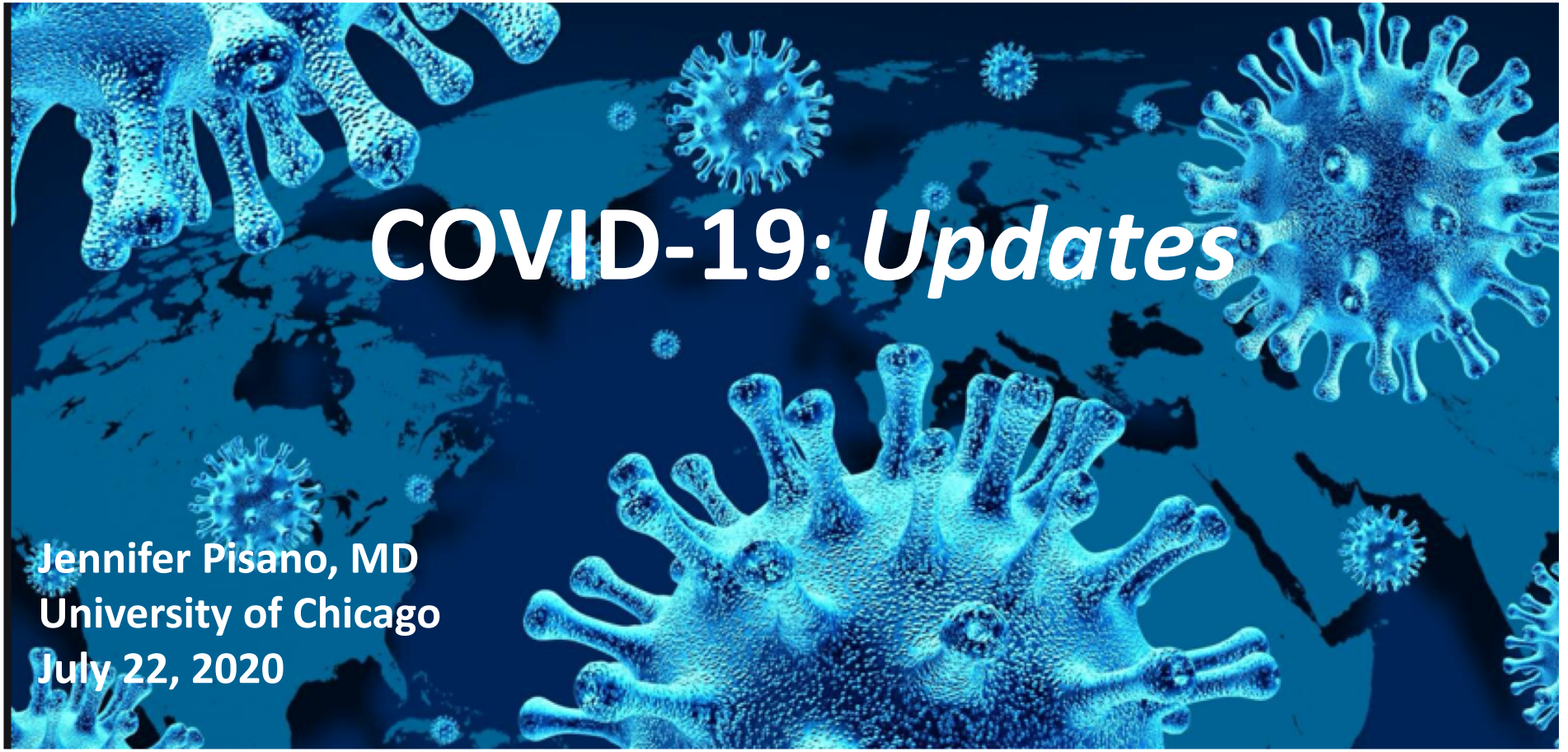

COVID-19: *Updates*

Jennifer Pisano, MD
University of Chicago
July 22, 2020

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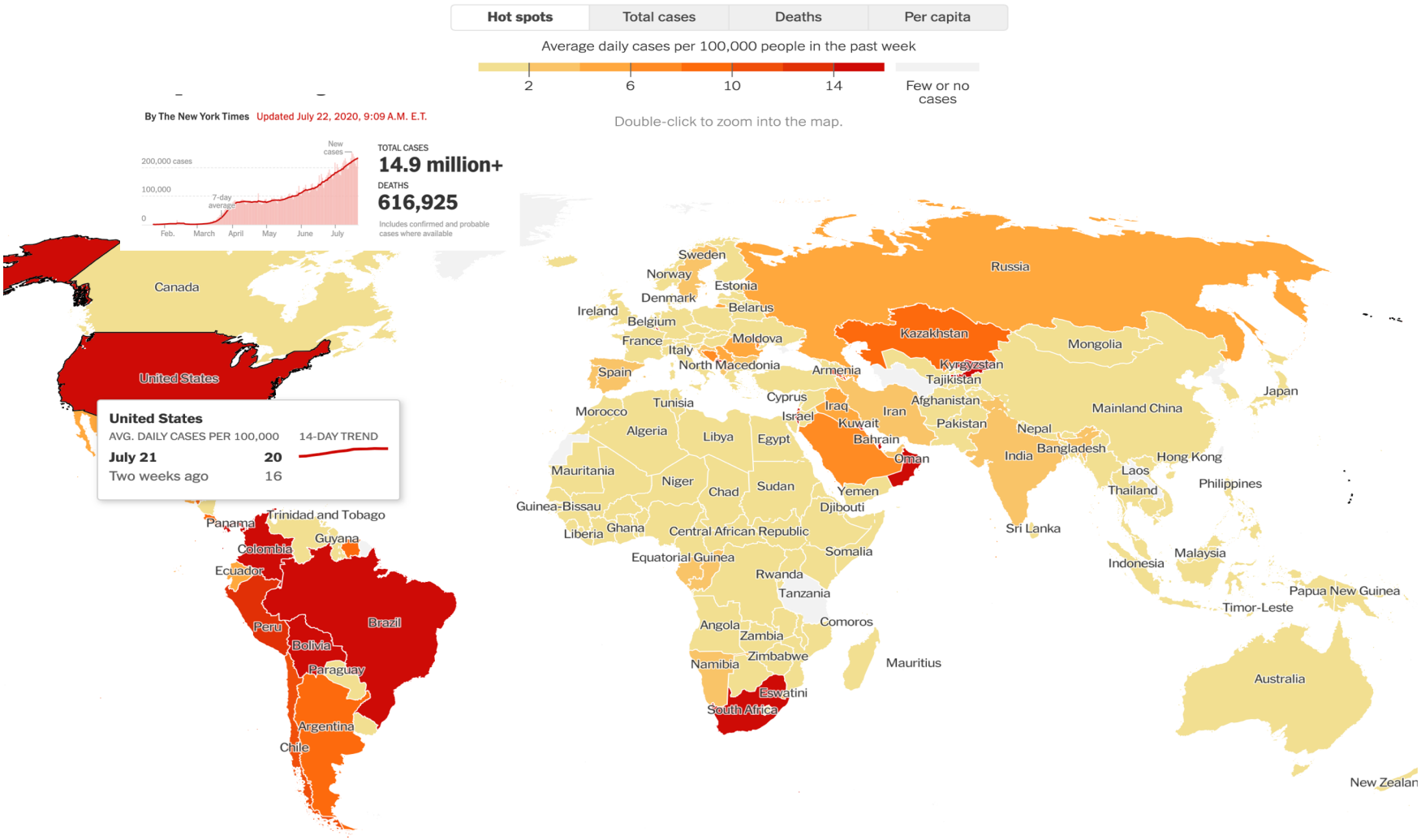
Disclosures

- I have no relevant financial interests to disclose.

