

An Alternative Stratified Cox Model for Correlated Variables in Infant Mortality

Authors : K. A. Adeleke

Abstract : Often in epidemiological research, introducing stratified Cox model can account for the existence of interactions of some inherent factors with some major/noticeable factors. This research work aimed at modelling correlated variables in infant mortality with the existence of some inherent factors affecting the infant survival function. An alternative semiparametric Stratified Cox model is proposed with a view to take care of multilevel factors that have interactions with others. This, however, was used as a tool to model infant mortality data from Nigeria Demographic and Health Survey (NDHS) with some multilevel factors (Tetanus, Polio, and Breastfeeding) having correlation with main factors (Sex, Size, and Mode of Delivery). Asymptotic properties of the estimators are also studied via simulation. The tested model via data showed good fit and performed differently depending on the levels of the interaction of the strata variable Z^* . An evidence that the baseline hazard functions and regression coefficients are not the same from stratum to stratum provides a gain in information as against the usage of Cox model. Simulation result showed that the present method produced better estimates in terms of bias, lower standard errors, and or mean square errors.

Keywords : stratified Cox, semiparametric model, infant mortality, multilevel factors, confounding variables

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