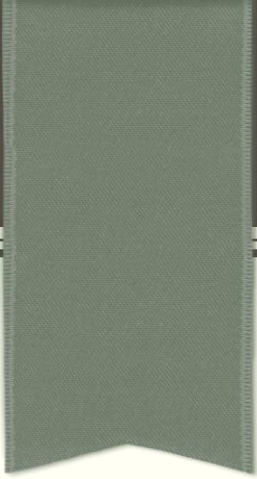


DISSERTATION 2020-21

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COVID-19 VACCINE HESITANCY: AN INDIAN PURVIEW

A CROSS SECTIONAL STUDY



Introduction

- Arguably one of the most successful achievements of science; vaccinations success has always been accompanied by opposition to its practice as evidenced by the current situation worldwide.
- Approved via Emergency Use Authorization (EUA) Covid-19 vaccines are being developed far more rapidly than traditional vaccines.
- But timeliness and availability are not the only factors responsible for vaccine uptake. A vaccines utility depends on its safety, efficacy, accessibility, mass penetration and utilization.
- When it comes to vaccine decision making, the continuum between vaccine acceptance and vaccine refusal needs to be addressed. This prompts discussion on vaccination hesitancy.
- Vaccine Hesitancy can be defined as the reluctance or refusal to vaccinate despite availability of vaccines”. An attitude of ambivalence towards vaccination where a person can, “delay, be reluctant and still accept, or refuse some or all vaccines” (MacDonald; 2015).
- For this study we focus on vaccine hesitancy with regards to Covid-19 vaccine. This study attempts to understand the key factors responsible for Vaccine hesitancy and assess vaccine attitudes, awareness, preferences and vaccine confidence in domestically made Covid-19 vaccines.

Rationale

- Identified as the top 10 threats to global health in 2019 by WHO.
- Vaccine Hesitancy is not unique to Covid-19 vaccine. According to the SAGE Working Group, there were widespread issues in 2013 with vaccination uptake for H1N1 and HPV too.
- While children's vaccines have remained a steady focal point, divergence has been seen for both adult and adolescent vaccines.
- Despite evidence of behavioral and attitudinal barriers to vaccination in adults, it has been an understudied and under-researched area in India.
- Crucial to have a thorough awareness of the present situation and the factors that influence VH.
- Understanding how different vaccine attributes affect individual preferences about vaccination may help inform public health authorities about what types of endorsements, incentives, or messages are necessary to achieve broader community uptake.

Research Question and Objective:

- **Research Question** to be answered here is:
- What are the key factors responsible for Vaccine hesitancy in India?
- **Broad Objectives:-**
- To assess the sociodemographic and attitudinal determinants of vaccine hesitancy across a representative sample.
- **Specific Objectives:-**
- To determine the key factors responsible for Vaccine hesitancy
- To assess vaccine attitudes, awareness, preferences and vaccine confidence in domestically made Covid-19 vaccines.

Methodology

Study Design

- Mixed methodology was used. A literature review followed by evaluation of primary data sources.
- First a literature review was conducted from the internet using Google Scholar, Mendeley, and PubMed databases. The search criterion was limited to literature from 2011-2021 focusing on studies looking at Vaccine Hesitancy and associated factors. Key search terms included were Covid-19, Covid-19 vaccine, Vaccine hesitancy. Both peer-reviewed journals and official government reports were included in this search.
- Based on the findings a cross sectional online self administered survey was conducted from June 10 – June 17, 2021.
- Inclusion criteria –
 - The respondents are Indian citizens
 - At least 18 years old

Participants

- A total of 516 adults completed the survey (non probability convenience sampling). Out of these 13 sets had missing data and were excluded from further analysis.

Methodology

Study Material

- A Predesigned and structured questionnaire was designed to understand the key factors responsible for vaccine hesitancy and assess vaccine acceptance, attitude and awareness.

Outcome Measures

- The questionnaire design was guided by the SAGE group matrix of hesitancy determinants. These included:
 - *Contextual factors* like Age, Gender, Religion, Caste, Educational level, influence of leaders and media.
 - *Individual and Group Influence* like Self perceived risk, Vaccination experience, perception of Safety, efficacy and accessibility of vaccines and vaccine importance, Mode of information and motivators.
 - *Vaccine specific issues* like Risk to children and elderly, Confidence in the COVID-19 vaccines available.

Analysis

- Excel and SPSS 22.0 to analyze the data using descriptive statistics, Chi square, and binary logistic regression.

Results and Findings

Demographic Attributes of the Respondents (N = 503)

We received 516 responses to the survey; of these 13 had missing values and were excluded from the analysis, leaving 503 responses. The demographic distribution of respondents showed :

- 19.5 % healthcare workers
- 53.1 percent of them were male.
- 87.9% resided in urban areas
- 91.1% Hindus
- 83.7% General Category with OBC and others making up 9.5 and 6.8 percent respectively.
- Age group 18-25 and 26-35 constituted the majority with 29.4 and 30 percent respectively. Age group 36-45, 46-55 and 55 and above saw a decreasing order with 16.5, 14.1 and 10 percent respectively.

