

# A STUDY OF VACCINATION DRIVE TOWARDS COVID-19 IN SANGLI AND KOLHAPUR DISTRICT OF MAHARASHTRA, INDIA

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## ABSTRACT

Vaccination is administration of vaccine to help the immune system develop protection from diseases. The ongoing Covid-19 pandemic has been unstoppable across the globe and pandemic. Arrival of vaccine on horizon has raised hopes of termination of pandemic in near future. India from June 21, every citizen above 18 years will be vaccinated free of cost. However, this can be available only at vaccination centers run by State and Centre government. Vaccination database uses the most recent official number from Government and The Health Ministries worldwide 26% of world population has received 3.7 billion doses of vaccine has been administered 31.14 million are now administered each day. The aim of this paper is to analyse statistically the total vaccination Age- wise vaccination, preference of vaccine in Kolhapur and Sangli district of Maharashtra state, India.

Key Words- Statistical analysis, Covid-19, Vaccination.

### 1. Introduction-

In early December 2020, WHO has started the mass vaccination programme and they also administered the number of vaccination doses on a daily basis. To protect people against harmful diseases, vaccination is a simple, effective and safe way. They make your immune system stronger and use your body's natural defenses to build resistance to specific infection [1]. In India Oxford–AstraZeneca vaccine (manufactured under license by Serum Institute of India under the trade name Covishield) and Covaxin (a vaccine developed locally by Bharat Biotech) initially approved by Indian Government.

One of the studies conducted by William Joe, Assistant Professor at the Population Research Centre at the Institute of Economic Growth, Delhi suggested that in Indian women who contract COVID-19 are at a higher risk of dying than men, a recent study of cases until May 20, 2020 and they found that 3.3% of infected women died of the disease compared to 2.9% of men. It suggests that the overall risk of mortality among women is slightly higher than men [2]. One of the study conducted by Cathleen O'Grady said that "COVID-19 affects men and women differently. So why don't clinical trials report gender data?" They further said that COVID-19 doesn't strike the sexes equally. Globally, for every 10 COVID-19 intensive care unit admissions among women, there are 18 for men; for every 10 women who die of COVID-19, 15 men die [3]. However, no such studies were conducted to analyze the gender disparities towards COVID-19 Vaccination in Maharashtra State, India. Our study focuses on identifying significant relationship between gender and vaccination efforts took place at Maharashtra.

### 2. Aim and Objective

- To analyse the total vaccination in Kolhapur and Sangli district.
- To find out the trend of vaccination in Sangli and Kolhapur district.
- To test whether Covaxin and Covishield vaccine preference in Sangli and

