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Hesitation to COVID-19 Vaccinations among Health Care Worker and Public in Tamil Nadu

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Abstract: ***COVID-19 and its evolving multiple variant is a challenge to the whole world and to our country. It has been estimated that vaccine coverage of 70-80% is achieved to attain heard immunity. COVID-19 vaccine deployment faces an unprecedented degree of hesitancy based on social and behavioral insights. Method: Using the Untitled-Google Form, which collected data through saiabisha[at]gmail.com from 140 responders aged 18 years and above, across Tamil Nadu State of India and make use of the same Untitled-Google Form statistical analysis for the study was done Result: In our study Low level of vaccine hesitancy-likely to get the vaccine but not certain is 27.5%, High levels of vaccine hesitancy-probably not get the vaccine is 39.1%, Vaccine resistant-definitely not going to get the vaccine is 3% and definitely going to be vaccinated is 30.4% among our study group. Conclusion: Our findings suggest that low level and high level Vaccine Hesitancy (27.5%+39.1%) accounts for a significant proportion of the population which can be addressed by public health messaging but for a significant minority of the population with strongly held beliefs (3%), alternative measures should be looked to achieve sufficient vaccination coverage to end the COVID19 pandemic.***

Keywords: COVID vaccine, Hesitancy, resistant, Low level, High level.

1. Introduction

In History Vaccination is a *'Miracle of Modern Medicine'* and the most successful Public Health measure, preventing many infections and saving millions of lives with large societal and economic benefits. Development of safe and effective vaccine with appreciable community-level vaccination coverage will be required to protect the community from this COVID-19 pandemic. COVID-19 vaccination deployment faces an unprecedented degree of hesitancy based on social and behavioral insights.

SARS-CoV-2 is a RNA virus is the causative agent for COVID-19 with Basic Reproduction Rate (R_0) of 3.11 (2.49–3.71) persons and Case Fatality Rate (CFR) of 2.56 (2.06–3.05) per cent [(1).] COVID 19 and its evolving multiple variant is a challenge to the whole world and mainly to our country. It has been estimated that vaccine coverage of 70%-80% is to achieve, to attain herd immunity.

The World Medical paternity is racing to develop and deploy safe and effective vaccines against COVID-19 and save lives to end this pandemic. As of April 2021, 13 vaccines are authorized for public use [(3).]

S. No	Type of Vaccine	Product Name
1	RNA vaccine	1. Pfizer–BioNTech vaccine 2. Moderna vaccine
2	Conventional inactivated vaccines	1. BBIBP-CorV, 2. CoronaVac 3. Covaxin 4. WIBP CorV 5. CoviVac
3	Viral vector vaccines	1. Sputnik V 2. Oxford–AstraZeneca vaccine 3. Convidecia 4. Johnson & Johnson vaccine
4	Protein subunit vaccines	1. EpiVacCorona 2. RBD-Dimer).

COVID-19 Vaccination drive strategies in India [(4) (5)]
Prioritization and plans for phased distribution of available COVID Vaccine was implemented by many countries including India. On 16 January 2021, Government of India launched the world's largest vaccination drive for COVID-19 [(6)] and approves Covishield (a version of the Oxford–AstraZeneca vaccine manufactured by the Serum Institute of India), and Covaxin (developed by Bharat Biotech) for emergency use at the onset of the program [(7)] and a third vaccine Sputnik V was approved in April 2021 with deployment expected to begin by late-May 2021 [(8).]

The Phase 1 of the vaccination drive involved Health Workers and Frontline workers including Police, Paramilitary forces, Sanitation workers, and Disaster management volunteers [(6).] The next phase of the vaccine rollout covered all residents over the age of 60, residents between the ages of 45 and 60 with one or more Comorbidities, and any health care or frontline worker that did not receive a dose during phase 1 [(9)] and from 1 April 2021, eligibility was extended to all residents over the age of 45 [(10).] The next phase of the vaccine drive is extended to all residents over the age of 18 from 1 May 2021 [(12).]

Vaccine hesitancy, defined by the World Health Organization (WHO) as a "delay in acceptance or refusal of vaccines despite availability of vaccination services", is a

key hindrance in achieving optimal vaccination coverage among populations around the globe (Larson *et al.*2018) [14] [15]. Some of the behavioral factors underpinning vaccine uptake by community such as Complacency, Trust and confidence in Efficacy and Safety, Convenience, Sources of information and Socio-Demographic variation will determine the COVID19 Vaccination coverage and hesitancy [13].