Characteristics	Percent
Respondent Type	
Healthcare workers	19.5
General Public	80.5
Age	
18-25	29.4
26-35	30.0
36-45	16.5
46-55	14.1
56 and above	10
Gender	
Male	53.1
Female	46.9
Religion	
Hindu	91.1
Others	9.0
Caste	
General	83.7
Other backward class	9.5
Others	6.8

Characteristics	Percent
Residence	
Urban	87.9
Rural	12.1
Education	
Less than Grade 8	12.1
Secondary Schooling (9-12)	22.5
Graduate and above	65.4
Occupation	
Employed	65.2
Unemployed	34.8
Co morbidities	
Yes	18.3
No	72.8
Don't Know	8.9
Vaccination Status	
Yes	60.6
No, I will get it later	25.2
I'm unsure whether I want to	14.2
CoWIN Registration	
Yes	67.6
No	18.1
I will later	14.3

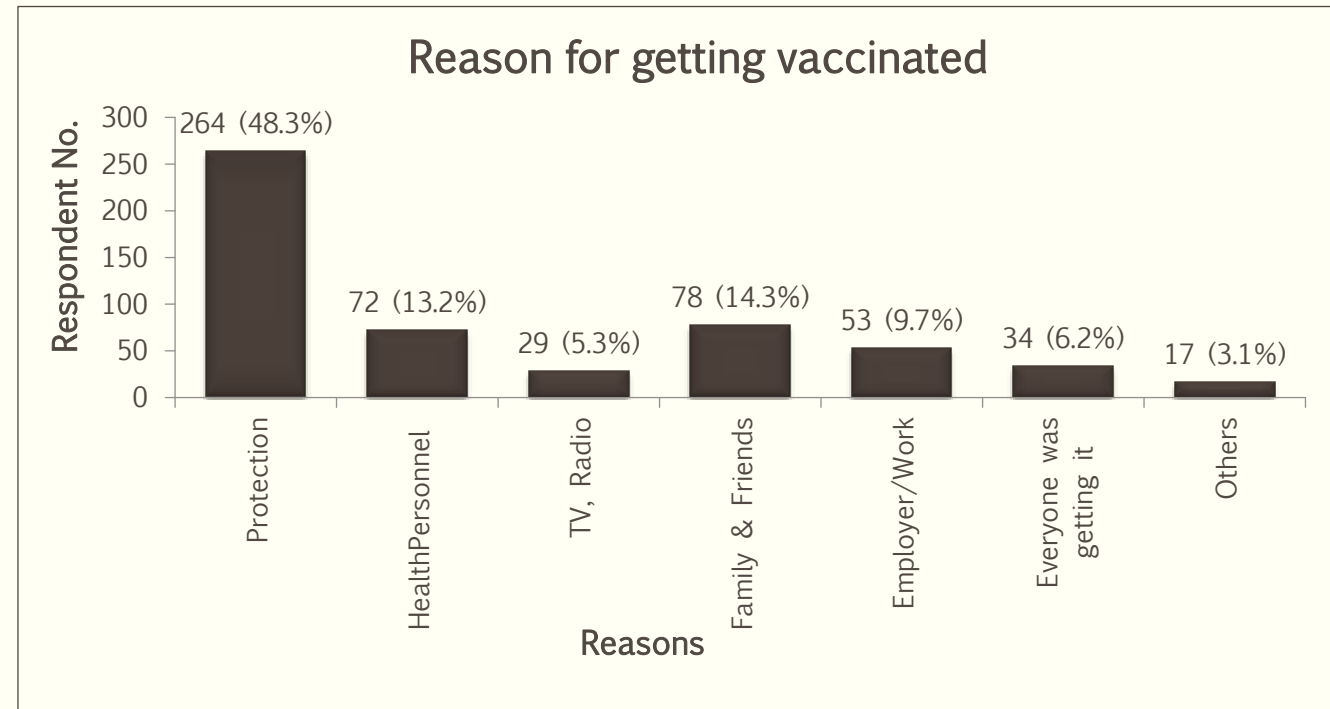
Reasons for getting vaccinated

- The top three reasons for getting vaccinated were ‘To protect me from the disease’, ‘on recommendation of family member’ and ‘on recommendation of health personnel’ respectively.

- As necessitated by employer or by indicators in work was another favored response.

- Mass influence like with everything else seemed to play a significant role in getting vaccinated.

- Surprisingly the positive influence of media was not seen as it was the lowest ranking option apart from others and is one of the top three trusted sources of information.



