

# A Study of Effectiveness of Corona Vaccine Taken During Covid-19 Period: A Study of Patna District

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## Abstract

This study was done to investigate the effectiveness of corona vaccine in Bihar during covid 19 period.. To complete this study a sample of 300 adults from Patna district age ranging from 18-65 years were choose to complete this study. Samples were chosen through purposive cum random sampling. A 54 point self developed questionnaire was used in this study. Result was tabulated and analyzed on MS. Excel and SPSS respectively. Result shows that during Covid-19 pandemic in rural as well urban areas maximum people have taken corona vaccine. In rural areas most of people have taken two dose of corona vaccine while in urban areas most of the people have taken three dose of corona vaccine. In rural areas most of the people said it dangerous as well as effective while in urban areas most of the people said it effective or little effective.

**Key points:** Corona vaccine, dose, effectiveness, rural, urban, covid-19 pandemic

**Key points:** Eating habits, covid-19 pandemic, increased, decreased, consumption, fruits, nuts, coffee, snacks, bread, dairy products, eggs, ice-cream, red meat. soft drinks etc.

## Introduction

Vaccination was one of the safest and cost-effective public health interventions for infectious disease prevention and control, especially in a pandemic situation (WHO, 2024)<sup>1</sup>. The corona virus disease-19 (COVID-19) pandemic which has affected 31 174 322 individuals and has claimed 414 482 lives in India as of 21 July 2021 is not an exception (WHO, 2021)<sup>2</sup>. In the absence of a curative therapy, and the difficulty of imposing strict COVID-appropriate behaviors, the demand for safe and effective vaccine emerged early, leading to its development at an unprecedented pace. As of 15 April 2021, two COVID-19 vaccines, Covaxin and Covishield, are in use in India.

The Covaxin is a virion-inactivated severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2) vaccine developed and produced by Bharat Biotech whereas the Covishield is a recombinant chimpanzee adenovirus vector vaccine manufactured by Serum Institute of India (SII) with technology transfer from the Oxford University and AstraZeneca. The Covaxin, administered with two doses weeks apart, is reported to have overall efficacy of 77.8%, and 93.4% against the severe symptomatic disease. The Covaxin is also reported to have good efficacy (65.2%) against the Delta (B.1.617.2) variant of SARS-CoV-2 (Ella R, et al (2021)<sup>3</sup>.

The Covishield vaccine, also administered with two doses, claimed to have an efficacy of 55.1% for a shorter time interval ( $\leq 6$  weeks) between the two doses. The increase in interval between the two doses of the Covishield vaccine to 12 weeks or more was claimed to confer 147% higher protection (vaccine efficacy: 81.3%) compared to the short interval (Voysey M, et al (2021)<sup>4</sup>.

India started the world's largest vaccination drive with the use of the Covaxin and the Covishield vaccine both in a phased manner against COVID-19 on 16 January 2021 (WHO, 2021). In the initial two phases, only the healthcare workers (HCWs) and the front-line workers irrespective of their age were eligible for vaccination. The COVID vaccines were made available for the general public of the country in a phased manner starting from 1 March 2021 (for the elderly and the individuals aged above 45 years with the co morbidities) and from 1 May 2021 (for all adults) (CoWIN Dashboard, MHFW (2021). The interval between the doses of the Covaxin is 4 weeks and the Covishield is revised from 4 weeks at the start of the vaccination drive to 12–16 weeks as of May 2021 (Samantaray A, et al., 2021)<sup>5</sup>.

Both the COVID-19 vaccines in India demonstrated good clinical efficacy and received the approval from the Drug Controller of India (DGCI) for emergency use. However, the real-world effectiveness of these vaccines have been largely unexplored and not documented in Indian settings till date. Moreover, the vaccine effectiveness (VE) assessment is required to overcome the vaccine hesitancy, restoration of faith and increase the acceptance of COVID-19 vaccines among the target population to prevent and control the current pandemic (Sallam M, 2021)<sup>6</sup>. As of 21 April 2021, only 8.3% and 1.3% of the total population of the country could be vaccinated with first and second doses of SARS-CoV-2 jab, respectively (GOI, 2020)<sup>7</sup>.

Widespread and global vaccination programmes have played a critical role in bringing the severe acute respiratory syndrome corona virus 2 (SARS-CoV-2) virus under control. However, neutralizing antibody levels were found to decline substantially 6 months after vaccination. This led to a decline in vaccine effectiveness over time, as shown in several observational studies. Understanding the effectiveness of vaccines is critical for guiding public health policy, informing vaccination strategies and promoting public confidence in immunization programmes.

