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Vaccine: A Protective Barrier Against Covid-19

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Abstract

We have vaccines for nearly thirty of the more than seventy infectious diseases which are pathogenic for humans. Most of the vaccines, especially those to prevent childhood diseases, are highly effective with a high safety profile. Vaccines are being developed against many of the other bacteria and viruses, and some parasites. Fortunately, new techniques are becoming available making it possible to consider developing vaccines based on inducing strong cell-mediated immune responses to control the agent's replication when antigenic variation in surface antigens (e.g., HIV, influenza) makes classical techniques based on induction of antibody responses less attractive. The vaccination for the novel Coronavirus (COVID-19) is undergoing its final stages of analysis and testing. This review also looks at the process a new drug analogue undergoes, from (i) being a promising lead compound to (ii) being released into the market, from the drug development and discovery stage right through to FDA approval and aftermarket research. This article gives the overview about the benefits, importance and the need to get vaccinated.

Keywords: Vaccination; Covishield; Covaxin; Side effects; Vaccine; Types of vaccination; Efficacy of vaccination.

Introduction

Role of Vaccination

Vaccination is the act of introducing a vaccine into the body to produce immunity to a specific disease.[1] Immunization means a person becomes protected against a disease through vaccination. Vaccination is basically simple, safe, and effective way of protecting people against harmful diseases, before they come into contact with them.[2] It just uses your body's natural defenses to build resistance to specific infections and makes your immune system stronger.

Purpose of vaccination

Its purpose is to produce immunity. Immunity is responsible for production of antibodies that results in a protective immune response.[3]

Vaccine is like suspension of weakened, killed, or fragmented microorganisms or toxins or of antibodies or lymphocytes that is administered primarily to prevent disease.

Types of vaccines

- live attenuated vaccines
- rotavirus vaccine
- MMR vaccine
- nasal flu vaccine
- shingles vaccine
- chickenpox vaccine
- BCG vaccine

Vaccination against covid-19

COVID-19 is basically an infectious and very harmful disease that spreads easily therefore vaccination is the only and most effective way of avoiding serious illness or death due to the disease.[4] It also helps reduce the spread of COVID-19 in the community so therefore it is important to get vaccinated.

Benefits of getting vaccinated

- It reduces the probability of contracting the virus
- It reduces risk of spreading of infection
- It will help us to get rid from wearing mask everytime
- It will help newborns if pregnant women are getting it
- It protects against severe illness
- It will eventually help you to connect with friends and family
- It offers natural protection called immunity
- It is important for immunocompromised people
- These vaccines are free and easily available in free

Importance of covid vaccine

The pandemic has impacted almost every corner of life, causing global economies to stall, changing the way we work and interact with our loved ones, and stretching healthcare systems to the limit.[5] Governments around the world have been forced to implement harsh restrictions on human activity to curb the spread of the virus.

Fortunately, the beginning of 2021 saw numerous vaccines given emergency approval and begin their roll out in countries across the world. As of March 2021, just shy of 300 million vaccine doses had been administered worldwide. The figures give hope of a return to ‘normal’. However, global COVID-19 vaccination faces several challenges which may impact its success.

Efficacy of covid-19 vaccination

Currently, a total of seven COVID-19 vaccines available across three platforms have been approved and are being rolled out across the globe. Research has demonstrated that the Moderna and the mRNA-based Pfizer vaccines are 94-95% effective, and these figures have proven true even in trials studying those at high risk and the elderly.[6]

It is a common misconception that this means 95% who get the vaccine are protected from the disease, leaving 5% unprotected. If this were true, in a population of 100,000 were vaccinated this would lead to 5,000 people contracting the virus and developing the disease over three months. This rate is similar to the current UK COVID-19 case rate.

The 95% effectiveness actually means that people with the vaccine have a 95% lower risk of COVID-19 when compared to a control group. Without the vaccine, we would expect roughly 1% of the population to get the disease, and with the vaccine, this reduces to 0.05%. At such low rates, the vaccines will allow society to get back to 'normal' and for restrictions to be permanently eased.

While the current vaccines have proven to be highly effective against the novel severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) strain that has caused the pandemic, recent data has highlighted the emergence of several mutational strains. There has been uncertainty as to whether the current vaccines will protect against these variants.