COVID-19 Cases Continue to Rise Globally



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

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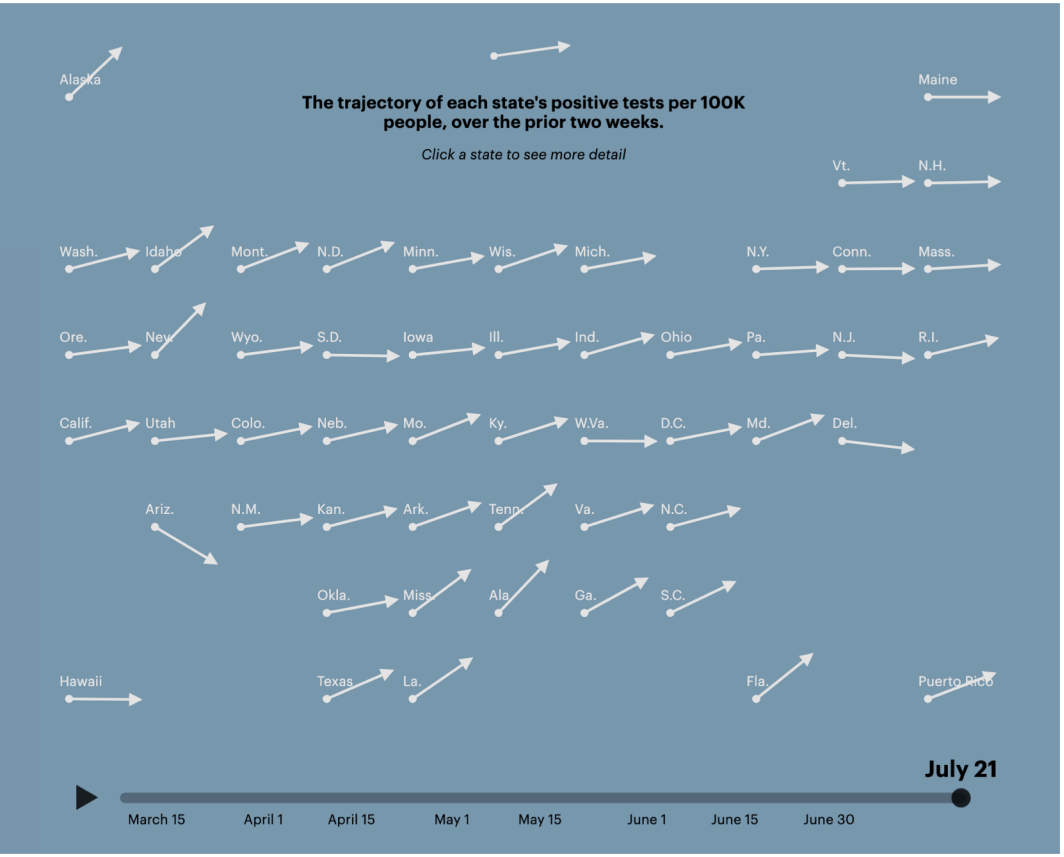
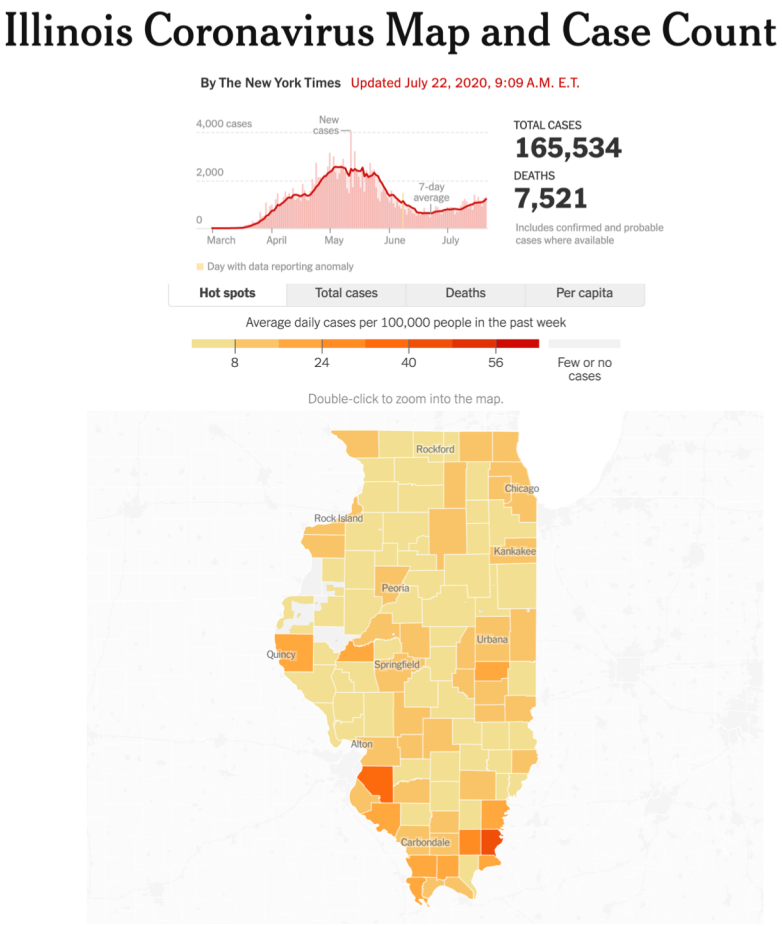
Across the US, in Illinois and Cook County