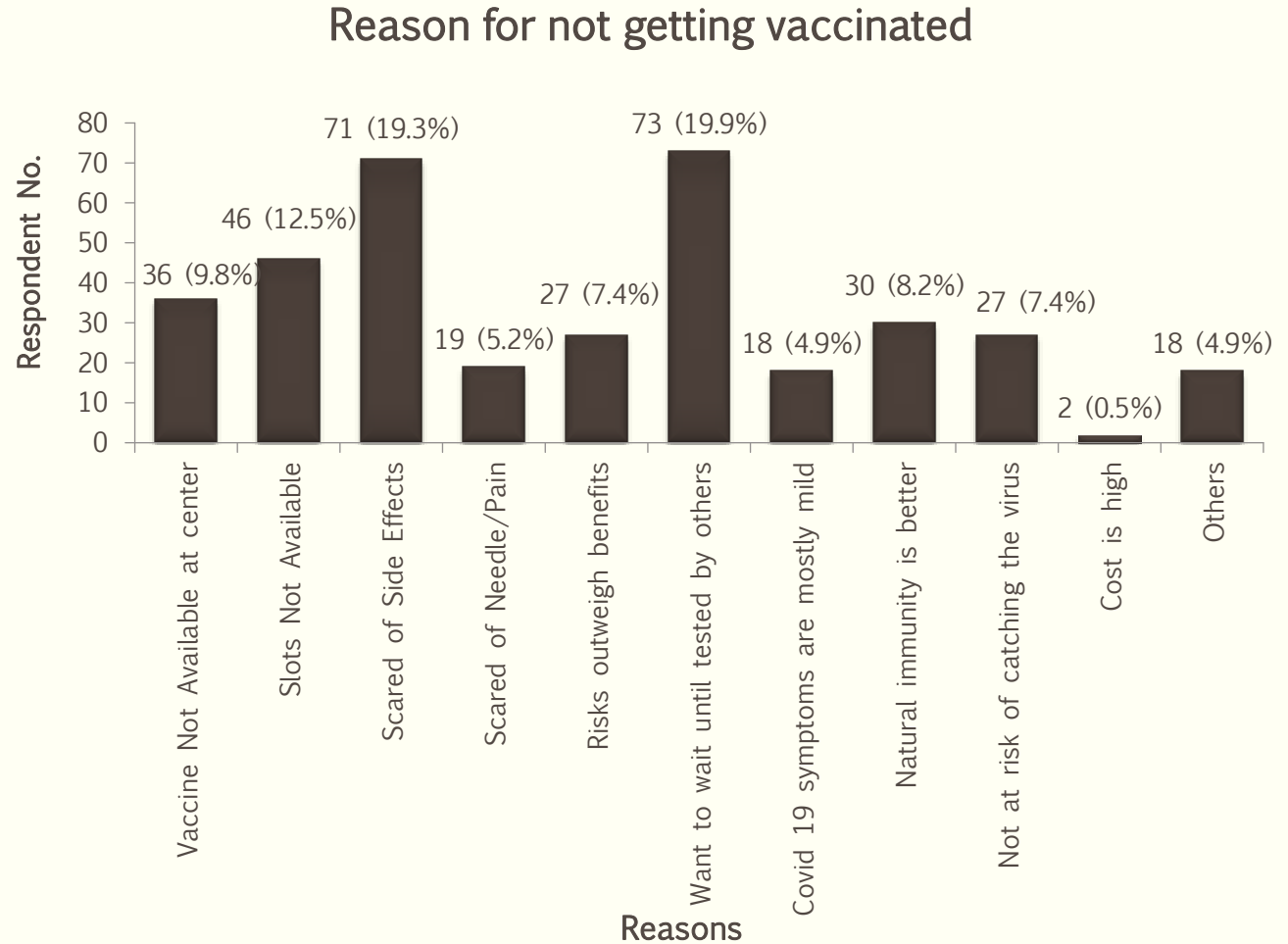
Reasons for not getting vaccinated

While the barriers to vaccination has varied options

- Unavailability of vaccines (9.8 percent) and slots (12.5 percent) show intent to registration and getting vaccinated.

- Scared of side effects (19.3 percent), Scared of needle/pain (5.2 percent), Risks outweighing benefits (7.4 percent), wanting to wait until tested by others (19.9 percent) make up a whopping 51.8 percent that represents concerns regarding Safety and efficacy of Covid-19 vaccine.

- While the section that chose Covid 19 symptoms are mostly mild (4.9 percent), Natural immunity is better (8.2 percent), not at risk of catching the virus (7.4 percent) possesses a greater challenge to BCC and IEC programmes given the lack of acceptance for the disease severity and in turn the vaccine.



Factors associated with Vaccine Hesitancy

To understand the factors associated between “Vaccine Hesitancy” and different socio-demographic variables, chi-square test was accomplished separately. From the investigations, the $p < 0.05$ indicates that there was a **significant association between vaccine hesitancy and Respondent type, Age, Religion, Caste, Education, Co morbidities and CoWIN Registration**. Gender, residence and occupation did not show significant relation with Vaccine hesitancy

Demographic characteristics	Yes	No, I will get it later	I'm unsure whether I want to	Total	Chi square	P value
Respondent Type*						
Healthcare workers	73	21	4	98	13.237	0.001
General Public	232	106	67	405		
Age*						
18-25	85	48	15	148	46.361	<0.001
26-35	90	46	15	151		
36-45	36	24	23	83		
46-55	52	7	12	71		
56 and above	42	2	6	50		
Religion*						
Hindu	282	117	59	458	6.435	0.040
Others	23	10	12	45		
Caste*						
General	260	110	51	421	19.376	0.001
Other backward class	32	9	7	48		
Others	13	8	13	34		

