Report to the Boards of Health

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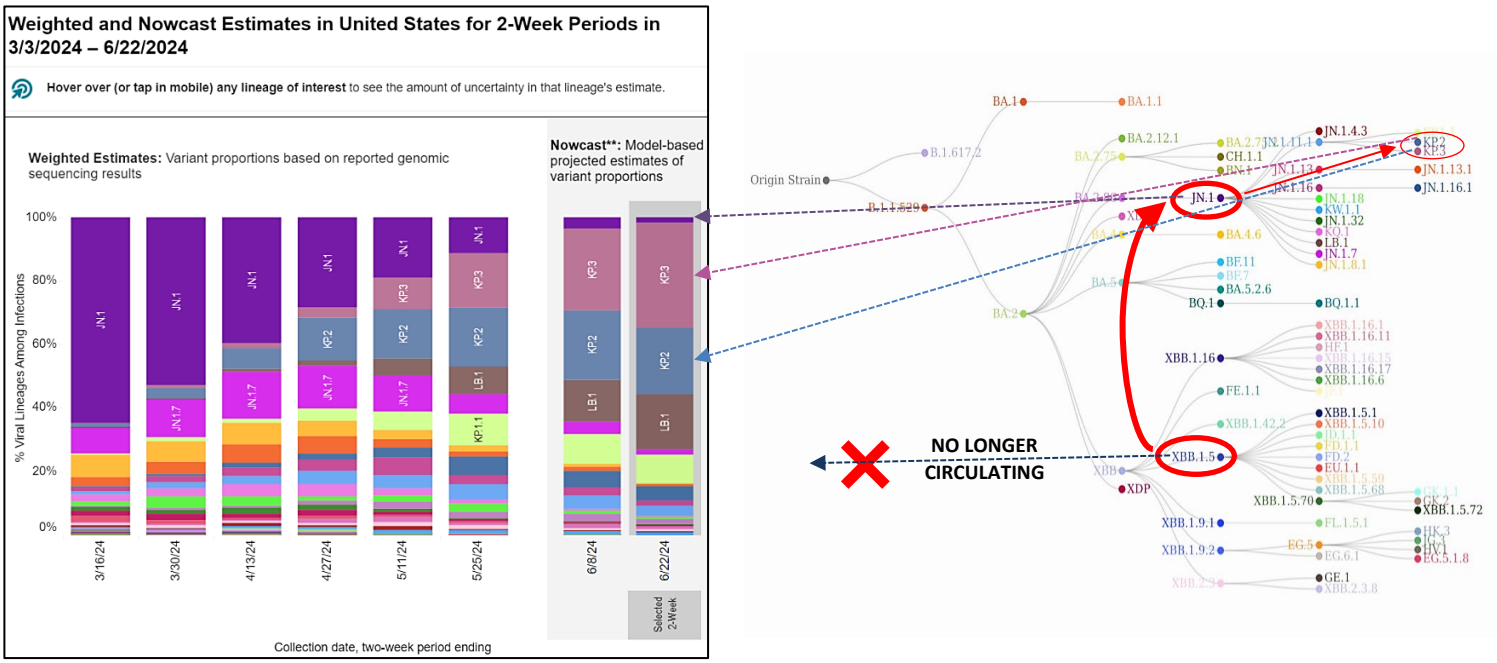
Mid-Michigan District Health Department, Wednesday, June 26, 2024
Central Michigan District Health Department, Wednesday, June 26, 2024
District Health Department 10, Friday, June 28, 2024

COVID-19 Vaccine 2024-2025 Updates

On April 26, 2024, the World Health Organization Technical Advisory Group on COVID-19 Vaccine Composition (TAG-CO-VAC) recommended that upcoming formulations of COVID-19 vaccines should be monovalent (one strain) and use the JN.1 variant. At that time, the JN.1 variant made up nearly all (over 94%) of the SARS-CoV-2 genetic sequences that were being submitted to public databases around the world. The recommendation to only use one strain means the origin strain of SARS-CoV-2 be left out of the vaccine, as this strain does not circulate any more. June 6, 2024, the FDA Vaccines and Related Biological Products Advisory Committee (VRBPAC) also recommended a monovalent JN.1 variant for the 2024-2025 formula of COVID-19 vaccines used in the United States.