https://projects.propublica.org/reopening-america/

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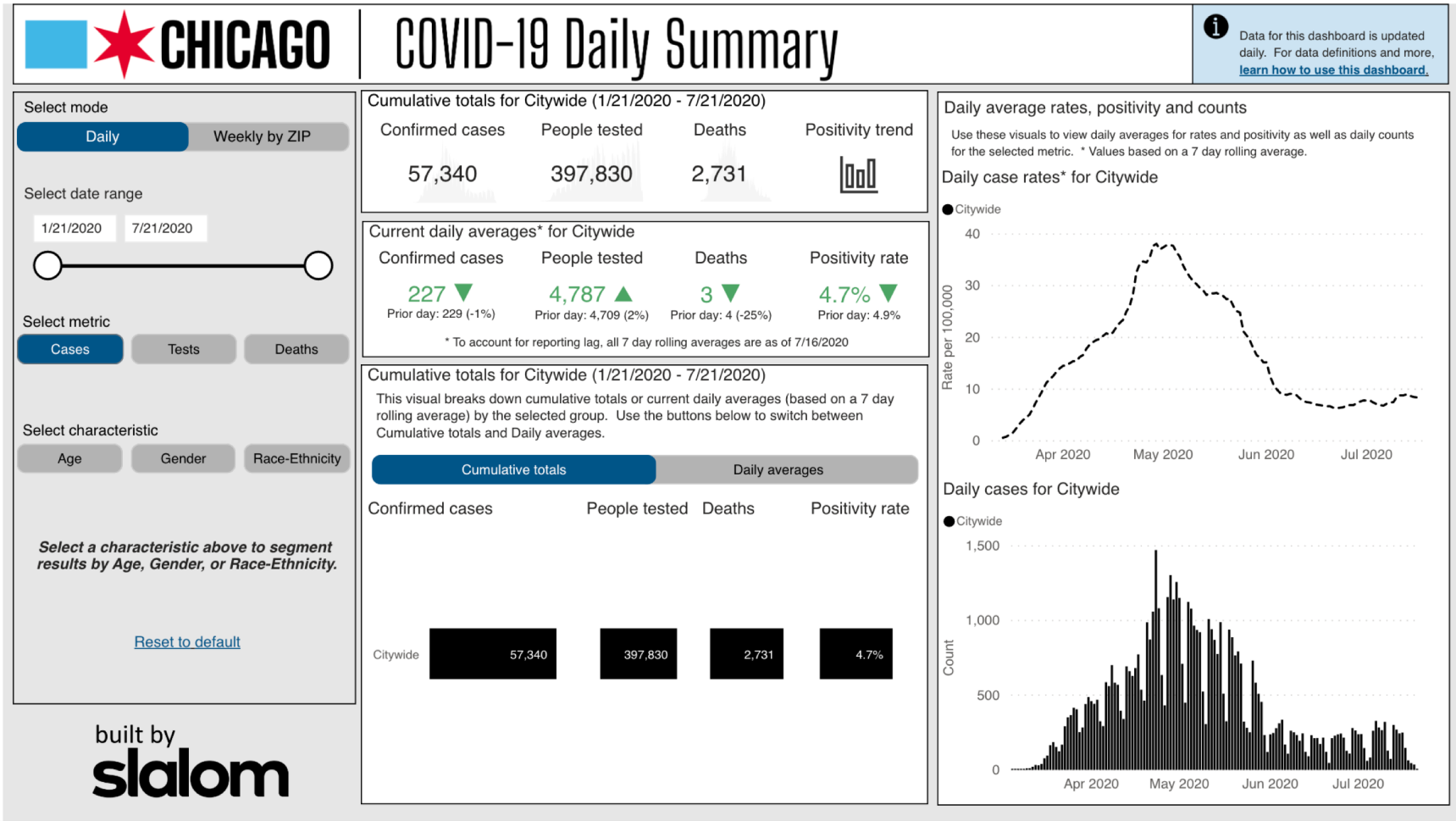
COVID Dashboard



https://www.chicago.gov/city/en/sites/covid-19/home/covid-dashboard.html

Emergency Travel Order

Updated as of 7/14/2020

On Thursday, July 2, Chicago Department of Public Health Commissioner Allison Arwady, M.D., issued an Emergency Travel Order directing travelers entering or returning to Chicago from states experiencing a surge in new COVID-19 cases to quarantine for a 14-day period from the time of last contact within the identified state. This includes both Chicago residents returning from travel to a designated state, and travelers arriving in Chicago from a designated state. The Order went into effect on Monday July 6, 2020, at 12:01am. Below you will find answers to common questions regarding the Emergency Travel Order and how it applies to Chicago residents and visitors.

States Currently Covered by the Order

Travelers from the following states should quarantine upon arrival in Chicago: Alabama, Arkansas, Arizona, California, Florida, Georgia, Idaho, Louisiana, Mississippi, North Carolina, Nevada, South Carolina, Tennessee, Texas, and Utah. Starting July 17, the Order will also apply to Iowa and Oklahoma. The list will be updated every Tuesday and go into effect the following Friday at 12:01 a.m.

- States are designated if case rates *>15 new COVID19 cases/100K resident population*, per day, over a 7-day rolling average
- Reviewed every Tuesday with the order effective for those states the following Friday
- **Iowa and Oklahoma added 7-17-20, Kansas 7-24**
- **Arwady: ”Wisconsin is close”**

By age: Confirmed coronavirus cases, deaths and tests

As of July 21.

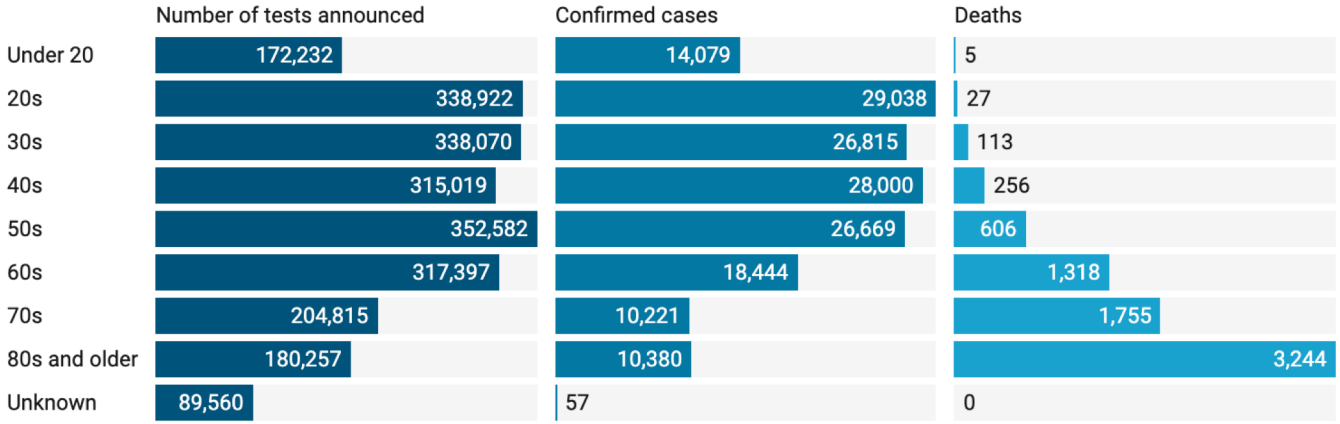
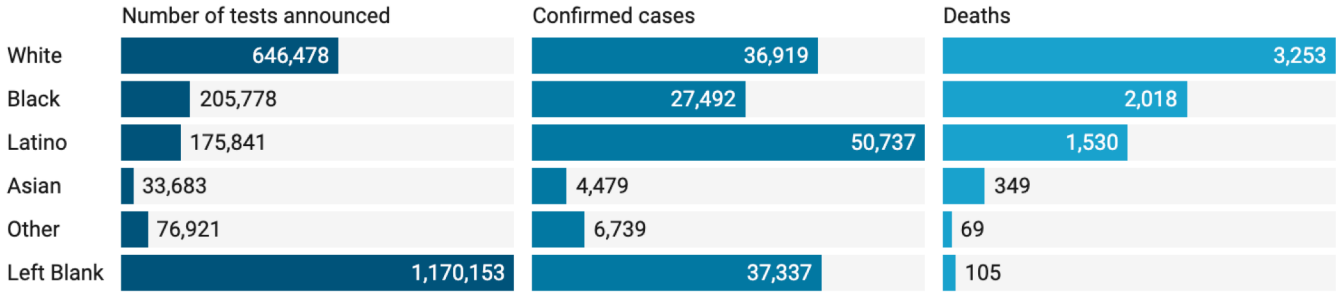


