

**Milestone Two**

Tutorial Group P2-04

A full-page background image showing a person's silhouette standing on a dark, rocky ridge. The person is looking up at a vast night sky filled with stars and the Milky Way galaxy, which appears as a bright, colorful band of light stretching across the sky. The colors of the Milky Way range from warm orange and yellow at the bottom to cooler blue and purple at the top. The foreground is dark and silhouetted, showing the rough texture of the ground and some small bushes.

People ignore design  
that ignores people

- Frank Chimero



## Milestone Two

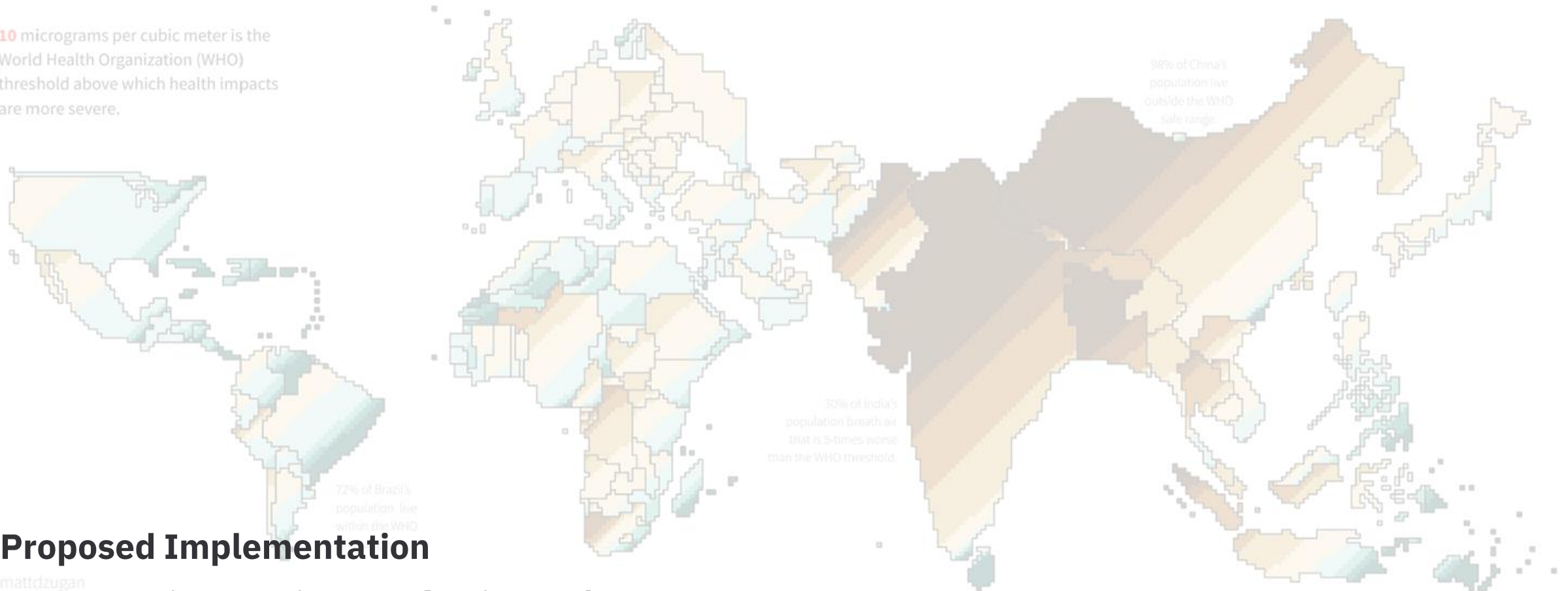
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Countries are resized according to their population to represent *people* rather than *land*

Fine Particulate Matter (PM2.5) Concentration with Dust and Sea-Salt Removed



10 micrograms per cubic meter is the World Health Organization (WHO) threshold above which health impacts are more severe.