These decisions need to be made early in the year to allow time for the manufacture, testing, and distribution of vaccines. As an example, the influenza composition recommendations were already made in early March. Since the WHO TAG-CO-VAC made their recommendation, the SARS-CoV-2 virus has continued to mutate and other variants, namely KP.2 and KP.3 have become most predominant. However, these variants are only slightly different from JN.1 and vaccines targeted toward JN.1 are expected to work well towered KP.2 and KP.3.

Why do we need a new vaccine? SARS-CoV-2 virus continues to mutate at about twice the rate of the influenza virus. Changing the COVID-19 vaccine to better cover the virus is the same as changing the influenza vaccine to better protect against that virus. The SARS-CoV-2 virus variant that is currently circulating is quite different from the strain used in the current vaccine, XBB 1.5, and XBB 1.5 has been pushed out by other variants.



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

The protection of the vaccines decreases as the virus changes, as seen below. The numbers are relative as the total number of cases and hospitalizations from COVID-19 are going down, likely due to the variants getting less severe over time, and community immunity increasing due to infections as well as vaccinations.

% Effective: the further the dot is to the **LEFT**, **the less effect it is**.
The **lower row the dot** is in, **the longer it has been since vaccine.**

Effectiveness to prevent illness

ICATT: VE of *2023-2024 COVID-19 vaccine* against *symptomatic infection* among adults aged ≥18 years, by age group and time since dose

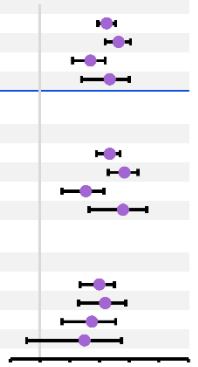
September 2023 – May 2024

In people over 18 yrs. old

In people 18 to 49 yrs. old

In people 50 yrs. and older

Age group/2023 -2024 COVID-19 vaccination status/days since dose	Total tests	SARSCoV-2-test-positive, N (%)	Median interval since last dose among those vaccinated, days (IQR)	Adjusted VE (95% CI)
≥18 years				
No 2023-2024 COVID19 dose (ref)	12,965	4,661 (36)	687 (436 to 879)	Ref
2023-2024 COVID-19 dose, >7 days	1,895	483 (25)	70 (38 to 102)	45 (39 to 51)
2023-2024 COVID-19 dose, 7-59 days earlier	772	181 (23)	32 (20 to 46)	53 (44 to 61)
2023-2024 COVID-19 dose, 60-119 days earlier	809	237 (29)	84 (71 to 97)	34 (22 to 44)
2023-2024 COVID-19 dose, 120-179 days earlier	262	60 (23)	140 (128 to 152)	47 (28 to 60)
18-49 years				
No 2023-2024 COVID-19 dose (ref)	10,395	3,609 (35)	702 (451 to 887)	Ref
2023-2024 COVID-19 dose, ≥7 days	1,167	272 (23)	69 (39 to 101)	47 (38 to 54)
2023-2024 COVID-19 dose, 7-59 days earlier	474	96 (20)	32 (19 to 46)	57 (46 to 66)
2023-2024 COVID-19 dose, 60-119 days earlier	507	144 (28)	82 (71 to 95)	31 (15 to 43)
2023-2024 COVID-19 dose, 120-179 days earlier	147	27 (18)	139 (128 to 154)	56 (33 to 72)
≥50 years				
No 2023-2024 COVID-19 dose (ref)	2,570	1,052 (41)	610 (407 to 821)	Ref
2023-2024 COVID-19 dose, ≥7 days	728	211 (29)	71 (36 to 103)	40 (27 to 50)
2023-2024 COVID-19 dose, 7-59 days earlier	298	85 (29)	32 (21 to 44)	44 (26 to 58)
2023-2024 COVID-19 dose, 60-119 days earlier	302	93 (31)	85 (73 to 98)	35 (15 to 51)
2023-2024 COVID-19 dose, 120-179 days earlier	115	33 (29)	142 (128 to 152)	30 (-9 to 55)*



Link-Gelles, et al. MMWR 2024: http://dx.doi.org/10.15585/mmwr.mm7304a2 (Results updated with additional data since publication.)
*Some estimates are imprecise, which might be due to a relatively small number of persons in each level of vaccination or case status. This imprecision indicates that the actual VE could be substantially different from the point estimate shown, and estimates should therefore be interpreted with caution. Additional data accrual could increase precision and allow more precise interpretation. Ref=referent group; IQR=interquartile range; CI=confidence interval

Effectiveness to prevent visits to ER or Urgent Care

VISION: VE of *2023-2024 COVID-19 vaccine* against *ED/UC encounters* among immunocompetent adults aged ≥18 years, by age group