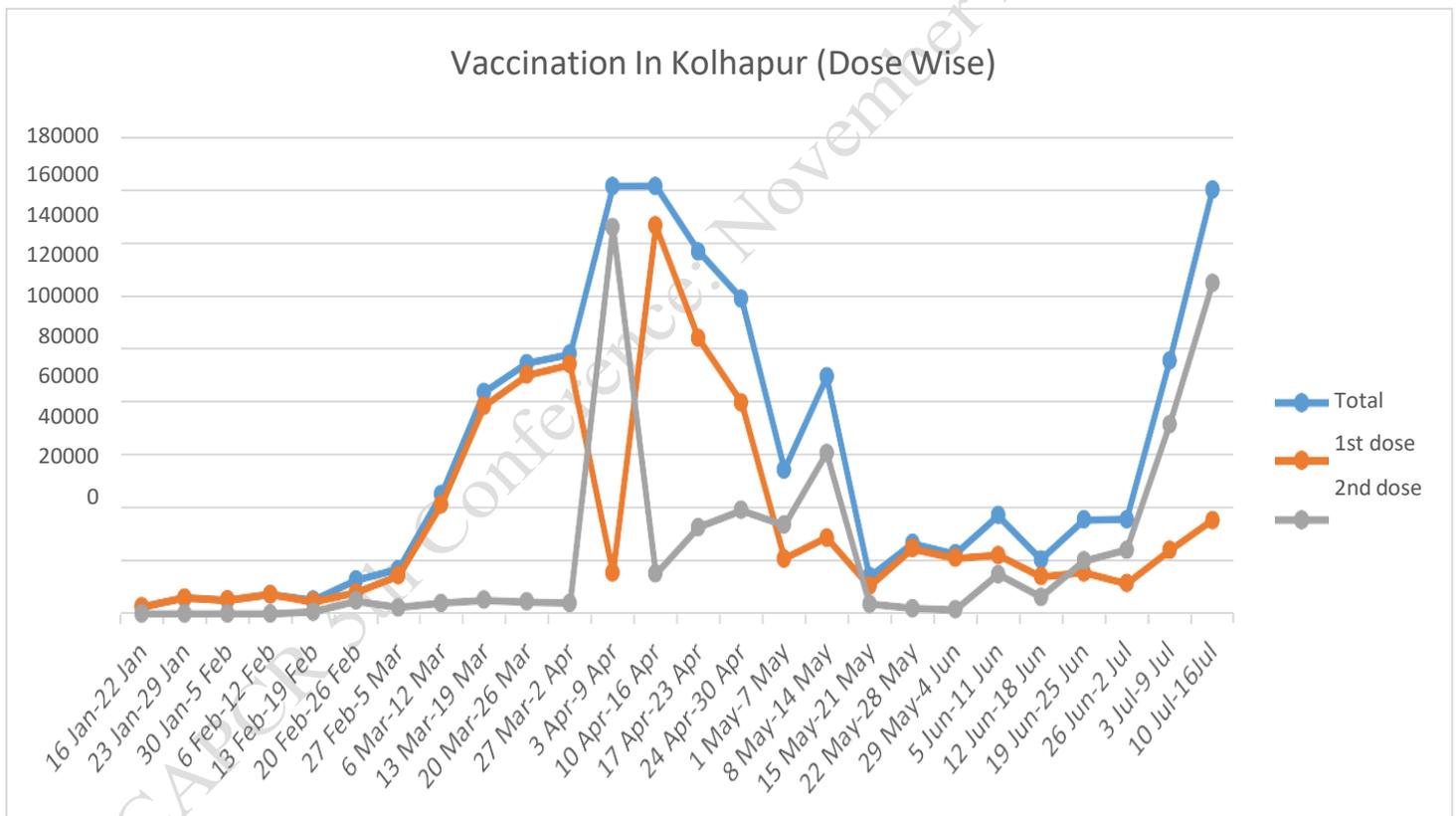
Kolhapur district.

- To analysis the age wise vaccination in Sangli and Kolhapur district.
- To compare 1<sup>st</sup> and 2<sup>nd</sup> dose completion in Sangli and Kolhapur district by Graphical Method.
- To test the Proportion of mean vaccination of Kolhapur and Sangli District
- To estimate the correlation coefficient between Kolhapur and Sangli district for total vaccination.

### 3. method of data collection

We used the secondary data for survey. Aarogya Setu app and other government websites is our data collection platform.

