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Supply Chain Visibility for Informed Resupply Decisions

Using cStock to Collect Logistics Data in
Crisis Settings



INTRODUCTION

In situations of humanitarian crisis, access to supplies, especially for health services, is a primary concern that can save countless lives. To manage a supply chain, humanitarian responders and program managers must have visibility into the supply situation on the ground, and in the case of health supplies, into the lowest levels of health service delivery.

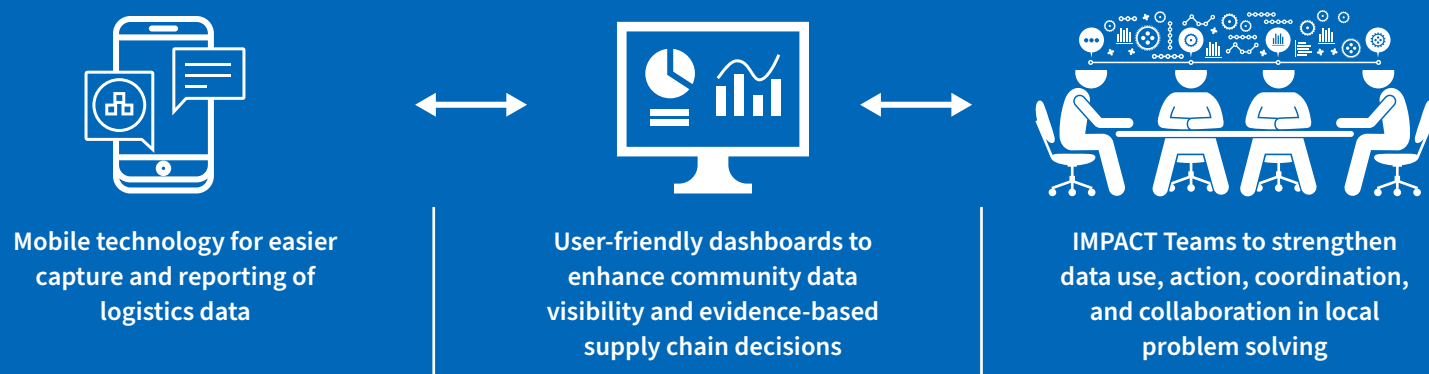
BACKGROUND

cStock is a mobile solution for reporting and resupply of health commodities at the community level. With user-friendly dashboards, and combined with an IMPACT¹ Team approach, cStock can strengthen health supply chains in low resource settings. From 2017 to 2018, Kenya-based JSI affiliate inSupply Health piloted cStock in Siaya, a mostly urban county in Kenya. The pilot offered a digital approach to strengthening the community supply chain, resulting in reduced stockouts of critical commodities.

For the past three years, under the Supply Chain Alternatives for Last Mile Equity (SCALE) project, inSupply has supported Kenya's Ministry of Health (MOH) in implementing cStock across four of Kenya's arid and semi-arid lands (ASAL), which pose challenging environments. The ASAL counties face geographical, infrastructure, political, resource, and capacity difficulties, leading to fragmented and disrupted health supply chains. The SCALE project worked with marginalized populations that are remote, hard to reach, and sometimes migratory. inSupply used human centered design processes to adapt cStock to these resource constrained settings, as well as to the area's nomadic community health volunteers (CHVs), who often have less access to training than their urban peers.

¹ Information Mobilized for Performance Analysis and Continuous Transformation

FIGURE 1. KEY FEATURES OF cSTOCK'S DESIGN AND PROCESS



MOBILE TECHNOLOGY

The cStock mobile solution is a suite of applications integrated with the District Health Information System 2 (DHIS2) Tracker. It enables users to report and manage their commodities using any technology that is available to them. This can be feature phones, smartphones, tablets, or computers. When CHVs report stock data (quantity dispensed, stock on hand, and quantity received) through cStock, it triggers messages that prompt their supervisors, the community health assistants (CHAs), to take action. The messages alert CHAs to execute resupply or address emergency orders, thereby removing barriers associated with lack of data for demand and supply planning, order fulfillment, and inventory management. Data reported regularly through cStock also provides program managers with the information needed for planning and strategic purchasing.

cStock can capture logistics data offline and submit it when internet access is available. Using unstructured supplementary service data (USSD), users with a feature phone or no internet access are able to submit logistics data with no cost incurred for them. Data sent via USSD is integrated with data sent via the cStock app, and all data becomes available in the open source DHIS2 platform. cStock also has a CHA portal with dashboards to support management of CHVs and products. inSupply worked with the MOH to integrate cStock with the Kenya Health Information System (KHIS), which is the national DHIS2 aggregate instance. cStock is flexible, affordable, and designed for scale and sustainability for the more than 200 countries that use DHIS2 as their national health information system.

