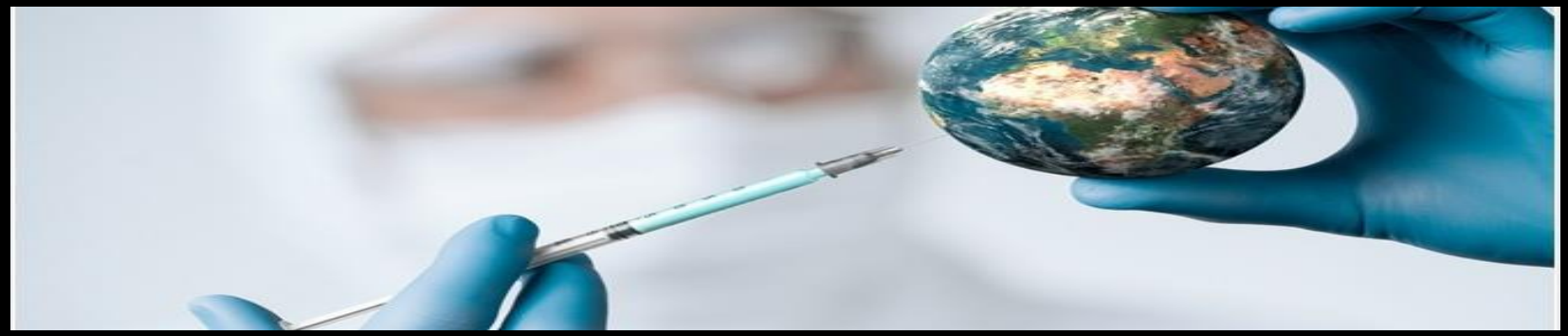
A COMPARITIVE STUDY ON THE EFFICACY & EFFECTIVENESS OF COVAXIN AND COVISHIELD



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ABSTRACT

The study's primary goal is to evaluate and compare how these two covid-19 vaccinations were carried out. The goal is to determine whether they are effective in preventing covid19 infection, lowering the severity of symptoms, and reducing hospitalizations and deaths.

The research method was based on two studies. In primary study, at first a list of potential respondents was developed & their contact details like phone number, email, whatsapp, facebook accounts the researcher or family members (including extended family members) have. Then afterwards, age was confirmed & a list was prepared between 18-65years. Keeping in view the lesser respondent rate for e-survey, as well as refusal, the friends who were not included in the final list were further be asked to share the survey tool to their contacts. Out of 125 people, 117 responded to the survey & the rest did not respond.

For secondary data, we did literature review using different search engines like google scholar, pub-med, research gate & various generals, press release magazines, brochures, pamphlets, cds, & written documents. (E.G., Inc42, daily hunt etc.). Data was be analyzed using different excel tools in terms of distribution, percentages & averages & represented in graphical & table format. Clinical trials were conducted on covaxin and covishield to assess its effectiveness and safety. The effectiveness of covishield is bit higher than covaxin, but it is debatable to compare the efficacy & effectiveness of both the vaccines in general.

A COMPARITIVE STUDY ON THE EFFICACY & EFFECTIVENESS OF COVAXIN AND COVISHIELD

- The novel human coronavirus disease 2019 (COVID-19) was first reported in Wuhan, china, in 2019, and subsequently spread globally to become the fifth documented pandemic since the 1918 flu pandemic. Coronavirus, brought about by the sars-cov-2 covid, is an infectious sickness that started in Wuhan, china in December 2019 and has since turned into a continuous pestilence. Coughing, sneezing, and speaking are the primary methods by which the virus is spread, with droplets typically falling to the ground or onto surfaces rather than traveling long distances through the air.
- The first official cases of covid-19 were recorded on the 31 December 2019, when the world health organization (who) was informed of cases of pneumonia in Wuhan, China, with no known cause. On the 7th of January, the Chinese authorities identified a novel coronavirus, temporally named 2019-ncov, as the cause of these cases. On the 1st of March 2020, the united nations released $15 million in funds to support the global COVID-19 response. A week later, on the 7th of march, cases of COVID-19 reached 100,000. Several days after that, on the 11th of march, COVID-19 was declared a pandemic by the WHO.

- The first case of covid-19 infection reported in Kerala, India. On January 27, 2020, a 20year old female presented to the emergency department in general hospital, Thrissur, Kerala, with a one-day history of dry cough and sore throat. The coronavirus disease (COVID-19) pandemic, which originated in the city of Wuhan, China, has quickly spread to various countries, with many cases having been reported worldwide. As of may 8th, 2020, 56,342 positive cases have been reported in India.
- To lessen the impact of covid-19 and bring an end to the pandemic, efforts were made to control the virus's spread and develop effective treatments and vaccines continue worldwide. The first COVID-19 vaccine administered worldwide was the Pfizer-Biotech vaccine. It was cleared for emergency use in the UK and handed over to the first recipient, Margaret Keenan, on 8 December 2020.In India, the vaccination campaign against COVID-19 started on January 16, 2021. The first vaccine administered in India was Covishield, a locally manufactured version of the oxford- Astrazeneca vaccine. The first recipient in India was a healthcare worker named Manish Kumar, who received the vaccine at the Indian institute of medical sciences (AIIMS) in Delhi. It should be noted that different countries started vaccination programs at different times and used different vaccines depending on availability and clearance in their regions.
- By utilizing the force of inoculation, worldwide endeavors were centered around controlling the spread of coronavirus, saving lives, and re-establishing cultural and financial predictability. In addition to other preventative measures like wearing masks, maintaining good hygiene, and adhering to local health guidelines, vaccinations were an essential tool in our collective fight against the pandemic.

Covishield vs Covaxin

Comparison Chart

Covishield	Covaxin
Developed by the University of Oxford and AstraZeneca, and locally manufactured by the Serum Institute of India.	Developed by Hyderabad-based Bharat Biotech in collaboration with ICMR and Pune-based National Institute of Virology.
Covishield is a Recombinant COVID-19 vaccine based on Viral Vector Technology which uses the chimpanzee adenovirus.	Covaxin is a whole inactivated COVID-19 vaccine candidate developed from the Indian strain of novel Coronavirus and made using dead viruses.
The number of doses in each vial is 10.	The number of doses in each vial is 20.
Efficacy goes up to 90% when there is a gap of more than 28 days between the doses.	An average efficacy of 60% to 70% based on the phase 3 clinical trials.

DB Difference Between.net

COMPARISON

AIM

- Any vaccination program aims to meet the burden of disease and vaccination in questions and for various goals, save many lives, prevent premature deaths, improve children's cognitive abilities, reduce health care costs, and reduce economic losses caused by lack of or access to medical care.

RESEARCH OBJECTIVE

- **RO 1**-to evaluate the efficacy & effectiveness of covishield & covaxin in protecting against COVID-19
- **RO 2**- to examine the duration of protection offered by these two vaccines against COVID-19 virus.
- **RO 3**-to evaluate the safety of covishield & covaxin including the possible side effects (if any).

RESEARCH QUESTION

- **RQ1**- what are the factors that affect the efficacy & effectiveness of covishield & covaxin in protecting against COVID-19?
- **RQ** 2- what is the duration of protection offered by covishield & covaxin against covid-19?
- **RQ3**-what is the public perception & acceptance of covishield & covaxin in terms of efficacy & safety?

