D4.6 ASSESSING STRATEGIES FOR IMPROVING HOSPITAL CAPACITY FOR HANDLING PATIENTS DURING A PANDEMIC

Project acronym: BuildERS
Project title: Building European Communities’ Resilience and Social Capital

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<table>
<thead>
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<table>
<thead>
<tr>
<th>Version</th>
<th>Date</th>
<th>Reason</th>
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</thead>
<tbody>
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Executive Summary

D4.6 consist of a scientific publication based on the work done in T4.6 in USA by George Mason University. The scientific article has been submitted to the Disaster Medicine and Public Health Preparedness.

The content of the paper has been included in D4.8, which sums up all the main results from the case studies in BuildERS WP4.

On the next pages, the abstract of the article can be found.

The work was funded by National Science Foundation grant 2027624 and the World Bank Group.
Abstract

Objective
The aim of this study was to investigate the performance of key hospital units associated with emergency care of both routine emergency and pandemic (COVID-19) patients under capacity enhancing strategies.

Methods
This investigation was conducted using whole-hospital, resource-constrained, patient-based, stochastic, discrete-event simulation models of a generic 200-bed urban U.S. tertiary hospital serving routine emergency and COVID-19 patients. Systematically designed numerical experiments were conducted to provide generalizable insights into how hospital functionality may be affected by the care of COVID-19 pandemic patients along specially designated care paths under changing pandemic situations from getting ready to turning all of its resources to pandemic care.

Results
Several insights are presented. For example, each day of reduction in average ICU length of stay increases intensive care unit patient throughput by up to 24% for high COVID-19 daily patient arrival levels. The potential of five specific interventions and two critical shifts in care strategies to significantly increase hospital capacity is described.

Conclusions
These estimates enable hospitals to repurpose space, modify operations, implement crisis standards of care, prepare to collaborate with other health care facilities, or request external support, increasing the likelihood that arriving patients will find an open staffed bed when one is needed.

This work was funded by National Science Foundation grant 2027624 and the World Bank Group.
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