In Kenya, cStock is used by CHVs who have no special training and sometimes low literacy levels. The system facilitates this by using audio features with instructions for navigating the software, as well as visuals adapted from paper forms that CHVs are familiar with.

USER-FRIENDLY DASHBOARDS

Data reported by CHVs and CHAs are converted into relevant, aggregated, and timely information that measures the performance of the supply chain. The user-centered dashboards with easy-to-read graphs and charts aid decision-making at all levels of the supply chain. Accessible via phone or computer, the dashboards provide the user with a choice of different visuals for the same indicator. cStock monitors the supply chain using key performance indicators (KPIs), such as reporting rates, order fill rates, stock status, stockouts, reporting and processing of emergency orders, and consumption rates.

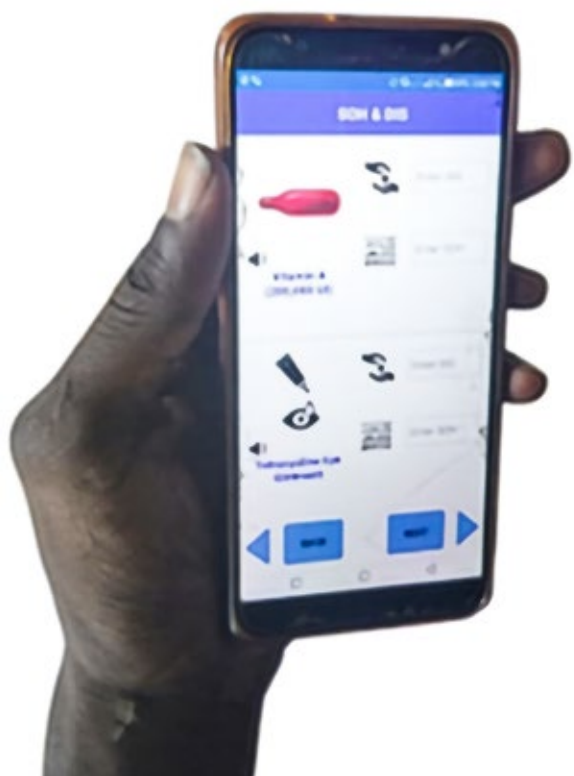
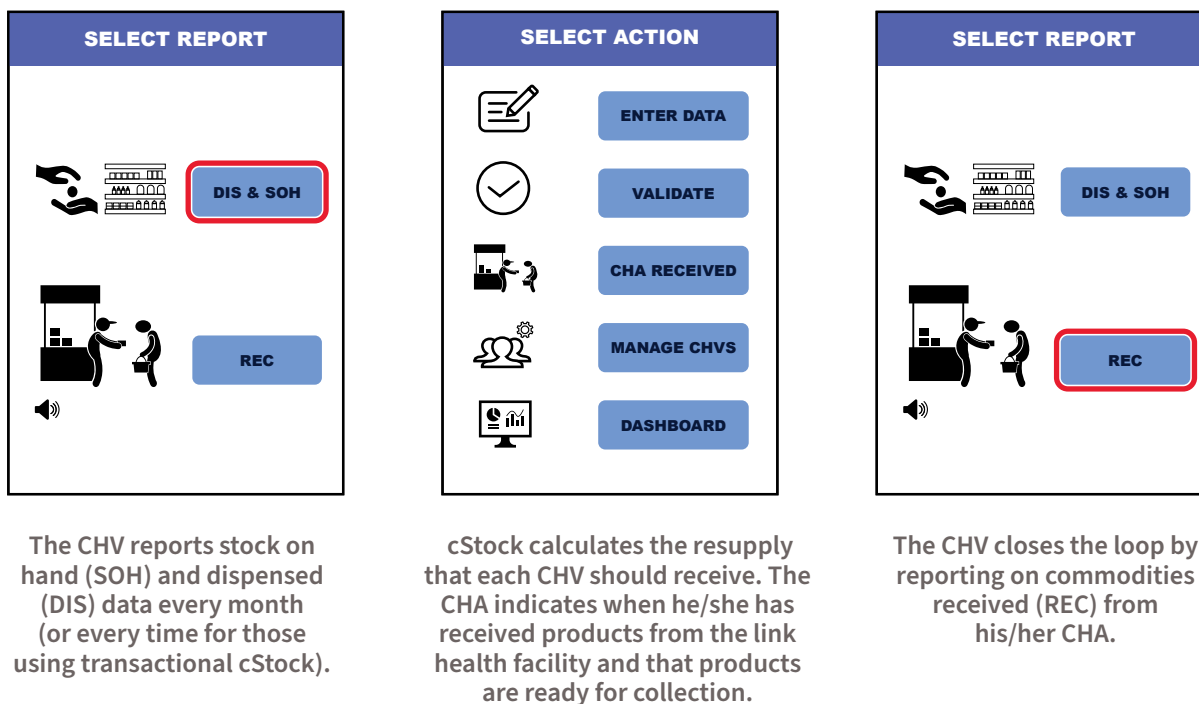


FIGURE 2. HOW DOES cSTOCK WORK AS AN LMIS?

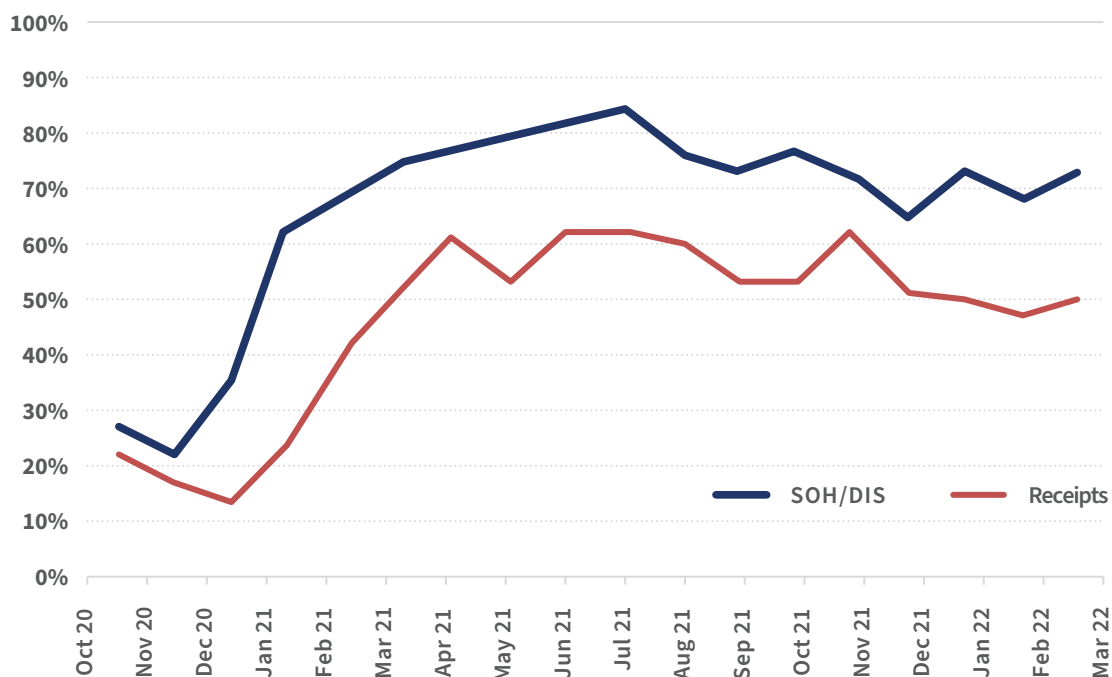


IMPACT TEAMS

IMPACT Teams provide a structured approach for using data and creates a culture of joint problem solving. Established at the facility and sub-county levels, IMPACT Teams are composed of CHVs, the CHA, the drug store or facility in-charge from the link facility where CHVs collect their supplies, and in some cases representation from the Community Health Committee. The teams are trained to develop, interpret, and set targets for key supply chain indicators, and to use action-oriented dashboards. They are encouraged to follow a structured problem-solving process, using their data for operational and strategic decisions with the goal of improving the performance of their supply chain. IMPACT Teams meet when CHVs go to the link facility for resupply. They discuss progress on KPIs and recognize good performance. Participants take minutes at the meeting to develop action plans for accountability.



FIGURE 3. REPORTING RATES BY COMMUNITY HEALTH VOLUNTEERS IN FOUR ASAL COUNTIES IN KENYA SINCE DEPLOYING cSTOCK



KEY RESULTS

The SCALE project implemented cStock in the ASAL counties of Samburu, Turkana, Wajir, and Mandera in addition to implementation in Siaya County. A total of 3,230 CHVs and 223 CHAs used the application to report on their consumption and commodities received, as well as making emergency reports when re-order levels were reached or when supplies were stocked out. As of March 2022, reporting rates for consumption was at 73 percent and at 50 percent for commodities received. Stock reporting is linked to resupply as resupply quantities are displayed on the CHA dashboard for each CHV and is automatically calculated based on supply chain principles. The dashboard has supported the CHAs in monitoring performance of CHVs as well as providing accountability for health commodities. Through the CHA portal, CHAs have been able to validate logistics data as reported by CHVs and thereby improve the quality of data. Data visibility for community health commodities has increased through the dashboards as well as through KHIS. As shown in Figure 3, reporting rates grew steadily across the counties after implementation of cStock in October 2020, then slowed down slightly at times because of health workers' strikes and limited availability of commodities.



Lolopul, a CHV from Turkana County, fills out a paper form.



Lolopul takes a picture of the form with her phone.



Lolopul's supervisor receives her stock data and uses it for resupply.

THE FUTURE OF cSTOCK: REMOVING REPORTING BARRIERS FOR LOW-LITERACY COMMUNITY HEALTH VOLUNTEERS

In a partnership between inSupply Health and Health-E Net, through the Hybrid Paper to Digital (HP2D) initiative, inSupply aims to improve the usability of cStock for CHVs who fall on the lower end of the literacy spectrum. HP2D is exploring how to remove literacy barriers by taking pictures of paper forms and digitizing the data so it can be captured by cStock automatically. It removes a step for both CHVs and CHAs, and automates the transition from manual to digital reporting. HP2D simplifies digitization of data, moving it automatically from manual forms used by CHVs into cStock.

From August 2020 to September 2021, HP2D was piloted through the SCALE project and demonstrated positive results. The MOH is using lessons from cStock to inform the development of the supply chain module for its electronic Community Health Information

System. Based on the results of the HP2D pilot, the MOH hopes to scale up the paper to digital technology as well.

cSTOCK TRANSACTIONAL SYSTEM

cStock improves commodity availability at the community level by streamlining reporting, resupply, and inventory management, and by removing barriers for CHVs to participate in national supply chains. The system includes the transactional reporting mode, with intricate features designed to facilitate frequent reporting and management of inventory. Registration of households provides a practical approach to provision of commodities through the members registered within each unit. Monitoring of stocks at various points of the supply chain, especially at the last mile, is an essential feature that informs decisions such as inventory management.

The ability of CHAs and CHVs to view their stock status enables transparency, accountability, and convenient planning when conducting community health work. The Update Stock feature documents stock on hand and includes stock adjustment functionalities. CHVs can use stock adjustments to report any discrepancies between their physical stock on hand and the stock on hand values in cStock. These features support inventory management by providing real time data for commodity movement.

USING cSTOCK IN HUMANITARIAN SETTINGS

cStock provides a flexible mechanism for collecting, analyzing, and sharing data using a variety of mobile devices. In places where a crisis has disrupted the health system, or if humanitarian needs arise in places without established or functional health systems, cStock may be an option for managing supplies. With options for using USSD if internet, bandwidth, and use of smartphones are limited, cStock is designed for rapid customization and adaptation in resource constrained settings and allows for emergency resupply.

Designed with ease of replicability and scalability in mind, cStock is built on DHIS2, which is also used in the humanitarian sector. cStock accommodates the full spectrum of literacy levels among end users, as well as national reporting structures, existing technology infrastructure, and manual tools and processes.



The feasibility of using cStock in humanitarian settings depends on factors that include geographies, human resources, and infrastructure. A basic version of the system could be deployed in as little as three months, depending on existing systems in use, level of support on the ground, customizations required, and parameters to be integrated, as well as platforms to be used such as android application or USSD. cStock may be especially helpful during protracted humanitarian crises, where humanitarian and development partners work together to transition health services back to the routine health system.

BUILDING CAPACITY TO IMPROVE PHARMACEUTICAL AND MEDICAL COMMODITY MANAGEMENT IN HUMANITARIAN AND DISASTER SETTINGS PROJECT

The [Building Capacity to Improve Pharmaceutical and Medical Commodity Management in Humanitarian and Disaster Settings Project](#) improves the capacity for managing health products and supply chains in humanitarian settings. Staff from international organizations and local nongovernmental organizations strengthen their supply chains for pharmaceutical and medical commodities by gaining access to training, guidance, resources, and follow-up support. JSI manages the project, which is funded by USAID's Bureau for Humanitarian Assistance.

INSUPPLY HEALTH LTD

[inSupply Health Ltd \(inSupply\)](#) is a Kenyan health advisory firm and a subsidiary of JSI that transforms lives by creating innovative and sustainable solutions for healthy communities. inSupply is committed to co-designing, implementing, scaling, and building partnerships for sustainable health solutions that align with universal health coverage priorities and ensure delivery of life saving commodities to all communities. inSupply's approach brings together deep local expertise matched with regional and global perspectives, enabling it to identify and adapt innovations and best practices in a context-appropriate and sustainable way.

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