

# SIGNIFICANCE OF N95 MASKS IN THE PANDEMIC

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## Abstract

The year 2020 has known to be a year of disaster for mankind. From natural calamities to coronavirus disease, the world is trying to find its way to fight back. WHO announced the COVID-19 outbreak as a pandemic in March 2020. The COVID-19 statistics show that 16.5 (approx.) million people have been affected by this virus and 654K people lost their lives all over the world by July 2020. In the current scenario, the emergent need for countries all over the world is to stop the spread of coronavirus disease. The objectives of this paper are- 1. To form a roadmap to be followed which could help to fight coronavirus disease 2. To explain the advantage of the N95 mask over the other masks. This paper puts light on the significance of N95 masks to hinder the spread of coronavirus. This research is useful for the people around all over the globe who are not using proper precautions for this situation which could help save humanity in this period. Various interviews were conducted to know the perception of people with respect to the N95 mask. The critical analysis made by the study is that not many people are aware of the significant aspects of N95 mask concerning coronavirus disease.

Keywords: coronavirus disease, N95 mask, pandemic

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## 1. Introduction

We are facing a pandemic situation right now which we never imagined could be possible. Originated in Wuhan, China when the first case of Coronavirus was identified on November 17<sup>th</sup>, 2019 and it has spread worldwide (Zhi, 2020). In India, the first COVID-19 case was identified on 30<sup>th</sup> January 2020. It has been several months since we are dealing with this situation and trying to fight back every day dealing with a lot of problems. It could be well said that the poor people of the country are most affected by this situation as they have many big savings in their account which they could utilize to fulfil their basic needs. Migrant laborers are also majorly affected by this situation. Away from their homes without any source of income, they are facing problems that could disturb them financially, mentally as well as physically. This research is based on how we could fight back coronavirus with the help of a few precautions. One of the most important precautions is to cover your face with a mask to protect yourself from COVID-19. But people are not using the proper prescribed mask to cover their faces. They are using normal cloth and other normal mask which have very limited period of usage. The most effective mask in fighting back COVID-19 is N95 mask (Jessica J. Bartoszko<sup>1</sup> | Mohammed Abdul Malik Farooqi<sup>2</sup> | Waleed Alhazzani<sup>1</sup>, 2020). This research is used to provide insights to the people who are not aware of the right precautions to be followed for preventing COVID-19. Interviews of people of different ages have been recorded to gather information about their views on covid-19 and N95 mask. Efforts are to identify the perception of the people for not using N95 mask and provide suitable arguments in favour of using the mask. As covering your face with the help of mask is the primary precaution which everyone must follow (Casella M, 2020). Some provinces and municipalities located in China have enforced compulsory face mask policies in for the public; however, China's national guideline has adopted a risk-based approach in offering recommendations in order to use face masks among health-care workers and the general public (Feng S, 2020). This research studies the people's perception and relates it with the Howard Sheth Model of consumer behavior.

COVID-19 is often more prone to following-

- People who are older than 60 years
- People who have health conditions like lungs, heart disease, diabetes or conditions that affect their immune system

### *Problem Definition*

- To provide solution on how to fight COVID-19
- To educate about the use of N95 mask in regard of COVID-19

### *SCOPE OF RESEARCH*

This research is based on the pandemic situation which whole world is facing right now and trying to fight back each and every day. This research highlights the importance of N95 masks in this current situation of pandemic. This research is useful for the people around all over the globe who are not using proper precautions for this situation which could help save humanity in this period. With the help of this study more awareness could be spread about how N95 mask is different and more effective than other masks in this pandemic.

### *OBJECTIVES OF THE RESEARCH*

- To form a roadmap to be followed which could help people to fight COVID-19
- To explain the advantages of N95 mask over the other masks

## **2. Theoretical Framework**

A N95 mask is a particulate-sifting facepiece respirator that encounters the necessities for U.S. National Institute for Occupational Safety and Health (NIOSH) N95 characterization of air filtration. This implies that it can channel in any event 95% of airborne particles. This particular kind is recognized as the most widely recognized particulate-separating face respirator. Also, known as the case of the mechanical channel respirator, which gives security against particulates yet not against gases or fumes about all specialists suggest that medicinal services laborers wear a N95 cover or proportionate gear while playing out a vaporized creating technique (Ng K, 2020)

Across the board, utilization of suggested obstruction safety measures, (for example, covers, gloves, outfits, and eye wear) under the watchful eye of all patients with respiratory indications must be of most elevated need (Adams JG, 2020). N95 respirators are viewed as practically equal as regard to specific respirators directed under the non-U.S. purviews. Notwithstanding, somewhat various models are utilized to grandstand their presentation, for example, test specialist and stream rate, the channel proficiency, and admissible weight drop. The N95 cover requires a fine work of manufactured polymer filaments. It is delivered by dissolve blowing and structures the inward filtration coating that can sift through perilous particles.

