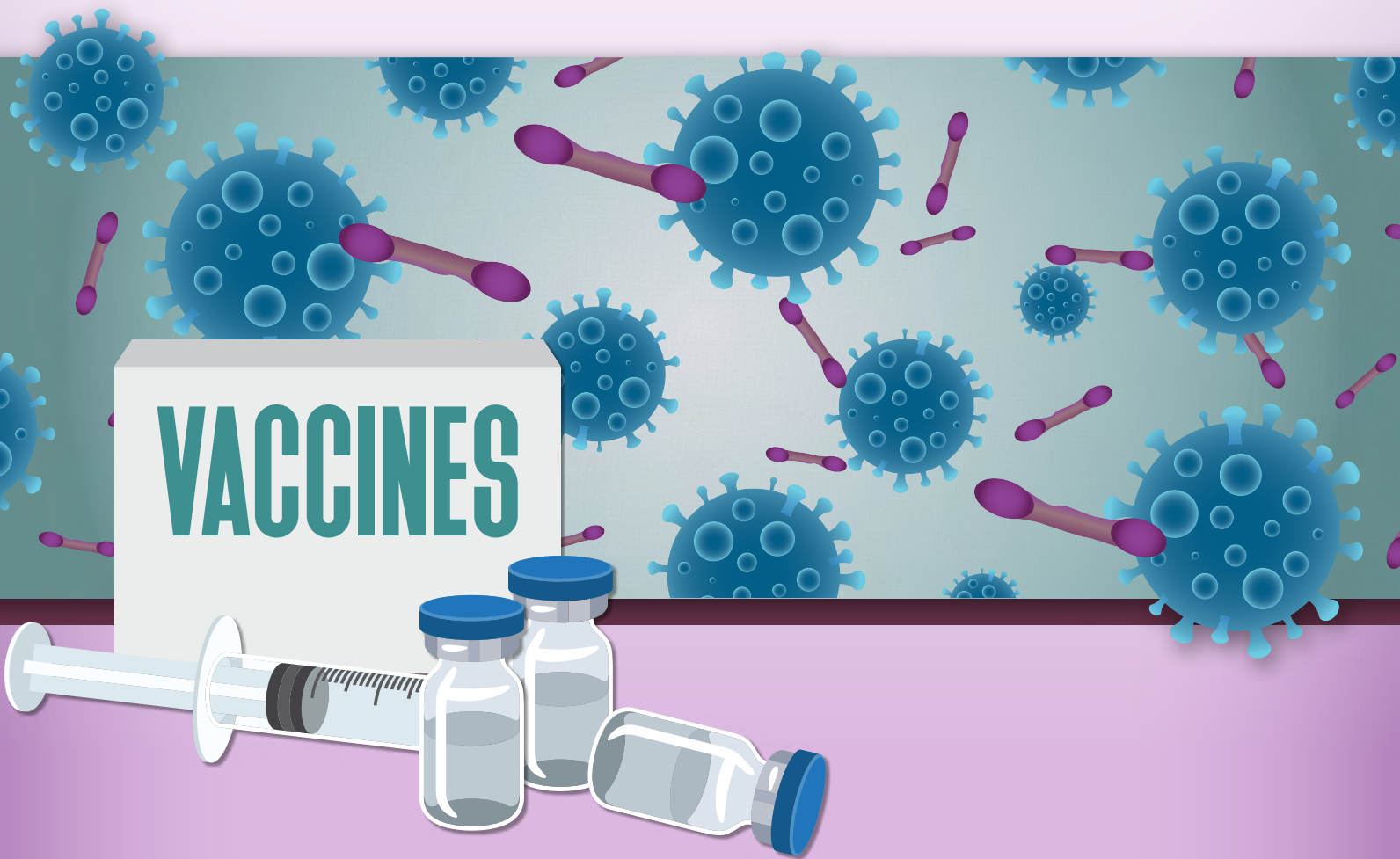


OUR BEST SHOT: The Truth About Vaccines for You and Your Loved Ones



www.agingresearch.org/OurBestShot

OUR BEST SHOT: The Truth About Vaccines for You and Your Loved Ones

Vaccines Work

Vaccines are one of the greatest success stories in modern medicine. Thanks to vaccines, polio no longer exists in the U.S., smallpox has been eliminated globally, and other serious diseases that were commonplace only a generation ago — such as measles, mumps, diphtheria, and tetanus — are becoming increasingly rare.

