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SUPPLY CHAIN DISRUPTION ON MEDICAL COMMODITIES DURING COVID IN INDIA

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ABSTRACT

The interruptions in China had a domino effect on worldwide supply networks before the severe lockdowns were imposed and COVID-19 spread. Priorities have shifted to ensure that expenditures are kept to a minimum and that necessities are delivered on time. Since the epidemic has worsened in India, the logistics supply chain has seen interruptions. The rising demand and decreasing supply may be traced back to a number of causes. Several practical options exist for investigating the current state of affairs. Promoting Indian markets and adjusting policies to aid the local labour force in reducing import dependence on other nations is a priority. The Indian logistics supply chain will benefit from this. This will boost economic growth and job prospects. The objective of the paper states to evaluate supply chain perspective of medical equipment and commodities on India's covid-19 crisis, to analyse the impact of covid-19 disruptions on the medical commodity supply chain in India and to discuss how healthcare facilities developed resilience and responsiveness towards supply chains of medical commodities post covid in India. The data came in undercover, through a variety of secondary resources. This employs describing and exploring techniques. According to the retracted result, the logistics supply chain is far broader than only the worldwide transport of medications and other products. It deals with problems at the grass-roots level, such the lateness of transporters and couriers and the difficulty of moving people inside industrial units and prohibiting transportation activities (especially trucks). Disruptions in the supply chain affect a wide variety of products, including vaccines, hand sanitizers, testing kits, protected healthcare equipment (PPE), medicines, medical equipment, raw materials, and much more.

Keywords : supply chains, COVID-19 pandemic, medical commodities, health care, pharmaceutical companies, public health imperative.

1. Introduction

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The Director-General of the World Health Organization proclaimed the COVID-19 outbreak a Pandemic on March 11, 2020, and a Public Health Emergency of International Concern on January 30, 2020. After making this proclamation, the battle for one's life and one's means of survival really began. It was difficult for public health officials to respond because of the lack of information about who was to blame and how bad things really were. Patients have a hard time navigating the disjointed Indian health care system to get essential medications (Kilpatrick, & Barter, 2020). Though many things have been blamed for the health care system's breakdown, it cannot be comprehended by looking at any one of them in isolation (such as a lack of appropriate intensive care unit beds and oxygen production capacity).

1.1 Background

After 2020, the production and delivery of food ended (Impact of COVID-19 on People's Livelihoods, Their Health, and Our Food Systems) as a result of containment attempts such as border closures and trade restrictions (Seth, 2021). Instability in the market brought on by a lack of raw materials and sluggish consumer demand further added to the woes of businesses. Supply lines are being disrupted by the COVID-19 epidemic, prompting authorities to establish a variety of lockdowns in various areas. More people needing medical attention at the same time has put a burden on the healthcare supply system, which has been already overwhelmed by the current pandemic. The supply of resources required to contain COVID-19 is being strained by rising global demand (Kirkley, 2021). Medical infrastructure and anti-pandemic supplies may be severely impacted by the COVID-19 pandemic's disruption of supply lines. Gloves, surgical gowns, masks, testing kits, vaccinations, oxygen, pharmaceuticals, disinfectants, and breathing apparatus are just some of the respiratory protection equipment and supplies that have seen a considerable increase in demand. The rapid worldwide spread of the virus forced existing supply networks to collapse under the weight of an unexpectedly large demand (McDonnell, et al., 2021).

2. Literature Reviews

As per Balfour, 2020, Every nation, every business, and every supply chain on the earth has been touched by the unprecedented severity of the COVID-19 outbreak. In the health care sector, the pandemic generated a number of issues, including hospitals on the verge of collapse owing to capacity overflow, interrupted supply chains for vital commodities, and federal and state authorities looking for palliative and preventative measures. Pandemic exposed multiple significant supply chain weaknesses, such as a lack of personal protective equipment (PPE) and testing kits, even while governments and private sector organisations had contingency plans and stockpiles in place.

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According to Liao, & Fan, 2020, Natural disasters, war, terrorism, supplier bankruptcy, labour disputes, cyberattacks, and data breaches are just few of the many possible causes of supply chain disruptions. The unprecedented degree of uncertainty, the length of the interruption, and the simultaneous impact on a large number of sites all make the COVID-19 pandemic stand out. COVID-19 is impacting the supply and demand sides of the market more than most other disruptions.

