
COVID19
Keeping Up with a Moving Target

COVID-19: KEEPING UP WITH A MOVING TARGET
February 24, 2021 UPDATE

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CME Information

Jointly provided by Postgraduate Institute for Medicine, DKBmed, and the Institute for Johns Hopkins Nursing.

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Paul G. Auwaerter, MD, MBA, FIDSA	JNJ: Ownership equity Scientific Consulting: Verily, EMD Serono DMSB: Humanigen

Dr. Auwaerter has indicated that he will be referencing the unlabeled or unapproved use of agents currently being investigated in on-going studies and trials, including a remdesivir, baricitinib, and several vaccine platforms.

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CME Information

To attest for CME/CE/AAPA credit, please visit

COVID19.dkbmed.com

Learning Objectives

- Describe real-world evidence of efficacy of COVID-19 vaccines
- Discuss implications of emerging variants on vaccine dosing strategies

Thank You

This activity is supported by educational grants from Gilead Sciences, Inc., Regeneron Pharmaceuticals, and Eli Lilly and Company.

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Please see **COVID19.DKBmed.com** for additional resources and educational activities

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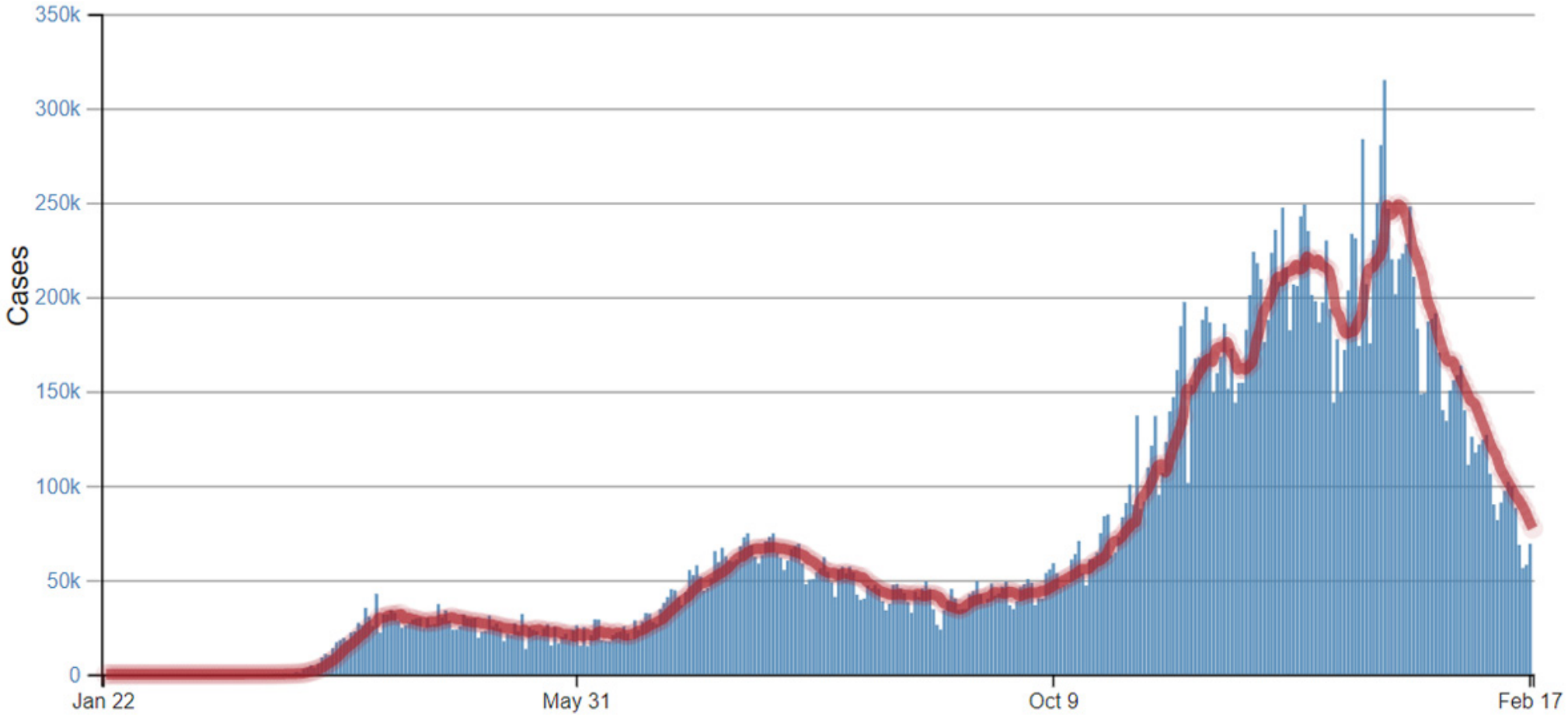
CDC US COVID-19 Data: Why the Rapid Decrease in Cases?



