

**Original research article****A study to estimate the COVID-19 vaccine demand and hesitancy towards it in Shivpuri Central India****<sup>1</sup>Dr Anjana Niranjana, <sup>2</sup>Dr. Devendra Kumar Niranjana**<sup>1</sup>Assistant Professor Department of Community Medicine, SRVS Medical College, Shivpuri, Madhya Pradesh, India<sup>2</sup>Associate Professor, Department of Microbiology, Maharshi Vishwamitra Autonomous State Medical College, Ghazipur, Uttar Pradesh, India**Corresponding Author:**Dr Anjana Niranjana ([dr.anju09@gmail.com](mailto:dr.anju09@gmail.com))**Abstract**

**Background:** Humans have become the witness of three deadly pandemics so far in the twenty-first century which are associated with novel corona viruses. All of these viruses, which are responsible for causing acute respiratory tract infections. Since the emergence of the 2019 novel corona virus (2019-nCoV) infection in Wuhan, China, in December 2019.

**Objective:**

1. To assess the sociodemographic profile of the population.
2. To assess the public response about the covid-19 vaccine demand.
3. The various causes of hesitancy against vaccine acceptance.

**Method:** A cross-sectional study was conducted in urban Shivpuri population of above 18 year who are eligible for COVID-19 vaccination after applying inclusion and exclusion criteria during the February 2020-to April 2020. Data was collected by subordinate staff after giving offline training to them by face to face interview to each participant on predesigned and pretested close ended questionnaire.

**Result:** In the present study we found that most common age group was 41-60 year male education middle class. We found that age, sex and religion not have any significance effect on their willingness for taking the vaccine but we found that education and people who have any co-morbidity was play the significance difference about their willingness towards the acceptance of vaccine against COVID.

**Conclusion:** We concluded that the people have hesitance about the acceptance of the COVID-19 vaccine in which most common reason was Not sure about its effectiveness on the other strain of the Covid-19 virus followed by they felt that after taking the vaccine we were not protect by it 100%.

**Keywords:** COVID-19 vaccine, hesitance, acceptance, effectiveness, ARI, SARS virus etc.

**Introduction**

Humans have become the witness of three deadly pandemics so far in the twenty-first century which are associated with novel corona viruses: SARS, Middle East respiratory syndrome (MERS), and COVID-19. All of these viruses, which are responsible for causing acute respiratory tract infections (ARTIs), are highly contagious in nature and/or have caused high mortalities. The recently emerged COVID-19 disease is a highly transmittable viral infection caused by another zoonotic novel corona virus named severe acute respiratory syndrome corona virus 2 (SARS-CoV-2).

Severe acute respiratory syndrome corona virus 2 (SARS-CoV-2) is a novel, zoonotic, positive-sense, single-stranded RNA. This sub-family also includes SARS-CoV and MERS-CoV (Middle Eastern respiratory syndrome) and the SARS-like (SL) viruses of bats: bat-SL-CoVZC45 and bat-SL-CoVZXC21.

Since the emergence of the 2019 novel corona virus (2019-nCoV) infection in Wuhan, China, in December 2019<sup>[1]</sup>, it has rapidly spread across China and many other countries<sup>[2, 3, 4, 5, 6, 7, 8]</sup>. So far, 2019-nCoV has affected more than 43 000 patients in 28 countries/regions and has become a major global health concern. On 11 February 2020, the World Health Organization (WHO) announced a new name for the epidemic disease caused by 2019-nCoV: corona virus disease (COVID-19). Regarding the virus itself, the International Committee on Taxonomy of Viruses has renamed the previously provisionally named 2019-nCoV as severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2)<sup>[3]</sup>. On 30 January 2020, the WHO declared the COVID-19 outbreak as the sixth public health emergency of international concern, following H1N1 (2009), polio (2014), Ebola in West Africa (2014), Zika (2016)

and Ebola in the Democratic Republic of Congo (2019). Therefore, health workers, governments and the public need to co-operate globally to prevent its spread<sup>[9]</sup>, and on February 28 it raised the global risk of COVID-19 to the highest level. On March 11, a global pandemic was declared.

In India, 1,01,46,845 confirmed COVID-19 cases and over 1,47,092 deaths have been reported as of 25th December 2020. While strong measures were adopted and some progress was made in containing the spread through better public health interventions, diagnostics and treatments, scientists across the world have accelerated the process to develop a safe and effective vaccine that will break the chain of transmission. COVID-19 most commonly manifests as fever, dry cough, shortness of breath and tiredness. Most people (~80%) experience mild disease and recover without hospitalization, while around 20% may become more seriously ill.

At present till date, there is no any drug was available to successfully treat COVID-19, scientists have shown some success of broad-spectrum antiviral and some other drugs in treating the infections of SARS-CoV-2. However, recently published studies about the trials carried out throughout the world do not show any positive impact of the drug<sup>[10, 11]</sup>.

Since there is no effective medicine for the treatment of COVID-19, the disease results in a number of complications in the patients. This will require a number of life support therapies to endure and minimize the losses caused by the disease.

