Updates to COVID-19 Testing and Treatment for the Current SARS-CoV-2 Variants

Clinician Outreach and Communication Activity (COCA) Call

Tuesday, January 24, 2023

Continuing Education

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- Using the Zoom Webinar System
  - Click on the “Q&A” button
  - Type your question in the “Q&A” box
  - Submit your question

- If you are a patient, please refer your question to your healthcare provider.

- If you are a member of the media, please direct your questions to CDC Media Relations at 404-639-3286 or email media@cdc.gov.

Updates to COVID-19 Testing and Treatment for the Current SARS-CoV-2 Variants

Presenters:

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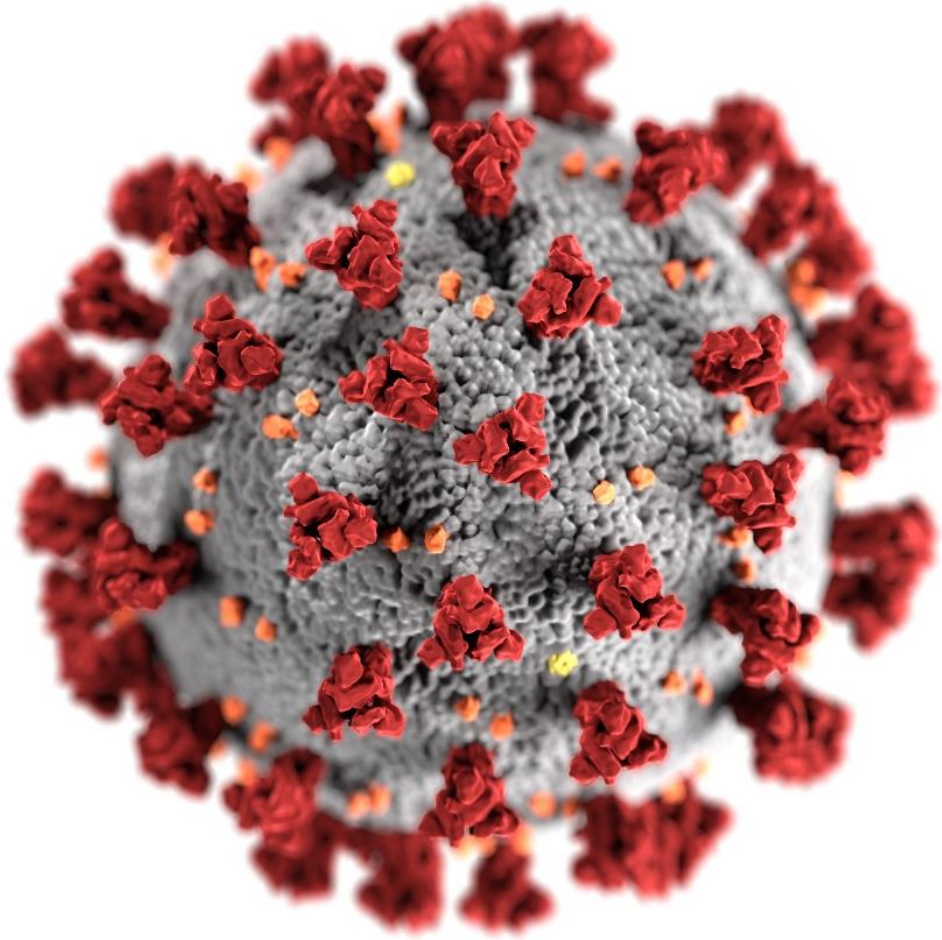

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Update on COVID-19 Epidemiology

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Chief Medical Officer
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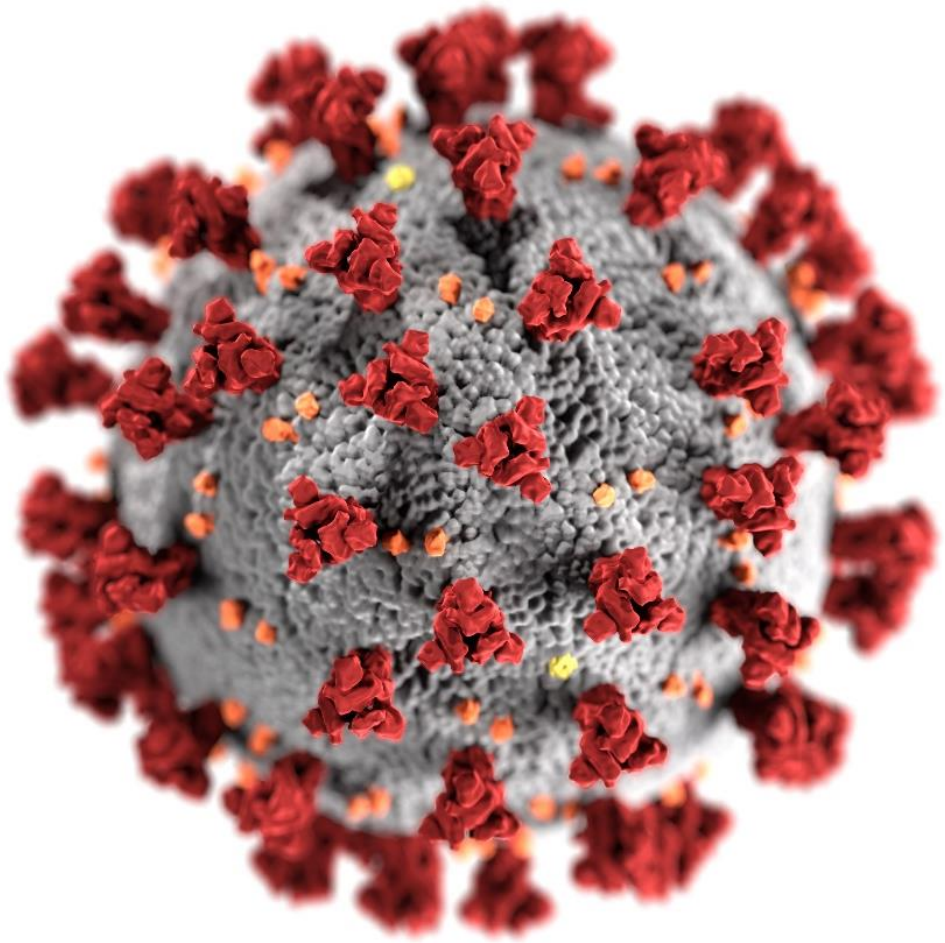

Clinician Outreach and Communication Activity

January 24, 2023

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Question

- How many COVID-19 cases have been reported so far, in your opinion?

Answer

- The correct answer is 101,873,730.

Daily Trends in COVID-19 Cases in the United States

Weekly Change in COVID-19 Cases, United States

January 22, 2020 - January 18, 2023

101,873,730
Total Cases Reported*

332,212
New Weekly Cases*
Jan 12, 2023 - Jan 18, 2023

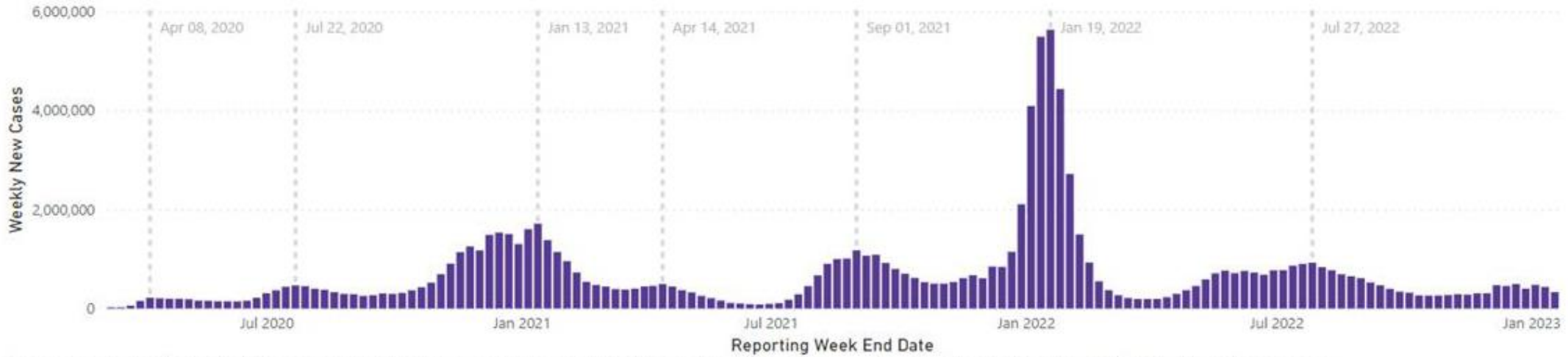
47,458.86
Current 7-Day Average**
Jan 12, 2023 - Jan 18, 2023

62,396.57
Prior 7-Day Average**
Jan 05, 2023 - Jan 11, 2023

-23.9%
Change in 7-Day Average

Peaks in Weekly Total and Weekly Average of Daily Cases**

Peak	Reporting Week End	Weekly Total - New Cases	7-Day Daily Average	% Change From Current Average
2020 - Spring	Apr 08, 2020	219,473	31,353	51.4%
2020 - Summer	Jul 22, 2020	466,693	66,670	-28.8%
2020 - Winter	Jan 13, 2021	1,714,377	244,911	-80.6%
2021 - Spring	Apr 14, 2021	496,751	70,964	-33.1%
2021 - Summer	Sep 01, 2021	1,175,796	167,971	-71.7%
2021 - Winter	Jan 19, 2022	5,629,914	804,273	-94.1%
2022 - Summer	Jul 27, 2022	926,393	132,342	-64.1%



* The graph displays data for Mar 05, 2020, to date. The totals include cases reported since Jan 22, 2020. The grey bar indicates the latest 6-week period used in calculating the current and prior 7-day daily case averages.

** The histogram, total of new cases in the last week, and weekly averages do not include historical cases reported retroactively that are not yet attributed to the correct date of report.

Of 21,397 historical cases reported retroactively, none were reported in the current week and none in the prior week.

Last Updated: Jan 19, 2023, 10:45

Data Source: CDC Case Surveillance, state-level aggregated COVID-19 Cases, HHS Protect; Visualization: CDC CPR DEO Situational Awareness Public Health Science Team

Daily SARS-CoV-2 NAAT Percent Test Positivity and Test Volume, United States

March 01, 2020 – January 16, 2023

1,007,362,591
Total Test Volume

306,307
Current 7-Day Avg. Daily Test Volume
Jan 06, 2023 – Jan 12, 2023

346,677
Prior 7-Day Avg. Daily Test Volume
Dec 30, 2022 – Jan 05, 2023

-11.6%
Percent Change in 7-Day Avg.

