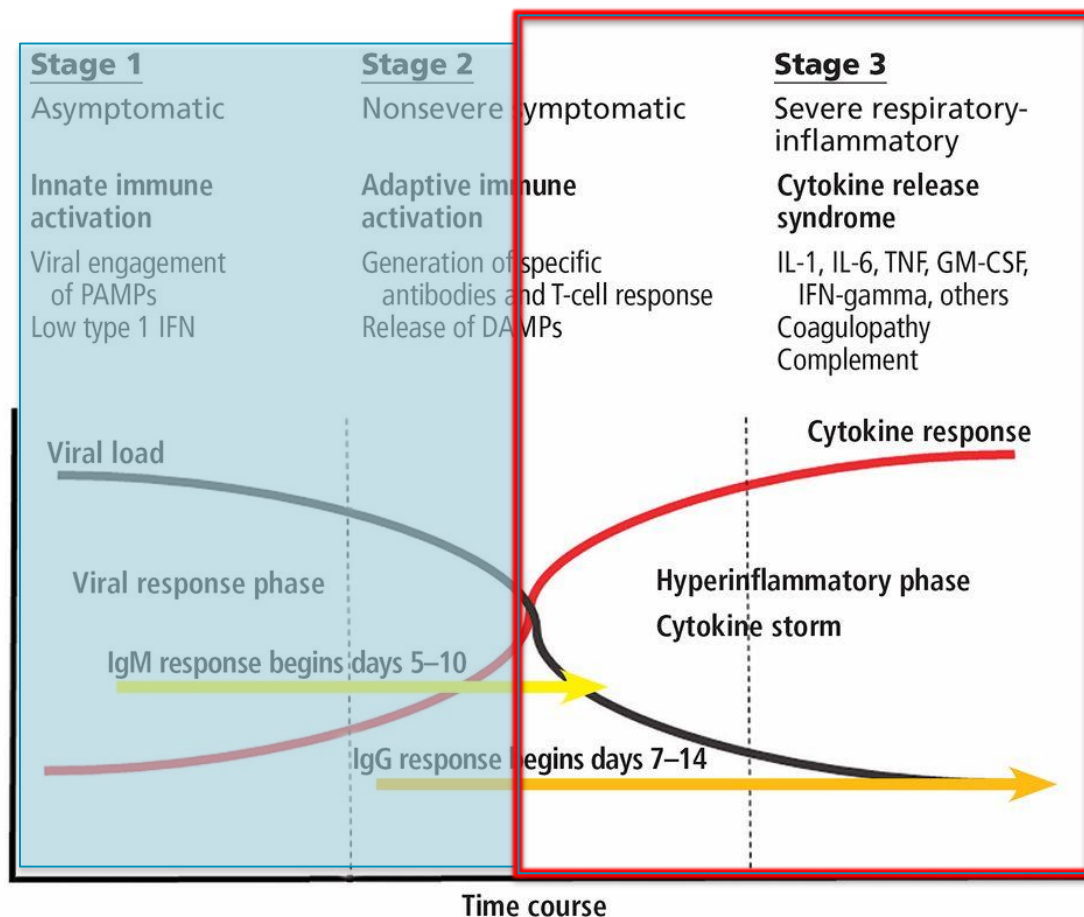
- Will FDA grant an emergency use authorization (EUA)?
- Narrow target population
  - Initial data on those with mild disease
  - "proof of concept"
  - Focused use in nursing homes or in those at high risk for severe disease?
  - Seronegative outpatients at highest risk - Will need point-of-care testing for antibodies and viral load?
- Phase 3 trial in hospitalized patients ongoing

# Therapeutic Windows

Immune response over time:  
Self-limiting in 80%  
Severe in 15%–20%  
Fatal in 1%–2%

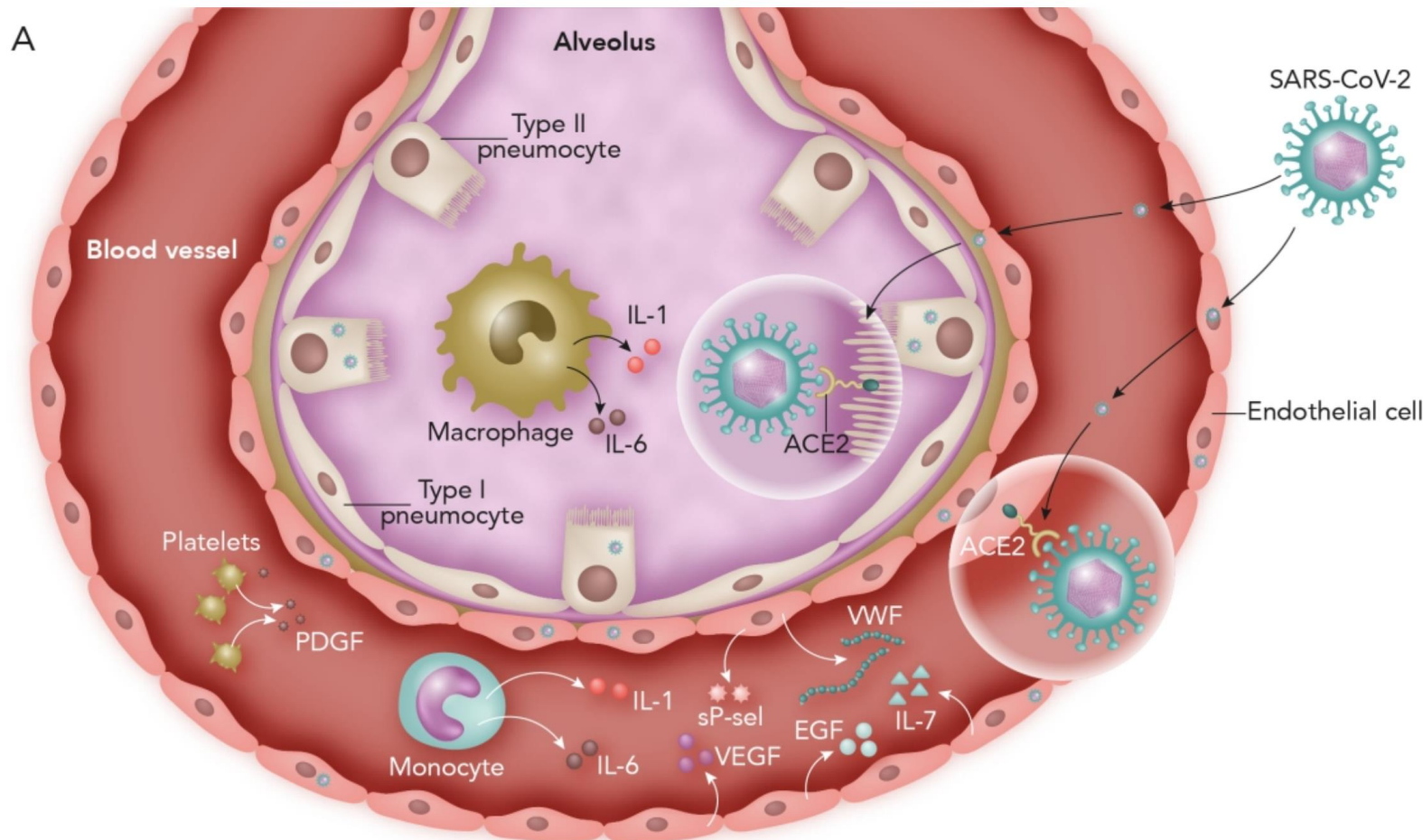
## IMMUNE MODULATORS Dexamethasone

Anakinra (IL-1)  
Tocilizumab (IL-6)  
Interferons ( $\alpha$  or  $\beta$ )  
BTK Inhibitors