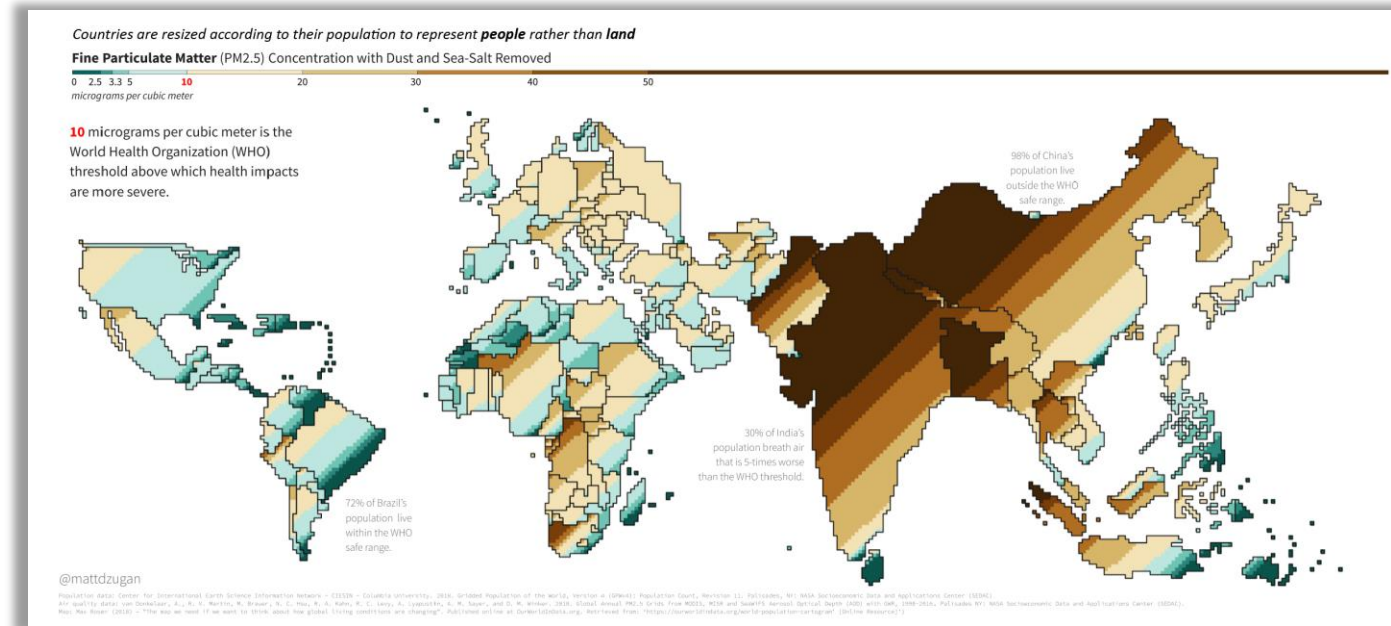


## Proposed Implementation

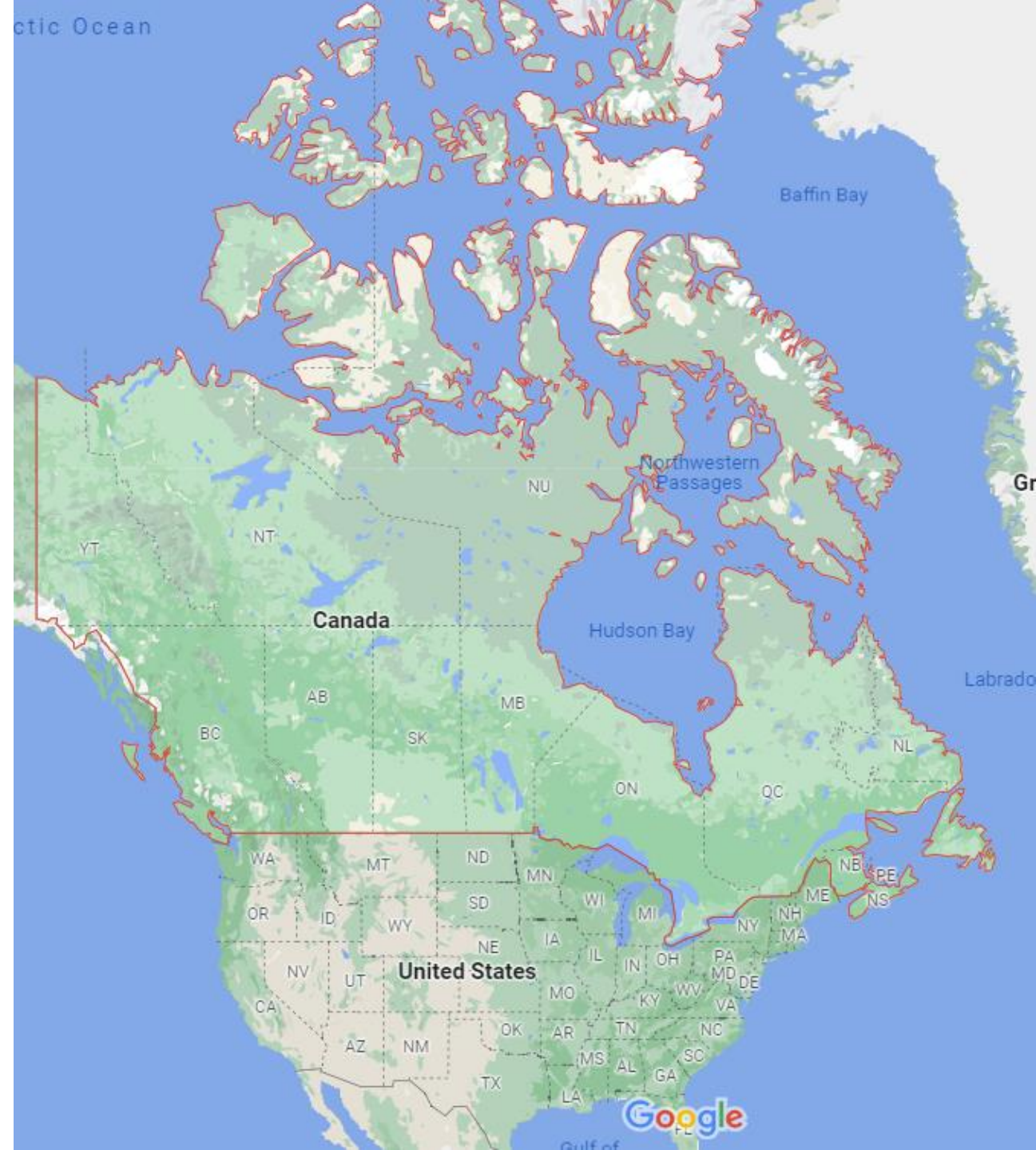
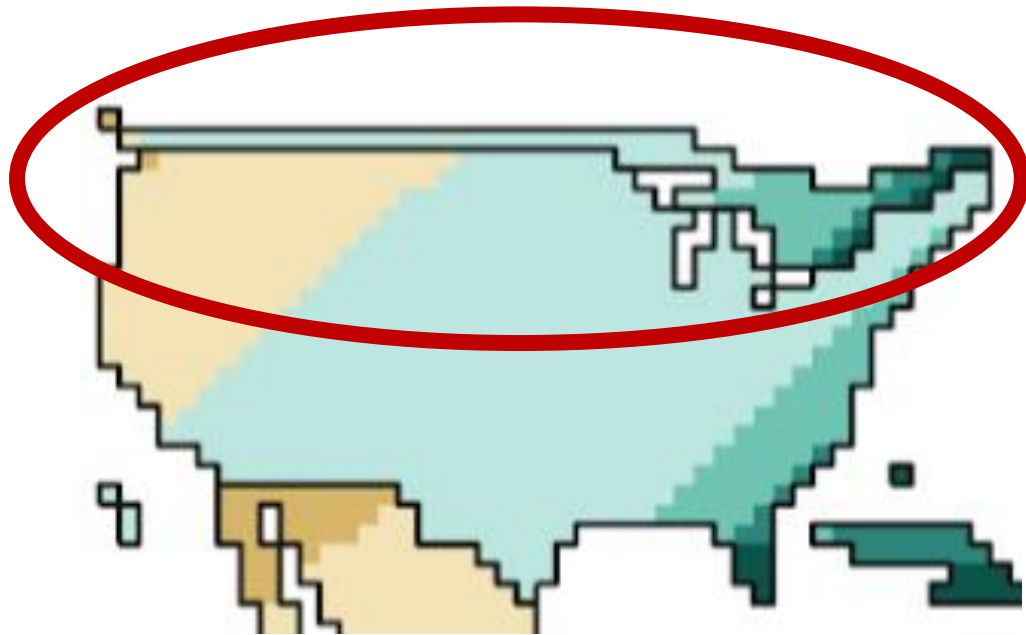
# A Continuation of Visual #2