Factors associated with Vaccine Hesitancy

Demographic characteristics	Yes	No, I will get it later	I'm unsure whether I want to	Total	Chi square	P value
Education*						
Less than Grade 8	32	18	11	61	12.464	0.014
Secondary Schooling (9-12)	56	34	23	113		
Graduate and above	217	75	37	329		
Co morbidities*						
Yes	65	10	17	92	47.295	<0.001
No	228	102	36	366		
Don't Know	12	15	18	45		
CoWIN Registration*						
Yes	274	48	18	340	202.880	<0.001
No	31	31	29	91		
I will later	0	48	24	72		

Determinants of Vaccine Hesitancy

•An attempt was made to find out the determinants of vaccine hesitancy. A binary logit regression analysis was carried out with vaccination status Yes=0 and No =1.

•The analysis suggests that predictors namely, Age group, Respondent Type, Caste, Co morbidities and CoWIN Registration had emerged as statistically significant determinants for vaccine hesitancy.

•The results revealed that in comparison to Healthcare workers, general public are significantly more likely to be vaccine hesitant.

•Among the age groups, those belonging to 46-55 and 56 and above were 0.85 and 0.94 times less likely to be vaccine hesitant than their other counterparts.

•Those who did not know about their current health status i.e. co-morbidities were 4 times more likely to be vaccine skeptics than those who knew and had pre-existing health conditions.

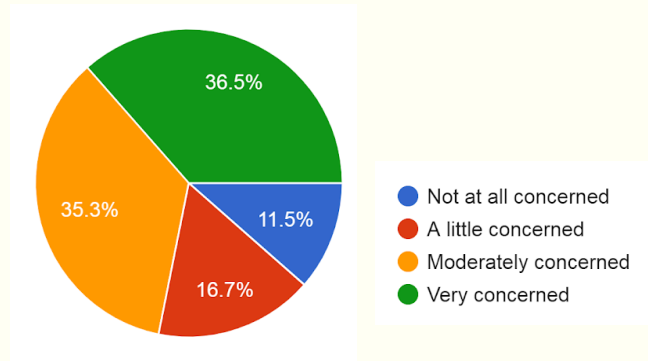
•Those who did not register on CoWIN portal were 8 times more likely to be vaccine skeptics than those who registered.

Determinants of Vaccine Hesitancy			
Determinants	Exp (B)	CI (lower)	CI (upper)
Respondent Type			
Healthcare workers@			
General Public*	4.316	1.840	10.125
Age			
18-25@*			
26-35	1.088	0.549	2.156
36-45	0.984	0.435	2.225
46-55*	0.149	0.049	0.449
56 and above*	0.059	0.016	0.216
Caste			
General@*			
Other backward class	0.461	0.175	1.215
Others	2.595	0.835	8.060
Co morbidities			
Yes@*			
No	1.610	0.698	3.712
Don't Know*	4.076	1.355	12.254
CoWIN Registration*			
Yes@*			
No*	8.035	4.825	13.382

Attributes for Vaccine Acceptance, Vaccine Confidence and Vaccine Preference

- Vaccine hesitant individuals are a heterogeneous group who hold varying degrees of indecision about specific vaccines or vaccination in general.
- Vaccine hesitant individuals may accept all vaccines but remain concerned about vaccines, some may refuse or delay some vaccines, but accept others; some individuals may refuse all vaccines.
- It is a behavior, influenced by a host of factors out of which we selected three broad categories to answer our objectives- Vaccine Acceptance, Vaccine Confidence & Vaccine Preference.
- Basic understanding of the need for vaccines, belief in their safety and efficacy, and access to vaccines and immunization services are all important factors associated with vaccine uptake rates.

