**Abstract**

The burden of cancer is growing globally and is one of the top leading causes of death. Information on cancer patterns is essential for effective planning of cancer control interventions. In specific the geographical study of cancer will help in identifying the high risk communities for further etiological studies. Objective: The present study aims to investigate the application of various spatial statistical tools to identify the high cancer risk zones in the western regions of Tamil Nadu, India. Methodology: Spatial point pattern analysis was performed to assess the area based risk factor for cancer in the study area. The cancer incidences recorded in each address were geo-coded to build point features. Dual kernel estimation method was used to simplify the complex point patterns without diminishing the significance of the incidence level data. The incident hot spots were verified and tested for their statistical significance against a random distribution by means of Nearest Neighborhood Index, Ripley’s K, Geary’s C and Moran’s I test. CrimeStat software (CrimeStat III, 2004) and ArcGIS 9.1 were used to obtain these results. Results and Conclusion: The smoothed map produced through the Kernel estimation method showed high clustering in the Coimbatore North, Coimbatore South and Erode taluks and was confirmed statistically by the Nearest Neighbouhood Index and Ripley’s K test. Further, from the values obtained by the Moran’s I and Geary’s C test it is observed that there exists positive partial autocorrelation in the point data. Hence the spatial analytical methods will be useful tools in conducting further etiological studies in the high risk regions. In addition, it will be also helpful for the health professionals to organize early cancer screening programs and better prevention strategies for the society