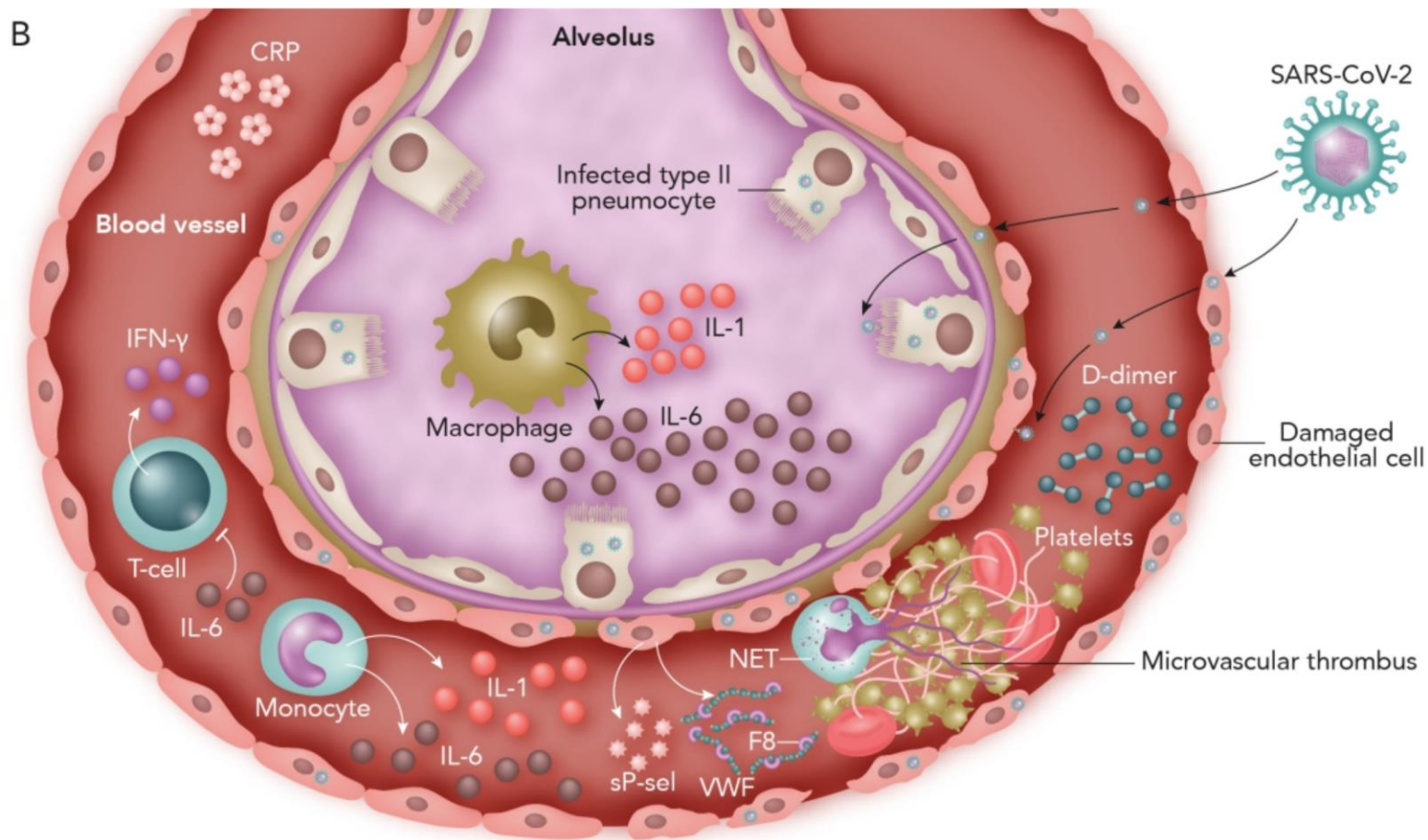


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# Mild Disease



# Severe Disease



ORIGINAL ARTICLE

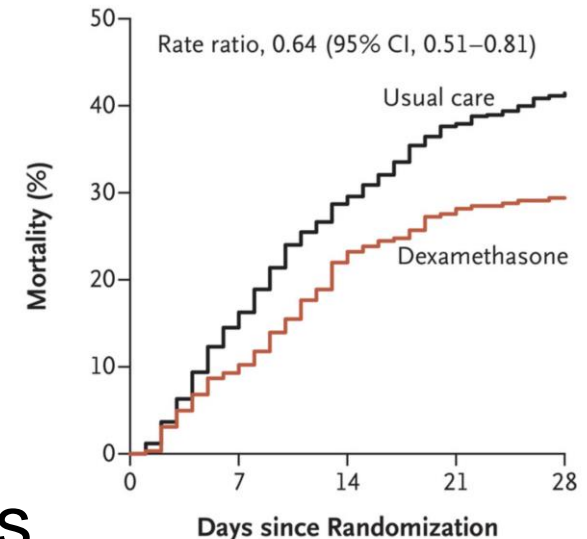
# Dexamethasone in Hospitalized Patients with Covid-19 — Preliminary Report

The RECOVERY Collaborative Group\*

# Dexamethasone – RECOVERY Trial

- 6,425 participants
  - Dexamethasone 2,104
  - Standard of Care 4,321
- Overall – 23% dex vs 26% in standard of care died within 28 days
  - Biggest benefit in mechanical ventilation arm – 29% dex arm and 41% of standard of care arm died
  - Supplemental O<sub>2</sub> – 23% dex arm vs 26% standard of care died
  - No benefit for those who did not require O<sub>2</sub>

B Invasive Mechanical Ventilation (N=1007)





# Corticosteroids

- RECOVERY Trial – COVID-19 Treatment Guidelines Panel
  - **For** using **dexamethasone** 6mg/d for up to 10 days or until hospital discharge if hospitalized and mechanically ventilated or on supplemental O<sub>2</sub>
  - **Against** using **dexamethasone** for the treatment of COVID-19 in patients not on supplemental O<sub>2</sub>
  - Can use other corticosteroids if dexamethasone not available

# Tocilizumab (IL-6)

Media / Press Releases

Thursday, Sep 17, 2020

## **Genentech's Phase III EMPACTA Study Showed Actemra Reduced the Likelihood of Needing Mechanical Ventilation in Hospitalized Patients With COVID-19 Associated Pneumonia**

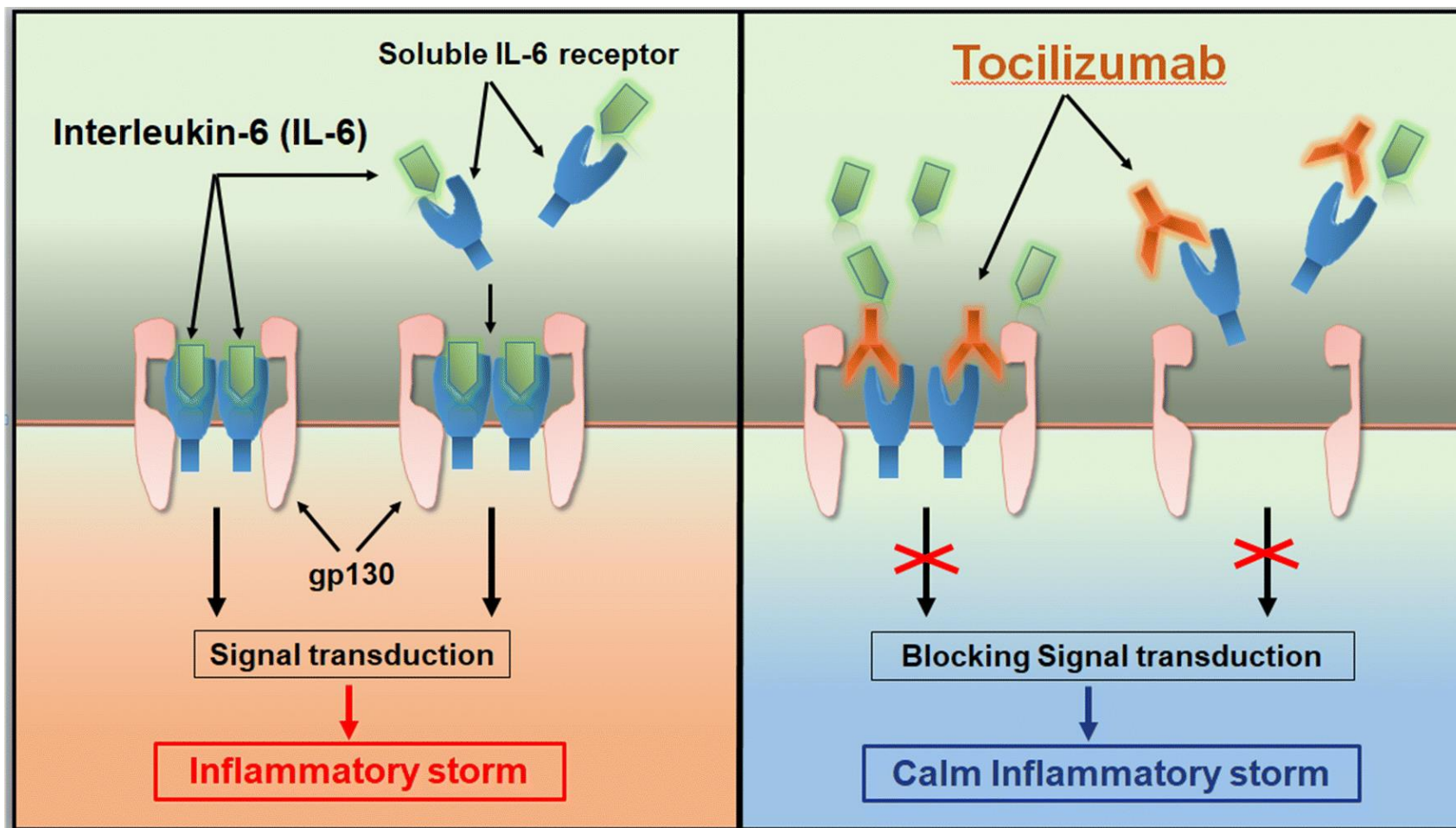
**EMPACTA is the first global Phase III trial to show efficacy with Actemra in COVID-19 associated pneumonia and the first with a focus on enrolling largely underserved and minority patients**

**There was no statistical difference in mortality between patients who received Actemra or placebo**

**Genentech plans to share these results with health authorities, including the FDA**



# Tocilizumab



# EMPACTA Study - Tocilizumab

- COVID-19 associated pneumonia who received tocilizumab plus standard of care were 44% less likely to progress to mechanical ventilation or death
- 12.2% of patients in the tocilizumab arm vs 19.3% in placebo arm progressed
- No difference in time to discharge
- No difference in time to improvement
- No difference in mortality

