



THE UNIVERSITY OF  
**CHICAGO**



**Department  
of Pediatrics**  
Established 1930

# **COVID-19 for Pediatric Populations**

July 28, 2020

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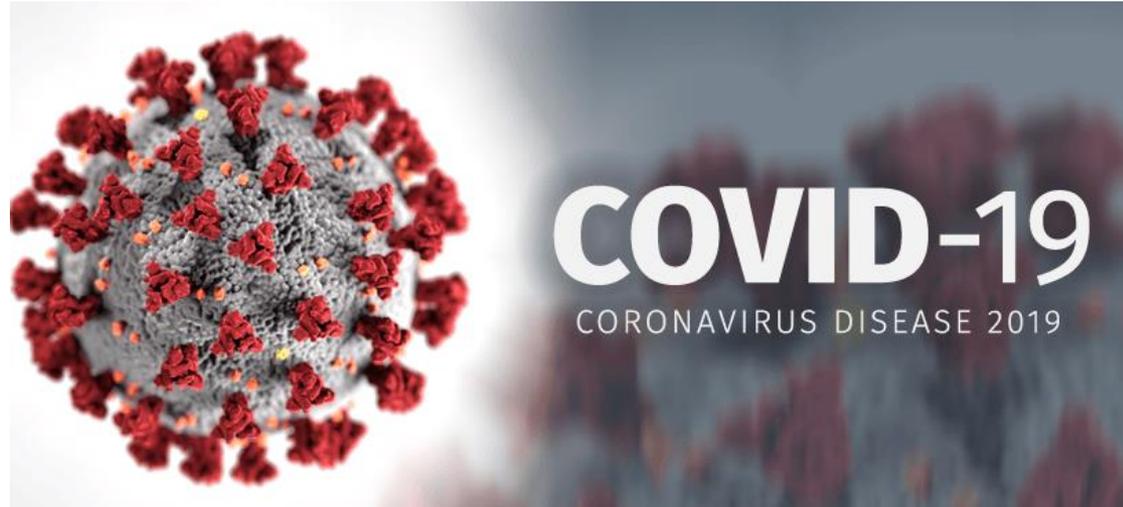
# Disclosures

- No financial disclosures
- What gets said here today may change based on new data and recommendations
  - Knowledge is moving rapidly, the fastest it has for any pandemic



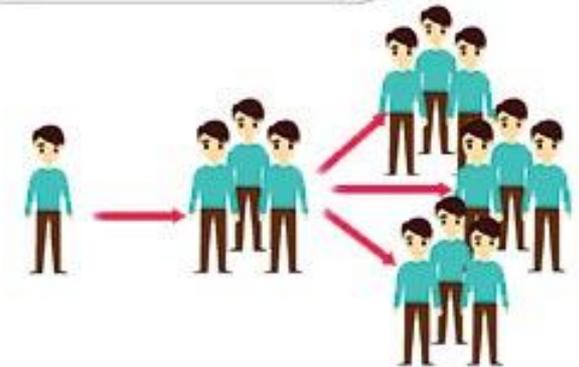
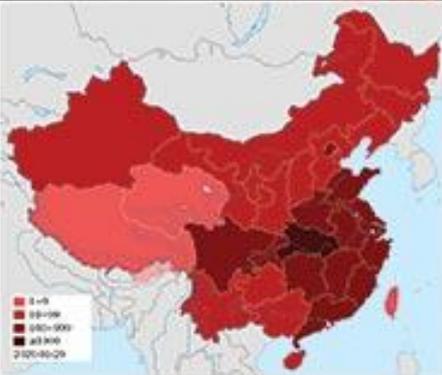
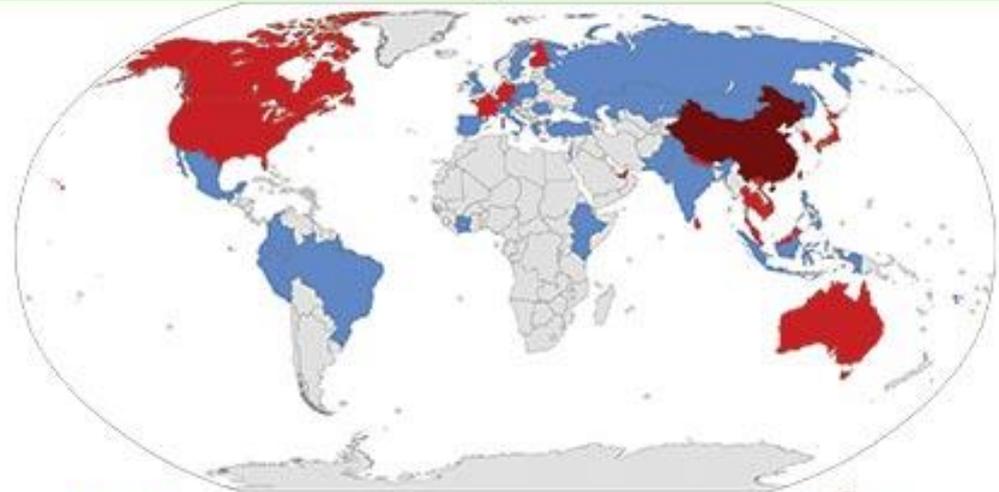
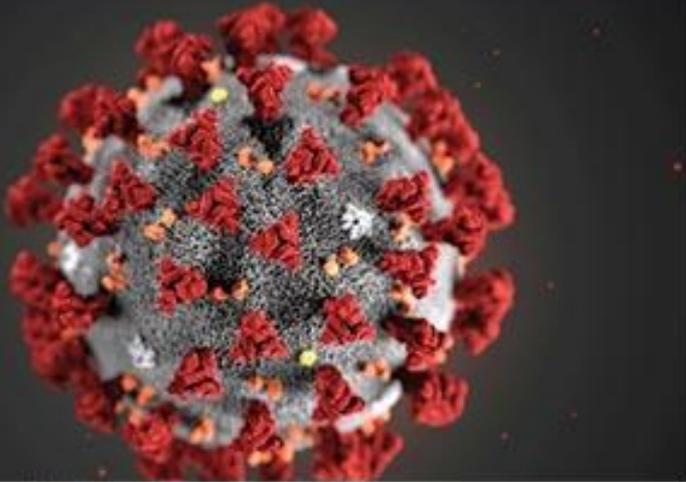
# Agenda

