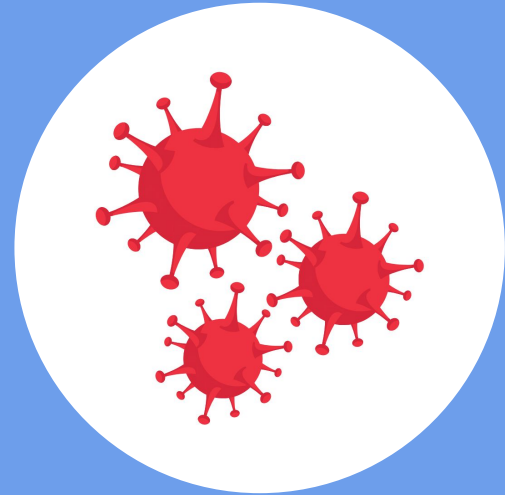# Democracy in Countries and the Covid-19 Pandemic

By Will Hanvey, Mia Padberg and Daniel Xu

Problem Statement

Research Question: Did democracies fare better or worse during the covid-19 pandemic?

Background

Universal Declaration of Human Rights: "the will of the people shall be the basis of the authority of government"

- Democracy provides an environment that respects human rights and fundamental freedoms

Ideological debate between democratic states and authoritarian regimes

- Great power conflict

Relevance today

THE WALL STREET JOURNAL.

LIFE & ARTS | IDEAS | ESSAY

Which Countries Have Responded Best to Covid-19?

The world should learn from the most successful strategies for testing, quarantine, public communication and economic support.

A medical worker performs a temperature check in Seoul, South Korea, May 2020.

The Atlantic

IDEAS

Democracies Are Better at Fighting Outbreaks

China's harsh response to the coronavirus has influential admirers, but Western nations recognize that public health fundamentally depends on public trust.

FEBRUARY 24, 2020

Ariana A. Berengaut
Penn Biden Center's director of programs, partnerships, and strategic planning

CHINA DAILY CDIC / REUTERS

CARNEGIE
ENDOWMENT FOR
INTERNATIONAL PEACE

Do Authoritarian or Democratic Countries Handle Pandemics Better?