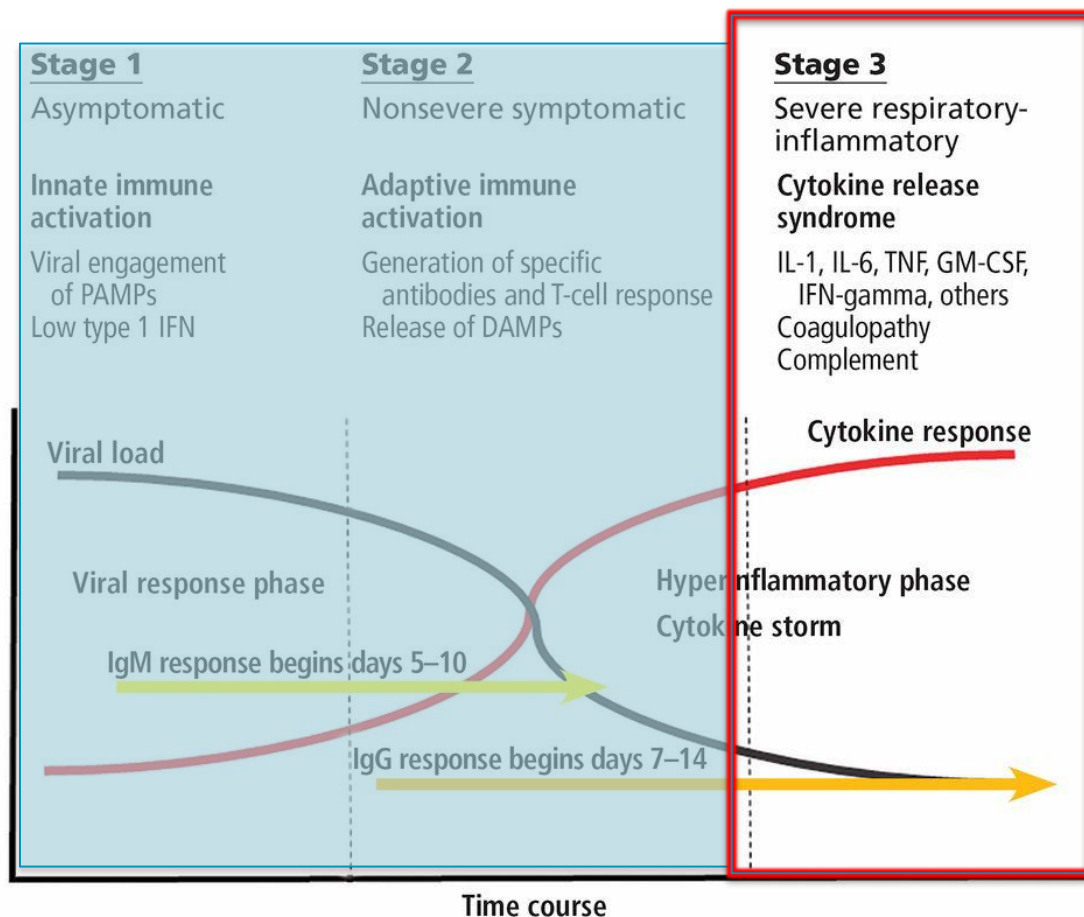
# Tocilizumab Thoughts

- Serum IL-6 levels – hard to get, but superior predictor of clinical outcomes than CRP, ferritin, LFTs, etc.
- Mild to moderate disease may not increase IL-6
- Severe disease + cytokine storm syndrome may increase IL-6 to over 1000x normal (100-10,000pg/mL)
- IL-1, IL-10 and TNF- $\alpha$  can be elevated 2-100x normal
- In general IL-6 levels  $\geq 80$ pg/mL predict increased risk of respiratory failure and death

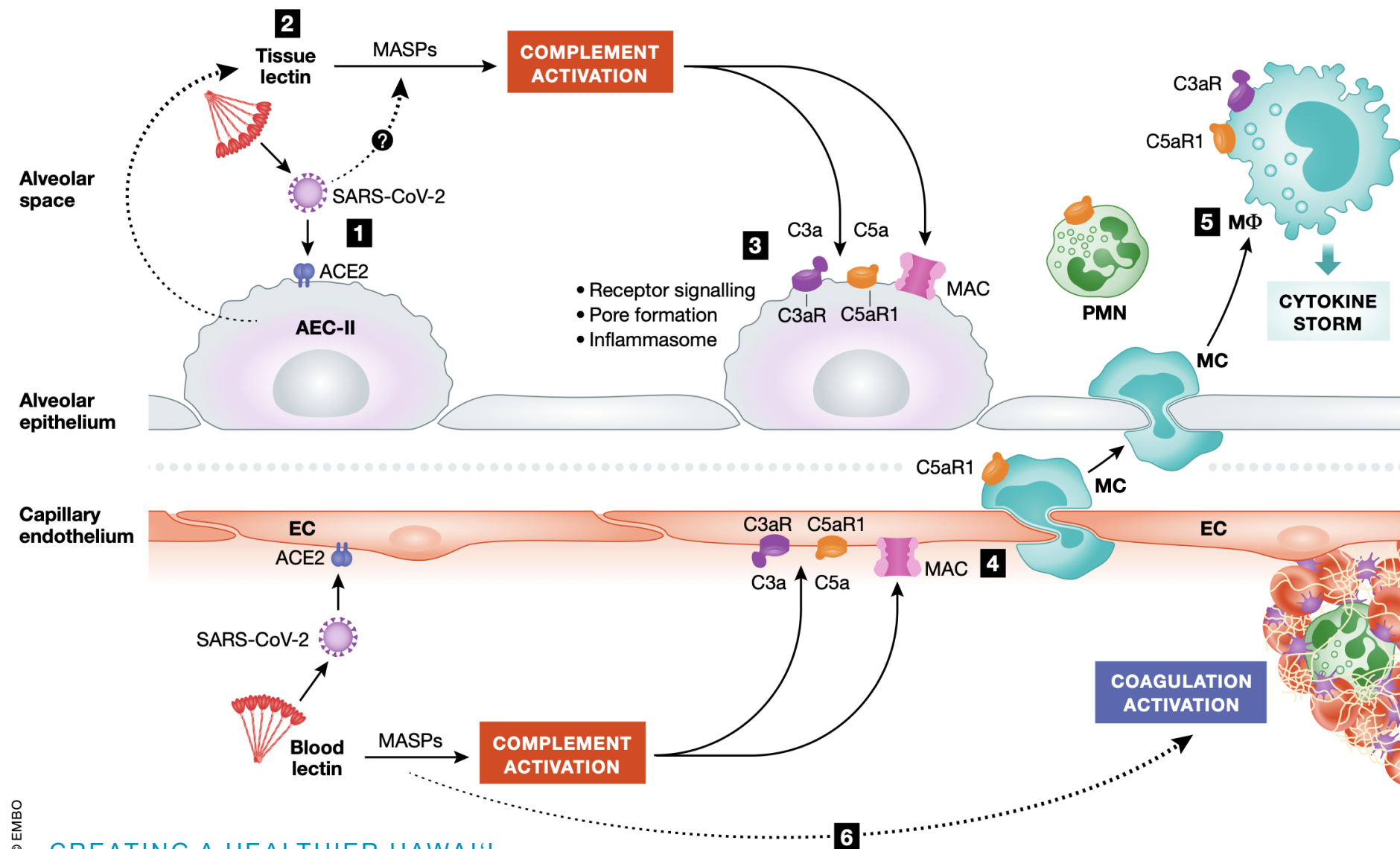
# Therapeutic Windows

Immune response over time:  
Self-limiting in 80%  
Severe in 15%–20%  
Fatal in 1%–2%

**Coagulopathy  
Complement**



DAMPs= damage-associated molecular patterns; GM-CSF = granulocyte macrophage colony-stimulating factor; IFN = interferon; IgM = immunoglobulin M; IL-1 = interleukin 1; IL-6 = interleukin 6; PAMPs = pathogen-associated molecular patterns; TNF = tumor necrosis factor



# Complement Activation and COVID-19

- Complement activation is a feature of ARDS
  - C5a elevation in peripheral blood
- SARS-CoV-2 S protein may activate lectin pathways and lead to **complement activation** with **inflammation** and **increased coagulation**
- **Inhibit Complement C3 and C5**
  - C5-specific antibody eculizumab has been used off-label in 4 pts with severe COVID-19 – all recovered
  - C3-specific antibody broader anti-inflammatory
- Ongoing trials of eculizumab and ravulizumab (available expanded access)

# COVID-19 Treatments

Immune response over time:  
Self-limiting in 80%  
Severe in 15%–20%  
Fatal in 1%–2%

## Stage 1

Asymptomatic

Innate immune activation

Viral engagement of PAMPs  
Low type 1 IFN

## Stage 2

Nonsevere symptomatic

Adaptive immune activation

Generation of specific antibodies and T-cell response  
Release of DAMPs

## Stage 3

Severe respiratory-inflammatory

Cytokine release syndrome

IL-1, IL-6, TNF, GM-CSF, IFN-gamma, others  
Coagulopathy  
Complement

## IMMUNE MODULATORS

**Dexamethasone**

Anakinra (IL-1)  
Tocilizumab (IL-6)  
Interferons ( $\alpha$  or  $\beta$ )  
BTK Inhibitors