12.3%
Current 7-Day Avg. % Positivity
Jan 10, 2023 – Jan 16, 2023

13.6%
Prior 7-Day Avg. % Positivity
Jan 03, 2023 – Jan 09, 2023

-9.3%
Percent Change in 7-Day Avg.

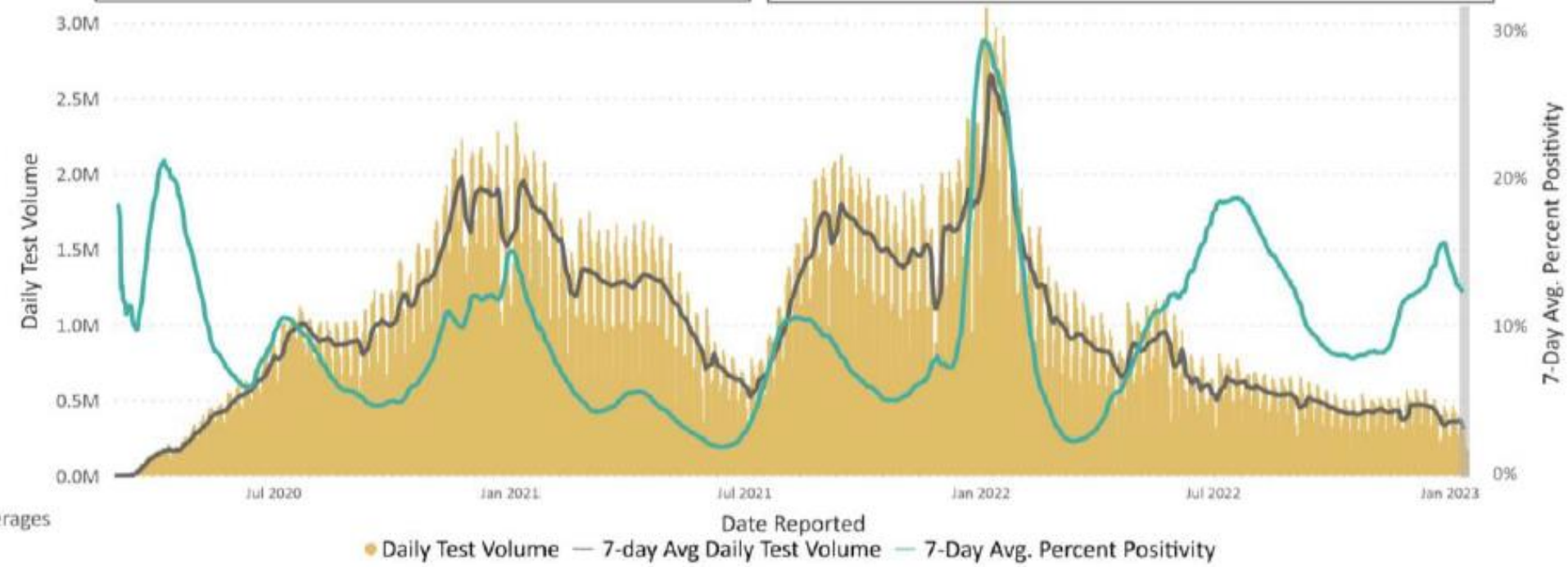
-1.27
Percentage Point Difference in 7-Day Averages

Peaks in Single Day and 7-Day Average Percent Positivity

Peak	Single Day % Positivity	Single Day Date	7-Day Average % Positivity	7-Day Average Date	% Change vs. Current 7-Day Average
1st Peak	11.3%	Jul-05-20	10.5%	Jul-08-20	17.3%
2nd Peak	16.0%	Jan-03-21	15.0%	Jan-03-21	-17.8%
3rd Peak	7.8%	Apr-04-21	5.5%	Apr-12-21	124.7%
Latest	30.8%	Jan-02-22	29.3%	Jan-07-22	-57.9%

Peaks in Single Day and 7-Day Average Test Volume

Peak	Single Day Test Vol	Single Day Date	7-Day Average Test Vol	7-Day Average Date	% Change vs. Current 7-Day Average
1st Peak	1,117,906	Jul-22-20	978,708	Jul-24-20	-68.7%
2nd Peak	2,342,393	Jan-06-21	1,912,164	Nov-25-20	-84.0%
3rd Peak	1,688,819	Apr-14-21	1,288,068	Apr-14-21	-76.2%
Latest	3,144,317	Jan-05-22	2,572,480	Jan-09-22	-88.1%



Data (shaded) for the most recent four days may be incomplete. 7-Day average test volume line ends before the gray shaded area to reduce the influence of incomplete data in the most recent four days. A nucleic acid amplification test (NAAT) remains the "gold standard" for clinical diagnostic detection of SARS-COV-2 and includes viral testing such as real-time reverse transcription polymerase chain reaction (RT-PCR). IA's data were excluded Feb 17, 2022 onward due to incomplete negative test result data, impacting testing volumes and percent positivity. Testing Data update for Sep 15, 2022: NV sent updated testing data dating back to March 2020 after addressing data cleaning issues resulting in an overall drop in test volume.

Last Updated: Jan 19, 2023, 09:06

HHS Protect Unified Laboratory Testing Dataset; Data, Analytics, & Visualization Task Force, Visualization: CDC CPR DED Situational Awareness Public Health Science Team

New Admissions of Patients with COVID-19 in the United States

New Admissions of Patients with Confirmed COVID-19, United States

August 01, 2020 – January 17, 2023

5,839,044
Total New Admissions
Aug 01, 2020 – Jan 17, 2023

4,614
New Admissions
Jan 17, 2023

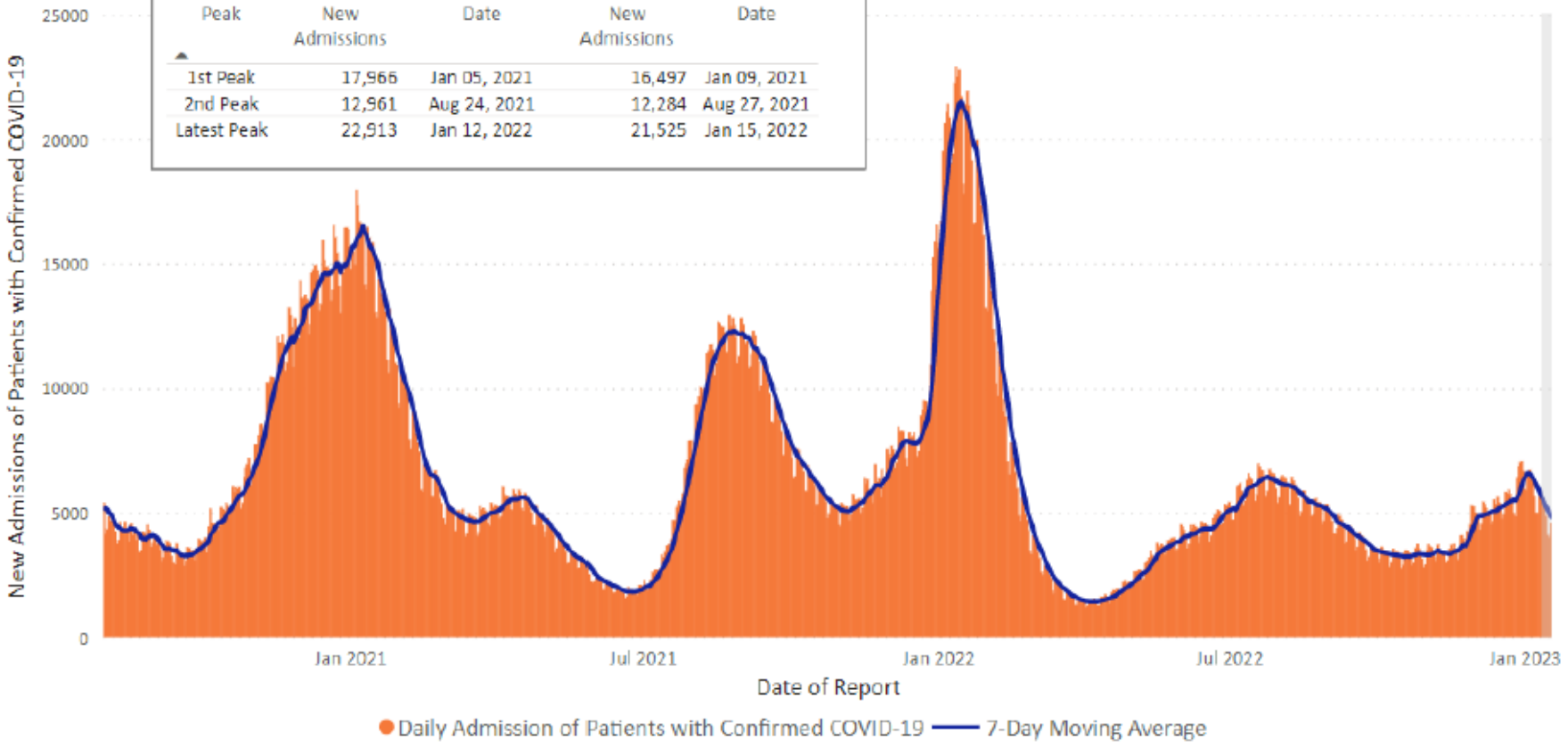
4,834
Current 7-Day Average
Jan 11, 2023 – Jan 17, 2023

5,861
Prior 7-Day Average
Jan 04, 2023 – Jan 10, 2023

-17.5%
Change in 7-Day Average

Peak in New Admissions and Highest 7-Day Moving Average*

Peak	Single Day: New Admissions	Single Day: Date	7-Day Average: New Admissions	7-Day Average: Date
1st Peak	17,966	Jan 05, 2021	16,497	Jan 09, 2021
2nd Peak	12,961	Aug 24, 2021	12,284	Aug 27, 2021
Latest Peak	22,913	Jan 12, 2022	21,525	Jan 15, 2022



Based on reporting from all hospitals (N=5,317). Due to potential reporting delays, data reported in the most recent 7 days (as represented by the shaded bar) should be interpreted with caution. Data reported prior to Aug 01, 2020 are unavailable.

*Small shifts in historic data may occur due to changes in the CMS Provider of Services file, which is used to identify the cohort of included hospitals.