Vaccine Acceptance



Concern about contracting disease

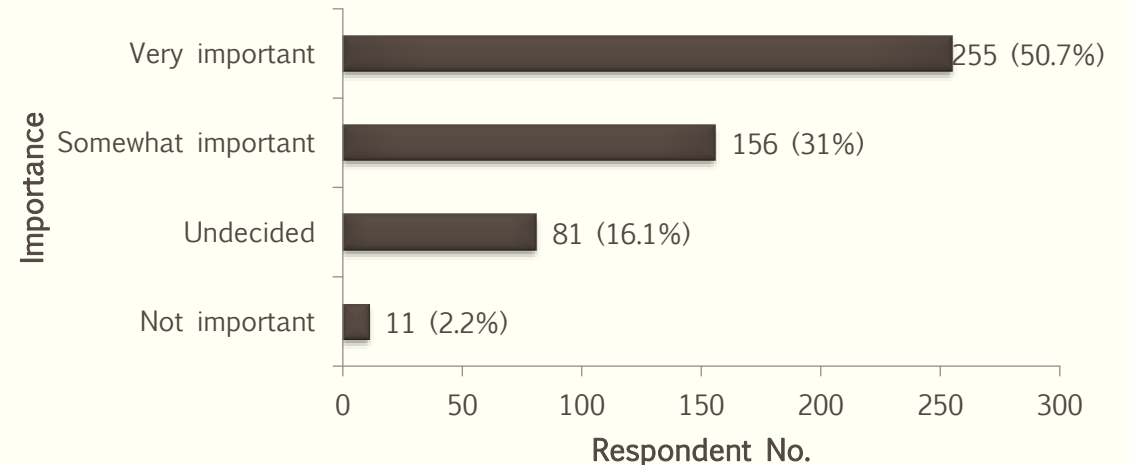
- As a follow up respondents were asked about how important they think Covid-19 vaccine is to prevent the disease. While a little more than half the respondents perceived the vaccine to be very important (50.7%), 2.2 percent thought the vaccine was of no import and 16.1 percent remain undecided on the importance of the vaccine to fight against the disease.

- Despite not being at all comparable to the actual population of India, as a representative sample the figures are a bit worrying as they show that figures for self perceived risk/severity of the disease and vaccination as a way to fight the disease are not where they ought to be.

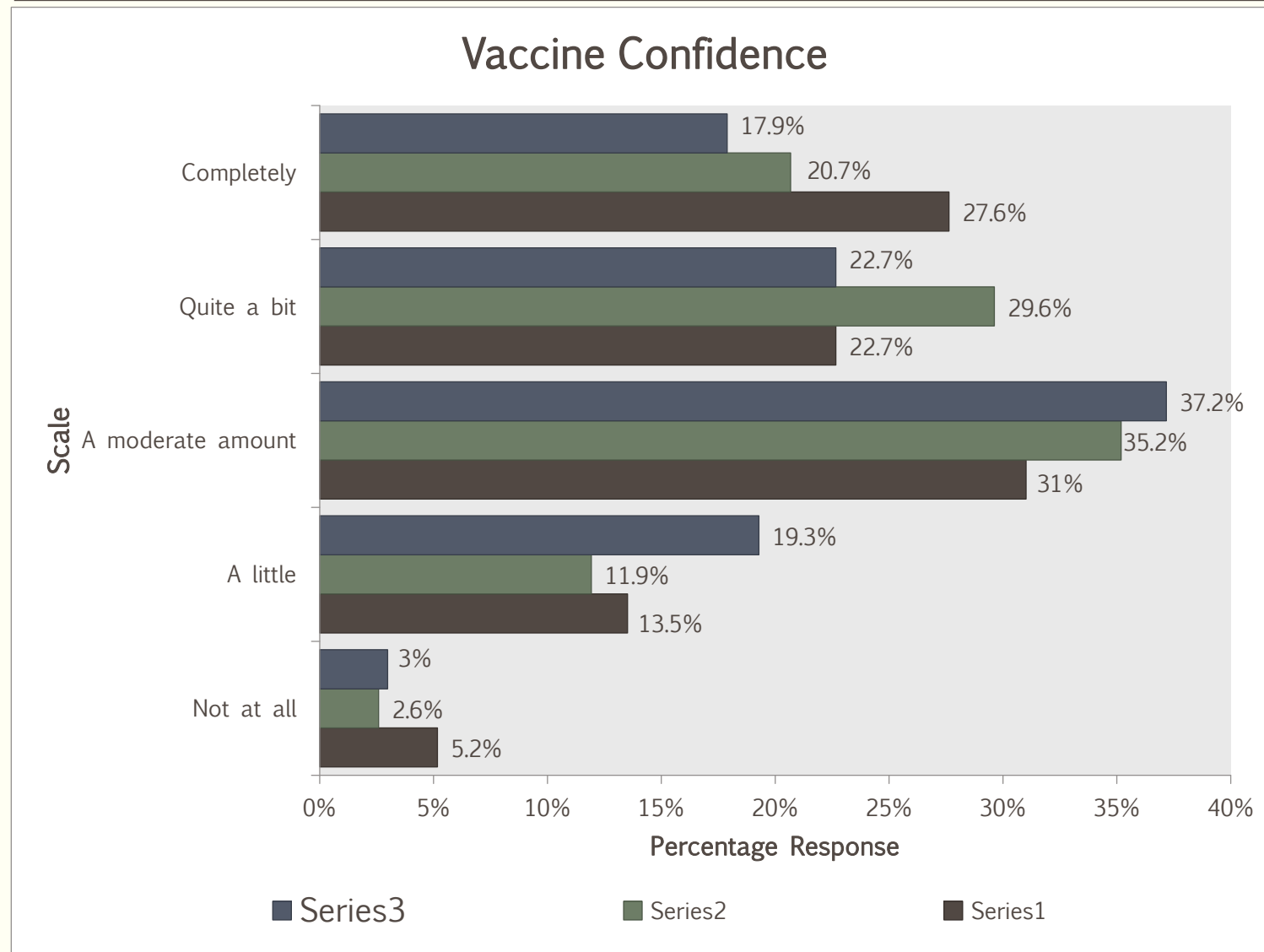
- When there is no/low perceived risks and need for vaccine, and alternate ways (natural immunity, alternative medicines) are perceived to be better than vaccination it can be said that Vaccine Acceptance is low.

