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Bolstering health system supply chain resilience to reduce risk

How health systems could enhance their ability to withstand supply shocks and deliver quality care in ordinary times and when crises strike.

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The COVID-19 pandemic exposed vulnerabilities in US health system supply chains. Persistent and elevated supply shortages (compared with before the pandemic), coupled with economic uncertainty and growing inflation, have highlighted that this may be an opportune time for health systems to improve their supply chain resilience.

Although health systems are accustomed to dealing with supply shortages, many were ill-equipped to respond to the magnitude of supply shocks when the pandemic struck. For example, almost overnight, personal protective equipment (PPE)—including N95 masks, latex gloves, face shields, eye masks, and gowns—was depleted. To quickly restock essential PPE, many health systems bypassed their standard procurement practices. They purchased from suppliers or resellers without their typical level of vetting, guaranteed future purchase volumes, or paid significantly higher prices. These actions sometimes resulted in overstocking, receiving supplies that did not meet quality standards, or not receiving a product at all.

Although the pandemic and associated supply chain disruptions are abating, health systems continue to face shortages of some critical medical and surgical supplies. Health systems are now shifting their focus from managing acute, pandemic-related shortages to creating more resilient, efficient, and economically viable approaches to procurement for the long term. This article explores the characteristics of health system supply chains and describes four actions health systems can consider to bolster resilience and mitigate supply chain risk.

Increasingly complex health system supply chains

Even under normal circumstances, managing a healthcare supply chain is a complex endeavor. A regional health system could purchase anywhere from 30,000 to 60,000 unique SKUs annually for clinical supplies.[1] These SKUs are sourced under numerous contracts from medical-supply and pharmaceutical distributors and manufacturers globally.

[1] Calculated based on health systems that range from $5 billion to more than $20 billion in net patient service revenue; the exact number is dependent on system size and scope of services, such as nonacute footprint and number of retail pharmacy sites.

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A set of interlocking supply-side dynamics is currently compounding the complexity, including the following:

— macroeconomic factors such as inflation and the threat of recession

— a streamlined supply base optimized for cost, which may cause downstream challenges if disruptions occur (such as shutting down a singular plant manufacturing certain supplies)

— logistical disruptions to supply, for example, due to labor challenges in shipping

— geopolitical factors that limit access to raw and finished materials

— an increase in disruptive weather events such as hurricanes and earthquakes

In the meantime, health systems must also be prepared for persistent demand-side threats such as a potential pandemic or another global health crisis, a regional health emergency, or a mass-casualty event of any origin.

Health systems that fail to adequately plan for future supply shocks could be unable to provide proper care to patients and incur substantial reputational, financial, and other risks. Caught short of critical supplies, health system leaders could face difficult challenges, including providing care of lesser quality or at higher risk, canceling certain types of care, or paying substantially more from alternate vendors for the same or equivalent supplies. Supply shortages also place pressure on an already stressed workforce, affecting employee engagement, mental health, and job satisfaction. Supply chain and pharmacy leaders may need to devote considerable time and effort to find alternatives, and clinicians may lack the supplies they need to properly do their jobs in the meantime.

It isn't possible for health systems to fully insulate themselves from all future supply shocks, given their unpredictability and varying levels of severity. But leaders could learn from their experiences during the pandemic and align strategies to minimize risk and bolster resilience going forward. Crucial to the effort will be striking the right balance between overinvesting and underinvesting in preparedness based on analysis of the potential risks—particularly in an environment of constrained margins.

Actions that may help develop a more resilient supply chain

Health systems have worked to confront the challenges of the COVID-19 pandemic; now, they have an opportunity to not only refine their pandemic response but also prepare for a broader set of potential shocks. Based on our experience working with health systems and their suppliers, health system leaders can consider four initiatives to help their supply chains better withstand future shocks. These are extending visibility into the supply chain; exploring product-specific strategies; developing relevant protocols, capabilities, and governance; and optimizing costs.

