

Preparing Supply Chain Operations for the Next Phase of the COVID-19 Response

This paper was written by members of the C19HCC Supply Chain Working Group:

- **Global Healthcare Exchange**
- **LLamasoft**
- **LMI**
- **MITRE**
- **The Center for Supply Chain Research® - Penn State Smeal College of Business**
- **SMI**
- **St. Onge Company**

The COVID-19 Healthcare Coalition is a collaborative private-industry response to novel coronavirus. Our mission is to save lives by providing real-time learning to preserve healthcare delivery and protect populations. (<https://c19hcc.org>)

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Introduction

The COVID-19 pandemic has resulted in significant disruptions of healthcare and other supply chains around the world. The origins of the pandemic in Chinese manufacturing regions has disrupted global supply as factories closed and transportation was curtailed. At the same time, global healthcare saw a sharp increase in demand for many different products to support treatment of COVID-19 patients. The result has been a severe strain on supply chains caught between a spike in demand and constrained supply.

During the surge in the U.S., organizations quickly reacted with a flurry of activity to meet as much demand as possible. Supply chain personnel, from the store clerk to the CEO, embraced innovation, bent the rules, and did the impossible to keep hospitals running and workers protected. Meeting the needs of the nation as the pandemic evolves will require a supply chain built on a systems perspective, rapid response, and agility. This paper offers seven recommendations to help your organization get ready.

The nation is moving from the lockdown phase—severe social distancing—to new phases that allow people to return to the office, re-open “non-essential” businesses, and engage in some social activities. At the same time, governments are focusing on testing and contact tracing to identify and track outbreaks, and isolation for people who have been infected or exposed. In addition, there will still be local outbreaks to be addressed as efficiently as possible.

This paper is intended for leaders across the health supply chain, from hospital logistics and procurement personnel to distributors and manufacturers. This information is also valuable for those who can influence and invest in supply chain capabilities. Understanding how the clinical requirements will change over time, and how these changes will drive shifts in the supply chain, is important for meeting the evolving needs of COVID-19 response. The time to prepare for the next phase is now.

For better or worse, the supply chain difficulties of the COVID-19 response have raised awareness of the critical importance of an effective supply chain. Reliable supply of test kits, equipment, pharmaceuticals, and Personal Protective Equipment (PPE) is essential to a continuous successful response effort.

This paper focuses on the stages between suppression (or lockdown) and an available vaccine. During this time, the focus will be on testing, contact tracing, isolation, and quarantine. We

encourage readers to keep track of lessons learned, both successes and failures, during the suppression phase and as we go forward.

Supply Chain Lessons Learned

To understand how to best prepare for the next phases, lessons must be quickly learned from the initial response. During the early stages of the COVID-19 response, we witnessed a health supply chain under severe stress. Safety of medical professionals required increased PPE use. Likewise, treatment of patients in high impact areas overwhelmed hospitals, especially critical care capacity and use of related equipment, such as ventilators. The spike in demand was steep, sudden, and global and matched with a global supply constraint given the epicenter of the pandemic (China) is a manufacturing region for many PPE supplies.

As a result, supply chain leaders spent significant time locating new sources of supply, increasing production capacity, converting capacity over to produce shortage items, and identifying alternative products. Supply chains that were built for lean, just-in-time operations were not designed to absorb the series of shocks that COVID-19 delivered. Years of focus on keeping product and operations costs low created a globally extended supply chain with operations concentrated in a few countries, including China and India.

As a result of the shortages, hospitals and other organizations leveraged any available resources, setting up numerous peer-to-peer exchanges. The COVID-19 Coalition summarized key exchanges at the Supply Chain Marketplace catalog (<https://c19hcc.org/resources/supply-chain-catalog/>).

Supply chain managers and operators worked long hours and used alternative mechanisms to get critical supplies to customers. The focus was on building near-term capacity and getting as much of the required COVID-19-related product as possible to flow through the supply chains. Passenger aircrafts were put into freight service; production lines were converted over to produce needed medical products; and communities banded together to hand produce masks and other products. For example, the Defense Logistics Agency procured over 14 million masks to support operations (Figure 1).¹ There were many successful efforts, but few are sustainable beyond the initial crisis response phase. This has been widely covered in the news and through various excellent outlets for knowledge sharing (i.e. the COVID-19 Coalition - <https://c19hcc.org/> and, MASC - <https://masc.psu.edu/>).