Raman, et al., 2018, stated that companies in all industries have performed risk assessments and put in place business continuity plans in response to the pandemic to ensure the reliability of their supply networks. As a result of the dramatic shifts in the market, many companies have diversified into related fields. The beer industry started making hand sanitizer, and the textile industry started making safety gear. 1 One way that some businesses are embracing more adaptable supply chains is by 3D printing products right on-site. Reshoring, or near shoring, is the process of bringing manufacturing operations back to the United States from other countries.

Mahajan, & Tomar, 2021 explained that supply chain issues are to blame for the company's failure to keep up with customer demand. The pandemic has disrupted supply chains for a wide variety of goods, including medicine, computer and electrical component semiconductors, timber, and textiles. Many experts attribute the United States' supply chain problems to the gradual loss of the "industrial commons," or the expertise needed to produce goods for domestic consumption. The United States is using the Defense Manufacturing Act to promote and sustain domestic vaccine manufacture in order to create enough COVID-19 vaccine for its own launch.

Okafor, et al., 2021 research mentioned that many companies are having trouble keeping up with increased customer demand because of "just in time" production processes and other lean manufacturing principles like running out of toilet paper. Since hospitals and other healthcare facilities are often overrun, it is essential that they get regular restockings throughout the day. There should be no problems if product demand remains constant. A number of areas experienced catastrophic shortages of life-saving medical supplies as a result of the pandemic's massive increase in demand.

As per Bhattacharya, et al., 2021, it is well accepted that businesses should minimise their stockpiles and find new uses for previously utilised materials. Globalisation has led to the creation of supply networks that span many industries and sometimes even borders.

According to Tirivangani, et al., 2021, past vaccination drives and pandemics might provide valuable insights. The medical industry places a premium on the education of students in the areas of science, communication, collaboration, and ethics. Politicians, public health authorities,

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physicians, scientists, and the media must work together to ensure the dissemination of information that is accurate, timely, and conducted in an ethical manner.

Tonday, et al., 2019 explains that the healthcare supply chain may experience extensive disruptions during a pandemic, and the first step in preventing these disruptions is to understand what causes them. Next, medical facilities and pharmaceutical companies need to figure out what precautions can most reliably and affordably prevent supply chain delays in the event of a major calamity. Keeping significant numbers of safety stocks for various medical supplies and/or reshoring manufacture of many commodities are both examples of options that could boost resilience but are impracticable owing to their high cost. When everything is said and done, commercial enterprise cannot be the exclusive solution. Governments at all levels need to be prepared for disasters to ensure the public's safety, and any lessons that can be drawn from this event should be used to shape new policies at the federal, state, and local levels.

2.1 Research Gap

This study will fill the knowledge gap by analysing the multidisciplinary approach of integrating supply chain and healthcare management concepts to develop plans for bridging the supply-demand gap and taking into account vital success variables.

2.2 Research Question

I. What is the supply chain perspective of medical equipment and commodities on India’s COVID-19 crisis?

II. What are the Impact of COVID-19 disruptions on the Medical commodity Supply Chain in India?

III. How healthcare facilities developed resilience and responsiveness towards supply chains of medical commodities post covid in India?

2.3 Importance of the Study

This article is quite helpful since it looks at the interruption in the pharmaceutical supply chain caused by the COVID19-induced economic shutdown in India. The authors of this study argue that a comprehensive examination of the healthcare supply chain is necessary to determine the causes of the government's slow reaction to the public health problem. Limited supply chain visibility, a lack of coordinated sourcing and resource allocation, and a lack of buffer capacity to rapidly ramp up supply were all significant contributors to the breakdown of the health system during the second wave in India, according to our analysis of supply chain challenges (and COVID19 waves in other countries).

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2.4 Research Objectives

I. To evaluate supply chain perspective of medical equipment and commodities on India's covid-19 crisis.

II. To analyse the impact of covid-19 disruptions on the medical commodity supply chain in India.

III. To discuss how healthcare facilities developed resilience and responsiveness towards supply chains of medical commodities post covid in India.

2.5 Scope and Limitation

The paper is limited to the research of Supply Chain Disruption On Medical Commodities During Covid In India.

3. Research Methodology

The material included should help to grasp the fundamental concepts of the project. Many different methods of collecting data are at the researcher's disposal for use in scientific study. Similar procedures were used to determine the study's findings. Collection, classification, and evaluation of data are all covered in detail. The method used to gather the data will have a major impact on the reliability and validity of the study's findings. The data came in undercover, through a variety of secondary resources. This employs describing and exploring techniques. The goal of this work is to assist scientists be more honest in their evaluations of their own work. In the end, it's up to the researchers to choose what data is useful, how that data will be organised, and what inferences may be drawn from that data..