Extend visibility into the supply chain

A critical way to enhance resilience is to extend visibility internally and externally into the supply chain, with the aim of detecting potential upcoming supply chain shocks earlier and having a more accurate sense of the organization's own inventory of affected items.

Internally. Within a health system, supplies are stored in warehouses, stock rooms, closets, and other locations across multiple care settings. The COVID-19 pandemic highlighted the lack of visibility into inventory quantity and location. Although it would be cost-prohibitive for most health systems to implement sophisticated inventory-tracking systems for all clinical and nonclinical supplies, such as those commonly used by consumer-packaged-goods companies or retailers, leaders could consider developing (or acquiring) a set of tools to increase visibility into inventory levels (for example, RFID[2] bar-coding for select critical and high-cost

[2] Radio-frequency identification (RFID) uses electromagnetic fields to automatically identify and track tags attached to supplies.

supplies). As a starting point, some health systems are consolidating available inventory data across all locations and systems (IT and manual), exploring extensions to existing inventory systems, and developing dashboards that show this full-system perspective and provide insights based on analytics. These steps can help health systems better understand which SKUs they have on hand, what quantities they have, and where SKUs are located. Some systems are then layering demand forecasts on top of this inventory visibility to anticipate potential shortages and mount a response.

Externally. Health systems could reach out to their group purchasing organizations (GPOs)[3] and distributors to explore ways to improve upstream visibility into supply chains and identify potential disruptions before they are felt. Some health systems have, for example, written provisions into contracts that provide daily visibility into distributors' own SKU-level inventory levels across all distribution centers, including days of inventory on hand and the expected length of supply disruptions. This allows health systems to better plan their ordering strategies to ensure adequate stock is on hand for a given supply or anticipate a shortage and take action to prevent it.

Because of their size, resources, and breadth of operations, GPOs and distributors typically can identify potential supply shocks earlier than their health system partners can. They have access not only to data and purchasing trends from across a wide set of health systems but also to data feeds and direct contact with manufacturers. Additionally, GPOs and distributors typically have more insight into manufacturers' industrial base and risk profile, with some having employees on the ground in countries where the goods are manufactured, further enhancing their visibility. As a result, they are often more able than health systems to identify precursors to shortages. Additionally, health systems that have strong relationships directly with manufacturers have started to explore data-sharing partnerships with similar aims and results.

A regular cadence of check-ins with upstream partners combined with a framework for information sharing can provide supply chain managers with a more detailed understanding of the supply base and potential vulnerabilities, as can advances to automate portions of this collaboration (for example, with proactive alerts rather than phone calls). Going one step further, convening an alliance of health systems, as some systems have done, can allow member organizations to collaborate on a list of critical supplies and share metrics as a way of becoming aware of shortages sooner, helping the alliance be more responsive to potential shocks.

Explore product-specific strategies

Health systems could also explore product-specific strategies to help circumvent disruptions and mitigate potential supply shocks.

Identify the most critical items. Because supply chain leaders cannot invest equally to boost resilience across all supply categories, they could start by working with their clinicians, emergency preparedness team, GPOs, and distributors to identify the most critical items—often those that are essential to operations and also at a high risk of disruption that results in shortages. Among the most important criteria in deciding criticality is whether the absence of a product would be life-threatening to patients. Other criteria could include the availability of substitutes, frequency of use, and potential effect on revenue if a shortage occurs. Some health systems implement a simple categorization of critical items (for example, high, medium, and low), while others use a more granular scoring system (such as a nine-point scale).

Devise mitigation actions for critical items. Next, health systems could take a variety of mitigation actions for the most critical items. Demand management protocols are one important mitigation

[3] A GPO is an entity created to leverage the purchasing power of a group of organizations to obtain discounts from suppliers based on the collective buying power of GPO members.

action, identifying clinically responsible ways to reduce consumption of critical supplies while minimizing adverse effects on safety or quality of care. For example, ordinarily, and early in the pandemic, health systems treated N95 masks as single-use supplies. After reviewing the utilization protocols and working with staff who specialize in infection prevention, health systems established new protocols that allowed masks to be reused or reprocessed, helping health systems better manage demand surges during the pandemic.[4] For each critical item, the supply chain function could continue partnering with clinicians to proactively identify product alternatives and develop clearly defined guidelines for use in normal times and during a crisis.