- Epidemiology
- Public health
- Neonatal care
- Treatment
- Vaccines
- Cases and Q&A?

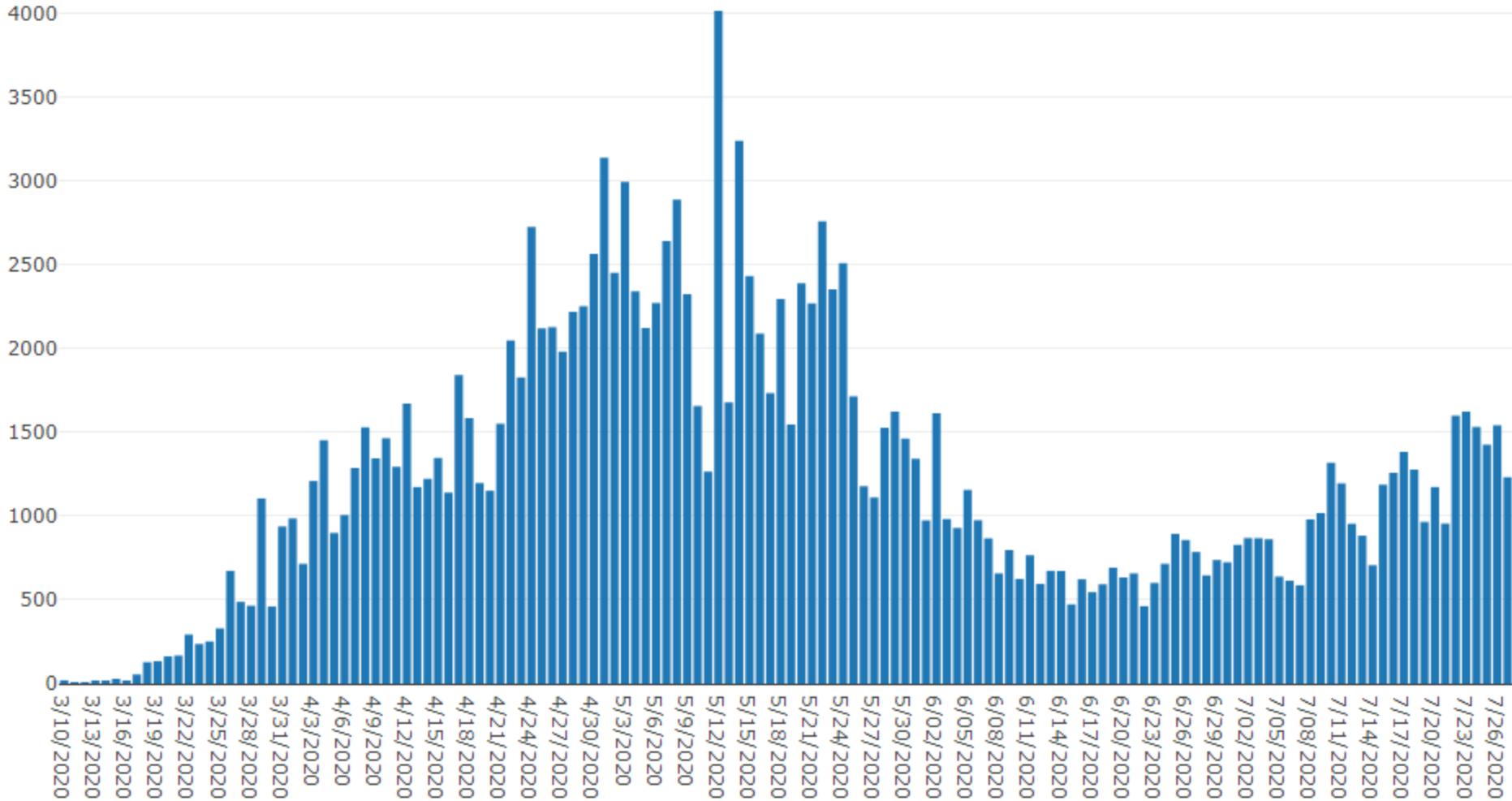




# Epidemiology of COVID-19 caused by SARS-CoV-2

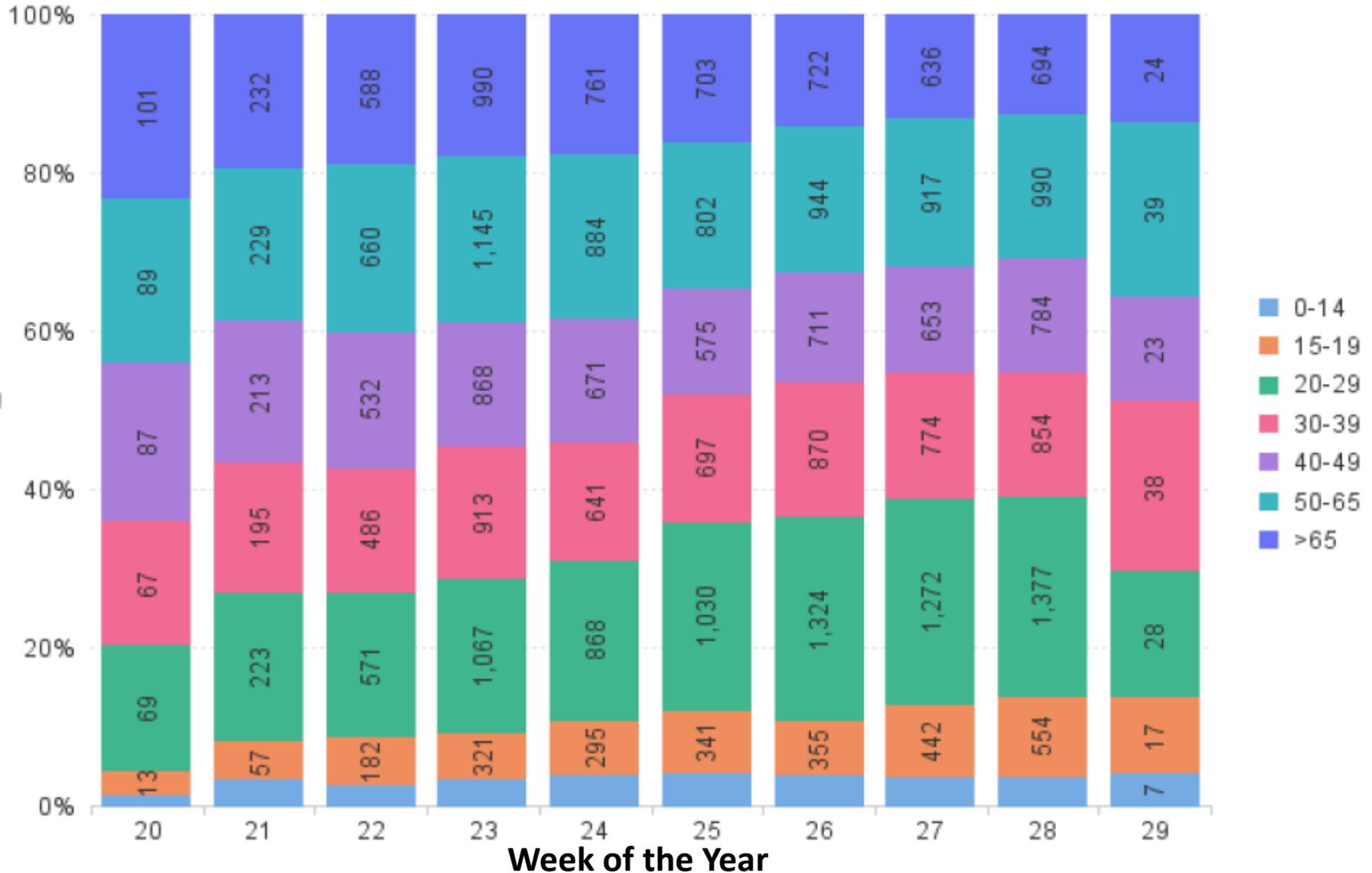


# Current Trends: Illinois



# Age of COVID-19 Cases: 7/14/2020

Case Count by Week and Ages



# Emily Oster's COVID Childcare Database

## June 29, 2020

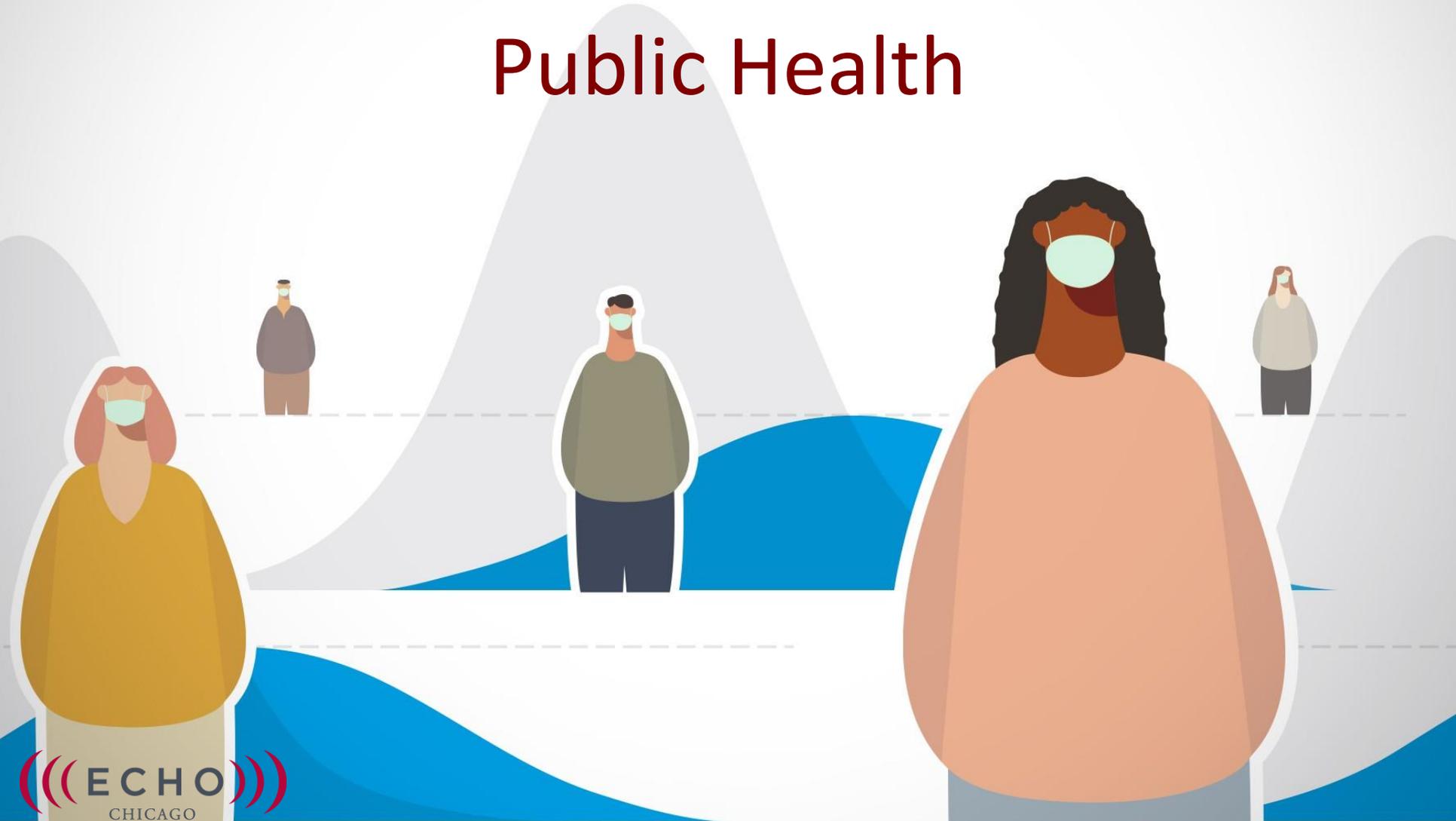
Open access, crowd sourced voluntary database so may not be representative

<https://explaincovid.org/kids/covid-19-and-children-our-crowd-sourced-data>

Child Care Survey	
All Locations	
Number of Centers	841
Total Students Served During Pandemic	20,424
Count of Covid-19 Cases in Students	44
Confirmed Case Rate, Students	0.22%
Total Staff During Pandemic	7,154
Count of Covid-19 Cases in Staff	86
Confirmed Case Rate, Staff	1.20%