THEN

Annual U.S. disease cases in the 1900s

(Roush et al. 2007)



NOW

U.S. disease cases in 2019

(CDC 2019)

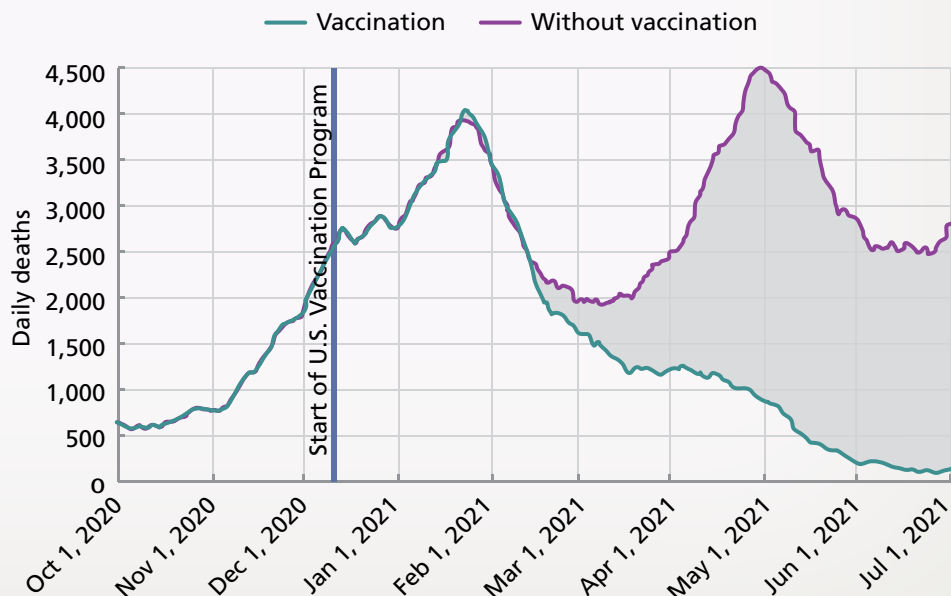


SMALLPOX	THEN	29,005	MUMPS	THEN	162,344
	NOW	0		NOW	3,780
DIPHTHERIA	THEN	21,053	RUBELLA	THEN	47,745
	NOW	2		NOW	6
PERTUSSIS	THEN	200,752	HEPATITIS A	THEN	117,333
	NOW	18,617		NOW	18,846
POLIO (PARALYTIC)	THEN	16,316	HEPATITIS B	THEN	66,232
	NOW	0		NOW	3,544
MEASLES	THEN	530,217	PNEUMOCOCCUS	THEN	63,067
	NOW	1,275		NOW	19,689

COVID-19 vaccines are no exception. They were produced with unprecedented coordination and financial resources and are extremely effective at preventing symptomatic disease (CDC 2021), and even more effective at preventing hospitalization and death. These vaccines are playing an undeniable role in helping life return to a level of normalcy.

Estimated U.S. seven-day rolling average of COVID-19 daily deaths with and without vaccination

(Galvani et al. 2021)



Misinformation/Disinformation Is DANGEROUS

Since the start of the COVID-19 pandemic, people have been exposed to an abundance of health misinformation and disinformation.

Misinformation and disinformation create massive confusion and fear which leads people to decline COVID-19 vaccines, reject masking and social distancing recommendations, and doubt scientifically proven health and safety measures.

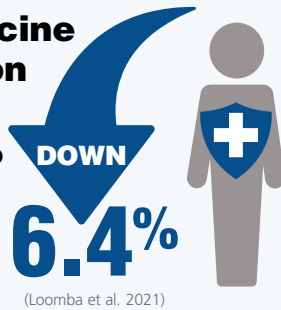


MISINFORMATION is false information that is created and spread regardless of any intent to harm or deceive.