In the absence of a effective treatment, all the nations worldwide are struggling to contain the spread of the COVID-19 with the enforcement of quarantine and lockdowns, social distancing measures, community-use of facemasks at all times, and travel restrictions. These have resulted in the tremendous impairment of physical and psychosocial well-being of people and has driven a massive decline in the global economy. The multi-faceted catastrophic consequences associated with the COVID-19 outbreak have intensified international efforts in developing an effective prevention method to keep outbreaks under control. There is an intense international effort for developing a safe and effective COVID-19 vaccine, after that now we achieved success in the direction of development of various vaccine against COVID-19 by various developed country and India was also achieved success in the development of own vaccine Two vaccines that have been granted emergency use authorization by the Central Drugs Standard Control Organization (CDSCO) in India are Covishield® (AstraZeneca's vaccine manufactured by Serum Institute of India) and Covaxin® (manufactured by Bharat Biotech Limited) and at present more than a dozen vaccines is under clinical trials developed by various organizations and research groups

Yes there are now several vaccines that are in use. The first mass vaccination programme started in early December 2020 and as of and as of 15 February 2021, 175.3 million vaccine doses have been administered. At least 7 different vaccines (3 platforms) have been administered.

WHO issued an Emergency Use Listing (EULs) for the Pfizer COVID-19 vaccine (BNT162b2) on 31 December 2020. On 15 February 2021, WHO issued EULs for two versions of the AstraZeneca/Oxford COVID-19 vaccine, manufactured by the Serum Institute of India and SKBio. On 12 March 2021, WHO issued an EUL for the COVID-19 vaccine Ad26.COV2.S, developed by Janssen (Johnson & Johnson). WHO are on track to EUL other vaccine products through June?

The products and progress in regulatory review by WHO is provided by WHO and updated regularly.

Once vaccines are demonstrated to be safe and efficacious, they must be authorized by national regulators, manufactured to exacting standards, and distributed. WHO is working with partners around the world to help coordinate key steps in this process, including to facilitate equitable access to safe and effective COVID-19 vaccines for the billions of people who will need them.

At present situation only Safe and effective vaccines will be a game changer but for the foreseeable future we must continue wearing masks, physically distancing and avoiding crowds. Being vaccinated does not mean that we can throw caution to the wind and put ourselves and others at risk, particularly because it is still not clear the degree to which the vaccines can protect not only against disease but also against infection and transmission.

Intention to be vaccinated against an infectious disease is recognized as a foremost issue affecting the success of vaccination programs. In India, vaccine hesitancy is a complex public health issue there are multiple factors influencing vaccination intention. In the last decade, vaccine scandals and a series of reports on electronic and social media about the serious side-effects of vaccination, not believe on local vaccine and other factor such as demographic factors and psychological characteristics (namely participants' health perception, presence of chronic diseases, and knowing someone in the community who has had COVID-19) assumed to exert etc. have increased vaccination hesitancy and distrust in the country's immunization program by keeping all these factor in mind we were plan to conduct This study to understand corona virus disease 2019 (COVID-19) vaccine demand and hesitancy by assessing the public's vaccination intention and willingness in Shivpuri Urban area in Madhya Pradesh central India.

## Material & Methods

The present study was a observational cross sectional survey conducted in urban Shivpuri in Madhya Pradesh central India from 1<sup>st</sup> January to 31<sup>st</sup> January 2020 to assess the public response about the covid-19 vaccine demand and its acceptance and various causes of hesitancy against it which was launched in

our country by Honorable prime minister Shree Narendra Damodardas modi on 16<sup>th</sup> January 2020 and world largest vaccination programme was started in our country. Study population of this survey was selected after applying the various inclusion and exclusion criteria.

**Inclusions criteria**

1. All individual above 18 year of age.
2. Who were willing to participate in the study.

**Exclusion criteria**

1. Individual less than 18 year.
2. Pregnant and lactating women.
3. Not willing to participate in the study.

After applying inclusion and exclusion criteria total Shivpuri urban population was .....we apply this survey on 2% of total population and considering 5% non-response rate so total calculated sample size was.....

Total population of urban Shivpuri was..... population.

Data was collected by subordinate staff after giving offline training to them by face to face interview to each participant on predesigned and pretested close ended questionnaire, Informed consent was requested. Confidentiality of information was assured.

**Data collection:** Demographic data including sex (male or female), age (18-25, 26-30, 31-40, 41-50, 51-60 or>60 years), religion, education, occupation and have any co-morbidity and whether they intend to accept future COVID19 vaccination and if yes then what the various enlisting region or if not then what the various causes of refusal of vaccination.

After collecting the data it was first entered in excel sheet by using auto coding methods and that it was analyzed by applying univariate analyses followed by a multivariable logistic regression analysis, including all factors showing significance ( $p<0.05$ ), to determine factors associated with the definite intention to take the COVID-19 vaccine. Odds ratios (OR), 95% confidence intervals (95% CI) and  $p$ -values were calculated for each independent variable.

All statistical analyses were performed using the Statistical Package for the Social Sciences version 20.0 (IBM Corp., Armonk, NY, USA). A  $p$ -value of less than 0.05 was considered statistically significant.