LEARNINGS FROM REVIEW OF LITERATURE

Vaccine Development and Background:

- Provide an overview of covaxin and covishield, including their development process, technology platforms used, and manufacturers (Bharat biotech and serum institute of India, respectively).
- Discuss the importance of covid-19 vaccination and the need for comparative studies to assess the efficacy and efficiency of different vaccines.

EFFICACY:

- Evaluate the clinical trials of covaxin and covishield, highlighting the study design, sample size, participant demographics, and endpoints used to measure efficacy.
- Compare the vaccine efficacy results reported in the literature, including the prevention of symptomatic covid-19, severe disease, hospitalization, and mortality.
- Consider the variations in efficacy against different sars-cov-2 variants (e.g., Alpha, beta, delta) and any available data on vaccine effectiveness against emerging variants.

Immunogenicity and duration of protection:

- Review the literature on immune responses elicited by covaxin and covishield, such as the development of neutralizing antibodies, cellular immune responses, and t-cell activation.
- Examine the duration of protection provided by each vaccine, including data on antibody persistence and potential need for booster doses.

Vaccine deployment and public health impact:

- Discuss the global and national deployment strategies for covaxin and covishield, including their availability, distribution, and accessibility in different countries.
- Evaluate the impact of these vaccines on reducing covid-19 cases, hospitalizations, and mortality rates, based on real-world evidence and observational studies.
- Consider the socioeconomic factors influencing vaccine uptake, public acceptance, and vaccine hesitancy for both Covaxin and Covishield.

Cost and manufacturing considerations:

- Analyze the cost-effectiveness and affordability of Covaxin and covishield, considering factors such as vaccine procurement, production scale, and global pricing.
- Discuss the challenges and successes in manufacturing these vaccines, including capacity, supply chain logistics, and technology transfer.

SAFETY AND ADVERSE EVENTS:

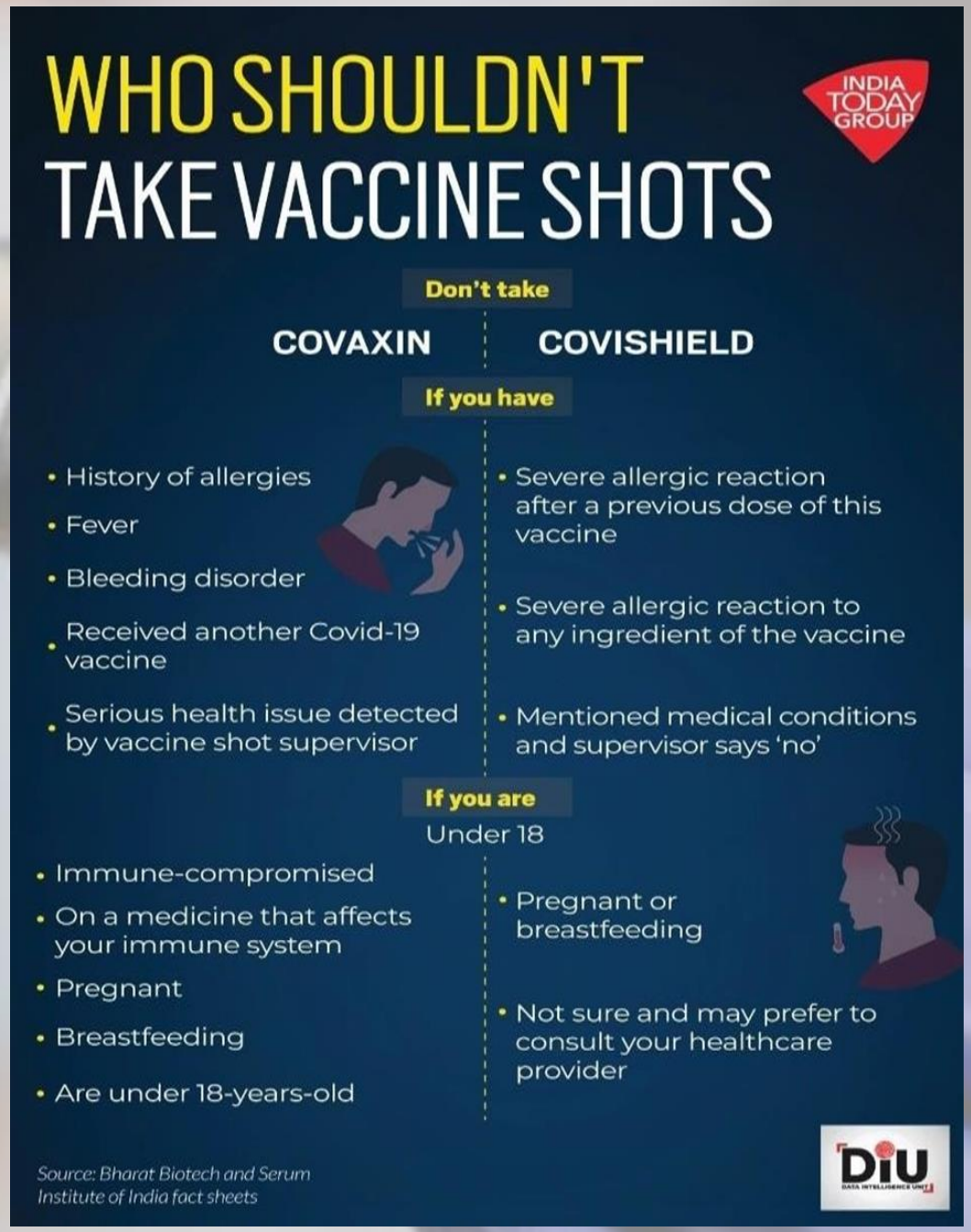
- Assess the safety profiles of covaxin and covishield based on clinical trial data, post-authorization monitoring, and real-world evidence.
- Discuss common and rare adverse events reported with each vaccine, including local and systemic reactions, allergic reactions, or any other safety concerns.
- Compare the incidence and severity of adverse events between the two vaccines.
- **Methodology**

Purposive sampling was used. This study was carried out in two parts respectively-

- In primary study, data was collected through questionnaire & responses of the participantswere recorded.
- In the secondary study, literatures review was done & articles and journals were referred.

STUDY DESIGN

- My study was observational in nature (comparative study).



METHOD FOR RESEARCH

- The two primary types of research methods used were qualitative and quantitative methods.Both approaches were utilized to meet the requirements of this study's research. Non-numerical data was examined using the qualitative method, while numerical data, facts, and figures were examined using the quantitative method.
- This work made use of both methods to comprehend the statistical components and link them to theoretical data.

Method for data collection

Primary data:

- A self-administered online survey form [or google form] was used as a tool to gather the primary data.
- The e-survey tool has two sections: consent and then main part. If the respondent gave consent, the main part had opened. Otherwise, the survey was closed after the consent part saying thanks.
- The tool was pre-tested with some friends who did not belong to College of Military Engineering, Pune.

Secondary data:

- Literature review using various search engines like google scholar, pub-med, research gate and various journals; press release magazines, brochures, pamphlets, cds, and written documents. (E.G., Inc 42, daily hunt etc.).

DATA SOURCE

- The questionnaire was the most important data source for this study. Also, existing comparativestudies for covaxin and covishield served as essential references. Scientific journals and publications have compared the two vaccines for providing individual data on covaxin and covishield. These studies offered insights into the vaccines' efficacy, immunogenicity, and adverse effects.

