

Methods of Assessing Air Pollution and Economic Development in Colombia

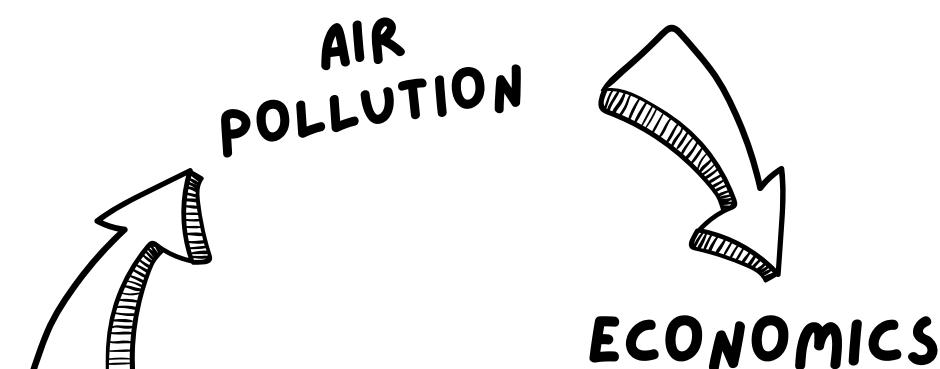
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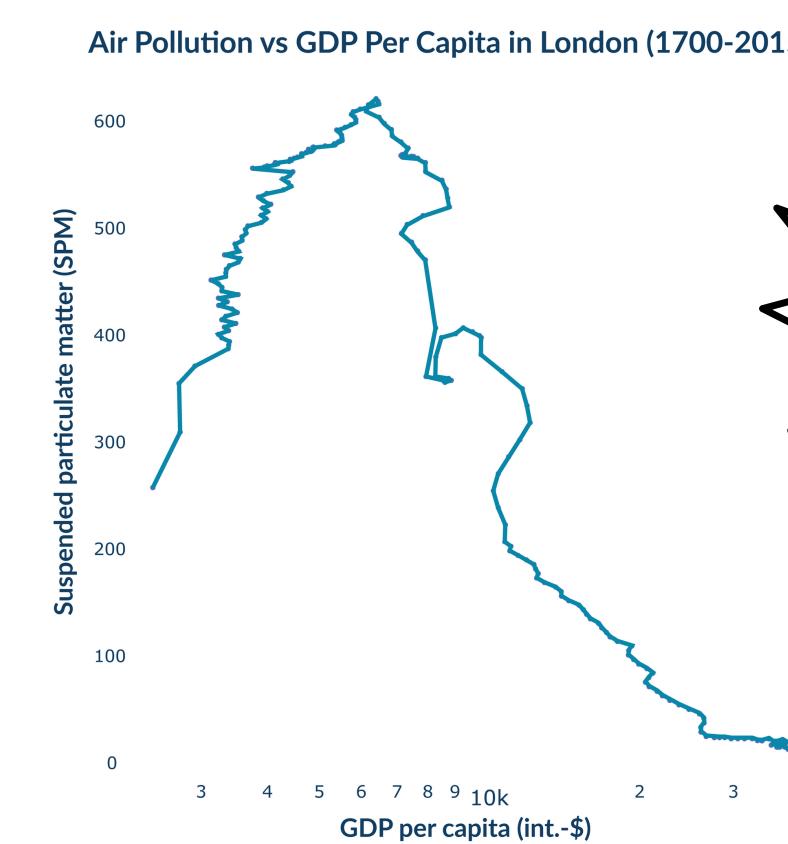
Geography