RACHEL KLEINFELD

MARCH 31, 2020
COMMENTARY

Source: Getty

Data

- The World Democracy Index from 2020

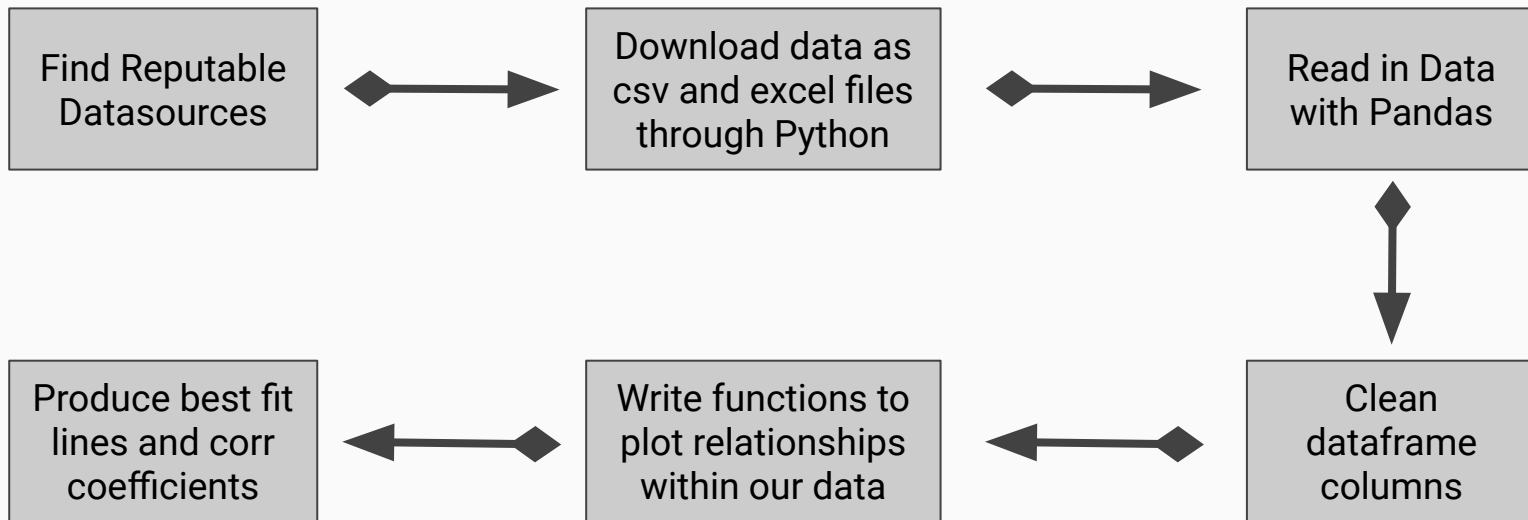- "Our World in Data" Covid-19 data set

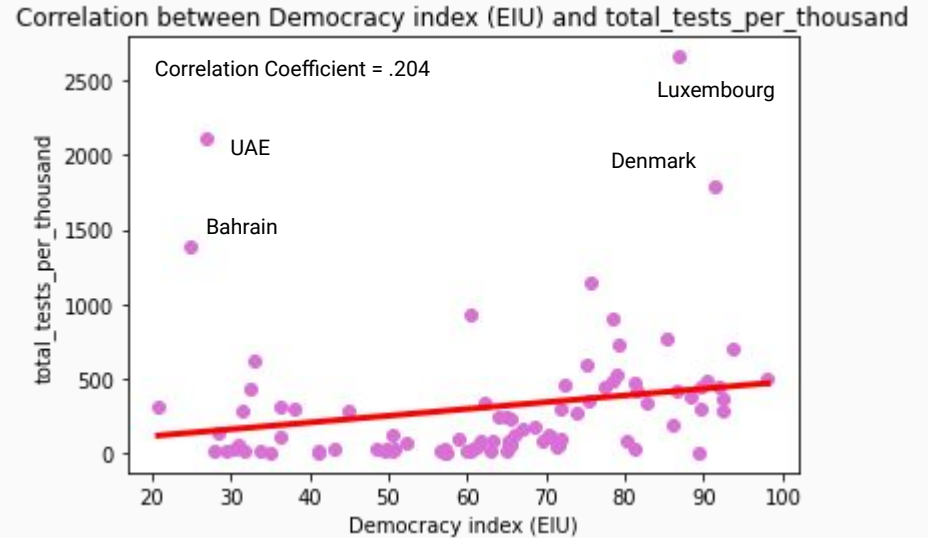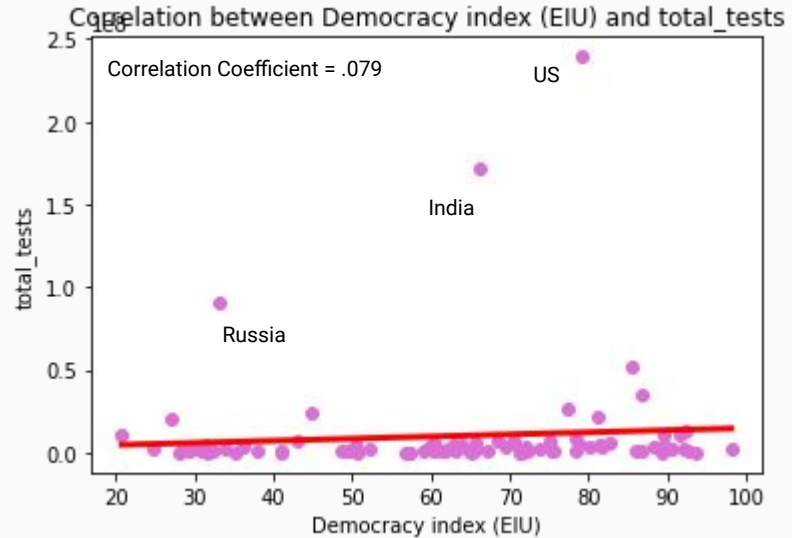|	Overall score	Rank	I Electoral process and pluralism	II Functioning of government	III Political participation	IV Political culture	V Civil liberties
Full democracy							
Norway	9.81	1	10.00	9.64	10.00	10.00	9.41
Iceland	9.37	2	10.00	8.57	8.89	10.00	9.41
Sweden	9.26	3	9.58	9.29	8.33	10.00	9.12
New Zealand	9.25	4	10.00	8.93	8.89	8.75	9.71
Canada	9.24	5	9.58	8.93	8.89	9.38	9.41
Finland	9.20	6	10.00	8.93	8.89	8.75	9.41
Denmark	9.15	7	10.00	8.93	8.33	9.38	9.12
Ireland	9.05	8	10.00	7.86	8.33	9.38	9.71
Australia	8.96	9=	10.00	8.57	7.78	8.75	9.71
Netherlands	8.96	9=	9.58	9.29	8.33	8.75	8.82
Taiwan	8.94	11	10.00	9.64	7.22	8.13	9.71
Switzerland	8.83	12	9.58	8.57	7.78	9.38	8.82
Luxembourg	8.68	13	10.00	8.57	6.67	8.75	9.41
