



## Lessons Learned

# Measuring Cost to Optimize Health Commodity Delivery in Zimbabwe



A DTTU team leader enters logistics data on a rugged laptop during a visit to an SDP along her delivery route.

**With the right number of products, DTTU teams can deliver commodities at a lower cost than traditional pull systems.**

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For years, health facilities in Zimbabwe suffered from frequent shortages of drugs and medical supplies. In 2004, the USAID | DELIVER PROJECT and its in-country partners started using a new distribution model—Delivery Team Topping Up (DTTU)—to ensure availability of products. DTTU is based on the vendor-managed inventory system used in the commercial soft drinks industry; it puts the burden of stocktaking on the delivery teams, rather than the already busy medical staff in each facility.

Since its inception, the DTTU system has raised product availability for its 16 HIV & AIDS prevention and reproductive health products to as much as 95 percent. The question is, at what cost? Is the cost too high to replicate the system for other products? How would the cost change if more products were added? And how does the cost compare to a traditional pull distribution system in which health facilities order their own supplies?

To answer these questions, the USAID | DELIVER PROJECT used its Supply Chain Costing Tool—a function-based methodology—to determine the cost of delivering a dollar's worth of product and how the cost would change in different scenarios.

First applied in Zambia in 2009, the tool identifies the actual cost of delivering health commodities to help managers make important decisions about how to design their distribution networks. It captures costs for functions such as procurement, storage, transportation, and management across different organizations and different levels of the supply chain.

Cost information can help to ensure that supply chains are properly funded and can improve efficiency, leaving more funds for purchasing products. Supply chain costing, though, is not a simple accounting exercise. In Zimbabwe, project staff members used key informant interviews and direct observation to collect information on time, effort, and resources spent on supply chain functions.

To collect information about costs for storage, transport, and management at the central level, project staff members surveyed all DTTU partners, including the Zimbabwe National Family Planning Council (ZNFPC), the USAID | DELIVER PROJECT, the Supply Chain Management System (SCMS) project, Crown Agents, NatPharm, and the Ministry of Health and Child Welfare (MOHCW) Logistics Sub Unit. Data from a small sample of the country’s 1,404 service delivery points (SDPs) served as examples of the range of facilities serviced, from small rural health centers through district facilities to provincial and central hospitals. By comparing cost data with the value and volume of commodities, project staff estimated the average cost of delivery to the sampled sites. To find the systemwide average costs, the sample facility costs were weighted and extrapolated to reflect facilities in the whole system.

Six scenarios with different commodities and delivery schedules were applied to the estimated average costs. (See figure 1.) For each scenario, project staff members calculated the average supply chain cost for delivering one dollar of health commodity. This enabled them to evaluate the relationship between delivery cost and the value of products—a key consideration for managers of the supply chain.

The historical bimonthly DTTU delivery schedule provided a baseline scenario, which was then adjusted to a quarterly delivery schedule. An additional 44 primary health care (PHC) commodities, corresponding to those procured by United Nations Children’s Fund (UNICEF), were added.

Finally, MOHCW salary and per diem rates, rather than those used by the project, were applied to simulate labor and operating costs if the Government of Zimbabwe managed DTTU exclusively.

Two additional scenarios compared DTTU with the Essential Drug System (EDS), a traditional pull distribution system functioning successfully before the economic decline in Zimbabwe. Economic conditions meant that EDS was not fully funded, making direct observation impossible. Instead, project staff members used a simple assumption-based model for those scenarios.

A key cost driver for DTTU was the amount of time that delivery teams spend on their routes. As products are added, more time is required to count inventory and pick products to stock facilities. Managing too many products on DTTU makes the cost of team salaries and per diems burdensome.

Also, because DTTU operates like a mobile warehouse, only so many products can be managed easily in one truckload and delivery. For larger numbers of products, picking and packing in the central or branch warehouse, rather than in a mobile warehouse, may be less costly.

In comparison, the key cost drivers for EDS are the total number of staff members to be trained, staff turnover requiring frequent training, supervision costs, and time spent by staff members managing their own stock. With 1,404 facilities in the system, these average costs are substantial for smaller volumes of products but decrease as the value and volume of commodities increases.

**Figure 1. Six Delivery Scenarios**

Scenario 1	Bimonthly DTTU delivery of 11 commodities
Scenario 2	Quarterly DTTU delivery of 11 commodities
Scenario 3	Quarterly DTTU delivery of 11 commodities plus 44 PHC commodities
Scenario 4	Quarterly DTTU delivery of 11 commodities plus 44 PHC commodities using government salaries and per diems
Scenario 5	Quarterly delivery of 44 PHC commodities using a traditional pull ordering system
Scenario 6	Quarterly delivery of 55 PHC and HIV/contraceptive commodities using a traditional pull ordering system

The cost drivers for the two systems suggest that, for fewer products, the DTTU approach would cost less than EDS. However, as the number of products increases, the cost of EDS decreases and at some point is likely to be lower than DTTU. The results of the costing exercise seem to confirm this.

DTTU delivery of 11 products on a bimonthly schedule costs 27 cents for each \$1 of commodity. With a quarterly schedule, savings on transport reduce the cost to 25.2 cents. Adding the 44 PHC commodities further decreases the cost to 23.4 cents. If MOHCW salaries and per diems are used, average cost falls as low as 19.7 cents per \$1 of commodity delivered.

The cost of delivering products under the two EDS scenarios was higher than DTTU. Delivering just the 44 PHC products resulted in the highest average cost of all scenarios at 30 cents. In Scenario 6, the EDS performed better when handling larger volumes of products, with an average cost of 26.5 cents for 55 commodities. The additional 11 commodities more than double the volume and value associated with the 44 PHC commodities.

Key lessons learned from the costing exercise include:

- A DTTU informed push approach is less costly than a pull system for a smaller number of commodities aimed at primary health care facilities.
- The DTTU system can add PHC commodities for a similar average cost of delivery with additional funding for capital and operating costs.
- For EDS, staff time, training, and supervision at the facility level represent the majority of the cost, and these activities must be funded to ensure that the system works. Without them, EDS is likely to underperform. EDS is also a burden to medical staff members, who take time away from patients to perform supply chain activities.
- In a fully functioning pull EDS, with a large number of commodities, supply chain costs are likely to be lower than if they were managed in a DTTU system. Training and supervision costs would be spread over a greater total value of commodities.
- To avoid supply chain performance problems, grant applications must include sufficient funding for facility costs, particularly staff time. In the past, grant applications, especially to The Global Fund, have not included sufficient budgets for Ministry of Health staff supervision and training.

The costing exercise helped the USAID | DELIVER PROJECT and its partners understand important dynamics of Zimbabwe's supply chain for health commodities. In further supply chain system design, average delivery cost will be a key indicator to improve the efficiency of supply chain operation, helping to increase the availability of medical supplies to patients.

Improved product availability and clear understanding of the costs have helped health facility managers recognize the benefits of a vendor-managed inventory approach in Zimbabwe. With the right number of products, DTTU teams can deliver commodities at a lower cost than traditional pull systems. DTTU-like delivery systems are being developed for malaria, tuberculosis, and primary health care commodities.

A full report on the Supply Chain Costing Tool exercise in Zimbabwe, *Zimbabwe: Supply Chain Costing of Health Commodities*, is available on the USAID | DELIVER PROJECT website.



A DTTU team delivers commodities to an SDP.

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