


# Possible Opportunities in Face Mask Manufacturing During the COVID-19 Pandemic: A Study From India


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## ABSTRACT

COVID-19 has been primarily regarded as a respiratory disease, and until a safer and effective treatment or vaccine becomes available, the prevention of COVID-19 may continue through interventions based on non-pharmaceutical measures such as maintaining of physical distances and use of personal protective equipment like facemasks, etc. Therefore, an attempt was made in this study to explore the drawbacks with the presently available facemasks for protection from COVID-19 viruses in the state of Odisha in India, and also to explore the possible opportunities for further development of these facemasks. The associated discomforts; strength, weaknesses, opportunities, and threats (SWOT) analysis of existing facemasks in Odisha; possible opportunities for “Make in India” of these facemasks; along with safer use have been analyzed with the help of interpretive structural modelling (ISM) approach followed by MICMAC analysis.

## KEYWORDS

COVID-19, Discomforts, Facemasks, India, ISM, Manufacturing, Protective, SWOT, Transmission

## 1. INTRODUCTION

The Indian public-health problems have been a serious concern since the past decades related to infectious diseases. Although some of the infectious diseases attain epidemic proportion occasionally, many of them are found to be endemic like flu, malaria, and tuberculosis, etc. Most of the epidemic cases refer to sudden as well as increased number of diseases in a population-based community that are usually public-health emergencies, which disrupts the routine health-services including viral-

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infections like dengue, measles, typhoid-fever, and so on. Majority of epidemic occurs owing to the non-availability of clean and hygienic drinking waters, contaminations in sources of drinking water, lack of awareness on insanitation, unhealthy-foods, over-crowding, and biological conditions as well as the ecological risk-factors. Also many of the developing countries like India have been frequently getting affected by epidemics that are resulting in higher mortality-rates in addition to adverse impacts on the public-health. The increasing COVID-19 viruses throughout the world have put the whole earth in more stresses in view of their control and mitigation strategies that has become a more challenging task for all the individuals.

By the use of masks, adequate prevention and control measures can be achieved by limiting the extension of certain respiratory viral diseases like COVID-19. These masks can be used for the protection of both healthy persons coming in contact with an infected person and for the infected person as well for preventing further onward-transmission. However, other most important requirements to control the transmission of COVID-19 viruses include “hand-hygiene; physical-distancing in addition to other infection prevention and control measures”. Specific guidance has been developed by the ‘World Health Organization (WHO)’ as infection prevention & control measures in health-cares (WHO, 2020a), facilities involved in long-term cares (WHO, 2020b), and for home-cares (WHO, 2020c). However, there occurs uncertainty in maintaining appropriate distance from infected patients in order to make the virus infective. Therefore, until a safer and effective treatment or vaccine becomes available, the prevention against COVID-19 may continue in depending on interventions based on non-pharmaceutical measures such as maintaining of physical distances and use of personal protective equipment like face masks, etc.

COVID-19 has been primarily regarded as a respiratory disease and this virus is transmitted primarily between individuals via ‘respiratory-droplets’ along with ‘contact-routes’. The transmission due to droplet occurs for the persons in close-contact (i.e. within one-metre) with infected persons, through coughs and sneezes (Burke et al., 2020; Chan et al., 2020; Huang et al., 2020; Li et al., 2020; Liu et al., 2020; WHO, 2020d), also it may occur through the immediate-environment around infected persons (Cheng et al., 2020; Ong et al., 2020). As a result, there exist greater possibilities of the COVID-19 virus’s transmission either by direct contact with infected individuals, or indirectly by getting in-contact with surfaces in the immediate-environment or the objects used by infected individuals. It has been recommended for the use of face masks without or with eye-protection in order to achieve additional-protection by public-health authorities and for the general-population in particular (Feng et al., 2020). However, although the use of face masks have been used for decades to prevent infection, but the optimal uses of these face masks are facing challenges with the shortages of personal protective equipment (MacIntyre et al., 2020). So, there has been a higher requirement for enhancement in hearing, vision, and communication in the use of personal protective equipment when dealing with the patients with COVID-19 (Parush, 2020). Therefore, an attempt was made in this study to explore the drawbacks with the present available face masks against the protection of transmission of COVID-19 viruses in the state of Odisha in India, and to look into the possible opportunities for further development of these face masks.

For the accomplishment of the research goals, this article has been organized in the following manner.

The Introduction section has been combined with the literature review section to highlight the related studies and researches made with regard to the protection of transmission of COVID-19 viruses and other possible mitigation strategies. The next section i.e. “Research Methodology” section described the detailed sequences of steps followed for this work. Then, the “Results and Discussion” section elaborated the findings with regard to the aspects, such as “the discomforts associated with the existing face masks in Odisha (India); “Strength, Weaknesses, Opportunities, and Threats (SWOT)” analysis of existing face masks in the state of Odisha to obtain possible opportunities in the manufacture and their uses against the transmission of COVID-19 viruses; Identification of the variables as the available opportunities in view of “local manufacturing and proper utilization of face masks” as an

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