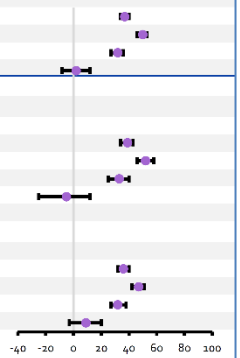
September 2023 – April 2024

In people over 18 yrs. old

In people 18 to 49 yrs. old

In people 50 yrs. and older

Age group/2023 -2024 COVID-19 vaccination status/days since dose	Total encounters	SARSCoV-2-test-positive, N (%)	Median interval since last dose among vaccinated among those vaccinated, days (IQR)	Adjusted VE (95% CI)
≥18 years				
No 2023-2024 COVID19 dose (ref)	194,095	22,114 (11)	712 (467-852)	Ref
2023-2024 COVID-19 dose, ≥7 days	35,243	2,613 (7)	78 (44-118)	37 (34-40)
2023-2024 COVID-19 dose, 7-59 days earlier	12,898	973 (8)	34 (21-47)	50 (46-53)
2023-2024 COVID-19 dose, 60-119 days earlier	13,918	1,150 (8)	87 (73-103)	32 (27-36)
2023-2024 COVID-19 dose, 120-179 days earlier	8,427	490 (6)	143 (131-157)	2 (-8-12)
18-64 years				
No 2023-2024 COVID-19 dose (ref)	138,644	14,839 (11)	743 (560-879)	Ref
2023-2024 COVID-19 dose, ≥7 days	12,727	795 (6)	74 (41-113)	39 (34-43)
2023-2024 COVID-19 dose, 7-59 days earlier	5,025	312 (6)	33 (20-46)	52 (46-58)
2023-2024 COVID-19 dose, 60-119 days earlier	4,962	339 (7)	87 (73-103)	33 (25-40)
2023-2024 COVID-19 dose, 120-179 days earlier	2,740	144 (5)	141 (130-156)	-5 (-25-12)
≥65 years				
No 2023-2024 COVID-19 dose (ref)	55,451	7,275 (13)	589 (390-788)	Ref
2023-2024 COVID-19 dose, ≥7 days	22,516	1,818 (8)	80 (46-120)	36 (32-40)
2023-2024 COVID-19 dose, 7-59 days earlier	7,873	661 (8)	35 (21-47)	47 (42-51)
2023-2024 COVID-19 dose, 60-119 days earlier	8,956	811 (9)	87 (73-102)	32 (27-38)
2023-2024 COVID-19 dose, 120-179 days earlier	5,687	346 (6)	144 (131-158)	9 (-3-20)



*Some estimates are imprecise, which might be due to a relatively small number of persons in each level of vaccination or case status. This imprecision indicates that the actual VE could be substantially different from the point estimate shown, and estimates should therefore be interpreted with caution. Additional data accrual could increase precision and allow more precise interpretation.
https://www.cdc.gov/mmwr/volumes/73/wr/mm7308a5.htm (Results updated with additional data since publication.) VE was calculated as (1 – odds ratio) x 100%, estimated using a test-negative case-control design, adjusted for age, sex, race and ethnicity, geographic region, and calendar time.

Effectiveness to prevent Hospitalization

VISION: VE of *2023-2024 COVID-19 vaccine* against *hospitalization* among immunocompetent adults aged ≥18 years, by age group