## Recap on Visual #2

- **Created by Matt Dzugan**
  - For explanatory analysis
  - Uses a Cartograph to visualise PM2.5 concentration by country
- **Data Types:**
  - Country Name (Nominal)
  - PM2.5 level (Ratio) – Not illustrated



## “Pixelated” Canada

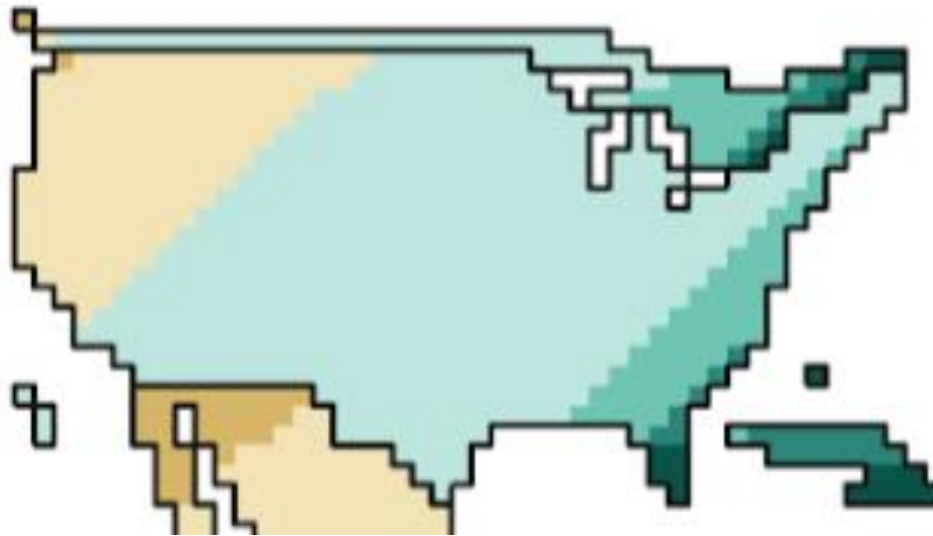




## Milestone Two

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### “Pixelated” USA

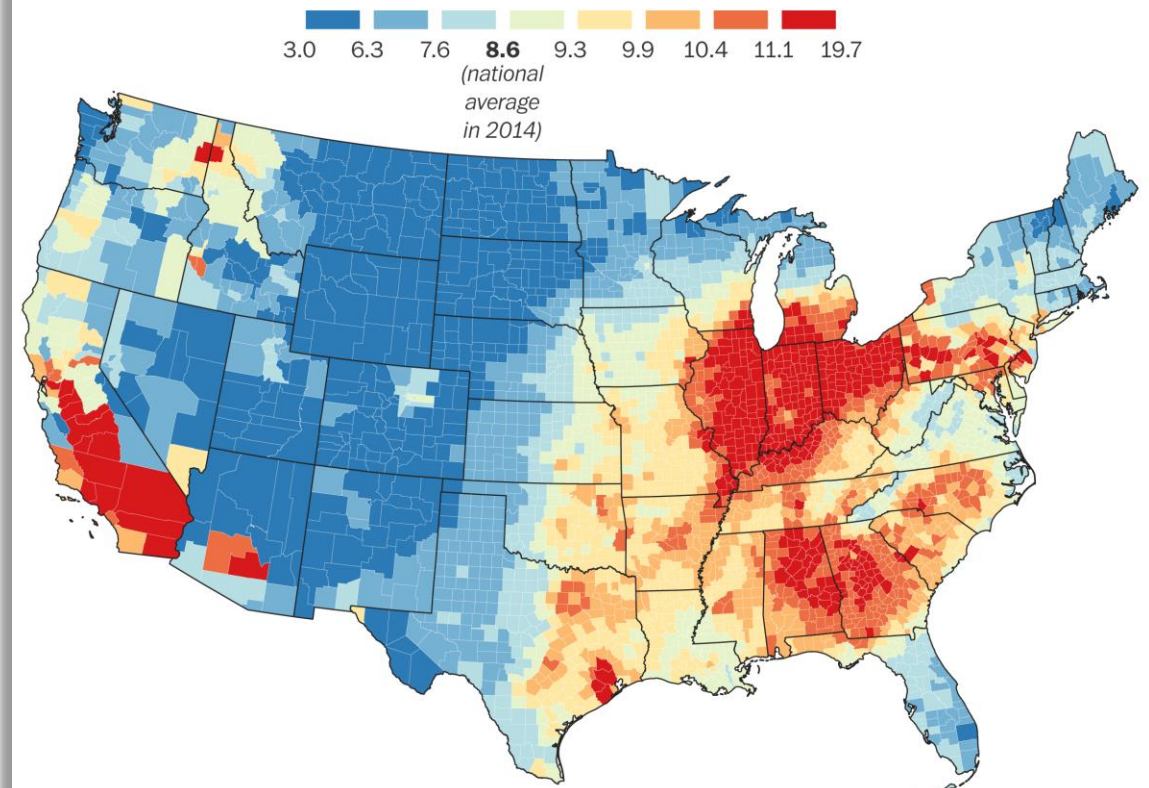


Difference between the “Pixelated” USA and the actual air pollution situation in the USA

