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Determination of Locations of Health Facilities in Idleb Governorate, Northwest Syria Using Mclp and P-Median Models

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Abstract

This study aims to determine the optimal location and number of health facilities in Idleb by using the maximal-covering location problem (MCLP) model. Furthermore, the model is solved by using the p-median model using GAMS, software for optimization problems. The objective function of MCLP is to maximize Z, which is the coverage of all the sub-districts in Idleb with capacity, distance, and the maximum number of demands in each sub-district constraints. The objective function in p-median is to minimize Z, which is the coverage of the maximum number of sub-districts in Idleb with minimum distance (travel time). Both approaches are used in this study. The MCLP model was utilized taking into consideration the distance limitations and the capacity of supply points 5 different distances in km were taken. P- median optimization model was also used to solve the problem with distance limitations constraint. 8 different numbers of facilities that should be opened (p) were taken. Then the comparison between the number of facilities that should be opened in each approach was made. The results showed improvement in the number of sub-districts that will be covered when the new solution will be applied.

Keywords: *Health System, Health Facility, MCLP, P-median, maximum number of demands.*