CDC 2/23/21 https://www.cdc.gov/coronavirus/2019-ncov/covid-data/covidview/index.html

COVID-19 Disease Burden

CDC estimates that from February–December 2020:

1 in 1.9 (95% UI* 1.7 - 2.2) COVID-19 hospitalizations were reported

1 in 4.2 (95% UI* 3.7 – 4.7) COVID–19 symptomatic illnesses were reported

1 in 4.6 (95% UI* 4.0 – 5.4) total COVID–19 infections were reported

These estimates suggest that during that period, there were approximately:

83.1 Million	70.4 Million	4.1 Million
Estimated Total Infections	Estimated Symptomatic Illnesses	Estimated Hospitalizations

CDC last updated 1/19/21

Vaccine News

Limited supply

Both Moderna and Pfizer pledge massive surge

- Pfizer 13 million doses/wk by mid-March
- Moderna 15 million doses/wk

FDA plans to approve Pfizer's new storage requirements to FDA (-20°C)

Reuters Feb 23, 2021; Washington Post 2/23/21

Real World Impact of COVID-19 Vaccines

Country with greatest percentage immunized

- 42% immunized since Dec 20
  - Almost all Pfizer/BNT vaccine

  <u>Study of Immunized (>600,000)</u>
- 94% protection from COVID-19
- 92% less likely to get severe COVID-19
- Same for ages > 70 years
- No safety concerns

Clalit, Israel Healthcare 2/15/21

COVID-19 Vaccines in the US

FDA-authorized COVID-19 vaccines are effective per real-world evidence synthesized across a multi-state health system

Colin Pawlowski, Patrick Lenehan, Arjun Puranik, Vineet Agarwal, AJ Venkatakrishnan, Michiel J.M. Niesen, John C. O'Horo, Andrew D. Badley, John Halamka, Venky Soundararajan

doi: https://doi.org/10.1101/2021.02.15.21251623

medRxiv THE PREPRINT SERVER FOR HEALTH SCIENCES

US experience (Dec-Feb 8) Mayo Health System

Study:

- 31,069 w/ at least 1 dose
- 8,041 w/ 2 doses

88.7% effective (95% CI, 68.4-97.1%)

- Lower need for hospitalization 3.7% v. 9.2% (RR 0.4, p = 0.007)

Dosing Dilemma

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PDF [63 K

Early rate reductions of SARS-CoV-2 infection and COVID-19 in BNT162b2 vaccine recipients

Sharon Amit • Gili Regev-Yochay • Arnon Afek • Yitshak Kreiss • Eyal Leshem

Published: February 18, 2021 • DOI: https://doi.org/10.1016/S0140-6736(21)00448-7

THE LANCET

One dose = 85% protection

Debate:

1. Extend vaccine supply (delay second dose)
2. Maintain schedule

	Unvaccinated	Vaccinated	
		1–14 days after first dose	15–28 days after first dose
All SARS-CoV-2 positive			
Number of cases	89	55	26
Number of exposure days	120 575	100 433	88 126
Rate per 10 000 person-days	7·4	5·5	3·0
Rate reduction compared with unvaccinated (95% CI)	--	26% (−4 to 47)	60% (38 to 74)
Adjusted rate reduction compared with unvaccinated (95% CI)*	--	30% (2 to 50)	75% (72 to 84)
Symptomatic COVID-19			
Number of cases	60	28	11
Number of exposure days	120 575	100 433	88 126
Rate per 10 000 person-days	5·0	2·8	1·2
Rate reduction compared with unvaccinated (95% CI)	--	44% (12 to 64)	75% (52 to 87)
Adjusted rate reduction compared with unvaccinated (95% CI)*	--	47% (17 to 66)	85% (71 to 92)

SARS-CoV-2 positivity was determined by PCR. *Rate ratios of new cases in vaccinated compared with unvaccinated health-care workers each day were adjusted for community exposure rates using Poisson regression (appendix). The adjusted estimates were subtracted from 1 to obtain rate reductions.

Table: **Rate reductions of SARS-CoV-2 infections and COVID-19 cases in health-care workers at the Sheba Medical Centre, Israel, from December, 2020, to January, 2021**

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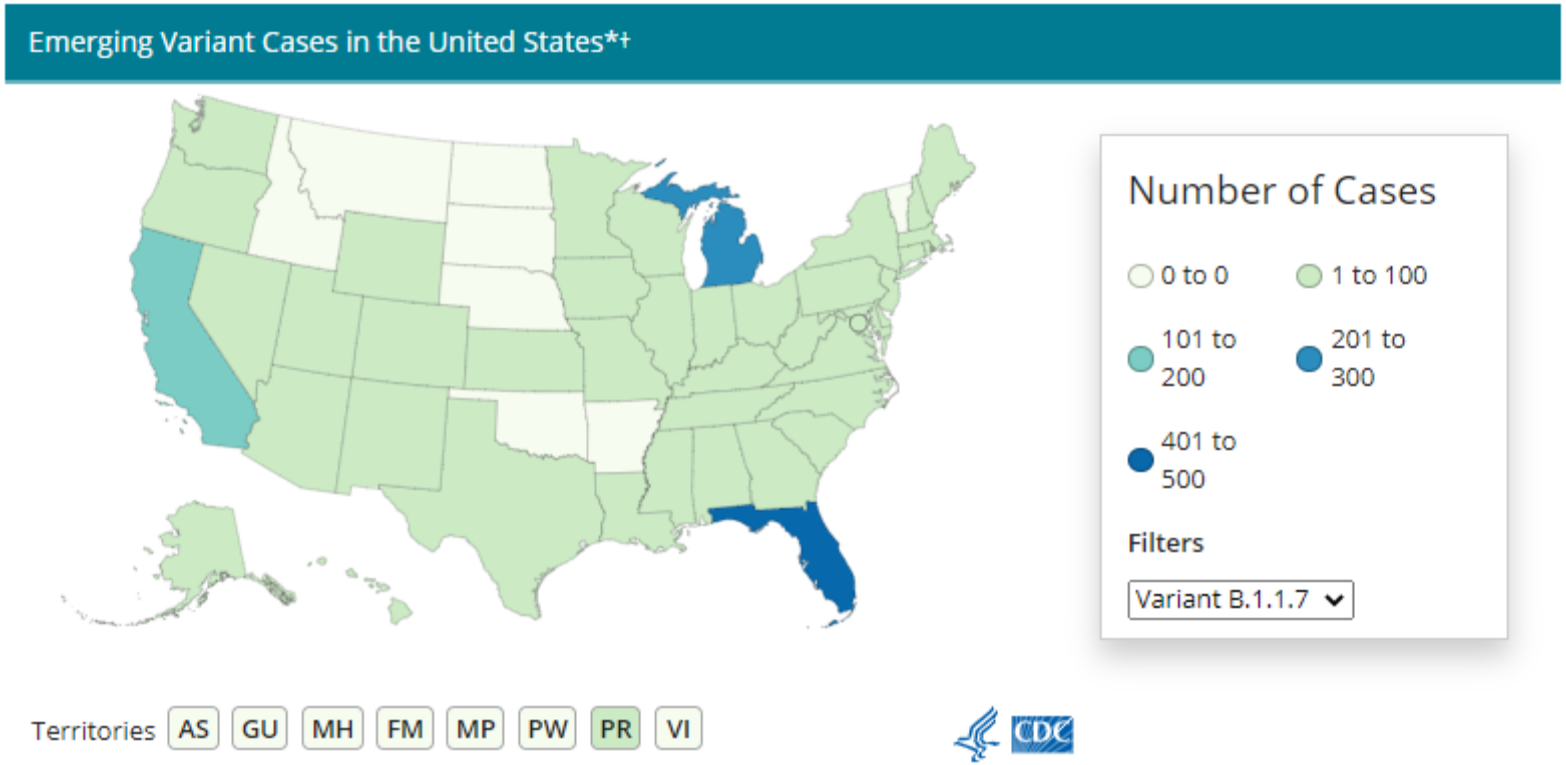
COVID-19: Variants in the US