DISINFORMATION is a type of misinformation that is designed to be deliberately deceptive.

Even Small Amounts of Misinformation/Disinformation Can Have an Impact.

A brief exposure to **COVID-19 vaccine misinformation/disinformation** caused the number of people **WILLING to GET VACCINATED** to go

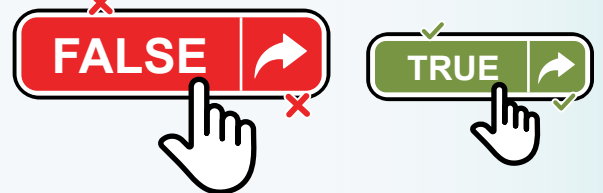


(Lomba et al. 2021)

An analysis of millions of social media posts found that **FALSE news stories** were

70% MORE LIKELY to be **SHARED** than **TRUE** stories.

(Vosoughi et al. 2018)



67% of adults who had not yet received a COVID-19 vaccine had **HEARD** at **LEAST ONE COVID-19 vaccine MYTH** and either **believed it to be true** or **weren't sure if it was true**, as of May 2021.

(Hamel et al. 2021)

MYTH

Tips on Spotting Misinformation/Disinformation

With so much information out there, it can be hard to know what's true and what sources to trust. Here are some steps you can take to spot misinformation/disinformation:



Check the Source

- Do you know and trust the author or publication?
- Can you find other trusted sources that are saying the same thing?
- Are they known for their objective and trustworthy facts and news, or more for their sensational headlines and opinions that are designed to get views or clicks? If you're not sure, don't share.



Question the Motive

- Is the article or post sensational or designed to play on your emotions?
- Could it be designed to draw you in simply to advance a financial or political goal?
- Remember that false news stories are 70% more likely to be shared on social media than true stories — so if you can't trust it, don't share it.

(Vosoughi et al. 2018)



Check the Date

- Is the information recent and up-to-date?
- Or is the news old but recycled to look new?
- Make sure you know when the information was released and look to see if it's been updated.



Find Reliable Sources

- Talk to your health care provider if you have questions about something you've read or heard, and to discuss which vaccines are right for you.
- The [World Health Organization's Vaccine Safety Net](#) consolidates resources from its network of websites that provide reliable information on vaccines.
- Learn more about spotting misinformation/disinformation at [Stronger](#).
- For access to trusted sources of vaccine information visit <https://vaccineinformation.org/trusted-sources>.



Check the Data

- Does the author or publication back up their claims with evidence from peer-reviewed journals and other established and reputable sources? Or are they vague about where their "data" come from?
- Make sure there is rigorous science behind the claims they make.



How Vaccines Work

Vaccines teach your immune system how to deal with a bacteria or virus before it can infect and cause disease, preventing you from getting sick. They either contain a weakened or inactive part of the bacteria or viruses they are protecting against, or instructions to create proteins or antigens to fight future infections. It is extremely rare to get sick from a vaccine so despite what you may have heard, flu vaccines don't cause the flu and COVID-19 vaccines don't cause COVID!

Vaccines Protect Against Serious Diseases that Cause Disability and Death

VACCINES WILL PREVENT AN ESTIMATED (CDC 2014)

322 MILLION
ILLNESSES

21 MILLION
HOSPITALIZATIONS

732,000
DEATHS

among Americans born 1994-2013, over the course of their lifetimes.

*These numbers do not include the tremendous impact of COVID vaccines.

Getting vaccinated not only keeps YOU safe but can also keep your LOVED ONES from getting sick. There are certain diseases that aren't serious for some people but can be deadly for others.

