

Maintenance of a highly perishable lifesaving product under a healthcare supply chain management

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Abstract

The inadequate management of the blood platelets supply chain leads to a wastage of this valuable lifesaving resource. Due to the high perishability nature of the blood platelets, a sustainable supply chain is needed to determine an optimum transportation way that can guarantee the efficiency of the collection and the diffusion processes of the platelets. A multi-collection and multi-distribution problem within a multi-echelon supply chain is presented. The objective of this research is to develop and solve a multi-objective optimization model with primary objective functions to minimize the total costs of the supply chain, minimize the carbon emitted due to the transportation activities throughout the network and minimize the delivery time in order to increase the shelf life of the platelets and increase the lifesaving rate as well. The augmented ϵ -constraint method is applied to solve the proposed model and numerical experiments based on a real case study are conducted to prove the effectiveness of the proposed model and its validity.

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