



# Comparison of Efficacy of COVID-19 Leading Vaccines

Qadir MI<sup>1</sup>, Javed MK<sup>1</sup> and Arbi MAJ<sup>2\*</sup>

<sup>1</sup>Institute of Molecular Biology and Biotechnology, Bahauddin Zakariya University, Pakistan

<sup>2</sup>LLM, Benzair Bhutto Shaheed University Lyari Karachi, Pakistan

**\*Corresponding author:** Malik Arslan Javed Arbi, 3LLM, Benzair Bhutto Shaheed University Lyari Karachi, Sindh, Pakistan, Email: kashanjaved01@gmail.com

## Research Article

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## Abstract

The aim concerning the review is to compare the efficacy of different well-known and active vaccines. The top vaccines are Pfizer, Moderna, Astra Zeneca, Sinovac, and CanSino for which we will compare the efficacy of these renowned vaccines around the sphere. So, after reviewing and comparing the efficacy of top vaccines we come to accomplish that the most effective vaccines are Sino vac and Pfizer with the efficacy rate of approximately 95% after 2nd dose vaccination in addition Moderna, Johnson and Johnson comes on 2nd with 94% efficacy after 2nd dose and Zydus Cadila secure 3rd rank with 90% efficacy while the least effective vaccines are CanSino comes on number 4th with efficacy of 86% and Astra Zeneca with 82% Efficacy rate rank in number 5th in leading vaccines.

**Keywords:** Efficacy; Vaccine; Covid; Leading

## Introduction

Corona virus is the RNA virus which initially affects only animal but in 2019 a covid-19 human patient is reported from China which means that it become zoonotic virus which affect humans who eats uncooked meats of that animal which have coronavirus. Covid symptoms in humans starts from mild type fever which became severe with the passage of hours its symptoms start to become severe from the 14<sup>th</sup> days of infection the symptoms of covid includes nosebleed, cough, severe fever, flu, and difficult breathing because it mainly targets human lungs. Initially its death rate was only 2% but with the passage of time it increases a lot like if we talk about Pakistan than almost 1.27 million cases of covid reported in Pakistan until now from which about 28,477 folks dead till now and the counting is not stopping yet. Till now the three most common strains or types of coronavirus disease -2019 also known as covid-19 (due to its origin in 2019) in humans are Alpha, Beta and Charli, additionally some cities and countries also claims the arrival of 4<sup>th</sup> strain which is known as delta or omicron strain. As far as the awareness of covid-19 concerns is that most of the people know about covid-19 and satisfy with the government

performance against covid-19 as well while few still needs to aware [1]. As far the name of corona concern, its protein is just like the crown, which is known as peplomer, and corona means crown that's why named as corona virus and due to its origin in 2019 it is also known as coronavirus disease 2019 or most commonly COVID-19. If you want to prevent this virus then we must take safety measures which includes surgical mask, washing hands for 20 seconds and maintain the distance from the person which is about one meters [2]. As far as the treatment of covid 19- concerns then its solution is to get vaccinated. There are lots of vaccines available for covid-19 developed by different countries which includes CanSino, Modena, Pfizer, Johnsen Jensen, Astra Zeneca, Sinovac, Sinopharm, Convidicea, Abdala etc.

## Study Objective

The objective concerning this review is to compare the efficacy of different famous and effective vaccines. The leading 5 vaccines are Pfizer, Moderna, Astra Zeneca, Sinovac and CanSino for which we will compare the efficacy of famous vaccines around the globe [3].

## Results and Discussion

### Efficacy of Sinovac

Sinovac is also known as CoronaVac which is developed by China and is injected intramuscular. According to [4] they injected the vaccine in approximately 10,077 random patient who were suffering from the disease known as covid 19 or coronavirus disease 2019. They evaluated that the patient suffering from covid-19 shows a great efficacy rate which was about 94.7% against foot, mouth, and hand disease in children for about two years while the efficacy after 1<sup>st</sup> dose is 51% shown in Figure 1. This trial last for 12 months [4].

### Efficacy of CanSino

CanSino or Sinopharm is also developed by China which is a leading vaccine with less side effects and successfully undergoing phase 3 clinical trials with the efficacy rate of about 86% while the internal analysis opens that its about 79% effective against corona virus while the efficacy after 1<sup>st</sup> dose is about 65.7% shown in Figure 1. This vaccine successfully active the immune system and T-Cell response [5].

### Efficacy of Pfizer

The developer of the vaccine named as Pfizer claims that it's really effective against covid-19 but with some side effects which includes fatigue, chills, joint pain or infection at the site of injection. The researchers claims that the Pfizer is about 95% effective after 2nd dose while 52% effective after 1st dose shown in fig 1 against the covid-19 with some side effects in some patients which includes swelling, pain, redness, chill etc., [6,7].