# Public Health



# State COVID Regions



# What Cause A Region To Be More Restrictive

- Sustained increase in 7 day rolling average (7 out of 10 days) in the positivity rate

**And one of the following:**

- Sustained 7 day increase in hospital admissions for a COVID like illness
- Reduction in hospital capacity threatening surge capabilities (ICU capacity or medical/ surgical beds under 20%)

OR

- Three consecutive days averaging greater than or equal to 8% positivity rate of COVID testing

# Mitigation Steps



## Bars and restaurants

**Tier 1:** Reduce indoor capacity, suspend bar service

**Tier 2:** Suspend indoor dining and bar service

**Tier 3:** Takeout only



## Hospitals

**Tier 1:** Reduce elective procedures, limit visitation

**Tier 2:** Suspend elective procedures. Consider adding COVID-19 care facilities.

**Tier 3:** Add COVID-19 care facilities.



## Gatherings (meetings, events, churches)

**Tier 1:** Add limitations on gatherings and room capacity

**Tier 2:** Increase limits

**Tier 3:** Most strict limits

# Mitigation Steps



## Offices

**Tier 1:** Emphasize remote work

**Tier 2:** Reduce office capacity

**Tier 3:** Remote work for all



## Gyms and recreation

**Tier 1:** Reduce indoor capacity

**Tier 2:** Suspend indoor services and activities

**Tier 3:** Suspend organized indoor and outdoor activities



## Retail

**Tier 1:** Reduce indoor capacity

**Tier 2:** Suspend in-person shopping at nonessential retail, and go to online and curbside pick-up

**Tier 3:** Suspend all nonessential retail



## Salons and personal care

**Tier 1:** Temporary shutdowns connected to outbreaks

**Tier 2:** Possible broader steps

**Tier 3:** Suspend operations

# CDC Recs for Discontinuing Precautions

## Test based strategy no longer recommended

### Symptom-Based Strategy for Discontinuing Transmission-Based Precautions.

Patients with mild to moderate illness who are not severely immunocompromised:

