

Chapter 1
Introduction

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1.1 History, Origin and Spread of COVID-19

The 2019 novel coronavirus is a severe respiratory syndrome that has spread from the Wuhan city of China to other parts of the world (Singhal, 2020). The virus was initially originated in bats and was then transmitted to humans. It is still unknown about the transmission of the virus from animals to humans in Wuhan, China in December 2019. After the 1918 flu pandemic, the human coronavirus is a disease that has become the fifth documented pandemic (Liu, 2020). The COVID-19 pandemic outbreak is very similar to the other previous outbreaks of SARS and Middle East syndrome which were emerged in China and Saudi Arabia. (Arden et al., 2020). The World Health Organisation (WHO) has declared the spread of the COVID-19 disease as a pandemic. More than 212 countries and territories have confirmed coronavirus infection cases. As of May 2021, more than 192,274,819 cases have been reported by WHO so far worldwide (Kumar, 2020). In India, more than 29 lakh cases and more than 5, 17,000 cases were confirmed. The virus can be transmitted through inhalation or even by coming in close contact with the infected droplets. The period of incubation of the disease ranges from 2- 14 days. The first case in India of the COVID-19 virus was reported on January 30th, 2020 in the state of Kerala. After that, there was a drastic rise in the number of cases in India and worldwide. The general symptoms of the deadly virus include fever, dry cough, sore throat, malaise, breathlessness, fatigue. In the present scenario, the symptoms are much varied and some people are also found asymptomatic. Before the virus was deducted, it was called Wuhan Pneumonia by the press because the pneumonia symptoms were found in people. But after the sequenced testing, it was found that the causative agent is a novel coronavirus. Therefore the COVID-19 virus can be declared as the seventh member of the family which is

infecting humans (wu et al., 2020). Since the mortality rate from its transmissibility is very high, it is advisable to take measures that prevent the spread of the disease. In India and other countries, various societal measures have been implemented such as stay at home orders, travel restrictions etc.

1.2 Behavioral Perspective of COVID-19 Pandemic

COVID-19 is like a black swan event that has an outsized impact (Mishra, 2020). The event has been described as a black swan because it is harder to predict and even much harder to compute the probabilities. The Coronavirus has posed significant challenges to global public health (Park, 2021). It has been argued that after the Great Depression of the early 1930s, it is the COVID-19 because of which the global economies have suffered a lot. So many major economies including India have witnessed a serious impact on income, output, inflation and employment over the last year. But on the other hand, some countries like Sweden and Switzerland have been able to combat the propagation of viruses up to a very large extent. There is a lot of information about the expected health and economic costs which the economies have to bear due to the outbreak (Global Preparedness Monitoring Board, 2019) but little has been done in taking preventive measures to attenuate the risk of such large pandemics.

It is very obvious to say that the Coronavirus will not leave early and hence we need to adjust to the virus and change our lifestyle. With this realisation, people have restarted their economic and social life. It has been called as 'New Normal' (Kumar, 2020). New normal means life with COVID-19 rather than life after COVID-19. People are encouraged to adopt some behavioral changes to alleviate the sudden spread of COVID-

19. Due to this, there have been certain behavior changes among economic agents such as consumers, distributors and producers. There has been a significant change in the livelihood of people. Hence it can be argued that the virus is not only a threat to the life of the people but also

it has created a significant impact on the livelihood of human beings. The preventive strategies and certain behavior changes implemented by people include social distancing, avoiding touching face, stay at home policies, frequent hand washing (Smith, 2020). It can be seen that individuals are influencing the economic variables such as employment, income, output etc when they are adapting themselves to new kinds of behavioral patterns. In the phase of COVID-19, it is becoming challenging for people to make economic decisions based on rationality. Hence the costs of such decisions outweigh the benefits leading to irrevocable losses.