DATA ANALYSIS-

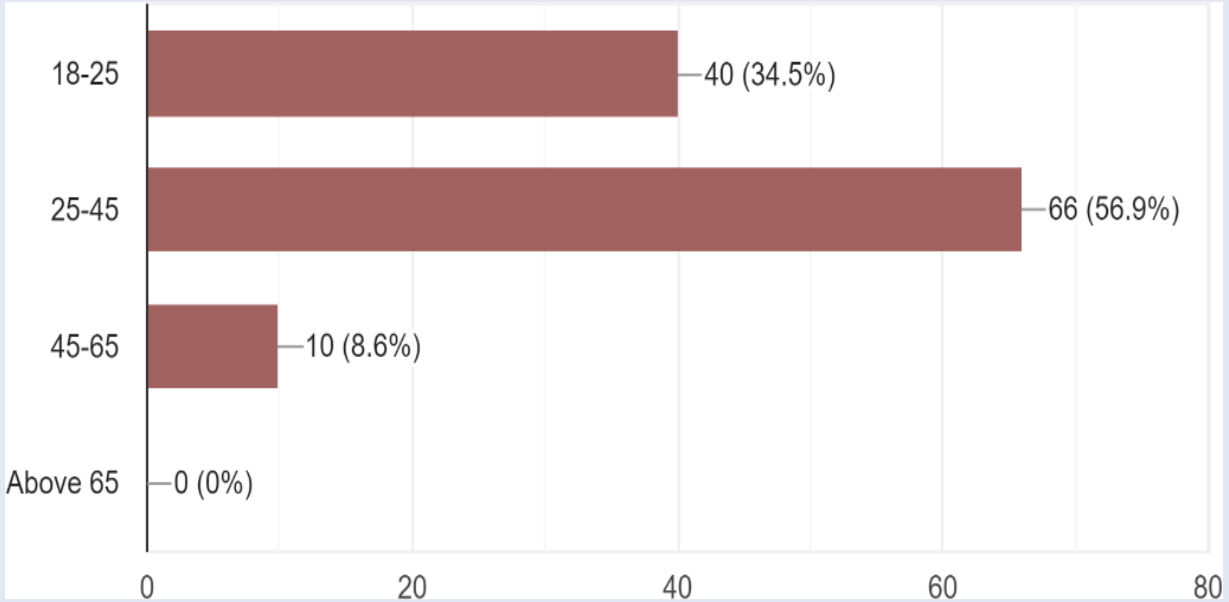
For the data examination, in this study utilized a subjective procedure of study. I have summed up the meeting answers and have drawn the outcomes. In this, all the responses were taken into consideration.There are a total of 25 questions that were asked to the participants & only the most relevant for the study were considered.

- Firstly, the entire data was put into spreadsheet to make it easier for analysis. The complete analysis was done using ms-excel. The questions which seem relevant were primarily considered & result for them was drawn on priority. Formula was used to carry out the percentage.
- As there were a total of 117 participants out of 125 who participated in the survey.
- So, 117/125*100 =93.6% people took part voluntarily in this survey.
- And on117 participants the questionnaire was conducted based upon their responses.
- Percentage was calculated using the basic mathematical formula & graphs were drawn (pie-charts & histograms)
- Formula (%) = VALUE/ TOTAL VALUES*1OO
- Hence, calculated using this formula & graphs were plotted, respectively.

RESULT

- **Fig1** depicts that around three-fourth (56.9%) respondents out of 117 fall under the age group of 25- 45yrs, more than one-third (34.5%) respondents comes under the ager group of 18-25yrs, rest 8.6% comes under 45-65 yrs. None were found to be in the age group of above 65yrs.

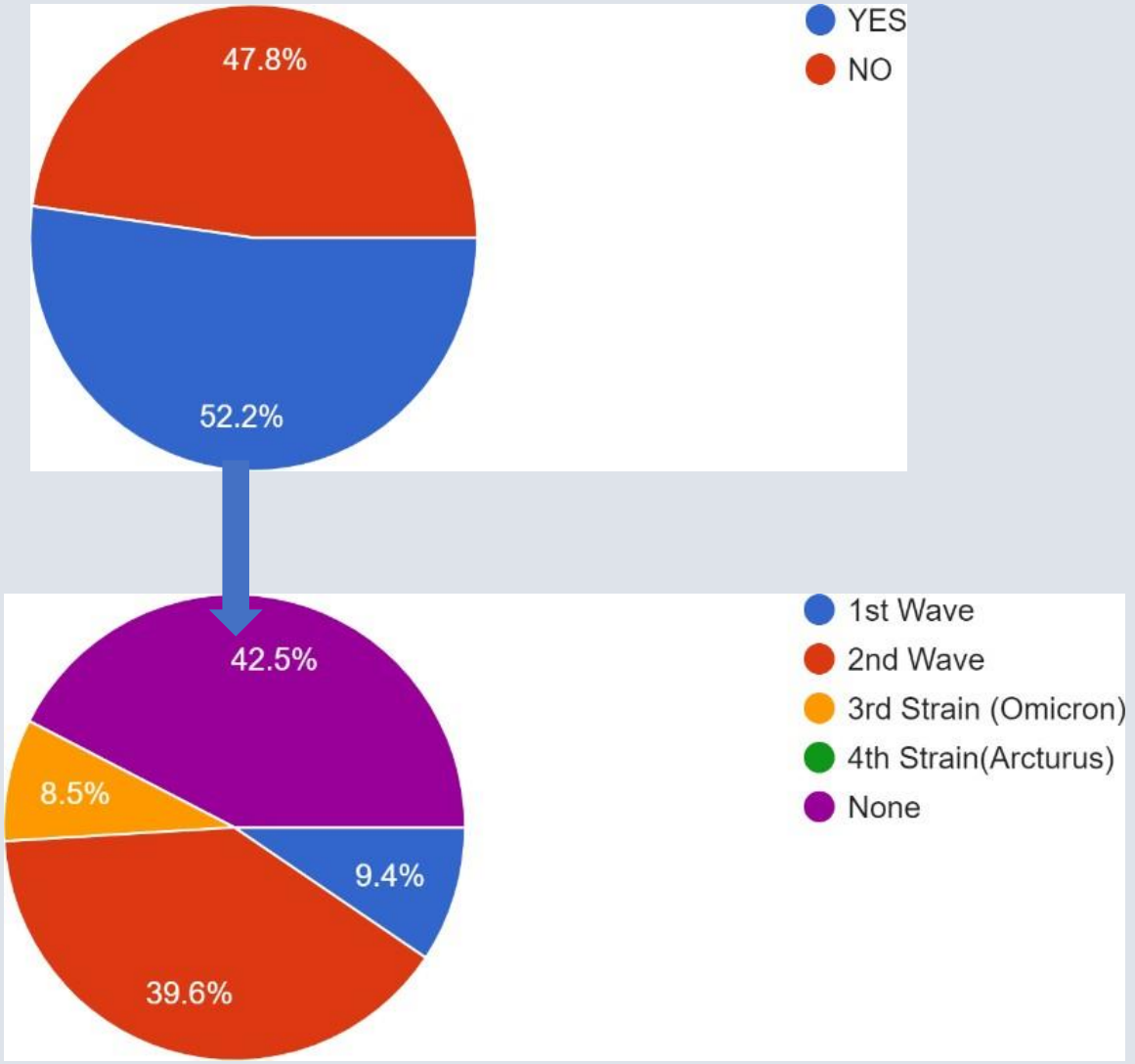
Figure 1: Age Distribution Of The Respondents