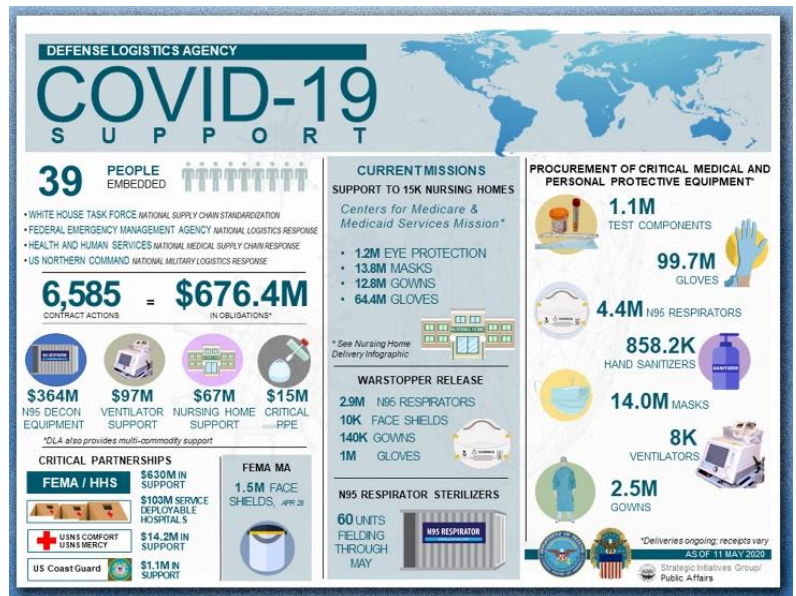


Figure 1: Scale of Defense Logistics Agency COVID-19 Response

¹ <https://media.defense.gov/2020/May/12/2002298380/-1/-1/0/200512-D-YE683-1001.JPG>

The Challenges Ahead

During this next phase, the focus will be on both management of the disease and monitoring to protect individuals and employees and prevent the spread. Testing, contact tracing and management will demand operational agility and a focus on rapid ingestion of new data with equally fast decision implementation. The medical supply chains must operate on multiple levels, simultaneously: providing needed equipment and supplies to 1) care for current COVID-19 patients, 2) support the resumption of elective and non-urgent, non-COVID care, and 3) prepare for a potential resurgence as well as future pandemics. We can expect to still see supply shortages of certain items as demand patterns shift, and these shortages will require allocation of scarce resources. With time, data, and confidence, the next phase of the COVID-19 response will evolve into a more stable system.

This phase will consist of several macro-level events, including:

- Opening up all facets of the economy, from retail to elective procedures, with every company bearing a responsibility for creating and managing the safest environment possible
- Employing continuous testing and maintaining a status of crisis readiness
- Leveraging data to measure if changes in processes or technology are reducing risk and COVID-19 infections
- Balancing of resources to meet needs, especially within the medical field. This will require planning and coordination of the room, staffing, equipment, and clinical preference supplies.

When traditional supply chain operations could not meet requirements during the surge, many different organizations rose to the occasion and found creative ways to meet those needs. As the country slowly reopens, organizations need to re-stabilize supply chain operations while creating a repository for those innovative solutions and making sure that they are shared and incorporated into the “new normal” going forward. Success will be determined by the supply chain team’s ability to coordinate the restart the upstream supply base to meet the service level needs.

Recommendations Going Forward

Adjusting to a more agile environment and supporting the reengagement of elective and ambulatory services while managing internal operations risks will take careful management and flexibility. While each supply chain is unique, as are the experiences in different geographic areas, there are some industry proven recommendations to help you prepare for the months ahead (Table 1).