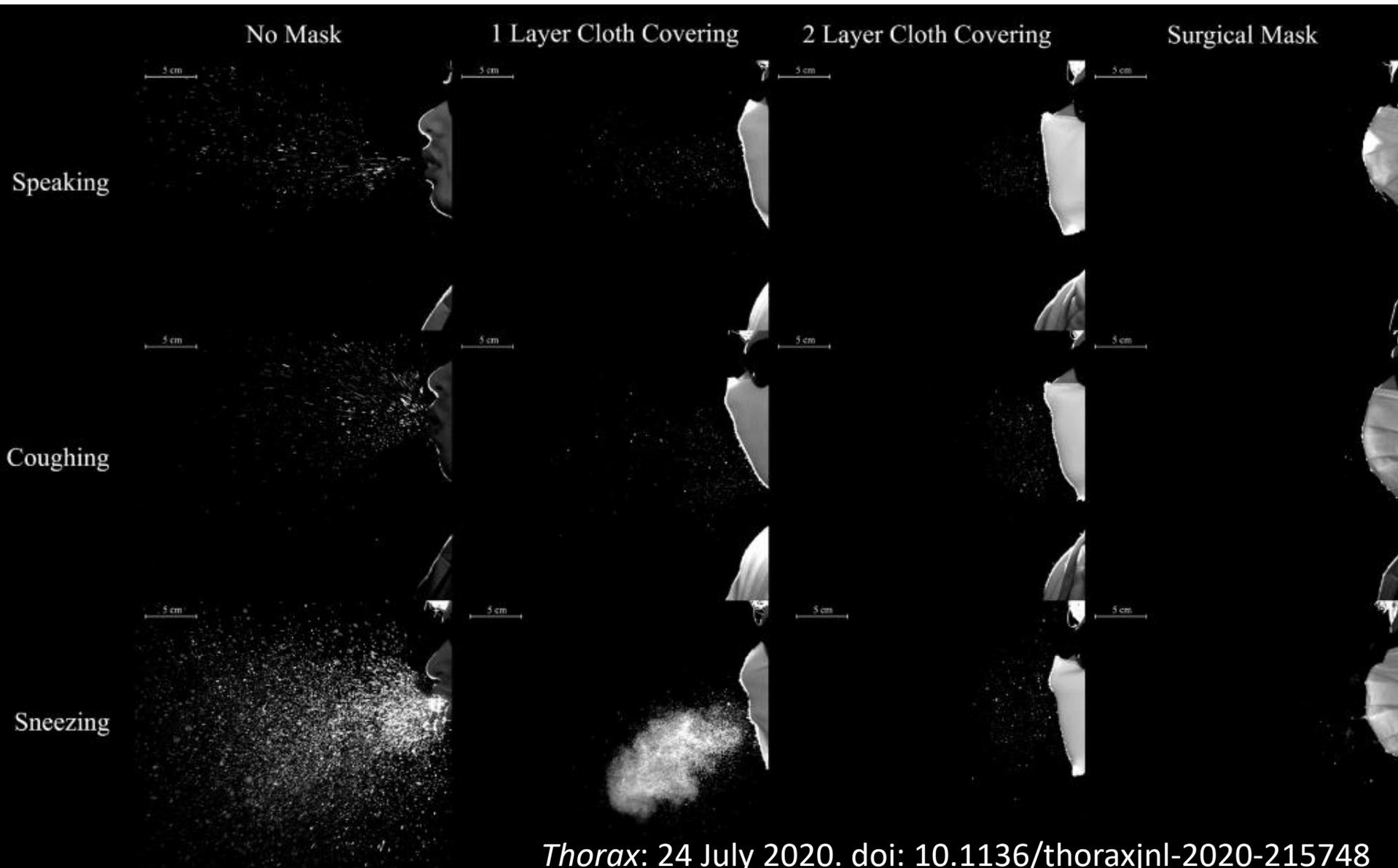
- At least 10 days have passed *since symptoms first appeared* **and**
- At least 24 hours have passed *since last fever* without the use of fever-reducing medications **and**
- Symptoms (e.g., cough, shortness of breath) have improved

Note: For patients who are **not severely immunocompromised** and who were **asymptomatic** throughout their infection, Transmission-Based Precautions may be discontinued when at least 10 days have passed since the date of their first positive viral diagnostic test.

Patients with severe to critical illness or who are severely immunocompromised<sup>1</sup>:

- At least 20 days have passed *since symptoms first appeared* **and**
- At least 24 hours have passed *since last fever* without the use of fever-reducing medications **and**
- Symptoms (e.g., cough, shortness of breath) have improved

