SPATIAL AND TEMPORAL VARIATIONS IN TUBERCULOSIS INCIDENCE, NEPAL

Sampurna Kakchapati, Chamnein Choonpradub and Apiradee Lim

Department of Mathematics and Computer Science, Faculty of Science and Technology, Prince of Songkla University, Pattani Campus, Mueang, Pattani, Thailand

Abstract. Tuberculosis (TB) is an important public health problem in Nepal. The aim of this study was to investigate the spatial and temporal variations in TB incidence in Nepal. Data regarding TB cases were obtained from the Nepal National Tuberculosis Center (NTC) for 2003-2010 and analyzed. Models were developed for TB incidence by gender, year and location using linear regression of log-transformed incidence rates. Apart from a relatively small number of outliers, these models provided a good fit, as indicated by residual plots and the $r$-squared statistic (0.94). The overall incidence of TB was 1.31 cases per 1,000 population with a male to female incidence rate ratio of 1.83. There were trends of increasing incidence in TB for recent years among both sexes. There were marked variations by location with higher rates occurring in the Terai region and relatively moderate and low rates of TB in the Hill and Mountain regions, respectively. TB incidence was also higher in the capital city Kathmandu and other metropolitan cities. A log-linear regression model can be used as a simple method to model TB incidence rates that vary by location and year. These findings provide information for health authorities to help establish effective prevention programs in specific areas where the disease burden is relatively high.

Keywords: TB, incidence, spatial variation, temporal variation, log-linear model, Nepal

Correspondence: Chamnein Choonpradub, Department of Mathematics and Computer Science, Faculty of Science and Technology, Prince of Songkla University, Pattani Campus, Pattani 94000, Thailand. Tel 66 (0) 89 4660803; Fax 66 (0) 73 335130 E-mail: cchamnein@bunga.pn.psu.ac.th