Table 1: Recommendations for Adapting Supply Chain for the Next Phase

#	Recommendation	Purpose	Resources	Goals and Benefits
1	Create a Command Center	Rapid and informed decision making	Command Dashboard with real-time data feeds	Better supply chain decisions
2	Take a Systems Approach to the Supply Chain	Holistic view of cost and risks	Supply Chain Dashboard	Better supply chain decisions

#	Recommendation	Purpose	Resources	Goals and Benefits
3	Improve Extended Supply Chain Visibility	Real-time extended event/risk visibility	Supply Chain Dashboard	Real-time information sharing, collaboration & better supply chain decision making
4	Create a Scenario Plan to Mitigate Risks	Scenario testing to develop robust plan	Supply Chain Digital Twin	Maintained business continuity and service levels
5	Rethink Demand Planning Processes	More informed demand planning	Responsive and adaptive models leveraging artificial intelligence (AI)	Better demand understanding and more informed plan
6	Be Agile	Build your processes and communications flows to facilitate rapid decisions	Full Supply Chain Capacity Plan	Adaptable, responsive business continuity plan
7	Focus on Key Relationships	Partnerships to enhance your success	Existing, new, public-private and government resources	Response driven relationships you can rely on in the next phase

1 Recommendation 1: Create a Command Center

Agility requires rapid decisions, and those are best made with the key stakeholders in the room (while socially distancing). Identify the right people to put in the command center and give them the tools and authority they need to make decisions quickly. Tools include dashboards and pre-determined scenario plans to sense change and enact a response. The command center should focus on upstream and downstream partners as well as internal operations.

The command center operations should be supported by a command dashboard that incorporates key information flow to track current operations, external influences, and business forecasts. Ideally, the dashboard will be enhanced with scenario planning or modeling tools to conduct what-if analysis and operational projections. Identify what data feeds you need and the tools to bring them together.

2 Recommendation 2: Take A Systems Approach to the Supply Chain

By now, we have seen how supply chains intersect with the health systems, local infection rates, global demand patterns, geopolitics, and many other factors. Supply chains, even those outside of healthcare, will continue to be heavily influenced by these factors. Recognizing this influence and bringing it into your planning processes will allow your operations staff to anticipate changes and respond while the change is happening rather than reacting and trying to catch up to the change. To achieve this, a systems approach is needed to understand how your supply chain connects with other processes and organizations. During this transition phase, you should identify how external changes will impact your operations, suppliers, customers, transportation partners, and other aspects of your supply chain. Understanding these connections will allow you to bring the right information to your planning processes, allowing a more proactive adjustment to the inevitable changes in the COVID-19 economy.

As part of a systems approach, rethink how you are viewing costs and risks in your supply chain. Often, costs are assessed at each stop of the supply chain (procurement, transportation, etc.). Using a systems approach requires looking at total landed costs for products. Likewise, risks should be viewed through a lens of impact to the overall system. These include risks to employees throughout the supply chain, especially where they interact with others, including drivers who enter warehouses or make deliveries, service contractors, and other customer service people. A more holistic view of costs and risks will enable better decisions, factoring in all costs associated with bringing a product to the patient.

3

Recommendation 3: Improve Extended Supply Chain Visibility

As we enter the next phase of COVID-19, we expect to see local or even regional outbreaks appear quickly. These outbreaks can happen anywhere in your supply chain. You should have a plan ready to address these outbreaks and divert the supply chain through alternative sources or routes to minimize disruptions. Be aware of where your suppliers are located (corporate, manufacturing and distribution locations), what routes products take, and how product flows to customers.

Understanding customer requirements can drive effective allocation decisions. When outbreaks occur, assess the impact on your supply chain and exercise your plan to minimize disruptions to your operations. Keep in mind that outbreaks can directly impact your facilities, possibly shutting down a node in your operations. Build a culture of delivering and accepting bad news early. When one identifies imminent risks, there is no reason to not alert the concerned parties. This is another time to think outside of the traditional supply chain box; a shutdown of a call center or an accounting office can disrupt your supply chain as much as a warehouse closure.