# Two Layers Is Better Than One!



# Neonates



# Neonatal management and outcomes during the COVID-19 pandemic: an observation cohort study

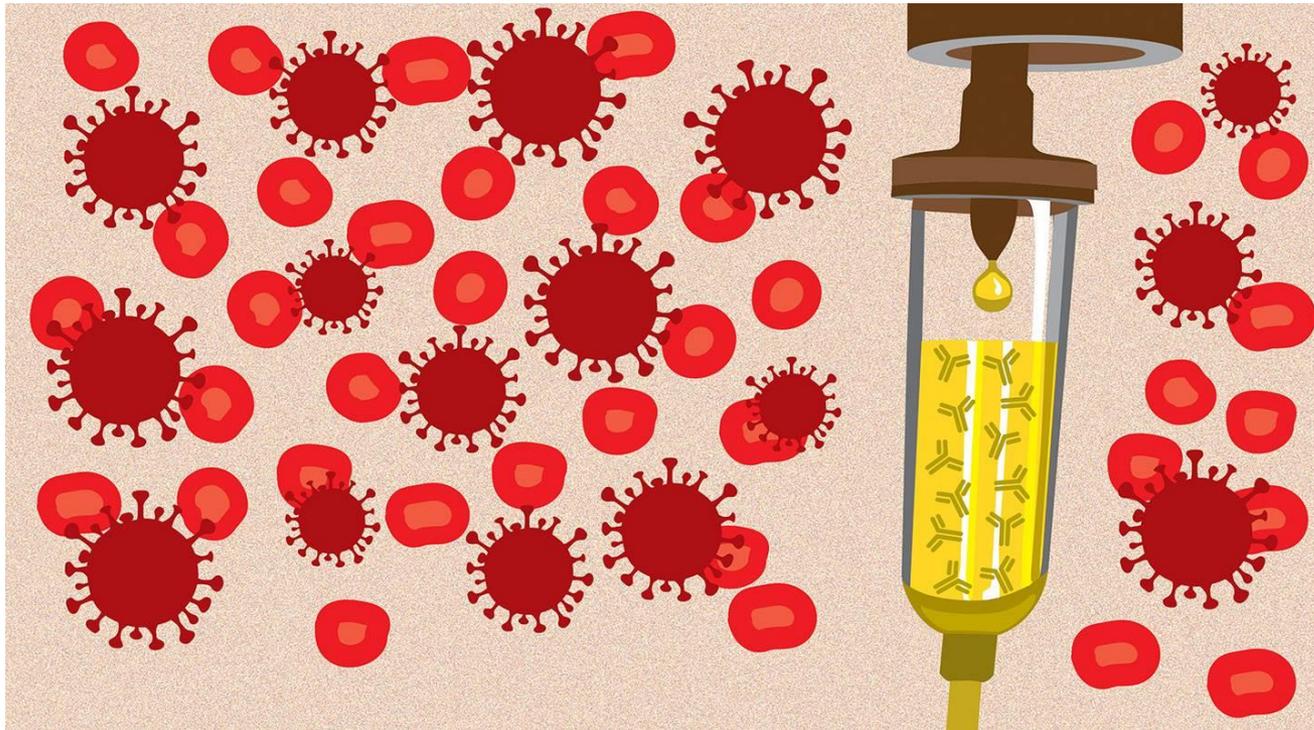


*Christine M Salvatore\*, Jin-Young Han, Karen P Acker, Priyanka Tiwari, Jenny Jin, Michael Brandler, Carla Cangemi, Laurie Gordon, Aimee Parow, Jennifer DiPace, Patricia DeLaMora\**

- **Observational study of 120 neonates born at 3 NYC hospitals to 116 SARS-CoV-2 mothers positive at delivery**
- **Mothers could practice skin-to-skin care and breastfeed in the delivery room and in their room, or when near or feeding their neonate and had to wear a surgical mask, practice proper hand hygiene, and cleaning before skin-to-skin contact, breastfeeding, and routine care**
- **Neonates were kept in a closed Giraffe isolette in the same room as their mothers**
  - **120 neonates were SARS-CoV-2 tested at 24 h of life and none were positive, 68 (83%) roomed in with the mothers**
  - **79 (96%) of 82 neonates had PCR at 5–7 days of life, all of which were negative, 72 (88%) neonates were also tested at 14 days of life and were negative; none had COVID symptoms**
- **If correct hygiene precautions are undertaken, rooming in and direct breastfeeding is safe when paired with effective parental education of infant protective strategies**