Work proactively to avoid shocks. Although the effects of supply shocks can be mitigated, taking proactive steps to avoid shocks could further reduce the risk of needing to go without critical products. One step that proved to be instrumental during the height of the pandemic was stockpiling products that were at greatest risk of shortage. Deciding when to use this strategy entails navigating trade-offs between supply chain resilience and increased inventory cost, but doing so could help delay or avoid some shortages.

In addition to stockpiling specific products, many supply chain leaders are also revisiting supplier strategies to help reduce disruptions. For example, health systems are working with their GPO and suppliers to shift from a sole-source contract to a multisource contract for a set of select supplies, particularly in medical and surgical commodities, although doing so may have an effect on negotiated prices. They may also work with distributors to sequester stock within their warehouses, especially for that health system to access as needed. When making these decisions, some systems are prioritizing adding, or expanding their reliance on, manufacturers who are onshore or nearshore.

Develop protocols, capabilities, and governance
Health systems could also consider taking actions to develop the tools, capabilities, and governance required to strengthen crisis preparedness. Even the most proactive health system cannot prepare for all potential crises, so it is important to put in place a framework and team that can be mobilized quickly when supply chain shocks or surges in demand

[4] Ahmed Abdul Azim, Preeti Mehrotra, and Christina Yen, "From single to multiuse: A brief review of N95 respirator decontamination strategies," *Infection Control Today,* March 26, 2021, Volume 25, Number 3.

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occur. In addition, while other resilience tactics may have limited impact depending on the type and magnitude of supply chain shock the system experiences, effective governance supports supply chain resilience regardless of the challenge (see sidebar "Creating a structured approach to health system supply chain preparedness: A case study").

Some ideas and proven techniques can help with the difficult task of preparing for potential supply chain disruptions:

Assemble a resilience team. Proactive preparedness begins with ensuring that the right people are in place across the health system. Some health systems have at least one person within supply chain fully dedicated to resilience efforts, with more organizations looking to hire additional full-time-equivalent personnel into these roles.[5]

Health systems may benefit from establishing a small, centralized team to explore potential scenarios and responses and quickly mobilize predefined subteams, aligned with a set of products or a service line, to act if a supply shock occurs. These cross-functional subteams could include representatives from relevant clinical and nonclinical areas—for example, physicians, nursing leadership, supply chain, and emergency preparedness—to ensure a clinically led process that brings in other required areas of expertise as needed to inform planning and decision making. Each team would need clear processes, decision rights, and escalation protocols in place to facilitate a speedy response in the face of a crisis, when speed is of the essence. For example, a higher-performing health system with a cross-functional resilience team took an average of four to five days to align on a decision (for example, product alternatives during a shortage), while others

[5] McKinsey survey of 26 individual leaders of academic medical centers and healthcare supply organizations.

Creating a structured approach to health system supply chain preparedness: A case study

After Hurricane Katrina, a large national health system realized it needed to be more proactive in responding to crises. As such, it took a three-part, structured approach to improving its preparedness:

Establishing a centralized emergency response center: A multidisciplinary group of more than 150 leaders is in place and can be activated in the event of a variety of types of crises.

Installing and maintaining protocols and practices: The center has established protocols to be implemented before, during, and after a crisis strikes. This includes having in place contracts with relevant suppliers and ensuring emergency equipment is ready for use.

Using data and technology to continually monitor risks: The health system implemented a data science platform that helps identify potential risks early and evaluates in real time the effects of that risk on patient populations at each care site.

By having the right governance, structures, and decision-making capabilities in place, this health system has been able to make decisions (such as clinically acceptable substitutions) more rapidly when faced with supply chain disruptions, including those that occurred during the height of the COVID-19 pandemic.

took about two weeks to align. These timeline differences are meaningful in a crisis situation, and COVID-19 highlighted the need to streamline and expedite governance for both minor and major disruptions, balancing informed expertise with the ability to move quickly.