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INTRODUCTION



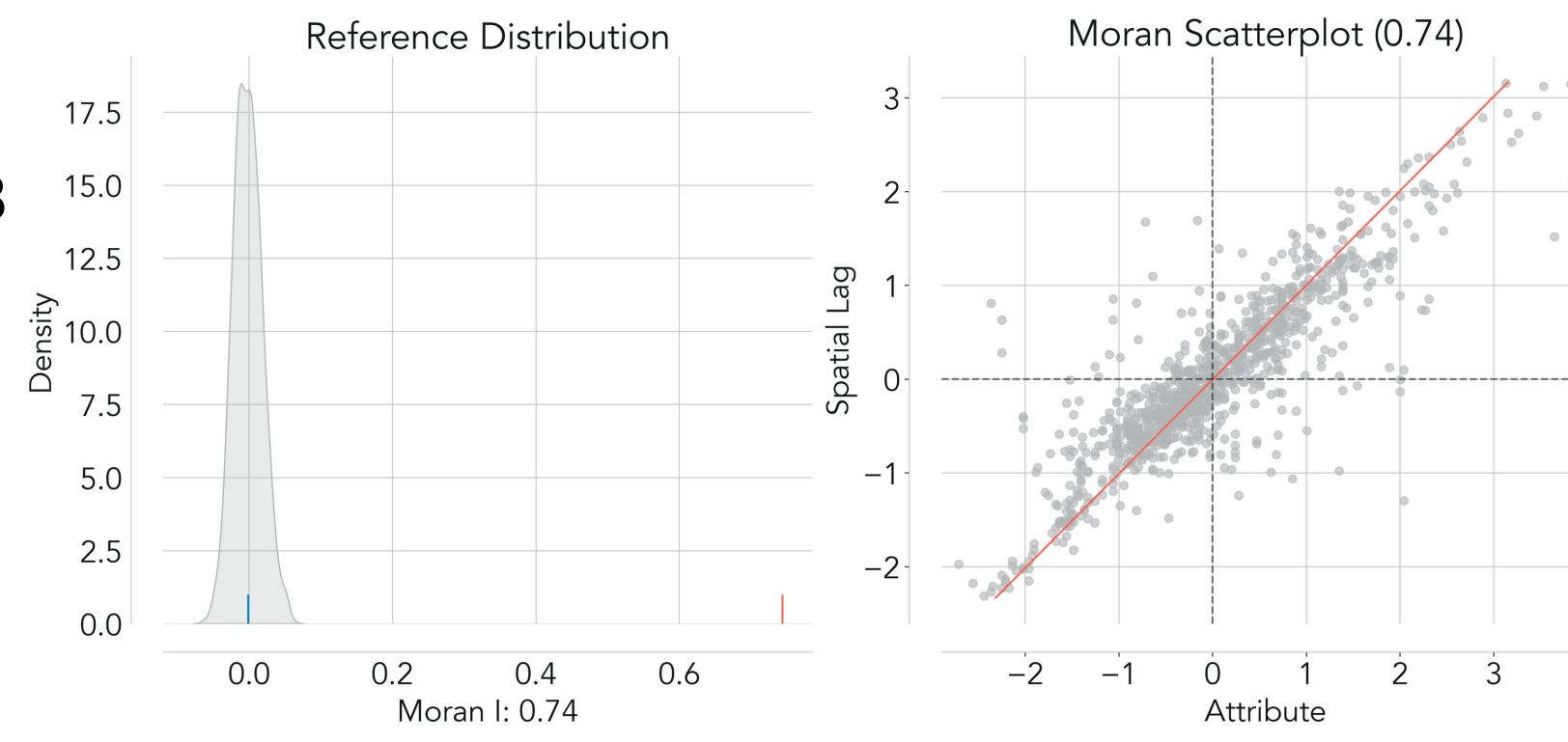
- In developing countries,
- pollution can be a major drag on the economy and people's health
- London showed an inverse-U shape relationship between air pollution and economic development.



