Researchers find machine learning supports emergency departments

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Researchers from the University of Minnesota Medical School recently published findings *PLOS ONE* that evaluated the real-time performance of a machine learning (ML) that supported clinical decision-making for

emergency department discharge at M Health Fairview hospitals.

The multidisciplinary team of intensivists, hospitalists, emergency doctors, and informaticians evaluated the real-time performance of a ML-enabled, COVID-19 prognostic tool. This tool delivered clinical decision support to emergency department providers to facilitate shared decision-making with patients regarding discharge.

"COVID-19 has burdened healthcare systems from multiple different facets, and finding ways to alleviate stress is crucial," said Dr. Monica Lupei, an assistant professor at the U of M Medical School and medical director M Health Fairview University of Minnesota Medical Center—West Bank.

Led by Dr. Lupei, the University research team successfully developed and implemented a COVID-19 prediction model in the 12-site M Health Fairview health care system that performed well across gender, race and ethnicity for three different outcomes. The logistic regression algorithm created to predict severe COVID-19 performed well in the persons under investigation, although developed on a COVID-19 positive population.

Drs. Christopher Tignanelli, Michael Usher, Danni Li, and Nicholas Ingraham have been instrumental in creating and assessing the COVID-19 predictive model.

"Clinical decision systems through ML-enabled predictive modeling may add to patient care, reduce undue decision-making variations and optimize resource utilization—especially during a pandemic," Dr. Lupei said.

A logistic regression model ML-enabled can be developed, validated, and implemented as clinical decision support across multiple hospitals

while maintaining high performance in real-time validation and remaining equitable.

Dr. Lupei recommends that the effect on patient outcomes and resource use needs to be evaluated and further researched with the ML model.

More information: Monica I. Lupei et al, A 12-hospital prospective evaluation of a clinical decision support prognostic algorithm based on logistic regression as a form of machine learning to facilitate decision making for patients with suspected COVID-19, *PLOS ONE* (2022). DOI: 10.1371/journal.pone.0262193

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