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A possibilistic Location-Inventory model for multi-period perishable pharmaceutical supply chain network design

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Highlights

- Designing a pharmaceutical distribution network via a novel location-inventory model
- Considering perishability feature of pharmaceutical items
- Accounting for epistemic uncertainty in critical parameters.
- Providing a real case study to examine the applicability of the proposed model

Abstract

In this paper, a location-inventory model is developed for a three-echelon pharmaceutical network design problem. The problem includes several strategic and tactical decisions (i.e. opening of manufacturing and distribution centers, material flows in the network, and the optimal inventory policy taking into account products' perishability) while aiming at minimizing the total cost of the network. A possibilistic programming approach is devised to cope with the imprecise parameters. In order to verify and analyze the proposed model, it is tested on a real case study and useful managerial insights are provided by conducting several sensitivity analyses.

Keywords: Pharmaceutical supply chain network design, Perishability, Possibilistic programming, *Me* measure.

1. Introduction and literature review

Network design problems typically include strategic decisions that influence tactical and operational decisions. Decisions related to designing a network are highly interrelated (Ozsen et al., 2008). The mutual effects of facility location and inventory control decisions of a distribution network is an obvious instance of this fact. For more information about the general location-inventory models, the interested author can consult Farahani et al. (2015).

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