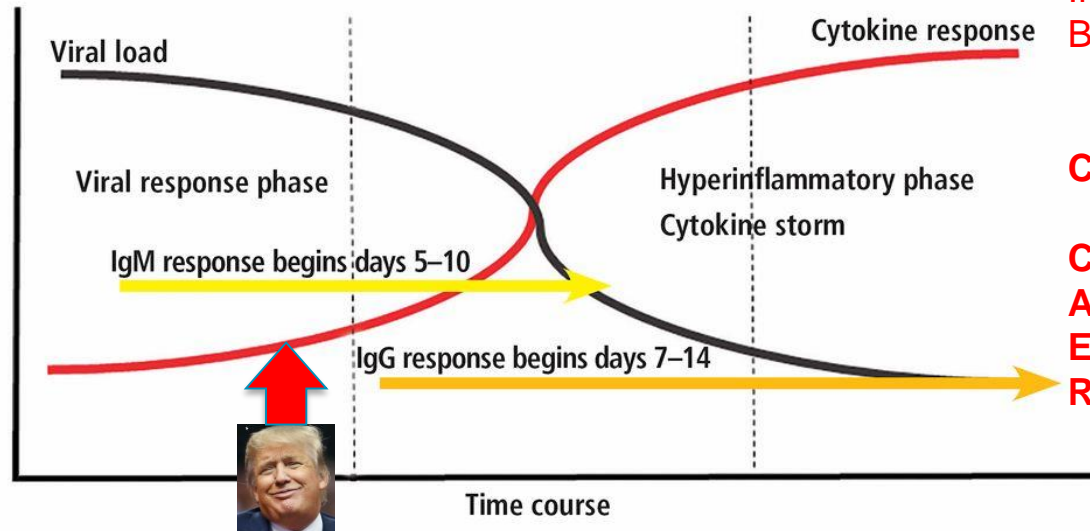
## VACCINES

## ANTIVIRALS

Remdesivir  
Lopinavir/Ritonavir

## IMMUNE-BASED

Convalescent Plasma  
Monoclonal Antibodies



## COAGULOPATHY

**COMPLEMENT**  
AMY-101 (C3)  
Eculizumab/  
Ravulizumab (C5)

DAMPs= damage-associated molecular patterns; GM-CSF = granulocyte macrophage colony-stimulating factor; IFN = interferon; IgM = immunoglobulin M; IL-1 = interleukin 1; IL-6 = interleukin 6; PAMPs = pathogen-associated molecular patterns; TNF = tumor necrosis factor



# COVID-19 in Pregnancy



**Dena Towner, MD**

*Endowed Professor and Associate Chair for Clinical Affairs*  
*Program Director, Maternal Fetal-Medicine Program*  
Department of Obstetrics, Gynecology, and Women's Health  
Division of Maternal-Fetal Medicine  
John A. Burns School of Medicine, University of Hawai'i at Mānoa



**Stacy Tsai, MD, MPH**

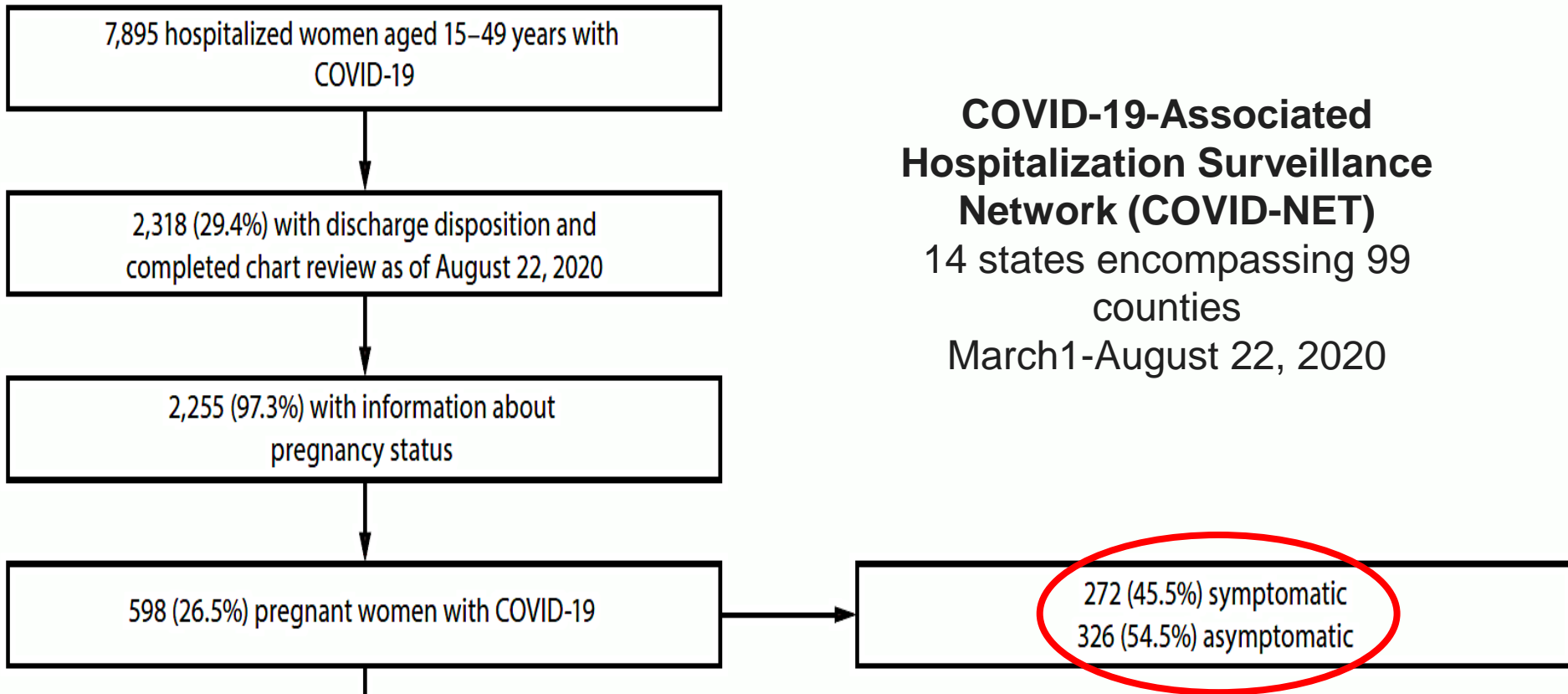
*Assistant Professor*  
Department of Obstetrics, Gynecology, and Women's Health  
Division of Maternal-Fetal Medicine  
John A. Burns School of Medicine, University of Hawai'i at Mānoa

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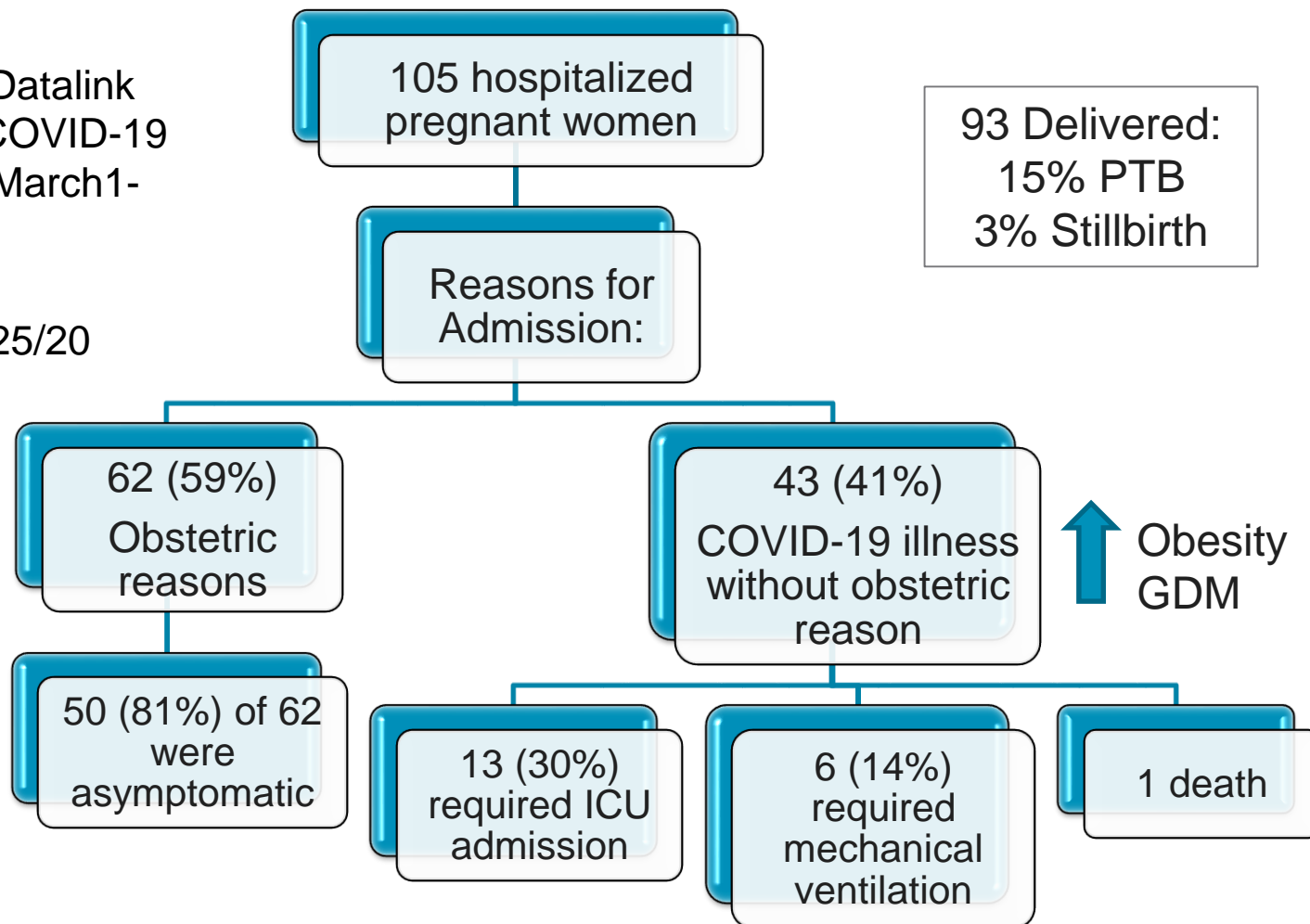
# Prevalence in Pregnancy



