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

Juan Pablo Pérez Bedoya[1,2], Alejandro Mejía Muñoz[2], Lina Marcela Ruiz Galvis[1], Elizabeth Herrera Franco[1,2], Flor Enid Taparcua Cardona[1,2], Oscar Ignacio Mendoza Cardozo[1,2], Carlos Andrés Pérez Aguirre[3], Noël Christopher Barengo[4], Paula Andrea Diaz Valencia[1].

(1) Epidemiology Group, National Faculty of Public Health, University of Antioquia UdeA, 70th Street No. 52-21, Medellin, Colombia. (2) Study Group on Type 1 Diabetes Epidemiology (EpiDiab), University of Antioquia, Medellín, Colombia. (3) Statistics Institute, National University of Colombia, Medellín, Colombia. (4) Department of Translational Medicine, Herbert Wertheim College of Medicine, Florida International University, Miami, FL, United States of America & Faculty of Medicine, Riga Stradins University, Riga, Latvia.

Introduction: Socioeconomic inequalities in diabetes have been associated with less control of the disease and a higher probability of complications.

Objective: The present study examined the spatial association between the multidimensional poverty index and the proportion of patients with diabetes presenting a glycated hemoglobin (HbA1c) less than 7% in Colombia.

Methods: Ecological study using secondary 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 HbA1c 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 HbA1c less than 7% (Global Moran's I: 0.451, $p < 0.001$) showed positive and statistically significant values with a cluster 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 HbA1c less than 7% in the northeastern and central region of the country. On the contrary, a grouping with a high poverty index and a low proportion of patients with HbA1c less than 7% was found in the eastern and southeastern regions of the country.

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