Germany	8.67	14	9.58	8.21	8.33	8.13	9.12
Uruguay	8.61	15	10.00	8.57	6.67	8.13	9.71
United Kingdom	8.54	16	10.00	7.50	8.89	7.50	8.82
Chile	8.28	17	9.58	8.21	6.67	8.13	8.82
Austria	8.16	18=	9.58	7.50	8.33	6.88	8.53
Costa Rica	8.16	18=	9.58	6.79	7.22	7.50	9.71
Mauritius	8.14	20	9.17	7.86	6.11	8.75	8.82
Japan	8.13	21	8.75	8.57	6.67	8.13	8.53
Spain	8.12	22	9.58	7.14	7.22	8.13	8.53
South Korea	8.01	23	9.17	8.21	7.22	7.50	7.94
Flawed democracy							
France	7.99	24	9.58	7.50	7.78	6.88	8.24
United States of America	7.92	25	9.17	6.79	8.89	6.25	8.53
Portugal	7.90	26	9.58	7.50	6.11	7.50	8.82
Estonia	7.84	27=	9.58	7.86	6.67	6.88	8.24
Israel	7.84	27=	9.17	7.50	9.44	7.50	5.59
Italy	7.74	29	9.58	6.43	7.22	7.50	7.94
Malta	7.68	30	9.17	6.79	6.11	8.13	8.24
Czech Republic	7.67	31	9.58	6.07	6.67	7.50	8.53
Cabo Verde	7.65	32	9.17	7.00	6.67	6.88	8.53
Botswana	7.62	33	9.17	6.79	6.11	7.50	8.53
Cyprus	7.56	34	9.17	5.36	7.22	7.50	8.53
Slovenia	7.54	35	9.58	6.43	7.22	6.25	8.24
Belgium	7.51	36	9.58	7.86	5.00	6.88	8.24