### Vaccination In Kolhapur District

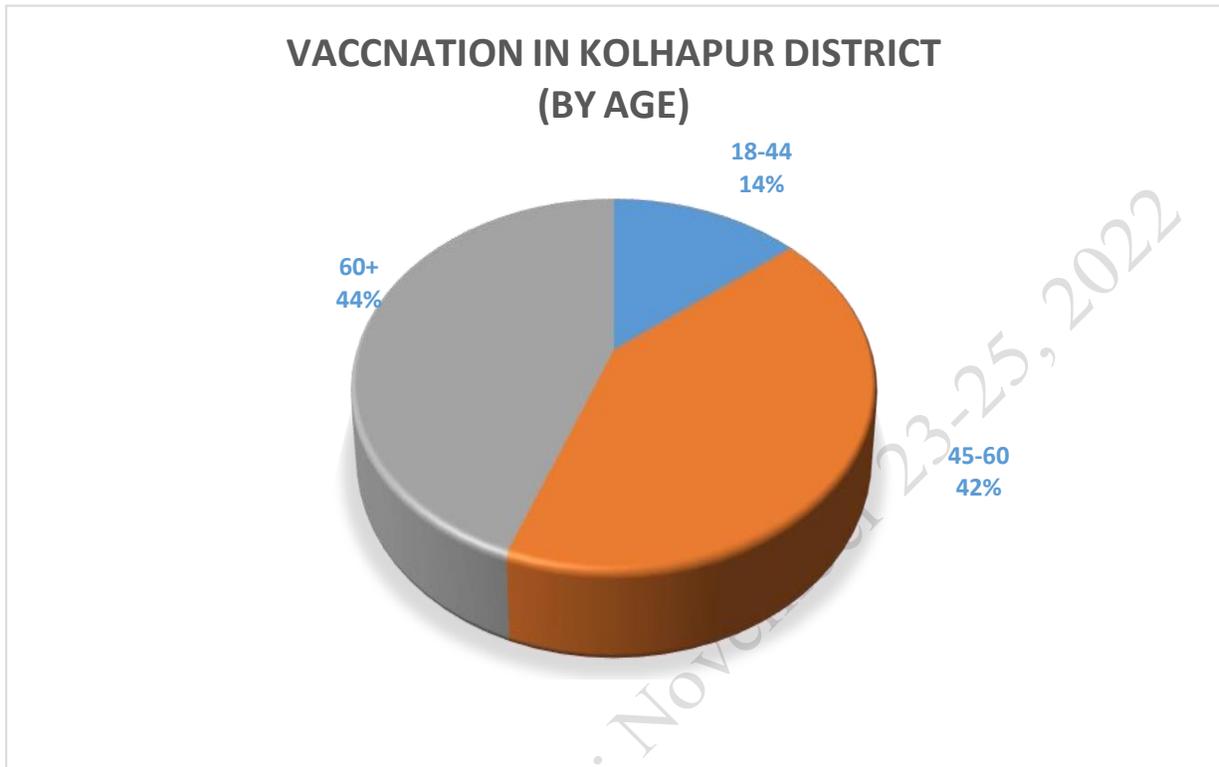


### 1. Doses Wise (Total Doses, 1<sup>st</sup> Doses, 2<sup>nd</sup> Doses)

Conclusion by graph:

From above graph the number of total dose increases upto second week of April then it is decreases and again increases upto 14 may then it gradually decrease. It suddenly increases from 2 July. Frist and second dose trend is approximately same as total dose trend.

