

Covid 19 And Impact On Healthcare Supply Chain

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Abstract: Objectives: The study finds out the challenges in healthcare supply chain and suggests the solutions for them. **Methods:** The study uses brief literature to discuss the challenges and solutions. The qualitative methodology used helps in discussing the main problems and possible methods for solving these. **Results:** Reach, Demand Uncertainty and shortages are the main problems and technology is one of the best solutions for addressing these. **Conclusion:** Technology, automation, localization, and data analytics will help healthcare supply chains to be resilient and sustainable in the future.

Keywords: Supply Chain, Localization, Demand Uncertainty, Technology, Localization.

1. INTRODUCTION

COVID-19 has already become a major disease and is causing challenges to the very existence of human beings. As on 21st October 2020, more than 41 million cases of COVID-19 are there in the world with roughly 11.32 lakh deaths.[1] Companies in healthcare are in the lookout for vaccine and there is a lot of research going on in this field. The pandemic has resulted in reach problems and shortage of products in the market. Shortages in personal protective equipment is one example. Supply chain is one of the industries which is badly affected by the covid-19 pandemic. This industry is very important as without supply chain it is impossible to get products or services. This industry is expected to reach 37.4 billion dollars by 2027[2] but faces the impact of covid-19. The pandemic and the detrimental impacts are not good for the humanity and our own existence is under radar. Healthcare is the only way forward. For this we need massive investments and equipment. Also, we will need safety and health of doctors, nurses, and healthcare workers. The personal protective equipment must be there at each corner of the country. Drugs must be available in sufficient quantities. Ventilators must be there which is in shortage in most parts of the world. Lockdowns have helped most of the countries to prepare for this and in combination with conversion of stadiums and rains into makeshifts we are trying our level best to combat the pandemic.

But the need of the hour is effective supply chain management in this area. Demand management is essential and reaching to the patients is of utmost importance. Production and distribution of sanitizers, personal protective equipment is essential. Supply of these to the right audience requires technology. In fact, new methods of technology like artificial intelligence, automation, internet of things are necessary to navigate the supply to the right areas and to the needy ones. The study gives insights into this using the help of some literature reviews to understand the challenges and solutions in this field. This paper is just an overview of the healthcare system during the pandemic and is not primary in nature.

2. RESEARCH METHODOLOGY

The study uses literature review. It briefly analyses some of the literature available in healthcare supply chain and tries to analyse the challenges and possible solutions.

3. LITERATURE REVIEW

Healthcare supply chain has become an important talking point as it is an industry which is growing all the time. The global Healthcare Supply Chain Management market size is projected to reach USD 2267.5 Million by 2026, from USD 2060.6 Million in 2020, at a CAGR of 9.3%% during 2021-2026[3]. If this must be maintained it is vital for the companies in healthcare to have a very effective, efficient, and responsive supply chain. This is the reason for the authors to take up the research on the effect of the pandemic on supply chain. Hospitals are facing employee shortages and some hospitals also are facing closures. Some of the works of researchers are given for understanding the impact.

Sudhanshu Singh et al [4] studied literature regarding supply chain issues in healthcare. This was submitted by feedback from doctors. This study can be used for decision making with respect to management of healthcare in supply chain.

Joseph Cavallo et al [5] talked about management of the pandemic. The general observation of the article was the lack of preparedness of the hospitals for facing massive outbreak of the pandemic. Capacity augmentation of hospital is necessary but more importantly mass testing and better awareness creation. It is important to prevent massive outburst than prepare for face the outbreak. In this respect this study gave insights to various measures.

Allie Nawrat [6] talked about impact of the pandemic on drug shortages and used literature to suggest that clinical trials are also affected due to the spread of the disease. The author also spoke about the disadvantages of reliance on China and the author concluded the article in a positive note that this can bring on necessary changes in the system and more of self-reliance.

Kannan Govindan et al [7] in their article developed support system for managing demand in supply chain and to help management of transmission during the pandemic. The paper divided community participants into groups based on previous diseases and age. Then demand was measured using the groups and this method was found to have a good effect on managing the supply chain and controlling the propagation of the pandemic. This method was found to be effective but at the same time more work is required in this.

Aryaman Tandon [8] in his article studied effect of apps like Arogya Sethu app in India. The pandemic has contributed to healthcare being promoted and pharmacies operated even during pandemic by using protection and safety systems. these. Use of technologies and innovations like artificial intelligence have helped in this. Online usage and consulting online have increased recently.

Ana Beatriz Lopes de Sousa Jabbour [9] defined the methodologies of formulating a resilient and sustainable supply chain with emphasis on local consumption, role of intermediaries, government support and e-commerce tools.

James Randall Patrinely, Jr [10] in their article mentioned about the reasons for shortages of medical equipment and other facilities. There are four reasons which are mentioned in the article. Dependence on just in time inventory system was one of the reasons. This led to lack of equipment when needed. In this pandemic time there is need for inventory and just in time may not work here. Second reason was dependence on global forces as the pandemic has affected global transportation. China contribute to major chunk masks respectively and

pandemic affected this supply. Bull-whip effect was the third factor in which countries ordered more of personal protective equipment based on future demand which created demand uncertainty in other parts of the world. This created problems in supply chain movement. Another reason which created issues was reduced sample size in clinical trials or lack of perfect data model created for predictions. All these factors contributed to problems in supply chain and authors believed effective operations management is crucial for good supply chain system during the pandemic.

Amallesh Sharma et al [11] in their article discussed the challenges faced by firms using NASDAQ data and found technology utilisation and demand-supply mismatch as the biggest hurdles. They suggested six broad steps which included better data capturing and visibility across supply chain using technologies. Monitoring supply chain across and better collaboration are the other recommendations. Better strategic planning and having more suppliers are the other suggestions to combat the challenges occurred during the pandemic.

Pérez-Gosende, P et al [12] discussed the role of dynamic planning of manufacturing facility layout and its significance on supply chain sustainability. This study focused on literature review and found the impact of planning and mathematical modelling on better facility structure and through that more sustainable supply chain.

TABLE-SUMMARY OF FINDINGS (LITERATURE AND AUTHOR CONTRIBUTIONS)

Challenges in Supply Chain	Possible Solutions
Reach	Use of digital technology. Use of Good forecasting and Artificial Intelligence. Use of groups for measuring impact of drugs
Bull Whip effect	Good forecasting, Use of Technology, Automation
Returns	Customer Service, intermediaries
Sourcing	Multiple Suppliers and collaboration
Inventory	Better Operations Management and Technology
Risk Management	Fintech, Sustainability
Shortages	Self-Reliance and use of better forecasting
Healthcare Systems during Covid-19	Capacity augmentation and creation of more awareness

4. CONCLUSION

Different studies of literature give insights into the healthcare supply chains, challenges and possible ways of remedies. Reach, Bullwhip effect and drug shortages remain the main challenges and technology remains the most important solution. Data Modelling, Inventory

Management, use of modern technology, local manufacturing and sourcing, good forecasting tools and optimization techniques can contribute to reducing the negative effects of the pandemic and contributing to the development of organisations. Sustainability by incorporating environment, corporate social responsibility and green policies can help supply chain to be robust and resilient. Future research can focus on quantitative research focused on modelling and hypothesis testing using the challenges and solutions mentioned in the table.

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Author Contributions

Both authors have contributed to the study by collecting literature reviews from different sources mentioned in the article.

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