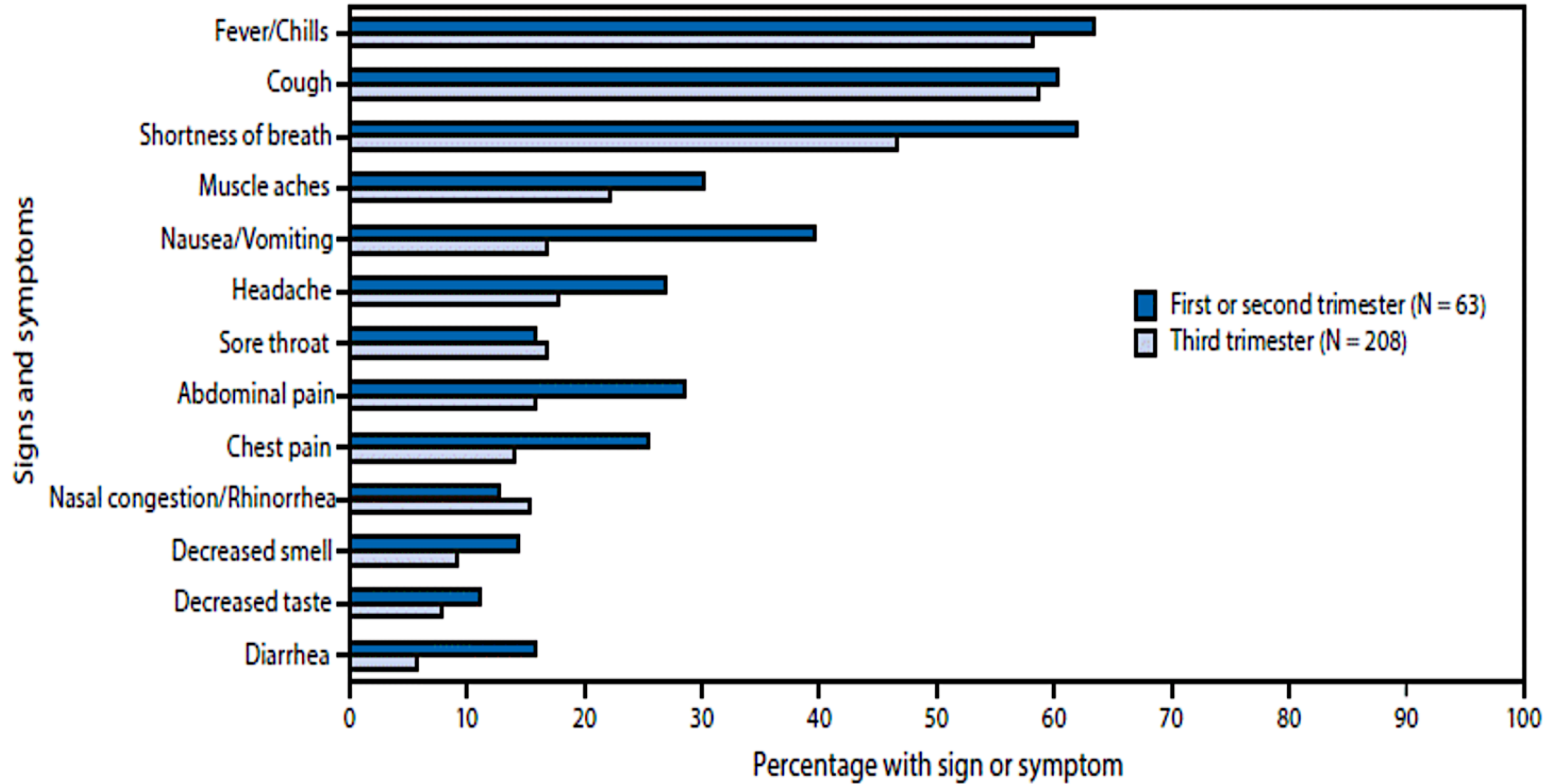
CDC MMRW Sept 25, 2020

# SARS-Cov-2 Infection Among Hospitalized Pregnant Women

- Vaccine Safety Datalink surveillance of COVID-19 hospitalization (March 1-May 30, 2020)
- CDC MMWR 9/25/20



# COVID-NET: Signs and Symptoms of Hospitalized Pregnancy Women with COVID-19



CDC MMRW Sept 25, 2020

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# Screening and Testing

- **Asymptomatic women with positive SARs-CoV-2**
- New York-Presbyterian Allen Hospital and Columbia University
  - 215 tested
  - 4 febrile → all 4 +SARs-Cov-2
  - 211 asymptomatic on admission → 29 +SARs-Cov-2 (13.7%)
  - 29/33 +SARs-Cov-2 (**87.9%**) were asymptomatic
- NYU Winthrop Hospital
  - 161 tested
  - 32 (19.9%) +SARs-Cov-2
  - 21/32 +SARs-Cov-2 (**66%**) were asymptomatic

## KMWCW

- Pre-admission testing for L&D implemented 4/7/20
- Universal admission testing implemented 6/29/20
- Rapid Abbott testing (only selected cases) 8/26/30

## KMCWC

### (Pregnant and Postpartum) September Testing Results:

- SARS-CoV-2 Molecular Testing 10 positive/376 total tests (**2.66%**)
- Rapid Testing 1 positive/3 total test

# PPE for Labor and Delivery

Adopt the higher level of protection if rule out or confirmed COVID patient and contact will be within 6 feet for more than 10 minutes.

## Non-Pushing (First Stage)

1



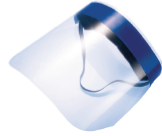
surgical mask

AND

OR



goggles



face shield

Headgear remains on health care worker through multiple patients (i.e., do not replace per patient)

- 2 Fresh gloves for all patient contact. Gown for contact/droplet precaution.
- 3 Break back tie in order to don gown over head gear.
- 4 Proper hand hygiene.

## During Pushing and Delivery (Second Stage)

1



N-95

and



full face shield

OR



CAPR

Headgear remains on health care worker through multiple patients (i.e., do not replace per patient)

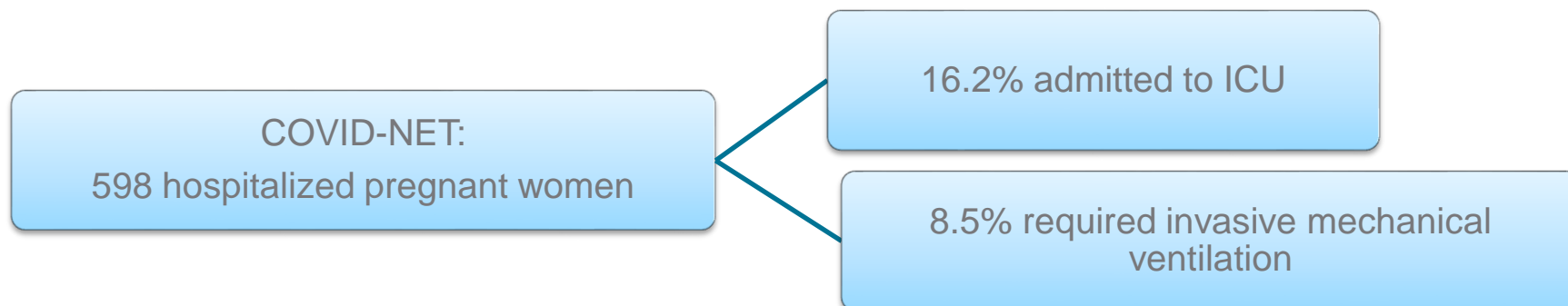
Bonnets and booties as deemed necessary

- 2 Fresh gloves and gown for contact/droplet precautions. Break back tie in order to don gown over headgear.
- 3 Proper hand hygiene.