For example, although older adults don't usually get whooping cough, they can carry the bacteria and expose others. Because infants are too young to be vaccinated against whooping cough,

1 in 2 infants who get **WHOOPIING COUGH** are **HOSPITALIZED** and can even **DIE**



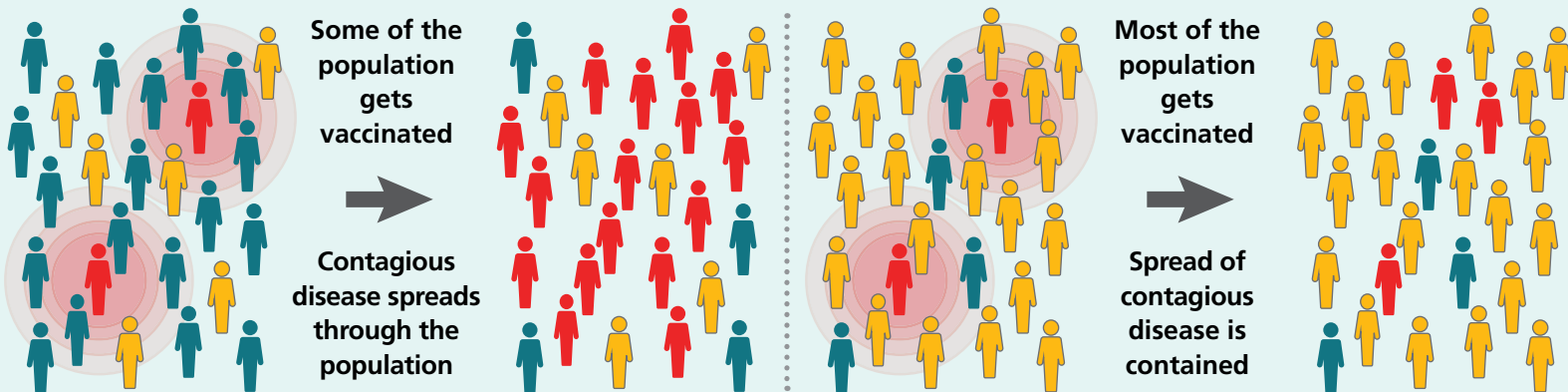
(CDC 2017)

grandparents can help protect their little ones by getting vaccinated themselves and not spreading the disease.

Herd Immunity

Vaccines also play an important role in the community. People who get vaccinated protect those who are too young, too old, or can't be vaccinated due to health reasons. The more people who are vaccinated, the lower the chance that the disease will spread. This is called "community immunity" or "herd immunity."

= not vaccinated but still healthy = vaccinated and still healthy = not vaccinated, sick, and contagious



Vaccines and Children



Science has Proven that Vaccines Don't Cause Autism

Scientific studies continue to show that vaccines do not cause autism. The original article that sparked the fears and controversy years ago was proven to be fraudulent, and the lead author has lost his medical license. Since then, dozens of large studies including millions of children, have found no evidence of a connection.

Because of all the misinformation, some people are reluctant to vaccinate their children, and as

a result, many diseases are experiencing resurgences.

Vaccines can cause MINOR, but manageable side effects like soreness, redness, low-grade fever, and fatigue. People allergic to any of the vaccine ingredients can have a more severe reaction. But serious side effects of any kind are **EXTREMELY RARE**.



Mercury is No Longer Used in Childhood Vaccines

Vaccines have never contained methyl-mercury — a toxic metal that can accumulate in the body and cause brain damage. Before 2001, some vaccines contained thimerosal — a preservative made of ethyl-mercury, which is safe. Even though thimerosal is safe, to prevent confusion the FDA ordered that it be removed from childhood vaccines. The flu vaccine in multi-dose vials still uses it, although thimerosal-free versions are available.

