

國立高雄大學統計學研究所

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Spatial-Temporal Analysis for Ecstasy Incidents in Kaohsiung

City and Its Risk Assessment Methodology

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Abstract

This study explores the application of the zero-inflated Poisson model for analyzing ecstasy incidents in Kaohsiung City, incorporating both spatial and temporal considerations. Within the Bayesian hierarchical model framework, Markov Chain Monte Carlo (MCMC) methods are employed to generate essential parameters. The primary contribution of this research lies in introducing a risk assessment method under the zero-inflated model, preceded by the selection of explanatory variable combinations based on the Deviance Information Criterion (DIC). Additionally, quantile regression is incorporated into the model to understand the distribution of data under different percentiles. The demonstration emphasizes a comprehensive approach to risk evaluation. The proposed methodology not only provides a refined understanding of the spatiotemporal distribution of ecstasy incidents but also introduces a risk assessment tool for relevant authorities.

Keywords: Conditional autoregressive model, Model selection, Risk assessment, Zero-inflated data

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