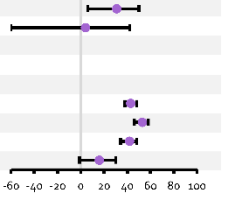
September 2023 – April 2024

In people over 18 yrs. old

In people 18 to 49 yrs. old

In people 50 yrs. and older

Age group/2023 -2024 COVID-19 vaccination status/days since dose	Total encounters	SARSCoV-2-test-positive, N (%)	Median interval since last dose among those vaccinated, days (IQR)	Adjusted VE (95% CI)
≥18 years				
No 2023-2024 COVID19 dose (ref)	58,682	6,295 (11)	682 (434-835)	Ref
2023-2024 COVID-19 dose, ≥7 days	12,148	881 (7)	79 (44-119)	42 (37-46)
2023-2024 COVID-19 dose, 7-59 days earlier	4,365	340 (8)	34 (20-47)	50 (44-55)
2023-2024 COVID-19 dose, 60-119 days earlier	4,758	367 (8)	88 (73-103)	41 (34-48)
2023-2024 COVID-19 dose, 120-179 days earlier	3,025	174 (6)	143 (131-157)	16 (0-29)
18-64 years				
No 2023-2024 COVID-19 dose (ref)	23,123	1,593 (7)	733 (526-876)	Ref
2023-2024 COVID-19 dose, ≥7 days	2,119	112 (5)	75 (39-112)	28 (11-41)
2023-2024 COVID-19 dose, 7-59 days earlier	838	50 (6)	33 (20-45)	31 (7-49)
2023-2024 COVID-19 dose, 60-119 days earlier	833	45 (5)	88 (74-103)	31 (6-50)
2023-2024 COVID-19 dose, 120-179 days earlier	448	17 (4)	143 (131-157)	4 (-60-42)*
≥65 years				
No 2023-2024 COVID-19 dose (ref)	35,559	4,702 (13)	634 (407-809)	Ref
2023-2024 COVID-19 dose, ≥7 days	10,029	769 (8)	80 (45-121)	43 (38-48)
2023-2024 COVID-19 dose, 7-59 days earlier	3,527	290 (8)	34 (20-47)	53 (46-58)
2023-2024 COVID-19 dose, 60-119 days earlier	3,925	322 (8)	88 (73-103)	42 (34-48)
2023-2024 COVID-19 dose, 120-179 days earlier	2,577	157 (6)	143 (131-158)	16 (-1-30)



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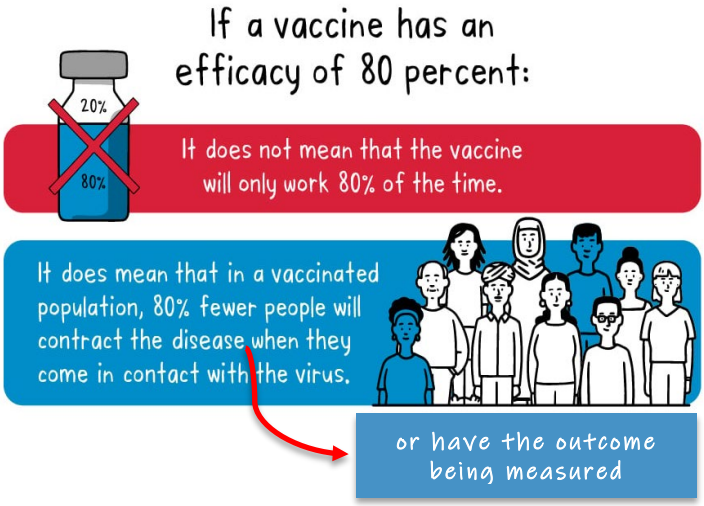
(https://www.cdc.gov/mmwr/volumes/73/wr/mm7308a5.htm (Results updated with additional data since publication.) VE was calculated as (1 – odds ratio) x 100%, estimated using a test-negative case-control design, adjusted for age, sex, race and ethnicity, geographic region, and calendar time.

Keep in mind when reviewing vaccine efficacy information:



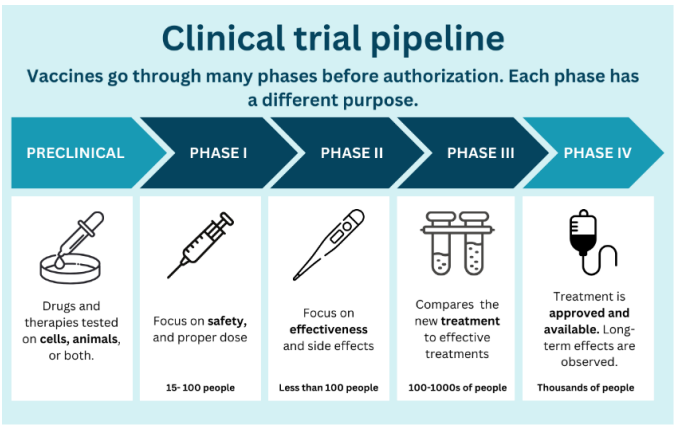
Pharmaceutical companies that make COVID-19 vaccines, anticipating this decision, have been testing JN.1 vaccines in monkeys and mice to evaluated safety and effectiveness. There have been no reported safety concerns and the vaccines have caused antibody levels to increase. There have not been any human studies, however the changes in the vaccines are minor, like the changes in our yearly flu shots which are not studied year to year prior to use.