Daily Trends in COVID-19 Deaths in the United States

Weekly Change in COVID-19 Deaths, United States

January 22, 2020 - January 18, 2023

1,099,866
Total Deaths Reported*

3,953
New Weekly Deaths*
Jan 12, 2023 - Jan 18, 2023

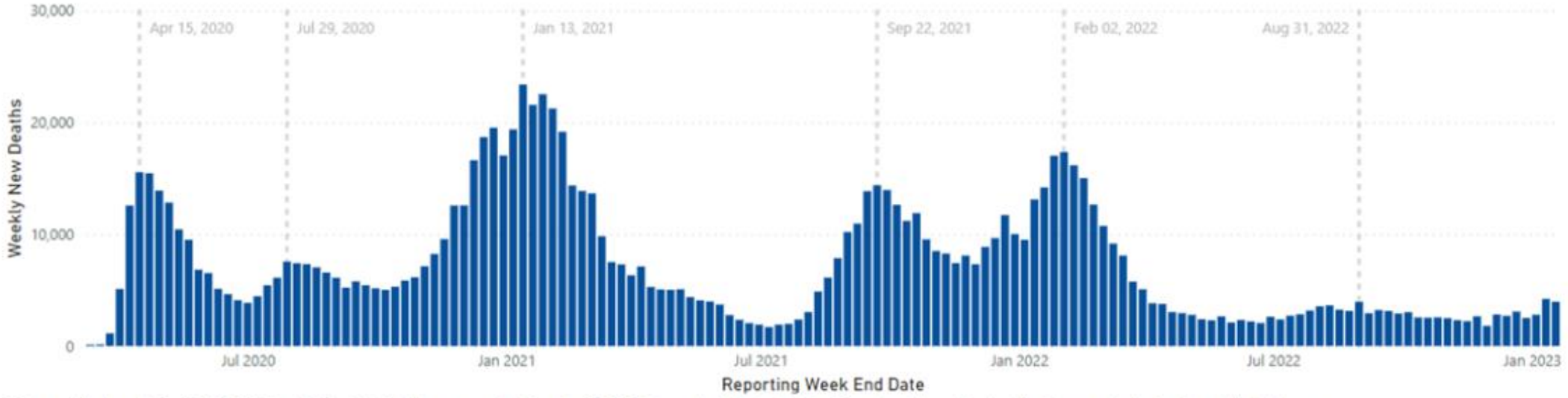
564.71
Current 7-Day Average**
Jan 12, 2023 - Jan 18, 2023

601.29
Prior 7-Day Average**
Jan 05, 2023 - Jan 11, 2023

-6.1%
Change in 7-Day Average

Peaks in Weekly Total and 7-Day Average of Daily Deaths**

Peak	Reporting Week End	Weekly Total - New Deaths	7-Day Daily Average	% Change From Current Average
2020 - Spring	Apr 15, 2020	15,539	2,220	-74.6%
2020 - Summer	Jul 29, 2020	7,546	1,078	-47.6%
2020 - Winter	Jan 13, 2021	23,387	3,341	-83.1%
2021 - Summer	Sep 22, 2021	14,372	2,053	-72.5%
2021 - Winter	Feb 02, 2022	17,351	2,479	-77.2%
2022 - Summer	Aug 31, 2022	3,947	564	0.2%

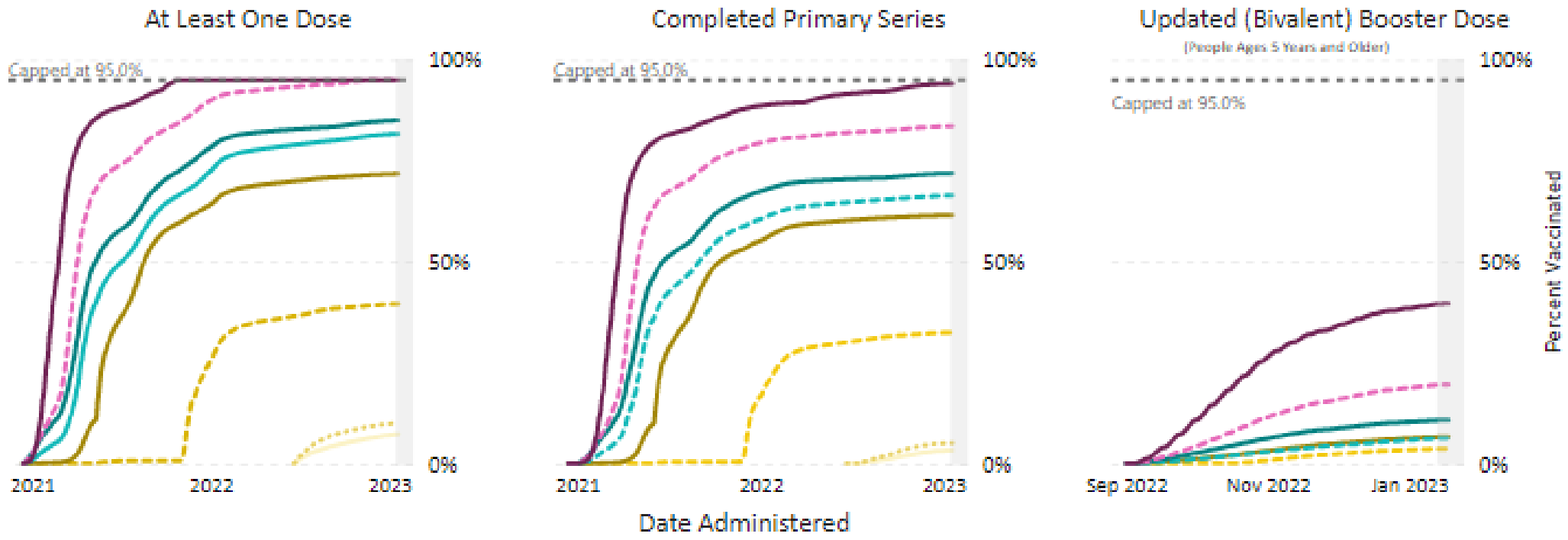


* The graph displays data for Mar 05, 2020, to date. The totals include cases reported since Jan 22, 2020. The grey bar indicates the latest 6-week period used in calculating the current and prior 7-day daily death averages.

** The histogram, total of new deaths in the last week, and 7-day averages do not include historical deaths reported retroactively that are not yet attributed to the correct date of report.
Of 3,838 historical deaths reported retroactively, none were reported in the current week and 86 in the prior week.

U.S. Vaccination Program – Coverage by Age

	<2 yrs	2-4 yrs	5-11 yrs	12-17 yrs	18-24 yrs	25-49 yrs	50-64 yrs	+65 yrs
At Least One Dose	7.3%	10.0%	39.6%	71.8%	81.7%	85.0%	95.0%	95.0%
Completed Primary Series	3.3%	5.1%	32.5%	61.5%	66.4%	71.9%	83.6%	94.1%
Updated (Bivalent) Booster Dose			3.7%	6.7%	6.3%	10.8%	19.6%	39.6%



https://covid.cdc.gov/covid-data-tracker/#vaccination-demographics-trends

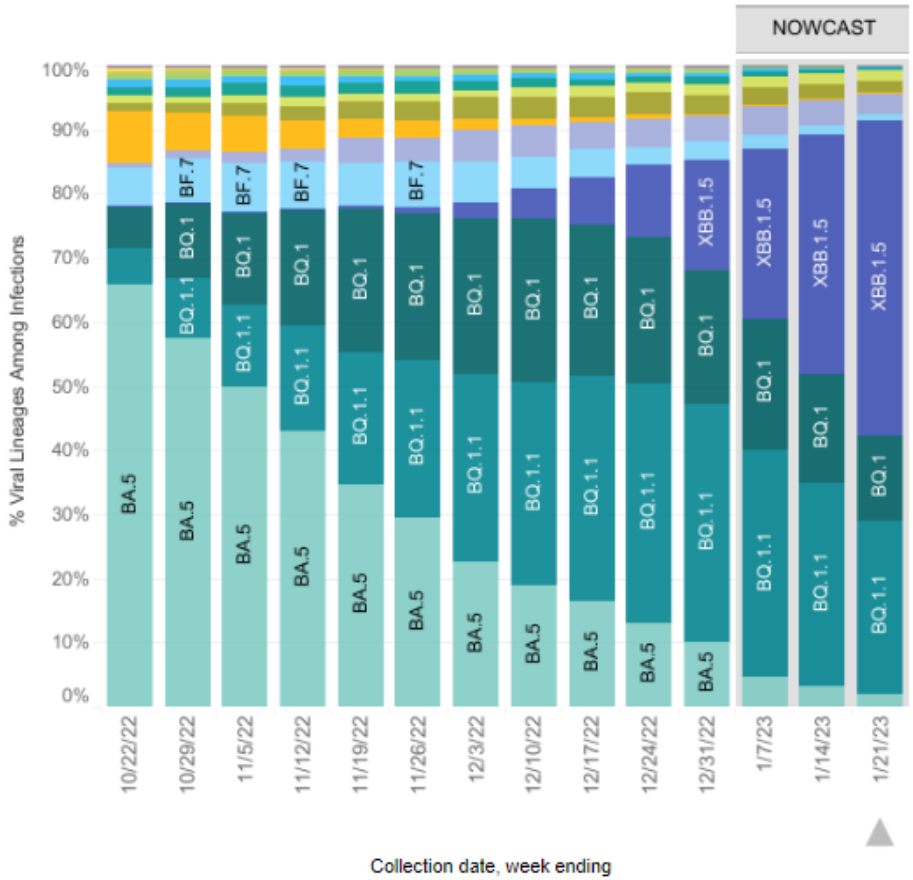
Surveillance for Variants of Concern - NOWCAST

United States: 1/15/2023 – 1/21/2023 NOWCAST

USA

WHO label	Lineage #	US Class	%Total	95%PI
Omicron	XBB.1.5	VOC	49.1%	37.5-60.8%
	BQ.1.1	VOC	26.9%	20.9-33.9%
	BQ.1	VOC	13.3%	10.1-17.4%
	XBB	VOC	3.3%	2.7-4.1%
	BA.5	VOC	2.0%	1.5-2.8%
	BN.1	VOC	1.8%	1.4-2.5%
	BA.2.75	VOC	1.6%	1.2-2.2%
	BF.7	VOC	1.0%	0.8-1.4%
	BA.5.2.6	VOC	0.4%	0.3-0.5%
	BA.2	VOC	0.2%	0.1-0.3%
	BF.11	VOC	0.2%	0.1-0.2%
	BA.4.6	VOC	0.1%	0.0-0.1%
	BA.2.75.2	VOC	0.0%	0.0-0.1%
	B.1.1.529	VOC	0.0%	0.0-0.0%
	BA.4	VOC	0.0%	0.0-0.0%
	BA.1.1	VOC	0.0%	0.0-0.0%
	BA.2.12.1	VOC	0.0%	0.0-0.0%
Delta	B.1.617.2	VBM	0.0%	0.0-0.0%
Other	Other*		0.0%	0.0-0.0%

United States: 10/16/2022 – 1/21/2023



* Enumerated lineages are US VOC and lineages circulating above 1% nationally in at least one week period. "Other" represents the aggregation of lineages which are circulating <1% nationally during all weeks displayed.

