Many hospital units use a mix of single- and semi-private rooms to cope with hospitalization demand. In order to accommodate new patients when operating at high utilization rates, these units must determine who to admit, and if to make more room, there is a need to transfer those already admitted to different rooms in the unit (i.e., internal movements). These decisions are complicated by the limited number of beds, nursing time availability, and the need to implement isolation guidelines that prevent healthcare associated infections. This study presents a discrete optimization model that suggests for an acute care unit with high utilization levels, how to accommodate admitted and incoming patients in order to enforce all isolation requirements, while trying to hospitalize the most critical patients, and to reduce the number of internal movements. The optimization model is then integrated into a Monte Carlo simulation to evaluate how the unit’s configuration affects the number of internal movements. The simulation results indicate that increasing the number of semi-private rooms not only increases capacity, but also the uncertainties associated with patient demand and the number of internal movements, and consequently the effort to transfer patients. This study also illustrates how to determine the number of spare resources necessary to cope with the variability resulting from the number of semi-private rooms in a unit.

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