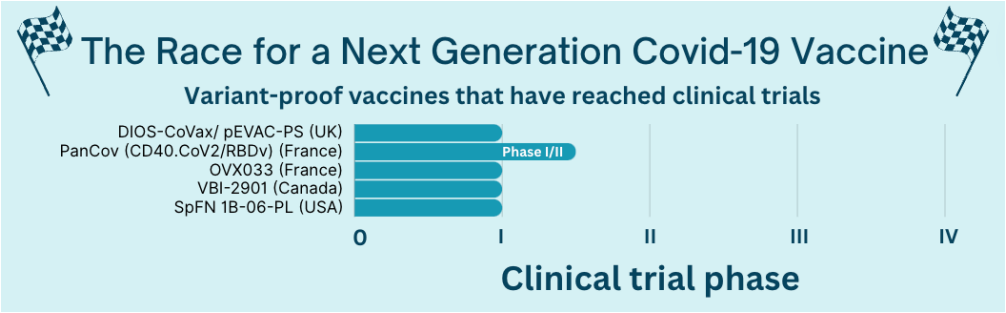
Now that the FDA VRBPAC has recommended the strain for use in the vaccine, the next step is for the CDC's external committee the Advisory Committee on Immunization Practices (ACIP) to discuss and decide if an updated vaccine is needed, who should be advised to receive it, and when. This meeting will occur on Thursday, June 27, 2024. These meeting are public and can be viewed at https://www.youtube.com/live/DQslT3K9L8Y starting at 8am, with the COVID-19 portion starting at 8:35am. The material that will be presented can be found at https://www.cdc.gov/vaccines/acip/meetings/index.html.

Our current COVID-19 vaccines were an amazing accomplishment of science, created with astonishing speed and are estimated to have saved nearly 2.4 million lives worldwide and 430,000 lives in the United States within the first 8 months of use. While the current COVID-19 vaccines were available quickly and filled the role needed in the ongoing emergency, better next-generation vaccines are needed that could ideally better stop transmission, work despite mutations, and have fewer side effects. Project NextGen is an investment made to work on better vaccines. These newer vaccines may take many years as we are no longer in an emergency and new vaccines would go through the traditional yet longer research and approval process.

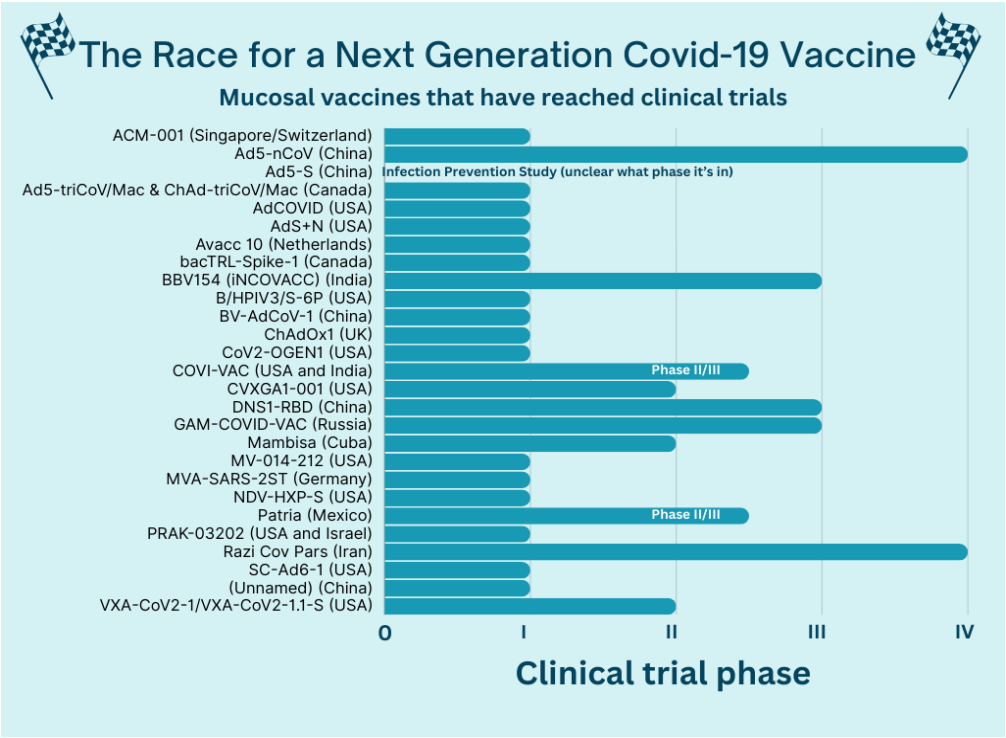
One type of next generation vaccine being explored is a universal coronavirus vaccine that would protect against all coronaviruses, SARS-CoV-2 included. This could prevent some common colds, prevent future pandemics caused by other coronaviruses, and be variant-proof for COVID-19. This is an incredibly challenging type of vaccine to make but some progress is being made.

