

MODELING THE INCIDENCE OF TUBERCULOSIS IN SOUTHERN THAILAND

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Abstract. The aim of this study was to examine the trend, seasonal and geographic effects on tuberculosis (TB) incidence in the fourteen southern provinces of Thailand from 1999 to 2004. Data were obtained from the National Notifiable Disease Surveillance Report (506), Ministry of Public Health. The joint effects of gender, age, quarterly season and location on the TB incidence rates were modeled using both negative binomial distribution for the number of cases and log-linear distribution for the incidence rate; then these models were compared. The linear regression models provided a good fit, as indicated by residual plots and the R^2 (0.64). The model showed that males and females aged less than 25 years had similar risks for TB in the study area. Both sexes had their risk increased with age but to a much greater extent for men than women, with the highest rate noted in males aged 65 years and over. There was no evidence of a trend in the annual incidence of TB during 1999-2004, but the incidence has a significant season variation with peaks in the first quarter over the six year period. There were also differences in the incidence rate of TB both within and between provinces. The high risk areas were in upper western and lower southern parts of the region. The log-linear regression model could be used as a simple method for modeling TB incidence rates. These findings highlight the importance of selectively monitoring geographic location when studying TB incidence patterns.

Key words: log-linear models, negative binomial model, tuberculosis incidence

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