

## Application Difference between Cox and Logistic Regression Models

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**Abstract :** The logistic regression and Cox regression models (proportional hazard model) at present are being employed in the analysis of prospective epidemiologic research looking into risk factors in their application on chronic diseases. However, a theoretical relationship between the two models has been studied. By definition, Cox regression model also called Cox proportional hazard model is a procedure that is used in modeling data regarding time leading up to an event where censored cases exist. Whereas the Logistic regression model is mostly applicable in cases where the independent variables consist of numerical as well as nominal values while the resultant variable is binary (dichotomous). Arguments and findings of many researchers focused on the overview of Cox and Logistic regression models and their different applications in different areas. In this work, the analysis is done on secondary data whose source is SPSS exercise data on BREAST CANCER with a sample size of 1121 women where the main objective is to show the application difference between Cox regression model and logistic regression model based on factors that cause women to die due to breast cancer. Thus we did some analysis manually i.e. on lymph nodes status, and SPSS software helped to analyze the mentioned data. This study found out that there is an application difference between Cox and Logistic regression models which is Cox regression model is used if one wishes to analyze data which also include the follow-up time whereas Logistic regression model analyzes data without follow-up-time. Also, they have measurements of association which is different: hazard ratio and odds ratio for Cox and logistic regression models respectively. A similarity between the two models is that they are both applicable in the prediction of the upshot of a categorical variable i.e. a variable that can accommodate only a restricted number of categories. In conclusion, Cox regression model differs from logistic regression by assessing a rate instead of proportion. The two models can be applied in many other researches since they are suitable methods for analyzing data but the more recommended is the Cox, regression model.

**Keywords :** logistic regression model, Cox regression model, survival analysis, hazard ratio

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