### Efficacy of Moderna

The vaccine named as Moderna developed by United states of America or US with some wonderful results regarding the protection. It activates the immune system just like other vaccines of covid-19 with some minor side effects which includes swelling in under arm, headache, tiredness etc., Moderna shows an efficacy of approximately 94% after the second dose of vaccine which means that there are about 6% chances are still there that covid-19 might infect the person who got Moderna. While the efficacy after 1s dose is about 52% shown in Figure 1 [7,8].

### Efficacy of Astra Zeneca

Astra Zeneca developed in the Oxford university which is in United Kingdom. This vaccine also shows a positive

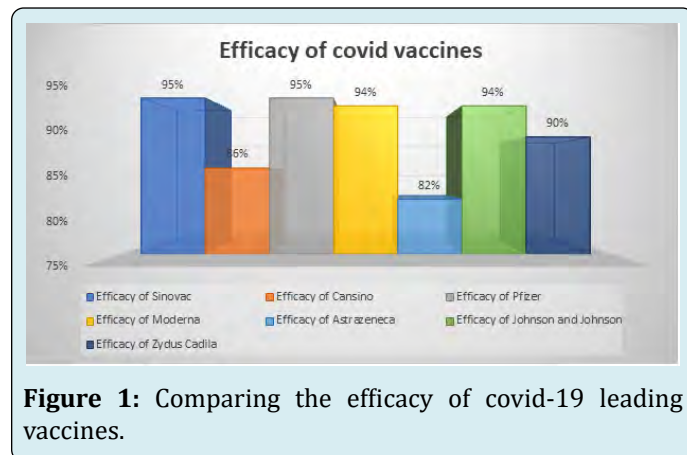
or advance response against the covid-19. This vaccine sometimes shows no side effect and sometimes shows mild side effects which are nausea, muscle pain, headache etc., AstraZeneca shows about 76% efficacy after the first dose of vaccine which increase to 82% after the second dose of vaccine shown in Figure 1 [9,10].

### Efficacy of Johnson and Johnson

Johnson and Johnson are another covid vaccine developed by Japanese scientist with the efficacy rate of 66.9% after 1st dose and approximately 94% after second dose of vaccination. This vaccine also known as J and J shown in Figure 1 [11,12].

### Efficacy of Zydus Cadila

Zydus Cadila is another vaccine against covid-19 which is developed by India, and they claim that this vaccine has about more than 90% efficacy with some side effects which includes ringing in the ears known as tinnitus, appetite loss, nausea, vomiting etc. shown in Figure 1 [13,14].



**Figure 1:** Comparing the efficacy of covid-19 leading vaccines.

### Clinical Implications of Coronavirus Vaccine

There are two types of coronavirus vaccines and clinical experts recommends according to the age of patient.

**Monovalent vaccine:** having immunogenic activity for single microorganism

**Bivalent:** having immunogenic activity for two microorganisms, also known as polyvalent.

- **Pfizer:** clinical experts suggest the use of monovalent Pfizer vaccine from 6 months till 12 years of age after 12 year they recommend bivalent Pfizer vaccine. Injection volume of 0.2mL till 11 years starting from 6 months and 0.3mL for 12 and above.
- **Moderna:** Clinical experts recommend monovalent till the age of 18 years starting from 6 months and after 18 years they prefer bivalent Moderna vaccine. They

recommend 0.25mL injection volume till 5 years starting from 6 months, 0.5mL for 6 and above.

- **Johnson and Johnson:** Clinical experts recommend monovalent Johnson and Johnson for 18 years and older person with injection volume of 0.5mL.

From the above-mentioned data, clinical experts prefer monovalent for less than 18 years of age and after 18 years they prefer bivalent vaccine with increased injection volume which we can say about all above talked vaccines. Clinical experts also recommend booster dose for adults specially [15].

## Conclusion

So, after reviewing and comparing the efficacy of leading vaccines we come to conclude that the most effective vaccines are Sino vac and Pfizer with the efficacy rate of approximately 95% after 2<sup>nd</sup> dose of vaccination and Moderna and Johnson and Johnson comes on 2<sup>nd</sup> with 94% efficacy after 2<sup>nd</sup> dose and Zydus Cadila secure 3<sup>rd</sup> rank with 90% efficacy while the least effective vaccines are CanSino comes on number 4<sup>th</sup> with efficacy of 86% and Astra Zeneca with 82% Efficacy rate rank in number 5<sup>th</sup> in leading vaccines. Clinical experts recommend monovalent or bivalent vaccine as well as injection volume based on age of the person.

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