

Investigating Factors Associated with Infant Mortality in Selected MOH Areas in Colombo District, Sri Lanka

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Infant mortality is a vital public health indicator that reflects socio-economic disparities, maternal health, and access to healthcare. Despite national progress in reducing the infant mortality rate (IMR), Colombo's IMR remains above the national average, warranting focused investigation. This study aims to conduct a comprehensive statistical analysis of the determinants of infant mortality in selected Medical Officer of Health (MOH) areas within the Colombo District, Sri Lanka. Secondary data were collected from nine MOH offices between 2019 and 2023. A random cluster sampling technique was used to select these nine MOH offices ensuring a representative sample. Additionally, the study examines the factors determining the number of days an infant survives prior to mortality. The dataset consists of 228 cases and encompasses variables related to various aspects of infant death, including socio-demographic factors, birth history, and maternal and paternal characteristics. Data were collected directly from the MOH offices and structured for analysis. Missing data were handled using multiple imputation techniques to ensure robust results. The analysis employs both descriptive and advanced statistical techniques, including negative binomial regression and decision tree models, to identify the significant predictors of infant survival and estimate the number of days an infant lived before mortality. Birth weight and maternal immunisation against rubella emerged as the most significant predictors, with higher birth weights associated with prolonged survival. Geographical disparities were also observed, particularly in the Kolonnawa MOH area, which emerged as a critical hotspot in the region. This area warrants targeted public health interventions due to its higher incidence of parents with no formal education and gaps in maternal rubella immunisation coverage. Despite limitations due to incomplete data coverage across all MOH areas, the findings remain robust due to rigorous statistical handling. This study offers actionable insights for improving neonatal care and guiding targeted public health interventions aimed at reducing infant mortality in Colombo. Moreover, estimating the likelihood of infant survival will aid in optimising resource allocation within hospitals, ensuring more effective use of available healthcare facilities.

Keywords: Birth weight, Colombo district, infant mortality, maternal immunization, negative binomial regression