Methods

```python
def plot_covid_vs_democracy(covid_df, covid_column, dem_df, dem_column):
    # Create a scatterplot, mapping all countries and their respective points
    # on a graph
    merged_df = pd.merge(left=dem_df, right=covid_df, left_on='name', right_on='location')

    nan_value = float("NaN")
    if covid_column == "hosp_patients" or covid_column == "hosp_patients_per_million":
        merged_df.replace(0.0, nan_value, inplace=True)
        merged_df.dropna(subset = ["hosp_patients"], inplace=True)
    if covid_column == "total_tests" or covid_column == "total_tests_per_thousand":
        merged_df.replace(0.0, nan_value, inplace=True)
        merged_df.dropna(subset = ["total_tests"], inplace=True)

    plt.scatter(merged_df[dem_column], merged_df[covid_column], color = "orchid")

    # Find m and b coefficients needed to create a best-fit line
    m, b = np.polyfit(merged_df[dem_column], merged_df[covid_column], 1)

    # Use m and b to create a best fit line
    plt.plot(merged_df[dem_column], (m * merged_df[dem_column]) + b,
            color = "red", linewidth = 3)
    plt.title("Correlation between " + dem_column + " and " + covid_column)
    plt.xlabel(dem_column)
    plt.ylabel(covid_column)
    plt.show()

    # Prints out the correlation coefficient of the two variables
    correlation = np.corrcoef(merged_df[dem_column], merged_df[covid_column])
    print(correlation)
```
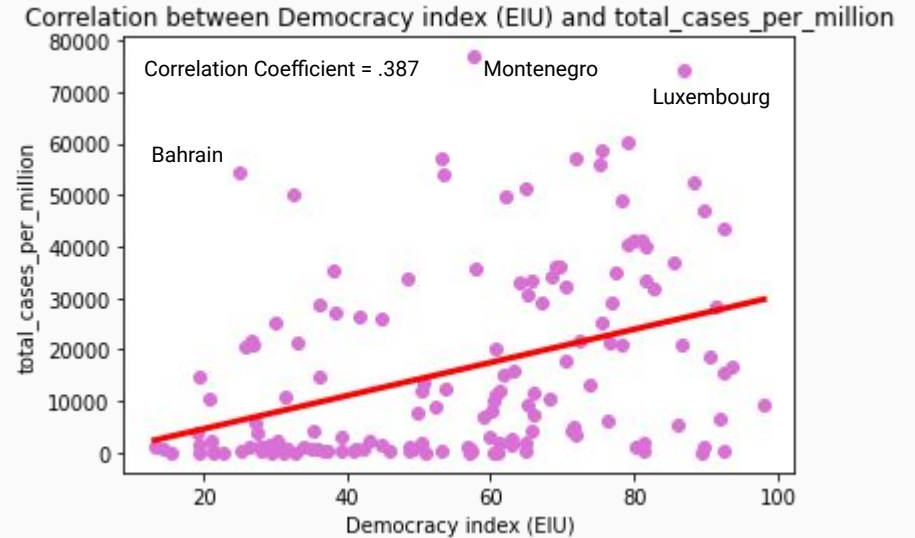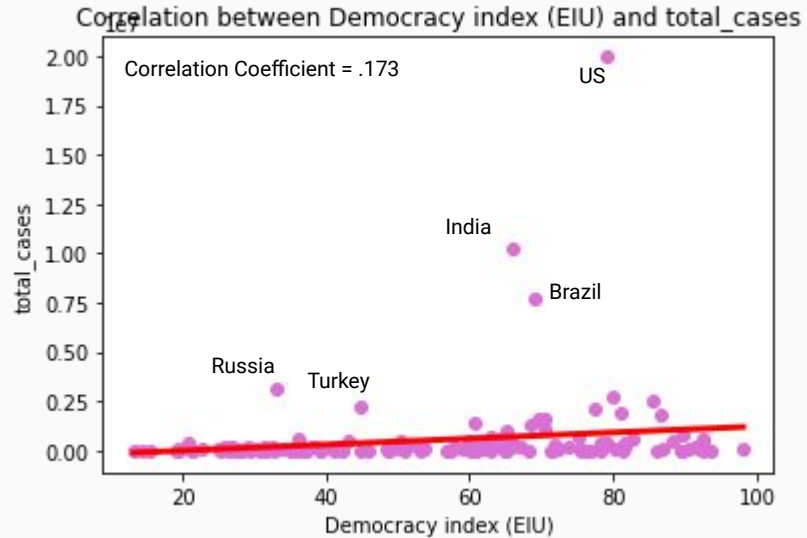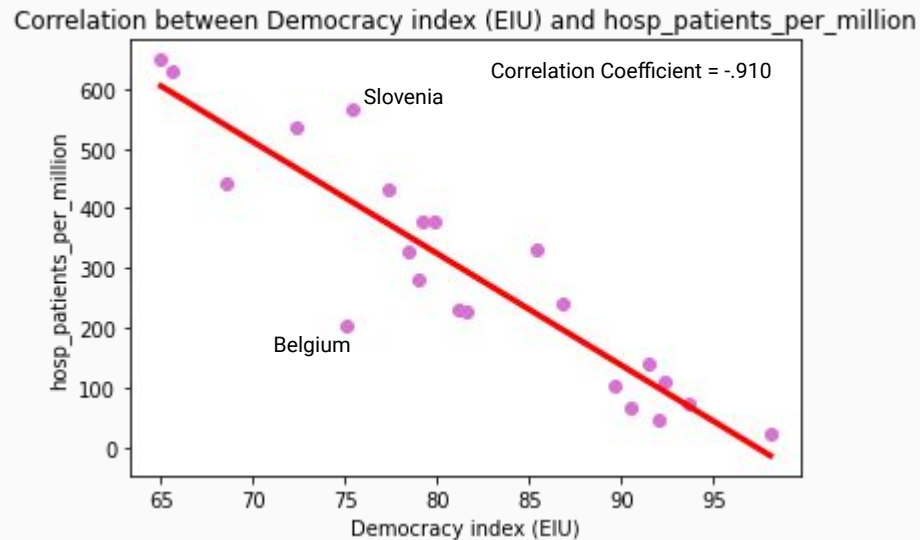
```
┌─────────────────────┐         ┌─────────────────────┐         ┌─────────────────────┐
│   Find Reputable    │  ◆────► │  Download data as   │  ◆────► │    Read in Data     │
│     Datasources     │         │  csv and excel files│         │     with Pandas     │
│                     │         │   through Python    │         │                     │
└─────────────────────┘         └─────────────────────┘         └─────────────────────┘
                                                                          ◆
                                                                          │
                                                                          ▼
┌─────────────────────┐         ┌─────────────────────┐         ┌─────────────────────┐
│  Produce best fit   │ ◄────◆  │  Write functions to │ ◄────◆  │       Clean         │
│  lines and corr     │         │  plot relationships │         │     dataframe       │
│    coefficients     │         │   within our data   │         │      columns        │
└─────────────────────┘         └─────────────────────┘         └─────────────────────┘
```