RESULT

- **Fig 2** reflects that there were a total of 64 male, accounting for 54.7% & 53 females that accounts for 45.3% out of 117 who participated.
- 60 participants were affected during covid-19, which turns out to be 52.2%. Out of which - 9.4% got affected in first wave, 39.6% got affected in second wave, 8.5% & none in the fourth wave. There was a total of 45 participants who were not affected in any wave, which accounts to 42.5%

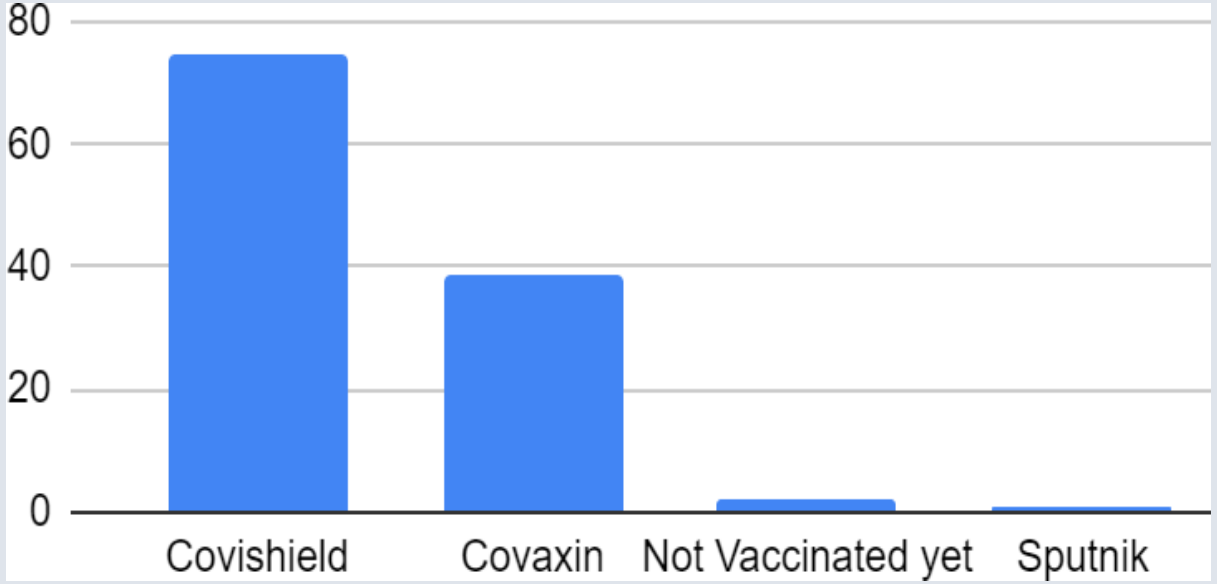
Figure 2: PEOPLE EXPERIENCED COVID



RESULT

- **Fig 3 states that** according to the data provided, most participants, 75 out of 117 (64.1%), received the covishield vaccine. Following closely behind, 39 participants (33.3%) received the covaxin vaccine. A small number of participants received the sputnik vaccine. Surprisingly, there are still 2 participants (1.7%) who have not received any vaccination yet. These numbers reflect the distribution of vaccines among the participants, highlighting the prevalence of covishield and covaxin as the primary choices, with a smaller number opting for sputnik, while a few individuals remain unvaccinated at this point.

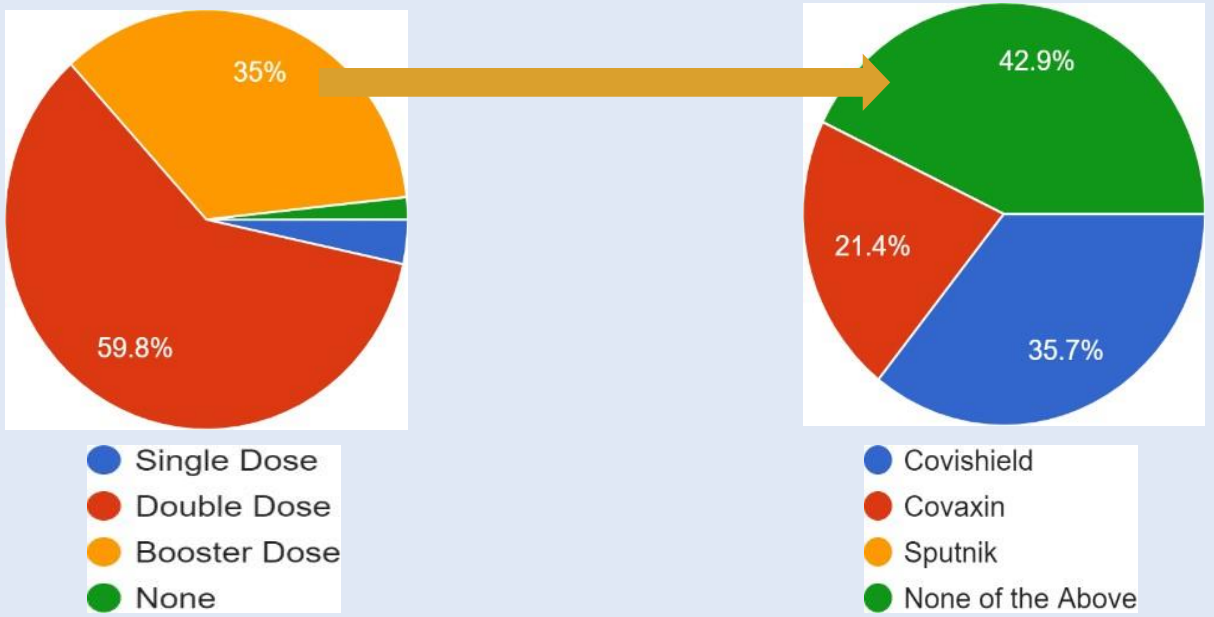
Figure 3: TYPE OF VACCINATION RECEIVED



RESULT

- States that out of the 35% - which is 30 partipants who received the booster dose maximum participants preferred covishield over covaxin due to their preferred advantantages.