Behavioral economics is an emerging field that has received great attention from public policymakers. It focuses on understanding people's behavior and choices to formulate more effective public policies (Soofi, 2020). Traditional economics acknowledges that people are rational decision-makers. It assumes that people make decisions based on rationality assumptions, it follows that consumers try to maximize utility and producers try to maximize profits. But the concept of behavioral economics goes beyond the standard economic theory of decision making. Behavioral economics deals with the bias involved in the decision-making process of the individuals and by capturing these behavior changes, it can be quite easy to use interventions to address such behaviors. It works on the simple fact that people are not rational agents and does not have the willpower to defend infinite rationality (Thaler, 2008).

Behavioral economics deals with many biases. But only some of these biases are relevant in the COVID-19 scenario. Individuals' daily choices are generally the trade-off that is between the immediate outcomes and the expected outcomes of the future. Present bias means when individuals prefer the payoff which is sooner over the payoffs which will be realized in future even if they are larger (Donoghue & Rabin, 1999). In the case of COVID-19, people tend to prefer the pleasure of going out for the current benefit at the future cost of contracting the virus. Some individuals have the disproportionate to choose the current options and are unwilling to

accept the change. This change can be referred to as ‘new normal’ as mentioned earlier. This preference of individuals can be defined as ‘status quo bias’. People have also tended to misunderstand the impact of the virus and are venturing out with the critical thinking that the virus would not attack them. This is what an economist calls as ‘optimistic bias and over confidence effect’.

It is also rightly said that individual choices are also influenced by the way the choices are mentioned or framed. These choices are then sometimes affected by the way possible outcomes are framed i.e. in terms of the gains or losses. This concept is known as the “framing effect”. The behavior of the individuals is directed towards health-promoting decisions with the help of framing effect. For instance, if it is mentioned that the recovery rate in the case of COVID-19 is 77.76 per cent would be called a gain- framed message and the mortality rate is 1% would be called a loss-framed message. These messages in terms of the way they are framed affect the behavior pattern of the economic agents.

1.3 COVID-19 Vaccination Status Worldwide

It is indeed important to develop safe and effective vaccines which protect against diseases and hence the development of such vaccines is one of the foremost scientific advances in the 21st century (Plotikin, 2020). Vaccines provide health benefits by the prevention of ill- health and death from infectious diseases such as COVID- 19. Vaccination, clean drinking water and sanitation are among the public health interventions which are responsible to improve health outcomes globally. It is indeed justified that the vaccinations not only improve the health outcomes globally but have been benefits to society and different spheres of society such as health, economy and social fabric.

Figure 1.1: Benefits of Vaccinations on Different Spheres

Health	Economic	Social
<ul style="list-style-type: none"> • Induce herd immunity • Eradicate infectious diseases • Prevent antibiotic resistance 	<ul style="list-style-type: none"> • Cost savings • Minimize the impact on family • Cost-effective preparedness for outbreaks • Productivity gains 	<ul style="list-style-type: none"> • Equity of healthcare • Impact of life expectancy and opportunity • Strengthen health and social care infrastructure

The coronavirus disease has been a major threat to the world and hence there was an urgent need to develop a vaccine. The trials to develop and test the vaccine were started in 2020 when the spread of the virus began in China. The official announcement regarding the approval and the distribution of vaccines in the first quarter of 2021 was made in September 2020 by Dr Harsh Vardhan, then Health Minister. The vaccination program in India began on 16 January 2021 with 3,006 vaccination centres when the Drug Controller General of India (DCGI) approved the use of the Oxford - AstraZeneca vaccine under emergency which is also known as "Covishield". On 2nd January, DCGI also granted and approved the use of BBV152 (Covaxin).

Out of the total world population, 10.2% of individuals are fully vaccinated with the COVID-19 vaccine. The total numbers of 2,790 million doses are administered worldwide. 18 vaccines are approved worldwide after the successful trials. It has been four months since the vaccination drive has been started; the US peaked at 1 vaccine dose daily per 100 people whereas, in India, it is only 0.25 doses per 100 people (World in data)

India has vaccinated only 4.3% of the total population as of 2nd July 2021 (Federal Health

Agency, Ministry of Health). On the other hand, the U.S.A has vaccinated 47% of their total population. It is indeed true that India needs to go a long way to reach desired vaccinated status. Total numbers of 450,000,000 vaccines have been administered in the country out of which 350,000,000 individuals are vaccinated with the 1st dose and 100,000,000 individuals are fully vaccinated (World in data)