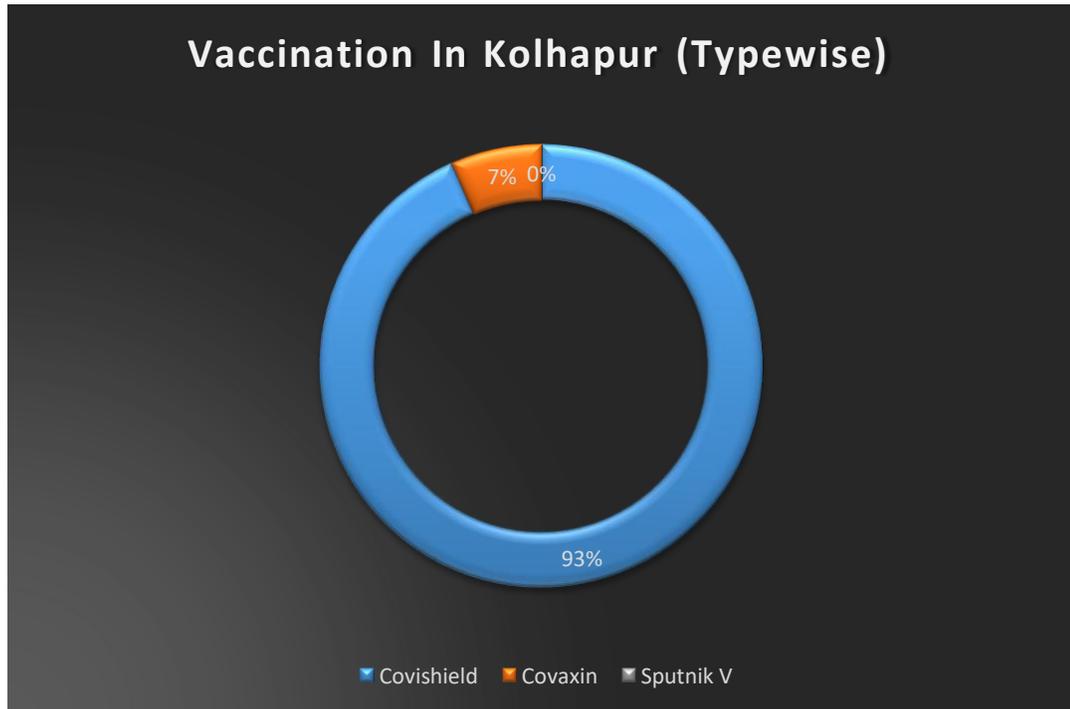
## 2. Vaccination By Age



Conclusion by graph:

From the above pie chart, we can observe that the above 60+ and above 45+ age people are get vaccinated in difference of 2% it means they are nearly in same stage.

3. Type Wise :

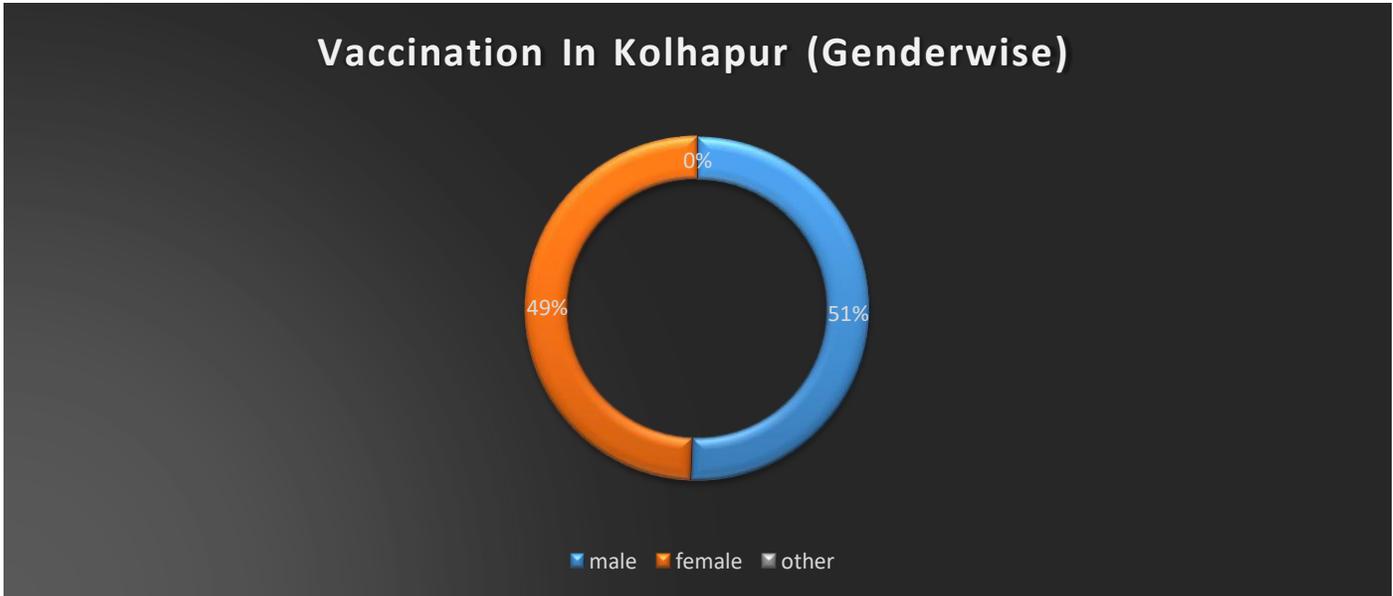


Conclusion By Graph :

According to this survey preference of people towards the Covishild vaccine is much more than Covaxin and Sputink-V vaccine.