** These data include Nowcast estimates, which are modeled projections that may differ from weighted estimates generated at later dates

\# BA.1, BA.3 and their sublineages (except BA.1.1 and its sublineages) are aggregated with B.1.1.529. Except BA.2.12.1, BA.2.75, BA.2.75.2, BN.1,XBB and their sublineages, BA.2 sublineages are aggregated with BA.2. Except BA.4.6, sublineages of BA.4 are aggregated to BA.4. Except BF.7, BF.11, BA.5.2.6, BQ.1 and BQ.1.1, sublineages of BA.5 are aggregated to BA.5. Except XBB.1.5, sublineages of XBB are aggregated to XBB. For all the lineages listed in the above table, their sublineages are aggregated to the listed parental lineages respectively. Previously, XBB.1.5 was aggregated to XBB. Lineages BA.2.75.2, XBB, XBB.1.5, BN.1, BA.4.6, BF.7, BF.11, BA.5.2.6 and BQ.1.1 contain the spike substitution R346T.

Evusheld resistance found in the following lineages:

- BA.2.75.2
- XBB
- BA.4.6
- BA.5.2.6
- BF.7
- BQ.1
- BQ.1.1
- BF.11

https://covid.cdc.gov/covid-data-tracker/#variant-proportions

Protect yourself and others

PEOPLE WITH WEAKENED IMMUNE SYSTEMS:

~~Take EVUSHELD, if prescribed, to prevent COVID-19 *before* exposure~~

PEOPLE AT HIGH RISK FOR SEVERE ILLNESS:

Find out where you can get treatment or prevention medication on CDC's website

EVERYONE:

Get recommended vaccines and boosters

Improve ventilation

Get tested if you have symptoms or have been exposed

Wear a mask when recommended

Stay home when you're sick or test positive

People Who Are Immunocompromised

cdc.gov/coronavirus

CS328947-GU

Diagnostic Testing Algorithm

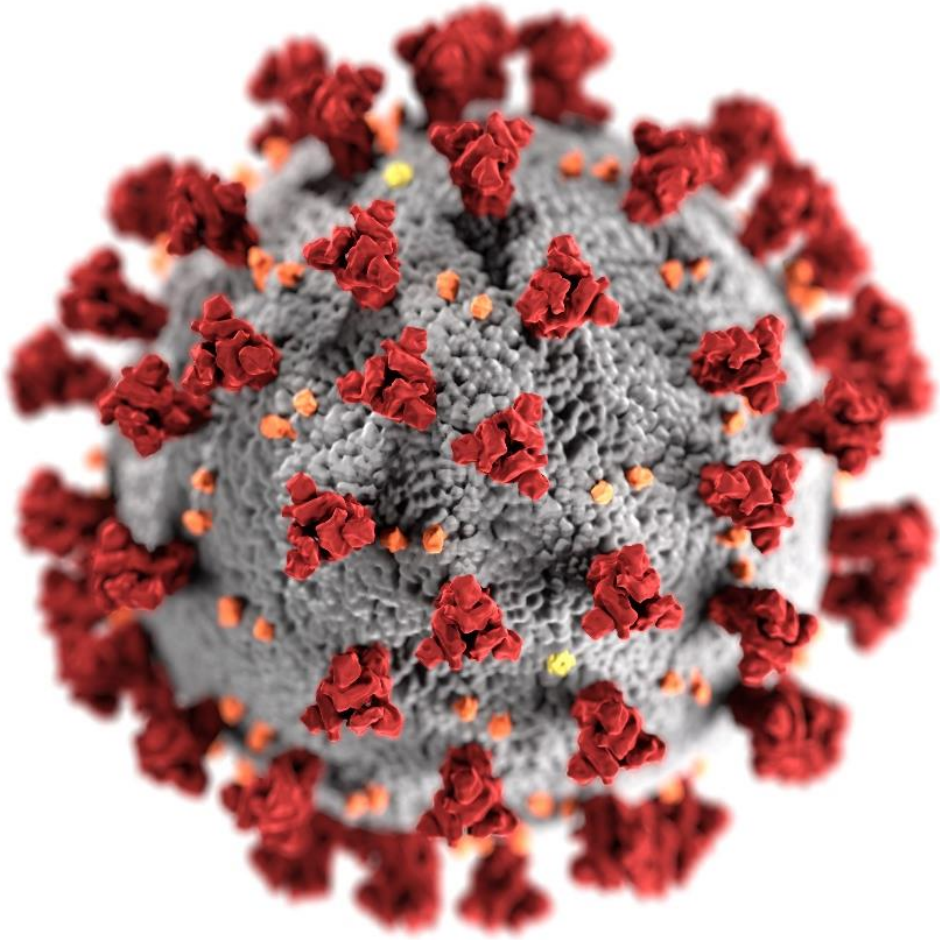
Natalie Thornburg, PhD

Branch Chief of Lab Branch (Acting)

Coronavirus and Other Respiratory Viruses Division (Proposed)

National Center for Immunization and Respiratory Diseases

Centers for Disease Control and Prevention



cdc.gov/coronavirus

Question

- A patient has had COVID-19 like symptoms for 3 days and tests negative on a home-based antigen test. Does the patient need any further follow up or is it safe to say they are not infected with SARS-CoV-2?

Answer

- The patient needs further follow up. They should either seek testing with a NAAT or 1-2 more times with home-based antigen tests to say it’s safe they are not infected with SARS-CoV-2. They should also consider contacting their health care provider to consider alternative diagnoses.

Overview

- When to test
- Types of tests
- How to interpret tests
- Current landscape of SARS-CoV-2 genomics
- Performance of current tests with currently circulating viruses

Diagnostic tests are for symptomatic and exposed persons

- Diagnostic tests are used when someone is:
  - Symptomatic
  - Known exposure to someone with SARS-CoV-2

- Screening tests are performed in specific environments on asymptomatic people
  - High risk settings (such as nursing homes or in health care settings)
  - Before events or travel

Diagnostic test timing

- If symptomatic, patients should test immediately
  - Limit exposure to others
  - Starting treatment as early as possible for high risk

- If asymptomatic and known exposure, test at least 5 days after exposure
  - Wear a high-quality mask when around others inside the home or in public for 10 days after exposure
  - The incubation period of SARS-CoV-2 is about 3-5 days, and it may take you that long to test positive

https://www.cdc.gov/coronavirus/2019-ncov/your-health/if-you-were-exposed.html

Diagnostic tests are based on nucleic acid or protein

- Nucleic acid amplification tests (NAAT)
  - PCRs, LAMP, CRISPR
  - Often lab-based
  - Highly sensitive and specific
  - Patients often test positive for extended period of time, well beyond infectiousness period

- Rapid antigen tests
  - Detect viral protein
  - May be POC (point-of-care) or at home
  - Less sensitive than NAATs
  - Virus must have replicated enough for protein to be detected
  - Delayed positivity

What you need to know about COVID-19 testing

I have not had COVID-19 or I have not had a positive test within the past 90 days.

You may choose NAAT or antigen tests.
If you use an antigen test and your result is negative, multiple tests may be necessary.

I tested positive for COVID-19 in the last 90 days.

My first positive test result was within:

30 days or less

I have symptoms
Use antigen tests. If negative, multiple tests may be necessary.

I do not have symptoms
Testing is not recommended to detect a new infection.

My first positive test result was within:

31-90 days

I have symptoms
Use antigen tests. If negative, multiple tests may be necessary.

I do not have symptoms
Use antigen tests. If negative, multiple tests may be necessary

[COVID-19 Testing: What You Need to Know | CDC]

Interpreting positive tests

If Your COVID-19 Test is

Positive

Any positive COVID-19 test means the virus was detected and **you have an infection**.

- Isolate and take precautions including wearing a high-quality mask to protect others from getting infected.
- Tell people you had recent contact with that they may have been exposed.
- Monitor your symptoms. If you have any emergency warning signs, seek emergency care immediately.
- Consider contacting a healthcare provider, community health center , or pharmacy to learn about treatment options that may be available to you. Treatment must be started within several days after you first develop symptoms to be effective.
  - You are more likely to get very sick if you are an older adult or have an underlying medical condition. Possible treatment may be available for you.

COVID-19 Testing: What You Need to Know | CDC

Interpreting negative tests

If Your COVID-19 Test is

Negative

A negative COVID-19 test means the test did not detect the virus, but this **doesn't rule out that you could have an infection**. If you used an antigen test, see FDA instructions on repeat testing.

- If you have symptoms:
  - You may have COVID-19, but tested before the virus was detectable, or you may have another illness.
  - Take general public health precautions to prevent spreading an illness to others.
  - Contact a healthcare provider if you have any questions about your test result or if your symptoms worsen.
- If you do not have symptoms, but were exposed to the virus that causes COVID-19, you should continue to take recommended steps after exposure.
- If you do not have symptoms and you have not been exposed to the virus that causes COVID-19, you may return to normal activities.
  - Continue to take steps to protect yourself and others, including monitoring for symptoms. Get tested again if symptoms appear.

COVID-19 Testing: What You Need to Know | CDC

If a patient tests negative by Rapid Antigen Test (RAT)

- FDA recommends
  - If symptomatic, test at least twice 48 hours apart. A third test might be needed if the patient is concerned they have COVID-19.
  - If asymptomatic, but believe they have been exposed, test with RAT at least 3 times, each 48 hours apart to be considered truly negative

- Consider reflex testing to NAAT
  - If NAAT is negative, consider alternative diagnoses such as flu, RSV, or strep throat

FDA monitors diagnostic tests

- FDA monitors diagnostic tests for performance with newly emerging lineages

- When FDA identifies specific tests with problems, they are updated here:
  - SARS-CoV-2 Viral Mutations: Impact on COVID-19 Tests | FDA

Luminostics, Inc. Clip COVID Rapid Antigen Test (as of 12/13/2022)

- **Test Name (Link to EUA)**: Clip COVID Rapid Antigen Test
- **Manufacturer:** Luminostics, Inc.
- **The FDA's Analysis:** Performance may be impacted when a patient sample containing the SARS-CoV-2 virus with certain viral mutations is tested. The mutations impacting performance include a mutation of the nucleocapsid protein, E136D, associated with the BE.1 and BQ.1/BQ.1.1 omicron variants.
- **Potential Impact:** While the impact does not appear to be significant, the FDA is providing this information out of an abundance of caution.
- **Notes:** The FDA's analysis included information provided by the manufacturer and the NIH RADx program.