1.4 Challenges in Vaccine Uptake

Since the pandemic has started in December 2019, so many pharmacological and non-pharmacological solutions are tested. It is indeed true that multiple vaccines have been developed against the virus. Vaccines are the best solution to prevent the spread of the disease (Paudel, 2021). An effective vaccine is the best option to control COVID-19 (Forman & Shah, 2021). So many vaccines are already approved and are administered in many countries. In India, two vaccines are granted authorisation against the virus. The development of a vaccine against the disease is certainly being a challenge but it is quite more challenging to achieve the desired vaccine uptake. The COVID-19 vaccine is burdened with so many challenges as it requires not only the development of a safe vaccine but also the authorization, production, distribution and administration (Fisk, 2021). These challenges are certainly arising from various structural problems but the real challenges in the case of vaccine acceptance include the behavioral problems which require certain attention of policymakers.

1.4.1 Structural Problems

The structural problems or barriers in the case of vaccination include issues that limit the access of an individual to vaccine service (Forman & Shah, 2021). These types of issues and problems require different kinds of attention which need to be addressed. Structural problems include-

- Production and supply bottlenecks i.e. disruption and constraints in the production, distribution and delivery of a particular vaccine.

- Limited access to vaccines includes cost and convenience barriers. Cost barriers could be the price of a particular vaccine or the cost incurred to reach the vaccination centre. Convenience barriers are the geographic and functional proximity to vaccines.

The current outbreak of the COVID-19 is much challenging and the vaccination program is an urgent requirement taking into account the severe effect of the pandemic. Reaching the desired goal with at least 70% of people vaccinated is a challenging task. So a political will, as well as required funding, is necessary for addressing structural barriers (Modlin, 2021).

Various measures have been taken by the government to overcome these problems. Time and cost act as a barrier in vaccine uptake so the government on their part is trying for mass vaccination and to make vaccines available at every end by removing these barriers. Even if the structural barriers are removed and resolved by making vaccines widely available free of cost will still not guarantee the vaccine uptake because the problem of behavioral barriers comes into the picture. The next section deals with behavioral barriers to vaccine uptake and why and how these issues need to be addressed more urgently.

1.4.2 Vaccine Hesitancy and Behavioral Problems

Even if the structural problems are solved, individuals have a negative attitude towards the vaccines and they are quite unwilling to accept the vaccine which is among the top barriers in improving the situation of the COVID-19 pandemic. People are uncertain about receiving the vaccine which is a difficult issue that needs to be resolved. The immunity in sufficient proportion is an essential requirement in response to the COVID-19 pandemic which is another essential element for the long term success of public health (Paul, 2021). So therefore it becomes relatively essential to achieve widespread vaccination by taking into account behavioral barriers in vaccine uptake and solving them.

Vaccination decisions are the task of individuals where they try to decide by taking into account the costs and benefits associated with vaccination. Talking about the rational choice perspective, the vaccine is accepted when according to the decision-makers, the subjective risks associated with the disease outweigh the risks associated with the vaccination but in the case when people are hesitant to take a vaccine, the case is opposite.

Vaccine hesitancy means the delay in the acceptance or refusal of vaccines despite the availability of vaccine services (Edwards, 2021). Individuals are unsure about getting a vaccine hence creating perceptions related to vaccines which are the major influencers of the decrease in vaccination uptake. Even before the COVID-19 pandemic, vaccine hesitancy was seen as a growing challenge to achieve the desired immunizations; it can be witnessed from the polio vaccines (Norris & Khan, 2021). According to the World Health Organisation (WHO), among the top ten global threats, vaccine hesitancy is also recognised as one among them (WHO, 2019). Research work was carried out in the high-income countries and a framework model was developed which is identified as the 5C model of the drivers or factors of vaccine hesitancy. These drivers are confidence, complacency, risk calculation, convenience and collective responsibility (Shinghai, 2021).