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4. Gender Wise:



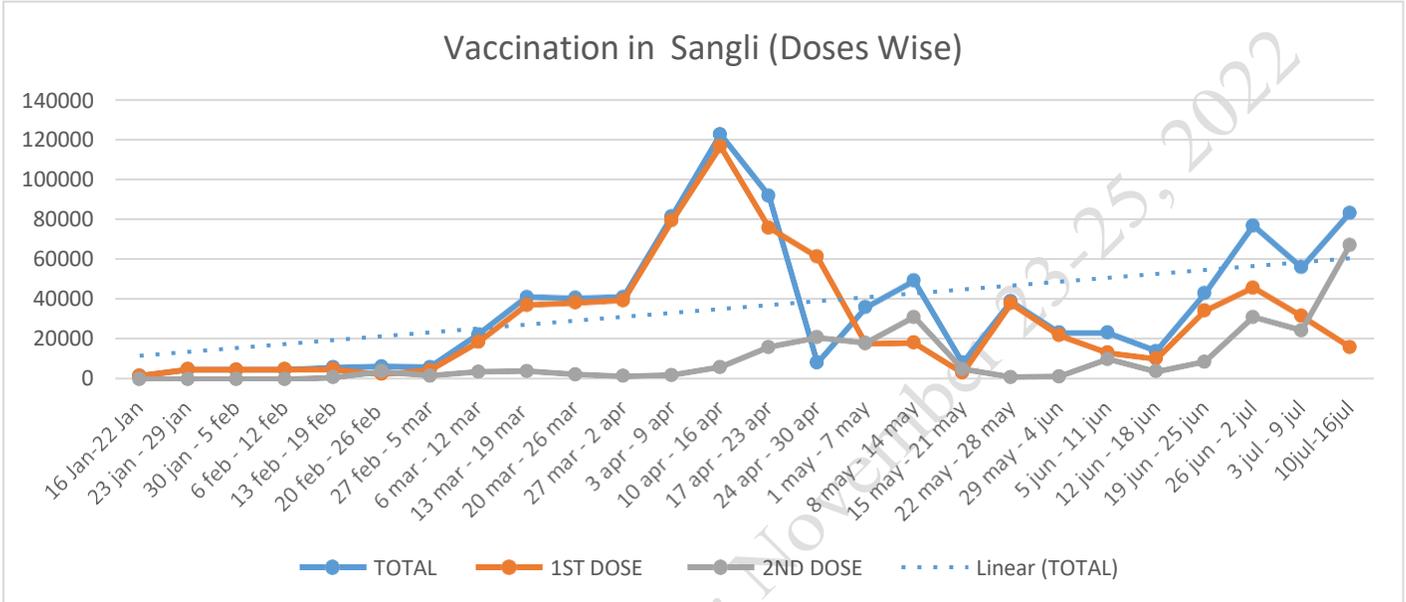
Conclusion By Graph :

Above graph clearly shows that In Kolhapur district both Male and Female almost get vaccinated at the same level.

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## Vaccination In Sangli District

