

Operational Strategies to Match Surplus with Humanitarian Needs

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» Research Questions Addressed

How can medical surplus recovery organizations (MSROs) overcome a challenging supply chain—limited supply, high and varied demand, and limited information about recipient needs—to deliver the right medical product to the right recipient healthcare facility?

Can MSROs simultaneously provide information about their inventory levels and obtain accurate need information from recipients?

» Primary Findings

Providing recipient organizations with information about the MSRO's current medical surplus inventory is considered a best practice, but it can be problematic. Time-based competition can result in recipients selecting and receiving medical items that might not meet their most pressing needs.

Two alternative strategies can improve the value MSROs can provide to all their recipients: i) not sharing inventory information with recipients; and ii) withholding information regarding the preferences of other recipients (i.e., competitors) in the recipient pool.

» Relevant Sectors

Government
Healthcare
Medical Equipment & Supplies
Non-governmental Organization (NGO)

» Keywords

Humanitarian supply chains
Mechanism design
Medical surplus
Resource allocation
Socially responsible operations

» Organizations Appearing in Research

MedShare
World Health Organization





Patients in Kenya receive Mobility Carts donated by MedShare.
Photo credit: MedShare.

» Topic Overview

Healthcare organizations regularly dispose of medical surplus products, such as unused, unexpired medical supplies and used biomedical equipment. Meanwhile, many people in the developing world suffer from inadequate access to medical supplies and care. Given this disparity between the developed and developing world, Medical Surplus Recovery Organizations (MSROs) play a critical role by collecting medical surplus products and redistributing them to healthcare organizations in medically-underserved communities. MSROs face the challenge of allocating supplies that best match a recipient's needs within the context of limited (and unpredictable) supplies and extensive humanitarian need.

» Link to Article

Zhang, C., Atasu, A., Ayer, T., & Toktay, L. B. (2017). [Truthful mechanisms for medical surplus product allocation](#). (Working Paper). Atlanta, GA: Georgia Tech Scheller College of Business. <http://dx.doi.org/10.2139/ssrn.3050085>

» Related Link

Atasu, A., Toktay, B., Yeo, W. M., & Zhang, C. (2017). [Effective medical surplus recovery](#). *Production and Operations Management*, 26, 1142–1162.

» Highlights

In contrast to a traditional supply chain where the objective is typically to maximize profit, the objective of an MSRO is to maximize value provision to recipients.

In many traditional supply chain management settings, information sharing typically improves system performance; however, for MSROs, the reverse is true.

When an MSRO's inventory information is shared, recipients may have an incentive to misreport their preferences to improve the likelihood of being served.

If recipients rank their preferred products, MSROs can use this information to determine which recipients to serve depending on the availability of inventory at each shipping opportunity.

» Implications for Sustainable Business

Matching supply with demand is difficult in an MSRO supply chain, especially when many organizations lack operational expertise. As a result, a significant portion of donated, surplus medical products goes to waste. Optimization of an MSRO ordering system can help the right product get to the right recipient, thus reducing waste and providing improved value to communities that do not have access to high-quality healthcare.