What is clear is that it is necessary to achieve HERD IMMUNITY through vaccination globally in order to prevent SARS-CoV-2 from continuing to mutate, becoming more resistant to current vaccines and causing more periods of mass fatality.[7]

Types of covid-19 vaccines

Several different types of potential vaccines for COVID-19 are in development including:

- Inactivated or weakened virus vaccines: which use a form of the virus that has been inactivated or weakened so it doesn't cause disease, but still generates an immune response.[8]
- Protein-based vaccines: which use harmless fragments of proteins or protein shells that mimic the COVID-19 virus to safely generate an immune response.
- Viral vector vaccines: which use a safe virus that cannot cause disease but serves as a platform to produce coronavirus proteins to generate an immune response.
- RNA and DNA vaccines: a cutting-edge approach that uses genetically engineered RNA or DNA to generate a protein that itself safely prompts an immune response.

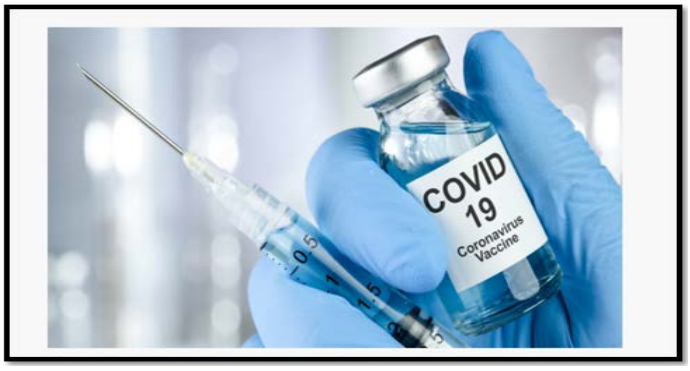
Different covid-19 vaccines

The best COVID-19 vaccine is the first one that is available to you. Do not wait for a specific brand. All currently authorized and recommended COVID-19 vaccines:

- Are safe
- are effective and
- Reduce your risk of severe illness.

Vaccine Brand Name	Who Can Get this Vaccine [1]	How Many Shots You Will Need	When Are You Fully Vaccinated?
Pfizer-BioNTech	People 12 years and older	**2 shots** Given 3 weeks (21 days) apart [2]	2 weeks after your second shot
Moderna	People 18 years and older	**2 shots** Given 4 weeks (28 days) apart [2]	2 weeks after your second shot
Johnson & Johnson's Janssen	People 18 years and older	**1 shot**	2 weeks after your shot

How covid-19 vaccines work



First You Need to Know that

- COVID-19 vaccines are safe and effective.

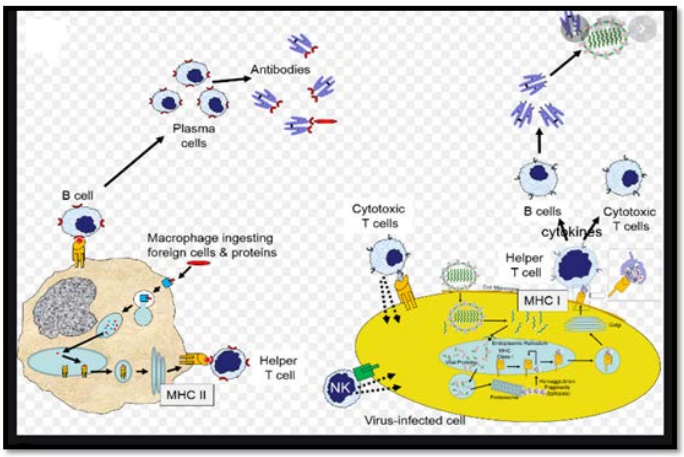
- You may have side effects after vaccination, but these are normal.
- It typically takes two weeks after you are fully vaccinated for the body to build protection (immunity) against the virus that causes COVID-19.[9]
- If you are not vaccinated, find a vaccine. Keep taking all precautions until you are fully vaccinated.
- If you are fully vaccinated, you can resume activities that you did prior to the pandemic. Learn more about what you can do when you have been fully vaccinated.

To understand how COVID-19 vaccines work, it helps to first look at how our bodies fight illness. When germs, such as the virus that causes COVID-19, invade our bodies, they attack and multiply. This invasion, called an infection, is what causes illness.[10] Our immune system uses several tools to fight infection. Blood contains red cells, which carry oxygen to tissues and organs, and white or immune cells, which fight infection. Different types of white blood cells fight infection in different ways:

- **Macrophages** are white blood cells that swallow up and digest germs and dead or dying cells. The macrophages leave behind parts of the invading germs, called "antigens". The body identifies antigens as dangerous and stimulates antibodies to attack them.
- **B-lymphocytes** are defensive white blood cells. They produce antibodies that attack the pieces of the virus left behind by the macrophages.
- **T-lymphocytes** are another type of defensive white blood cell. They attack cells in the body that have already been infected.