Reduce number of people in room when possible.

**HAWAII PACIFIC HEALTH** | KAPI'OLANI  
PALI MOMI  
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# Severity: Risk of Complications



## CDC COVID-19 Surveillance Report: Jan 22-June 7, 2020

Outcome	Pregnant women (n=8,207)	Nonpregnant women (n=83,205)	Adjusted risk ratio (95%CI)
Hospitalization	2,587 (31.5%)	4,840 (5.8%)	5.4 (5.1-5.6)
ICU Admission	120 (1.5%)	757 (0.9%)	1.5 (1.2-1.8)
Mechanical Ventilation	42 (0.5%)	225 (0.3%)	1.7 (1.2-2.4)
Death	16 (0.2%)	208 (0.2%)	0.9 (0.5-1.5)

CDC MMRW June 26, 2020

# Risk of Complications

## CDC COVID-19 Surveillance Report: Jan 22-June 7, 2020 ICU Admission

Race/Ethnicity	Pregnant women (n=8,207)	Non-Pregnant women (n=83,205)
Hispanic or Latino	49 (1.6%)	194 (0.9%)
Asian	9 (3.5%)	25 (1.3%)
Black	28 (1.9%)	194 (1.3%)
White	12 (0.8%)	158 (0.9%)

## Two cases of coronavirus 2019—related cardiomyopathy in pregnancy

Alexander Juusela, MD, MPH; Munir Nazir, MD; Martin Gimovsky, MD

CDC MMRW June 26, 2020  
Juusela et al, AJOG 2020



# Treatment Options

- Oxygen saturation in pregnancy is 95% or greater
- Prone positioning is feasible in pregnant and postpartum women
- Anti-coagulation
- Pregnancy remains an exclusion criterion for many clinical trials on COVID treatment
- **Proposed therapies are not contraindicated in pregnancy**



SMFM COVID Management July 2020



# Clinical course of severe and critical coronavirus disease 2019 in hospitalized pregnancies: a United States cohort study

**TABLE 3**  
**Management of patients with COVID-19**

12 US Institutions 3/5/20-4/20/20

Characteristic	All (N=64)	Severe group (n=44)	Critical group (n=20)	Pvalue
Hydroxychloroquine	52 (81)	33 (75)	19 (95)	.06
Antibiotic treatment for CAP	36 (56)	22 (50)	14 (70)	.14
Remdesivir	16 (25)	3 (7)	13 (65)	<.001
Convalescent serum	1 (2)	0 (0)	1 (5)	.31
Steroids for maternal treatment	15 (23)	4 (9)	11 (55)	<.001
Anticoagulants during admission				
Prophylactic heparin/LMWH	37 (58)	25 (57)	12 (60)	.81
Therapeutic heparin/LMWH	10 (16)	2 (5)	8 (40)	<.001
Supplemental O <sub>2</sub>	52 (81)	32 (73)	20 (100)	.01
High-flow nasal cannula	16 (25)	5 (11)	11 (55)	<.0001
BiPAP/CPAP	5 (8)	1 (2)	4 (20)	.03
Intubated	19 (30)	0 (0)	19 (95)	<.001
Reintubated	4 (6)	0 (0)	4 (20)	.008
Prone positioning	4 (6)	0 (0)	4 (20)	.008
ECMO	0 (0)	0 (0)	0 (0)	1.00
ARDS	14 (22)	0 (0)	14 (70)	<.001

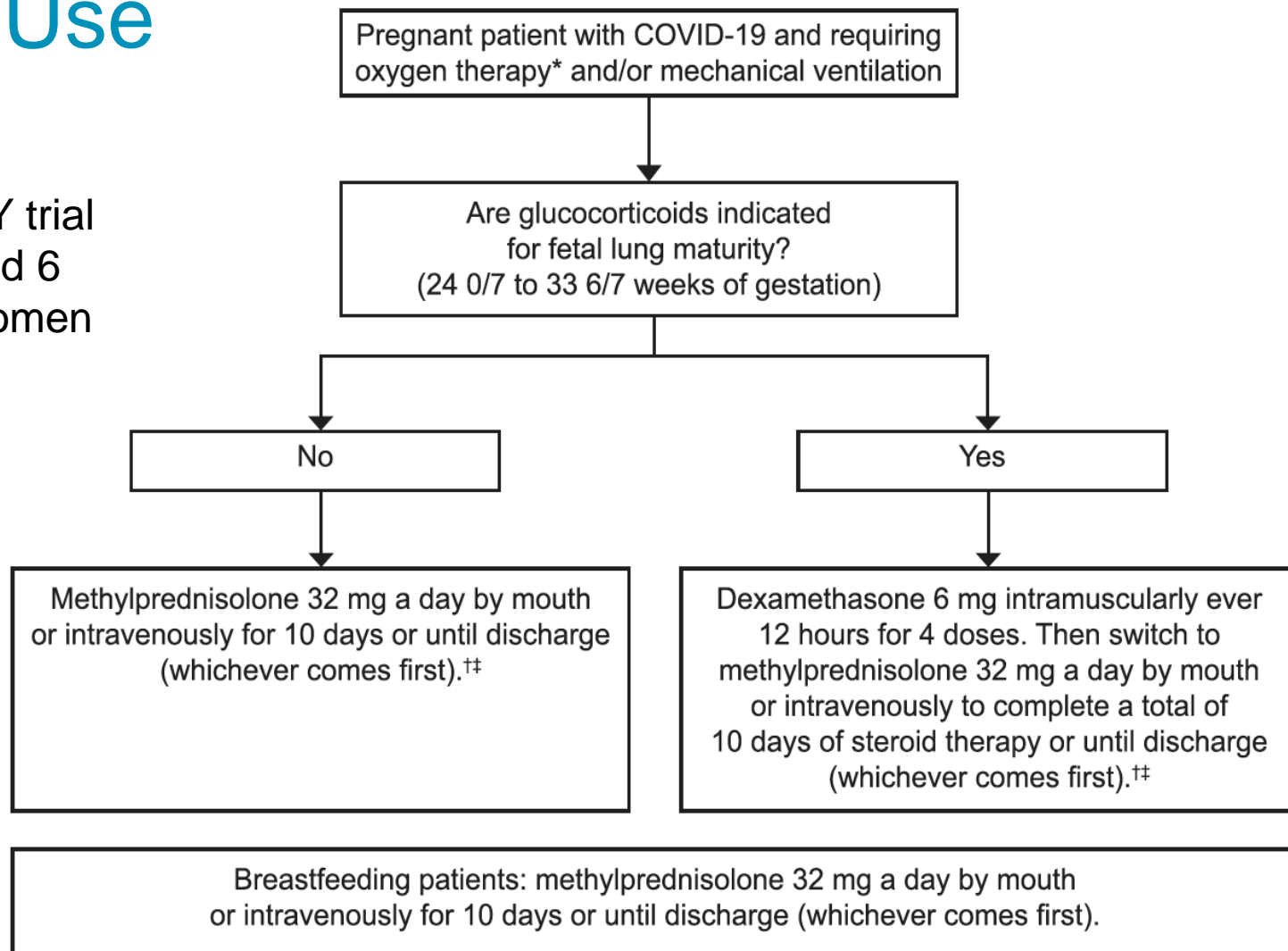
Pierce-Williams et al, AJOG 2020

## REMDESIVIR

- No known fetal toxicity
- Multiple case reports
- Compassionate use protocol
- SMFM recommends that remdesivir be offered to pregnant patients meeting criteria for compassionate use

# Steroid Use

RECOVERY trial  
only included 6  
pregnant women



Saad et al, Obstet Gynecol 2020

# Vertical/Perinatal Transmission Risk

## Intrauterine Infection

Rare viremia (1% of all cases)<sup>1</sup>  
AND  
Possible receptor (ACE 2) on placental cells<sup>2</sup>

Placental infection unlikely



SARS-CoV-2 congenital infection  
Rare  
1 confirmed published case

## Perinatal Infection

Vaginal delivery: potential exposure to maternal feces  
(30% of infected patients have a positive RT-PCR in feces)<sup>1</sup>

Exposure to maternal respiratory secretions after birth



Interpretation of IgM antibody levels in cord and neonatal blood

### SARS-CoV-2 neonatal infection:

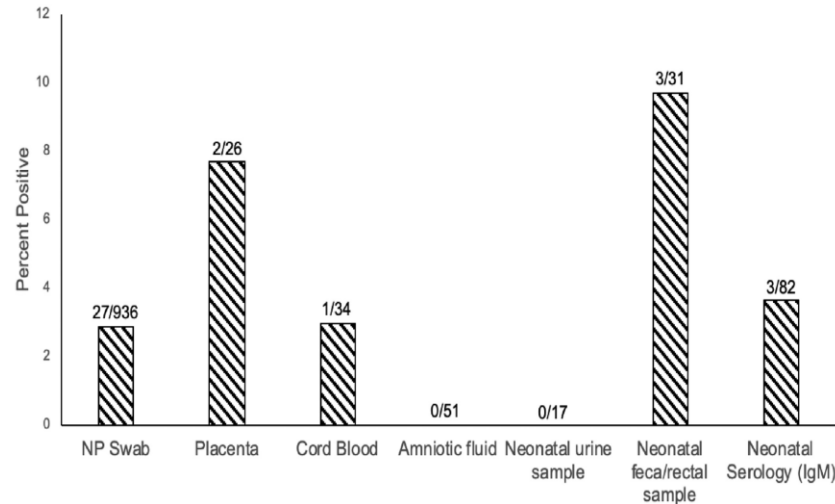
- Positive PCR in nasal swab in the first week of life
- Mostly asymptomatic
- Lethargy, fever, respiratory symptoms