### Actual air pollution in USA (2014)

#### The map of American air pollution

Daily average small particulate matter (PM2.5) concentration in 2014

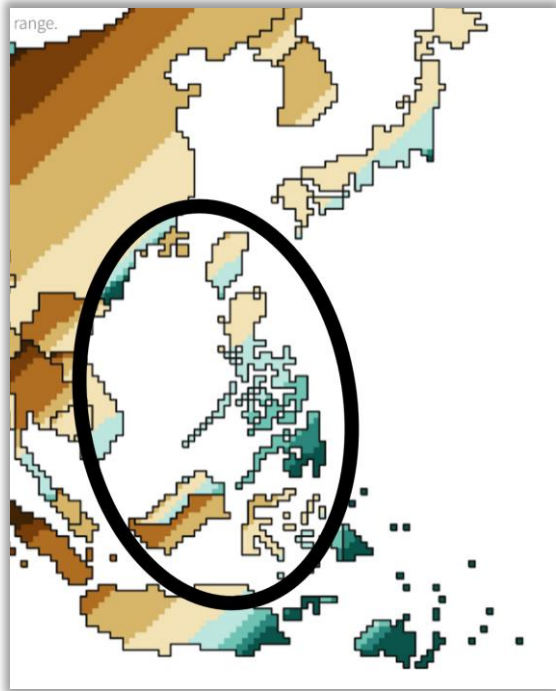


Source: Robert Wood Johnson Foundation County Health Rankings

THE WASHINGTON POST

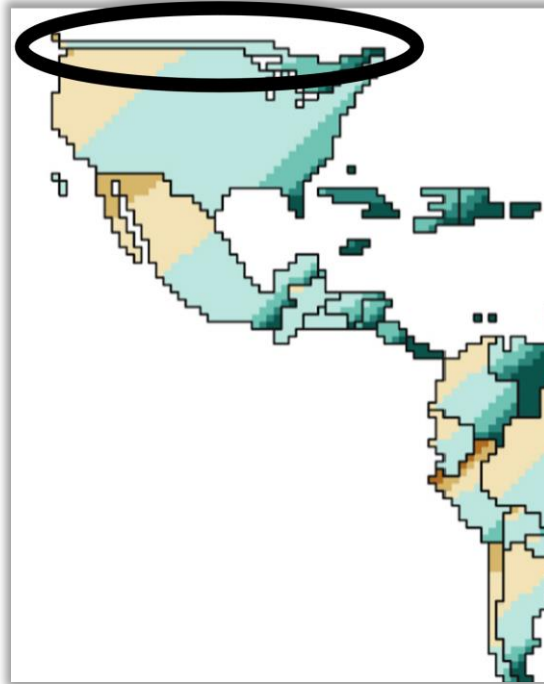
## Milestone Two

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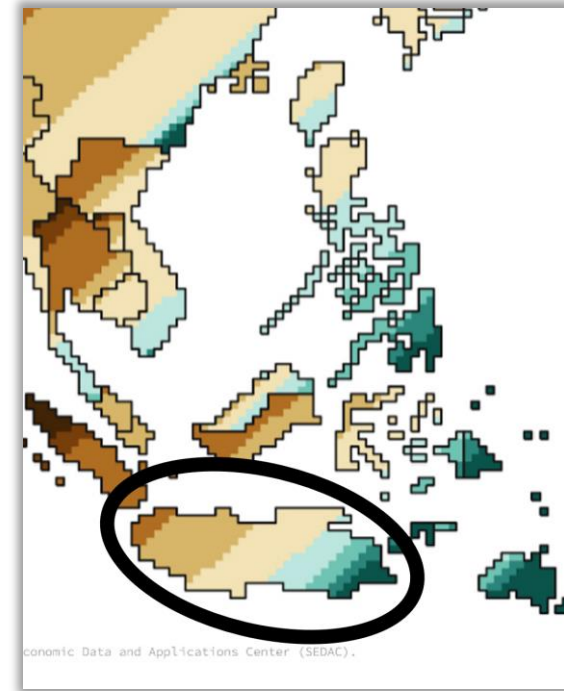
### Law of Prägnanz

Different shapes and sizes were utilised to fit the countries on the density map



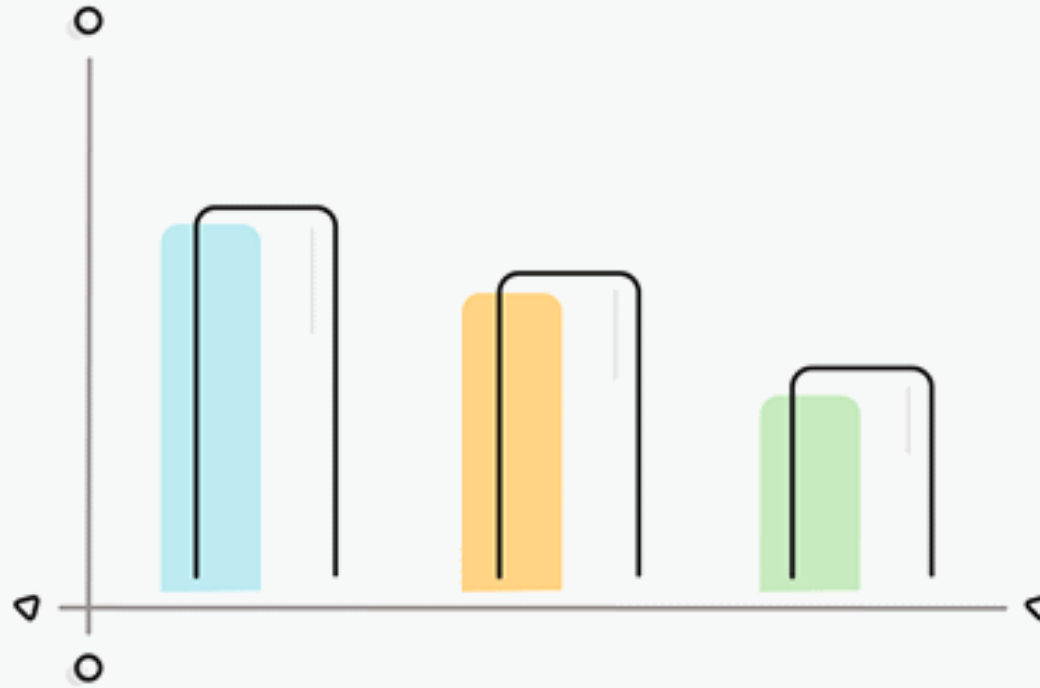
### Jakob's Law

Many countries were shrunk/enlarged and re-positioned to fit the diagram



### Krug's 1st Law of Usability

Different colours across the scale are used. What do the colours mean?