The first time a person is infected with the virus that causes COVID-19, it can take several days or weeks for their body to make and use all the germ-fighting tools needed to get over the infection. After the infection, the person's immune system remembers what it learned about how to protect the body against that disease.

The body keeps a few T-lymphocytes, called "memory cells," that go into action quickly if the body encounters the same virus again. When the familiar antigens are detected, B-lymphocytes produce antibodies to attack them. Experts are still learning how long these memory cells protect a person against the virus that causes COVID-19.[11]



Different types of vaccines work in different ways to offer protection. But with all types of vaccines, the body is left with a supply of "memory" T-lymphocytes as well as B-lymphocytes that will remember how to fight that virus in the future.

Below is a description of how each type of vaccine prompts our bodies to recognize and protect us from the virus that causes COVID-19. None of these vaccines can give you COVID-19.

- **mRNA Vaccines** contain material from the virus that causes COVID-19 that gives our cells instructions for how to make a harmless protein that is unique to the virus. [12] After our cells make copies of the protein, they destroy the genetic material from the vaccine. Our bodies recognize that the protein should not be there and build T-lymphocytes and B-lymphocytes that will remember how to fight the virus that causes COVID-19 if we are infected in the future.

- **Protein subunit vaccines** include harmless pieces (proteins) of the virus that causes COVID-19 instead of the entire germ. Once vaccinated, our bodies recognize that the protein should not be there and build T-lymphocytes and antibodies that will remember how to fight the virus that causes COVID-19 if we are infected in the future.
- **Vector vaccines** contain a modified version of a different virus than the one that causes COVID-19. Inside the shell of the modified virus, there is material from the virus that causes COVID-19. This is called a "viral vector." Once the viral vector is inside our cells, the genetic material gives cells instructions to make a protein that is unique to the virus that causes COVID-19. Using these instructions, our cells make copies of the protein. This prompts our bodies to build T-lymphocytes and B-lymphocytes that will remember how to fight that virus if we are infected in the future.

To be fully vaccinated, you will need two shots of some COVID-19 vaccines.

- **Two shots:** If you get a COVID-19 vaccine that requires two shots, you are considered fully vaccinated two weeks after your second shot. Pfizer and Moderna COVID-19 vaccines require two shots.[13]
- **One Shot:** If you get a COVID-19 vaccine that requires one shot, you are considered fully vaccinated two weeks after your shot. Johnson and Johnson's Janssen COVID-19 vaccine only requires one shot.

If it has been less than two weeks since your shot, or if you still need to get your second shot, you are NOT fully protected. Keep taking steps to protect yourself and others until you are fully vaccinated (two weeks after your final shot).

Who Should Get Covid Vaccines?

The COVID-19 vaccines are safe for most people 18 years and older, including those with pre-existing conditions of any kind, including auto-immune disorders.[14] These conditions include: hypertension, diabetes, asthma, pulmonary, liver and kidney disease, as well as chronic infections that are stable and controlled.

If supplies are limited in your area, discuss your situation with your care provider if you:

- Have a compromised immune system
- Are pregnant or nursing your baby
- Have a history of severe allergies, particularly to a vaccine (or any of the ingredients in the vaccine)
- Are severely frail

How quickly covid-19 vaccines stop the pandemic?

The impact of COVID-19 vaccines on the pandemic will depend on several factors. These include the effectiveness of the vaccines; how quickly they are approved, manufactured, and delivered; the possible development of other variants and how many people get vaccinated.[15]

Whilst trials have shown several COVID-19 vaccines to have high levels of efficacy, like all other vaccines, COVID-19 vaccines will not be 100% effective. WHO is working to help ensure that approved vaccines are as

effective as possible, so they can have the greatest impact on the pandemic.

Is the covid vaccine safe?

All three vaccines authorized for emergency use by the Food and Drug Administration (FDA) have been thoroughly tested and found to be safe and effective in preventing severe COVID-19. They continue to undergo continuous and intense safety monitoring.

Johnson & Johnson Vaccine

In April 2021, the Johnson & Johnson vaccine was paused while the FDA and the Centers for Disease Control and Prevention (CDC) investigated a small number of cases of rare blood clots in people who had received that vaccine.[16] Nearly all reports of this problem have been in adult women younger than age 50. After careful review, the FDA and CDC recommended that administration of the J&J COVID-19 vaccine could safely resume.