Variant	Reported Cases in US	Number of States Reporting
B.1.1.7	1661	44
B.1.351	22	10
P.1	5	4



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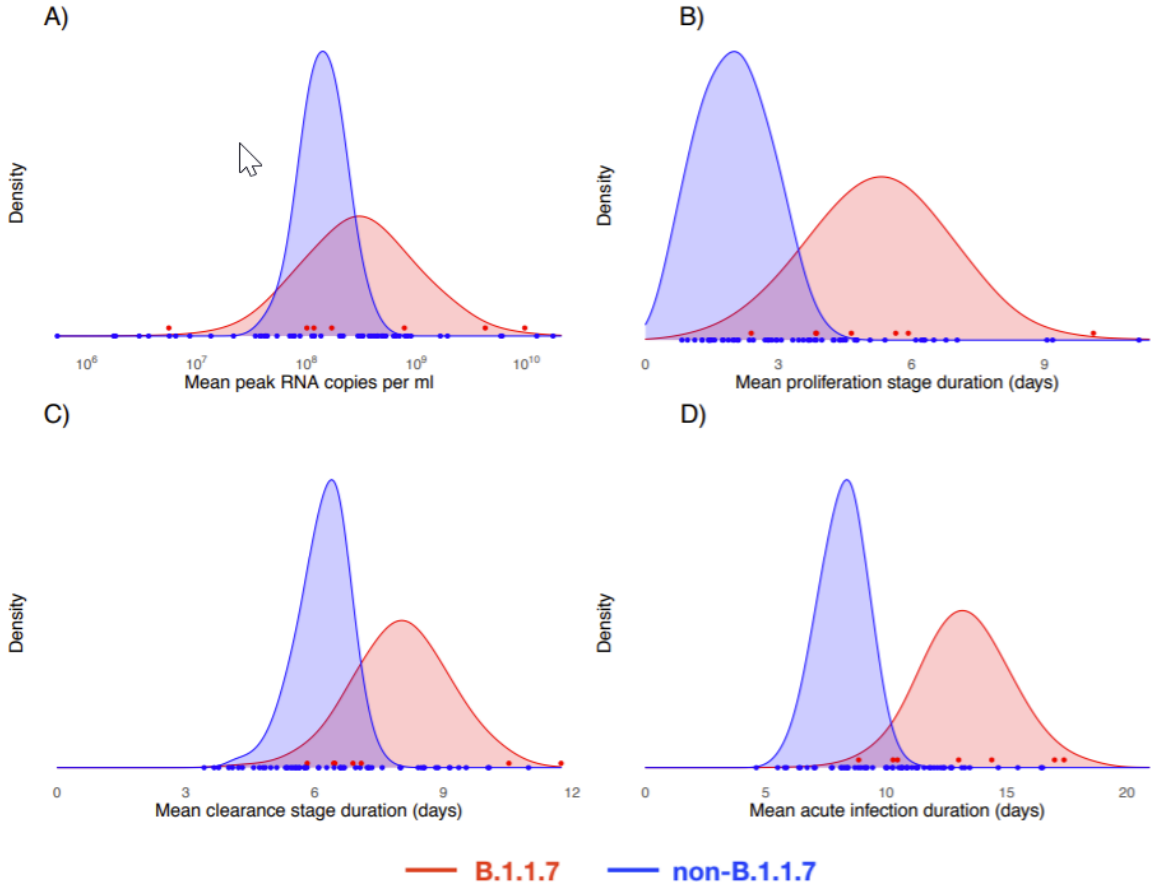
Variants

