



African Working Group  Healthcare Systems

AFROS - African Federation of Operations Research Societies

6th Healthcare Systems Seminar

Online Free Seminar

November 27, 2024, 17:00-19:00 pm Tunis/ 16:00- 18:00 pm GMT

Flow management in healthcare production systems - application to hospital sterilization departments and operating rooms

Maria Di Mascolo

Senior Researcher at the CNRS (French National Center for Scientific Research) Member of the G-SCOP (Grenoble-Sciences for Design, Optimization and Production) Laboratory



Planning and Optimizing Alternatives to Classical Hospitalization: Towards Patient-Centered Care with a Sustainability Perspective

Safa Chabouh

Assistant Professor of Industrial Engineering at the National Engineering School of Tunis (ENIT) Member of the LACS (Analysis, Design, and Control of Systems) Laboratory at ENIT

Q&A Session and Open Debate

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Abstract

This talk will present the stakes of flow management in the health domain. We will see some examples of work, carried out in the G-SCOP laboratory, showing the contribution of engineering sciences, and more particularly of industrial engineering, for the study and the improvement of the organization of healthcare production systems, and more particularly hospital sterilization departments and operating rooms. This talk will thus show how modeling, performance evaluation, mathematical optimization, and risk analysis can contribute to making the management of healthcare production systems more efficient.

Planning and Optimizing Alternatives to Classical Hospitalization: Towards Patient-Centered Care with a Sustainability Perspective



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Abstract

Hospitals are under strain from rising demand for healthcare services, leading to capacity and cost pressures. To address these challenges, cost-effective, patient-centered alternatives to hospitalization are being developed. By limiting hospital stays to essential care and shifting other services to flexible settings, this approach reduces overcrowding, lowers costs, and enhances patient comfort and quality of life. Optimizing and planning these healthcare delivery systems is essential to fully realize these benefits. This presentation focuses on two primary alternatives to traditional hospitalization: ambulatory surgery care and home health care. It provides an overview of our research on planning challenges encountered in Tunisian healthcare settings, with a particular emphasis on the sustainability aspects of organizing these types of care.

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Abstract: This talk will present the stakes of flow management in the health domain. We will see some examples of work, carried out in the G-SCOP laboratory, showing the contribution of engineering sciences, and more particularly of industrial engineering, for the study and the improvement of the organization of healthcare production systems, and more particularly hospital sterilization departments and operating rooms. This talk will thus show how modeling, performance evaluation, mathematical optimization, and risk analysis can contribute to making the management of healthcare production systems more efficient.

Bio: Maria Di Mascolo, is Senior Researcher at the [CNRS](#) (French National Center for Scientific Research), and a member of the [G-SCOP](#) (Grenoble-Sciences for Design, Optimization and Production) laboratory. Her main scientific interests are related to the modelling, analysis and optimization of systems for the production of goods and services, and in particular healthcare production systems. Her objective is to develop methods and tools to assist in making decisions that guarantee a good performance to production systems, despite uncertainties. The decisions to be made concern the design of production systems (including the control or maintenance policies to be implemented), as well as the planning of activities to be carried out, or the management of flows, with a special interest in the sustainability and human aspects.

She co-leads the [GISEH](#) (Hospital Systems Management and Engineering) technical committee of the [SAGIP](#) (French Society of Automatic Control, Industrial and Systems Engineering), and is editor-in-chief of the ISTE OpenScience journal "[Industrial and Systems Engineering](#)". She is Deputy Head of [Sustainable Industrial Engineering Master's degree](#) at Grenoble Institute of Technology.



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Safa Chabouh

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National Engineering School of Tunis (ENIT)*

*Member of the LACS (Analysis, Design, and Control of
Systems) Laboratory at ENIT*

Abstract Hospitals are facing growing demand due to an aging population, rising rates of chronic conditions, and longer life expectancies, leading to increasing capacity strain and escalating healthcare costs. At the same time, governments are under pressure to control these costs within limited budgets. To address these challenges, cost-effective, patient-centered alternatives to traditional hospitalization are being developed. These alternatives aim to minimize or avoid hospital stays by providing only the necessary care within the hospital and shifting other aspects of care to more flexible settings. This approach can reduce hospital overcrowding, lower healthcare expenditures, and improve patient comfort, enhancing overall quality of life. Optimizing and planning these healthcare delivery systems is essential to fully realize these benefits. This presentation focuses on two primary alternatives to traditional hospitalization: ambulatory surgery care and home health care. It provides an overview of our research on planning challenges encountered in Tunisian healthcare settings, with a particular emphasis on the sustainability aspects of organizing these types of care.

Bio: Safa Chabouh is an Assistant Professor of Industrial Engineering at the National Engineering School of Tunis (ENIT). She holds both Ph.D. and engineering degrees in Industrial Engineering from ENIT. Her research centers on the application and development of optimization and operations research tools for healthcare system planning and management, as well as on multi-criteria decision-making approaches for addressing sustainability challenges in supply chains. She has participated in international research projects, including PRIMA (in collaboration with Tunisia, Spain, France, and Italy) and PHC-Utique (Tunisia-Spain), as a postdoctoral fellow. Her collaborations extend to various socio-economic partners, such as public hospitals, the Tunisian Ministry of Agriculture and Fisheries, and stakeholders in the agri-food supply chain. Since its inception, she has also served on the executive committee of the African Working Group on Healthcare Systems, affiliated with the African Federation of Operational Research Societies (AFROS).