

## A Model for the Economic Impact of Healthcare Facilities During a Pandemic

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### Abstract:

This work deals with the economic implications of epidemics, in particular with those related with the implementation of healthcare infrastructure and facilities. It is evident that insufficient medical resources imply costs both in terms of human lives and economic burdens stemming from longer hospitalization stays and absenteeism due to sick leaves. An increase of medical resources is likely to have a positive impact on the mitigation of its consequences, primarily by reducing mortality rates, but it represents an economic cost to be assumed by the society. Also, beyond a certain point, additional medical resources do not necessarily imply a significant improvement in health care quality. The goal of this work is to establish a mathematical model to describe such a situation that might help in the decision-making to find a balance between the different costs involved in the health care system in the case of a pandemic.

Our proposal considers a continuous compartmental model for the evolution of the pandemic that separates hospitalized and ICU hospitalized individuals, and is linked to a cost functional that describes the economic cost derived from the different agents implied in the model, resulting in an optimization problem whose parameters are the number of hospital and ICU beds.