Relation between Climate Change and Disease

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Introduction

- Relation between the emission rate of Greenhouse gases and number of new diseases reported.

- 2 - datasets:
  - PRIMAP-crf :
    Dataset of gases emission reported by each country
  - Diseases:
    Dataset of new diseases reported by each country

- Annual reporting

PRIMAP-crf

- Dataset of many gases emitted by each category in each country
- Report to United Nations Framework Convention on Climate Change (UNFCCC) in the Common reporting Format(CRF) annually
- Information about how much tonnes of a gas is emitted by the country (category wise and in total)
- Period : 1986 - 2019
- Gross emission of gas in country
- Open Data CC BY 4.0 license

Diseases

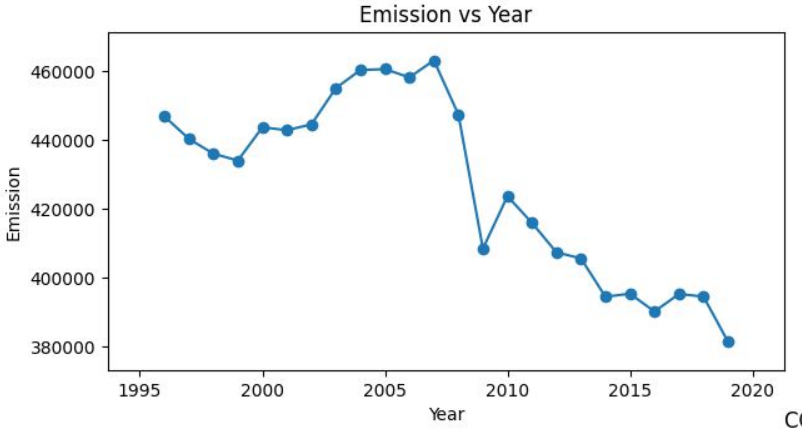
- Dataset of new infectious diseases outbreaks collected from the Diseases Outbreak News(DONs)
- DONs from World Health Organization
- Information about new diseases reported in country and year
- Period : 1996 - 2022
- Product of a research paper
- Many options of subsets
- Open Data CC BY 4.0 license

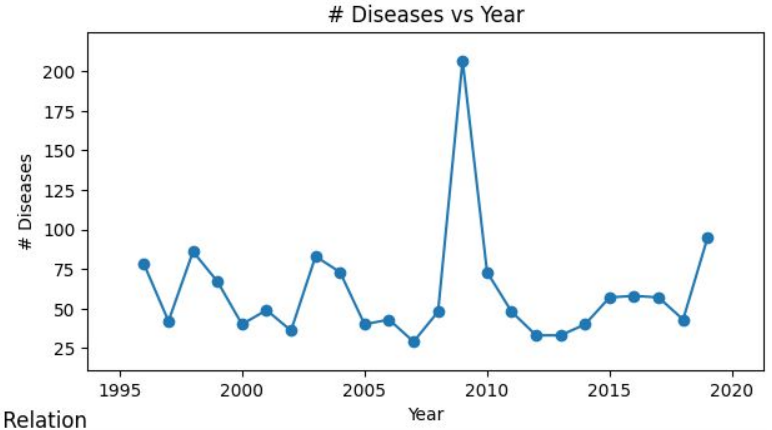
Data Cleaning and Transformation

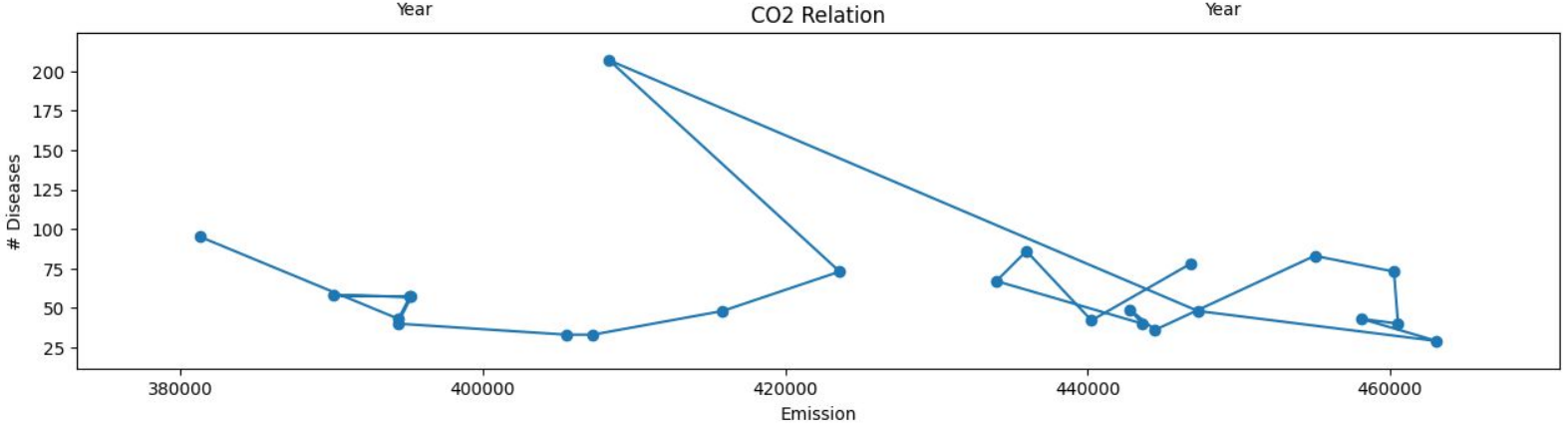
- Transformed both dataset to have common time period: 1996 - 2019
- PRIMAP-crf :
  - Filtered out only gross emission by the country for each gas
  - Select 7 major greenhouse gases
  - Replace NULL with least emission of that gas by the country
  - Converted all t/yr to kt/yr
- Diseases:
  - Remove all unnecessary columns

Analysis

- Averaged emission of each gas globally per year
- Plotted 7 graphs with year on x-axis and average emission on y-axis for each gas
- Most of the gases follow negative trend
- Calculated total number of new diseases reported each year globally
- Plotted a graph with year on x-axis and # diseases on y-axis
- Scattered & not following any trend


Emission vs Year
Emission
460000
440000
420000
400000
380000
1995
2000
2005
2010
2015
2020
Year


Diseases vs Year
Diseases
200
175
150
125
100
75
50
25
1995
2000
2005
2010
2015
2020
Year


CO2 Relation
Diseases
200
175
150
125
100
75
50
25
380000
400000
420000
440000
460000
Emission

Conclusion

- No noticeable direct relation between emission rate of these gases to the number of new diseases
- Other factors like natural calamities or diseases spread by other means than air
- Possibility of a delayed effect of high emission causing diseases in a later time.
    - CO_2 - peak in 2007
    - Diseases - peak in 2009 with 205