Supply Chains in Crisis

As the deadly Ebola outbreak threatened West Africa, a team of medical, humanitarian and logistics experts teamed up to respond to the deadly virus. The lessons learned by the team could provide a logistics blueprint for handling future crises.

By Jarrod Goentzel and Ian Heigh

DURING THE RECENT DEADLY EBOLA OUTBREAK, A UNIQUE group of experts and organizations formed a supply chain to improve the delivery of humanitarian aid. New supply chains often emerge during a crisis, relyingdo you on processes honed by professionals over the years. This Ebola effort leveraged the strengths of new and traditional groups through a coordination model that companies have long used – supply and demand planning, early and often.

As the Ebola epidemic spread in 2014, resources were appropriately focused on setting up Ebola treatment units while hospitals that provide other critical services were closed or severely constrained. Consequently, healthcare workers lacked enhanced training on infection protection and control (IPC) for Ebola and the personal protective equipment (PPE) supplies to safely deliver healthcare services despite lethal infection risk.

Doctors at the University of Massachusetts Medical School (UMMS) and Boston's Children's Hospital, who had worked with the Ministry of Health in Liberia for more than seven years, together with their colleagues at the Liberia College of Physicians and Surgeons (LCPS), sought to fill this gap in training and equipment. Realizing that the supply chain was critical, the medical specialists also teamed up with experts from the Center for

Transportation and Logistics at the Massachusetts Institute of Technology and from Avenir Analytics, a firm that specializes in supporting humanitarian agencies in response planning and implementation. Together they formed the Academic Consortium Combating Ebola in Liberia (ACCEL).

ACCEL proposed an intervention to provide IPC training coupled with three months of appropriate supplies to protect healthcare workers in hospitals prioritized by the Liberia Ministry of Health. The operation began in November 2014 with a grant from the Paul Allen Tackle Ebola Initiative.

PLANNING A CRISIS RESPONSE

While it's common for businesses to plan operations based on actual demand or agreed-upon sales forecasts, the practice is less evident in international emergency response. Donors typically release funds after the onset and ramp up aid in the immediate aftermath. With limited funding to mobilize resources initially and time pressure to deliver assistance quickly, organizational planning between technical programs and the supply chain is often overlooked.

In contrast, ACCEL experts combined knowledge of the Liberian health community and of commercial and humanitarian logistics capacity to plan its response from the start. The medical program director, international supply chain director and Liberian supply chain director met in Boston in November 2014 to draw up a plan. The initial plan included three main components.

1) Scope and implementation. ACCEL worked directly with the Liberian Ministry of Health to prioritize efforts based on budget constraints, selecting 16 of 21 government hospitals. Hospital staff training used a curriculum developed by the health ministry for safe care and sanitation. Training was delivered in each facility over one week by specially trained LCPS/ACCEL teams consisting of a doctor, midwife, water-sanitation technician and a psycho-social expert. ACCEL also provided three months of consumable and reusable personal protective equipment, and water and sanitation (WASH) items, which arrived simultaneously with the team.

2) Demand plan. The medical program director combined knowledge of current Ebola protection requirements with seven years of experience in Liberian hospital facilities, which was critical in determining specifications for and quantities of PPE and WASH commodities. Quantities were based on several factors, such as the number of hospital beds, surgeries, childbirths, Ebola emergencies expected, and healthcare and sanitation workers. Teams classified hospitals as large, medium and small, delivering standard kits for each.

3) Supply plan. The demand plan provided a basis for calculating supplies required over time and specifying necessary operational assets. The supply chain design incorporated resources already in place and knowledge of existing operations to reduce duplication and setup time. For example, the Logistics Cluster, a coordination body established by the international humanitarian community, worked with the Liberian government to establish a warehouse and distribution system. In addition, the health ministry, with assistance from the Clinton Health Access Initiative, tracked Ebola commodities (both in stock and planned) with a weekly interagency supplies/pipeline spreadsheet.

INTERNATIONAL PROCUREMENT

With the initial plan in place, and a mid-January 2015 training launch agreed on by the government, ACCEL conducted an RFP for the complete set of supplies required. Precise product specifications were difficult to determine, as several standards for treatment were circulating. Reference to standards, such as ISO 16603 for clothing that protects against contact with blood and body fluids, helped link specifications across health organizations and with manufacturer offerings. Ensuring that all products met standards was especially critical given the life or death risks of product failure.

Approved suppliers for UMMS were invited to bid. One large-scale commercial distributor stood out in its ability to provide a complete catalog of PPE and WASH items with relatively short lead times. The distributor used relationships with a large network of manufacturers to find capacity for products in high demand. Using a supplier with a catalog preapproved for the medical school's procurement organization saved significant time. The distributor's warehouse was able to consolidate the large shipment for international transportation.