### 1. Doses wise (Total Doses, 1<sup>st</sup>Doses, 2<sup>nd</sup>Doses)

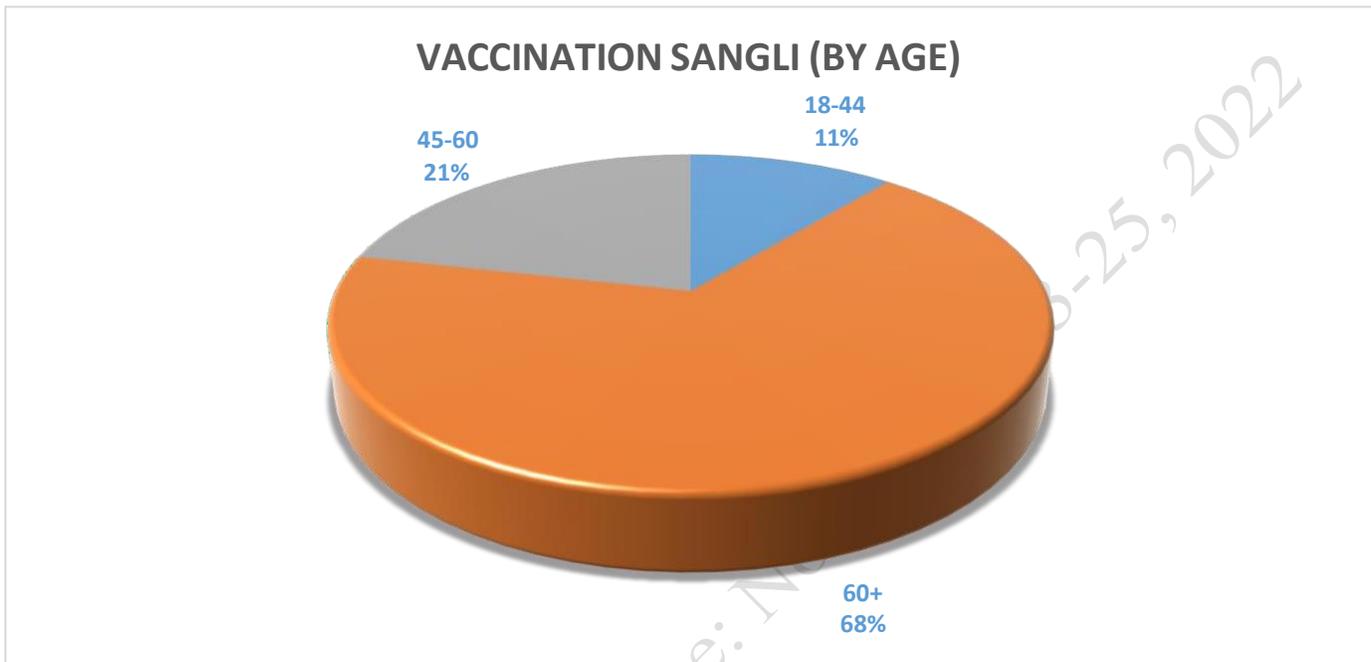


#### Conclusion By Graph :

From the above graph the number of total dose increases upto 2 week of April then it decreases and again increases upto 14 may then it decreases and goes on slowly increases.

Frist and second dose trend is approximately same as total does trend.