- Concern about contracting diseases among the respondents. Though majority of them answered with Very concerned (36.5%) and moderately concerned (35.3%), a substantial number of people reported feeling a little (16.7%) or not at all concerned (11.5%).

Importance of Vaccine



Vaccine confidence

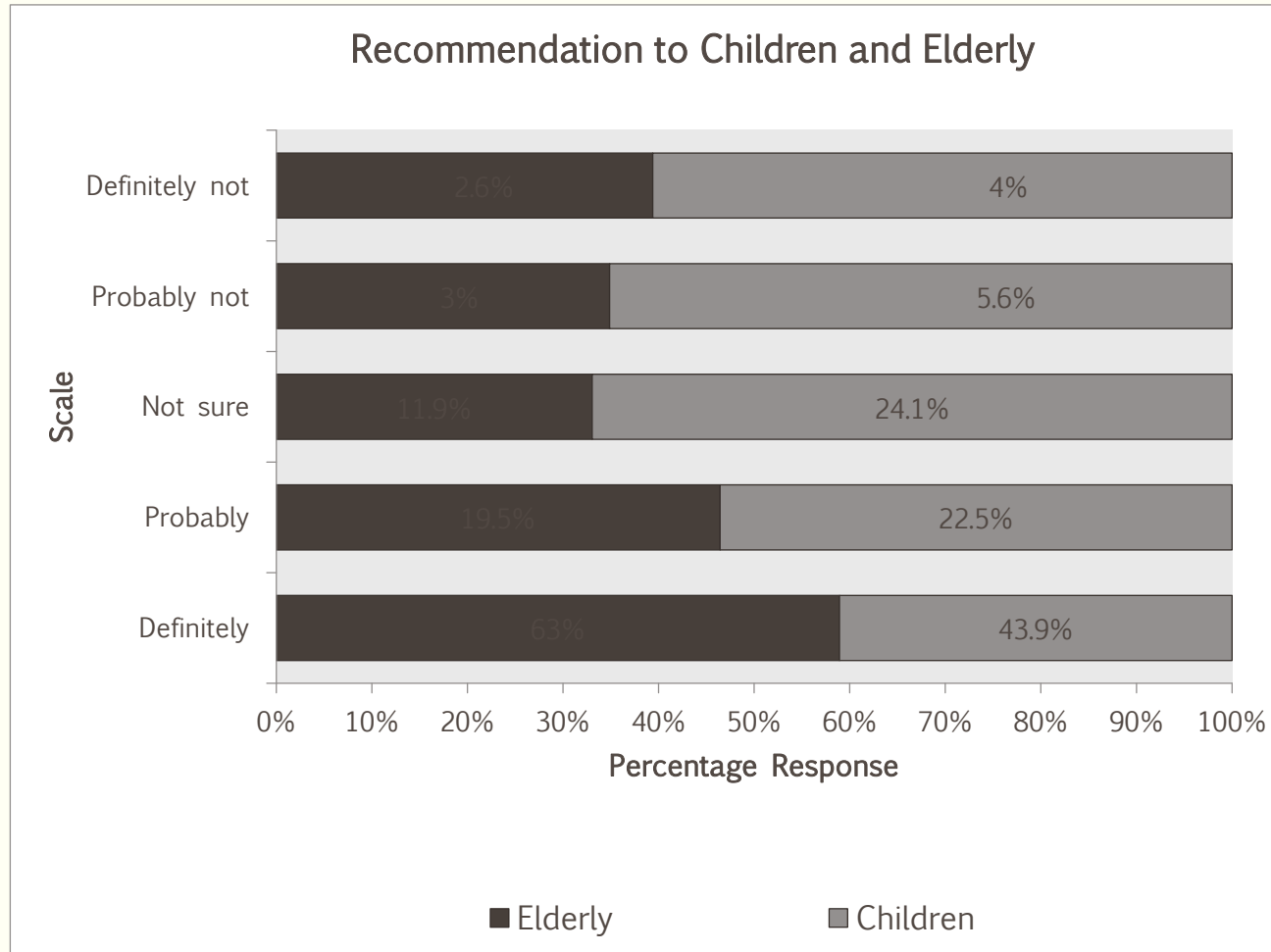


- Vaccine confidence pertains to trust in safety and efficacy of vaccine, healthcare workers and public figures that endorse them and trust in the agenda of the companies that manufacture them.

- Three parameters of Safety (does not cause health problems), Effectiveness (protects against disease) and Accessibility (available in need) the highest score comes from between the scales i.e. a moderate amount.