### **I Phase: High risk healthcare workers**

Phase I of the state COVID-19 vaccination strategy was launched on 16th January, 2021, when the healthcare workers were prioritized for vaccination. This workforce, including those in private institutions, was the first priority of the state. To ensure a seamless, responsive system, a robust database of all healthcare workers was created. ICDS workers were also included in this initial beneficiary target. Private institutions along with the government ones were engaged, and number of vaccination sites and sessions undertaken were increased to accommodate the growing numbers. The essential workers, such as the defense and security personnel, cleaning staff and the municipality workers were the next on the list of vaccination priority. Days were fixed for convenience, and the vaccination timings advanced to early mornings, so that there was no requirement for leave by the personnel for vaccination. This phase targeted the CISF, Home Affairs Department, Home Guards and the Nagar Nigam personnel, as well as the healthcare workers who were yet to be vaccinated. The Defense Ministry, Home Affairs and the Municipal Corporations were roped in to ensure that no one was left behind. People engaged in security jobs continued with their work during the lockdowns, risking continuous exposure to the virus. These men and women working as private security guards and those in firefighting related services, too were thus considered frontline workers and received priority vaccine, after 8th May 2021.

## II Phase: Senior citizens

The vaccination campaign then extended to include the senior population, those above the age of sixty, as well as those between 45-59, but with co morbidities. As per estimation, the target estimated in the state was one crore above the age of sixty and another 20 lakh in the co morbidity bracket. This staggering number entailed a substantial increase in the workload, vaccination sites and manpower requirement. To meet this surge of demands, private facilities and Primary Health Centers that matched the site selection criteria were added. Other departments such as Rural Development and Panchayati Raj Institutions were included, software training carried out and slots for self-registration increased. Specific strategies were adopted to enhance the vaccination drive. One such example is the medical colleges targeting OPD patients that matched the selection criteria to be included in the vaccination drive. Using a similar approach, a list of pensioners was shared with the district authorities to mobilize them for vaccination.

## Phase III: All above 18 years

Vaccination continued at the centers, available to the general public of 18 years and above. For this the registration process remained the same as before, through the online CoWIN portal.

### Special vaccination drives

In order to augment the vaccination campaign, government of Bihar launched special vaccination drives throughout this period. One such “Mega Vaccination drive” was mobilized on 31st August 2021, where over 2.7 million people were vaccinated. These state wide campaigns were organized in the backdrop of massive community mobilization campaigns.

### Starting of Vaccination

The first consignment of vaccines, Serum Covishield reached the state on 12th January, 2021, from Pune. In all, the state has received a total of 8,60,605 doses of Covaxin and 47,14,180 doses of Covishield vaccines (as of 30th September,2021)<sup>11</sup>. Comparing the vaccine distribution across the country as of as of 20th November 2021, Bihar has received an estimated 8.5 crores of vaccine out of 110 crores of the nation’s share<sup>12</sup>. Easy and prompt registration for vaccination has aided the success of the vaccination drive. Even when the lockdown restrictions were in place, steps were undertaken to ensure that people traveling for vaccination and their vehicles were exempted, and allowed to travel with impunity.

### Talking numbers

The total number of eligible beneficiaries in the state, is a mind boggling 7 Crore 34 Lakh, as of September 2021. This is more than two and a half times the entire population of Australia, 1.25 times that of England and higher than that of the complete population of France. Of these beneficiaries in the state, 5 Crore 32 Lakh eligible beneficiaries have been administered the first dose, and 2 Crore 40 Lakh eligible beneficiaries have received both the doses, as of 25th November 2021. <sup>13</sup> This puts the vaccinated percentage of people in the state at 72.1 percent<sup>14</sup>, who have received the first dosage as of the same date. The Maha survey outcomes threw up definite, detailed data which allowed a clearer picture to emerge. It was seen that of the 18+ population surveyed, 2.9 crore were partially vaccinated and had received the first dose only, while 1.7 crore were fully vaccinated with both the doses. Thus, 72.4 percent of the population had received at least one dose, while another 34 lakh were identified ready to take their vaccination<sup>15</sup>

### Vaccination centers creation

To meet vaccination goals, multiple, temporary, large and small-scale vaccination sites, both fixed location and mobile, were planned and operationalized so as to be able to vaccinate more of the population rapidly.

The existing State Vaccine Store in NMCH, Patna, was designated as the state vaccinator store. In the early period, during January/ February 2021, vaccination was carried out at 300 vaccination centers in the state. This number rapidly increased every month, to ease the vaccination process for every citizen, and has grown to the current level of 15,000 sites, as of October 2021. For these, onsite registration facility was also made available.