A reminder of the phases of research:





Another category of next generation vaccines aim to create mucosal antibodies. In other words, it would be like the nasal flu vaccine, and given up the nose so antibodies would be made mostly in a person's nose and throat. This is the main site where COVID-19 infection starts and should better prevent infection from starting and spreading to others. These kinds of vaccines are challenging to make as a higher dose is typically needed to overcome our natural defenses in our nose. In addition, a live virus is usually needed for this kind of vaccine, and we aren't sure if that would work and be safe with SARS-CoV-2. It would also be harder to measure success of this kind of vaccine, as blood levels of antibodies aren't as reliable (most stay in the mucus of the nose and throat), and it is hard to measure a reduction in the spread of COVID-19.

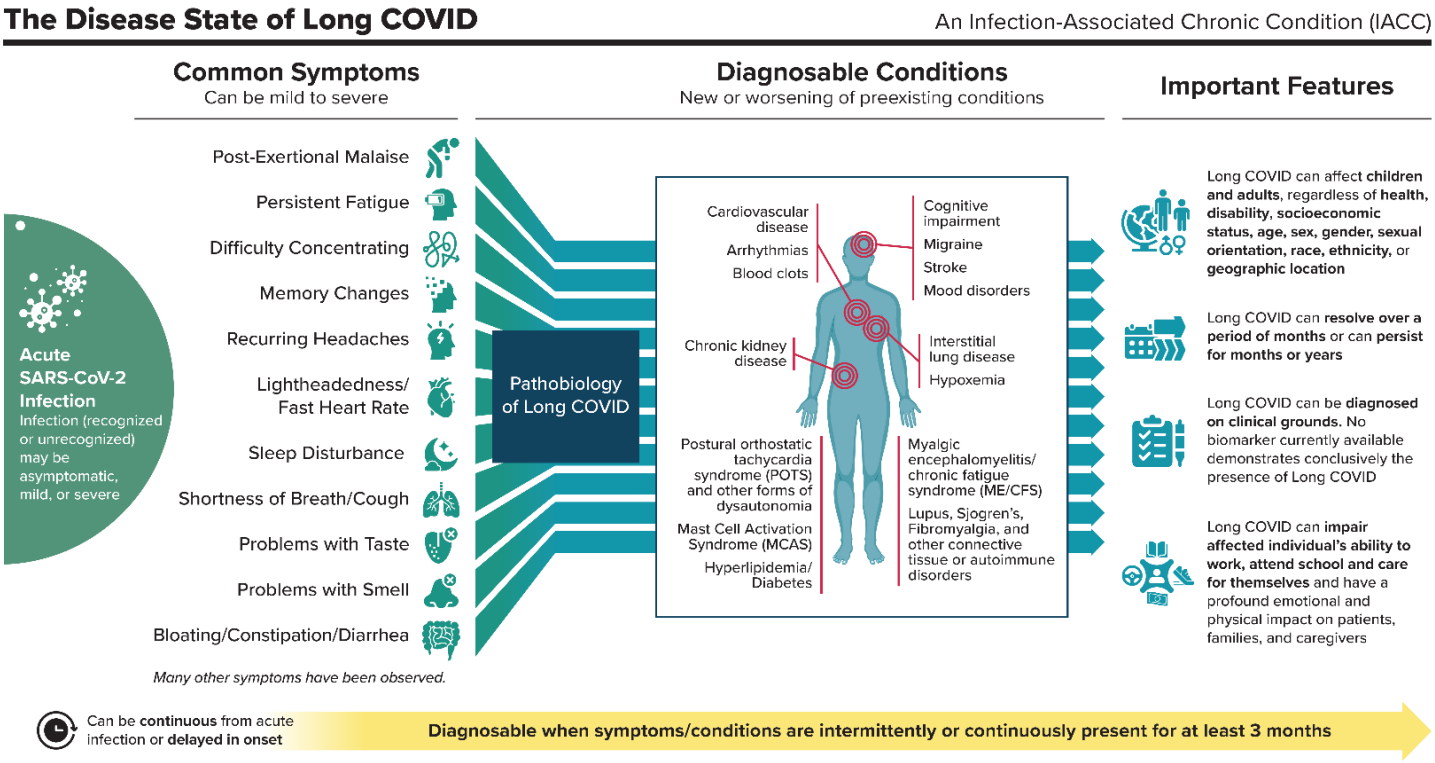


So why should we still care about COVID-19 vaccination?