For three weeks after receiving the J&J vaccine, you should watch for possible symptoms of a blood clot with low platelets called thrombosis with thrombocytopenia syndrome, or TTS. Although very rare and treatable when diagnosed in time, TTS is serious.

Get medical help immediately if you have any of these symptoms within 3 weeks of receiving the J&J coronavirus vaccine:

- Severe or persistent headaches or blurred vision
- Shortness of breath
- Chest pain
- Leg swelling
- Persistent abdominal pain
- Easy bruising or tiny blood spots under the skin near the injection site

Pfizer and moderna vaccine

The Pfizer and Moderna vaccines authorized by the FDA have very good safety records. The FDA granted emergency use authorization (EUA) because research data from large clinical trials has shown them to be safe and effective.[17]

All three types are safe and effective in preventing serious cases of covid-19.

Safety is always a top priority as federal agencies work with vaccine manufacturers to develop and authorize new vaccines.

What steps are taken to make sure the covid-19 vaccines are safe?

Here are some of the steps

- **Careful testing**. All vaccines go through clinical trials to test safety and effectiveness. For the COVID-19 vaccine, the FDA set high safety standards for vaccine developers to meet.[18] This infographic from the National Institutes of Health shows the four phases a vaccine goes through before it is released to the public.
- **Authorization for emergency use**. If a vaccine or medicine is needed to address an emergency situation such as the coronavirus pandemic, once it is shown to be safe and effective, the FDA can grant it an emergency use authorization, or EUA. An EUA allows a vaccine, treatment or medication to be used before the formal FDA approval.
- **Continuous monitoring for problems and side effects**. Once a vaccine gets an EUA and is being given to people, the FDA and the U.S. Centers for Disease Control and Prevention (CDC) continue to watch carefully to make sure no problems arise.[19] Data on the vaccine's safety record accumulates over time when more and more people who receive it report on their experience and any side effects they experience. One important way to report any adverse events after vaccination is through the Vaccine Adverse Events Reporting System (VAERS).

Is There Risk Of Allergic Reaction From Covid-19 Vaccine?

According to the CDC, anyone who has a known severe allergy (e.g., anaphylaxis) to any of the vaccine ingredients should not receive that vaccine.[20]

The CDC says people with allergies to certain foods, insects, latex and other common allergens can safely receive the COVID-19 vaccine. Those with a history of severe allergic reaction (anaphylaxis) to injectables or other vaccines should discuss the vaccination with their doctor, who can evaluate and assess their risk.

- Is covid vaccine safe for diabetic patients-

The novel coronavirus disease (COVID-19) tends to portend a poor prognosis in patients with diabetes mellitus (DM). Primary prevention remains the mainstay for mitigating the risks associated with COVID-19 in patients with DM. A significant step in primary prevention is timely vaccination. Routine vaccination against pneumococcal pneumonia, influenza, and hepatitis B is recommended in patients with DM with good efficacy and reasonable safety profile. With clinical data supporting a robust neutralizing antibody response in COVID-19 patients with DM, vaccination in individuals with DM is justified.[21] In fact, as the burden of the disease is borne by people with DM, COVID-19 vaccination should be prioritized in individuals with DM.

As written in the online health resource STAT, guidelines from the CDC released in December rank a person with type 2 diabetes as someone who "is at increased risk" of more severe illness from COVID-19. That means people with T2D will follow health care workers and people living in long-term care settings, getting their vaccines in Phase 1c of the rollout.

- Is covid vaccine safe for pregnant women-

Pregnant and recently pregnant people are more likely to get severely ill with COVID-19 compared with non-pregnant people. If you are pregnant, you can receive a COVID-19 vaccine. Getting a COVID-19 vaccine during pregnancy can protect you from severe illness from COVID-19.

Severe illness includes illness that requires hospitalization, intensive care, or a ventilator or special equipment to breathe, or illness that results in death. Additionally, pregnant people with COVID-19 are at increased risk of preterm birth and might be at increased risk of other

adverse pregnancy outcomes compared with pregnant women without COVID-19.[22]

- Is covid vaccine safe for children:

The centers for disease control and prevention recommends everyone 12 years and older should get a COVID-19 vaccination to help protect against COVID-19. Widespread vaccination is a critical tool to help stop the pandemic. People who are fully vaccinated can resume activities that they did prior to the pandemic. Learn more about what you and your child or teen can do when you have been fully vaccinated. Children 12 years and older are able to get the Pfizer-BioNTech COVID-19 Vaccine.