Summary

- For Symptomatic patients who haven't had a recent infection, should test using either RAT or NAAT as soon as possible
  - If positive, they should isolate and consider treatment
  - If negative by RAT, **they should retest one-to-two more times per FDA guidance,** or seek testing with a NAAT
  - If symptomatic patient tests negative at least 3 times by RAT or once by NAAT, alternative diagnoses should be considered

- If a patient has had a recent infection and has new symptoms, use RATs, though multiple negative tests may be needed.

COVID-19 Outpatient Treatment Updates
January 24, 2023

Rajesh T. Gandhi, MD

Director, HIV Clinical Services and Education, Massachusetts General Hospital

Co-Director, Harvard University Center for AIDS Research

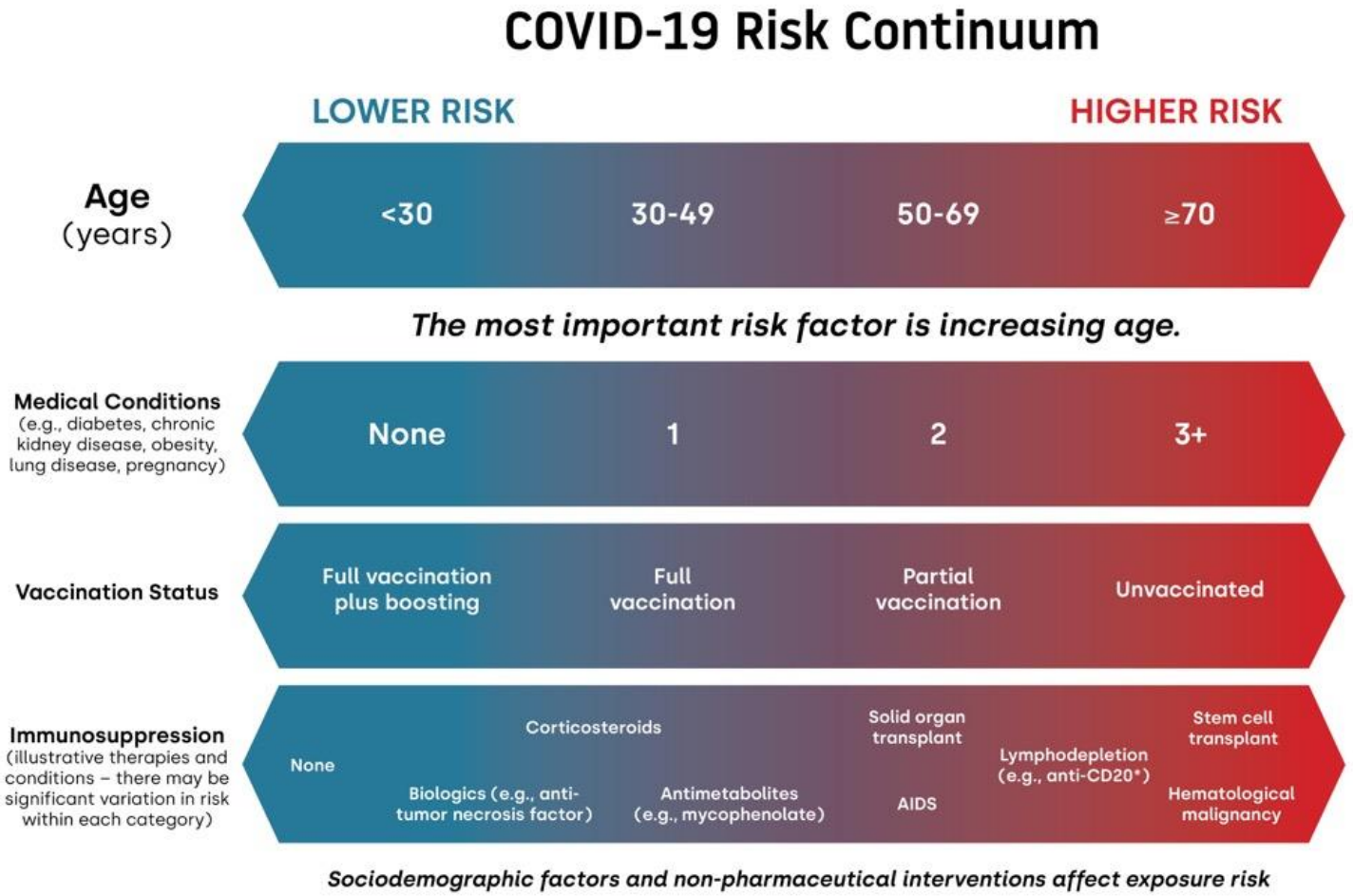
Disclosures (past 2 years):
Member, NIH & Infectious Diseases Society of America COVID-19 Treatment Guidelines Panels;
Recommendations in this talk are my own and not necessarily those of the Panels

Acknowledgments: Arthur Kim, Jon Li, Courtney Tern

Case

- 62 yo woman presenting with 2 days of fever, cough, myalgias. SARS CoV-2 rapid antigen test positive
- Oxygen saturation >95%
- History of HIV (CD4 cell count 350; HIV RNA undetectable), pulmonary hypertension
- Medications: bictegravir/FTC/TAF; tadalafil 40 mg daily
- Received 2 doses of mRNA COVID-19 vaccine in 2021; has not received any booster doses
- Would you treat? If so, with what?

COVID-19 Risk Continuum



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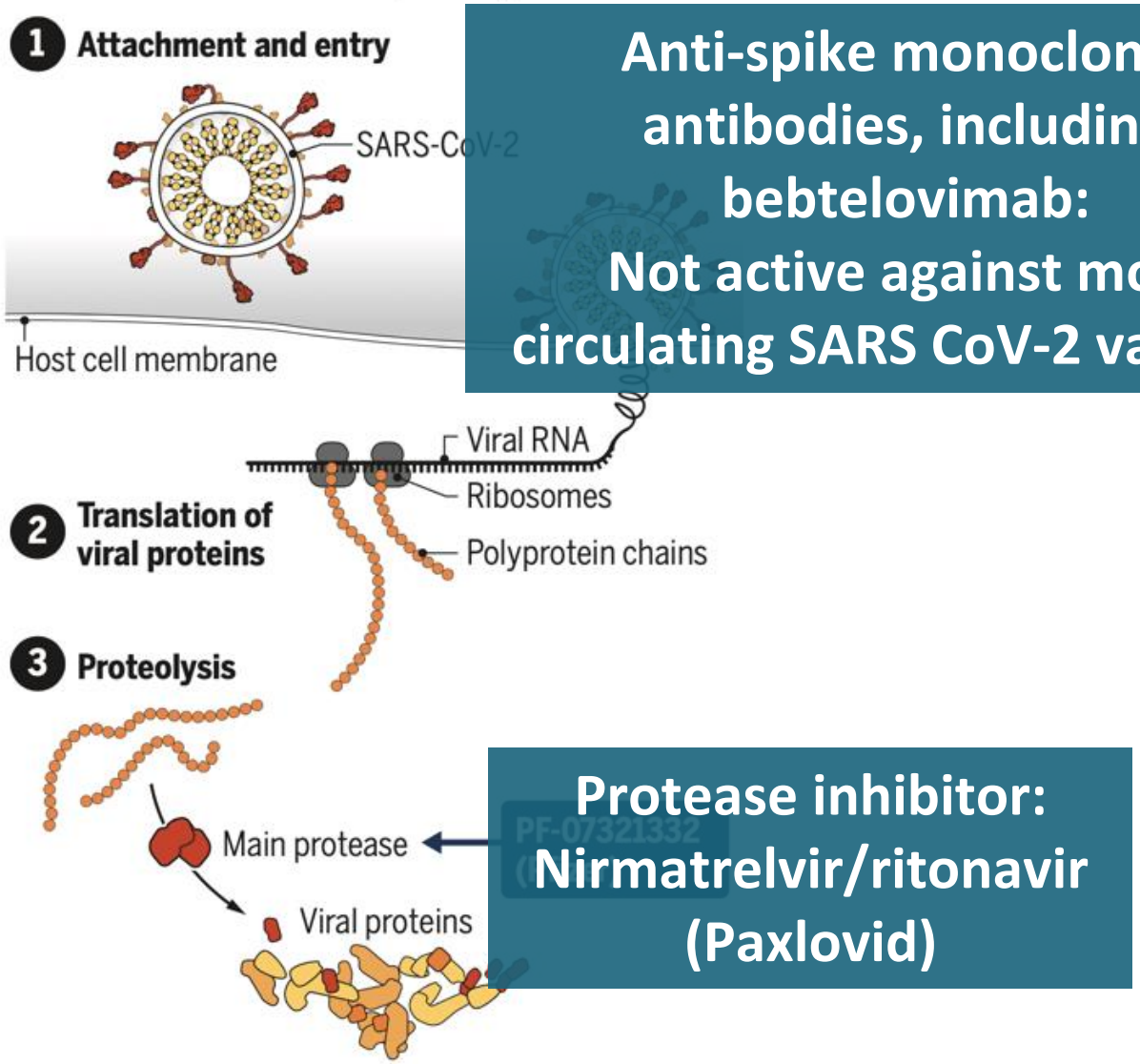
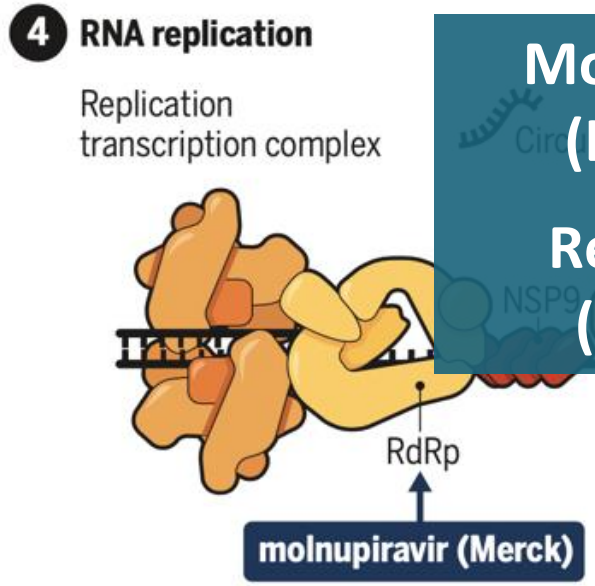
Original illustration by Dr. William Werbel. Adapted for the COVID-19 Real-Time Learning Network. Brought to you by CDC and IDSA