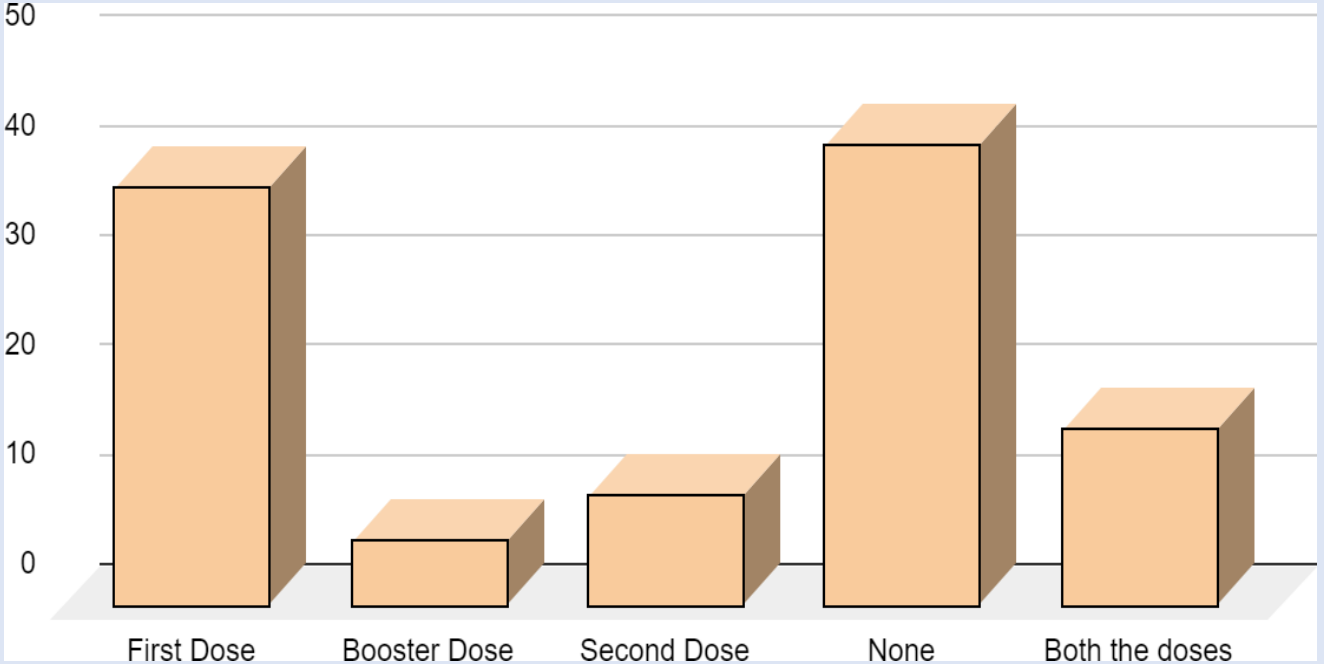
Figure 4- Types & Frequency of vaccine



RESULT

- **In Fig 5** the maximum effect of adversity was seen after first dose which is 38 out 117 accounting to 33% and the rest comparatively lesser affect which is 10 for dose 2 (9%), for both the doses – 16 (15%) and the rest showing no adverse effects – 42(37%).

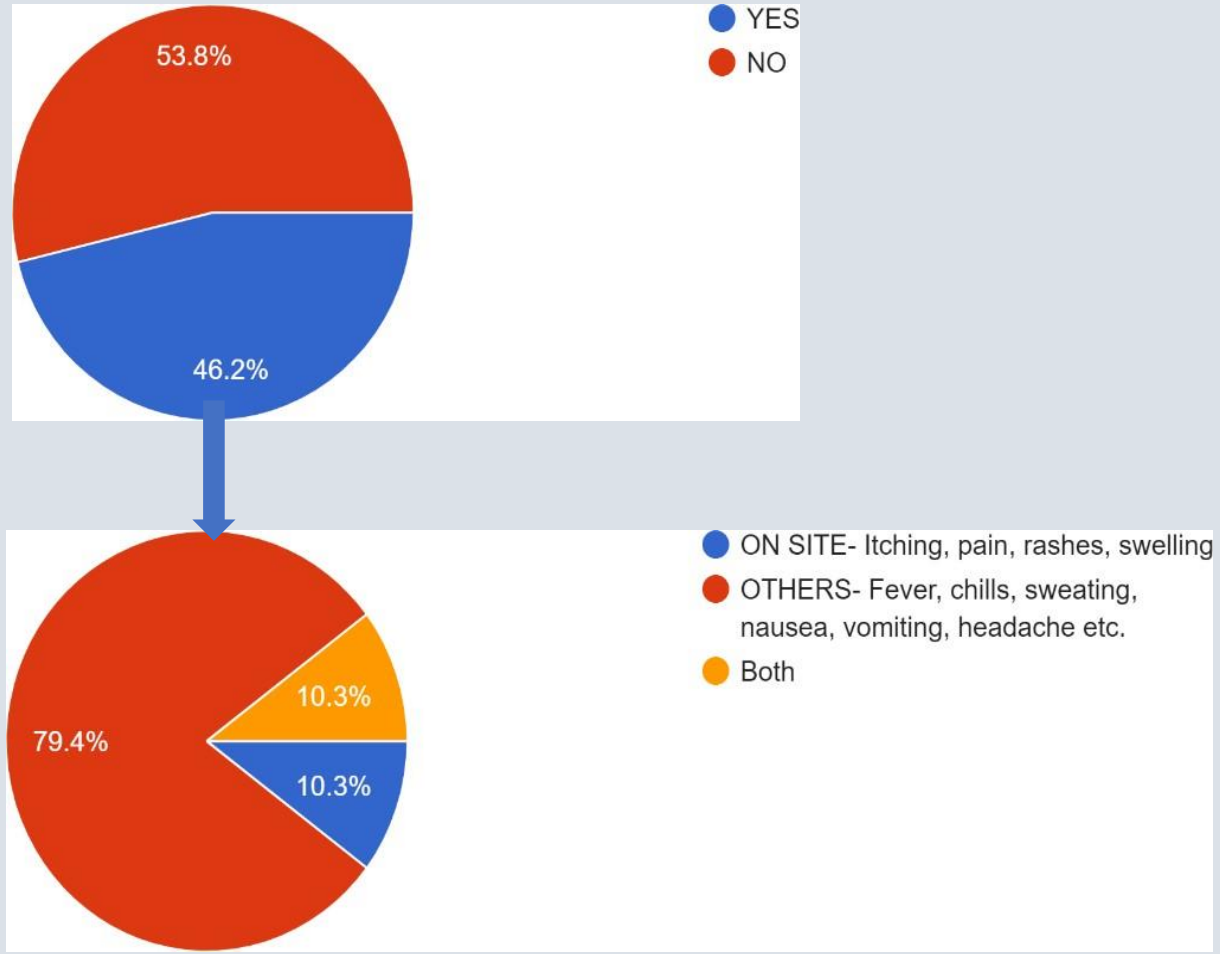
Figure 5:ADVERSE EFFECT AFTER RECEIVING THE DOSE



RESULT

- **Fig 6.** Reflects that there are a total of 54 participants out of 117 (46.2%) - Out of 46.2% participants 79.4% have side effects that includes fever, chills, sweating, nausea, vomiting, headache etc. 10.3% have experienced on site symptoms & both who have experienced side effects after receiving vaccine & 63 participants (53.8%) have not experienced anything after vaccination.