3.1 Research Method & Design

Many different methods were employed to gather information for this study. Online copies of papers, journals, periodicals, books, and webpages from the Law Division's library are scored first for relevant material. Inquiry council findings, judicial decisions, and media reports from reputable and dubious sources are just a few examples. The use of a descriptive research design ensures that the study is based on sound logic. In order to ensure that the study's goals are realised, it is essential that the researchers organise the relevant data or materials in meaningful ways so that they may be utilised to draw conclusions based on the results of the inquiry..

3.2 Research Approach

Undertaken research studies have made use of both the exploratory technique and the research methodology. The paper was written using a qualitative analysis, which relies on a

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presuppositional framework that determines the nature of the research questions and the author's interpretation of the results. Ethnography is an approach to qualitative research that requires the researcher to engage with the topic at hand. Whatever the study's focus, conversation is an essential part of the research process. It is critical to describe the inductive, deductive, and abductive reasoning that informed this study's approach. This study's statement model will inform the development of a new theory that draws on a range of existing testing and generalisation frameworks. Because of this, observational data are studied using a descriptive method of analysis.

4. Analysis of Study

I. What is the supply chain perspective of medical equipment and commodities on India's COVID-19 crisis?

Supply chain management is used by businesses to guarantee timely delivery of the appropriate product to the right client at the right place and time. Unfortunately, this is very difficult to put into action during catastrophes owing to the dynamic nature of the multiple system levels (including state, district, and hospital/clinic). Also, in calamities that affect many locations, like as pandemics, the peak of the caseload may occur at various times in each region. When disaster strikes, there is widespread "panic," prompting firms to overstock in anticipation of supply shortages (Xu, et al., 2020). Such inflationary ordering practices misrepresent real demand and may lead to allocation restrictions that are not based on actual area needs. These considerations emphasise the importance of a centralised command hub for the supply chain that, with the aid of a cohesive data architecture such as the one described above, can help alleviate the problem by distributing supplies proportionally to the regions' needs and coordinating and dynamically shifting resources from 'non peak-demand' regions to those experiencing peak demands.

The capacity to take advantage of economies of scale in buying is another potential perk of a centralised supply chain operations centre. Health care providers, municipalities, and states would all be fighting over the same limited supplies if they didn't pool their procurement efforts (Zhu, et al., 2020). It was not immediately clear who would be in charge of the supply chain for the pandemic response in the early months of the outbreak in the United States. Instead, federal response operations were delegated to the states, resulting in a heated competition between them and the federal government over the allocation of limited medical supplies. As with the first wave of COVID19, the second wave in India was met with a lack of coordination. There are no reliable suppliers; rather, a patchwork of governmental and private organisations as well as volunteer help has filled the immediate need. Drugs are being sold on the illicit market at exorbitant costs because of the disorganised process. The establishment of a central hub to oversee the whole supply chain, from sourcing to resource allocation to logistics, might be the

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answer to the aforementioned issues. In India, like in other nations with a varied population and a perception of health as the duty of states or local governing entities, a centralised strategy is unlikely to be successful (Miller, et al., 2021). As will be shown below, a hybrid approach that combines centralised and dispersed measures has a better chance of success in dealing with future waves of COVID-19.

II. What are the Impact of COVID-19 disruptions on the Medical commodity Supply Chain in India?

The healthcare supply networks' reaction time to the COVID-19 pandemic was prolonged by a number of causes. Some examples are:

The shipping process is slowed down due to port congestion and a lack of available cars.

A scarcity of labour due to absenteeism or illness, which prevents business as normal in production and distribution;

There are now fewer life-saving tools, medicines, and medical supplies available to countries that need them because manufacturers of these items have limited exports (Hossain, et al., 2021).

Due to companies' cost-focused strategies, which come at the expense of creating redundancy in the healthcare supply chain, we have an over-reliance on overseas manufacturing for essential products and raw materials; a lack of transparency in assessing existing supply and demand conditions; a small number of manufacturers of essential products; and a lack of overall resiliency in the healthcare supply chain.

