

Chemotherapy Outpatient Scheduling Optimization with a Practical Application Luxembourg

jeudi 31 juillet 2025 11:15 (30 minutes)

Cancer is the second leading cause of death in the world. Unfortunately, the projections from the International Agency for Research on Cancer (IARC) indicate a rising trend for new cancer cases in the following years. Among the various cancer treatments, chemotherapy is one of the most effective treatments for numerous cancer types. It generally contains one or more prescribed molecules according to a tailored protocol to eliminate or inhibit the growth of cancer cells. In recent years, chemotherapy outpatient scheduling has emerged as a critical and complex research topic due to the rising number of patients, the uncertainties in treatment processes, resource constraints, and the interdependencies between the sequential stages of treatment. The chemotherapy process generally includes the following steps: patient admission, blood testing, oncologist evaluation and validation, molecule production, infusion (or injection), and discharge. Numerous uncertainties are associated with the chemotherapy treatment process. For instance, our numerical analysis shows significant dispersion in molecule production times, even for identical molecules. In this research, we develop optimization models that account for these uncertainties across the different stages of the chemotherapy treatment process. Our objective is to enhance responsiveness to rising demand, reduce patient waiting times, and improve resource utilization. We evaluate our approach using data from a chemotherapy clinic in Luxembourg.

Authors: ONER, Nihat (University of Luxembourg); KOCYIGIT, Cagil (University of Luxembourg)

Orateur: ONER, Nihat (University of Luxembourg)

Classification de Session: Sequential decision-making under uncertainty

Classification de thématique: Sequential decision making under uncertainty