## Systemic Review of 30 case reports and 38 cohort/case series

### 936 neonates

- 3.2% neonates NP+
- 2.9% cord blood+
- 7.7% placenta+
- 9.7% fetal/rectal sample+

Rate of COVID-19 Infection in Neonates According to testing site



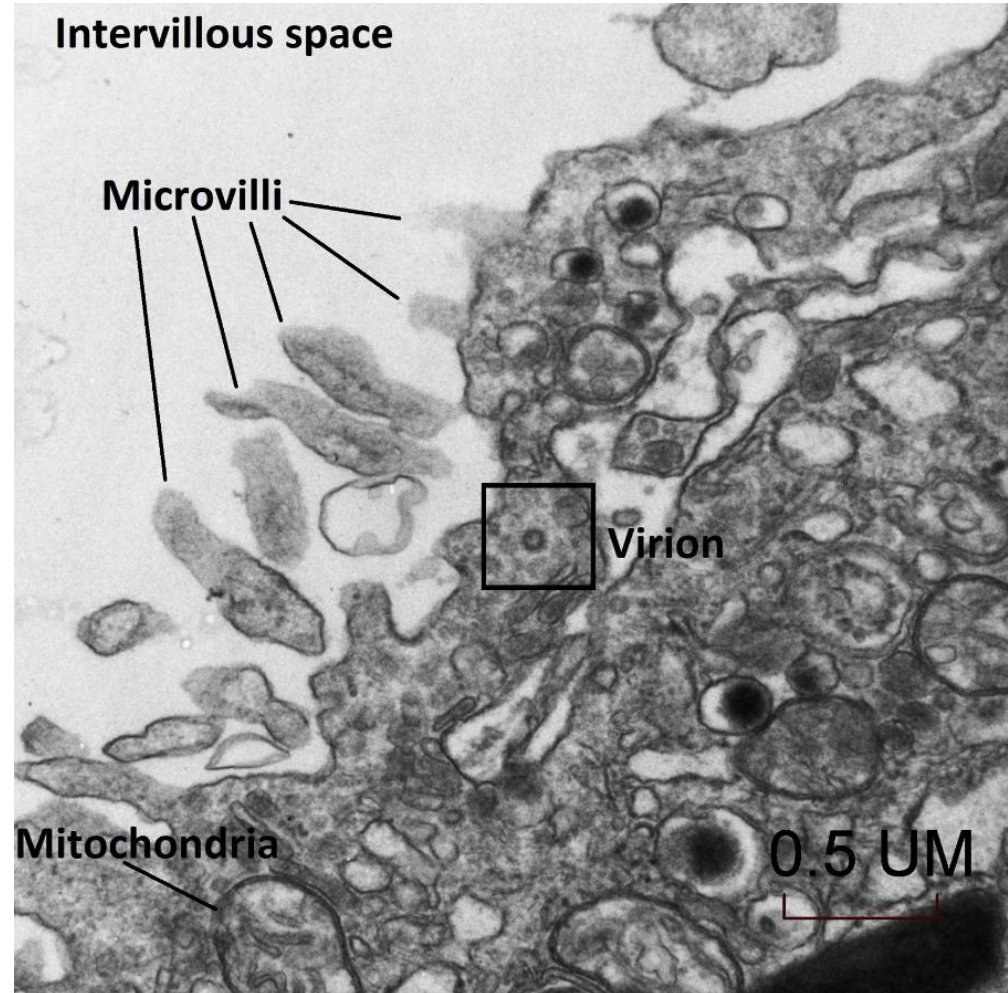
Kotlyar et al, AJOG 2020

Lamouroux et al, AJOG 2020

# ***Visualization of severe acute respiratory syndrome coronavirus 2 invading the human placenta using electron microscopy***

*Gabriela N. Algarroba, MD, Patricia Rekawek, MD, Sevan A. Vahanian, MD, Poonam Khullar, MD, Thomas Palaia, MS, Morgan R. Peltier, PhD, Martin R. Chavez, MD, Anthony M. Vintzileos, MD*

*American Journal of Obstetrics & Gynecology  
Volume 223 Issue 2 Pages 275-278 (August 2020)  
DOI: 10.1016/j.ajog.2020.05.023*



# BREASTFEEDING & COVID-19 IN HAWAI'I

Information and Resources  
for Parents and Families



1

## BREASTFEEDING PROTECTS

**Breastfeeding helps protect your infant from many illnesses.** The safest, ideal nutrition for an infant is human milk, and breastfeeding has many health benefits. COVID-19 transmission through breastmilk appears unlikely, based on limited data available.

2

## CONTINUE BREASTFEEDING

**Parents with suspected/confirmed COVID-19 should continue recommended feeding with necessary hygiene precautions:** initiate breastfeeding within 1 hour after birth, exclusive breastfeeding for 6 months, first solid food at 6 months, and continue breastfeeding for 2+ years. If mother is too unwell and donor milk is unavailable, provide a safe infant formula.



**HMIHC**  
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3

## SAFE FEEDING PRACTICES



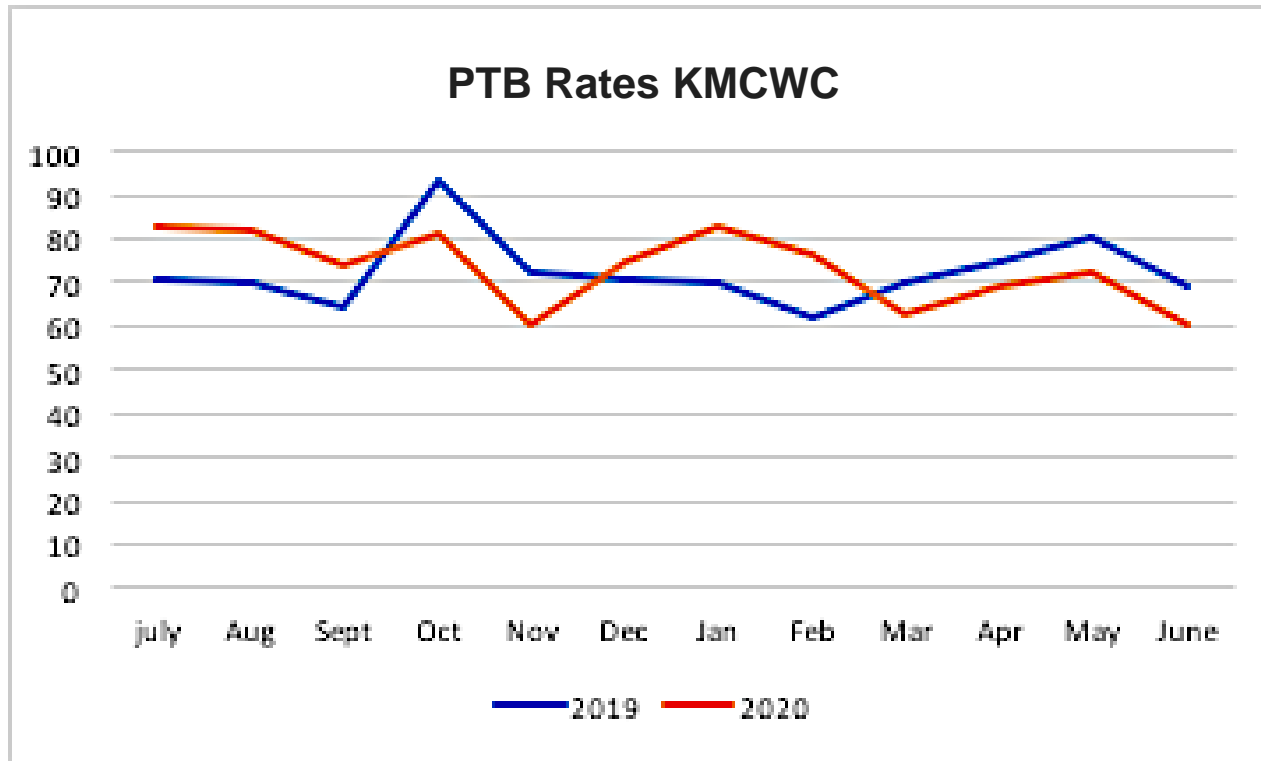
**All breastfeeding parents** should wash hands before handling infant. Clean pump parts and bottles after each use, and clean all touched surfaces.

**Parents with suspected/confirmed COVID-19** should wear a face mask while breastfeeding. Refer to manufacturer instructions to disinfect pump parts and bottles after each use. If mother is too unwell to breastfeed, bottle\* feeding can be done, preferably by someone with no signs of illness wearing a face mask.