Densely sampled viral trajectories suggest longer duration of acute infection with B.1.1.7 variant relative to non-B.1.1.7 SARS-CoV-2

Citation

Kissler, Stephen, Joseph R. Fauver, Christina Mack, Caroline G. Tai, Mallery I. sampled viral trajectories suggest longer duration of acute infection with B.1 non-B.1.7 SARS-CoV-2." Preprint, 2021.



N = 65

7 with B.1.1.7

Longitudinal PCR testing

<u>Duration</u>

B.1.1.7 =13.3 days vs. 8.2 days

https://dash.harvard.edu/handle/1/37366884

Viral Escape

One-dose sera are 30x less potent (mRNA vaccines)

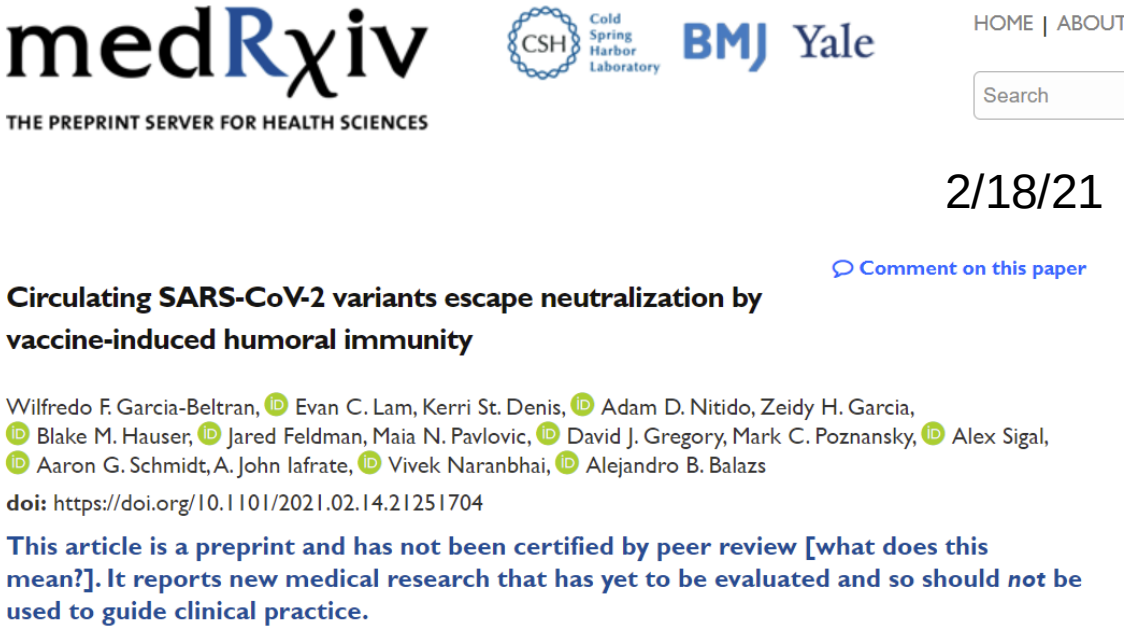
Temper enthusiasm for using one-shot vaccine