A N95 cover, when fitted accurately, squares 95% of 0.3-micron particles, and gives a significant hindrance against malady transmission as a feature of a medicinal services supplier's very own defensive hardware known as personal protective equipment(PPE) (Cramer, 2020). The N95 respirator mask is progressively being utilized for hindering the COVID-19 spread over the world. The N95 masks is known for as much more close fitting contrasted with the other expendable careful masks (Samy Rengasamy B. C., 2014). They can channel up to 95% of little particles including microscopic organisms and infections. Aside from going about as a boundary to enormous beads, showers, sprinkles, the N95 respirator masks have a few different focal points:

- Protects against breathing in dust, smoke, fog.
- Protects against tainting of infections, for example, COVID-19.
- Can channel particles of up to 0.3 microns or bigger.

- Can be reused in the wake of washing.

### About COVID-19

Coronavirus 2019 (COVID-19) is an irresistible illness brought about by the serious intense respiratory condition. The table below shows the place of origin of the virus in different countries along with the period in which the first positive case was affirmed in the respective country.

Table 1. Origin of COVID-19

Place	Country	First Positive Case
Hubei University, Wuhan	China	December 2019
Turin and Milan	Italy	December 2019
Kerala	India	January 30, 2020
Barcelona	Spain	March 12, 2020

Normal side effects incorporate hack, fever, windedness, exhaustion, and loss of smell and taste. While most of cases bring about gentle manifestations, some advance to intense respiratory misery condition. The interval between presentations to appearing of manifestations is regularly less than a week. The infection is basically spread between individuals that are in proximity to each other, regularly by little beads delivered by sniffing, talking and hacking. The beads for the most part tumble to the surface or onto ground instead of going through air over the significant distances. In any case, research as of June 2020 has indicated that the discourse produced beads may stay airborne for inexact many minutes. Less ordinarily, individuals may get tainted by contacting the defiled surface and afterward contacting their face.

The table given below shows the statistics of the countries with leading number of corona cases. The record mentioned in the table is taken from the source (<https://www.worldometers.info/coronavirus/>) updated on 26 August, 2020.

Table 2. COVID-19 Statistics

Country	Cases	Deaths	Recovered
USA	5,944,922	182,043	3,232,670
Brazil	3,231,522	115,646	2,778,709
India	3,231,522	59,608	2,467,220

### COVID-19 in India

On 11 March 2020, WHO declared Novel Coronavirus Disease (COVID-19) outbreak as a pandemic and made the call for countries to take immediate appropriate actions and scale up response to treat, detect and reduce transmission in order to save people's lives.

On 24th March, 2020, Prime Minister Narendra Modi requested an across the nation lockdown for 21 days, known as Janta curfew constraining development of the whole 1.3 billion populace of India so as to forestall the spread of the COVID-19 pandemic in India(P., 2020). It was ordered following a 14-hour willful open time limitation on 22 March, trailed by the requirement of arrangement of guidelines in the nation's coronavirus influenced locales. The lockdown was put when the quantity of affirmed positive coronavirus cases in India was roughly 500. Spectators have expressed that the lockdown had come about to eased back the development pace of the pandemic by 6 April to a pace of multiplying like clockwork, and by 18 April, to a pace of multiplying after like clockwork. As the end of the first lockdown period approached, state governments and other committees recommended extending the lockdown.

Still till July, in places like NCT of Delhi, Tamil Nadu, Maharashtra and many more, COVID-19 cases are increasing day by day. Total confirmed Cases in Maharashtra are 180298+ in which 93000+ have been recovered. We can see India has a recovery rate of 60.70% which is generally good as compared to other countries.

### 3. Methodology

Primary data would be collected from interviews of different aged groups trying to record their perception about the N95 mask in regard in COVID-19. Effort has been put to gather insights regarding the use of mask in order to protect yourself from the virus in this pandemic. Another source of data is online reviews which people have put after purchasing the N95 mask online through online websites such as Amazon.

Table 3. Selected Responses

Age	Have they ever used N95 mask	Whether they are aware of the advantages of N95 mask against COVID-19	Their reviews about the mask
16	YES	YES	Good quality
22	YES	YES	Feel safe
24	YES	YES	Good and comfortable
21	YES	YES	Good and cautious about COVID-19
38	NO	NO	Think could use another normal mask as it is costly
30	YES	PARTIALLY	Doctor recommendation
32	NO	PARTIALLY	Costly
28	YES	YES	Good and comfortable

The table 3 shows selected responses amongst various responses collected by interview taken about the perception of N95 mask in regard of Corona virus disease.