In India COVID-19 vaccine deployment faces an unprecedented degree of uncertainty and complexity, which is difficult to communicate, such as Immune response following Vaccination (e. g. Fever), doubt in the Safety, Effectiveness, Risks for various risk groups (Children, Older adults, Pregnant women, Chronic medical conditions, Immune compromised), Duration of immunity, Repeated vaccination, Transmission dynamics, Microbiological and Clinical characteristics, Multiple vaccines and Infodemic with misinformation characterized by Distrust of science and selective use of expert authority, Distrust in Pharmaceutical Companies and Government, Straight forward explanations, use of Emotion and anecdotes to impact rational decision-making and development of information bubbles and echo chambers made the Community to have a hesitation, deterrent and barricade towards COVID-19 Vaccination drive programe in India. During the First phase of the drive, little over 11 million vaccinated until February 2021, against a target of 30 million and the Spatio-Temporal trends of vaccine hesitancy was observed. Several state-level and regional surveys have since corroborated these anecdotal reports (Jayadevan *et al.*2021) [16]. The Second phase of vaccination derive is kicked off with the Government of India being vaccinated in March 1 after that Vaccination drive got momentum.

2. Methods

2.1 Study design and participants

The source of data for this paper is the Untitled-Google Form, which collected data through saiabisha[at]gmail.com from 140responses from 16th March 2021 aged 18 years and above, across Tamil Nadu State of India. Informed consent to participate in the study was signed by 100%of the responses.

2.2 Survey questions and responses

Survey questions some of them are mandatory field and some are not, were framed and the responses were multiple choice and made through their E-mail id by the voluntary participants. Untitled-Google Form itself provide the analytical data and it was made use for further interpretations.

3. Results

3.1 Statistical Analysis

Among the 140 responses

Factors	Percentage
Male	48.6%
Female	51.4%
Age 18-45 years	62%
Age 46-60 years	26%
Age >60	12%
Doctor	42.9%
Nurse	2.1%
Paramedical workers	7.9%
Public people	47.1%

Effectiveness of Vaccine

Confused	39.1%
Acceptable and clear	30.4%
Acceptable, not clear	27.5%
Unacceptable	3

Safety of Vaccine

Safety	47.9%
Confused	45.7%
Mislead	6.4%
Not safe	0

No Trust Over Vaccine

Social issue	84.8%
Familial issue	14.3%
Religious	0.9%
Limited survey	43.6%
Inadequate clinical survey	30%
No accurate long term effectiveness	26.4%

Information Regarding Vaccine

Not transparent	68.6%
Misinformation	12.8%
No freedom of expression	18.6%

Misinformation of Social Media

Confusing	63.6%
Threatening	13.6%
Made anxious	22.8%

Serious Side Effects

Fear	65.4%
Not want to be a animal model	28.3%
Death	6.3%

Not Accepted by Female

On infertility treatment	48.2%
Pregnancy	36.3%
Lactation	15.5%

Vaccine Schedule and Anti-Vaccine Propaganda

Dosage	Confused	Misleading
Schedule	92.8%	7.2%
Length of protection & booster dose	92.9%	7.1%
Anti-vaccine propaganda	34.4%	65.6%

Vaccination with Co-Morbidity

Fear	59.3%
Anxiety	40.7%

3.2 Vaccine Hesitancy and resistance

In our study we consider vaccine hesitancy into two levels.

Low levels hesitancy	27.5%
High levels hesitancy	39.1%
Resistant	3%
Acceptance	30.4%

4. Discussion

The aggregate weighted estimates at the Indian National level suggest that a significant proportion of individuals (29%) showed hesitancy in taking up the vaccination and about 45% would definitely choose to get vaccinated. More than 16% showed reluctance ('Probably Not') and 12% were definite about not taking the vaccine (Table 1) [(17).]

Response options	Frequency	Weighted percentage
Definitely Yes	100, 788	45
Probably Yes	61, 400	26.3
Probably Not	38, 590	16.3
Definitely Not	30, 081	12.4
Total	230, 859	100

Source: COVID-19 Symptom Survey.

It was also looked at the estimates of people expressing vaccine hesitancy from other data sources. The Delhi NCR (National Capital Region) Coronavirus Telephone (DCVTS)-round 4, conducted between 23 December 2020 and 4 January 2021, estimated 39% vaccine hesitancy among people in Delhi NCR. This includes 20% who were certain about not taking the vaccine [(17).]

On comparing the probably yes (26.3%) of the National Level estimate with our study group of Low level Hesitation (27.5%) is coinciding, probably not (16.3%) of the National Level estimate with our study group of High level Hesitation (39.1%) showed an increased percentage of High level Hesitancy in our study group and definitely not (12.4%) of the National Level estimate with our study group of vaccine resistance (3%) is comparatively low in our study group. On comparing the definitely yes (45%) of the National Level estimate with our study group of definite vaccine acceptance (30.4%) is low.

5. Conclusion

Given that over 70-80% of the population are likely to need to be vaccinated with a highly effective vaccine to extinguish the epidemic, Our findings suggest that low level and high level Vaccine Hesitancy (27.5%+39.1%) accounts for a significant proportion of the population which can be addressed by public health messaging but for a significant minority of the population with strongly held beliefs (3%), alternative measures should be looked to achieve sufficient vaccination coverage to end the COVID19 pandemic.

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