Chart: Chicago Tribune dataviz team • Source: Illinois Department of Public Health • Get the data • Created with Datawrapper

By race: Confirmed coronavirus cases, deaths and tests

As of July 21.



Other includes Native Hawaiian or other Pacific Islander, American Indian or Alaskan native and other.

Chart: Chicago Tribune dataviz team • Source: Illinois Department of Public Health, Chicago Tribune reporting • Get the data • Created with Datawrapper

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https://www.chicagotribune.com/coronavirus/ct-viz-coronavirus-cases-in-illinois-20200304-wz44mgw6wrd5zmzngx4kc3z6a4-htmlstory.html

Centers for Disease Control and Prevention
CDC 24/7: Saving Lives, Protecting People™

Test based strategy no longer recommended to determine when to DC transmission-based precautions

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[1]:

- 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

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https://www.cdc.gov/coronavirus/2019-ncov/hcp/duration-isolation.html

Research Letter

ONLINE FIRST FREE

July 9, 2020

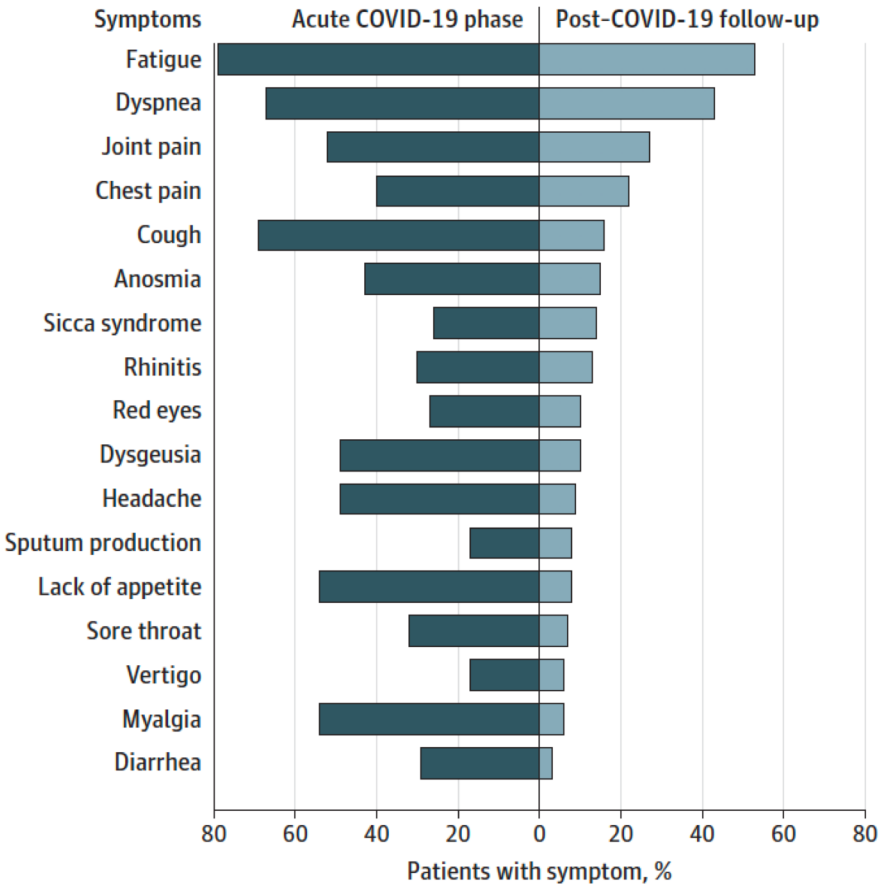
Persistent Symptoms in Patients After Acute COVID-19

Angelo Carfì, MD[1]; Roberto Bernabei, MD[1]; Francesco Landi, MD, PhD[1]; et al

- Post-hospital discharge outpatient service for COVID-19 patients in Italy
- 143 patients total, mean age 56y (19-84y)
- 72% of patients had interstitial pneumonia in the hospital
- Mean LOS 13.5 days, 15% NIV, 5% invasive ventilation
- Assessmed mean of 60d after onset of first symptom
- 32% had 1-2 symtpoms and 55% had 3+
- Worsened quality of life in 44%

Carfi A JAMA. Published online July 9, 2020. doi:10.1001/jama.2020.12603

Figure. COVID-19–Related Symptoms



The figure shows percentages of patients presenting with specific coronavirus disease 2019 (COVID-19)–related symptoms during the acute phase of the disease (left) and at the time of the follow-up visit (right).