#### *Analysis Table*

Various interviews were taken in regard to capture the perception and mind-set of the consumers using or not using N95 mask in context of Corona virus disease. Various research paper has been referred in order to come at a conclusion on how we can fight back COVID-19. Such research works are analyzed in the table given below.

Table 4. Research Analysis

Author	Objectives	Relevance	Conclusion
Adams JG, Walls RM. (2020)	The objectives of the study are 1. potentially overwhelming burden of illnesses that stresses health system capacity. 2. the adverse effects on health care workers, including the risk of infection	It provides suitable measures in order to fight against coronavirus disease taking the aspect of poor community and the health workers in this pandemic	The paper suggested covers for patients and other hindrance safeguards, improved hand cleanliness and surface sterilization are vital to wellbeing. The coronavirus is known to live on surfaces for a considerable length of time or days, but it is additionally successfully killed by accessible disinfectants when appropriately utilized. masks, goggles, gloves, and other obstruction safety measures will neglect to secure parental figures who later experience tainted surfaces and neglect to wash their hands. Social insurance faculty must concentrate on fastidious hand cleanliness, abstaining from polluting workspaces.
Cramer, Avilash (2020)	The objective of this study is on how masks can be sterilized without inducing mask degradation	This research could help the problem of shortage of mask in the market and as according to the current situation wearing mask is very crucial in order to protect yourself.	The author concludes that However, there are concerns regarding that there could be damage to the fibre material. In this research, Cobalt-60 (60Co) gamma irradiation as a method has been studied for effective sterilization without inducing mask degradation. assess mask integrity
Feng S, Shen C, Xia N, Song W, Fan M, Cowling BJ (2020)	The objective of this study is to highlight various guidelines by authorities on the use of mask in order to maintain the Continuous supply of masks for healthcare workers and those who are more prone to COVID-19	This research emphasizes on the urgency on the matter of maintaining continuous supply of mask for the health care workers and those who are more prone to disease.	Some authorities may recommend that people who have good immune system and are healthy, they might not have the urgency to wear mask as compared to others like if you have respiratory system such as cough or running nose.
Jessica J. (2020)	The objective in this study is to compare medical mask to N95 masks in in order to prevent viral infection and other respiratory illness including corona virus	Importance of this research is based on the preference of N95 mask over other normal mask in regard to COVID-19.	Randomized controlled preliminaries (RCTs) were directed contrasting the defensive impact of the clinical masks to N95 respirators. Proof recommend that clinical masks and N95 respirators offer comparative insurance against viral respiratory contamination incorporating coronavirus in medicinal services laborers during non-airborne creating care.
Ng K (2020)	The objective of this study is to highlight the risk which health workers are facing in order to help people in this time of pandemic.	Relevance of this research is to provide strict precautions to be followed in order to treat patients during the time of this pandemic.	Case analysis has been done in this research. It has been concluded from the research that all experts recommended that health care workers should wear an N95 mask or equivalent equipment while performing a procedure.
P., Pulla (2020)	Measures taken by govt. of India in respect to coronavirus disease.	The authors have suggested that the govt. of India should consider a universal basic income for poor and vulnerable people who are affected by lockdown and tries to fulfil their basic needs	As cases of coronavirus are increasing day by day, the govt. of India are taking measures and are trying to create awareness about the norms which are to be followed in respect to coronavirus disease.

T., Singhal (2020)	Detailed explanation about coronavirus disease and what are the key measures to be followed	Few practice points to be followed to fight coronavirus disease from the Indian perspective	This new outbreak has challenged economic, medical and public health infrastructure. It is more likely to continue despite many efforts are being made to fight it so efforts must be made in order to devise comprehensive measures for preventing future outbreaks
Zhi, Zhonghua Liu Xing Bing Xue Za (2020)	Describe the effect of coronavirus disease in China	How coronavirus has spread in China and now it is affecting whole worldwide is clearly shown in this study.	This paper examines that Coronavirus plague has spread quick and took just 30 days to grow from Hubei to the remainder of territory China. The same number of individuals are coming back from extended vacations, China needs to get ready for the potential answers for the pestilence.