2. Vaccination By Age :

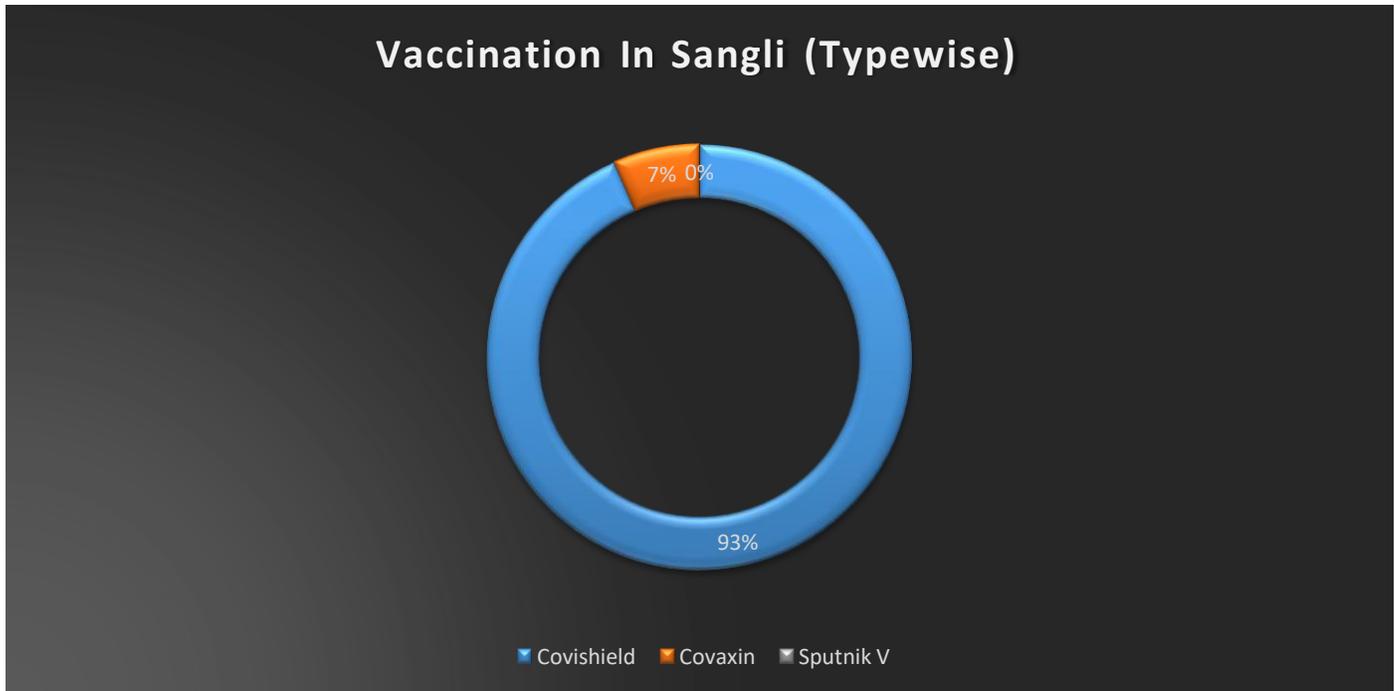


Conclusion By Graph:

From above Pie chart we can say that people of above 60+ old get more vaccinated than the age below 60 years.

Because the risk of severe illness from Covid -19 increases with age so they get more vaccinated.

3. Type Wise :

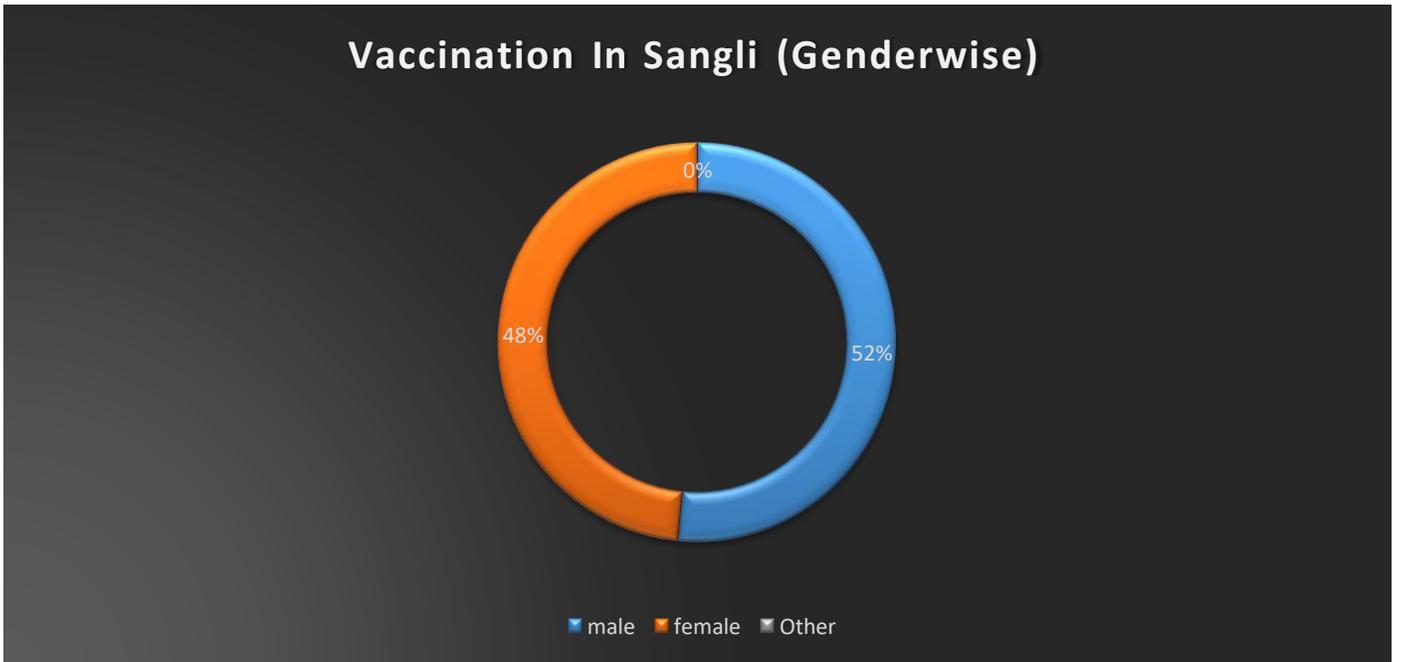


**Conclusion By Graph:**

From above pie chart we observe that the use of Covishield vaccine is more as compared to Covaxin and Sputnik-V because the Covishield is mostly available on all the vaccination centre and the effectiveness of this vaccine is nearly 90% as per globe.