## Research on Visualisation Charts

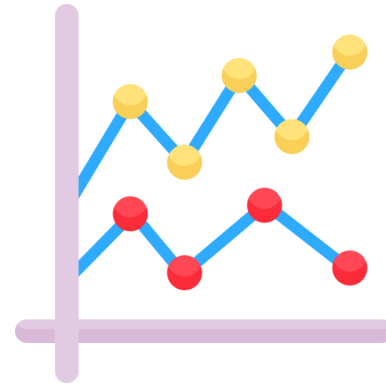
## Possible Charts (Considered, but not used)



**Pie Charts**



**Circular Charts**



**Line Charts**



**Stacked Bar Charts**





**Pie Charts**

- **Not all countries can be visualised**
- Too many data to visualise (176 countries)
- Hard to visualise countries with low PM 2.5 emissions



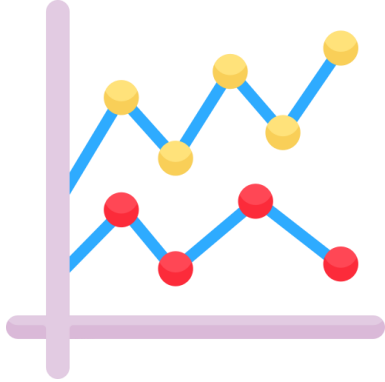
**Circular Charts**

- **Difficult to locate each country**
- Too many data to visualise (176 countries)
- Hard to visualise countries with low PM 2.5 emissions

## Milestone Two

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## Possible Charts (Considered, but not used)



**Line Charts**

- **Not about visualising trends**
- Too many data to visualise (176 countries)
- Hard to visualise countries with low PM 2.5 emissions

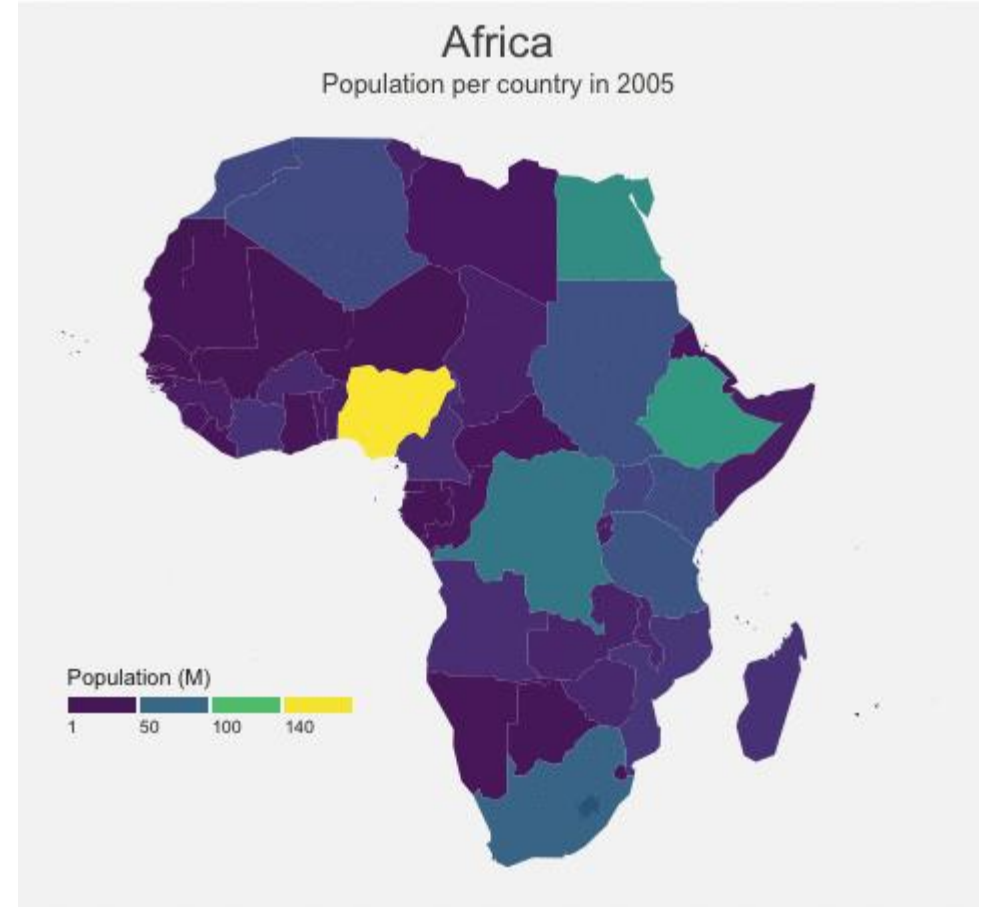


**Stacked Bar Charts**

- **Not about showing comparison between categories**
- Too many data to visualise (176 countries)
- Hard to visualise countries with low PM 2.5 emissions

# Why use Choropleth Maps?

- Data Representing: **Country Name (Nominal)**
- Familiar geographical layout (Law of Familiarity)
- Countries with high PM 2.5 values can be identified easily (Von Restorff Effect)
- Provides a concise view of the regions

