Spatial association between the multidimensional poverty index and glycated hemoglobin control in patients with diabetes in Colombia: a population-based secondary data analysis

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Pediatric diabetes in a rapidly changing world

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Objective: To examine the spatial association between the multidimensional poverty index and the proportion of patients with diabetes presenting a glycated hemoglobin less than 7% in Colombia.

Methods: Ecological study of secondary sources with data aggregated at the departmental level. The multidimensional poverty index was collected from the Colombian National Administrative Department of Statistics for the year 2021. The proportion of patients with diabetes who had a glycated hemoglobin less than 7% were derived from the High-Cost Account during the year 2021. We calculated Moran's I statistics and local indicators of univariate (LISA) and bivariate (BiLISA) spatial association along with significance map, cluster map and Moran's scatter plot. Queen's first-order contiguity matrix was used to produce spatial weights. Results were based on 99999 permutations with a pseudo-significance level of 0.05.

Results: The multidimensional poverty index (Global Moran's I: 0.417, p <0.001) and the proportion of patients with diabetes who had a glycated hemoglobin less than 7% (Global Moran's I: 0.451, p <0.001) showed positive and statistically significant values with a cluster-like pattern. In the case of the bivariate local Moran's I, a value of -0.385 (p < 0.001) was obtained between both variables. The BiLISA measures showed the conformation of clusters by departments, indicating the clustering of a low poverty index and a high proportion of patients with glycated hemoglobin less than 7% in the northwest region. On the contrary, a grouping with a high poverty index and a low proportion of patients with glycated hemoglobin less than 7% was found in the eastern and southeastern regions of the country.
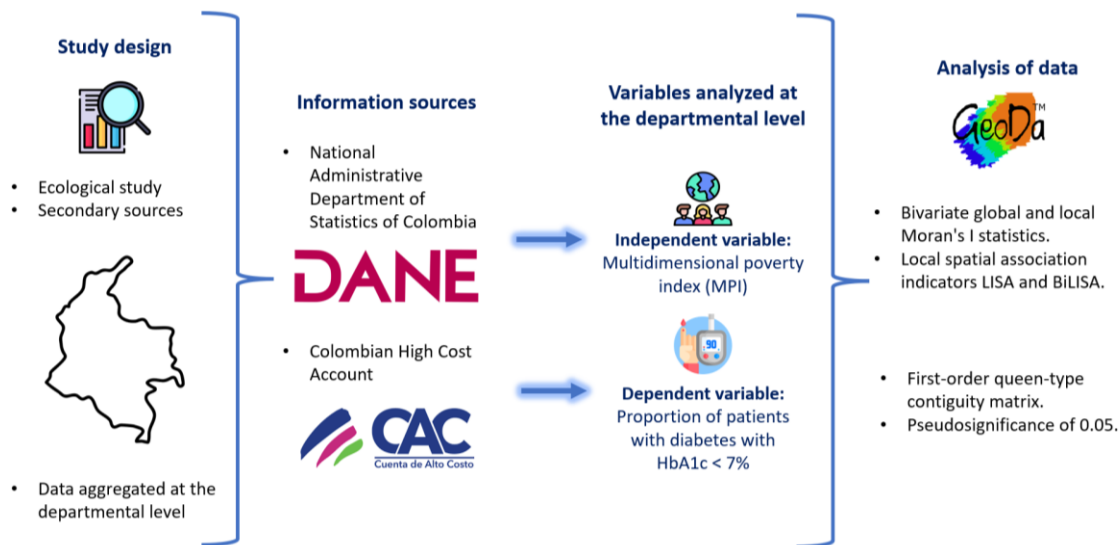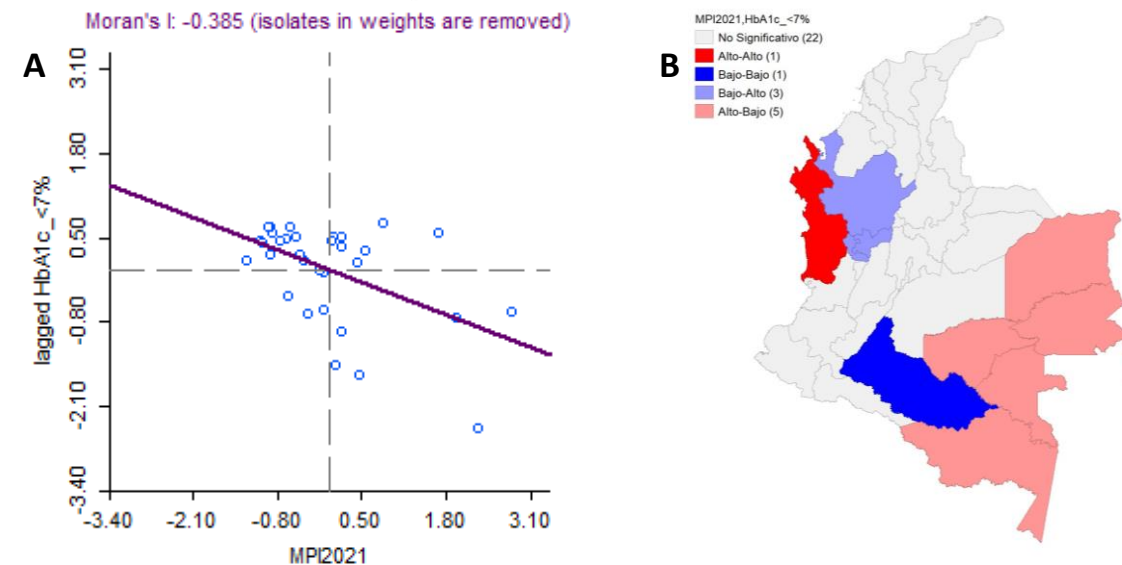
Figure 1. Study methodology

Figure 2. Scatter diagram of bivariate local Morán's I at departmental level, between HbA1c < 7% and MPI (A). Cluster map by department between HbA1c < 7% and MPI (B).

Conclusion: Public health actions aimed at the metabolic control of patients with diabetes should be better targeted in regions with greater socioeconomic inequalities.

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