

# Identifying Triage Determinants and Using a Novel Bayesian 3D-CNN Model for COVID-19 Mass Casualty Incidents (MCI) Triage Recommendation

## Abstract

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Liege Cheung

UIUC, Champaign, IL, USA

## Abstract

**Objective:** This research identified the key determinants and designed a novel Bayesian three-dimension convolution neural network (3D-CNN) for COVID-19 mass casualty incidents (MCI) triage recommendation.

**Methods:** 109 articles between 2019 and 2022 were archived from MEDLINE databases. An empirical review and content analysis were done to find out the triage determinants and a Bayesian 3-D CNN model was designed for triage recommendation.

**Results:** 35 out of 109 articles were used. The severity of infection (signs and symptoms of coronavirus), likelihood of spreading (attitudes of pandemic spreading, personal behaviors, and government policy), and available resources (physician and medication availability, hospital vacancy, and evacuation assets) were the identified determinants. The likelihoods of having COVID-19 were calculated with a Bayesian network based on the parameters of the three determinants, and were pre-processed for training the 3D-CNN model with the COVID19 test result, recover history, and medication outcome for “immediate (hospital admission with immediate medical care)”, “delayed (quarantine center and observation)”, “minimal (home quarantine with medication)”, “semi-minimal (home quarantine without medication)”, or “no priority (no therapeutic resources)” triage recommendation.

**Conclusions:** The determinants and AI model classify patients to an optimal healthcare facility for reducing disaster medicine risk. The model verification and validation were undergoing.

**Supplementary material.** The supplementary material for this article can be found at <http://doi.org/10.1017/dmp.2024.224>.