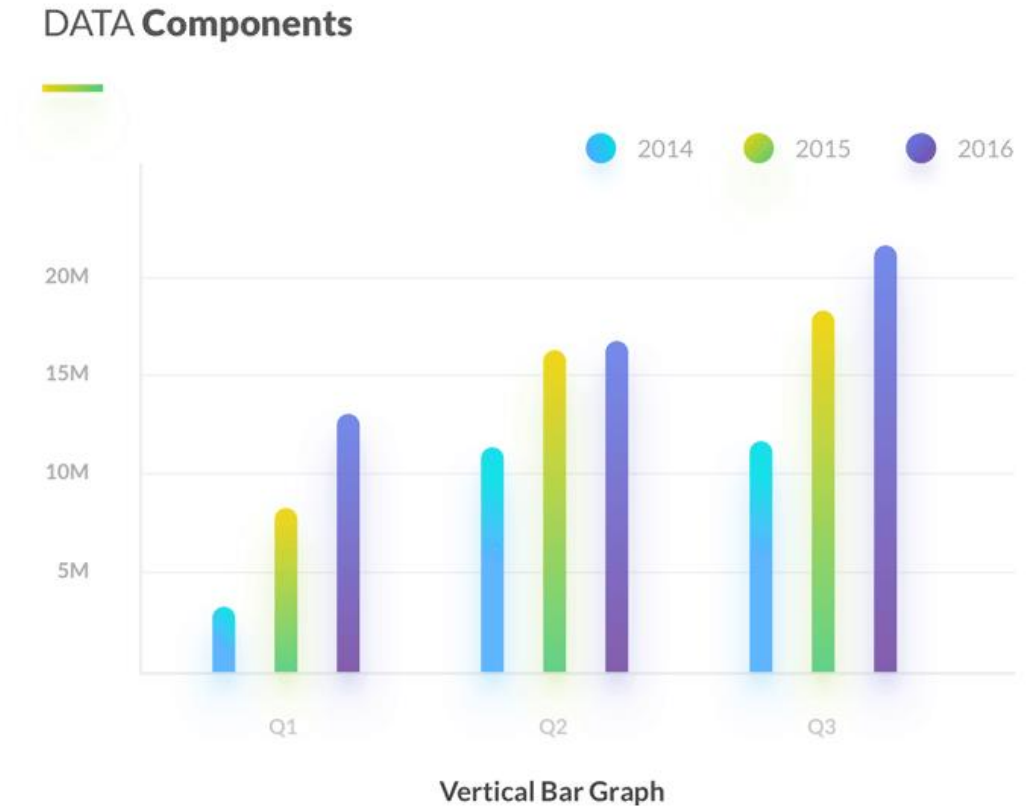


<https://r-graph-gallery.com/a-smooth-transition-between-chloropleth-and-cartogram.html>



# Why use Bar Charts?

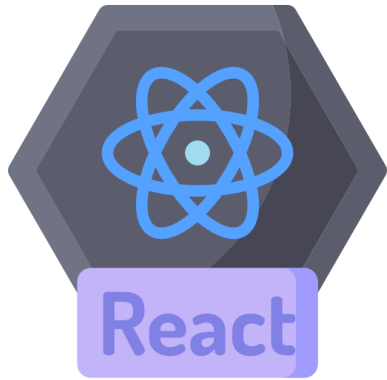
- Data Representing: **PM 2.5 Data (Ratio)**
- Summarize a large data set in visual form
- Can be used for ranking of countries by PM 2.5 values
- Clarify trends in data better than table