# Changes to Patient Experience

- Increased rates of perinatal depression and anxiety
- Visitor policy (both inpatient and outpatient)
- Decrease in hospital visits
- Decreased diagnosis of hypertension
- Decreased rates of preterm birth (Ireland, Denmark)
- Decreased NICU admission
- Increased incidence of stillbirth in U.K. (not in patients with COVID-19)

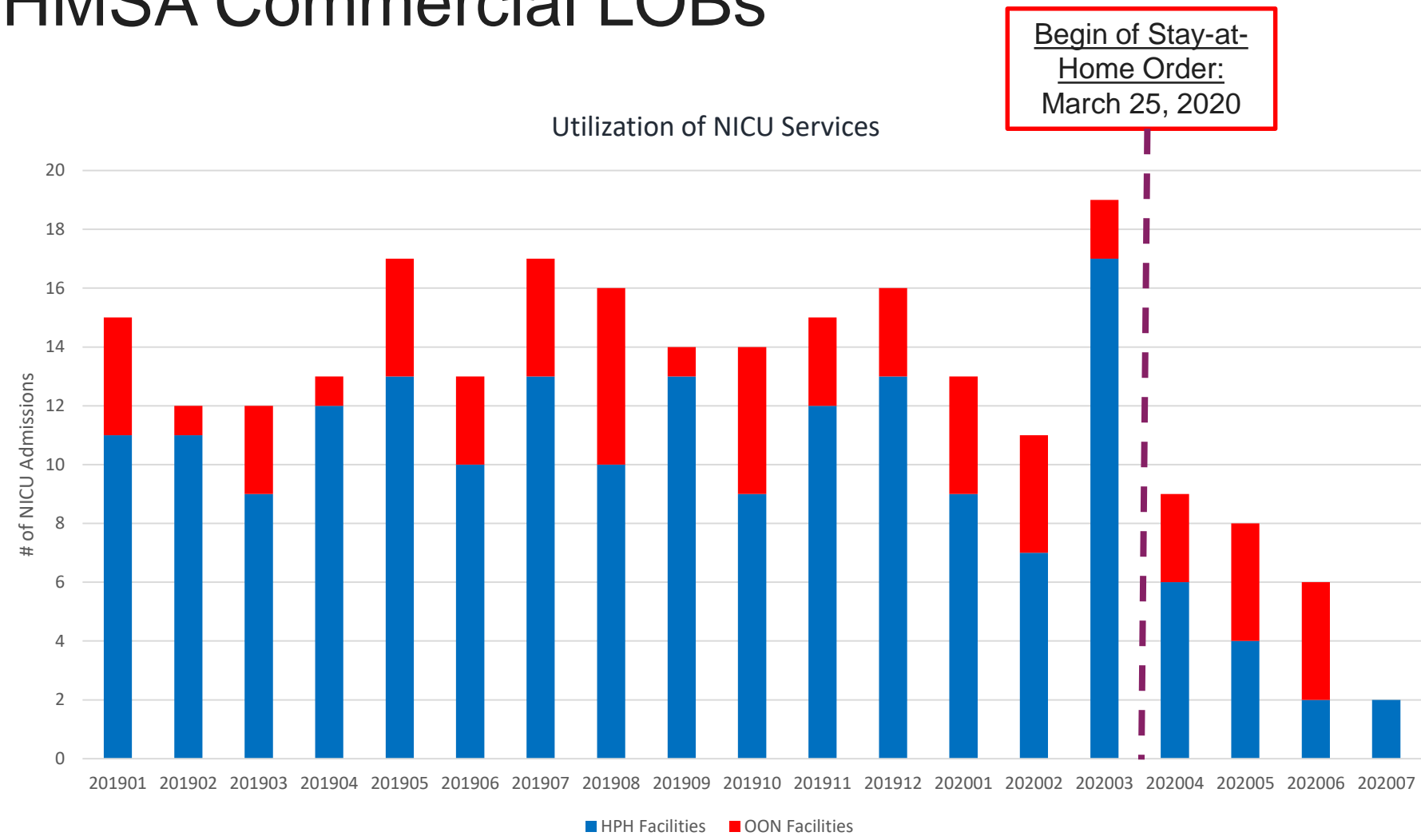
# Rates of Preterm Birth



Possible reasons:

- Reduced physical activity
- Decreased infections
- Reduced air pollution

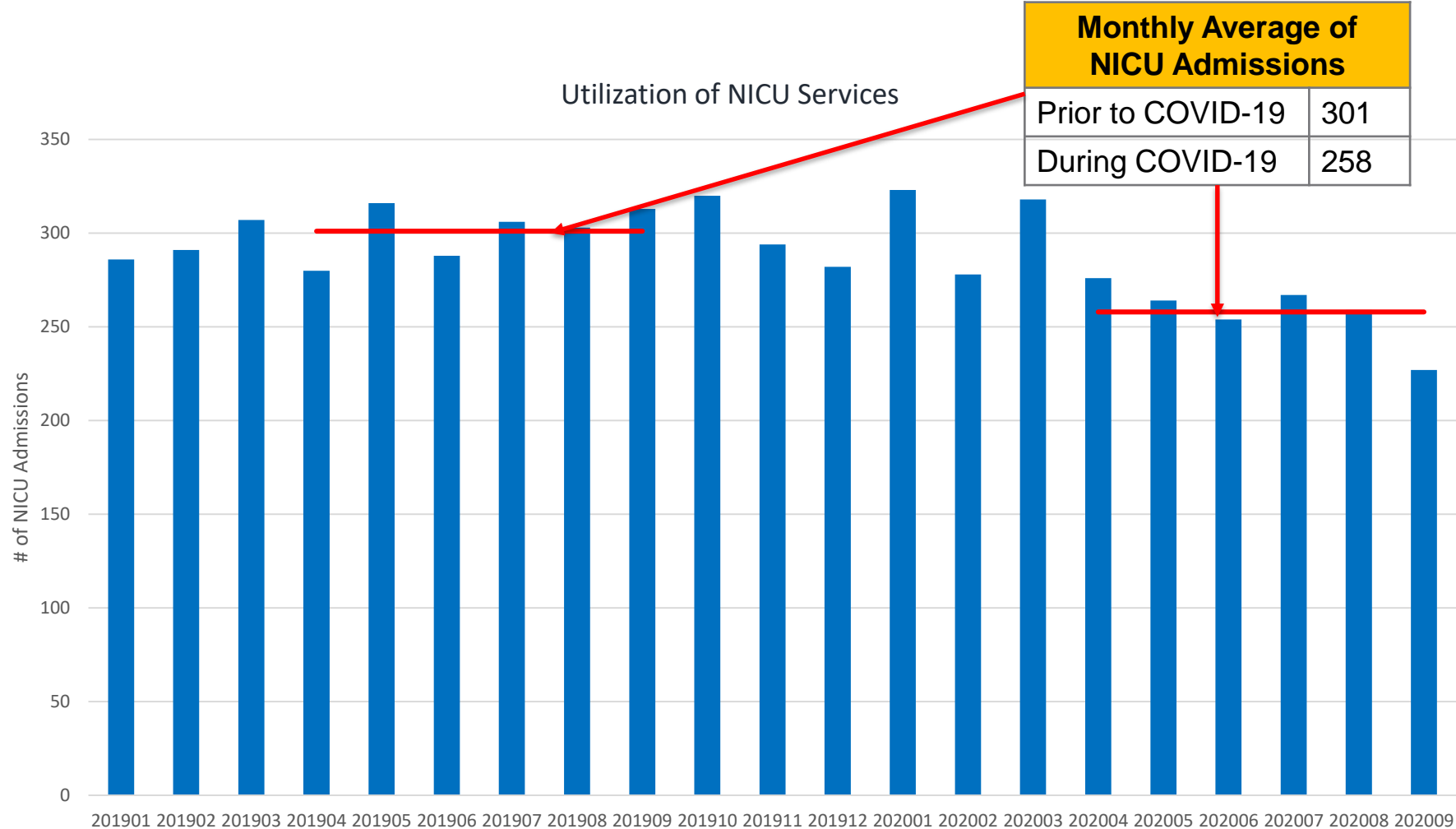
# HMSA Commercial LOBs



Source: HMSA commercial claims data (Jan 2019 – July 2020)



# HMSA Members @ HPH Hospitals



Source: Epic (jan 2019 – Aug 2020)



Thank You

# Q&A

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PACIFIC  
HEALTH**

HAWAI'I  
HEALTH  
PARTNERS

# **Save the Date!** HHP 7<sup>th</sup> Annual Membership Meeting

- Saturday, November 7, 2020
  - 8:00 a.m. to 12:30 p.m.
- Physician Planning Committee
- Virtual meeting
- Community giveback project
  - Blood Bank of Hawai'i
  - Hawai'i Food Bank
  - Aloha United Way
  - Child & Family Services
- Details & updates forthcoming:
  - HHP website under “For Providers/Events Calendar”
  - HPH eConnect, “Hawai'i Health Partners” channel
  - Emailed via [Info@hawaiihealthpartners.org](mailto:Info@hawaiihealthpartners.org)

# Thank you!

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