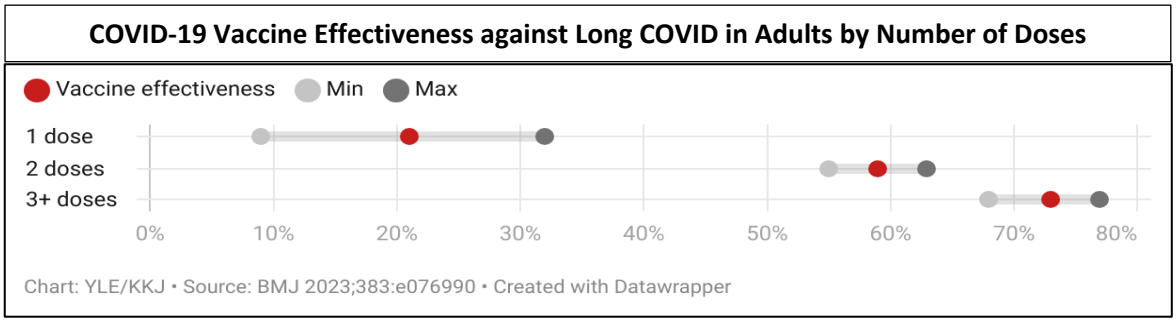
There are several reasons but to highlight a few, vaccines help protect against getting Long COVID. Long COVID (LC) was recently defined by the National Academies of Sciences, Engineering, and Medicine (NASEM) as an infection-associated chronic condition (IACC) that occurs after SARS-CoV-2 infection and is present for at least 3 months as a continuous, relapsing and remitting, or progressive disease state that affects one or more organ systems. LC can follow any kind of COVID-19 infection including asymptomatic, mild, or severe infection, though it is most common after more severe illness.

The signs and symptoms of LC are very broad, and it can manifest in many ways. Any organ system can be involved. The estimates of Long COVID in those that have been infected with COVID-19 range from 10% to 35% or higher. A U.S. Census Bureau and the National Center for Health Statistics Household Pulse Survey showed, as of March 5 to April 1, 2024, about 17.6% percent of all U.S. adults have had Long COVID at some time and 6.9% of all U.S. adults are currently experiencing Long COVID. Long COVID also occurs in children and teens, and it is