SARS CoV-2 Antivirals



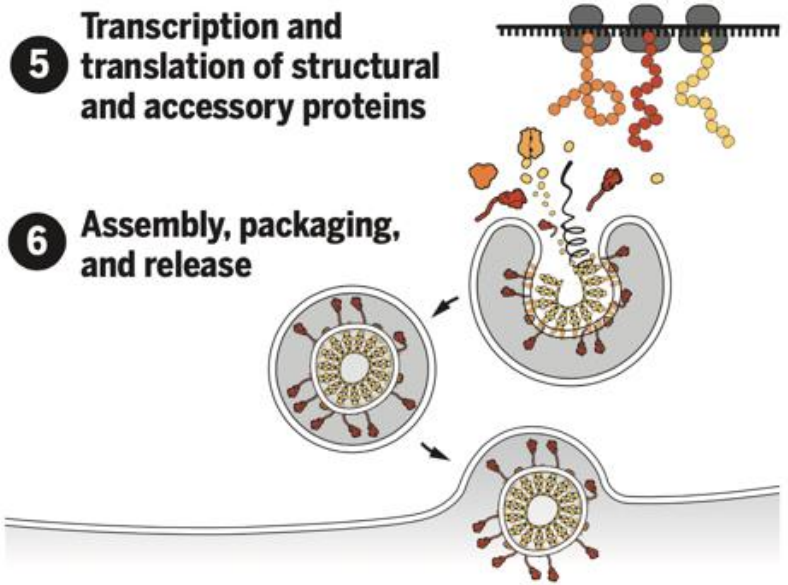
Anti-spike monoclonal antibodies, including bebtelovimab: Not active against most circulating SARS CoV-2 variants

Protease inhibitor: Nirmatrelvir/ritonavir (Paxlovid)



Molnupiravir (Lagevrio)

Remdesivir (Veklury)



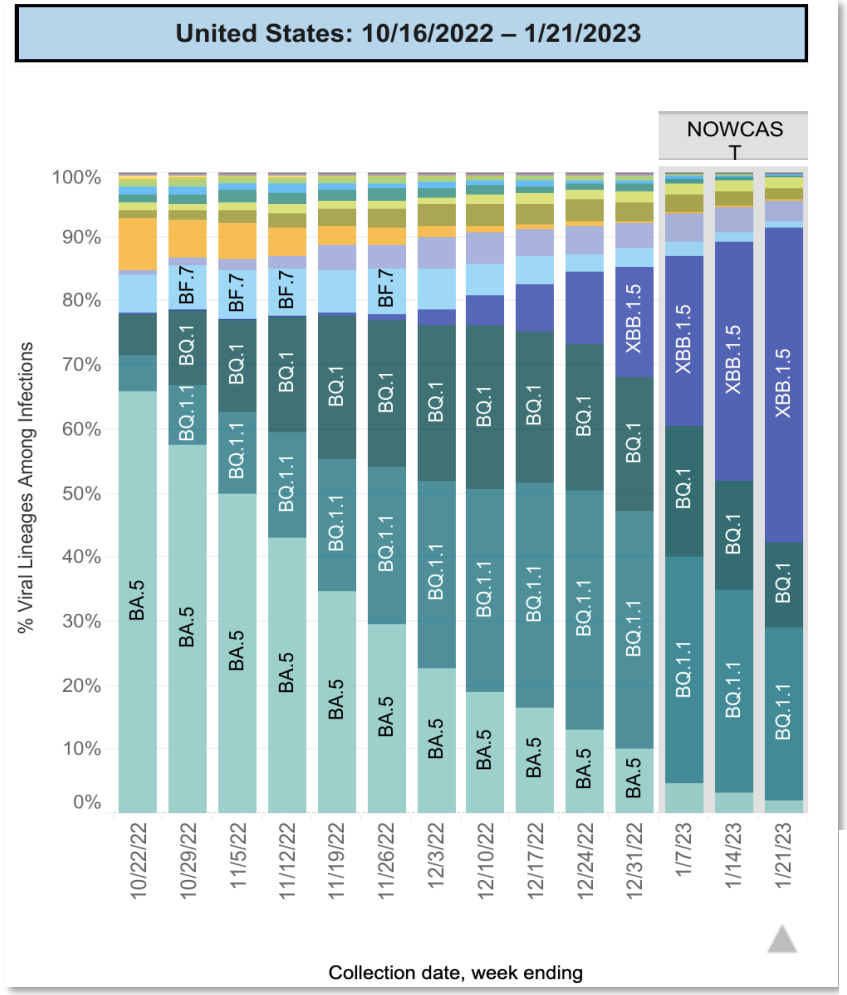
Modified from https://www.science.org/doi/epdf/10.1126/science.acx9605

Omicron variants resistant to Bebtelovimab (Beb)

Jan 21, 2023: XBB.1.5, BQ.1.1, BQ.1, XBB: vast majority of US isolates

Most prevalent variants

- XBB.1.5: 49.1%
- BQ.1.1: 26.9%
- BQ.1: 13.3%
- XBB: 3.3%



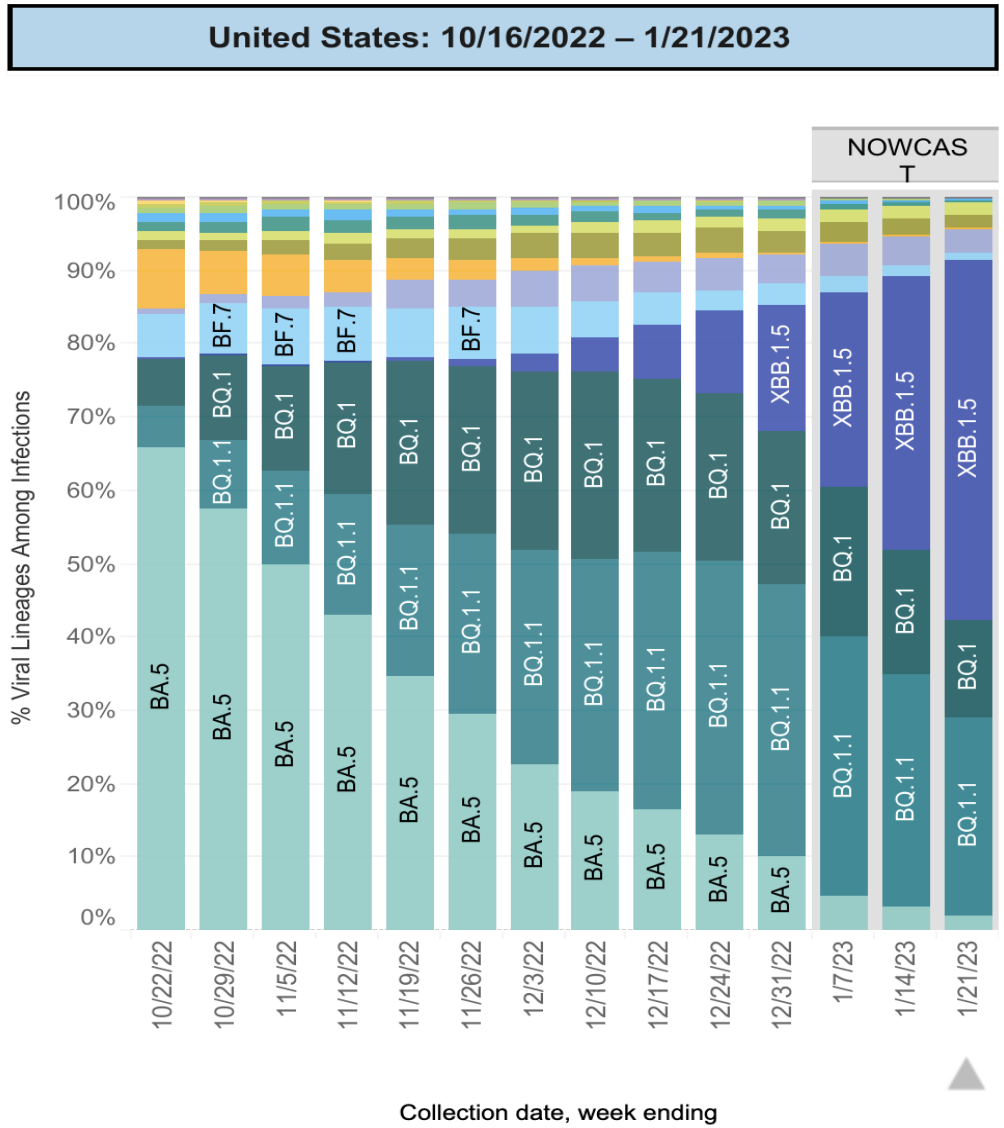
Omicron	Beb
BQ.1, 1.1	✗
XBB, XBB.1.5	✗

Modified from slide by Dr Jon Li

Nov 30, 2022:

FDA Announces Bebtelovimab is Not Currently Authorized in Any US Region

New Omicron variants resistant to tixagevimab/cilgavimab



Jan 21, 2023: about 94% of US variants anticipated to be resistant to tixagevimab/cilgavimab

Omicron	Tixa/cil
XBB, XBB.1.5	✗
BQ.1, 1.1	✗
BF.7	✗

National Institute of Health COVID-19 Treatment Guidelines

NIH | COVID-19 Treatment Guidelines

https://www.covid19treatmentguidelines.nih.gov/therapies/statement-on-evusheld/

The COVID-19 Treatment Guidelines Panel's Statement on Tixagevimab Plus Cilgavimab (Evusheld) as Pre-Exposure Prophylaxis of COVID-19

Last Updated: January 10, 2023

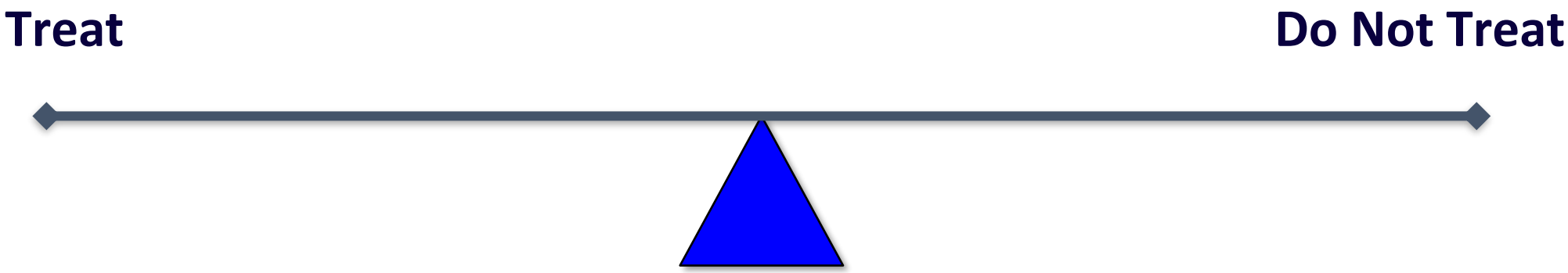
- Tixagevimab/cilgavimab unlikely to be effective in preventing COVID-19 for vast majority because of high prevalence of resistant Omicron subvariants
- Given lack of other PrEP options, clinicians could still administer tixagevimab/cilgavimab after considering individual's risks and regional prevalence of resistant subvariants
- Immunocompromised individuals who receive tixagivimab/cilgavimab should be counseled to continue measures to avoid infection (including keeping up to date with vaccination) and to seek testing and treatment if symptoms of COVID-19 develop