The U.S. Food and Drug Administration has authorized the emergency use of three COVID-19 vaccines in the United States: A Pfizer vaccine to prevent COVID-19 for people 12 years of age and older as well as Johnson & Johnson and Moderna for people age 18 and over. There is no vaccine approved yet for children under age 12.[23]

- Is covid vaccine safe for people with asthma-

Yes. People with mild to severe asthma were included in clinical trials for the Moderna, Pfizer-BioNTech, and Janssen (Johnson & Johnson) vaccines currently being distributed in the United States, according to briefings from the U.S. Food and Drug Administration (FDA).[24]

For example, in a Moderna vaccine clinical trial with more than 27,000 people, 22 percent had underlying health conditions including moderate to severe asthma, according to an FDA briefing report dated December 17, 2020. The report notes that safety and efficacy for participants with mild to severe asthma were on par with results for the vaccine group as a whole.

There are no specific health concerns or contraindications for people with asthma when it comes to the Janssen vaccine, according to Mitchell H. Grayson, MD, a professor and the chief of the division of allergy and immunology at Nationwide Children's Hospital in Columbus. Regarding blood clots, he says: "It appears that people with asthma are at the same risk as the general population for any of these extremely rare events."

Seasonal allergies (like pollen allergies) as well as allergies to food, latex, and inhaled triggers (like dust and pet dander) do not raise your risk of an allergic reaction to the vaccine, according to the ALA and the American Academy of Allergy, Asthma, and Immunology (AAAAI). But if you have a history of severe allergic reactions, have a drug or vaccine allergy, know you're allergic to the chemical polyethylene glycol or to any other ingredient in the vaccines, talk to your doctor.

- Is covid vaccine safe for people with heart diseases-

  It is important that all patients with cardiovascular conditions receive the COVID-19 vaccine. The vaccine does not necessarily prevent people from catching the COVID-19 infection, but it will reduce the likelihood of serious illness which may require hospital admission, and could result in death. People

with heart disease may be at increased risk of dying from COVID-19 because the infection places stress on the heart through several mechanisms, including direct inflammation of the heart. Therefore, it is essential that all patients with heart disease accept the vaccination when offered.

The COVID-19 vaccine trials included patients with heart disease and did not demonstrate any serious effects from the vaccine in such patients. The most common complaints in all patients included pain at the injection site, tiredness, headache, muscle pain or chills. The arm may be stiff and painful for a couple of days. Fatigue and chills are secondary to the effects of the immune system recognising the viral proteins as foreign. It does not mean that the vaccine has resulted in COVID-19 infection. It is possible that, during the second vaccine when the immune response to the vaccine is likely to be more exaggerated, patients who have severe heart disease and are generally breathless at rest may feel slightly more unwell due to a mild fever and flu-like symptoms. These effects will be short lived, lasting approximately 24-48 hours and respond to paracetamol and increased fluid intake.

- Is covid vaccine safe for smokers-

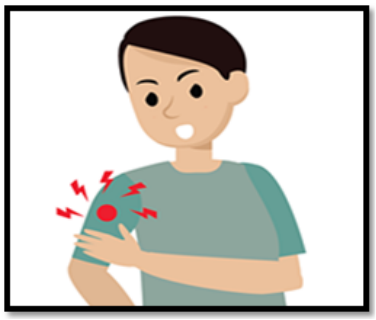
Smoking any kind of tobacco reduces lung capacity and increases the risk of many respiratory infections and can increase the severity of respiratory diseases. COVID-19 is an infectious disease that primarily attacks the lungs. Smoking impairs lung function making it harder for the body to fight off coronaviruses and other respiratory diseases. Available research suggests that smokers are at higher risk of developing severe COVID-19 outcomes and death.

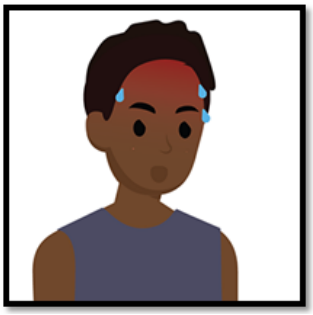
Side effects after getting a covid vaccine

Common side effects:

On the arm where you got the shot:

- PAIN
- Redness
- Swelling





Throughout the rest of your body:

- Tiredness
- Headache
- Muscle pain
- Chills
- Fever
- Nausea

If you had a severe or immediate allergic reaction after getting the first dose of an mRNA COVID-19 vaccine, you should not get a second dose of either of the mRNA COVID-19 vaccines.[25]

Helpful tips to relieve side effects

Talk to your doctor about taking over-the-counter medicine, such as ibuprofen, acetaminophen, aspirin, or

antihistamines, for any pain and discomfort you may experience after getting vaccinated. You can take these medications to relieve post-vaccination side effects if you have no other medical reasons that prevent you from taking these medications normally.