- There are a good number of skeptics (19.3%, 11.9%, and 13.5%) and naysayers (3%, 2.6%, and 5.2%) for Accessibility, Efficacy and Safety respectively

Vaccine confidence



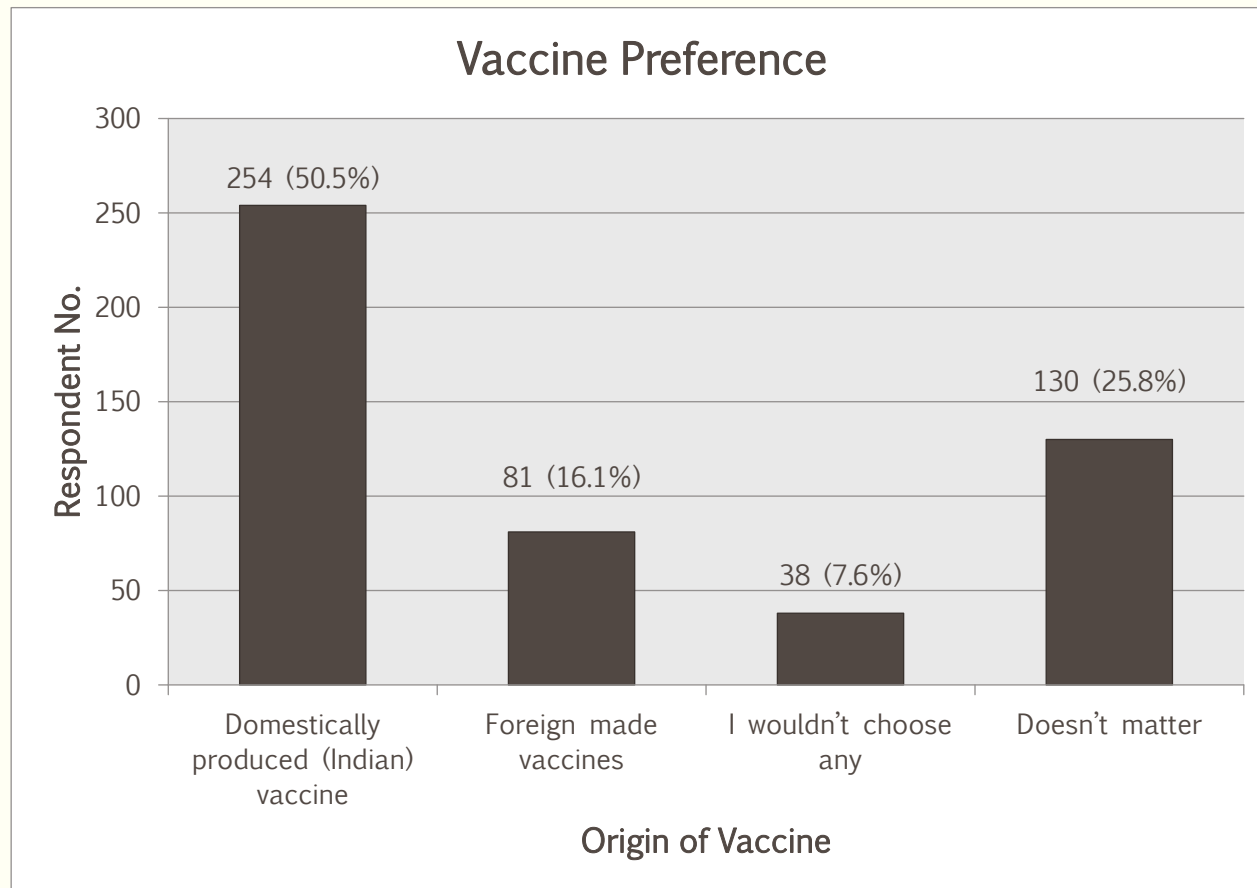
- When asked whether the vaccine is something they would recommend to children (hypothetically) and elderly, 82.5 percent respondents gave positive responses for elderly (63% chose definitely while 19.5% chose probably) and 66.4% gave positive responses for children (43.9% chose definitely while 22.5% chose probably).

- It is the respondents who were unsure or would definitely not recommend vaccination that need to be targeted while disseminating information.

- Vaccine hesitancy doesn't arise solely from a lack of knowledge or awareness, it also stems from misinformation (that is not clarified) and legitimate doubts that are not answered.

- What this tells us is that when targeting BCC or developing IEC material the most pertinent questions need to be addressed.

