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Modelling breast cancer incidences in Sri Lanka using time series analysis

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In Sri Lankan women, Breast cancer is the most prevalent type of cancer. Sri Lanka has relatively low breast cancer survival rates when compared to more developed countries. Over 3,000 new cases of breast cancer are diagnosed each year, according to the analysis of the Sri Lanka National Cancer Registry. The breast cancer incidence data published in the National Cancer Registry, Sri Lanka during 2005 – 2020 was obtained. Sri Lanka has primarily a public health care system. Therefore, by understanding and predicting breast cancer rates, healthcare systems and organizations can be better equipped to prevent, detect, and treat this disease effectively. The main objective of the study was to predict a suitable model and forecast future breast cancer incidences. In this study, we predicted the Quadratic trend model, Exponential trend model, and Holt-Winters methods and did a comparison based on the residuals to find the best model. According to the results, the best prediction model was determined based on accuracy measures of Mean Absolute Percentage Error (MAPE), Mean Absolute Deviation (MAD), and Mean Standard Deviation (MSD). By comparing these accuracy measures, the Quadratic trend model is selected as the best-fitted model for breast cancer incidences during these 15 years. The forecasted values for the years 2021, 2022, and 2023 are 5267, 5602, and 5950 respectively.

Keywords: Breast Cancer, Quadratic, Holt-Winter's, Sri Lanka, forecasting

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