It is not recommended you take these medicines before vaccination for the purpose of trying to prevent side effects.

To reduce the pain and discomfort where you got the shot:

- Apply a clean, cool, wet washcloth over the area.
- Use or exercise your arm.

To reduce discomfort from fever:

- Drink plenty of fluids.
- Dress lightly.

Side effects after your second shot may be more intense than the ones you experienced after your first shot.[26] These side effects are normal signs that your body is building protection and should go away within a few days.

When to Call the Doctor

In most cases, discomfort from pain or fever is a normal sign that your body is building protection. Contact your doctor or healthcare provider:

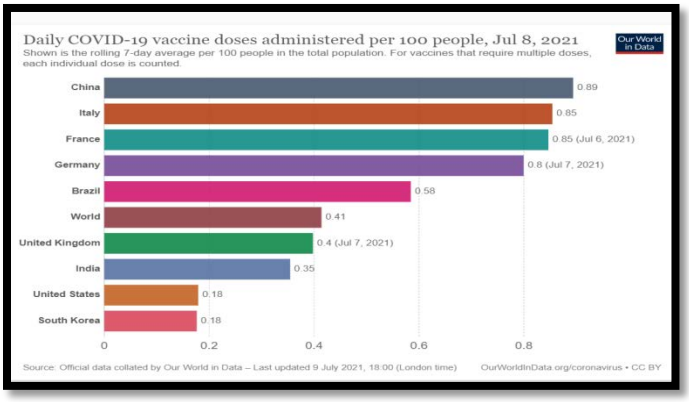
- If the redness or tenderness where you got the shot gets worse after 24 hours
- If your side effects are worrying you or do not seem to be going away after a few days

Remember

- **Side effects can affect your ability to do daily activities**, but they should go away in a few days.
- **The Pfizer-BioNTech2COVID-19 Vaccine and Moderna COVID-19 Vaccine both need 2 shots** in order to get the most protection.[27] You should get the second shot even if you have side effects after the first shot, unless a vaccination provider or your doctor tells you not to get it.
- **You only need 1 shot of the Johnson & Johnson's Janssen (J&J/Janssen) COVID-19 Vaccine** to get the most protection.
- **It takes time for your body to build protection after any vaccination.** People are considered fully vaccinated two weeks after their second shot of the Pfizer-BioNTech or Moderna COVID-19 vaccine, or two weeks after the single-dose J&J/Janssen COVID-19 vaccine. You should keep using all the tools available to protect yourself and others until you are fully vaccinated.

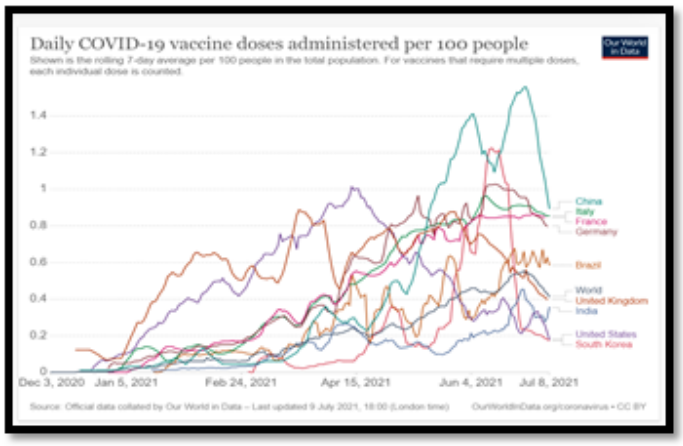
How Many Covid-19 Vaccine Doses Are Administered Daily?

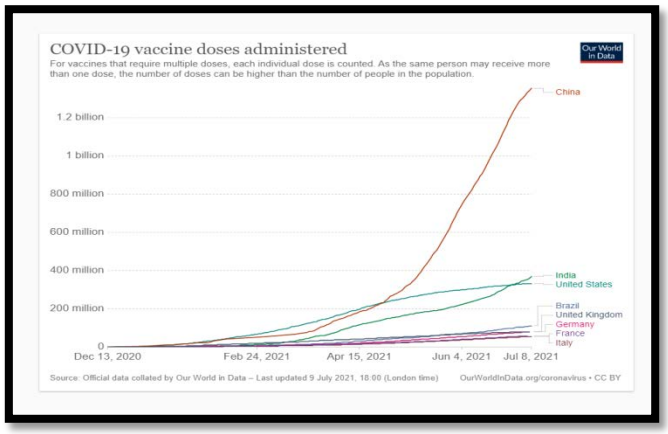
The following chart shows the daily number of COVID-19 vaccination doses administered per 100 people. This is shown as the rolling seven-day average. Note that this is counted as a single dose, and may not equal the total number of people vaccinated, depending on the specific dose regime (e.g., people receive multiple doses).

