We consider an operating room block scheduling problem, in which stochastic patient surgery duration is taken into account. Given a surgery waiting list, a set of Operating Room (OR) blocks and a planning horizon, the decision herein addressed is to determine the subset of patients to be scheduled in the considered time horizon and their assignment to the available OR block. The objective is the minimization of a measure of the waiting time of patients. To this aim we introduce a penalty function associated with waiting time, urgency and tardiness of patients.

In a real case setting, planning is decided several weeks ahead. This provisional planning cannot take into account new arrivals of patients. Some of the new arrivals have a high priority, and need to be scheduled within a short period. Unpredictable events (such as, extensions in surgery duration) may occur, leading to the necessity of modifying the planned schedule. Some already planned surgeries may be cancelled and therefore must be re-scheduled.

In our approach, at the beginning of each week, an n week plan is devised. Only the first planned week is carried out. After this week, a new n week plan is devised, taking into account the previously planned solution, new arrivals and to-be-rescheduled patients. The problem is formulated as an ILP model and solved with a commercial solver. A deterministic formulation and a robust one are proposed and compared.