THE INVERTED U-GRAFH IS THE EXPECTED DISTRIBUTION

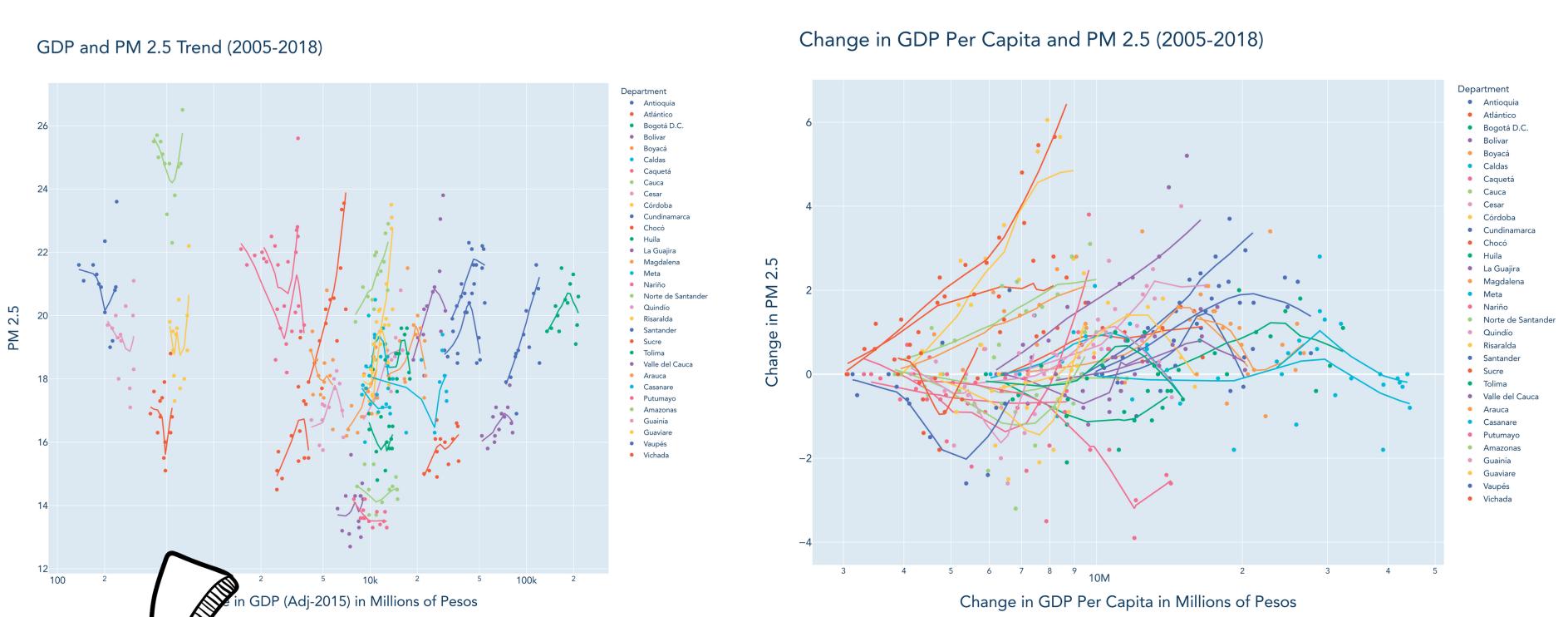
STATISTICS & SPATIAL AUTOCORRELATION

- PM 2.5 is measured in ug/m³
- In 2018, the global median PM 2.5 value is 12.8, the median PM 2.5 value in Colombia is 18.
- Air pollution has strong spatial autocorrelation (local Moran's I = 0.74).