In the various situations, where vaccination uptake is identified to be very low and does not meet the desired uptake, vaccine hesitancy is visible in such situations (MacDonald, 2015) which could be due to the system failures like limited availability of vaccination services etc. But even if the problems in the system failures are solved, the vaccine hesitancy remains intact due to some other reasons. In a multi-country survey, it was identified that among all the participants, there were only 71.55 participants who reported that they will accept the COVID-19 vaccine (Lazarus, 2021). According to some other surveys of the COVID-19 vaccine which took place, it was identified that perceived risk, effectiveness and safety, doctor's

recommendation are crucial factors driving vaccine hesitancy among people. Many studies have also found demographic, socio-economic and behavior factors directly influence the decision to get vaccinated. According to various studies conducted in the field of behavioral economics, the decision of an individual to accept the vaccine is generally based on perceived benefits associated with the vaccine, perceived risk of vaccine side effects and the effectiveness (Nicholas, 2021).

The decisions to vaccinate are highly varied according to the context, time, as well as place and thus vaccine hesitancy, is quite complex. There are wide ranges of factors that are encompassed within the phenomenon of vaccine hesitancy. Many advisory groups on behavioral insights and science have identified the number of drivers and hence recommended contextualizing these drivers. If these complex behaviors of individuals are identified, then it would be easy to address these issues to increase vaccine uptake. Hence the interventions are aimed at influencing the behavior among people. These issues and biases can be addressed by changing the behavior of individuals through the use of '**nudges**' (Thaler & Sunstein, 2009).

Behavior science theory could help in both to find out the suitable reasons for vaccination acceptance among people and also to find the reasons for refusal. To promote vaccination uptake, nudges can be used. A nudge is any aspect of the 'choice architecture' which indirectly influences the individual's decision making in a way that the economic incentives for the individuals do not change (Hansen, 2013). Hence, nudge is anything that modifies the 'choice architecture' of an individual without reducing the options available to them. Policymakers have been using nudges to improve the decision-making behavior of an individual. It is used in many parts of the world and is applied in various domains such as education, health, finance etc.

1.5 Research Motivation

The existing literature related to vaccination in India is mostly descriptive, with very few

empirical studies that have covered demographic and socioeconomic drivers of vaccine acceptance or refusal. The attitude and behavioral analysis have remained unexplored. The previous findings take into account the fact that people behave rationally but the economic principles as discussed and formulated for a rational man does not fit perfectly in the real world (Singh, 2020). The actual decisions of a person are not rational. Hence a study is required to take into account the various behavioral factors as well as socio-demographic factors which influence the decision making of people for vaccine acceptance due to vaccine hesitancy, hence leading to irrational behavior.

1.6 Objectives of the Study

The following are the objectives that need to be fulfilled through this study-

- i) To identify the underlying factors that determine the attitude of individuals towards COVID-19 vaccine uptake in India.
- ii) To study the extent to which factors such as demographic, perception towards immunization, and behavioral variables can affect individual decision to vaccinate.

1.7 Research Question

What demographic, attitude related and behavioral factors influence the individual decision to vaccinate?

1.8 Organization of the Study

The following research study is organised into six chapters

After the introductory analysis in the present chapter, **Chapter 2** provides a theoretical framework of the study. This chapter gives a quick outlook about the emergence of various theories related to behavioral economics in the context of health. It cites the development of how individuals are moving towards irrational behavior from rational behavior and what are the behavioral biases associated with the case of vaccination decision making.

Chapter 3 discusses the features of data and the methodology adopted in this empirical analysis for simplification and analysing data to reach the desired results. This chapter also gives a brief outlook about the theoretical concepts of the statistical tools which were followed by the concrete analysis.

Chapter 4 discusses the data analysis and evaluation of the results obtained. After the descriptive analysis, logistic regression analysis/model was used to analyse the association of independent variables on the vaccination uptake and refusal and the results obtained were discussed thereafter.

Chapter 5 deals with the discussion and results. Finally, **chapter 6** confines the thesis by deducing the conclusion and policy implications. Additionally, this chapter also tried to discuss the further scope of the study and recommendations related to future research.