# Treatment



# Treatment

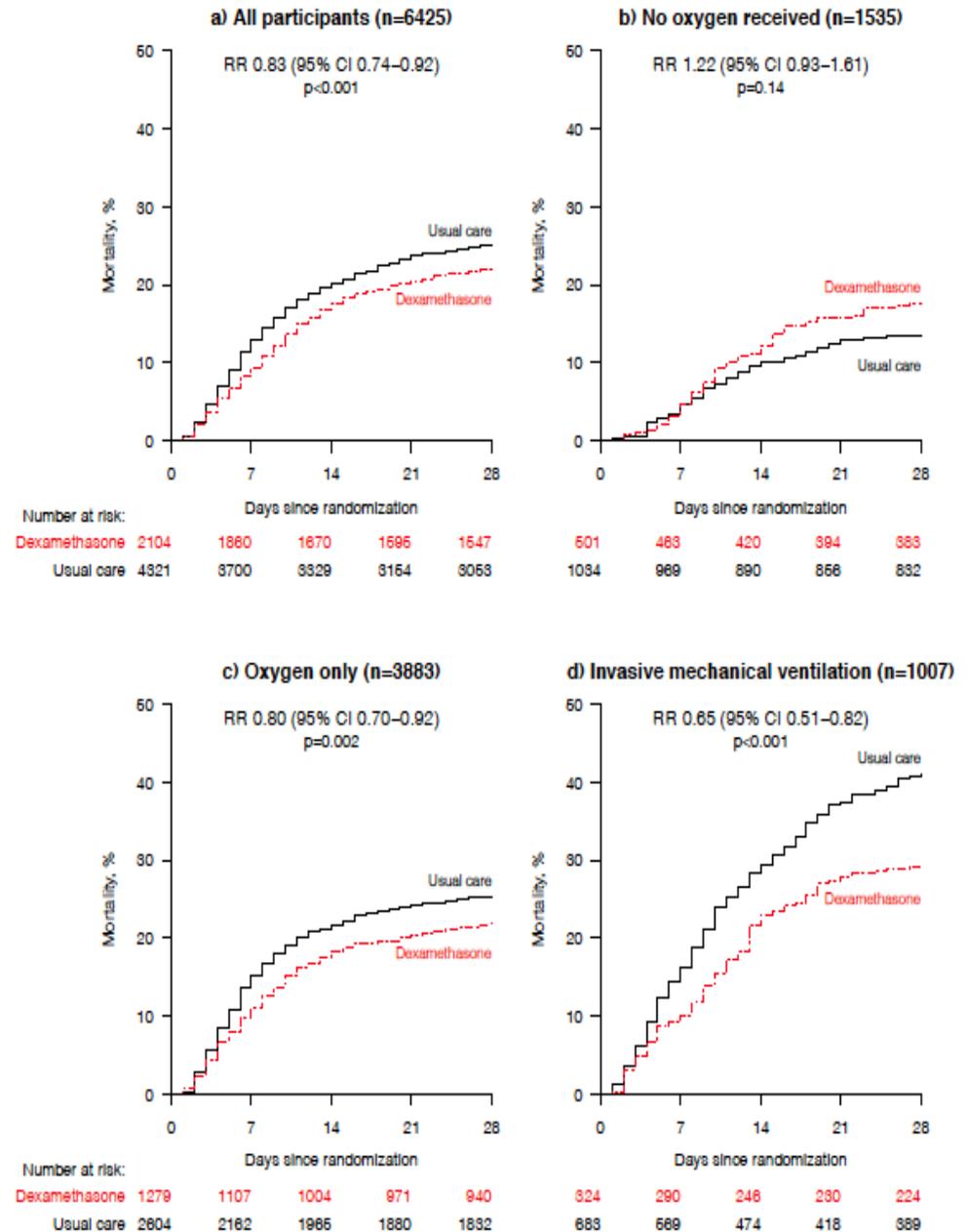
- Remdesivir remains the drug of choice for anyone who requires therapy
  - Phase 3 SIMPLE-Severe trial, a real-world retrospective cohort of patients with severe COVID-19
    - Adult data shows an improvement in clinical recovery and a 62 percent reduction in the risk of mortality vs standard of care
    - 83% of pediatric patients (n=77) and 92% of pregnant and postpartum women (n=86) with a broad spectrum of disease severity recovered by day 29, no comparative data
    - No differences in outcomes across racial and ethnic groups
    - No new safety signals

<https://www.gilead.com/news-and-press/press-room/press-releases/2020/7/gilead-presents-additional-data-on-investigational-antiviral-remdesivir-for-the-treatment-of-covid-19>

# Treatment

Use of dexamethasone in adults resulted in lower 28-day mortality among those who were receiving either invasive mechanical ventilation or oxygen alone at randomization, but no impact on those receiving no respiratory support

NEJM 2020 Jul 17. doi: 0.1056/NEJMoa202143



# Treatment in Children

- As yet undetermined for children with COVID-19 lung and GI tract disease
- No treatment for kids generally speaking unless severe presentation
  - Remdesivir helps in adults
    - No data in kids
  - Convalescent sera helps in adults
    - No data in kids
  - Dexamethasone helps in adults with severe disease
    - No data in kids
  - Anticoagulation with ASA and/or heparin (LMW) helps in adults
    - No data in kids
- MIS-C
  - Unknown what is needed
  - Recommend the use of IVIG, steroids, anakinra, anticoagulation

<https://doi.org/10.1101/2020.06.22.20137273>

NEJM. 2020 May 22;NEJMoa2007764

J Clin Invest . 2020 Jun 1;130(6):2757-2765

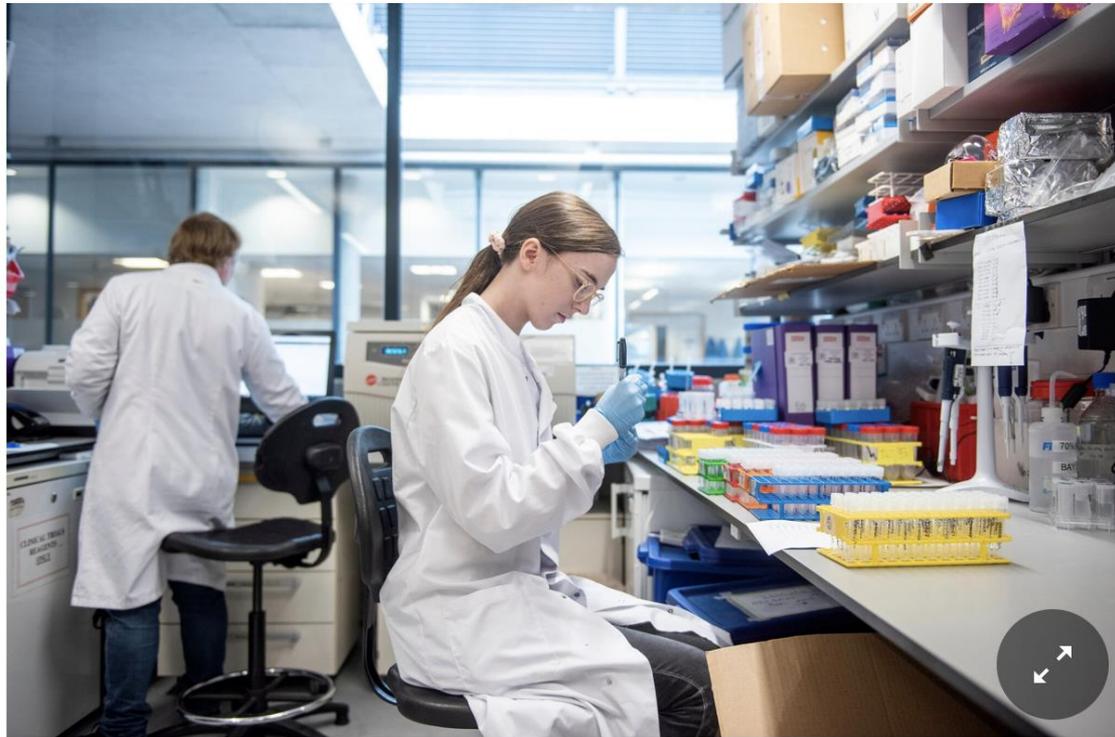
Prog Pediatr Cardiol. 2020 May 23 : 10123