TRENDS

Some Departments showed an inverse-U shape trend

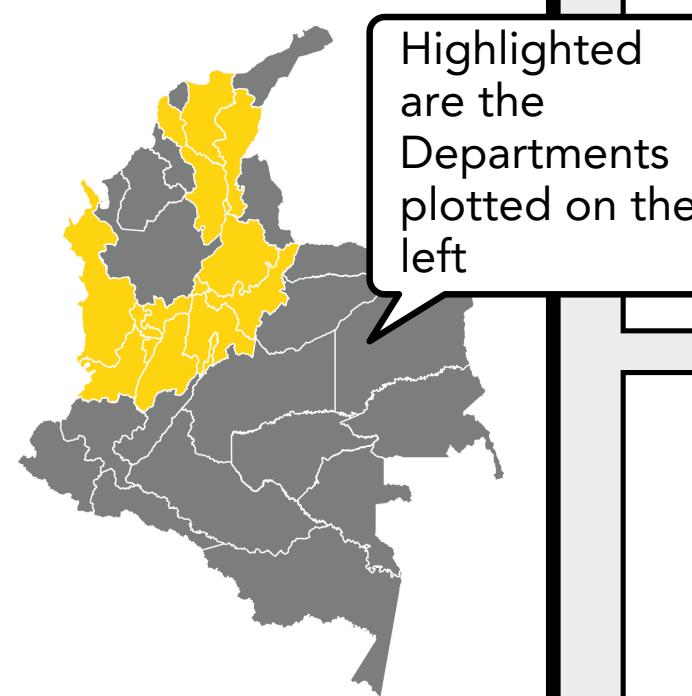
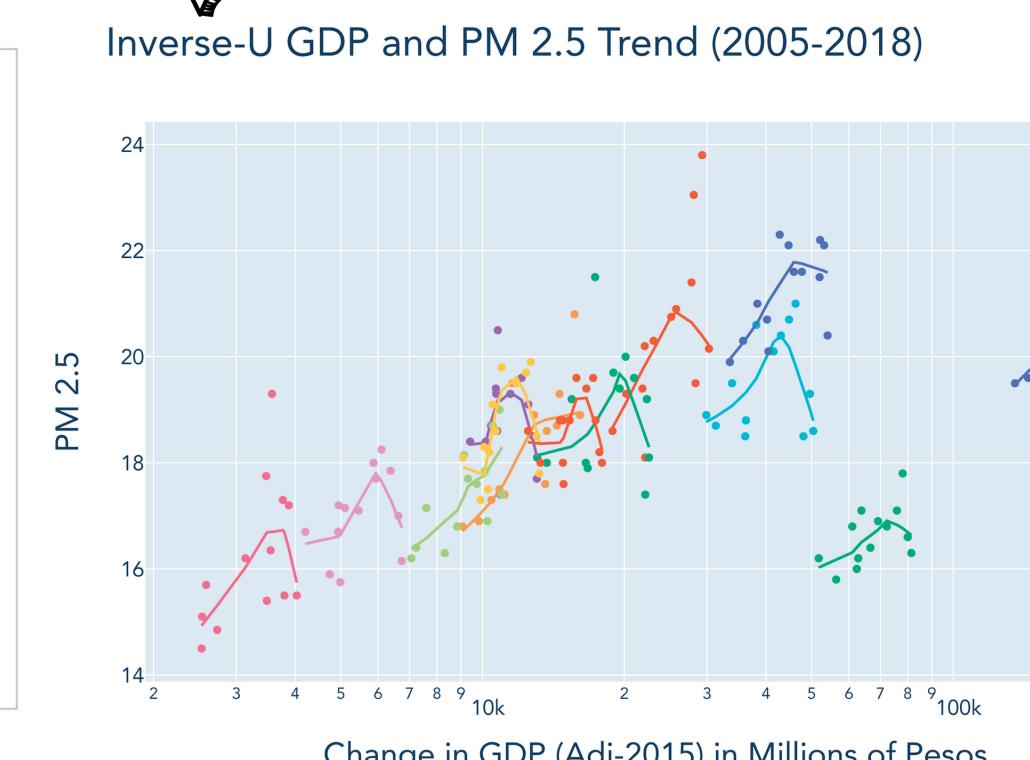
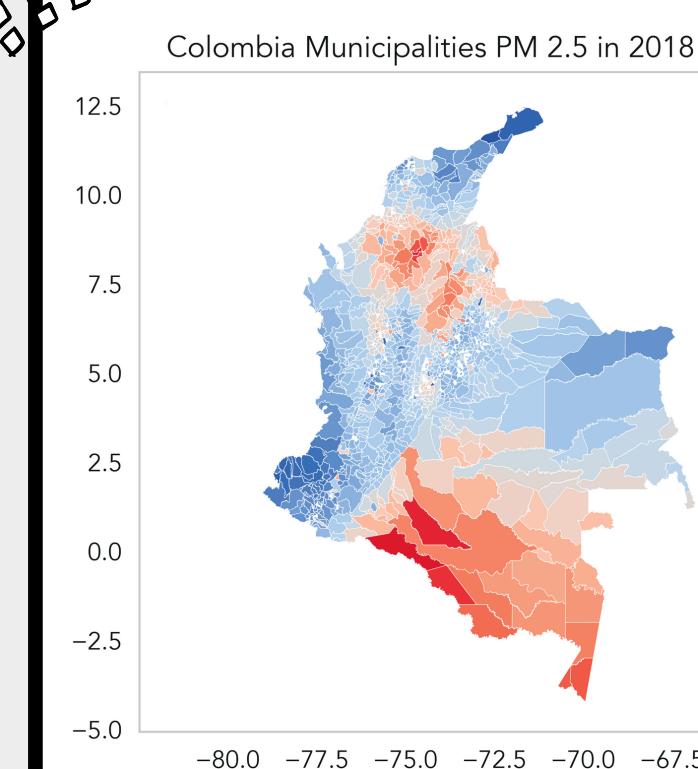


QUESTIONS

- Can the same pattern be observed in developing countries?
- How is air pollution distributed in Colombia? How does it affect indigenous/less privileged people in Colombia?

