Spatial Analysis of Survival Pattern and Treatment Outcomes of Multi-Drug Resistant Tuberculosis (MDR-TB) Patients in Lagos, Nigeria

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Abstract : The study is aimed at assessing the Geographic Information System (GIS)-based spatial analysis of Survival Pattern and Treatment Outcomes of Multi-Drug Resistant Tuberculosis (MDR-TB) cases for Lagos, Nigeria, with an objective to inform priority areas for public health planning and resource allocation. Multi-drug resistant tuberculosis (MDR-TB) develops due to problems such as irregular drug supply, poor drug quality, inappropriate prescription, and poor adherence to treatment. The shapefile(s) for this study were already georeferenced to Minna datum. The patient's information was acquired on MS Excel and later converted to . CSV file for easy processing to ArcMap from various hospitals. To superimpose the patient's information the spatial data, the addresses was geocoded to generate the longitude and latitude of the patients. The database was used for the SQL query to the various pattern of the treatment. To show the pattern of disease spread, spatial autocorrelation analysis was used. The result was displayed in a graphical format showing the areas of dispersing, random and clustered of patients in the study area. Hot and cold spot analysis was analyzed to show high-density areas. The distance between these patients and the closest health facility was examined using the buffer analysis. The result shows that 22% of the points were successfully matched, while 15% were tied. However, the result table shows that a greater percentage of it was unmatched; this is evident in the fact that most of the streets within the State are unnamed, and then again, most of the patients are likely to supply the wrong addresses. MDR-TB patients of all age groups are concentrated within Lagos-Mainland, Shomolu, Mushin, Surulere, Oshodi-Isolo, and Ifelodun LGAs. MDR-TB patients between the age group of 30-47 years had the highest number and were identified to be about 184 in number. The outcome of patients on ART treatment revealed that a high number of patients (300) were not ART treatment while a paltry 45 patients were on ART treatment. The result shows the Z-score of the distribution is greater than 1 (>2.58), which means that the distribution is highly clustered at a significance level of 0.01.
Keywords : tuberculosis, patients, treatment, GIS, MDR-TB
Conference Title : ICHMI 2021 : International Conference on Health and Medical Informatics
Conference Location : Vienna, Austria
Conference Dates : December 27-28, 2021