4

Recommendation 4: Create a Scenario Plan to Mitigate Risks

Many organizations in other industry verticals have found scenario planning to be an effective tool for understanding how the supply chain can respond to a localized outbreak; however, the healthcare industry lags in the use of scenario planning for supply chain. Create a model or digital twin of your supply chain and use it to model outbreaks or even multiple simultaneous outbreaks at various locations. Use the results to craft a strategy for quickly responding, protecting employees, and rerouting operations to sustain product flow.

While your organization may not be disrupted during the next phase, these type of pre-mortem assessments can help identify areas or improvements that you may wish to build into your normal operations. Ensure you include internal (e.g., clinical, financial, operational leaders) and external (government/public health agencies, upstream and downstream trading partners, manufacturers, and enabling technology companies) factors in your scenario planning and tabletop exercises. Another important outcome of these joint exercises are the relationships and trust that are built among participants, which creates a foundation for effective crisis response.

5

Recommendation 5: Rethink Demand Planning Processes

On a more tactical level, rethink the demand planning processes. Most demand planning tools use historical data and statistical analysis to project future demand. These methods do not work, however, in a rapidly changing scenario such as we are experiencing now. Statistical forecasts simply do not incorporate the myriad of external factors influencing demand today. Being able to factor in not just historical sales and shipments but also incorporating external source of data—such as geo-specific hotspots and disease ramp up/ramp down—can help you better anticipate demand.

More responsive and adaptive models are now feasible with the emergence of artificial intelligence (AI). AI models can include internal and external causal factors, including economic and public health data, to more accurately shape the forecast. For example, companies have used AI tools to link social mobility data with COVID-19 infection rate data to predict elective procedure demand. Scenario-based planning can help you understand how demand could change and help you build more agile plans. The health environment is extremely dynamic, and your forecasting methods should focus on understanding how changes impact demand and reacting quickly rather than relying on a past that is not prolog.

6

Recommendation 6: Be Agile

The ability to maintain an agile supply chain will be essential. For example, you will have regions where elective procedures are increasing and other areas where COVID-19 cases are surging, but there is no way of knowing today where those regions will be next month. Build your processes and communications flows to facilitate rapid decisions based on emerging trends, coupled with an ability to rapidly shift operations in response to those decisions.

Having options for sourcing, production, and distribution points will be critical for agility. This work includes finding options at the component and ingredient level. Another consideration is the regulatory nature of the healthcare industry and the changes that could occur during a crisis, such as the COVID-19 pandemic. We have all seen the need for swift regulatory approvals of products and services to respond to the situation.

7

Recommendation 7: Focus on Key Relationships

Finally, focus on your business relationships. A lot of traditional partnerships have been disrupted in the past few months. At the same time, you have likely found new partners to support your supply chain through the chaos. Review all these partnerships and use this as an opportunity to evaluate what you need. As health systems restart elective procedures and other customers restart operations, identify the partners you need to reengage to serve these reemerging customers.

Think about which partners can enhance your business. You may focus on new ones and, at the same time, identify old partners you are comfortable leaving behind. When reviewing and formalizing partnerships, consider public-private partnerships that integrate government and industry capabilities. Explore how the future supply chain design could be either hindered or enhanced by your business relationships, and keep in mind that some partnerships will be driven by a response mission rather than traditional business motives.

Getting Started

The time to adjust your supply chain is now; consider what you will need to create the agile operations required for the future. This may require some significant changes to how your supply chain has traditionally operated, but these are not traditional times. Start with a review of your current operations and structure through the lens of these seven recommendations. Identify how you need to adapt to meet the challenges ahead and build a plan for that change. Make sure you include the perspectives of your customers, suppliers, and other partners in this review; supply chain success relies on the entire system working together.

The COVID-19 pandemic made the first quarter of 2020 a time that everyone involved in the health supply chain will remember. The rapid changes in demand and supply during the surge caught almost everyone off guard. As we enter the next phase, we have a better understanding of the supply chain system, which provides an opportunity to plan. Taking the right steps to prepare your operations and partnerships for this next phase will provide your supply chain with some stability and predictability in an otherwise hectic healthcare environment.