The time line dictated air transportation, although capacity was constrained because most commercial airlines had suspended operations into Ebola-affected countries. ACCEL used new air-bridge capacity that emerged through the efforts of Airlink, which also received a Tackle Ebola grant from Paul Allen. Airlink established the air bridge from the United States and Europe directly into West Africa. The Liberian government's National Ebola Command Center established a clear process to quickly facilitate customs clearance for all humanitarian aid shipments. As a result, the deployment of supplies was rapid — the MD-11 charter with ACCEL cargo departed Miami on January 11, 2015, and the first hospital delivery was completed the morning of January 16, 2015.

IN-COUNTRY OPERATIONS

Effective execution relied on the capabilities of the ACCEL staff and its partners in Liberia. The Liberia College of Physicians and Surgeons' existing capabilities and relationships in-country helped ACCEL quickly set up operations. Because the college

focuses on teaching, setting up an operational agency with a supply chain required specialized support from logistics professionals. After recruiting a national logistics manager, warehousing and transport officer, procurement officer and head driver, the logistics team developed the following three core processes.

1) Local procurement. To save costs and ensure products were appropriate for the context, the team purchased 13 of the 68 SKUs locally. It also established an auditable process for local procurement, based on rules used by the LCPS to ensure compliance with national requirements.

2) Warehousing and transport. ACCEL established an agreement with the Logistics Cluster to accept internationally and locally procured PPE and WASH supplies in the central store in Monrovia, the capital of Liberia. The cluster also provided trucks to move goods to each location. ACCEL worked closely with the cluster team and submitted service requests to plan receipts and dispatches in advance.

3) Fleet services. Safe transport was crucial for the training teams traveling throughout the country, and it was determined that ACCEL needed nine 4WD vehicles. Through an innovative arrangement, the United Nations Mission for Ebola Emergency Response transferred eight vehicles from other U.N. operations in the region to ACCEL, which were inspected, repaired as needed, and equipped with safety kits, communication systems and tools. It also established maintenance and fueling contracts, and its drivers were trained and tested on standard procedures.

Standard forms (electronic and paper) and spreadsheet tools were developed to support and track the processes. Data were consolidated in a weekly report to provide management with progress updates.

After the first few weeks, the health ministry requested expansion of the program from the original 16 to all 21 hospitals. The logistics costs, which represented more than 70 percent of the original budget, were tracking well under budget due to procurement savings, operational efficiencies and contributions from partners. These savings, combined with Ministry of Health supplies identified in the interagency supplies/pipeline spreadsheet, enabled ACCEL to cover all 21 hospitals with the original budget by the third week of March 2015.

MAKING A DIFFERENCE

The training and supplies had a major impact on the Liberian health system. By the end of March 2015, more than 2,200 healthcare and sanitation workers were trained and equipped to safely provide health services. Several hospitals that had been closed were reopened. The minimum standards for safe-care provision, as measured by a checklist established by the Liberian health ministry, increased from 61 percent to 86 percent after the first round of training. Most important, thousands of patients had access to health services that otherwise would not have been available from January through March 2015.

The ACCEL supply chain procured more than 70 metric tons of supplies, internationally and locally, and delivered them to hospitals across the country within 12 weeks. By the end of March, the vehicle fleet had safely transported ACCEL teams nearly 35,000 miles. Team capabilities combined with budget savings allowed improvements to hospitals, including construction or modification of Ebola triage areas, construction of safe waste-disposal incineration facilities, rehabilitation of water systems and deployment of shipping containers for supplemental storage.

LESSONS LEARNED

This Ebola-response supply chain brought together a mix of development and humanitarian emergency experts, each with important core competencies for the situation. They further leveraged international and national service providers, both commercial and humanitarian, in operating the supply chain. Combining expertise and tailoring partner capacities was possible because of the demand and supply plan devised at the start and updated through the implementation.

The rapid scale-up of operations relied on a capable in-country organization. LCPS provided a solid foundation of human resources, standard processes and key partnerships to ramp up operations. It also provided a link to the Ministry of Health to ensure the intervention was coordinated with other initiatives. The school was able to set up and manage its supply chain using a simple design provided by experienced logistics professionals and supplemented by control mechanisms to ensure goals were achieved.

The efforts of the ACCEL team have contributed to the work of other aid agencies in supporting the government of Liberia to contain the Ebola outbreak, although critical work remains to achieve zero new Ebola cases in West Africa. ACCEL training teams are making second visits to each hospital to refresh training, train workers who were not available during the first round, assess the quality of new practices and determine supply consumption under these guidelines.

Even the most resilient supply chains will occasionally be overwhelmed by a crisis. The ACCEL supply chain was designed to be rapid and temporary, building on local capacity to provide a boost for government systems that were overwhelmed. Consistent and coordinated demand and supply planning was a key component in maximizing the impact of the project. Investment in planning and information systems, and in training professionals to use them, is essential for supply chains to keep pace with the aggressive viruses of the future and other challenges in delivering assistance to people in need.

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