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Gilead Presents Additional Data on Investigational Antiviral Remdesivir for the Treatment of COVID-19

Fri July 10, 2020 8:30 AM | Business Wire | About: GILD

- Virtual COVID-19 Conferences as part of the 23rd International AIDS Conference
- Comparative analysis of the Phase 3 SIMPLE-Severe trial and a real-world retrospective cohort of patients with severe COVID-19
- Remdesivir was associated with an improvement in clinical recovery and a **62 percent reduction in the risk of mortality vs standard of care**
- Requires confirmation in prospective clinical trials
- No differences in outcomes across racial and ethic groups
- 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 new safety signals

https://www.cnbc.com/2020/07/10/gilead-says-remdesivir-coronavirus-treatment-reduces-risk-of-death.html

ORIGINAL ARTICLE

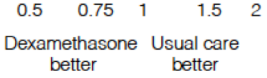
Dexamethasone in Hospitalized Patients with Covid-19 — Preliminary Report

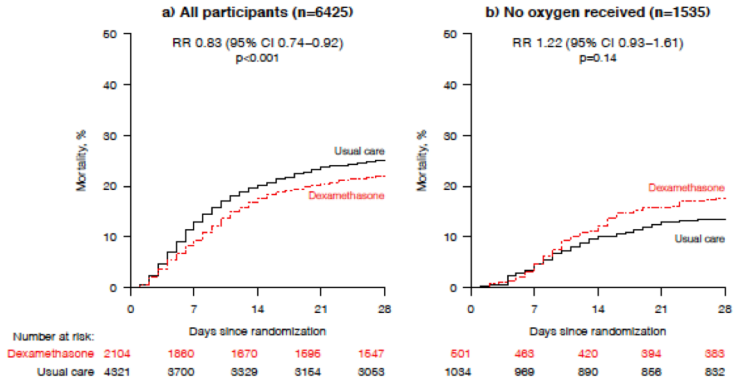
The RECOVERY Collaborative Group*

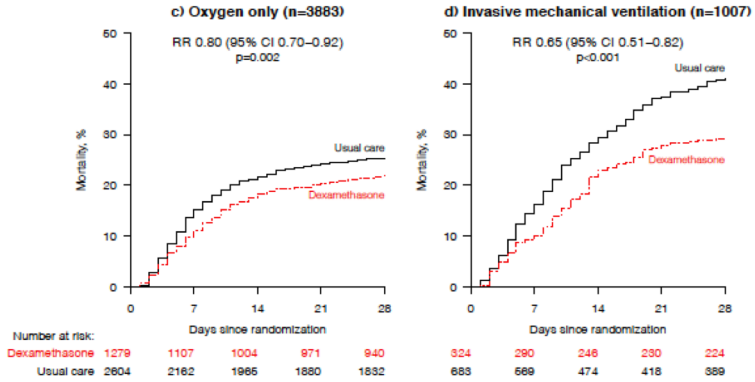
Figure 2: Effect of allocation to dexamethasone on 28–day mortality by level of respiratory support received at randomization

Respiratory support at randomization	Dexamethasone	Usual care	RR (95% CI)
No oxygen received	85/501 (17.0%)	137/1034 (13.2%)	1.22 (0.93–1.61)
Oxygen only	275/1279 (21.5%)	650/2604 (25.0%)	0.80 (0.70–0.92)
Invasive mechanical ventilation	94/324 (29.0%)	278/683 (40.7%)	0.65 (0.51–0.82)
All participants	**454/2104 (21.6%)**	**1065/4321 (24.6%)**	**0.83 (0.74–0.92) p<0.001**

Trend across three categories: χ^2_1=11.49; p<0.001







RR=age–adjusted rate ratio. CI=confidence interval. The 'oxygen only' group includes non–invasive ventilation. Note: in the RECOVERY trial press release of 16 June 2020, effects in subgroups of level of respiratory support received were shown with 99% CIs, not 95% CIs as inadvertently stated. The age–adjusted rate ratio and 99% confidence intervals remain unchanged in this analysis: no oxygen required, RR 1.22 (99% CI 0.86–1.75); oxygen only, RR 0.80 (99% CI 0.67–0.96); invasive mechanical ventilation, RR 0.65 (99% CI 0.48–0.88).

Conclusion: In patients hospitalized with COVID-19, the use of dexamethasone resulted in lower 28-day mortality among those who were receiving either invasive mechanical ventilation or oxygen alone at randomization but not among those receiving no respiratory support.

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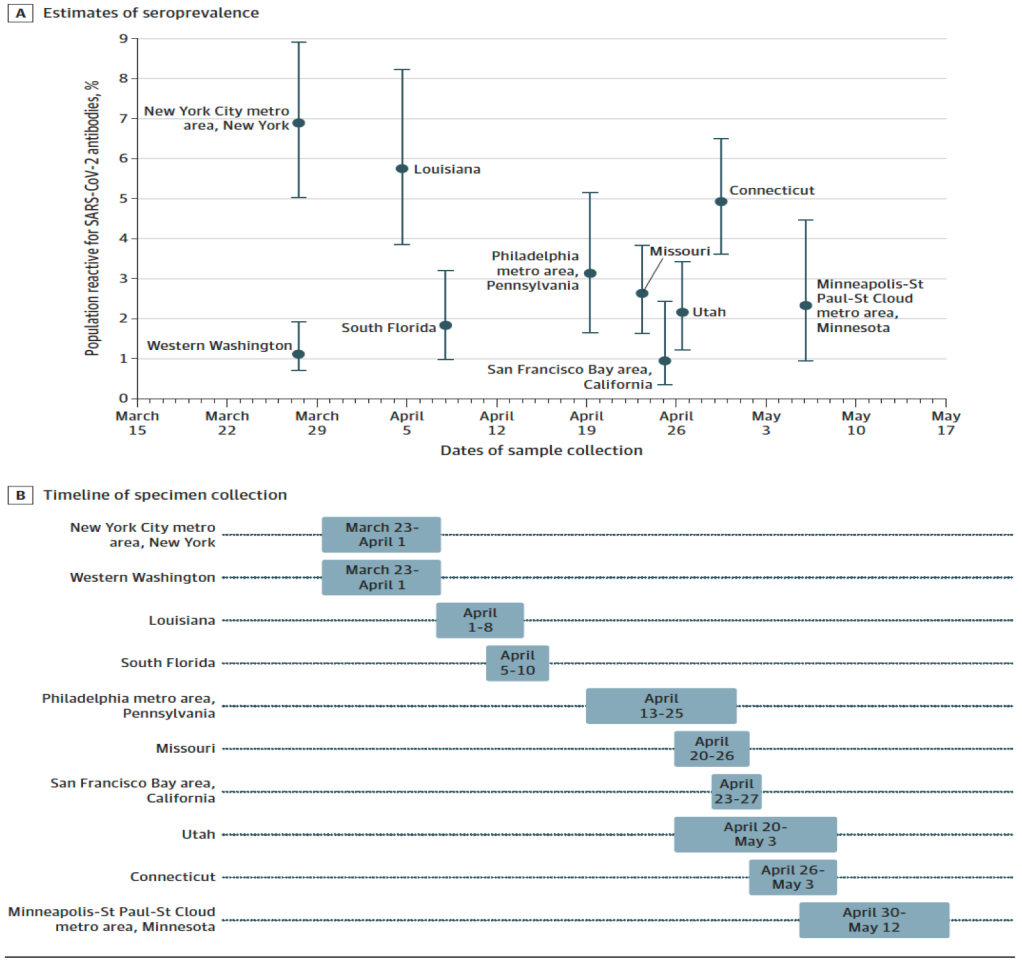
JAMA Internal Medicine | Original Investigation