Altering the CDC's Recommended Vaccine Schedule is Dangerous

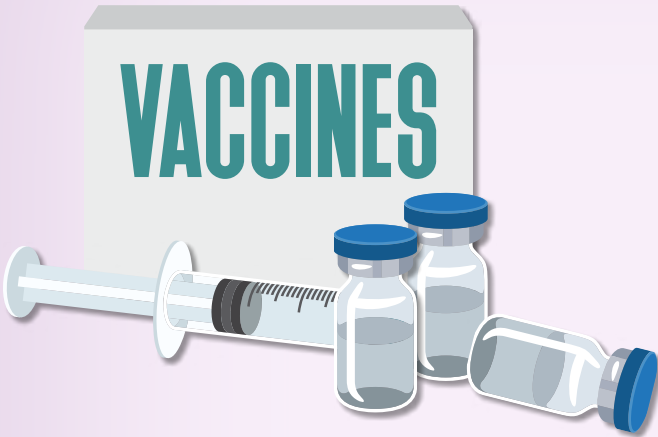
The timing of recommended vaccines has been scientifically tested and carefully arranged to maximize the effectiveness of the vaccines and offer the best opportunity for protection. People concerned about vaccinations sometimes spread out or delay the timing of when their kids are vaccinated. There is NO evidence that this provides any benefit. There IS evidence that it leaves kids and adults vulnerable to dangerous infectious diseases AND makes it more likely that they get infected and spread diseases to others.

	HepB	RV	DtaP	Hib	PCV	IPV	Flu (yearly)
BIRTH	✓						
1 MO	✓						
2 MO		✓	✓	✓	✓	✓	
4 MO		✓	✓	✓	✓	✓	
6 MO		✓	✓	✓	✓		
12 MO	✓			✓	✓	✓	✓

Natural Immunity Practices are Dangerous

Deliberately exposing ourselves or our kids to diseases without vaccination in order to “develop natural immunity” is not a safe choice. Infections come with the possibility of serious illness and complications, while vaccines help us build immunity in a safe and controlled way. Natural is not always better.

Vaccines and Older Adults



Adults Still Need Vaccines

The immune system weakens with age, so as we saw with the COVID-19 pandemic, older adults are often more likely to be infected and develop complications from vaccine-preventable diseases — including long-term illness, hospitalization, and death. Immunity from some vaccines can decrease over time, which means boosters or additional doses are necessary to maintain protection. Also, some viruses change over time, making annual vaccines or boosters necessary.

Vaccines Work Even If They Don't Completely Prevent Disease

Some people may still get the disease they were vaccinated against, but they will typically be less ill and less likely to experience complications.



RISK OF
**HEART
ATTACK**



6x

WITHIN A WEEK

of a confirmed flu infection — even in people without a history of heart disease.

(Kwong et al. 2018)

Skipping Vaccines is Even More Risky If You Have Serious Conditions

Chronic conditions can make it harder to fight off infection and make complications more severe. For example, flu increases your risk of heart attack if you have heart disease; can raise blood sugar to dangerous levels if you have diabetes; and can lead to pneumonia and serious respiratory problems if you have chronic lung disease.

Even if Your Health Care Provider Doesn't Bring It Up, You Still Need Vaccines

Most adults see more than one health care provider, and vaccine records may be scattered amongst them. Ask your health care provider to report the vaccines they give you to your state or local Immunization Information System (or registry) so all your providers will have access to your vaccine history. Your health care provider may not know you are due for a vaccine or may forget to bring it up. That doesn't mean you don't need any vaccinations, so be sure to ask if you are up-to-date and use a wallet card or phone app to track which vaccines you have received and when.

Vaccine Tracker

Vaccine	Vaccine Type	Date	Next Dose Due
Tdap			
COVID-19			
Influenza			
Shingles			
Varicella (chicken pox)			
Pneumonia			

COVID-19 Misinformation

Misinformation on social media, the Internet, on TV, and passed from person to person has plagued the COVID-19 pandemic.



f On Facebook alone more than **185 MILLION PIECES** of **COVID-19 misinformation** have been removed or debunked, (Rosen 2021) but much more remains which makes it critical to get the facts and spread the truth.

