

ABSTRACT

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Maximum Abbreviated Injury Scale (MAIS) scale is available only if a person involved in a crash is taken to the hospital. MAIS is a better estimation of severity outcome than KABCO scale (K=Killed, A=Incapacitating Injury, B= Non-incapacitating Injury C= Possible Injury and O= PDO), which is normally determined by a police officer at the crash scene. However, the issues of sample selection should be taken into consideration before using the linked police-hospital data that generates MAIS. This is because an accident victim with considerable injury goes to hospital and a person died on crash scene hardly receives an MAIS code. Past studies dealing with injury model using MAIS scale overlooked this problem. If not properly addressed, this issue can lead to a considerable bias in both parameter estimate and model prediction. A bivariate sample selection model is an established way to correct the selection bias. However, it is important to compare different model specifications with a view to determining the most suitable model structure. This is also important to investigate how the estimation errors vary with different censoring level and model specification.

This study conducts a monte-carlo simulation study to investigate these issues. The bivariate ordered probit models with three alternative model specifications are compared with the univariate ordered probit model. Parameters are compared at different censoring levels, and correlation between the sample selection and outcome equations.

A pedestrian injury severity analysis has been demonstrated as a case study. Certain important factors like pedestrian actions, weather variables, road type and functional classification have been confirmed. The injury analysis has also been extended to a survival analysis for victims who died later in the hospital. Injury by different body regions (like head or lower extremities), gender and external environmental factors can significantly affect the survival rate. The model results can help making priorities for emergency preparedness.