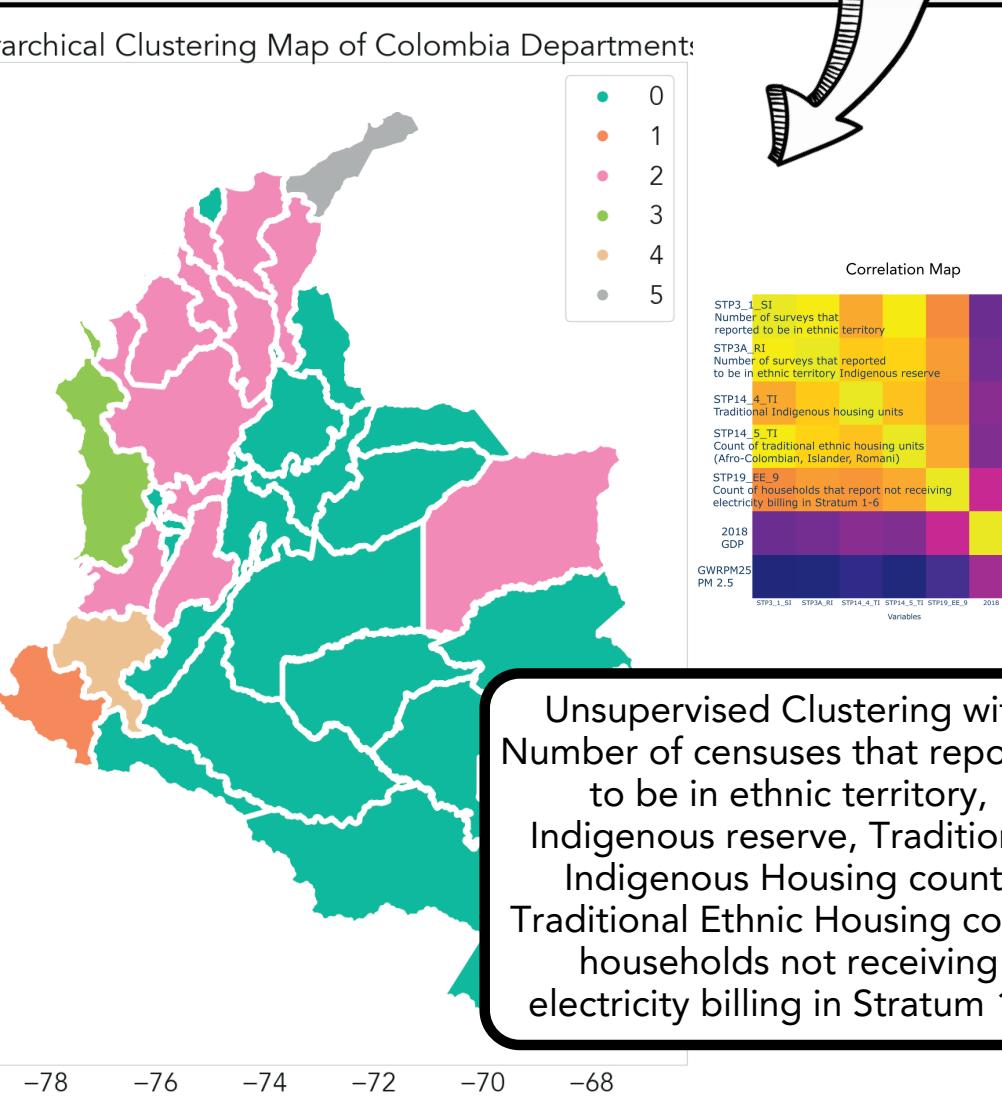
OVERVIEW

- Colombia has a growing economy and rich cultural heritage.
- Colombia suffers from high level of air pollution compares to rest of the world
- Exposure to air pollutants like PM 2.5 can cause respiratory diseases and have serious health consequences (add citation)
- Poor air quality can also impact economic activity by reducing worker productivity, increasing healthcare costs, and decreasing tourism. (add citation)
- In 2019, Colombia's GDP was \$330.5 billion, making it the fourth-largest economy in South America. (add citation)