Small molecule antivirals anticipated to be active against new variants

	1) Nirmatrelvir/r	2) Remdesivir	3) Molnupiravir
Efficacy (hospitalization/death in unvaccinated, high risk)	•**Relative risk reduction: 88% (EPIC-HR)** •Absolute risk: 6.3%→0.8% •NNT: 18	•**Relative risk reduction: 87% (PINETREE)** •Absolute risk: 5.3%→0.7% •NNT: 22	•**Relative risk reduction: 30% (MOVe-OUT)** •Absolute risk: 9.7%→6.8% •NNT: 35
Pros	•Highly efficacious •Oral regimen •Ritonavir studied (safe) in pregnancy	•Highly efficacious •Studied in pregnancy •Few/no drug interactions	•Oral regimen •Not anticipated to have drug interactions
Cons	•Drug drug interactions	•Requires IV infusion on 3 consecutive days	•Lower efficacy •Concern: mutagenicity •Not recommended in pregnancy/children

Modified from Table in Gandhi RT, Malani P, del Rio C, JAMA, Jan 14, 2022

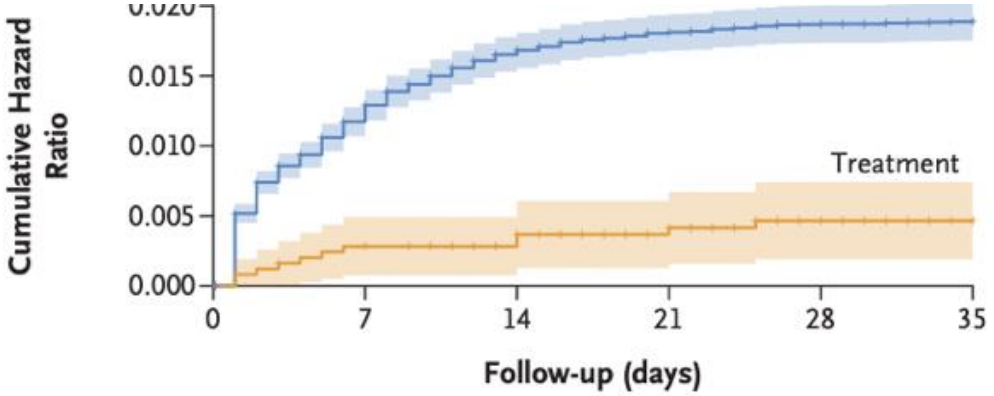
Should Vaccinated People be Treated?



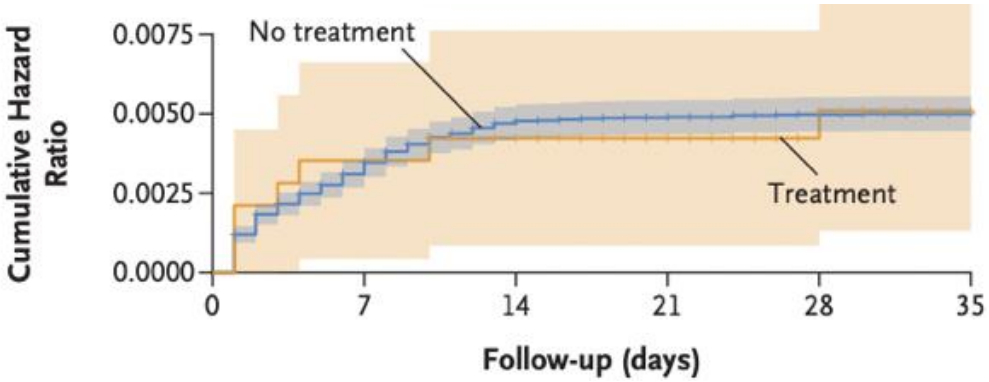
Nirmatrelvir/r in People with Previous Immunity

- Retrospective cohort study in Israel
- N/r (n=3902); No N/r (n=105,352)
- ~80% had previous immunity (vaccination, prior infection, both)
- ≥65 y: hospitalization less likely in treated group (hazard ratio, 0.27). Benefit regardless of previous immunity status.
- Patients aged 40–64, hospitalizations similar in treated and untreated groups

Age ≥ 65 y



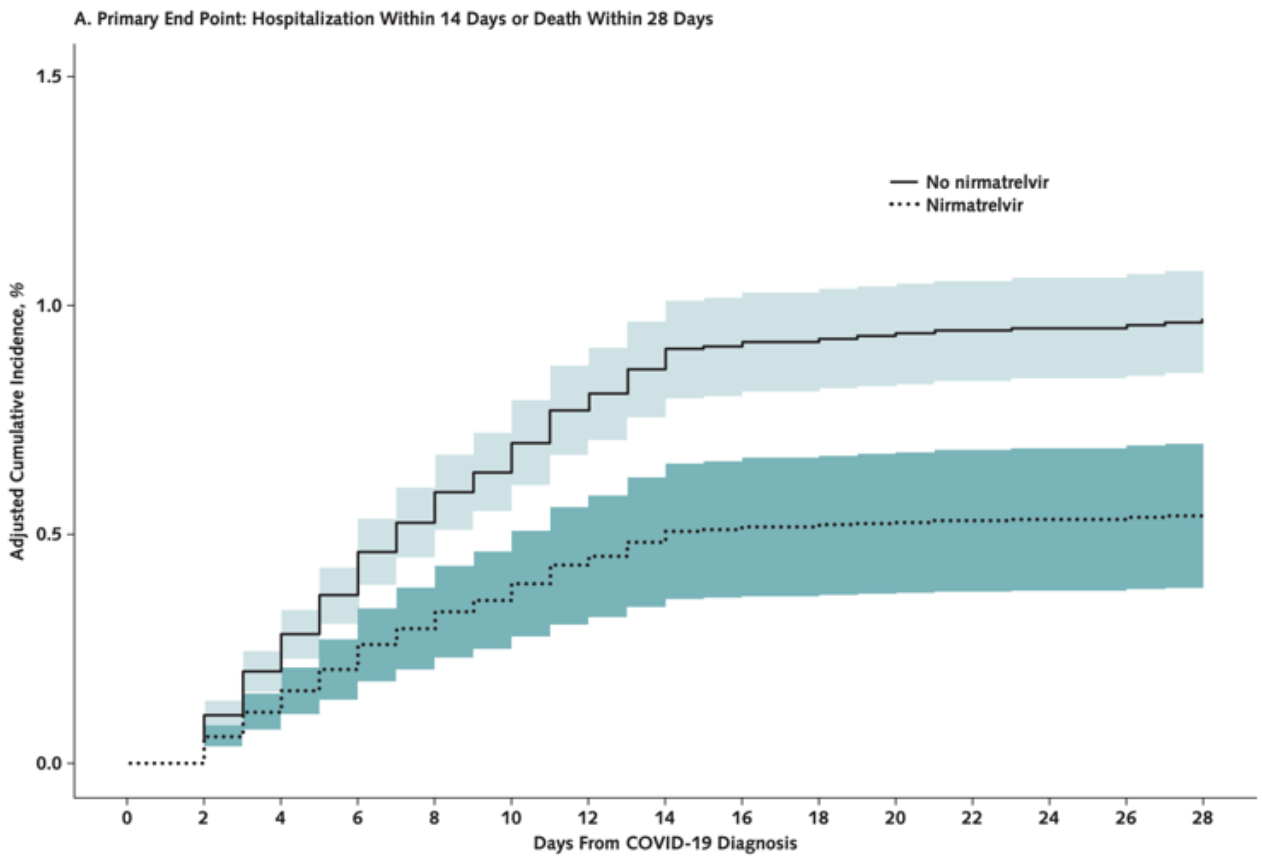
Age 40-64 y



Arbel R, NEJM, 2022

Nirmatrelvir/Ritonavir for Early COVID-19 in Large US Health System

- 44,551 outpatients aged 50 years or older with COVID-19
- 90% with ≥3 vaccine doses
- Hospitalization/death: 0.55% (NMV/r) vs. 0.97% (no NMV/r)
- NMV/r recipients: lower risk for hospitalization (adjusted RR=0.60) and death (adjusted RR=0.29)