J Am Coll Cardiol. 2020 Jun 16;75(23):2950-2973



# *Three Coronavirus Vaccine Developers Report Promising Initial Results*

Early trials showed a good immune response in vaccinated subjects, but one researcher sounded a note of caution: “There is still a long way to go.”



A scientist at Oxford working with blood samples for vaccine trials. John Cairns/University of Oxford, via Associated Press

# An mRNA Vaccine against SARS-CoV-2 — Preliminary Report

Lisa A. Jackson, M.D., M.P.H., Evan J. Anderson, M.D., Nadine G. Rouphael, M.D., Paul C. Roberts, Ph.D., Mamodikoe Makhene, M.D., M.P.H., Rhea N. Coler, Ph.D., Michele P. McCullough, M.P.H., James D. Chappell, M.D., Ph.D., Mark R. Denison, M.D., Laura J. Stevens, M.S., Andrea J. Pruijssers, Ph.D., Adrian McDermott, Ph.D., et al., for the mRNA-1273 Study Group\*

- mRNA-based vaccine that encodes the SARS-CoV2 spike (S) glycoprotein
- Phase 1, dose-escalation, open-label trial
- 45 health adults 18-55yo
- 2 vaccinations, 28 days apart at doses of 25ug, 100ug, or 250ug (15 each)
- **The mRNA-1273 vaccine induced anti-SARS-CoV-2 immune responses in all participants**
- No serious adverse events
- Fatigue, chills, headache, myalgia and pain at injection sites were seen in more than half of the participants

# Safety and immunogenicity of the ChAdOx1 nCoV-19 vaccine against SARS-CoV-2: a preliminary report of a phase 1/2, single-blind, randomised controlled trial

*Pedro M Folegatti\*, Katie J Ewer\*, Parvinder K Aley, Brian Angus, Stephan Becker, Sandra Belij-Rammerstorfer, Duncan Bellamy, Sagida Bibi, Mustapha Bittaye, Elizabeth A Clutterbuck, Christina Dold, Saul N Faust, Adam Finn, Amy L Flaxman, Bassam Hallis, Paul Heath, Daniel Jenkin, Rajeka Lazarus, Rebecca Makinson, Angela M Minassian, Katrina M Pollock, Maheshi Ramasamy, Hannah Robinson, Matthew Snape, Richard Tarrant, Merryn Voysey, Catherine Green\*, Alexander D Douglas\*, Adrian V S Hill\*, Teresa Lambe\*, Sarah C Gilbert\*, Andrew J Pollard\*, on behalf of the Oxford COVID Vaccine Trial Group†*

- Chimpanzee adenovirus-vectored vaccine expressing SARS-CoV-2 spike protein compared to MenACWY
- 5 sites in the UK
- Healthy adults 18-55y with no history of COVID-19
- Subgroup of participants assigned to receive 2 doses, booster at 28 days
- **91% had neutralizing antibody responses after single dose and 100% after booster dose**
- No serious adverse events
- Common side effects of pain, feeling feverish, chills, muscle aches, HA and malaise more likely with trial vaccine

# Immunogenicity and safety of a recombinant adenovirus type-5-vectored COVID-19 vaccine in healthy adults aged 18 years or older: a randomised, double-blind, placebo-controlled, phase 2 trial

*Feng-Cai Zhu\*, Xu-Hua Guan\*, Yu-Hua Li, Jian-Ying Huang, Tao Jiang, Li-Hua Hou, Jing-Xin Li, Bei-Fang Yang, Ling Wang, Wen-Juan Wang, Shi-Po Wu, Zhao Wang, Xiao-Hong Wu, Jun-Jie Xu, Zhe Zhang, Si-Yue Jia, Bu-Sen Wang, Yi Hu, Jing-Jing Liu, Jun Zhang, Xiao-Ai Qian, Qiong Li, Hong-Xing Pan, Hu-Dachuan Jiang, Peng Deng, Jin-Bo Gou, Xue-Wen Wang, Xing-Huan Wang, Wei Chen*

- Replication defective Ad5 vectored vaccine expressing the spike glycoprotein of SARS-CoV-2
- 508 healthy adults received 2 different doses
- Antibody responses to receptor binding domain (RBD)
- **Seroconversion rates at 96% and 97% at day 14 and 28 at both doses of the vaccine**
- T-cell responses measured by interferon gamma observed in 90% and 88% of 129 patients in both groups
- Fatigue, fever, headache most commonly reported