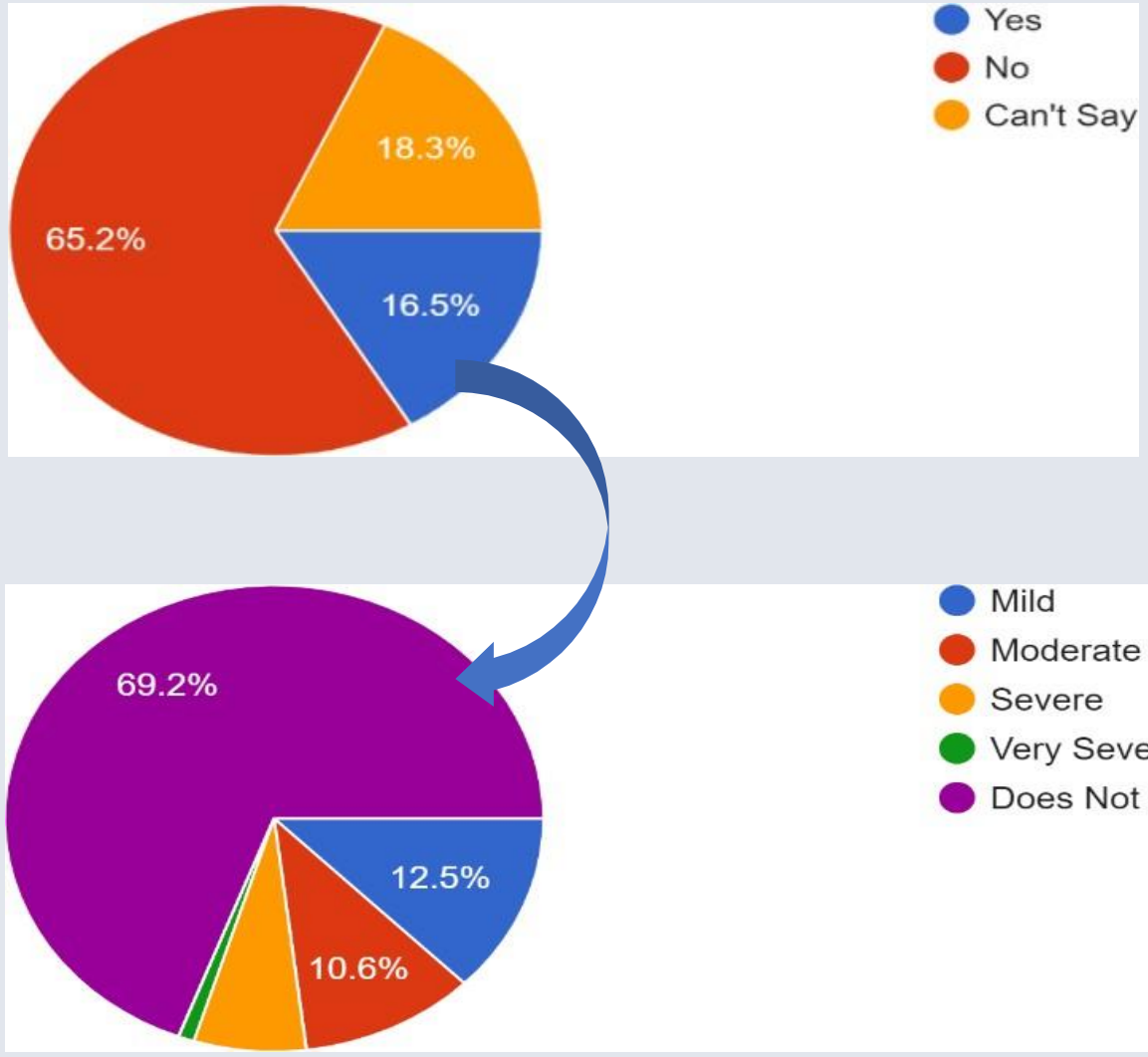
Figure 6: SIDE EFFECTS AFTER RECEIVING



RESULT

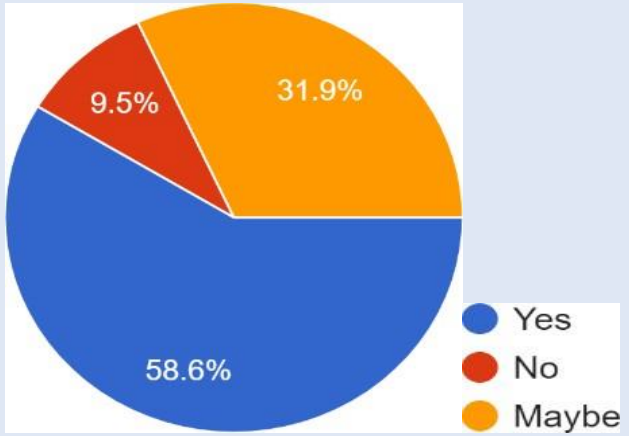
- Out of 117 participants, 19 suffered from covid after vaccination. Fig7 implies that (16.5%)- out of which 12.5% showed mild symptoms, 10.6 % showed moderate symptoms & rest 70% with no symptoms. &75 did not suffer from covid post vaccination. (65.2%).