Seroprevalence of Antibodies to SARS-CoV-2 in 10 Sites in the United States, March 23-May 12, 2020

Fiona P. Havers, MD, MHS; Carrie Reed, PhD; Travis Lim, DrPH; Joel M. Montgomery, PhD; John D. Klena, PhD; Aron J. Hall, DVM; Alicia M. Fry, MD; Deborah L. Cannon, BS; Cheng-Feng Chiang, PhD; Aridth Gibbons, BS; Inna Krapiunaya, MS; Maria Morales-Betoulle, PhD; Katherine Roguski, MPH; Mohammad Ata Ur Rasheed, PhD; Brandi Freeman, PhD; Sandra Lester, PhD; Lisa Mills, PhD; Darin S. Carroll, PhD; S. Michele Owen, PhD; Jeffrey A. Johnson, PhD; Vera Semenova, PhD; Carina Blackmore, DVM; Debra Blog, MD; Shua J. Chai, MD; Angela Dunn, MD; Julie Hand, MSPH; Seema Jain, MD; Scott Lindquist, MD; Ruth Lynfield, MD; Scott Pritchard, MPH; Theresa Sokol, MPH; Lynn Sosa, MD; George Turabelidze, MD; Sharon M. Watkins, PhD; John Wiesman, DrPH; Randall W. Williams, MD; Stephanie Yendell, DVM; Jarad Schiffer, MS; Natalie J. Thornburg, PhD

- Serum samples were tested from 16,025 persons
- Estimates of the proportion of persons seroreactive to the SARS-CoV-2 spike *ranged from 1% in SF to 6.9% in NYC*
- The estimated number of infections ranged **from 6 (CT) -24 times (MO) the number of reported cases**
- For Connecticut, FLA, Louisiana, Missouri, NYC metro area, Utah and western Washington State, an estimated greater than 10 times more SARS-CoV2 infections occurred than the number of reported cases

Figure 1. Estimates of Seroprevalence to Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) Antibodies and Timeline of Specimen Collection



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medRxiv
THE PREPRINT SERVER FOR HEALTH SCIENCES

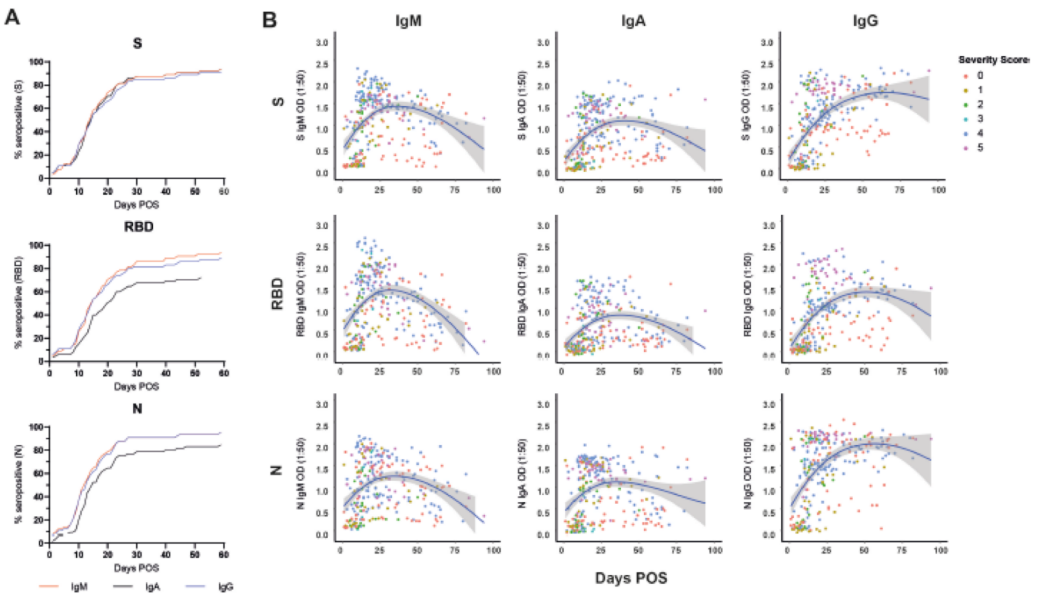
Longitudinal evaluation and decline of antibody responses in SARS-CoV-2 infection

Jeffrey Seow, Carl Graham, Blair Merrick, Sam Acors, Kathryn J.A. Steel, Oliver Hemmings, Aoife O'Bryne, Neophytos Kouphou, Suzanne Pickering, Rui Galao, Gilberto Betancor, Harry D Wilson, Adrian W Signell, Helena Winstone, Claire Kerridge, Nigel Temperton, Luke Snell, Karen Bisnauthsing, Amelia Moore, Adrian Green, Lauren Martinez, Brielle Stokes, Johanna Honey, Alba Izquierdo-Barras, Gill Arbane, Amita Patel, Lorcan OConnell, Geraldine O Hara, Eithne MacMahon, Sam Douthwaite, Gaia Nebbia, Rahul Batra, Rocio Martinez-Nunez, Jonathan D. Edgeworth, Stuart J.D. Neil, Michael H. Malim, Katie Doores

doi: https://doi.org/10.1101/2020.07.09.20148429

- Sequential samples from 65 individuals with PCR confirmed SARS-CoV-2 infection and 31 seropositive HCW up to 94 days post-onset of symptoms
- IgM and IgA binding responses decline after 20-30 days POS
- Magnitude of the nAb response is dependent on disease severity
- Peak on day 23 POS and then decrease 2-23 fold during an 18-65 day follow-up period
- Modest titers become undetectable after about 50 days

Figure 1: Kinetics of antibody development against SARS-CoV-2 antigens over time. A) A cumulative frequency analysis describing the point of seroconversion for each person in the cohort. Graph shows the percentage of individuals in the cohort that become IgM, IgA or IgG positive to S, RBD and N each day. A serum is considered positive when the OD is 4-fold above background. B) IgM, IgA and IgG OD values against S, RBD and N are plotted against the time post onset of symptoms (POS) at which sera was collected. Coloured dots indicate disease severity (0-5). The line shows the mean OD value expected from a Loess regression model, the ribbon indicates the pointwise 95% confidence interval. OD = optical density.



medRxiv preprint doi: https://doi.org/10.1101/2020.07.09.20148429.this version posted July 11, 2020.
Seow J et al. Longitudinal evaluation and decline of antibody responses in SARS-CoV2 Infection