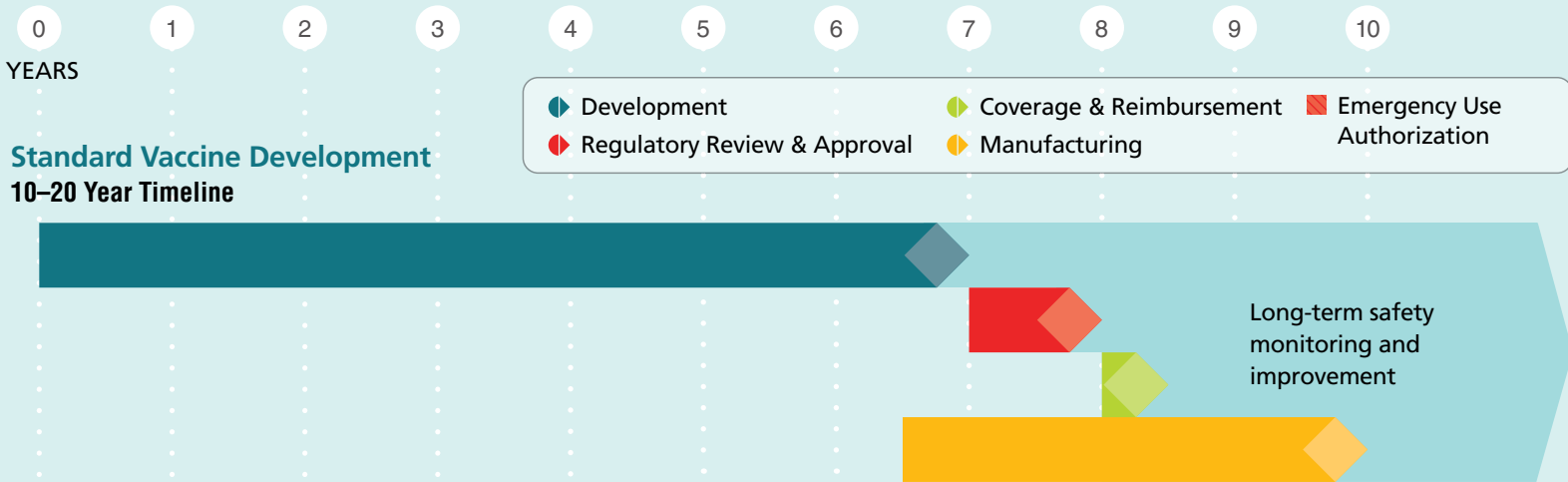
COVID-19 Vaccines Work

While no vaccine is 100% effective at preventing infection, the COVID-19 vaccines are highly effective at preventing serious infections that can lead to hospitalization and death. As scientists get new evidence about the virus and the vaccines, they update their recommendations and assessments.

According to the Centers for Disease Control and Prevention's Director Dr. Rochelle Walensky, between January and July 2021,

~99.5% of COVID-19 **DEATHS** & **97%** of COVID-19 **HOSPITALIZATIONS** were in the **UNVACCINATED** (The White House 2021).

COVID-19 Vaccines Are Safe



COVID-19 vaccines were developed quickly, but **WITHOUT** cutting corners or sacrificing safety.

- Existing and previously tested technology and vaccine research made development faster.
- Public and private partners also took on significant financial risk by manufacturing vaccines while they were still being tested.
- If the vaccines had failed, they would have had to start over — some vaccine strategies did fail, and were abandoned.
- But instead, once the vaccines were tested and the FDA approved their use, they were ready to be distributed.

COVID-19 Vaccines Are Safe (continued)



Two of the COVID-19 vaccines approved in the U.S. use messenger ribonucleic acid (mRNA). The mRNA carries instructions that teach the body how to make a protein that triggers your body to generate an immune response and prepares the body to fight a future coronavirus infection. **The mRNA only survives for a few hours in the body and can't alter DNA or interfere with the reproduction or development processes.**

There is no evidence that the COVID-19 vaccines affect fertility in men or women. They are safe and recommended for use in pregnancy.