Figure 7: SUFFERED WITH COVID POST VACCINATION



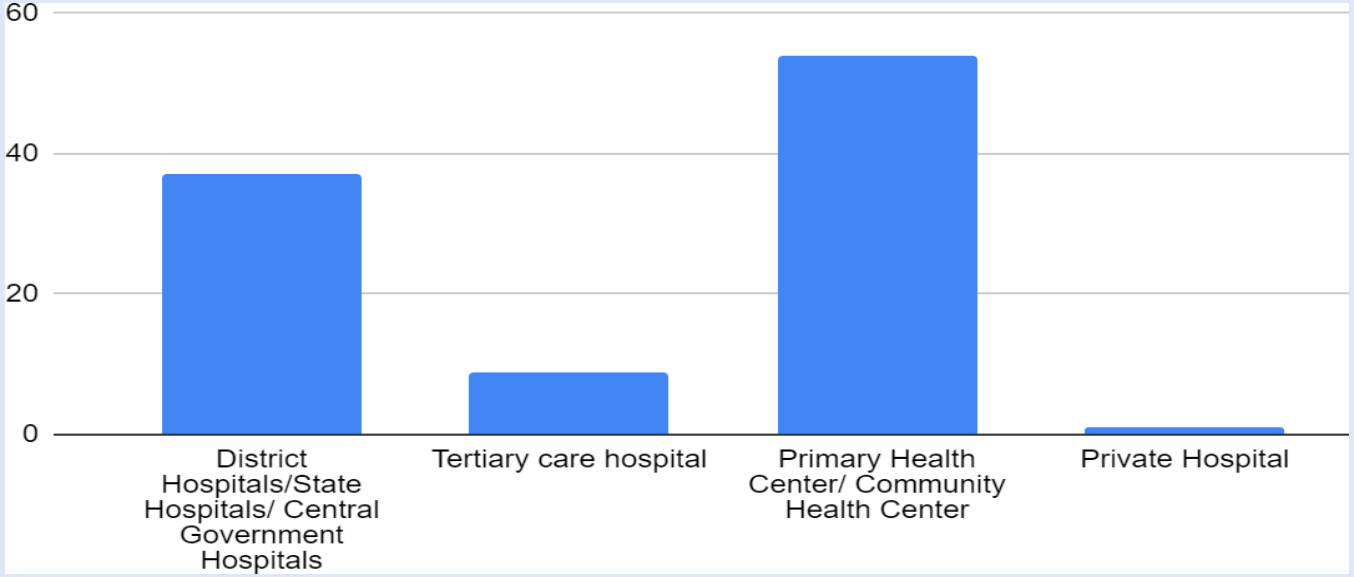
RESULT

Figure 8: SAFETY AGAINST COVID AFTER VACCINATION



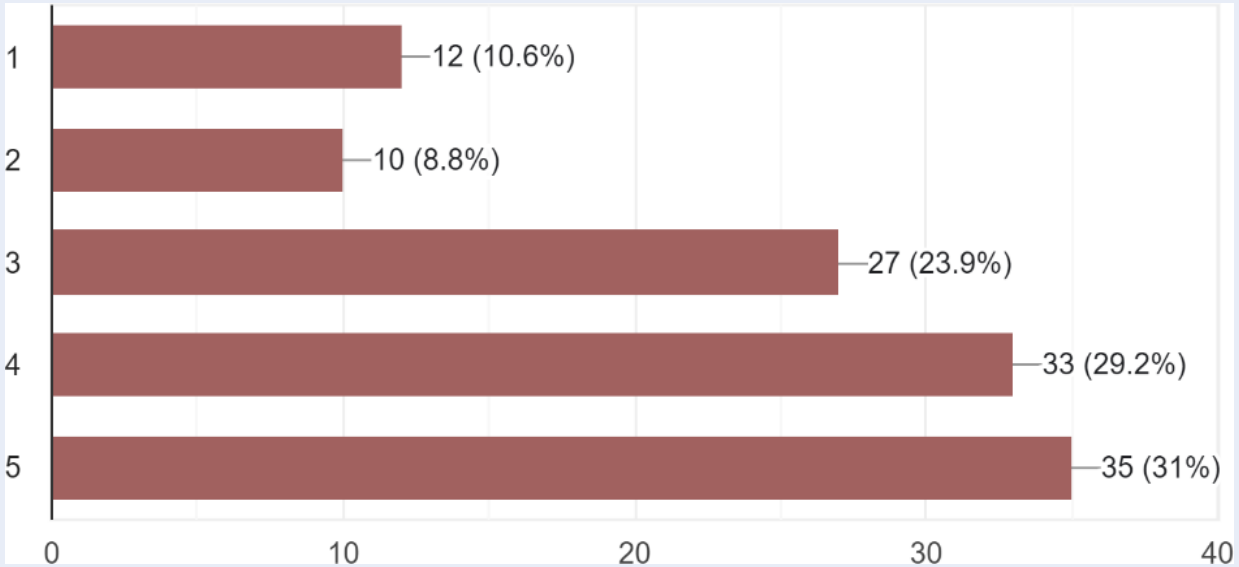
- **Fig 8.** Implies that Out of 117 participants, 66 were confident of vaccine , 15 were not confident & rest 46 were unsure about the confidence in Vaccination

Figure 9: ACCESIBILTY TO VACCINATION



- It is evident from Figure 9 that around 50% had access to primary health center & 30 % had access to Govt Hospitals & the rest preferred tertiary and private health facilities for the vaccination.

Figure 11: SIDE EFFECTS FOLLOWING A MEDICAL CONDITION



- **Fig 10.** Implies that Here a scale of 1-5 is taken. Where 1 indicates least confident and 5 indicates most confident. Hence, if we observe it on an average around 60% of participants (4-5) feel confident about the vaccination, which accounts to majority being very confident of vaccine.

FIGURE 11: SIDE EFFECTS FOLLOWING A MEDICAL CONDITION

- **Fig 11** reveals that participants with a medical condition around 19% suffered with side affects following the vaccination where in around 60% faced weakness & fatigue, around 10% faced mental illness & multiple organ failures & the rest faced other severe ailments

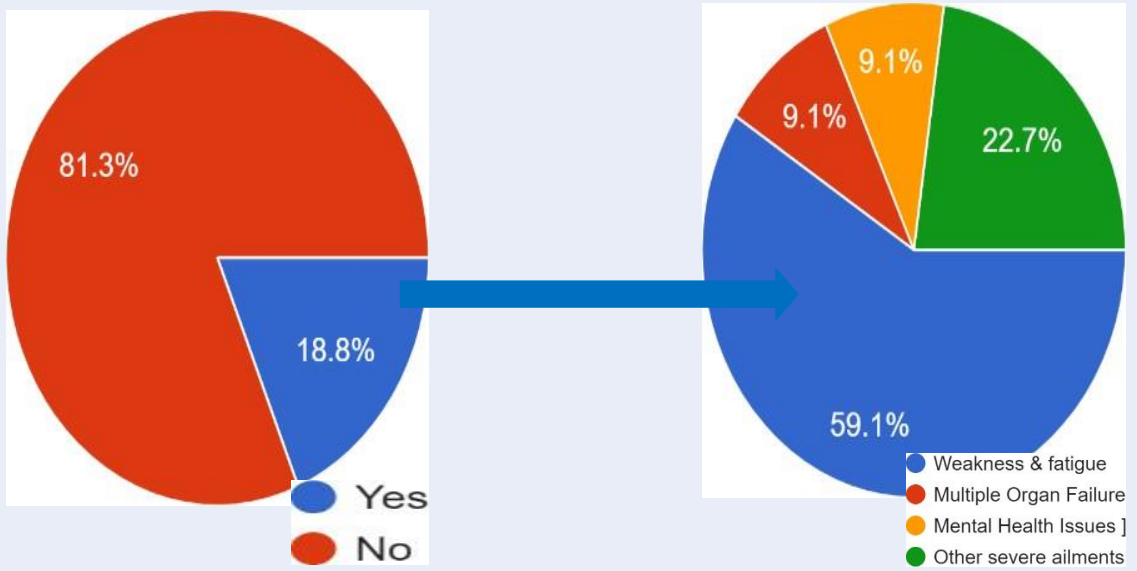
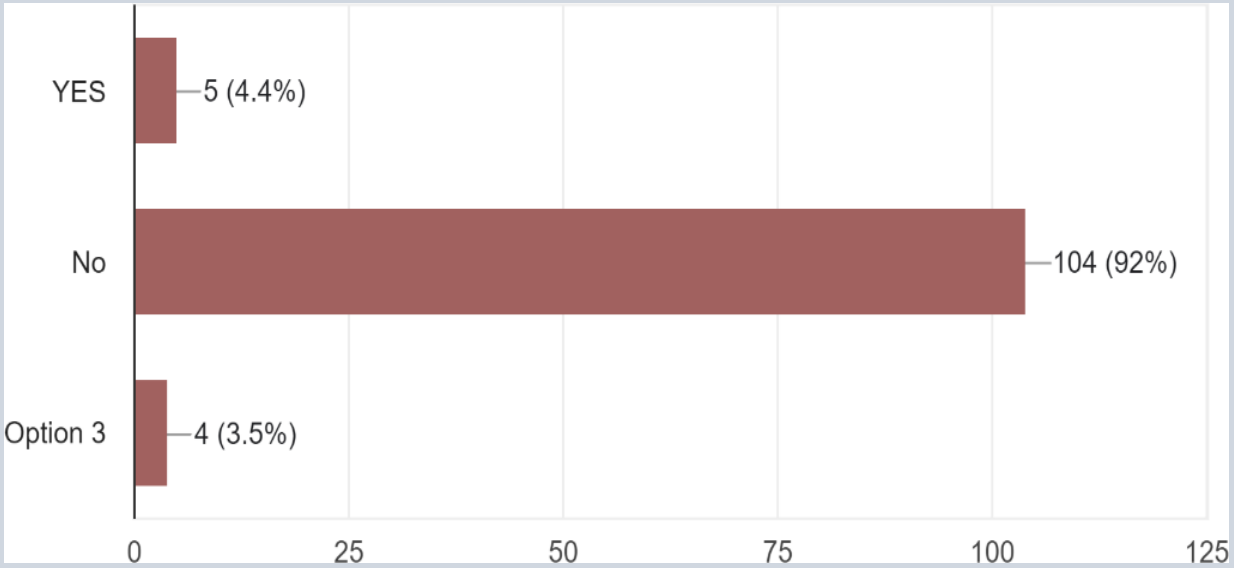


Figure 12: BEEN HOSPITALISED FOR ANY MEDICAL CONDITION FOLLOWING COVID



- It is evident from Figure12 that participants who were hospitalized following were very less accounting to just 5% (5 participants) & the rest weren't hospitalized.

FIGURE 13: ALOS AT HOSPITAL FOR COVID TREATMENT

- **Fig 13.** Clearly states that participants who were hospitalized for one week were around 10, & for 10- 15 days were around 8. It is significant that around 65 participants were not hospitalized & very less participants were admitted over a month for treatment.