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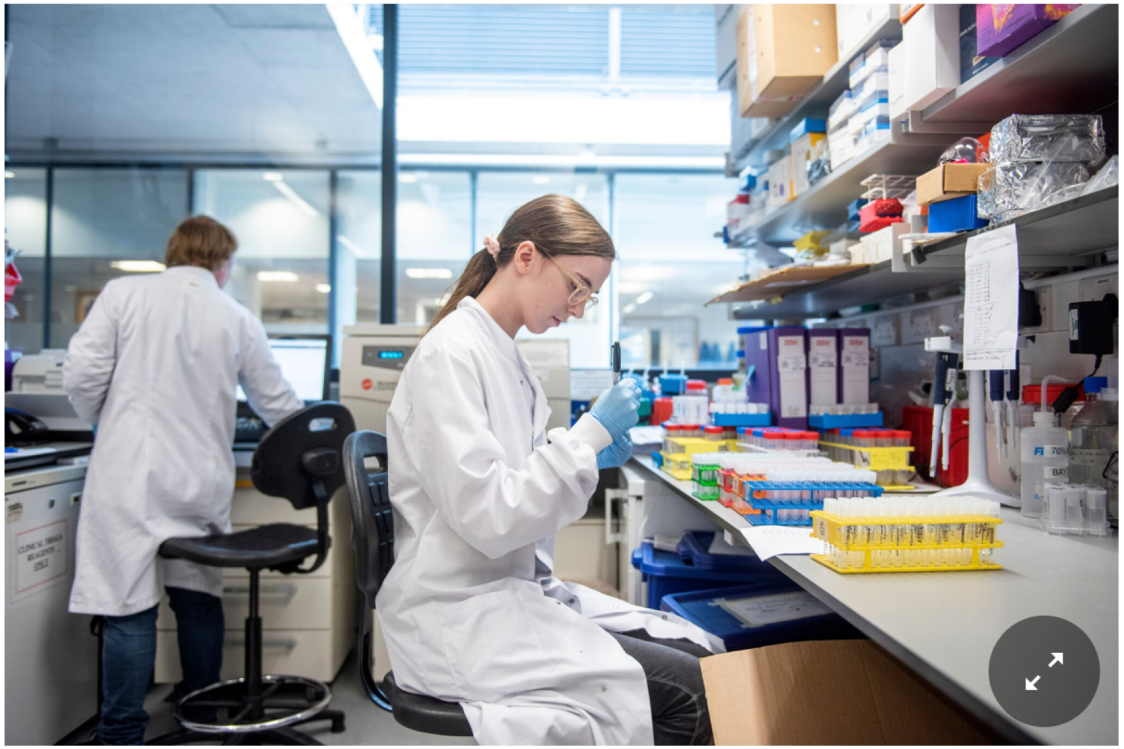
Three Coronavirus Vaccine Developers Report Promising Initial Results

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

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https://www.nytimes.com/2020/07/20/world/covid-coronavirus-vaccine.html

ORIGINAL ARTICLE

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 trial-limiting safety concerns
- Fatigue, chills, headache, myalgia and pain at injection sites were seen in more than half of the participants

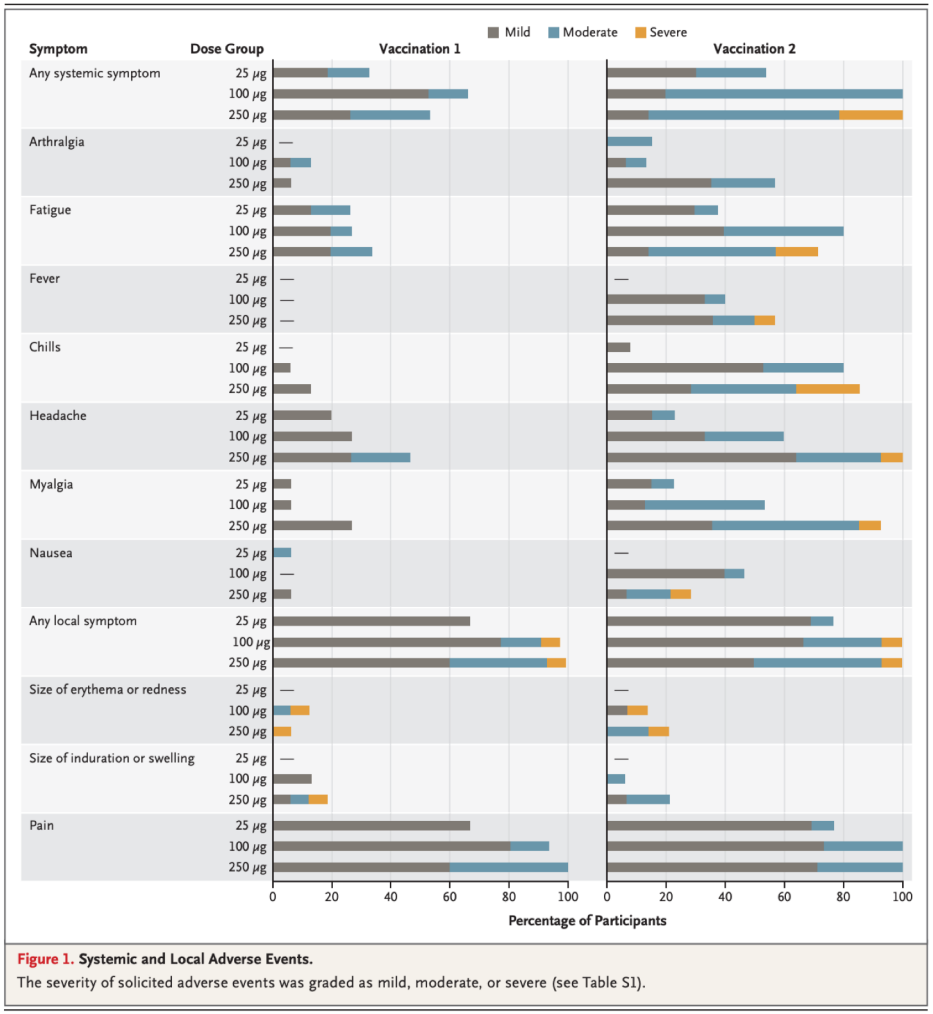

Figure 1. Systemic and Local Adverse Events.
The severity of solicited adverse events was graded as mild, moderate, or severe (see Table S1).