**Result**

In the present study in the table no.01 we distribute the study participant according to their socio demographic characteristic to assess their socio-demographic status.

**Table 1:** Distribute the study participant according to their socio demographic characteristic

S. N.	Variable	Frequency	Percentage (%)	
1.	Age (Years)	18-30	294	15
		31-40	372	19
		41-60	881	45
		>60	411	21
2.	Sex	Male	1331	68
		Female	627	32
3.	Religion	Hindu	1664	85
		Muslim	235	12
		Other	59	3
4.	Caste	General	449	27
		OBC	566	34
		SC	433	26
		ST	216	13
5.	Education	Uneducated	411	21
		Primary	274	14
		High school	568	29
		Higher secondary	294	15
		Graduate	333	17
		Post graduate	78	4
6.	Occupation	Unemployed	470	24
		Students	39	2
		Unskilled worker	333	17
		Housewife	490	25
		Skilled worker	372	19
		Professionalism	255	13

In the present study we found that most common age group was followed by and least common was, mostly of them were male and female was, according to religion most of them were Hindu followed by Muslim and other were, most of them were belong to general followed by OBC then SC then ST, according to education mostly were according to occupation most of them were In the pie chart we represent the number of people saying yes and no to administered the vaccine.

In table number 02 we observe the association of socio-demographic factor towards the willingness of taking the vaccine.

We found that age, sex and religion not have any significance effect on their willingness for taking the vaccine but we found that education and people who have any co-morbidity was play the significance difference about their willingness to wards the acceptance of vaccine against COVID-19.

**Table 2:** Socio-demographic factor towards the willingness of taking the vaccine

S.N.	Variable		Willing to take the vaccine	Not willing to take the vaccine	P-Value
1.	Age (Years)	18-45	206	88	Not significance 0.285
		Above 45	260	112	
2.	Sex	Male	932	399	0.220 Not significance
		Female	439	188	
3.	Religion	Hindu	1165	499	Not significance 0.328
		Muslim	165	71	
		Other	41	18	
4.	Education	Uneducated	288	123	Significance 0.004
		Primary	192	82	
		High school	397	170	
		Higher secondary	206	88	
		Graduate	233	100	
		Post graduate	55	23	
5.	Have any co-morbidity	Yes	357	153	Significance 0.004
		No	1014	434	

In table number 03 we distribute the only those participant who were willing to take the vaccine and the cause of compliance towards the vaccine.

In the present study we found that the most common cause for acceptance of vaccine was that the people think that the vaccine protect them from covid-19 infection in future followed by they will feel free to move any where then it was available at free of cost and least common (51%) reason was that we Not need to done the covid-19 testing before any elective or emergency treatment.

**Table 3:** Distribute the only those participant who were willing to take the vaccine and the cause of compliance towards the vaccine

S. N.	*Cause of Compliance	No. of Participants (1371)	Percentage (%)
1.	It protects us from Covid-19	1275	93
2.	Available at free of cost	1111	81
3.	Feel that after taking the vaccine we become free from restriction of movement in local and abroad.	1220	89
4.	After receiving the vaccine we not need to follow the covid-19 protocol	1042	76
5.	Not need to done the RTPCR testing before any elective or emergency treatment	699	51

\*= multiple responses

In the table no. 04 we distribute the only those participant who were not-willing to take the vaccine and their cause. In this we found that those people was not willing to take covid-19 vaccine in which most common reason was Not sure about its effectiveness on the other strain of the Covid-19 virus followed by they felt that after taking the vaccine we were not protect by it 100% and least common reason was they have addiction of alcohol so we not need to take it because alcohol will kill the virus.

**Table 4:** Distribute the only those participant who were not-willing to take the vaccine and their cause

S.N.	*Cause of Non-Compliance	No. of Participants (587)	Percentage (%)
1.	Fear of side effect	405	69
2.	Want to take it after some time	41	7
3.	Not permitted by family member	47	8
4.	Fell after taking the vaccine we were not protect by it 100%. (Its efficacy was 70%)	434	74

5.	Feel you were infected by covid-19 previously so you not need to take it	317	54
6.	Want to take vaccine of other brand	129	22
7.	Not sure about the duration of protection after taking the vaccine	241	41
8.	Not sure about its effectiveness on the other strain of the Covid-19 virus	464	79
9.	Have addiction of alcohol so we not need to take it because alcohol will kill the virus.	76	13
10.	Negative news in social and electronic media about the vaccine safety.	311	53

\*= multiple responses

### Discussion

**Ethical approval and consent to participate:** The research proposal was approved by Ethics Review Committee of the Government Medical College Shivpuri M.P. and verbal informed consent was obtained from all the study participant.

**Consent to publish:** Administrative authorities consented the collection and publication of data. All authors read the manuscripts and agreed to publish.

**Authors' contributions:** PA conceptualized the study. AN and AJ involved in the data collection process. AN and SS assisted the data analysis and manuscript preparation to PA. All authors read and approved the final manuscript.

**Conflicts of interest:** The authors have none to declare.

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