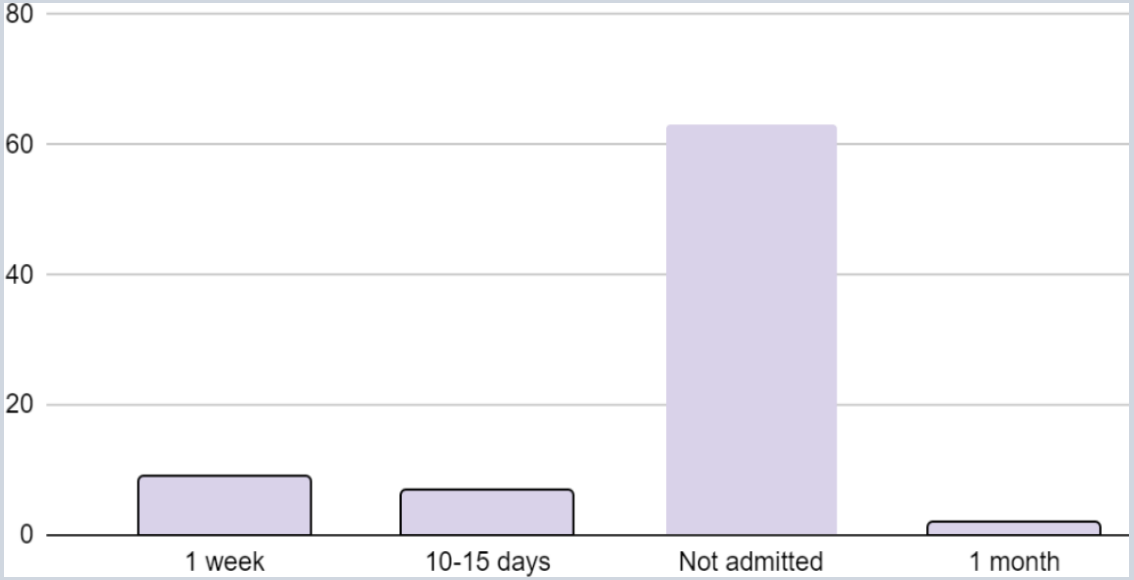
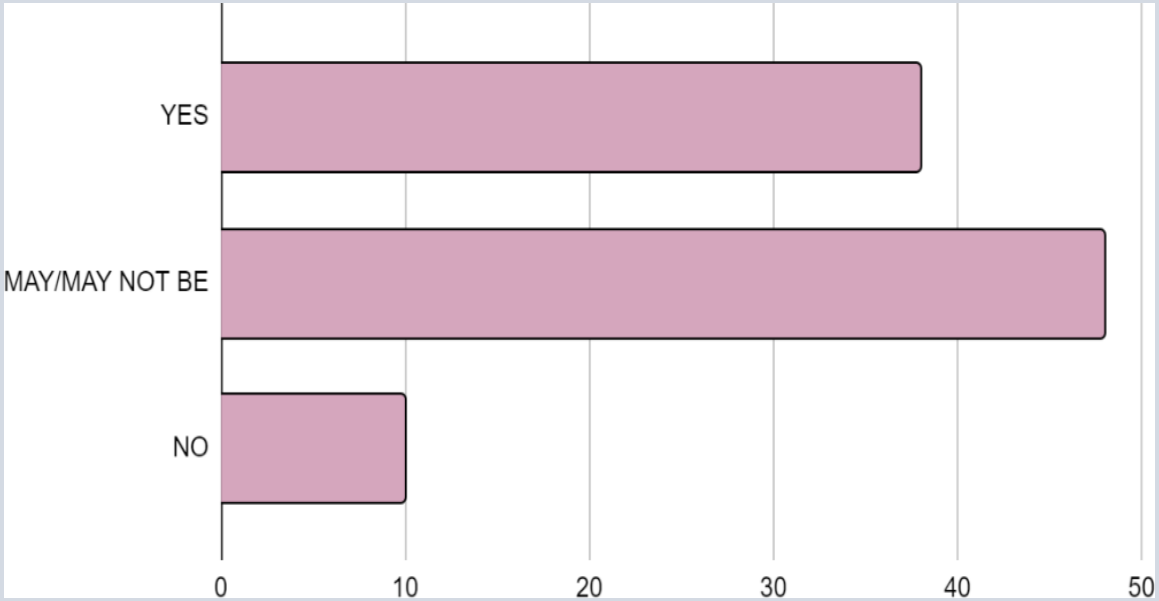


Figure 14: Effectiveness of booster (& if it should be taken mandatorily by each & every individual)

- **Fig 14** reflects that 42 participants out of 117 have felt the effectiveness for booster dose, while only 15 participants denied the same & the rest were not sure about its effectiveness.



Hence, from the responses on the questionnaire (primary data) & the secondary data, it is found that Covishield is more effective than covaxin due to the following reasons-

- Due to less side effects than covaxin.
- Due to better availability at various healthcare facilities.

CONCLUSION

The efficacy & effectiveness of Covishield & Covaxin in protecting against COVID-19

- Referring to our data, around 75 out 0f 117 participants have received covishield & only 39 participants have received Covaxin.
- It is important to note that vaccine efficacy and effectiveness can vary based on several factors, including the study population, the prevalence of different variants, and the time elapsed since vaccination.
- Additionally, the efficacy and effectiveness of both covishield and covaxin against emerging variants, such as the delta and other variants of concern, may evolve over time as new data becomes available.

TO EXAMINE THE DURATION OF PROTECTION OFFERED BY THESE TWO VACCINES AGAINST COVID-19 VIRUS

- Covaxin, created by Bharat Biotech in India, was an inactivated immunization. Clinical preliminary information around then recommended that Covaxin gave assurance against Coronavirus after two dosages. Nonetheless, the length of security presented by Covaxin was not broadly considered or laid out by that point.
- Covishield, created by the College of Oxford and AstraZeneca, was a viral vector immunization in the light of a chimpanzee adenovirus. The clinical preliminaries of Covishield showed that it gave assurance against Coronavirus after two dosages. The term of security presented by Covishield was additionally not set in stone during my last update.
- It was critical to take note of that examination and concentrates on Coronavirus antibodies are progressing, and new data is continually arising. I would suggest counseling refreshed sources, for example, official wellbeing associations or late logical examinations for the most dependable and exceptional data on the length of assurance given by Covaxin and Covishield against Coronavirus.

TO EVALUATE THE SAFETY OF COVISHIELD & COVAXIN INCLUDING THE POSSIBLE SIDE EFFECTS (IF ANY)

- Covishield (Oxford-AstraZeneca vaccine) received emergency use authorization in India. Covaxin (Bharat Biotech vaccine) also underwent rigorous testing in clinical trials to establish its safety and effectiveness. Common side effects include pain at the injection site, headache, fatigue, muscle pain, fever, nausea, and joint pain. Severe allergic reactions to the vaccine are rare but possible but can occur.
- As a result of the global emergency, these factors are likely to guide drug research and development, particularly during pandemics. In the light of the doubts among public following the vaccine's emergency approval, the study attempted to influence concerns regarding the vaccine's safety. The study's highlight is the absence of serious side effects and systemic effects that affected day-to-day activities.
- Our population's relatively lower severity of adverse effects and systemic effects may indicate better tolerability in this region. In India, there are currently no data on post-vaccination safety. It is debatable whether vaccination should be delayed until long-term safety data are available.
- In this unique circumstance, our review turns out to be more applicable in dispersing transient security information post-immunization. People will be benefitted from this when making the decision to self-vaccinate.

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Thank you