Vaccine Preference

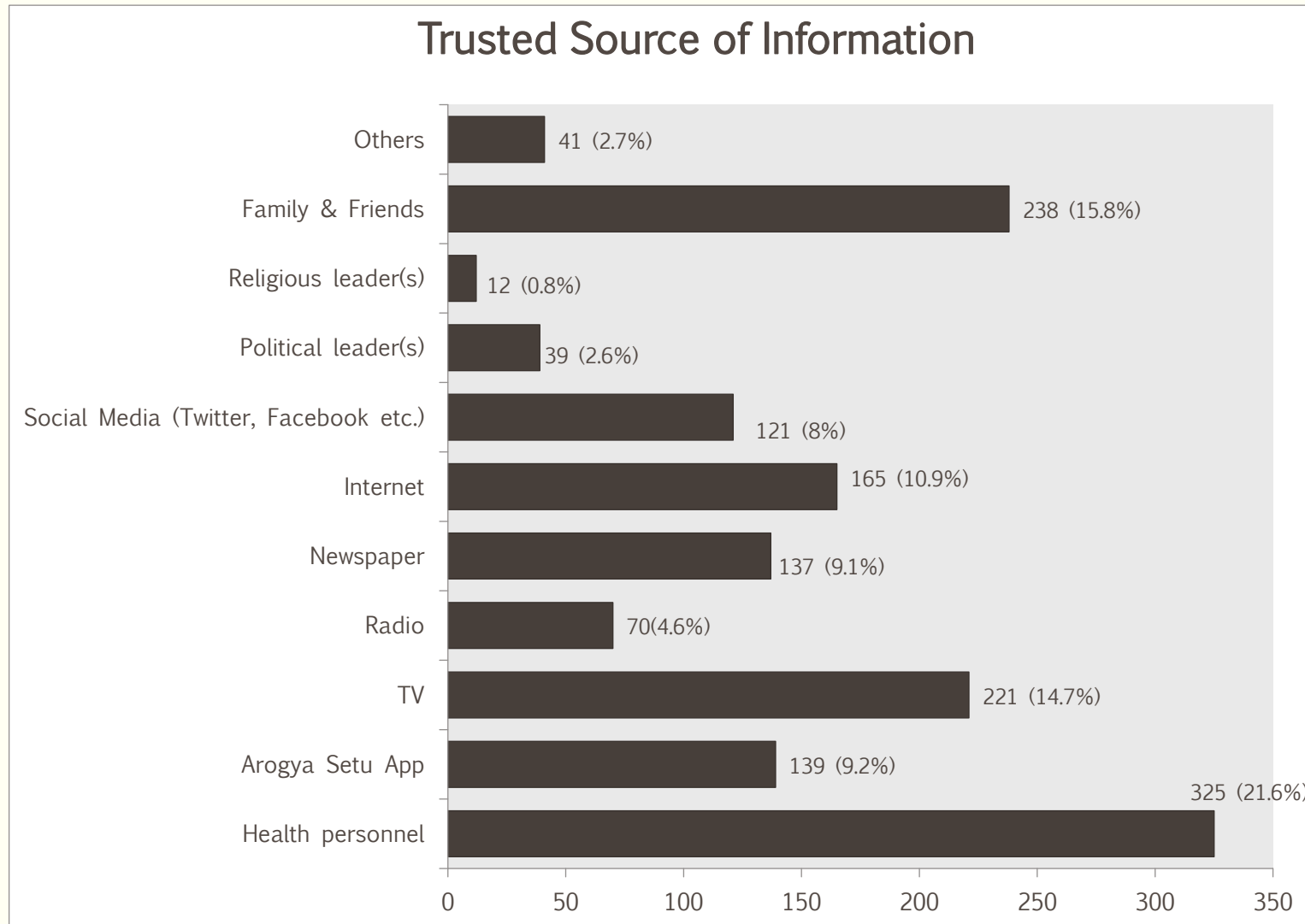


- Vaccine Preference is the choice made based on ease of access, place of origin and other factors affecting views on vaccine.

- Half the respondents prefer domestically produced vaccines while 16 percent preferred foreign made vaccines. For 26 percent of the respondents the choice does not matter and almost 8 percent remain skeptic and would not choose any vaccine.

- Available evidence suggests that this preference for domestic vaccines over foreign ones may stem from prejudice against foreign countries, but identifying prejudice-based vaccine preferences is difficult because people also draw inferences about the quality of vaccines based on country of origin.

Vaccine Preference



•The 3 most trusted sources of information chosen were –

- Health personnel's (21.6%)
- Family and Friends (15.8%),
- Television as a media outlet (14.7%) .

- Internet (10.9%),
- Arogya Setu App (9.2%) and
- Newspaper (9.1%) followed.

Conclusion

- Success of planned immunization initiatives and mass immunization depends on vaccine uptake and a significant proportion of the respondents for this study showed vaccine hesitancy to Covid-19 vaccine.
- The hesitancy attitudes were mostly driven by lack of knowledge and concern around the vaccine safety. The reliance on health personnel and family and friends opinions rather than personal research or the government mandated app underlines the role of positive media that targets family centricity (on recommendation of family members or for the protection of loved ones being popular choices) and addresses the concerns regarding Vaccine safety and efficacy.
- A complex array of interrelated factors was seen at play since expected sociodemographic factors though significantly associated did not seem to be the determinants for vaccine hesitancy. VH was associated with both high and low educational and occupational status, place of residence and varied across age. This showcases the need for targeted evidenced based behavior change communication and IEC materials endorsed by healthcare professionals to increase COVID-19 vaccine acceptance.
- These findings highlight the urgent need to address vaccination hesitancy in combination with vaccine distribution as COVID-19 vaccines become more widely available.

