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CASE REPORT

Impact of COVID-19 on Bio-medical Equipment Supply Chains

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ABSTRACT

In the wake of COVID-19, many hospitals were left without vital clinical equipment needed for patient care which resulted in a domino effect that critically impacted both public health and private medical practices globally. This pandemic also exposed vulnerabilities within hospital supply chains, especially those involving protective personal odds (gloves), diagnostic biomedical equipments and devices, reagents/supplies (cartridges), clinical practice aids such as pulse oximeters or concentrators which are used by physicians to measure blood oxygen saturation levels. The lack of supply chain coordination during the pandemic led to medical entities running out of equipment that were supposed to help control and limit damage. The virus caused various disruptions in global industries, including those that produce and sell medical manufacturing machinery like factories or conveyor belts to retail stores across the globe that need them for their inventory management systems (IMS). These events led to companies either having too much business, which meant higher prices because there weren't enough material available and reduced work hours due to employees being sick at home instead of going into jobsite cubicles each day. To strengthen their supply chains, equipment suppliers should analyze risk assessments and adopt a plan for when there is an interruption in production. They can also try diversifying what they buy from other countries or companies so that it's less dependent on just one source of goods in case of any healthcare emergency like COVID-19.

Keywords: Biomedical Equipments, COVID-19, Supply Chain.

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INTRODUCTION

The COVID-19 pandemic had a huge impact on health care systems around the globe. It exposed several major hospital supply chain vulnerabilities, including hospital medical equipment supply shortages such as protective equipment (gloves, goggles, respirators), diagnostic equipment (cartridges for and reverse transcription polymerase chain reaction (RT-PCR) automatic systems) and clinical care equipment (pulse oximeters, concentrators, ventilators). The medical entities such as equipment that were supposed to help control the spread of the disease and to limit its damage ran out of effectiveness due to the lack of proper equipment supply chain at the peak of the pandemic. COVID-19 caused an enormous negative effect on the chains. Globally, as the situation worsened due to pandemic, there were various disruptions in the equipment supply chain. There were several causes that attributed to the increase in demand and slowing of the supply. After COVID, work towards strengthening markets and amending policies should be done to lessen the dependence of imports.[1] Equipment suppliers must try to stabilize their supply chains by analyzing risk assessments and adopting supply continuity plans. They must try to diversify their supply chain portfolio to respond to changing demands. This will enormously benefit in strengthening the supplier's chains.

IMPACT OF PANDEMIC ON SUPPLY CHAIN AT THE HOSPITAL LEVEL

The COVID 19 pandemic has caused tremendous breakdown in the global supply of medical equipment. They became a critical factor for every country they were needed to manage and control the evolution of the pandemic. During the pandemic, huge problems emerged in providing a sufficient supply of critical medical equipment. Around the whole world, imports of medical equipment increased by a huge percentage, such as those of ventilators, which rose by double the rate. Moreover, prices increased tremendously with prices of surgical masks rising enormously. The unavailability of supply was due to export bans, logistic disruptions, and shortages of packaging. Moreover, exports from other countries immediately came to a stop. The prices of equipment increased. This happened at all levels, from wholesalers to retailers to hospitals leading to disruption of the supply chain. Global requirement of personal protective equipment (PPE) suits every day reached to new heights as the infection cases hiked.[2] Another rising concern

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with the supply of PPE was the substandard quality. They were being sold at cheaper prices, which made hospitals fall from them. Various big and small manufacturers intended to start up production of Ventilators, but due to issues related to supply chain, travel restrictions and raw material unavailability, companies were not able to manufacture them. There also was a shortage in supply of testing kits which resulted in more positive cases. This further leads to a delay in the flattening of the COVID-19 cases curve.

CURRENT SCENARIO OF MEDICAL EQUIPMENT SUPPLY CHAINS

The supply chain is slowly recovering. This has led to increase in the capacity due to manpower and increase in logistics. There has been an increase in supply of vital equipment that has led to safety of the healthcare staff. There has been a rise in supply of N95 masks and PPE. There has also been an increase in supply of gloves, masks and gowns. Many countries have doubled the daily production of PPE suits.[2] They have increased their capacity of functional ventilators tremendously. Lower mortality in COVID-19 patients has been attributed to the higher number of ventilators. Another major highlight has been the increase in the availability of COVID-19 testing kits. Both swab testing RT-PCR kits are in great supply. Mass testing has been increasingly important to detect COVID-19-positive patients, so the medical research bodies have also collaborated with equipment manufacturers to increase the manufacturing of testing kits. For seriously ill patients, mechanical ventilators are also increased in supply. Hand scrubber and hand sanitizer supply has also been increased.[3]

FUTURE CHALLENGES FOR HEALTHCARE SUPPLIERS

Medical equipment supply market is one of the largest in the world in terms of volume and value chain. It is set to increase to more than double rate by the end of this decade. The governments in various regions earlier showed slow progress in investing in Research and development (R&D) and also in promoting the local equipment supply industry. They also have now started to use raw materials from locality. In future, there will be less dependence and less pricing volatility and assure good supply even in situations of restrictions. Apart from this, suppliers have several other challenges ahead. Some of the products that are made from non-woven materials, finding textile solutions for affordability, accessibility, reusability, and scalability can be explored. Healthcare devices need to comply with higher standards of quality, safety, and performance criteria. To ensure that the products of substandard quality are avoided. Testing and certification services need to be enhanced and the cost to be economized to help local manufacturers to improve their products without substantial cost.

CONCLUSION

For the strengthening and stability of the equipment supply chain, it's important to first identify the challenges that resulted in the major supply chain interruptions seen during COVID-19. Next, medical equipment supply companies need to assess which strategies can help them to reduce supply chain disruptions during major breakouts without incurring tremendous prices, while holding important amounts of safety stocks for a wide variety of equipment to produce a wide array that would improve resilience and cost strategies. Finally, solutions cannot just come from the suppliers. Emergency preparedness is a public health issue. Governments need to assess what policy prescriptions they should enact in the wake of this experience as well.

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