**ROADMAP-** A roadmap has been made in order to describe the norms to be followed in order to fight back corona virus disease. It shows few **MUST DO** things (J., 2020) in this time of pandemic-

- Wear N95 mask or other approved mask to cover your face
- Follow the norms of social distancing
- Avoid going to crowded places
- Keep your hand sanitized
- Try to build good immune system by having proper diet and doing normal exercises

#### **ADVANTAGES OF N95 OVER OTHER MASKS**

Many consumers don't know all of the benefits that N95 mask provides in order to fight Corona virus disease. Many people use normal mask for a longer duration of time and they are not aware of the fact that those normal masks come with an expiry date and are preferred only for a particular period of time. Other masks are not able to cover the face properly as they might not be able to provide a tight fitting on the face in order to prevent germs to get in contact of the person. Not at all like NIOSH-endorsed N95s, different facemasks are baggy and give just hindrance security against beads, including enormous respiratory particles (J.L. Derrick, 2005). No fit testing or seal check are required with facemasks. Most facemasks don't work

viably so as to channel little particles from the air and don't forestall spillage around the edge of mask when the individual breathes in (Samy Rengasamy B. E., 2010). Following are the few benefits of N95 mask which make it more distinctive from other masks which could help to fight corona virus disease-

- N95 respirators decrease the client's presentation to airborne particles, from little molecule pressurized canned products to enormous beads. (Smith JD, 2016) N95 respirators are known as tight-fitting respirators that filter out at least 95% of the particles in air, including large and small particles.
- N95 masks are tested, evaluated, and approved by NIOSH as per the requirements.
- Reduces user's exposure to particles including large droplets and small particle aerosols.
- It has a tight fitting and comfortable to wear

As wearing N95 mask only doesn't guarantee you a protection against COVID-19 as it is very important that you are wearing that mask properly and follow some norms in order to ensure that there is maximum possibility that you are protected from corona virus (Cowling BJ, 2010). There are few norms which are to be strictly followed like-

- While going out to eat something or at some other place other than home you must wear mask.
- When you are about to eat something, you must remove your mask.
- This is why many people pull down their mask on their neck which is wrong because there is already exposed to the germs which are harmful for our health.
- When they again use that mask in order to cover their face, it would be already contaminated as there was a contact with the inner part of mask with the neck of the person.

#### 4. Implications and Contribution to Knowledge

This research emphasizes on the role of N95 mask played in fighting the pandemic of Corona virus disease. Importance of N95 mask has been highlighted in this research.

- **Practical Implications-** The findings of this research are useful for the people who are more prone to COVID-19 as they have to take special care in respect to this pandemic situation. They include- people who are older than 60 years old and people who have health conditions like lungs, heart disease, diabetes or conditions that affect their immune system. They could follow the proper norms for the prevention of the corona virus disease.
- **Theoretical Implications-** This research will create a basis for further studies those who want to do research on importance of N95 masks and how it can help to prevent the spread of Corona virus disease. This research could also help in future if any other similar pandemic people face. This would help people to be prepared in advance to fight back the pandemic situation like corona virus disease

#### MANAGERIAL RECOMMENDATIONS TO THE BRANDING TEAM

It is clear that N95 mask plays a very crucial part in fighting back corona virus disease by covering the face with its protective shield. But somehow, we don't see that everyone has been using N95 mask due to some reason. It could be due to price factor, availability issue or many other reasons. There are few managerial recommendations to the branding team:

- Proper awareness must be done in order to educate people about how N95 mask is more effective than other masks. TV advertisements could also be done in order to educate people,
- Make sure there is availability of N95 mask in every market to every customer. It is important to ensure that there is no shortage of the product in the market.
- The price factor is important issue for many customers as N95 mask starts from Rs.150 and it is not affordable for every lower- and middle-class people to afford it. They can reduce the price by substituting lower cost materials where ever possible and not compromising with the quality.

### *Machine Learning Techniques for Future Research*

In future, we aim to employ machine learning techniques for the predicting the correlation between awareness among people and the spread of corona virus. The attributes that will be considered during the construction of the computational model based on machine learning will be whether the person tested positive wore **N95** mask or other approved mask to cover themselves, followed social distancing norms, attended some crowded gathering, used hand sanitized or has good immune system. This can evidently point the requirement of awareness among people of safety measures.

## **5. Conclusion**

The cases of coronavirus disease are increasing day by day at a rapid rate which is creating a challenge as economic as well as health for the whole world. There is a need to take proper measures in order to fight coronavirus. The roadmap to be followed for fighting coronavirus disease could be as -Wear N95 mask or other approved mask to cover your face, Follow the norms of social distancing, avoid going to crowded places, keep your hand sanitized, try to build good immune system by having proper diet and doing normal exercises. The role of N95 mask in fighting coronavirus disease is very crucial as it has been cleared that N95 mask is more superior in terms to avoid respiratory infections transmitting through persons. N95 respirators reduce the user's exposure to airborne particle so as to provide protection against various disease specially coronavirus. Although there are still some strict ways to be followed while wearing N95 mask so that maximum protection could be provided against coronavirus disease.

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