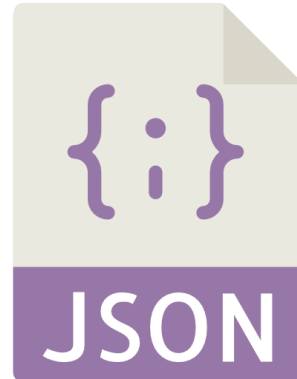


# Proposed Implementation

# Technology Stack



Framework/Library



Data Source



UI Library



## Chart Libraries Utilised



Choropleth Chart

Recharts

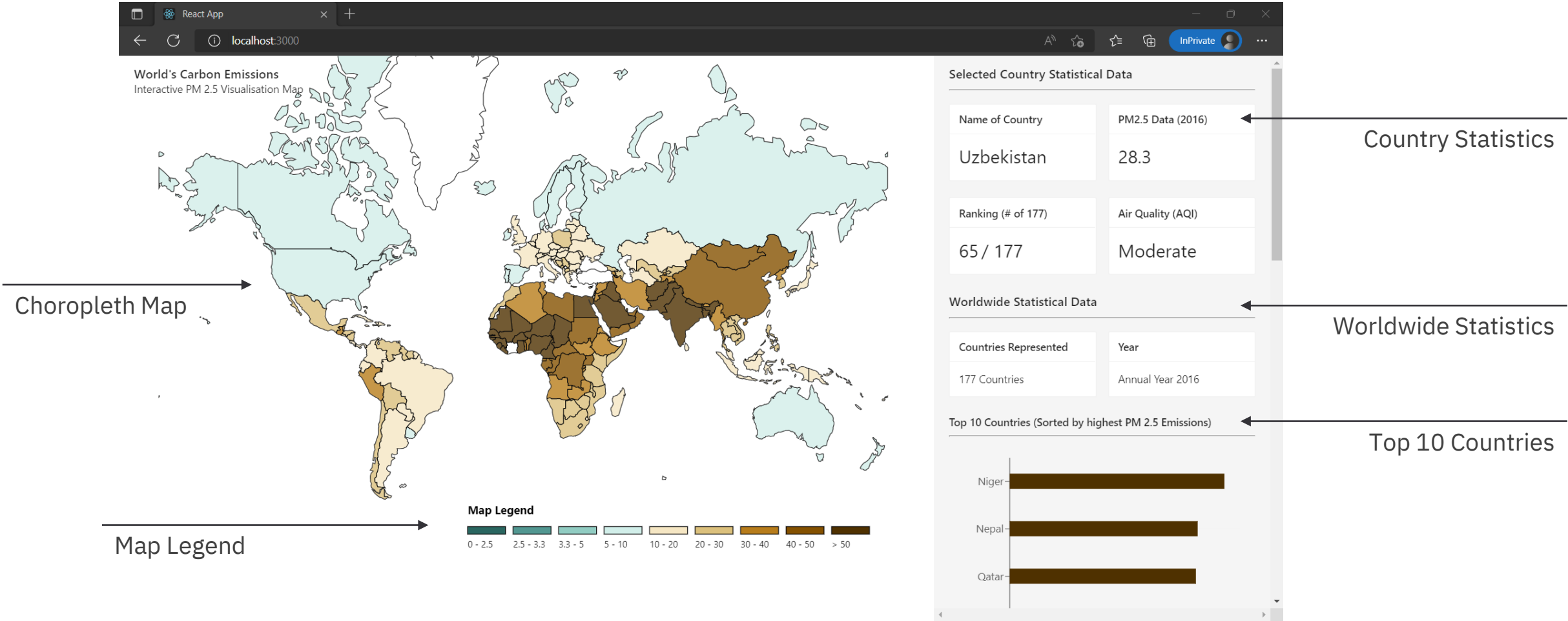
Bar Chart



# UI Demonstration

Milestone Two

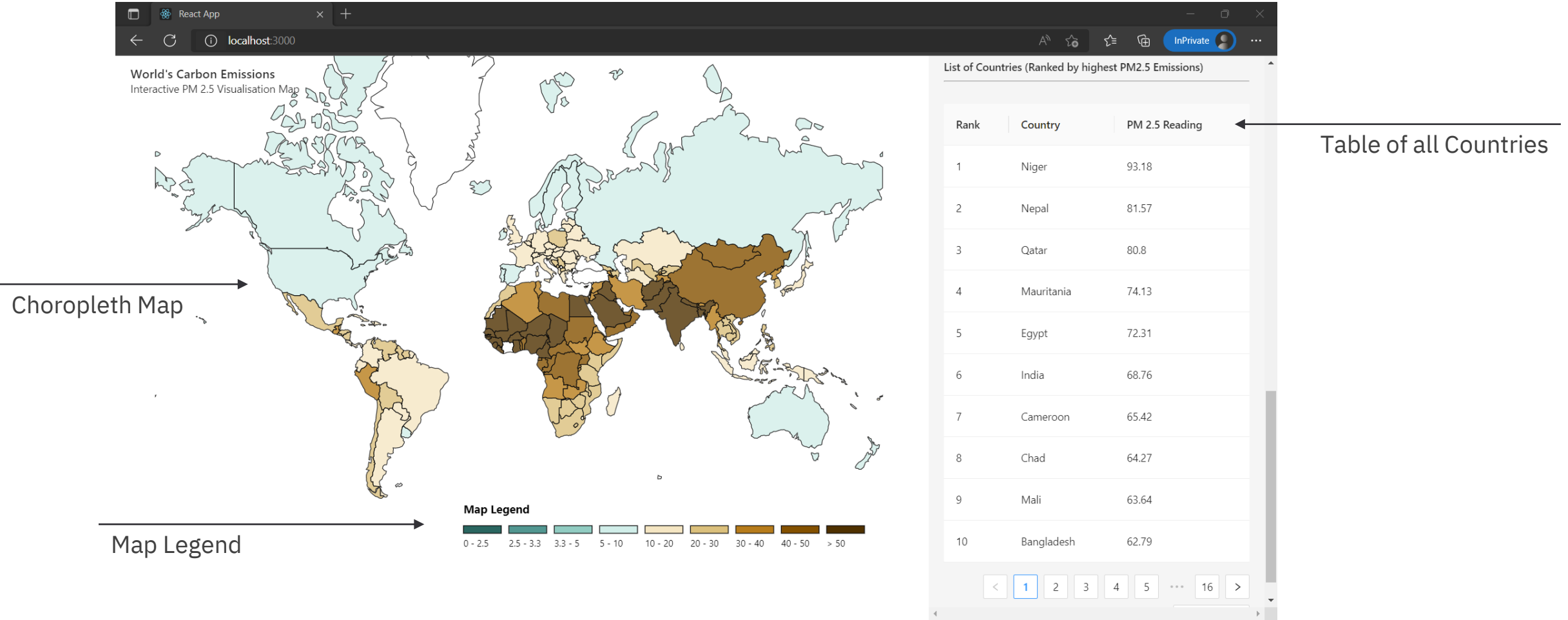
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## Milestone Two

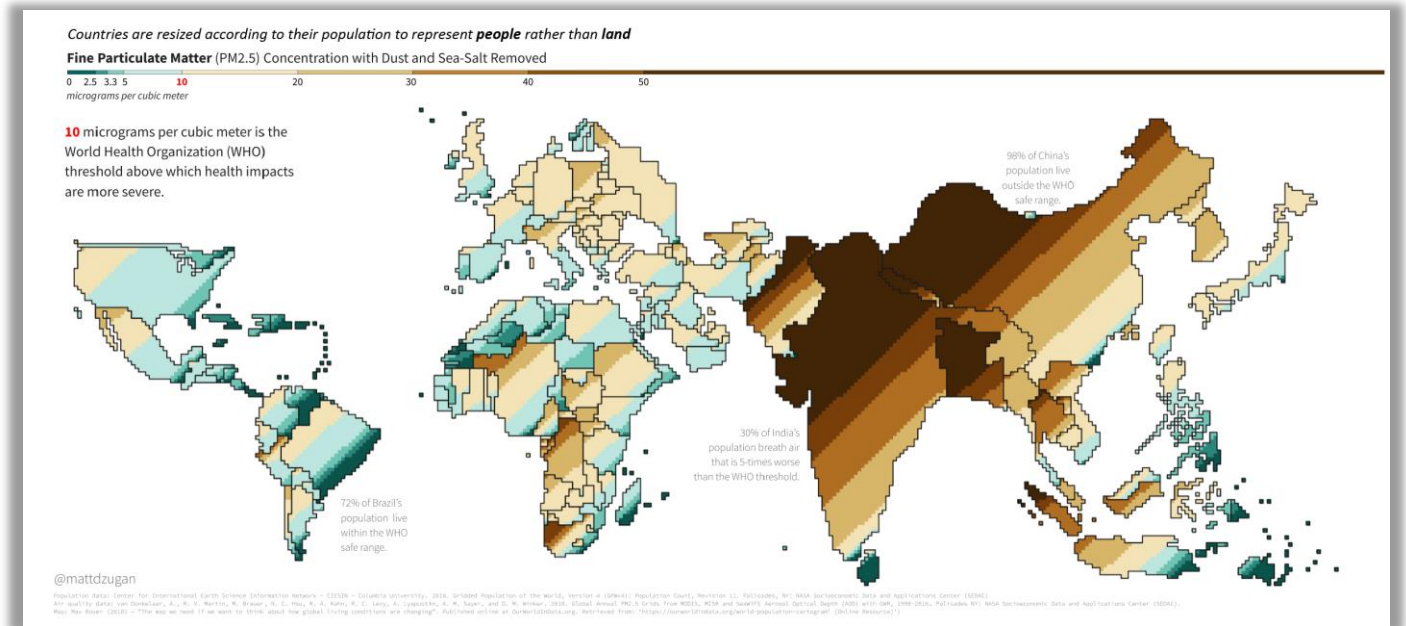
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# Limitations / Future Works / Retrospective