VACCINE SHEDDING

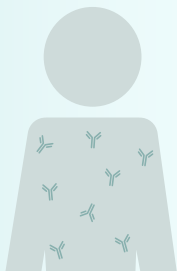
Vaccine shedding is the release of vaccine components outside of the body after vaccination. This can occur in vaccines that contain a live but weakened version of the virus. **None of the COVID-19 vaccines approved in the U.S. contain a live version — so they CANNOT shed and get others sick.**

The vaccines can't give you COVID-19. They contain only a piece of the virus or instructions for creating one of the virus' proteins. People can still get infected by the virus after vaccination if they are exposed to the virus soon after getting their vaccines when their bodies have not had enough time to build immunity. Also, the vaccines are not 100% effective and the virus can mutate. However, the vaccine is never the cause of getting COVID-19.



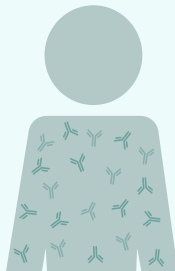
COVID-19
TEST RESULTS:

Positive
 Negative



COVID-19

Infection Immunity



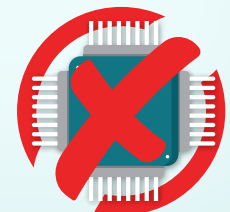
COVID-19

Infection Immunity + Vaccine

Even if you've been infected with the COVID-19 virus, you still need to get vaccinated.

While a previous infection might offer some protection from new infections, it's not clear how much protection and how long it will last.

The vaccines don't contain microchips. There is no evidence to support this claim and currently, there is no technology to make a microchip small enough to be injected via a syringe.

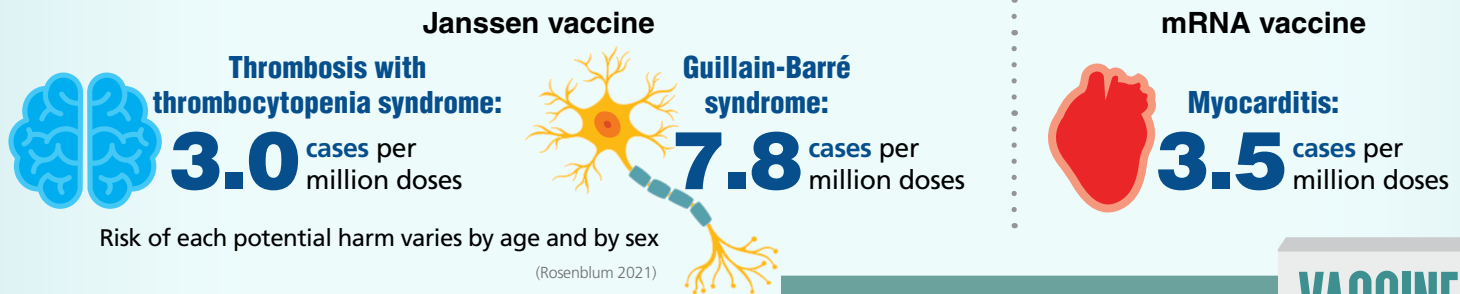


Serious Vaccine Side Effects Are Rare

It's not uncommon to have short-term pain, redness, or swelling where you got the shot. You may also experience tiredness, headache, muscle pain, chills, fever, or nausea. These reactions are symptoms of your body building up protection against the virus. Some people feel sick for a day or two after their vaccine so if you can, schedule your vaccine at the end of a week or when you don't have to work. Some people may experience swollen lymph nodes which indicate that your body is building up immunity. It is not a sign of cancer.

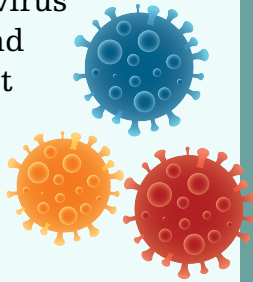
While there have been reports of serious side effects, they are extremely rare.

Risk of Severe Side Effects from COVID-19 Vaccines Among Adults



Vaccines Can Help Prevent Variants

Variants of viruses develop as the virus is passed from person to person and mutates. If the virus can't spread, it can't mutate, which is why high vaccination rates are so important. The only way to stop new variants is to stop the spread of the virus.



Everyone can be affected by COVID-19 — no matter their age, gender, ethnicity, or political party.