B.1.351 (E484K) mutation in RBD is the worst variant

75-100x reduction (two dose)

No effect one dose

Assays used also important (no standardization)



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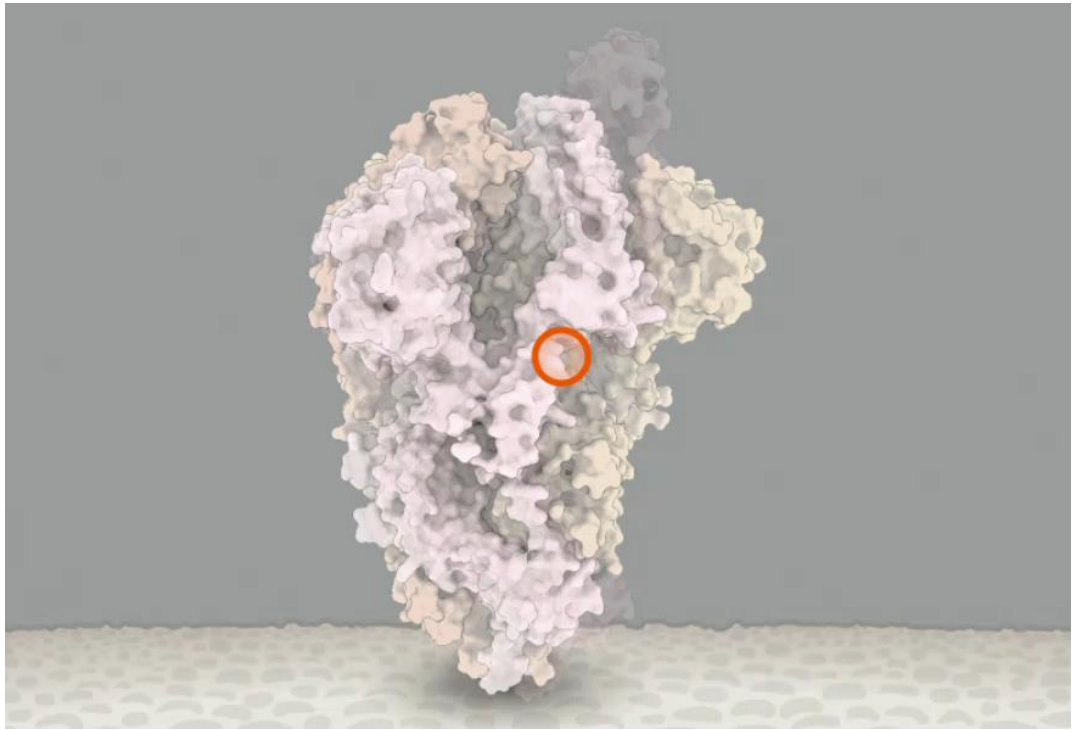
Circulating SARS-CoV-2 variants escape neutralization by vaccine-induced humoral immunity

Wilfredo F. Garcia-Beltran, Evan C. Lam, Kerri St. Denis, Adam D. Nitido, Zeidy H. Garcia, Blake M. Hauser, Jared Feldman, Maia N. Pavlovic, David J. Gregory, Mark C. Poznansky, Alex Sigal, Aaron G. Schmidt, A. John Iafrate, Vivek Naranbhai, Alejandro B. Balazs

doi: https://doi.org/10.1101/2021.02.14.21251704

Mutations Affect the Spike (S) Protein



Amino acid changes increase binding to cell receptor (ACE 2)

Increased transmission by 40-70%

May evade monoclonal antibodies and also permit reinfection in people who have recovered from COVID-19

E Callaway, Nature

Can elderly people who are fully vaccinated visit with unvaccinated family members who have taken all standard precautions?

What can you tell us about the new J&J vaccine?

Thank You!

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