

Implementation of Lean Six Sigma to Lessen Waiting Times in Public Emergency Care Networks: A Case Study

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Abstract

Emergency Care Networks (ECNs) are integrated healthcare systems comprised of emergency departments (EDs). ECNs are called to be the primary response of healthcare authorities to deal with the expected uptick in the future demands for emergency care during the current Covid-19 pandemic. Lean Six Sigma (LSS) has been proposed to address this challenge since it allows managers to detect factors contributing to the extended waiting times (WT) throughout the patient journey. The suggested framework follows the DMAIC cycle that was initiated with the project charter definition; in the meantime, a SIPOC diagram was drawn to analyze the emergency care process and pinpoint critical process variables. Following this, a nested Gage R&R study was undertaken to study the measurement system performance; subsequently, a normal-based capability analysis was carried out to determine how well the ECN process satisfies the specifications. The next step was to identify the potential causes separating the ECN nodes from the desired target. Afterwards, improvement strategies were devised to lessen the average WT. After suitable data collection, a before-and-after analysis was performed to verify the effectiveness of the implemented strategies. Ultimately, a control plan containing an I-MR control chart was designed to maintain the improvements achieved with the LSS implementation. The results revealed that the average WT of the showcased node passed from 190.02 min to 103.1 min whereas the long-term sigma level increased from -0.06 to 0.11 . The proposed framework was validated through a case study including the involvement of a medium-sized hospital from the public sector. © 2021, Springer Nature Switzerland AG.

Keywords

Covid-19; Emergency Care Networks (ECNs); Healthcare; Lean Six Sigma (LSS); Waiting times (WT)