GOR abstract 2023 (Hamburg, Germany)

Title: Integration of location and inventory decisions in healthcare supply chains: state of the art and first model

Abstract (max. 1800 characters):

Healthcare systems face tight budgets because of government savings. Moreover, hospitals experience rising costs due to the energy crisis and the COVID-19 pandemic. Accordingly, healthcare systems are under pressure. As a result, hospitals continuously seek efficiency improvements while ensuring a high quality of care. About 30% of hospital costs are associated with logistics, making logistics costs the highest after personnel costs. Since hospitals are labor-intensive organizations, improvements are mainly present in hospital logistics. So, optimizing the hospital supply chain is relevant.

Integrated decision-making concerning location and inventory has been recognized as an opportunity to improve the hospital supply chain. The critical driver of integrating location and inventory is to achieve inventory pooling benefits. These benefits can be realized by consolidating multiple inventory locations into a single location or a few locations. As a result, improvements such as decreased inventory and operational costs can be achieved, resulting in reduced hospital logistics costs. These improvements may enhance the hospital supply chain to deliver the expected service to patients while dealing with tight budgets.

This study makes two main contributions. First, existing literature on integrating location and inventory decisions over the past decade is reviewed, and interesting research opportunities are identified. Second, a first idea for an optimization model to address these opportunities is proposed. In the future, a mathematical formulation will be developed. This model will account for typical healthcare features such as service level constraints, perishability, and emergency deliveries to investigate the integration of location and inventory in a healthcare context.