Investigating (de-)centralized decision-making scenarios in Hospital Mergers using Multidimensional Knapsack Problems.

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Résumé

Health crises, such as epidemics, require a precise decision-making and control process between the different components of the health system in order to manage patients effectively. In this context of improvement, governments in various countries create GHTs, i.e., hospital mergers or, in French, "Groupement Hospitalier de Territoire".
The purpose of this article is to compare centralized and decentralized decision-making scenarios within the GHT. In this article, these different decision-making models have been applied to a specific GHT located in the Loire region of France. The proposed scenarios are formulated by using the Operational Research solver "CPLEX" to optimise decisions and/or interactions between lower-level hospitals and their direct superior (presented by agents) to coordinate these decisions. In the centralized scenario, SH (Support Hospital) uses CPLEX to make the decision and resolve the MKP (Multidimensional Knapsack Problems : resource allocation problem) for everyone.However, in the decentralized scenario, every hospital will make their own decision and solve their MKP problem, so we will employ multiple CPLEX that interact through holonic interactions.

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