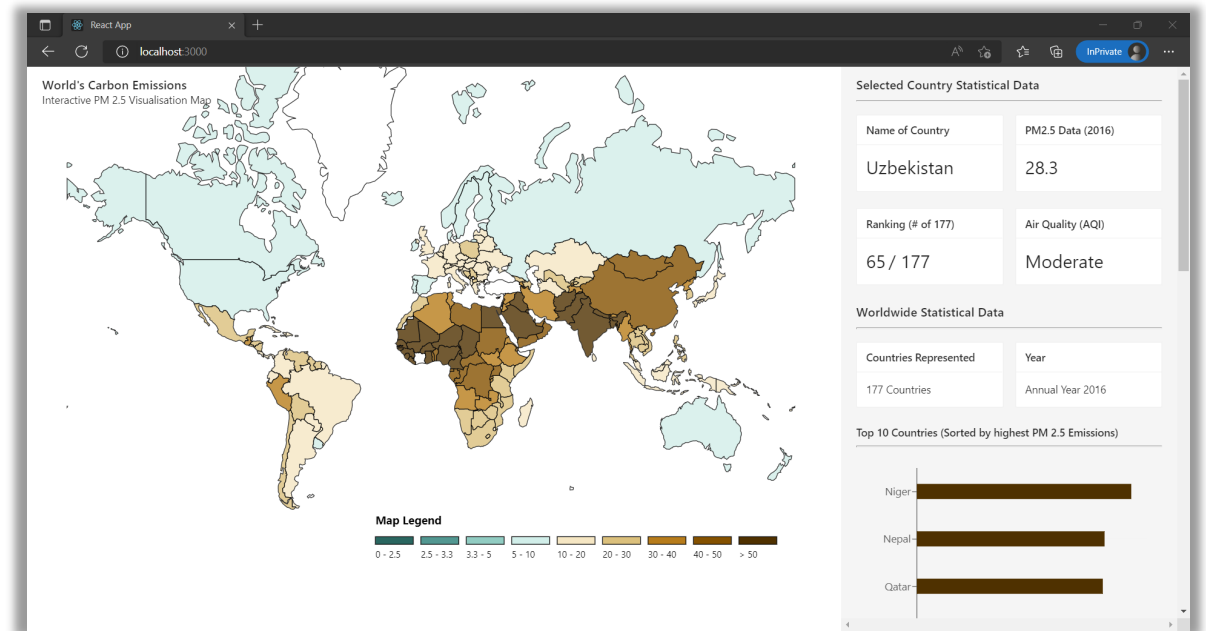
# Limitations Discovered

- **Design/Data Mismatch**
  - Data does not tally with the actual data in Matt's Cartograph
- **WHO Data is up to 2016?**
  - Despite "last updated" in 2021, the latest data is for 2016
  - Cartograph is not clear on the year(s) used

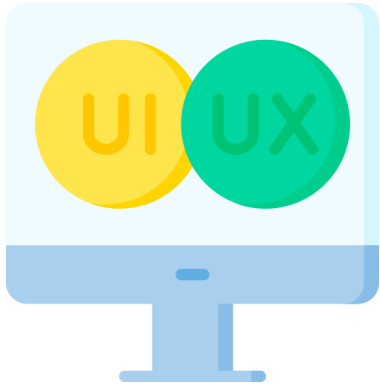


# UI Development Issues

- **Outdated D3 Source Code**
  - Most source code found online and on the official D3 gallery website are deprecated
- **JSON/GeoJSON Name Mismatch**
  - Additional time is needed to resolve country name mismatches in the WHO JSON and GeoJSON file



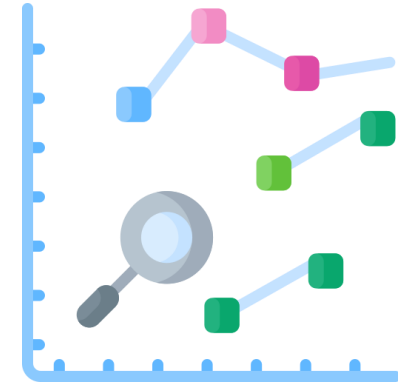
## Future Works (If there is more time)



Explore Other Libraries



Toggle 2D vs 3D



Population Trends?



# Distribution of Project Work

## Zheng Yu

- ✓ Data filtering and restructuring for GeoJSON
- ✓ Research on graphs for data representation
- ✓ Development on Table UI component (all countries)
- ✓ Documentations on GitHub

## Claudia

- ✓ Data filtering and restructuring for GeoJSON
- ✓ Research on graphs for data representation
- ✓ Development of Bar Chart component (Top 10 countries)
- ✓ Documentations on GitHub

## Keith

- ✓ UI design scheme
- ✓ Development on Choropleth Map component
- ✓ Development on Card UI components (Country details)
- ✓ Documentations on GitHub
- ✓ Overall Project Integration and ReactJS state management

## Team Retrospective

Need more time to  
explore more data  
visualisation libraries

Should have crafted User  
Stories to sieve out  
unnecessary functions

All team members are  
receptive of new findings  
and UI changes

Some source code are not  
compactible with ReactJS

Using of UI library helps  
standardise the UI layout

Feedback from Milestone  
#1 is very helpful

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A full-page background image showing a person standing on a dark, rocky ridge at night. The person is silhouetted against a spectacular view of the Milky Way galaxy, which appears as a dense, colorful band of stars stretching across the sky. The colors of the galaxy range from warm oranges and yellows on the left to cooler blues and greens on the right. The person is looking up at the stars.

Thank you!