Clinical treatment was hampered by insufficient diagnostic options, poor care coordination, and limited supplies. Each party concerned is well aware of the issue. The World Health Organization issued a statement on March 5, 2020, warning that health care personnel are ill-equipped to deal with the pandemic due to interruptions in the worldwide supply chain for personal protective equipment (Fernandes, et al., 2022).

III. How healthcare facilities developed resilience and responsiveness towards supply chains of medical commodities post covid in India?

Businesses have been investing in supply chain information systems including point-of-sale software (to collect customer demand data) and blockchain technology in order to more quickly match consumer expectations (to obtain insight into upstream product movement). The healthcare industry needs a separate supply chain for items such as hospital beds, pharmaceuticals, and personal protective equipment (PPE). The patient's care would be put on hold or delayed if even one "bundle" component was unavailable. Assuring constant and

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accurate data availability from multiple nodes of the health care system and making that data "accessible" to the appropriate stakeholders is essential for implementing a comprehensive resource allocation strategy that can dynamically adapt to quickly emerging demands during health catastrophes (Zheng, et al., 2022).

As the pandemic has spread throughout India's several states, there has been a lack of uniformity in how data has been collected. The total number of beds in Delhi's critical care units, for instance, is available to the public. Tamil Nadu is unique among the states in that it provides a complete inventory of hospital beds, including details such as whether or not they are standard, critical care unit, or oxygen-equipped beds. More effort is needed to develop a consistent communication strategy throughout the supply chain, although public disclosure of hospital bed availability might help with supply-demand mismatches (Kale, et al., 2021). In specifically, we believe that the following elements should be included in any such plan:

i. Data gathered from anywhere, including the open internet and protected COVID servers. Combining this information with genetic sequencing might improve health care planning and evaluation.

ii. Compiling information on publicly and commercially available sources of essential medical supplies. Since obtaining inventory information from private players is difficult on an ongoing basis, disaster-specific laws mandating the disclosure of such information by private firms would be crucial in facilitating the rapid establishment of supply chain information systems for efficient pandemic response. We advocate for expanding the definition of "disclosure" to include more components of the care "basket" (such as drugs and oxygen cylinders) in order to accurately evaluate the health care system's ability to provide access to all of the resources needed to provide care (e.g. hospital bed availability) (Gereffi, et al., 2022)

5. Results

Decision-makers must have a thorough understanding of the operating environment in which the supply chain will function to guarantee the resilience of its essential components. As may be seen by comparing the Indian government to that of other countries in the region. Keep in mind the bureaucratic hurdles that may appear when you attempt to implement a more adaptable supply chain strategy. The second COVID19 wave in India provided evidence that disagreements would arise over who should pay for the centrally acquired commodities—the federal government or the individual states. Drafting fair distribution laws for dividing the acquired goods among the many states may be difficult. Given the difficulty and the need for cooperation between states and the federal government in order to identify solutions, we urge

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immediate action to begin developing a comprehensive framework that will guide procurement and allocation alternatives in the event of future health emergencies.

6. Conclusion

The epidemic has seriously hampered the ability to get supplies. In response, some companies have gone out of business entirely, while others have been driven to innovate in the face of adversity. Supply chains may need time to recover or develop a new normal after long-term COVID has terrible effects on patients. The effectiveness of supply chains during the pandemic might teach a great deal about how to lessen the impact of shortages in essential commodities like medicines and vaccines. Data is already accessible, and more will be added as new applications for it.

6.1. Future Scope

More research is needed to determine who exactly in the supply chain did what when. Consumers' buying patterns impacted the efficiency of several supply networks. Some businesses, however, gained significantly from the subsequent buying frenzy and were spared from collapse because of it. After the lockdown, more individuals shopped than normal as they sought to replenish their supplies. Understanding the supply chain's dynamics and consumer behaviour is crucial for effective supply chain design.

6.2. Suggestions

- The following are some strategies health care organisations and pharmaceutical businesses may do to strengthen their supply chains and minimise disruptions during major emergencies:

- Make changes to incentives and build redundancy within the supply chain. One way to increase supply chain resilience is to introduce redundancy, such as extra stock of essential medical supplies, spare manufacturing capacity for key commodities, or contracts with backup suppliers.

- Because of the costs involved and the prioritisation of efficiency in the supply chain, however, many industry professionals may see redundancy as counterintuitive. Risk management is not as often rewarded as cost-focused metrics like inventory reduction and rationalising the supplier base. Until the remuneration structure is altered, it is unrealistic to expect sourcing executives to prioritise measures that would strengthen supply chains.

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