**Awareness generation**

To create adequate awareness, posters and messages were posted, and inter personal communication between the staff and beneficiaries encouraged, across the centres. This clear communication strategy undertaken, benefitted all stakeholders involved in this mammoth exercise.

The roll-out of Covid-19 vaccine campaign prioritized the healthcare workers and the frontline workers in the state, estimated to be around 11 lakhs in the first phase. This was followed by those above 60 years of age and those in the 45-59 age population group, but with co morbidities, who numbered 1.2 crore. As of 28th October, 2021, the district that boasts of the highest inoculation percentage is Patna with an impressive 76.7 percent coverage for the first dosage, while Jehanabad district lags at the end with 60.2 percent coverage. For the second dosage too, Patna district leads at 66.2 percent coverage, with district Madhepura at the end with 23.8 percent coverage.

**Methodology**

**Objectives**

1. To assess the effectiveness of corona vaccine taken during covid-19 pandemic in Bihar.
2. To understand the quantity of corona vaccine dose taken by the people of Bihar.

**Hypotheses**

1. There will be more effectiveness of corona vaccine taken during covid-19 pandemic in Bihar.
2. Maximum people of Bihar have taken 2--3 dose of corona vaccine..

**Sampling**

A sample of 300 adults from Patna district age ranging from 18 - 65 years were choose to complete this study. Samples were chosen through purposive cum random sampling.

**Tests and tools**

A 54 point self developed questionnaire were used to complete this study. The questionnaire contained questions related to general information, village information, change in nutrition pattern, change in life style, depression and anxiety etc.

**Data Analysis -**

Data was tabulated on MS Excel and analyzed on SPSS software.

**Result and Discussion**

**Table 35:- Vaccinated dose taken**

Vaccine dose taken	Area		Total
	Rural	Urban	
No	9	9	18
	6.00%	6.00%	6.00%
Yes	141	141	282
	94.00%	94.00%	94.00%
<b>Total</b>	150	150	300

	100.00%	100.00%	100.00%
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Table 35 shows the status of vaccine taken by respondents. It shows that in rural areas as well as urban areas 94 percent respondents said that they have taken corona vaccine while 6 percent respondents in rural as well urban areas said that they have not taken the corona vaccine. It shows that in rural as well urban areas maximum people taken corona vaccine.

**Table 36:- Quantity of dose taken**

Quantity of dose taken	Area		Total
	Rural	Urban	
One	21	33	54
	14.00%	22.00%	18.00%
Three	21	45	66
	14.00%	30.00%	22.00%
Two	108	72	180
	72.00%	48.00%	60.00%
<b>Total</b>	150	150	300
	100.00%	100.00%	100.00%

Table 36 shows the vaccine dose taken by the respondents. It shows that in rural areas 14 percent respondents said that they have taken one dose, 72 percent respondents said that they have taken two dose of corona vaccine while 14 percent respondents said that they have taken 3 dose of corona vaccine. Like this in urban areas 22 percent respondents said that they have taken one dose, 30 percent respondents said that they have taken two dose of corona vaccine while 48 percent respondents said that they have taken 3 dose of corona vaccine. It shows that in rural areas most of people taken two dose of corona vaccine while in urban areas most of the people taken three dose of corona vaccine.

**Table 37:- Effectiveness of vaccine**

Effectiveness of dose	Area		Total
	Rural	Urban	
Dangerous	33	21	54
	22.00%	14.00%	18.00%
Little effect	33	45	78
	22.00%	30.00%	26.00%
Not effective	18	30	48
	12.00%	20.00%	16.00%
effective	66	54	120
	44.00%	36.00%	40.00%
<b>Total</b>	150	150	300
	100.00%	100.00%	100.00%

Table 37 shows the effectiveness of corona vaccine by the respondents. It shows that in rural areas 44

percent respondents said effective, 22 percent respondents said little effective, 12 percent respondents said not effective, and 22 percent respondents said it dangerous. Like this in urban areas 36 percent respondents said effective, 30 percent respondents said little effective, 20 percent respondents said not effective, and 14 percent respondents said it dangerous. It shows that in rural areas most of the people said it dangerous as well as effective while in urban areas most of the people said it effective or little effective.

### Conclusion

From the above result it can be concluded that during Covid-19 pandemic in rural as well urban areas maximum people have taken corona vaccine. In rural areas most of people have taken two dose of corona vaccine while in urban areas most of the people have taken three dose of corona vaccine. in rural areas most of the people said it dangerous as well as effective while in urban areas most of the people said it effective or little effective. It shows that in rural areas people had some doubt about it's effectiveness while due to more literacy in urban areas people were in favor it's effectiveness.

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