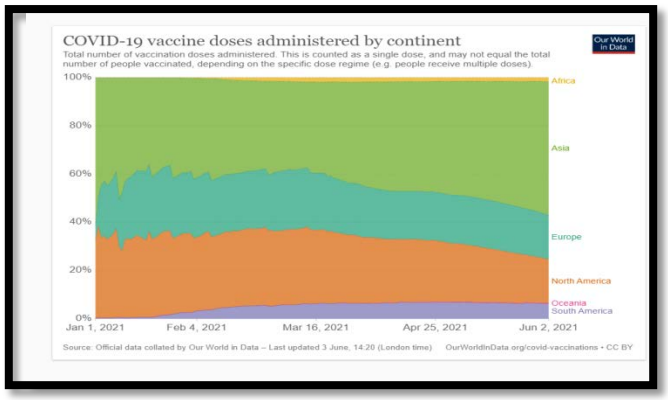


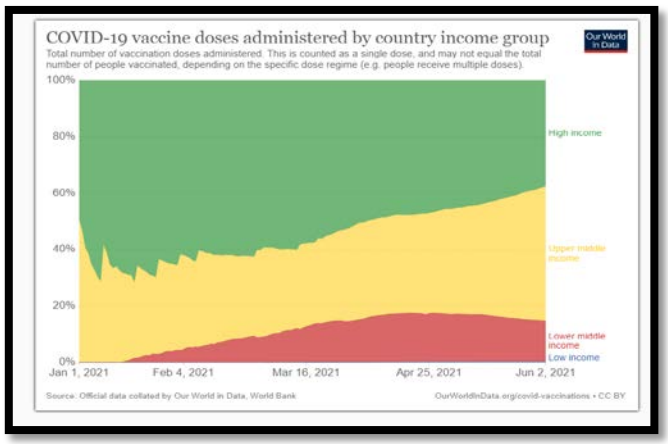
How many covid-19 vaccination doses have been administered?

The following chart shows the total number of COVID-19 vaccination doses administered. Note that this is counted as a single dose, and may not equal the total number of people vaccinated, depending on the specific dose regime (e.g. people receive multiple doses).









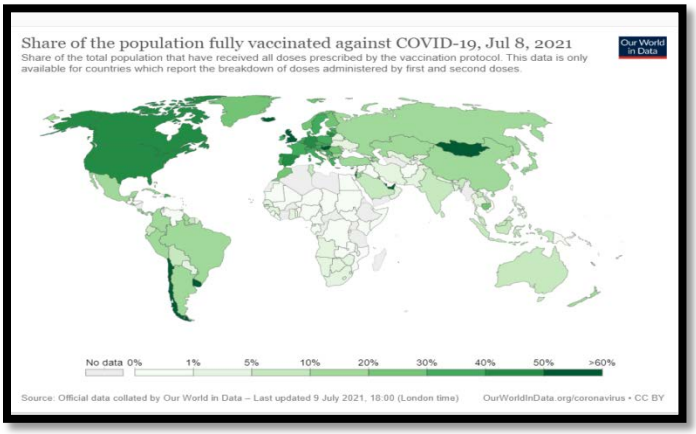
What share of population has received atleast one dose of covid-19 vaccine?

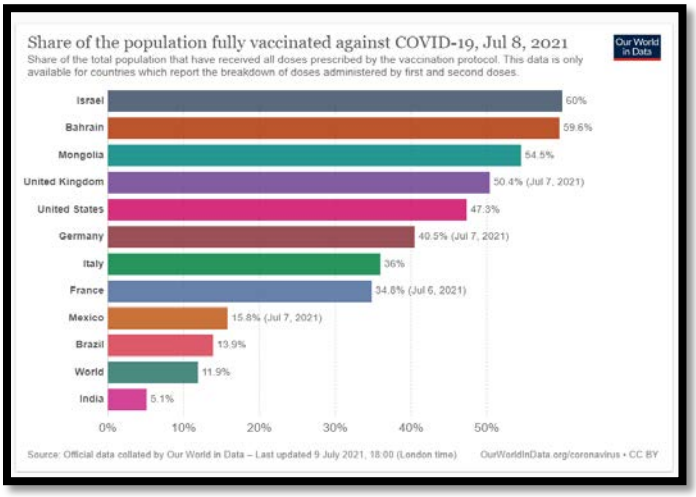
The following chart shows the share of the total population that has received at least one dose of the COVID-19 vaccine. This may not equal the share that are fully vaccinated if the vaccine requires two doses. If a person receives the first dose of a 2-dose vaccine, this metric goes up by 1. If they receive the second dose, the metric stays the same.

