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Survival Probabilities of COVID-19 Patients: Insights from Length of Hospital Stay

The **COVID-19** pandemic has posed significant challenges to healthcare systems worldwide. Understanding the factors influencing patient outcomes, particularly survival rates, is crucial for effective management and resource allocation. This study focuses on the estimation of survival probabilities for patients hospitalized due to COVID-19, specifically analyzing the **length of stay** in Intensive Care Units (ICUs) with a focus on patients requiring ventilator support.

Using survival analysis techniques such as the **Kaplan-Meier**, Weighted Kaplan-Meier, and Reverse Kaplan-Meier methods, this study analyzed time-to-event data from **NIMHANS Hospital**, focusing on COVID-19 patients. The dataset included critical variables like age, comorbidities, gender, blood pressure, sugar levels, and oxygen levels. Non-parametric methods were employed for their flexibility and accuracy without assuming a specific distribution. Results revealed significant associations between survival and factors such as age, comorbidities, and oxygen levels, with Kaplan-Meier curves effectively illustrating survival probabilities across different subgroups. The analysis also highlighted the importance of handling censoring to ensure unbiased survival estimates. The findings emphasize the need for personalized care and continuous monitoring of key health indicators in ICU settings, offering valuable insights for future research and strategies aimed at improving patient outcomes during pandemics and other health crises.

This research contributes to the growing body of knowledge on COVID-19 survival analysis, providing evidence-based guidance for clinical practice and public health interventions.

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