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4. Gender Wise :



Conclusion By Graph: Given data and graph shows that the in Sangli district number of vaccinated males is more than females.

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calculation:-

$$r = \frac{\sum(x_1 - \bar{x})(y_1 - \bar{y})}{\sqrt{\sum(x_1 - \bar{x})^2 \sum(y_1 - \bar{y})^2}}$$

$$= \frac{4.834 * 10^{10}}{\sqrt{(7.7370 * 10^{10}) * (3.040 * 10^{10})}}$$

$$= \frac{4.834}{4.85}$$

$$= 0.9966$$

Here  $r_{xy} = 0.9966 \geq 0$  that means the total

vaccination in Kolhapur and Sangli district are positively correlated. Whenever total vaccination in Kolhapur is increases there in Sangli district Government supply equality vaccine in this two district.

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Proportion Test :-

Total population Kolhapur district

$$N_1 = 3,876,000$$

$A_1$  = Total number of people have got at least 1<sup>st</sup> of vaccination

= Total Vaccination

$$= 1546877$$

$A'$  = Total number of people not get vaccination

$$1 = 2329123$$

P = Proportion of people got Vaccine in Kolhapur district

$$P_1 = \frac{A_1}{N_1} = \frac{1546877}{3876000} = 0.399091$$

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From above calculation we say that 39.90% of people got the vaccine in Kolhapur district and 60.09% are remaining.

Total population of Sangli district

$$N_2 = 2822143$$

$A_2$  = Total number of people have got at least 1<sup>st</sup> dose of vaccination

= Total vaccination

$$= 1009444$$

$A'$  = Total number of people not got vaccination

$$= 1812699$$

$P_2$  = Proportion of people got vaccination

$$= 0.357687$$

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#### 4. Overall Conclusion

1. In Kolhapur and Sangli district first and second dose trend is approximately same.
2. According to data, we conclude that in Kolhapur district above 60 and above 45 people are vaccinated more but Sangli district more vaccinated people are above 60.
3. According to survey, we conclude that people get vaccinated more by Covishield as compared to Covaxin and Sputnik V.
4. From the survey we conclude that by gender wise Kolhapur district has same ratio of male and female. And Sangli district males are vaccinated than females.
5. By using proportion test we conclude that in Kolhapur district 39.90% of people got vaccine and 60.09% are remaining. In Sangli district 35.16% people got vaccine and 64.23% are remaining.
6. Kolhapur district got more vaccinated as compared to Sangli district.

#### 5. References-

1. WHO Coronavirus disease (COVID-19): vaccines. 2021. [https://www.who.int/news-room/q-a-detail/coronavirus-disease-\(covid-19\)-vaccines](https://www.who.int/news-room/q-a-detail/coronavirus-disease-(covid-19)-vaccines) Retrieved August 2021, from World Health Organization:
2. Shetty D. Indian women more likely to die of COVID-19 than men, but more data needed to know why. 2021. <https://www.indiaspend.com/indian-women-more-likely-to-die-of-covid-19-than-men-but-more-data-needed-to-know-why/> Retrieved August 2021, from IndiaSpend:
3. Science A.A. Science. 2021. <https://www.sciencemag.org/news/2021/07/covid-19-affects-men-and-women-differently-so-why-don-t-clinical-trials-report-gender> Retrieved August 2021, from sciencemag:
4. news18.com As India crosses 22-crore mark, gender gap in vaccine remains worse than country's sex ratio. 2020. <https://www.news18.com/> Retrieved August 2021, from News18:
5. Zaiontz C. Effect size chi square. 2021. <https://www.real-statistics.com> Retrieved August 2021, from REAL STATISTICS USING EXCEL:

