

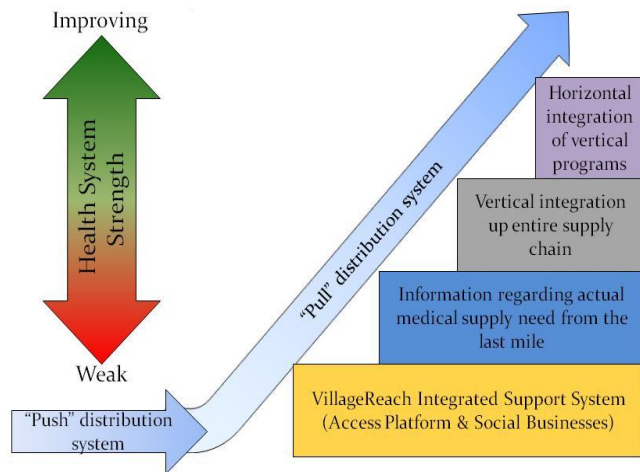
VillageReach®

INTEGRATED SUPPORT SYSTEM FOR IMPROVING HEALTHCARE: “STARTING” AT THE LAST MILE

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Tremendous amounts of time and money have been applied to strengthen medical supply distribution systems in low-resource countries. Progress has been made, yet many systems remain ineffective, inefficient and in no position to handle the increases in throughput required to meet the needs of the people these systems are designed to serve. Weak systems have led to further fragmentation as vertical interventions must build their own distribution systems to support their programs. As a consequence, multiple systems converge at the health center where health workers must deal with each separate system and associated paperwork. In many countries, distribution systems do not formally extend

to the health center, forcing health workers to travel to a district or provincial warehouse to deliver a stack of paper forms and obtain supplies for their health center. It is difficult to strengthen health systems with a “push” distribution system in which supply needs are determined from the top down. Health centers and health workers end up serving the distribution system rather than the other way around.

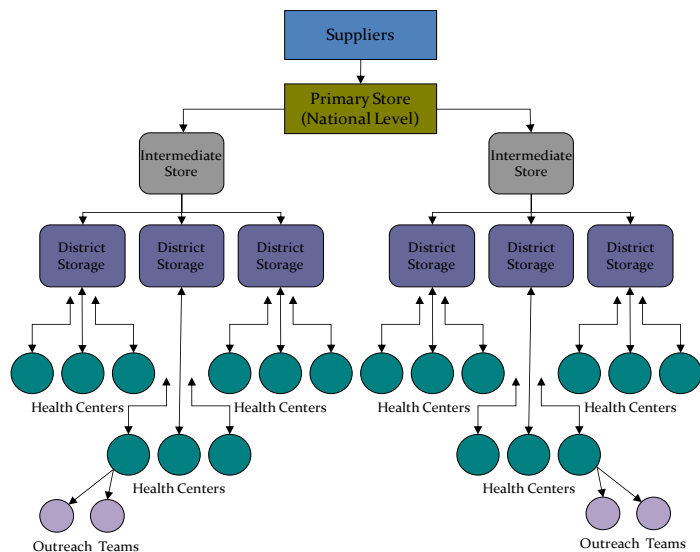


VillageReach believes existing medical supply distribution systems can be radically improved by strengthening the final segment or “last mile” of the supply chain. This approach produces accurate information regarding the

actual need for medical supplies at the point of use. The medical supply distribution system shifts to a “pull” system which provides a foundation for integration of the supply chain both vertically and horizontally. Resulting improvements to the health system are significant. This paper provides a high-level explanation of VillageReach’s Integrated Support System for improving healthcare at the last mile.

CURRENT MEDICAL SUPPLY DISTRIBUTION SYSTEMS IN LOW-RESOURCE COUNTRIES

The diagram to the right depicts a simplified picture of the typical distribution system for medical supplies currently used in low-resource countries. The diagram is highly simplified as typically there is not just one distribution system flowing through the various levels shown. Due to the multitude of vertical healthcare intervention programs there is usually a chaotic patchwork of distribution systems, each with its own operational logistics. The resulting fragmentation prevents the system from achieving the benefits of streamlining, integration and standardization. Existing systems in many countries are at capacity and cannot handle the anticipated future increases in medical supply throughput.



These systems distribute medical supplies from one source to many locations. Efforts to strengthen medical supply distribution systems typically start at the top where supplies are still grouped together in bulk at one or a limited number of locations and fewer people are involved. Even though each distribution system is a single, unified system, it is obvious the system will become weaker as it becomes more spread out or “distributed.” Moving down the supply chain, inventory is broken into smaller and smaller quantities, spread across more locations and handled by a greater number of people. The number of distinct transactions involving the inventory goes up as does the complexity of managing the inventory. In low-resource countries, as the distribution system becomes more complicated, the quality of infrastructure (e.g., electricity, roads, warehouse facilities, communications and computers) available to support the system drops significantly.

Each level of the supply chain is dependent on the level above for its supplies. It is often overlooked, however, that each level is also dependent on the level below it for information. Each level must determine how and when to divide and distribute the inventory it holds to the level below, based on information from below. That information originates from health centers and outreach teams at the final segment or last mile of the distribution system. In low-resource countries, the lack of infrastructure at the last mile level severely limits the quality and availability of information regarding the medical supplies needed at each health center and for each outreach team.

Absent accurate information regarding the supplies actually needed at the last mile, the distribution system can only be a supply-driven or “push” system that must pre-position bulk supplies at various levels and locations based on anticipated vs. actual demand. This approach requires infrastructure and forecasted inventory plus appropriate buffer stocks at each location. Forecasts based on incomplete and inaccurate information lead to over and under supply at all levels of the supply chain. These distribution systems constantly suffer from a garbage in, garbage out problem. They will remain top down, push systems that consistently fail to deliver the right product, at the right time, to the right location. Increasing inventory throughput will only exacerbate the problem.

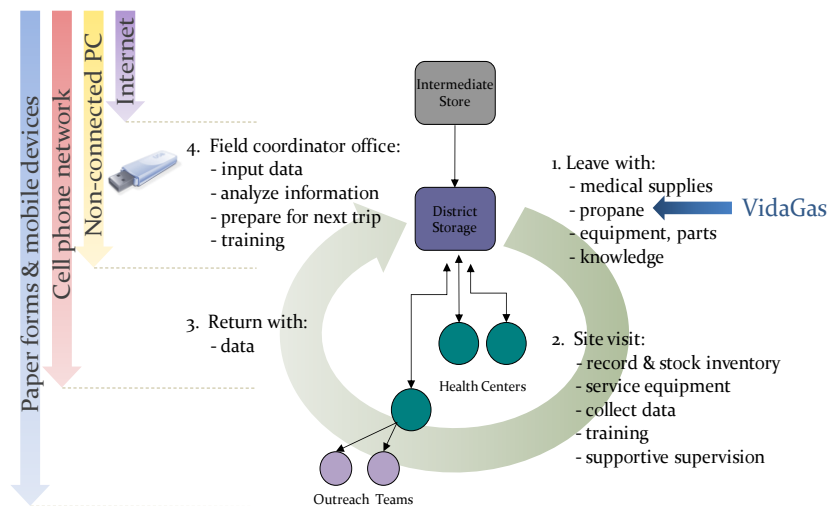
VILLAGE REACH LAST MILE INTEGRATED SUPPORT SYSTEM

Medical supply distribution systems in low-resource countries are weak, in part, because of the lack of focus on strengthening the final segment. VillageReach’s solution is to build from the bottom up by implementing its Integrated Support System at the last mile segment. The system uses modern business management techniques and advanced technology to generate accurate, ongoing information regarding needs at the last mile. As a result, medical supply distribution systems can be turned into “pull” systems that are responsive to and support the health centers, health workers, outreach teams and ultimately the people they serve.

VillageReach’s Integrated Support System establishes a functional team comprised of field coordinators who perform various distribution and support activities for health centers and outreach teams. The functional team utilizes methodologies and tools developed by VillageReach with limited customization for each local environment. Field coordinators are typically employees of the Ministry of Health or a private healthcare provider. VillageReach trains and manages the field coordinators until the system is understood and established, at which time VillageReach transitions full responsibility for the system to the public or private healthcare provider. The functional team can operate out of the provincial or district level depending on available infrastructure and geographic distances to the health centers. The system can be used by public and private health systems in support of any type of health intervention.

Because many of the infrastructure components needed by health centers can be more effectively and efficiently provided by a social business, VillageReach establishes and incubates one or more for-profit businesses. The social businesses typically offer services which are not unique to the health system, such as transportation, energy, communications, and/or sanitation. As a result, these infrastructure services can be provided to the health system at a lower cost. Social businesses will fill one or more gaps in the health system’s wide range of needs as well as contribute to rural economic development.

The purpose and activities performed by the functional teams are illustrated in the diagram below. Each field coordinator is responsible for a group of health centers and related outreach teams. A field coordinator will visit each health center for which he is responsible on a regular schedule. He leaves his



office with the items identified in group 1. In Mozambique, the field coordinator will take propane purchased from VidaGas, a social business established by VillageReach, for cold chain and other health center infrastructure use. At each health center, he performs a site visit covering activities identified in group 2. Upon returning to his office with data collected during the site visit, the field coordinator will perform the tasks in group 4.

Field coordinators use a decision support tool developed by VillageReach. The tool is an Internet-enabled, SQL, form-based application where customized code performs the complex data entry validations and analysis. USB sticks are used to synchronize non-connected computers with the online database. The tool provides a report identifying actions to be taken by the field coordinator at each health center during the next visit (i.e., the “knowledge” referred to in group 1).

The Integrated Support System represents a first step in establishing a functioning medical supply distribution system at the health center. Health centers can then act as a platform to support outreach teams. Because the physical transfer of inventory must occur, VillageReach systematizes that activity to establish a regular network to and from the last mile. Equipment servicing, data/information/knowledge, training and supportive supervision are then also carried on that network.

Consistent with the adage “you manage what you measure,” VillageReach has found this approach significantly improves performance of the medical supply distribution system at the last mile. The improvement applies not only to stock out reduction, cold chain performance and other supply measures, but the quality of the information coming from the health center level. In managing stock levels, field coordinators are able to partner with health workers who, because they are on the front line of healthcare delivery, are in the best position to understand and forecast medical supply needs at their location.

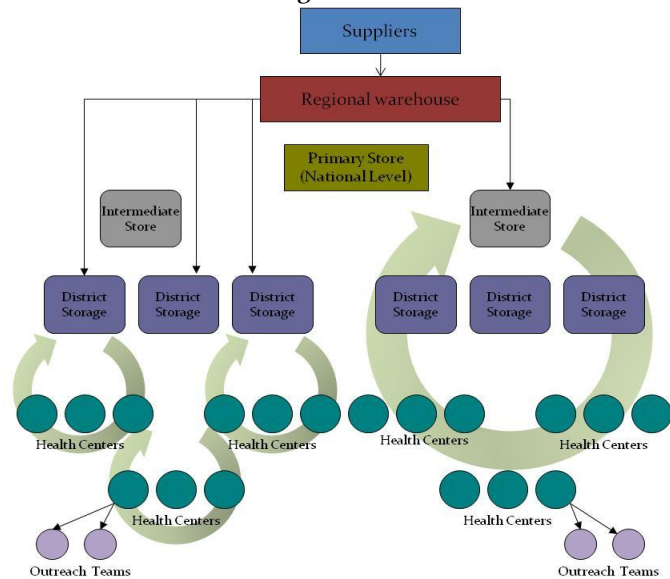
Obviously, the Integrated Support System adds some additional cost compared to having no medical supply distribution system at the last mile. The additional cost must be evaluated, however, against improvements in health worker productivity and healthcare quality. With field coordinators taking on the responsibility and improving the quality of medical supply distribution and equipment support, more health worker time is focused on providing healthcare and the quality of that healthcare increases. In addition, by taking advantage of the high quality of information regarding actual supply needs at the last mile produced by the Integrated Support System, significant cost savings can be gained at higher levels of the supply chain and through integration of existing vertical programs as described below.

EXTENDING THE ADVANTAGES OF THE INTEGRATED SUPPORT SYSTEM UP THE SUPPLY CHAIN

As noted above, current medical supply distribution systems in low-resource countries are forced to be push systems due to the lack of quality information regarding actual supply needs at the last mile. Commercial distribution systems currently used in the developed world are premised upon this type of information. With accurate, ongoing information from the bottom of the supply chain, a distribution

system can become a pull system and distribute the right product, in the right amount, at the right time and location without waste.

The following diagram shows how the supply chain for low-resource countries can be drastically improved by applying supply chain techniques currently available in developed countries. In this diagram, the green circles represent the Integrated Support System operating from either the district or provincial level in support of health centers and related outreach teams. With regular and accurate information regarding actual medical supply needs at the health center level, there would be no need to pre-position bulk inventory at various levels of the supply chain to address anticipated but unknown need. A state-of-the-art regional warehouse could be established in a free trade zone to receive all supplier shipments on behalf of a particular country. The country will remain in charge of its procurement, ordering and forecasting. On a monthly basis, the regional warehouse could pre-pack inventory for each health center and related outreach team and load the pre-packs in containers to match how the deliveries will be divided once they arrive in country. Once the containers clear customs in country, a cross-docking operation is performed and the pre-packed inventory bundles are transported to provincial or district locations for pick-up by field coordinators and immediate delivery to health centers. Depending on the efficiency of the system, there might be multiple months of inventory deliveries on order and in process. Appropriate buffer stocks would be pre-positioned in country to address faults in the system and for emergency use. This approach would produce significant cost savings and facilitate the expansion of supply chain capacity.



THE INTEGRATED SUPPORT SYSTEM ENABLES INTEGRATION ACROSS VERTICAL PROGRAMS

All vertical programs need accurate information from the last mile, but have little in the way of functioning systems at that level. Rather than seeking integration at the top of the supply chain where multiple systems already exist, the current absence of systems at the last mile provides the best opportunity for beginning the integration process. VillageReach's Integrated Support System is a generic supply chain activity and can provide deliveries, inventory management, equipment servicing, training, and supportive supervision for multiple vertical programs. As the field coordinators take over responsibility of logistics-related tasks for various vertical programs at health centers, large amounts of health worker time can be redirected to providing healthcare.

CONCLUSION

Starting at the last mile can drastically change and improve medical supply distribution systems in low-resource countries. The VillageReach Integrated Support System is scalable and sustainable. Because it is simple and non-proprietary it can be applied by others to all types of healthcare programs. The system produces significant increases in healthcare quality (e.g., in Cabo Delgado, Mozambique, stock outs were reduced from 80% to less than 5% on a regular basis; vaccine coverage rates improved from the upper-60%'s to over 90%). When paired with the entire supply chain and/or used as a starting point for integration of vertical programs, it will produce significant improvements in effectiveness and efficiency of the medical supply distribution system and corresponding improvements in the overall health system.