Use scenario planning to develop response plans. Once these teams are established, health systems could begin developing response plans based on potential crisis scenarios—such as diverse types of pandemics, bioterrorism events, or natural disasters—defined by the emergency preparedness team, with plans including detailed actions for the central teams and subteams. Health systems could then pressure-test their response plans through a series of tabletop exercises designed to simulate each potential risk and identify ways to improve risk response and coordination.

Develop a communications strategy. Last, health systems could develop a clear, organization-wide communication strategy related to the various potential crises. This strategy, developed by leaders in the communication function, could include cascading messages that are consistent across threat types and delivered in a timely fashion to relevant stakeholders, including staff, patients, and the community. Communications can include details related to the nature and source of the supply disruption, the group involved in responding, the steps being taken to alleviate the challenge, and the best sense of the timeline to resolution.

Optimize costs

Organizations could consider addressing costs to help increase financial resilience. Crises often strain organizations financially and can be followed by economic uncertainty; ensuring that the health system is financially healthy can help guarantee that there is a sufficient financial cushion to withstand future shocks. Organizations can look at approaches to ensure the cost base is optimized and prepared to weather a potential downturn. Examples of these interventions can be found in a previous McKinsey article, "Optimizing health system supply chain performance."[6] No amount of preparation can fully insulate a system from risk, so creating a healthy, lean cost base prior to a shock can further help drive resilience.

[6] Brianne Bowen, Borja Carol Galceran, Sabriya Karim, and William Weinstein, "Optimizing health system supply chain performance," McKinsey, August 23, 2022.

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Questions to help kick-start the supply chain resilience conversation

Leaders of health systems and supply chains can collaborate to identify key focus areas. Asking the right questions is a crucial part of this discussion.

People and partnerships.

- How clear are the roles and responsibilities between supply chain and clinical teams to develop a clinically supported process to make supply decisions?
- How cross-functional is your crisis management team? How clear are the decision rights, and how does information cascade to other business functions?
- Do you have any standing agreements in place to partner with other hospitals to coordinate crisis management (such as patient transfer and transportation) and share resources (such as access to suppliers, personnel, and medical equipment)?
- Do you have any standing agreements in place with suppliers or group purchasing organizations to identify crises and create action plans to mitigate risk more proactively?

Processes.

- What steps have you taken to proactively review supplies to identify potential risks related to your supplier footprint (such as geographic dispersion, geopolitical risk, or climate risk)?
- Can you describe the escalation and communication process between facilities and system supply chain?
- To identify areas for improvement and further development, what stress tests have you conducted and what analysis have you performed regarding crisis response simulation outputs?
- Have you updated your internal processes and risk mitigation strategies (for example, supplier contract terms and demand management protocols) based on crisis response simulation outputs?
- How often do you revisit your crisis preparedness plans and decisions? Are you set up to sustain these processes and plans in between crises?
- Have you developed a clear action plan with defined milestones in response to potential scenario impacts?

Tools.

- What processes are in place to track and manage supply purchases and inventory centrally? How are you using data to optimize purchasing and inventory management?
- Which monitoring tools have you implemented to help identify potential disruptions on an ongoing basis to provide early warning?

Support the effort

Health system executives can support the effort to build a resilient supply chain by first boosting their understanding of their health system's current state. A discussion with supply chain leaders can help them identify key areas to focus on in the short term (see sidebar "Questions to help kick-start the supply chain resilience conversation").

Health systems operate in an increasingly complex environment, and the supply chain function is no exception. We have seen these complexities and the resulting challenges play out in real time over the past three years. The four steps described above could help create a more resilient and agile supply chain organization in the near term. However, the journey to resilience is ongoing and will likely take years to mature. Resilience has become an imperative for health systems; to best enable systems and their caregivers to deliver care effectively and efficiently, this imperative requires continued focus beyond the COVID-19 pandemic.

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