What share of population has been fully vaccinated against covid-19?

The following chart shows the total number of people that have been fully vaccinated against COVID-19. This represents the number that has received all doses prescribed by the vaccination protocol. If a person receives the first dose of a 2-dose vaccine, this metric stays the same. If they receive the second dose, the metric goes up by 1.

This data is only available for countries which report the breakdown of doses administered by first and second doses.





Vaccines In India

Covishield: Covishield is the Indian-made version of AstraZeneca's Vaxzevria jab, which has been authorised in the EU.

The vaccines currently eligible for the green pass have all been **approved by the European Medicines Agency (EMA).**

A source in India's external affairs ministry earlier said India had requested EU states to individually consider extending the exemption to people who had taken Covid-19 vaccines in India - Covishield and Covaxin - and "accept the vaccination certificate" issued by the government.

Covishield was listed for emergency use by the WHO in February.[28]

India has so far overwhelmingly administered Covishield jabs - they account for more than 290 million of the 350 or so million vaccinations given so far.

Covishield vaccine efficacy rate:

The entire course of this vaccine is completed after 2 doses. According to government data the covishield vaccine efficacy percentage of 70% has been seen in patients after its two doses. In one estimate 100% efficacy has been observed after both doses of this vaccine. This vaccine has been approved by the Health Department Government of India.

Covishield vaccine efficacy after second dose is considered around 90%.[29] You have to give some gap between so that your body can withstand the mild side effects of vaccine. After applying it your body's immunity to fight corona increases by about 90%.

Covaxin

Covaxin, also known as BBV152, was authorised for emergency use by India's Central Drugs and Standards Committee (CDSCO) on 3 January 2021, even though phase 2 clinical trials were unpublished, and larger phase 3 trials still ongoing. Some criticised the decision, but the regulator cited the need for protection against the Alpha variant, which was at that time spreading fast and outcompeting previous variants. The Alpha variant has since been overtaken by the Delta variant.

Covaxin is an inactivated whole virus vaccine, containing SARS-CoV-2 particles that have been chemically deactivated.[30] That means they can no longer infect cells, but still stimulate a protective immune response. Because the viral particles cannot cause disease, the vaccine is suitable for people with compromised immune systems. Covaxin also contains two adjuvants – chemicals designed to strengthen the immune response to the vaccine – aluminium hydroxide, and a toll-like receptor (TLR) 7/8 agonist. The vaccine comes as a two-dose regimen, recommended to be taken 28 days apart.

Covaxine efficacy rate

The study found that Covaxin had an efficacy of 93.4% against severe COVID-19 disease, and an overall vaccine efficacy of 77.8% against symptomatic infections confirmed by PCR tests.[31] Against asymptomatic COVID-19, the efficacy was 63.6%. The vaccine also conferred 65.2% protection against symptomatic infection with the Delta variant, at least two weeks after the second dose. Outside of India, Covaxin has also been approved for emergency use in 15 countries, including Iran, Zimbabwe, Mexico, the Philippines, Guatemala and Botswana. Bharat Biotech has also signed deals with the US-based biopharmaceutical company Ocugen to produce the vaccine for the North American market, and the Brazil-based Precisa Medicamentos, subject to additional trials and regulatory approval there.

Conclusion

Getting vaccinated against COVID-19 will be one of the best ways to protect yourself and everyone around you. The more people who get vaccinated against COVID-19, the better it is for everyone. By stopping the spread of COVID-19, we can keep businesses, schools, and other venues open. Stopping the spread of COVID-19 gets us closer to the end of the pandemic.

If you are fully vaccinated, you can resume activities that you did before the pandemic.

Fully vaccinated people can resume activities without wearing a mask or physically distancing, except where required by federal, state, local, tribal, or territorial laws, rules, and regulations, including local business and workplace guidance.

If you haven't been vaccinated yet, find a vaccine.

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