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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†*

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

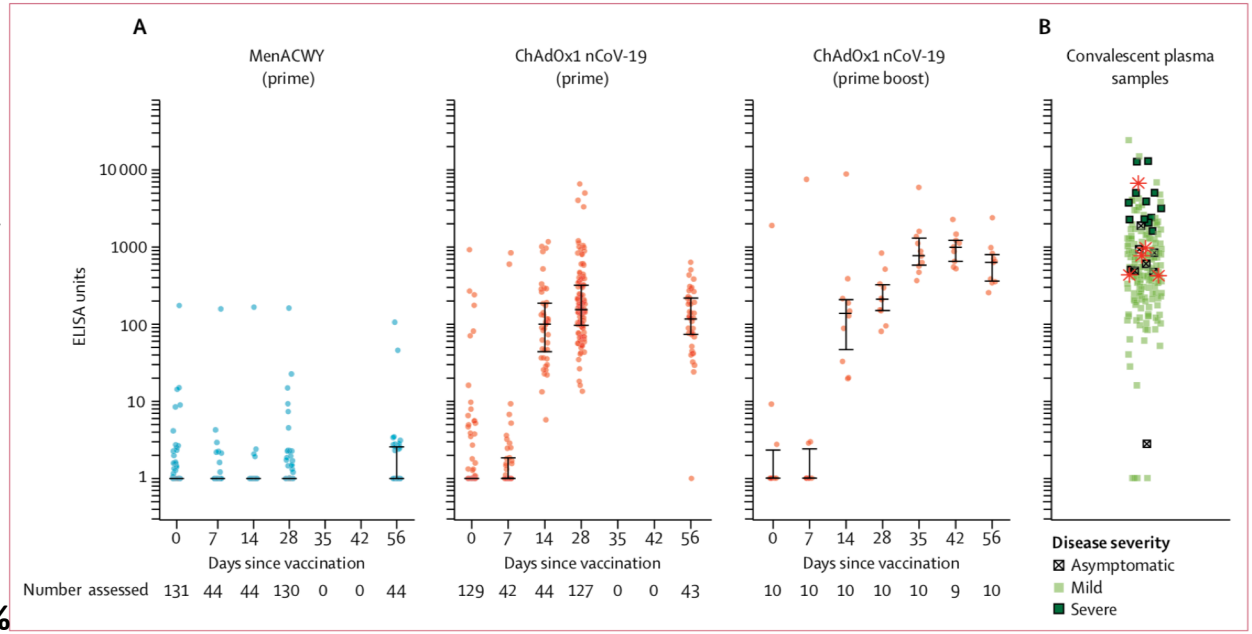

Figure 3: **SARS-CoV-2 IgG response by standardised ELISA to spike protein in trial participants (A) and in 180 convalescent plasma samples from 172 patients with PCR-confirmed COVID-19 and eight asymptomatic health-care workers (B)**

Error bars show median (IQR). Participants in the prime boost group received their second dose at day 28. Lower limit of quantification is 1 ELISA unit. Red stars in panel B show five samples also tested on the Marburg VN assay (see figure 4). MenACWY=meningococcal group A, C, W-135, and Y conjugate vaccine. SARS-CoV-2=severe acute respiratory syndrome coronavirus 2.

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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*

- 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

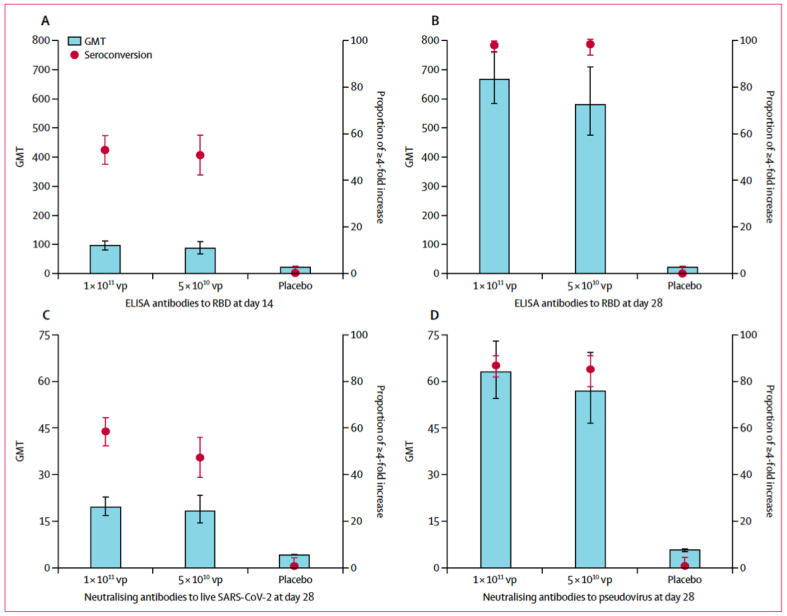

Figure 2: **Specific antibody responses to RBD, neutralising antibodies to live severe acute respiratory syndrome coronavirus 2 and pseudovirus post vaccination**
Seroconversion was defined as an increase in post-vaccination titre of at least four-times baseline. The baseline antibody titres are shown in the appendix (p 1). All comparisons across the three treatment groups are p<0·0001. Multiple comparisons showed no significant difference between the 1×10^{11} vp and 5×10^{10} vp dose groups. GMT=geometric mean antibody titre. RBD=receptor binding domain. vp=viral particles.

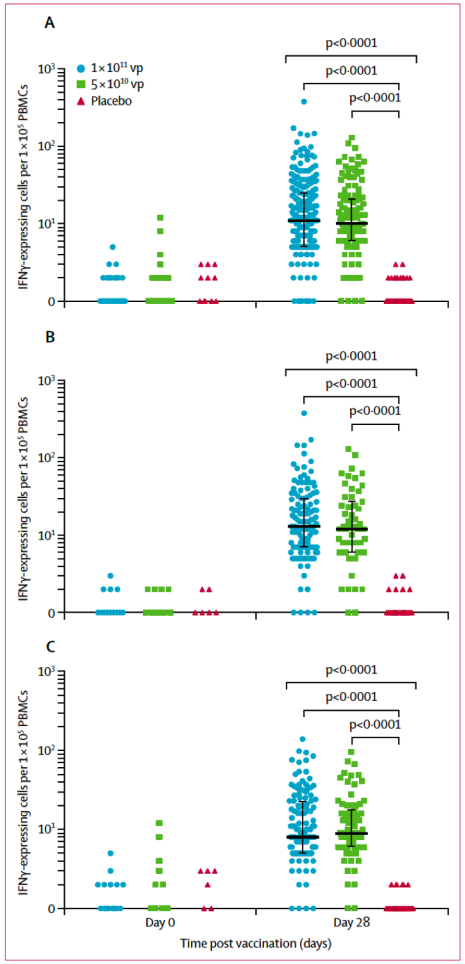

Figure 3: **Specific T-cell responses measured by ELISpot**
The number of specific T cells with secretion of IFNγ at days 0 and 28 in all participants (A), and stratified by pre-existing adenovirus type-5 neutralising antibody titres of less than or equal to 1:200 (B) and more than 1:200 (C). vp=viral particles. IFN=interferon. PBMC=peripheral blood mononuclear cell.

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