

# Analyzing Risk Factors for Out-Migration in Venezuela

## Background

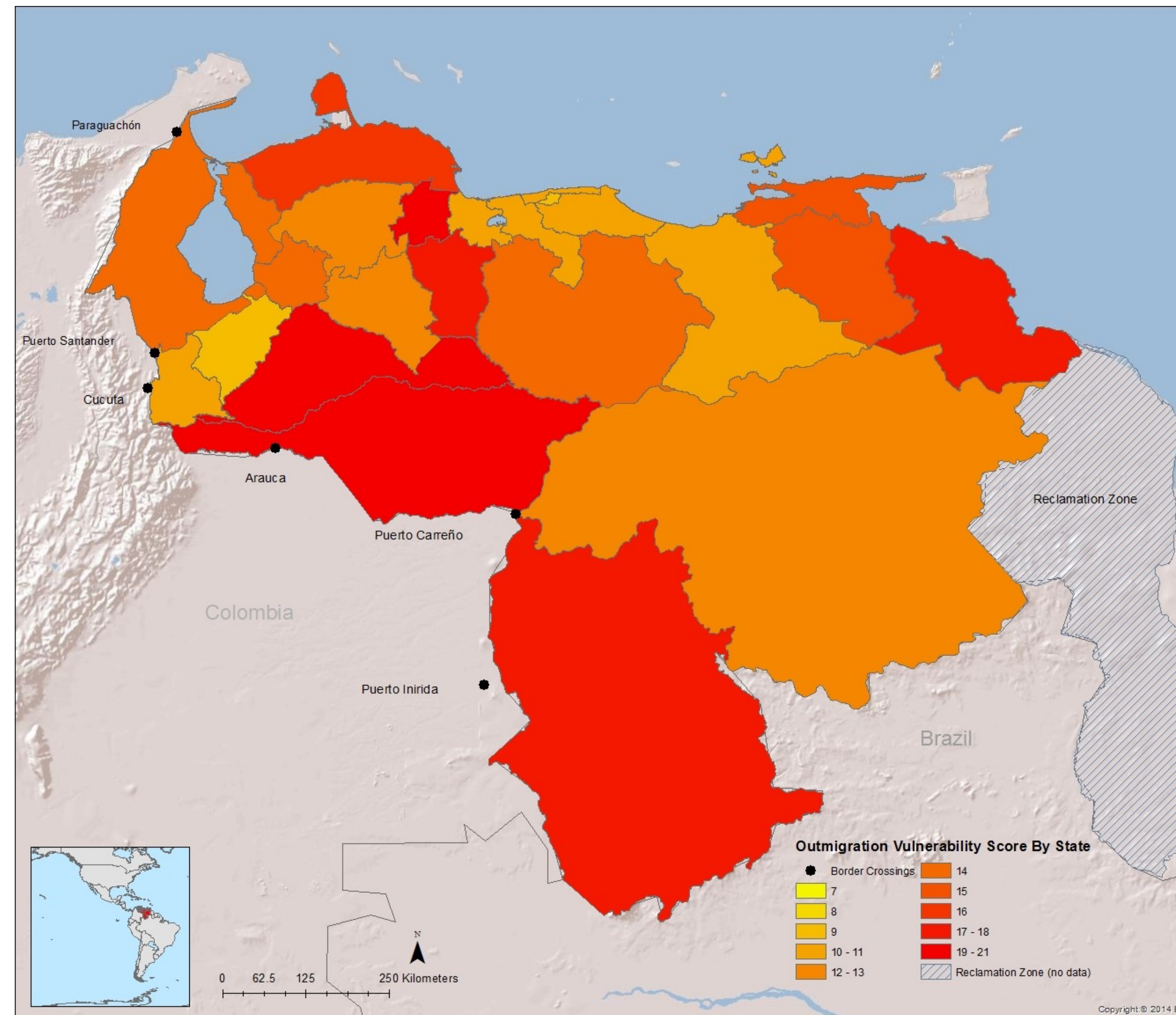
Venezuela has recently experienced severe economic hardship and the country is in the middle of a humanitarian crisis. Factors such as the collapse of the healthcare system, food insecurity, increased violence, and economic hardship have contributed to a sharp increase in the number of people fleeing Venezuela. The Washington Post reports that an average of 3,000 individuals per day are currently crossing the border into Colombia alone.

If these conditions worsen still, Venezuela could see a massive uptick in out-migration. I examine potential risk indicators for migration, and identify geographic regions that are at highest risk of out-migration. Potential risk indicators include the size of population, health indicators such as high maternal mortality rates, and economic factors such as unemployment rates.

## Methodology

The spatial question I asked is: which areas of Venezuela have the highest risk factors for potential out-migration? I calculated an out-migration vulnerability index based on the following seven variables from the 2011 census: population ("total population" by State) poverty ("Gini coefficient", "rate of poor households"), economic factors ("average income", "employment rate") and health factors ("infant mortality rate", "gross mortality rate"). These rates are based on the percentage of the total population in the respective state.

Each indicator was assigned a score from zero to four based on natural breaks. A score of four represents the most vulnerable states and zero the least vulnerable states. I then aggregated the vulnerability score for each state. The states with the highest score are considered most vulnerable to out-migration.



## Results and Limitations

The five states with the highest vulnerability scores (indicating populations most at risk for out-migration) are Barinas, Apure, Yaracuy, Cojedes, and Delta Amacuro. It is interesting to note that Paraguachón and Cucuta, the two border crossings that have received the highest flows of Venezuelans during 2012-2016 (see table below), are not adjacent to states with the highest vulnerability. Furthermore, two of the border crossings adjacent to the most vulnerable states (Arauca and Carreño) have seen an uptick in arrivals over the four year period. This could suggest that these border crossings may see a further uptick of Venezuelans in the near future.

Table 1: Border Crossings of Venezuelan Nationals 2012-2016

Border Crossings	2012	2013	2014	2015	2016	Total
Paraguachón	45,821	41,463	45,667	43,633	64,014	240,598
Cúcuta	40,444	39,618	60,848	68,078	98,206	307,194
Puerto Santander	-	-	-	-	1,486	1,486
Arauca	1,643	2,250	2,759	3,180	22,580	32,412
Carreño	1,147	3,342	3,588	6,941	14,074	29,092
Inirida	-	-	14	653	657	1,324

There are several limitations. The census data was only disaggregated on the state level. Furthermore, the latest available data is from 2011, meaning the recent effects of the humanitarian crisis are not yet captured in this data.

## Sources

**Data Sources:** Orogenesis Soluciones Geograficas, Knoema Demography Statistics of Venezuela 2011, UN Office for the Coordination of Humanitarian Affairs (OCHA) Colombia, ESRI World Shaded Relief

**Projected Coordinate System:** WGS 1984 UTM Zone 19N

**Cartographer:** Floor de Ruijter, MALD 2018

**Class:** DHP207: GIS for International Applications

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