This means we are all responsible for helping to stop the spread of COVID-19 in our communities. Talk to your health care provider if you have any questions or concerns about getting vaccinated.



References

Centers for Disease Control and Prevention. 2014. Benefits from Immunization During the Vaccines for Children Program Era: United States, 1994-2013. *MMWR* 63(16):352-5.

Centers for Disease Control and Prevention. 2019. National Notifiable Diseases Surveillance System, 2019 Annual Tables of Infectious Disease Data. Atlanta, GA. CDC Division of Health Informatics and Surveillance, 2021. Available at: www.cdc.gov/nndss/data-statistics/infectious-tables/index.html.

Centers for Disease Control & Prevention. Pertussis (Whooping Cough): Fast Facts. Last Updated August 7, 2017. Available at www.cdc.gov/pertussis/fast-facts.html.

Centers for Disease Control and Prevention. Science Brief: COVID-19 Vaccines and Vaccination. Last updated July 27, 2021. Available at: www.cdc.gov/coronavirus/2019-ncov/science/science-briefs/fully-vaccinated-people.html.

Galvani, A, S Moghadas, and E Schneider. 2021. Deaths and Hospitalizations Averted by Rapid U.S. Vaccination Rollout. The Commonwealth Fund. Available at www.commonwealthfund.org/publications/issue-briefs/2021/jul/deaths-and-hospitalizations-averted-rapid-us-vaccination-rollout.

Hamel, L, L Lopes, G Sparks, M Stokes, and M Brodie. 2021. KFF COVID-19 Vaccine Monitor: April 2021. Available at: www.kff.org/coronavirus-COVID-19/poll-finding/kff-COVID-19-vaccine-monitor-april-2021.

Kwong, J, K Schwartz, M Campitelli, H Chung, N Crowcroft et al. 2018. Acute Myocardial Infarction after Laboratory-Confirmed Influenza Infection. *The New England Journal of Medicine* 378(4):345-53.

Loomba, S, A de Figueiredo, S Piatek, K de Graaf, and H Larson. 2021. Measuring the Impact of COVID-19 Vaccine Misinformation on Vaccination Intent in the UK and USA. *Nature Human Behaviour* 337-48.

Rosen, G. July 17, 2021. Moving Past the Finger Pointing. Available at <https://about.fb.com/news/2021/07/support-for-COVID-19-vaccines-is-high-on-facebook-and-growing>.

Rosenblum, H. 2021. July 22, 2021 ACIP Meeting: COVID-19 Vaccines in Adults: Benefit Risk Discussion. Available at www.cdc.gov/vaccines/acip/meetings/downloads/slides-2021-07/05-COVID-Rosenblum-508.pdf

Roush, S, T Murphy, and the Vaccine-Preventable Disease Table Working Group. 2007. Historical Comparisons of Morbidity and Mortality for Vaccine-Preventable Disease in the United States. *JAMA* 298(18):2155-63.

Vosoughi, S, D Roy, and S Aral. 2018. The Spread of True and False News Online. *Science* 359(6380):1146-51.




The White House. July 22, 2021. Press Briefing by White House COVID-19 Response Team and Public Health Officials. Available at: www.whitehouse.gov/briefing-room/press-briefings/2021/07/22/press-briefing-by-white-house-COVID-19-response-team-and-public-health-officials-46.



Catalyzing Innovation for Healthy Aging

1700 K Street, NW
Suite 740
Washington, DC 20006
202.293.2856

www.agingresearch.org

-  Alliance for Aging Research
-  @Aging_Research
-  @agingresearch

The Alliance for Aging Research is the leading non-profit organization dedicated to accelerating the pace of scientific discoveries and their application in order to vastly improve the universal human experience of aging and health.

© 2021 Alliance for Aging Research

With support from



Many thanks to our expert reviewers:

- **Mitchel C. Rothholz, RPh, MBA**
Chief of Governance & State Affiliates and
Executive Director, APhA Foundation
American Pharmacists Association
- **Kawsar Talaat, MD**
Associate Professor, Department of International Health
Johns Hopkins Bloomberg School of Public Health