DATA SOURCE

- Observed lower air pollution in areas that have a higher proportion of indigenous people (discuss what can be the cause?)
- Clustering and Global Moran's I suggest that air pollution is connected with geographic features.

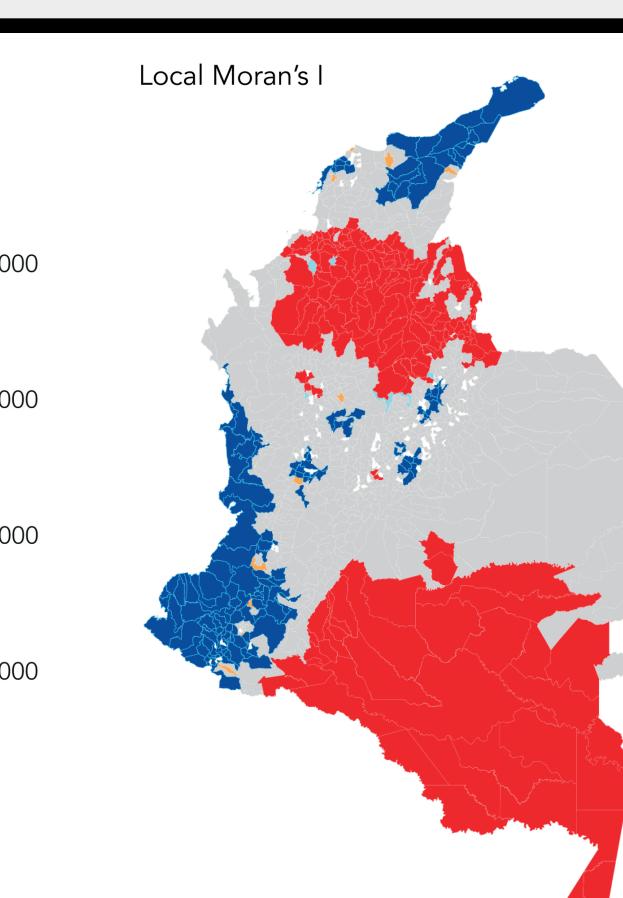
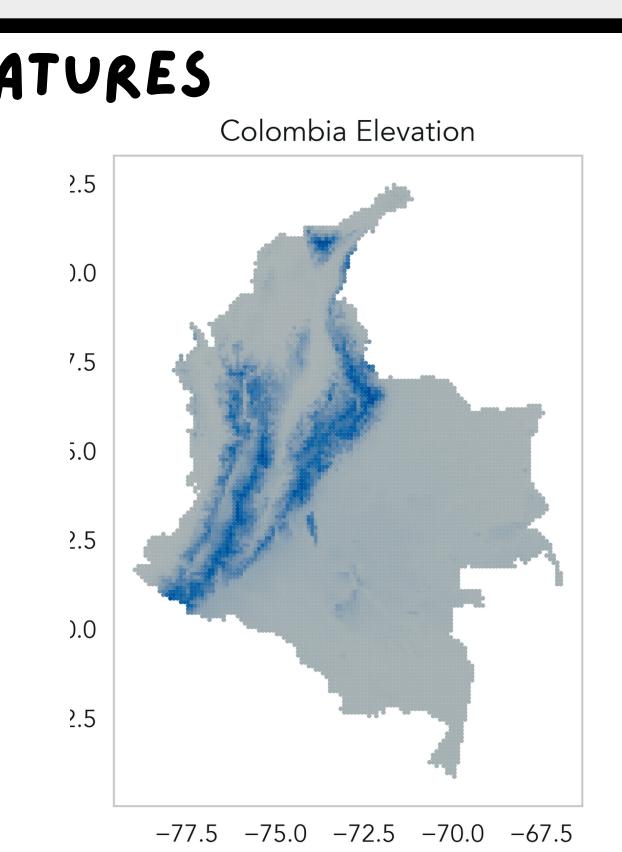
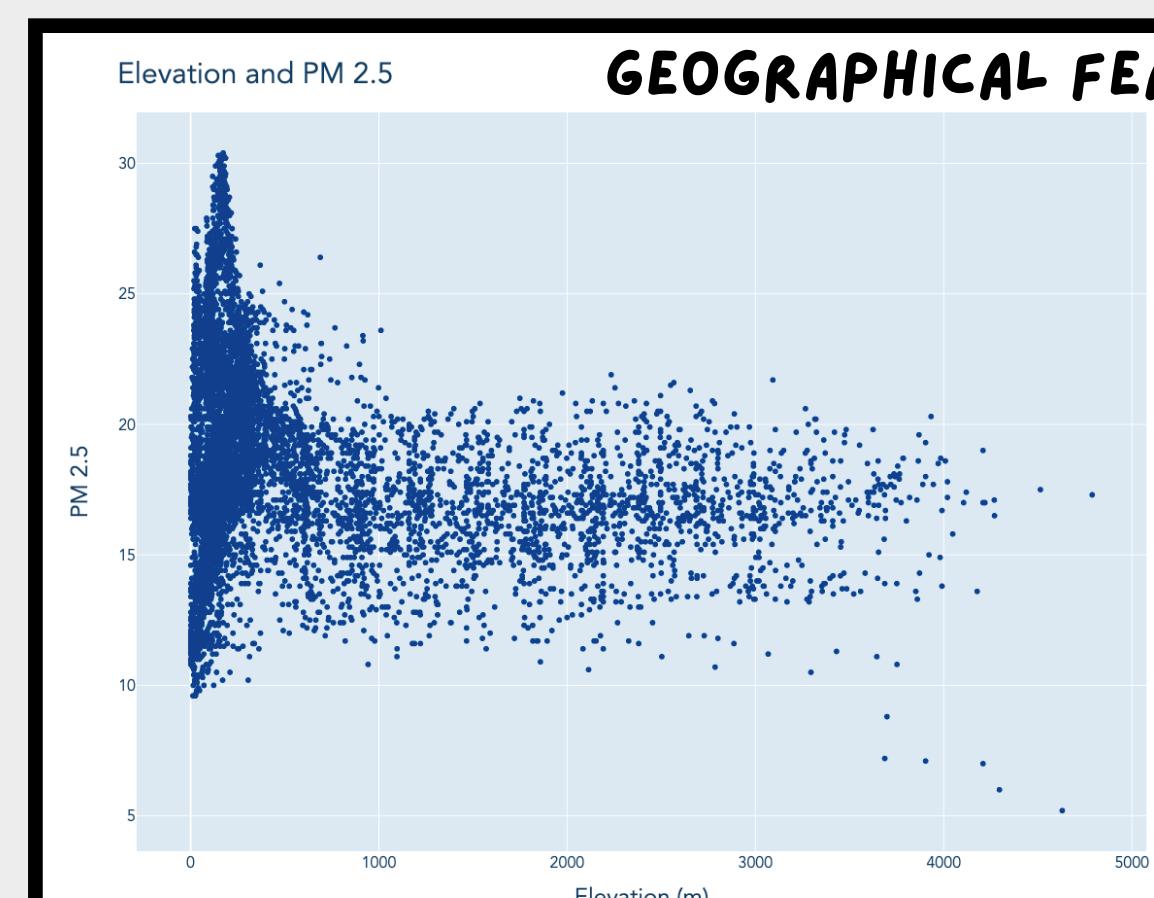


NEXT STEPS

- Connect more census data with air pollution observations
- Expand the study to other developing and underdeveloped countries that get less attention
- Introduce population density and weigh air pollution more in densely populated area

LIMITATIONS

- Air pollution data is derived from remote sensing data, which can be inaccurate.
- Identify a more accurate indicator or metric to assess economic development.



Most of the high air pollution observation are in low elevation areas. The mountains also separate Local Moran's I zones.

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