Dryden-Peterson S, Ann Intern Med, 2022

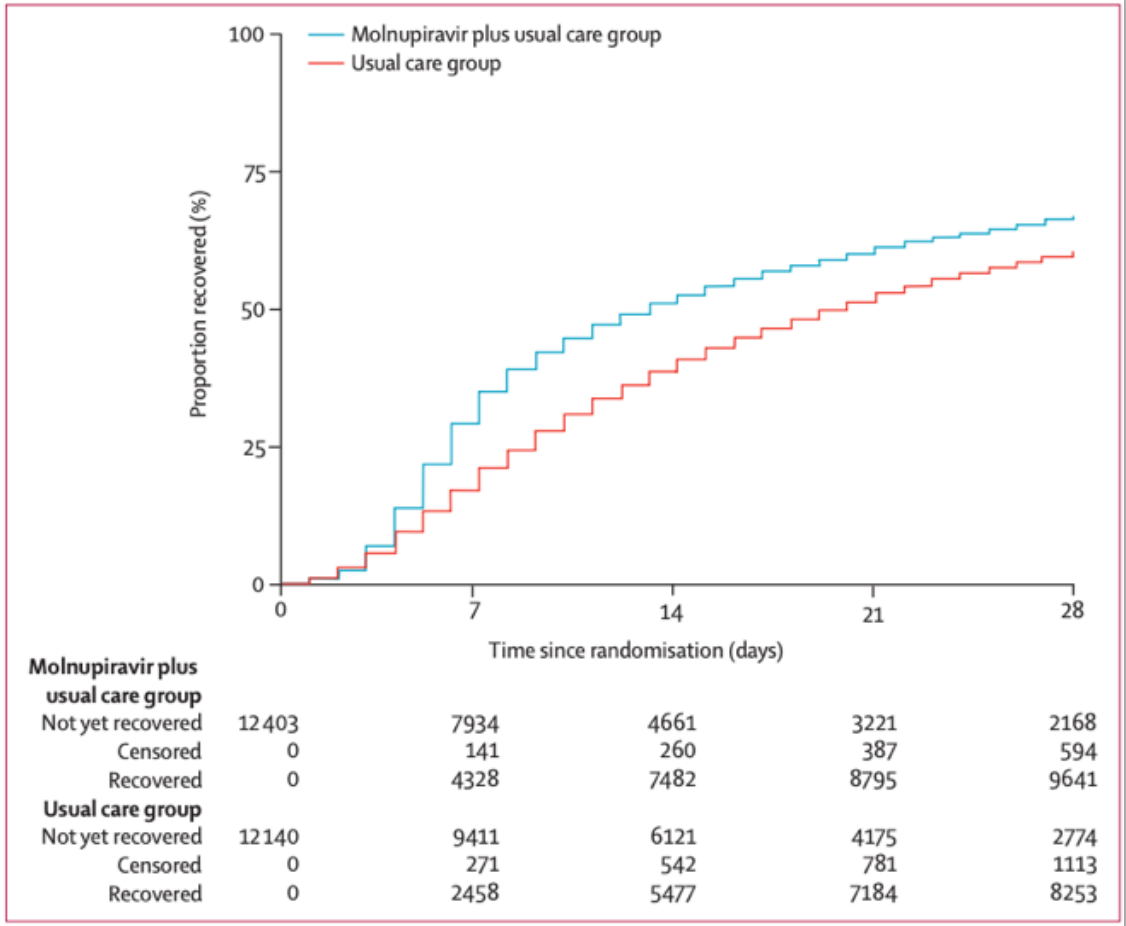
Nirmatrelvir/ritonavir: Drug Drug Interactions

- Ritonavir inhibits CYP3A during treatment (5 days) and for additional 2-3 days after treatment completed
  - Some medicines should not be coadministered, eg rivaroxaban, amiodarone, rifampin, tadalafil (for pulmonary hypertension)
  - Others may need to be held or markedly dose reduced, eg calcineurin inhibitors
  - Other medications may be temporarily stopped: eg, atorvastatin, rosuvastatin
- Useful resources:
  - NIH COVID-19 Treatment Guidelines
  - IDSA Management of Drug Interactions: Resource for Clinicians
  - Univ. of Liverpool COVID-19 Drug Interaction Checker

https://www.covid19treatmentguidelines.nih.gov/
https://www.idsociety.org/practice-guideline/covid-19-guideline-treatment-and-management/management-of-drug-interactions-with-nirmatrelvirritonavir-paxlovid/
https://www.covid19-druginteractions.org/

Molnupiravir (MOV) in Vaccinated Adults: PANORAMIC

- Open-label, randomized controlled trial in UK, Dec 2021 to April 2022
- ≈25,000 non-hospitalized adults with COVID and symptoms for ≤5 days
- MOV + usual care vs. usual care
- Aged ≥50 y or ≥18 y with high-risk comorbidity
- 94% received ≥3 COVID vaccine doses
- Hospitalization/death: 1% in both groups
- Time to self-reported recovery: 9 days (MOV) vs. 15 days (usual care)



Molnupiravir plus usual care group					
Not yet recovered	12 403	7934	4661	3221	2168
Censored	0	141	260	387	594
Recovered	0	4328	7482	8795	9641
Usual care group					
Not yet recovered	12 140	9411	6121	4175	2774
Censored	0	271	542	781	1113
Recovered	0	2458	5477	7184	8253

Figure 3: **Time from randomisation to first reported recovery from COVID-19**

Butler CC, Lancet, 2022

Should Vaccinated People Be Treated? My Take

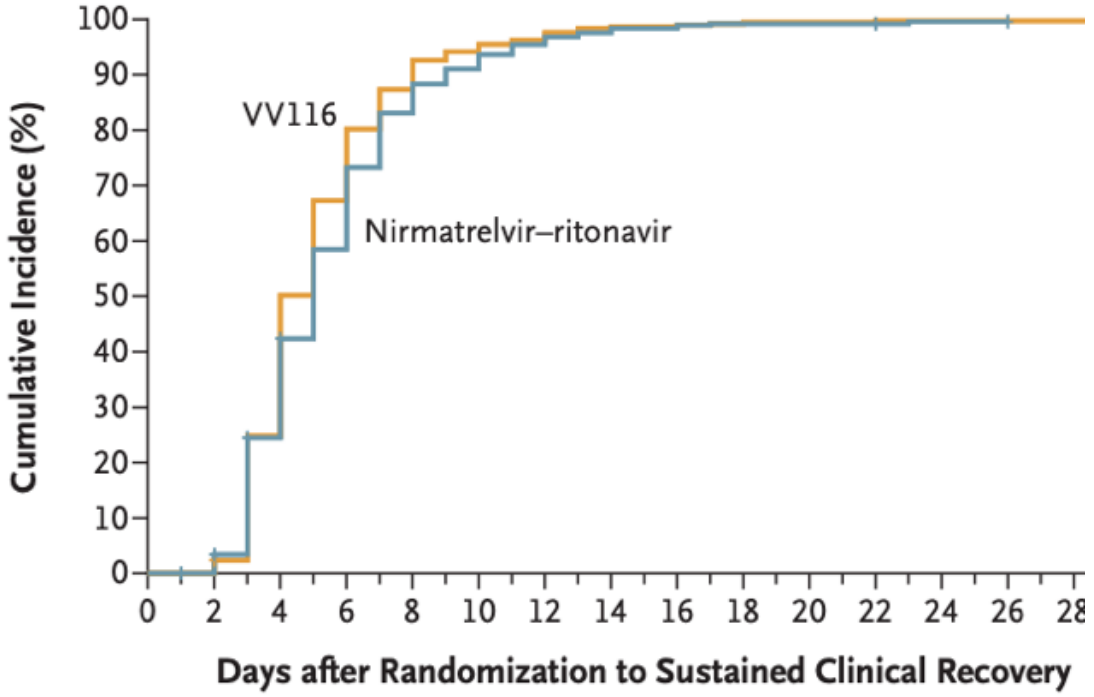
- Gradient of benefit: higher risk patients likely to derive more benefit
- Recommend treatment for older people, regardless of vaccination status
- For younger people who are vaccinated/boosted, recommend treatment if they have conditions that confer substantial risk, including obesity, heart or lung disease, immunosuppression, other high-risk conditions
- Not yet known whether early treatment ameliorates post-acute sequelae of SARS CoV-2 (PASC) – important research and knowledge gap

VV116 vs Nirmatrelvir-Ritonavir (NMV/r)

- VV116: oral remdesivir analogue
- Phase 3, observer-blinded, randomized trial during Omicron outbreak in China
- 771 adults with mild to moderate COVID-19 and high risk of progression to severe disease
- About 75% fully vaccinated or boosted
- Randomized: VV116 or NMV/r for 5 days
- Time to sustained clinical recovery: VV116 non-inferior to NMV/r; median time to symptom resolution was 7 days in both groups
- No deaths or progression to severe disease

Sustained clinical recovery

(alleviation of symptoms for two consecutive days)



Cao Z, NEJM, 2022

Back to the Case

- 62 yo woman presenting with 2 days of fever, cough, myalgias. SARS CoV-2 rapid antigen test positive.
- Oxygen saturation >95%
- HIV (CD4 cell count 350; HIV RNA undetectable), pulmonary hypertension. Medications: bictegravir/FTC/TAF; tadalafil 40 mg daily
- 2 doses of mRNA COVID-19 vaccine in 2021; has not been boosted
- Treatment recommended. Because NMV/r cannot be given with her pulmonary hypertension medicine (tadalafil), she received iv remdesivir with rapid clinical improvement

Question

- The patient is an 85-year-old male, and up to date on his COVID-19 vaccinations.
- Has hyperlipidemia which is controlled with statin treatment and has a family history of heart disease.
- Presents with a positive SARS-CoV-2 at home antigen test after developing mild symptoms.
- Denies fever and reports only cough.
- Has had SARS-COV-2 in the past and was treated with ritonavir-boosted nirmatrelvir, tolerated the metallic taste, and responded well with recovery in 2-3 days.
- Received his bivalent booster one week before presentation to your clinic.
- Should he receive COVID-19 treatment at this time? Why or why not? What is important to consider in your decision to treat?

Answer

- Treatment is recommended especially if his last bout of Covid and his last vaccine booster prior to the bivalent vaccine were more than 3-6 months ago and if he is within 5 days of symptom onset.

To Ask a Question

- Using the Zoom Webinar System
  - Click on the “Q&A” button
  - Type your question in the “Q&A” box
  - Submit your question

- If you are a patient, please refer your question to your healthcare provider.

- If you are a member of the media, please direct your questions to CDC Media Relations at 404-639-3286 or email media@cdc.gov.

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- **What:** Video recording
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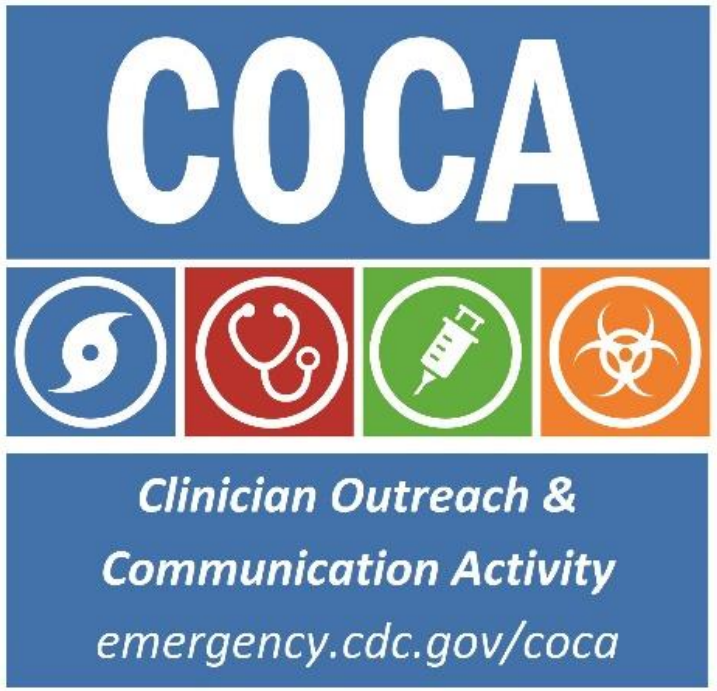

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