Original Paper

Relationship between socio-economic factors and tuberculosis using negative binomial and Poisson regression models

Sarvi F (M.Sc)[1], Mehrabi Y (Ph.D)*[2], Abadi AR (Ph.D)[3]
Nasehi M (Ph.D)[4], Payandeh A (Ph.D)[5]

[1]M.Sc in Biostatistics, Department of Biostatistics and Epidemiology, Paramedical Sciences Faculty, Shahid Beheshti University of Medical Sciences, Tehran, Iran. [2]Professor, Department of Epidemiology, School of Public Health, Shahid Beheshti University of Medical Sciences, Tehran, Iran. [3]Associate Professor, Department of Health and Community Medicine, School of Medicine Sciences, Shahid Beheshti University of Medical Sciences, Tehran, Iran. [4]Assistant Professor, Department of Epidemiology, School of Public Health, Shahid Beheshti University of Medical Sciences, Tehran, Iran. [5]Ph.D Candidate in Biostatistics, Department of Biostatistics and Epidemiology, Paramedical Sciences Faculty, Shahid Beheshti University of Medical Sciences, Tehran, Iran.

_____

Abstract

Background and Objective: Tuberculosis (TB) is the most important cause of death worldwide. The main reason for the increasing global burden of TB are severe poverty and class distinctions between rich and poor population groups in various communities. This study was performed to determine the relationship between socio-economic factors and TB using negative binomial and Poisson regression models.

Method: This descriptive - analytic study was conducted on 11320 TB affected patients in Iran during 2010. Data was gathered from the Iranian Ministry of Health and Medical Education. The relationship between the numbers of cases with socio-economic indicators was determined using negative binomial and Poisson models. Fitting models were compared using AIC (Akaike Information Criterion) and BIC (Bayesian Information Criterion).

Results: The Poisson regression model showed a significant relationship between the TB mortality rate and socio-economic factors (P<0.05). Negative binomial regression model showed a significant relationship between TB and unemployment, illiterate, immigration and urban residency (P<0.05). Negative binomial regression model showed no relationship between TB and family size, physicians' ratio to the number of population centers and annual average income.

Conclusion: There is a significant impact of socio-economic factors with the number of TB cases. Negative binomial regression model is suitable for accountable data in comparision with Poisson regression model.

Keywords: Tuberculosis, Socio-economic indicators, Negative binomial regression model, Poisson regression model

_____