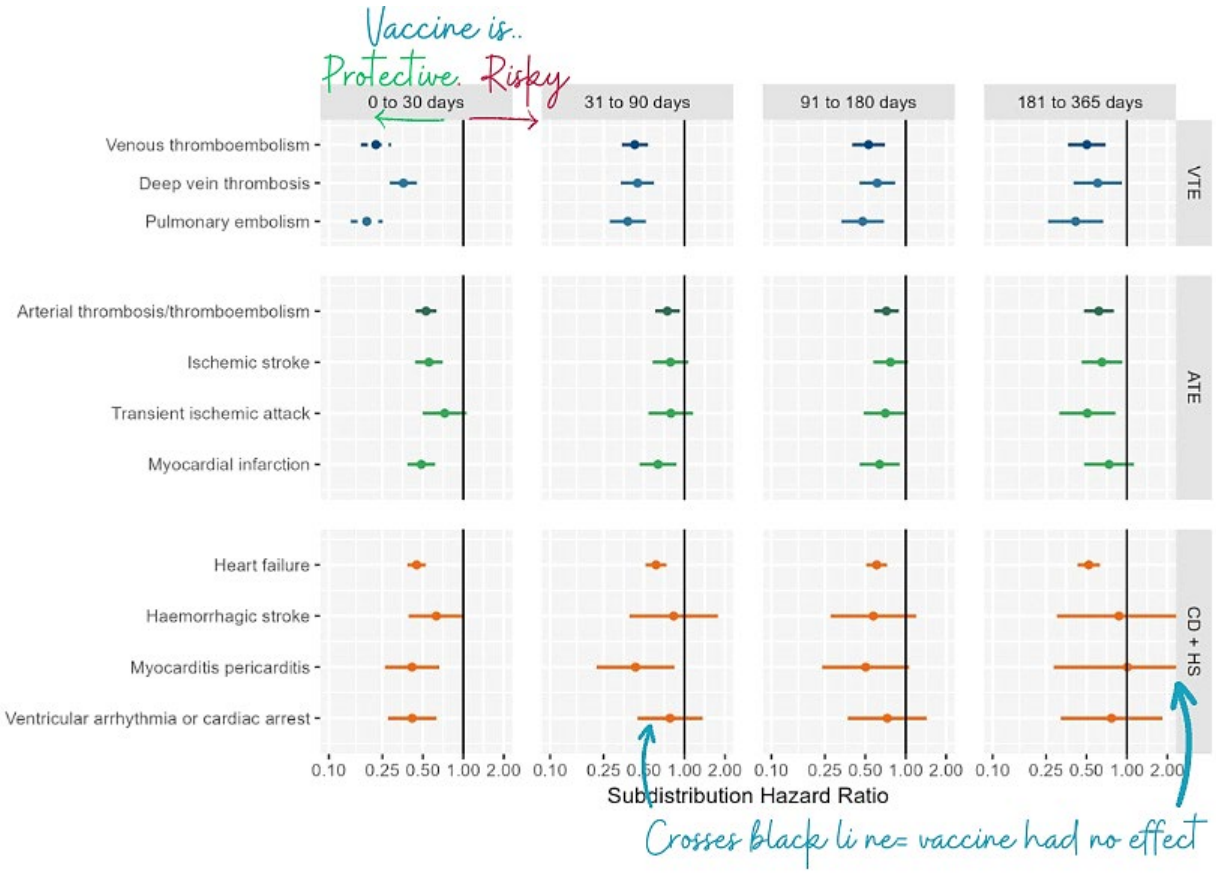
estimated about 10% to 20% have struggle at some point within the first 6 months after an infection with COVID-19.



The latest evidence has found that among children, COVID-19 vaccination provides 35% effectiveness against symptoms of Long Covid and 42% protection against being diagnosed with Long Covid within a year of receiving the vaccine. The protection was higher in adolescents and did drop over time after being vaccinated. Among adults, the risk of Long COVID reduces based on the number of doses of vaccines received. One dose of vaccine reduced the risk by 21%, 2 doses reduce risk by 59%, and 3 or more doses reduces risk by 73%.



Reduction in heart risk if you get infected with COVID-19 is another benefit in vaccination. A large cohort study that compared 10 million vaccinated to 10 million unvaccinated people from UK, Spain, and Estonia found risk of all adverse heart events (heart attack, strokes, blood clots, heart failure, myocarditis, etc.) was significantly lower after infection among vaccinated people, compared to unvaccinated people. They reviewed outcomes for up to 12 months for most heart outcomes. The authors do state their study included only a small number of young men and teens.



There also continues to be a relatively high death rate from COVID-19 in adults. An analysis of the deaths of patients hospitalized for COVID-19 compared to those hospitalized for influenza during the fall-winter 2023-2024 found that patient hospitalized for COVID-19 had a higher risk of death compared with those hospitalized for seasonal influenza. The adjusted death rate for COVID-19 at 30 days was 5.70% vs 4.24% for influenza. The death rate for COVID-19 in 2023-2024 was 5.97%. Of note, this study was performed using the Veterans Affairs population, which is of older age and predominantly male and may not represent the general population.

Our current vaccines continue to be studies and found to be effective. Their effectiveness is limited by continued mutations of the virus. A continually updating summary of the studies and other resources can be found at https://view-hub.org/vaccine/covid/. Specifically, see COVID-19 Vaccine Effectiveness Results Summary Table on https://view-hub.org/vaccine/covid/resources page. This table summarizes the vaccine effectiveness data for COVID-19 studies conducted globally and is updated weekly. This section of the VIEWhub contains studies assessing serious adverse events found in published and preprint literature or reports https://view-hub.org/vaccine/covid/safety-studies?target=adverse&field_covid_studies_vaccine_all=64353&field_covid_studies_vaccine_all=64356 .

Recommendations:

1. Support efforts for development of improved COVID-19 vaccines. Find more information here https://medicalcountermeasures.gov/nextgen/ (NextGen also includes efforts to find better COVID-19 treatments).
2. Current COVID-19 vaccines still have proven benefit and safety. Await ACIP guidance on June 27, 2024, and talk with your healthcare provider or local health department if you have any questions or concerns.

Sources:

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