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## Systematic Review on COVID-19 Readmission and Risk Factors: Future of Machine Learning in COVID-19 Readmission Studies

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#### Abstract

In this review, current studies on hospital readmission due to infection of COVID-19 were discussed, compared, and further evaluated in order to understand the current trends and progress in mitigation of hospital readmissions due to COVID-19. Boolean expression of ( "COVID-19 " OR "covid19 " OR "covid " OR "coronavirus " OR "Sars-CoV-2 ") AND ( "readmission " OR "re-admission " OR "rehospitalization " OR "rehospitalization ") were used in five databases, namely Web of Science, Medline, Science Direct, Google Scholar and Scopus. From the search, a total of 253 articles were screened down to 26 articles. In overall, most of the research focus on readmission rates than mortality rate. On the readmission rate, the lowest is 4.2% by Ramos-Martinez et al. from Spain, and the highest is 19.9% by Donnelly et al. from the United States. Most of the research (n = 13) uses an inferential statistical approach in their studies, while only one uses a machine learning approach. The data size ranges from 79 to 126,137. However, there is no specific guide to set the most suitable data size for one research, and all results cannot be compared in terms of accuracy, as all research is regional studies and do not involve data from the multi region. The logistic regression is prevalent in the research on risk factors of readmission post-COVID-19 admission, despite each of the research coming out with different outcomes. From the word cloud, age is the most dominant risk factor of readmission, followed by diabetes, high length of stay, COPD, CKD,

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liver disease, metastatic disease, and CAD. A few future research directions has been proposed, including the utilization of machine learning in statistical analysis, investigation on dominant risk factors, experimental design on interventions to curb dominant risk factors and increase the scale of data collection from single centered to multi centered.

### Keywords

**Author Keywords:** COVID-19; readmission; risk factors; mortality; machine learning

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