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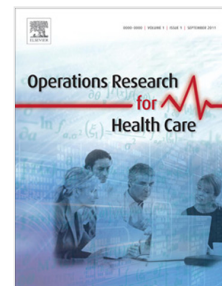
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Local Search Heuristics for a Surgical Case Assignment Problem

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Abstract

This work is part of an ongoing project with a Portuguese public hospital, where the elective surgeries scheduling problem is studied. The administration of the hospital aims to achieve the targets set by the Portuguese Ministry of Health for surgical production and to ensure a surgical service with a high level of efficiency. However, hospitals do not have an elective surgeries scheduling system, so the surgeries are unsystematically scheduled and without respecting equity criteria, thus disregarding the Ministry's goals.

Three versions of the problem are considered and local search heuristics are developed in order to quickly find good solutions for each version of the problem. The heuristics select patients from a long waiting list for surgery to be scheduled in each week, and define a room, a day and a shift for each selected surgery according to one of three different perspectives of the problem.

The heuristics developed are tested in real instances and the values of the solutions are compared with the values of the solutions obtained using mixed integer linear programming models. The solutions obtained by the heuristics are of very good quality and the computational time required is generally quite low, even considering the instances with more surgeries in the waiting list.

In addition, a user-friendly interface is created for the hospital, which reads all the relevant data and proposes a weekly surgical schedule in a systematic manner.

Keywords: Health services management, Elective surgeries scheduling, Heuristics, Local search, Interface

1. Introduction

The Portuguese National Health Service was created in 1979 to ensure the right to health protection for all citizens, regardless of their economic and social condition. One of the challenges of the Portuguese Ministry of Health is to improve the management of the National Health Service, to provide better quality of health, with better working conditions for human resources. It is known that in certain public hospitals, the waiting time in various services is much higher than recommended and even socially accepted; as is the case of the surgical service. To change this situation, the Ministry of Health intends to achieve some targets that limit the number of patients on the waiting list, the number of days that a patient is on the

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