

*Prediction of Inpatient Unit's Bed Needs at RSU Kaliwates Jember Using the
Support Vector Regression Algorithm*

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ABSTRACT

The Bed Occupancy Rate (BOR) is one of the indicators used to assess the efficiency of hospital bed utilization. The BOR value in RSU Kaliwates Jember didn't reach 60-85% the standard stated by Kemenkes RI, where certain classes had values below the ideal standard, while others exceed it. To achieve efficient bed utilization, research on predicting days of care is essential for estimating bed needs. Support Vector Regression (SVR) algorithm predicts the days of care, employing the Radial Basis Function (RBF) kernel as a threshold to ensure model follows the actual data pattern. Based on inpatient census recapitulation across all classes between 2020-2024 exhibit fluctuating trends. Predictions values for days of care demonstrate patterns of increase and decrease, closely aligning with actual data. The lowest prediction is President Suite class in 2025 with 290, while the highest is class 1 in 2025 with 13521. Each inpatient class produces varying levels of prediction error. Six out of ten classes have MAPE categorized as fair (<50%), while the remaining are categorized as poor (>50%). Variations in input data, presence of outliers, and variations in parameters contribute to the high MAPE values. Based on the predictions of bed needs for 2025–2027, the smallest number of beds is President Suite class in 2025 with one bed, while the largest number is class 1 with 44 beds. These predictions can be serve as strategic reference for hospital policy to achieve efficient bed use by implementing relocation.

Keywords: *Bed needs, BOR, Prediction, Support Vector Regression*