Spatial Associations of Lung Cancer Rates and Socioeconomic, Health, and Environmental Factors in Georgia

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Abstract

According to CDC, Lung and Bronchus Cancer ranks the highest by the rate of cancer deaths among different types of cancers in the United States with the rate of 31.8 per 100 thousand people, and also for Georgia with the rate of 33.4 per 100 thousand people. Thus, to reduce the death rate of lung cancer, it is quite important and urgent to understand its risk factors. Smoking and inhaling radon are among the top risk factors of lung cancer for individuals. The socioeconomic, health, and environmental characteristics of communities might be also related to the likelihood of getting lung cancer for the residents in the communities, but their associations are not well understood. The overall objective of this study is to analyze the spatial associations of lung cancer rates and socioeconomic, health, and environmental factors at county-level in Georgia using GIS (Geographic Information System) and statistical analyses. GIS is used to map and compare the spatial patterns in lung cancer rate, socioeconomic, health, and environmental factors by counties. GIS-based hot spot analysis is used to identify the spatial clusters of the lung cancer rate. Statistical analyses, especially correlation analysis, are used to quantify and compare the associations of the lung cancer rate with each of the studied socioeconomic, health, and environmental factors. The lung cancer rates between male and female, and among specific age groups are also compared. This study is expected to reveal the spatial patterns and hot spots of the lung cancer rate and its associations with risk factors across counties in Georgia. It will contribute to a better understanding of the associations of lung cancer rate with the health, socioeconomic, and environmental conditions of communities and provide useful information of health policy making.