From Multidimensional Poverty Index by block to mean by urban neighborhood using free data from foursquare.

A case Study in Medellín city,Colombia

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2. DATA

2.1 DATA SOURCE

Free data from the last census in the year 2018, Multidimensional Poverty Index (MPI) is available at **Census DANE MPI** like a shape file with it is index for each block in the city.

Data about every neighborhood is available at Neighborhoods Medellin like a shape file.

WIth QGIS software we change data from shapefile to geojson to see neighborhoods and extract table datas to excel to use Multidimensional Poverty Index.

Data about venues is available at foursquare using a free acount.

2.2 DATA CLEANING

Data with Neighborghood geometries was downloaded and opened with QGIS software to transform data from shapefile to geojson , additionally extract coordinates inside each urban neighborhood (Table 1) and data tables to excel with Multidimensional Poverty Index by block with values from cero to 58,65 (Table 2)

CODE	Neighbourhoods	SUBTIPO_BA	Boroughs	SHAPEAREA	SHAPELEN	Lat	Long
1422	La Aguacatala		1 El Poblado	622090,156	3302,658	6,199	-75,577
810	El Pinal		1 Villa Hermosa	413416,805	3271,575	6,244	-75,545
719	Fuente Clara		1 Robledo	236441,173	3022,338	6,278	-75,605
102	Santo Domingo Sav		1 Popular	264750,452	2943,708	6,298	-75,539
302	Las Granjas		1 Manrique	641349,275	3964,702	6,279	-75,549

Table 1(first 5 rows from 298, Coordinates from urban Neighborhood in Medellín, Colombia)

CODE	Neighbourhoods	SUBTIPO_BA	Boroughs	IPM
1509	Cristo Rey	1	Guayabal	9,6
1422	La Aguacatala	1	El Poblado	1
1414	El Castillo	1	El Poblado	0
1509	Cristo Rey	1	Guayabal	10,5
1421	Patio Bonito	1	El Poblado	0

Table 2.(first 5 rows from 13998, Multidimensional Poverty Index(IPM) by block)

With Multidimensional Poverty Index(IPM) by block, now group by mean IPM to each neighbourhood and reduce to 13998 blocks to 294 neighboorhoods (Table 3).

CODE	IPM	Neighbourhoods	Boroughs	Lat	Long
101	23.347692	Santo Domingo Savio No.2	Popular	6298	-75544
102	23.133333	Santo Domingo Savio No.1	Popular	6298	-75539
103	29.224786	Popular	Popular	6299	-75548
104	22.317722	Granizal	Popular	6292	-75546
105	22.534454	Moscú	Popular	6290	-75550

Table 3. (first 5 rows from 294, Multidimensional Poverty Index(IPM) mean by Neighbourhood)

Data from venues was downloaded from foursquare using a free acount and taking in a count restriction about amount of data. Despite this, data available to Medellin city in this study have 4063 venues and 235 categories (Table 4).

Making dummies venues categories and ordered data venues now are columns . The data available in foursquare, reduce data from 294 to 277 neighborhoods .(Table 5).

Other useful table is a categorical Multidimensional Poverty Index(IPM): Low (0-10), Medium (10-20), HIGH (20-30) and very high >30. (Table 6)

CODE	IPM	Neighbourhoods	Neighborhood Latitude	Neighborhood Longitude	Venue	Venue Latitude	Venue Longitude	Venue Category
101	23,34769	Santo Domingo Savi	6,298	-75,544	La Mesa del Barr	6,294748560948	-75,5440434137111	South American Restaurant
101	23,34769	Santo Domingo Savi	6,298	-75,544	Mirador Somos T	6,294683789031	-75,5448678675302	Bar
101	23,34769	Santo Domingo Savi	6,298	-75,544	Mi Cebi & Chela	6,293481	-75,541798	Caribbean Restaurant
101	23,34769	Santo Domingo Savi	6,298	-75,544	Metrocable Linea	6,29509961273	-75,5481883799316	Cable Car
102	23,13333	Santo Domingo Savi	6,298	-75,539	Placa La Avanzac	6,294780362067	-75,5396083421013	Playground

Table 4. (first 5 rows from 4063, venues from Medellin city downloaded from foursquare)

Venue	Venue Latitude	Venue Longitude	Advertising Agency	Airport	Airport Lounge	Airport Service	American Restaurant
La Mesa d	6,294748560948	-75,5440434137111	0	0	0	0	0
Mi Cebi &	6,293481	-75,541798	0	0	0	0	0
Metrocable	6,29509961273	-75,5481883799316	0	0	0	0	0
Donde sab	6,2939332	-75,5380763	0	0	0	0	0
Mi Cebi &	6,293481	-75,541798	0	0	0	0	0

Table 5. (first 5 rows from 277 , and first 5 categories as columns from 235 total categories)

IPM	PROVERTY_LEVEL	LEVEL
23.347692	High	3
23.133333	High	3
29.224786	High	3
22.317722	High	3
22.534454	High	3

Table 6.(first 5 rows from 277, categorical data from Multidimensional Poverty Index(IPM), by neighborhood)