Mapping Libya’s prostate cancer based on the SMR method: A geographical analysis

Maryam Ahmed Alhdiri¹, Nor Azah Samat², Zulkifley Mohamed

¹Department of Statistics, Faculty of Science, University of Tripoli, Alfernag, Tripoli, Libya, ²Department of Mathematics, Faculty of Science and Mathematics, Universiti Pendidikan Sultan Idris, 35900 Tanjong Malim, Perak, Malaysia

Correspondence: Maryam Ahmed Alhdiri (email: m.alhdiri@yahoo.com)

Abstract

Disease mapping has become an important method used in public health research and disease epidemiology. It is a spatial representation of epidemiology data. A very common disease mapping method is called Standardized Morbidity Ratio (SMR). Many researchers used this method to estimate the relative risk of the disease as a preliminary analysis. In this study, the SMR method displays the high and low risk areas of prostate cancer for all districts in Libya. SMR is the ratio of the observed to the expected number of prostate cancer cases and was applied to the observed prostate cancer data from Libya for the years 2010 and 2011. The results were presented in graphs and maps. The highest risk of prostate cancer (all type of cancers) is in the West of Libya probably due to the oil installations in this area such as Mellitah Oil and Gas B.v, the Azawia Oil Refining Company and Bouri Oil Field, as well as the electrical power stations. Susceptible people located in the Eastern part of the country have the lowest risk when compared to the overall population. In conclusion the results show that the use of the SMR method to estimate the relative risk in maps provides high-low risk appearances in maps compared to using the total number of cancer incidence alone. In other words, the SMR method can be considered a basic procedure because it takes into account the total human population for each district.

Keywords: disease mapping, Libya, prostate cancer, relative risk, spatial analysis, Standardized Morbidity Ratio