Does democraticness affect...

Tests

Correlation between Democracy index (EIU) and total_tests

Correlation Coefficient = .079

US

India

Russia

Correlation between Democracy index (EIU) and total_tests_per_thousand

Correlation Coefficient = .204

Luxembourg

UAE

Denmark

Bahrain

*data as of Jan 1

Cases

*data as of Jan 1

Hospitalizations

Correlation between Democracy index (EIU) and hosp_patients

Correlation Coefficient = -.140

US

Correlation between Democracy index (EIU) and hosp_patients_per_million

Correlation Coefficient = -.910

Slovenia

Belgium

*data as of Jan 1

Deaths

Correlation between Democracy index (EIU) and total_deaths

Correlation Coefficient = .203

US

Brazil

India

Mexico

Russia

Correlation between Democracy index (EIU) and total_deaths_per_million

Correlation Coefficient = .432

Belgium

Bosnia

*data as of Jan 1
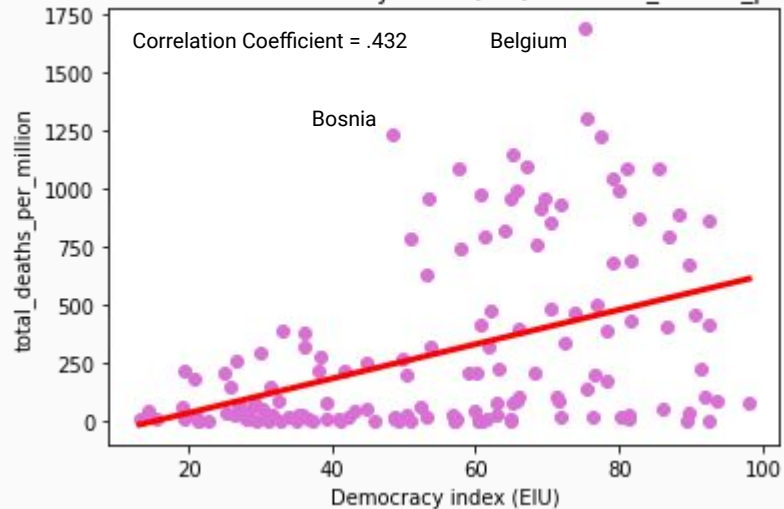
Conclusions

- ❖ Bad data ---> Even worse correlations
  - ➢ Unreliable data sources
- ❖ Unable to make any claims about the correlation between a nation's democracy and the effectiveness of their Covid-19 response
  - ➢ Only likely correlation is between DIS and Hospitalized Patients per million
- ❖ Potential directions to expand further into:
  - ➢ Only include democracies/flawed democracies in our data
  - ➢ Include vaccinations into our research
  - ➢ Include prior outbreaks/pandemics
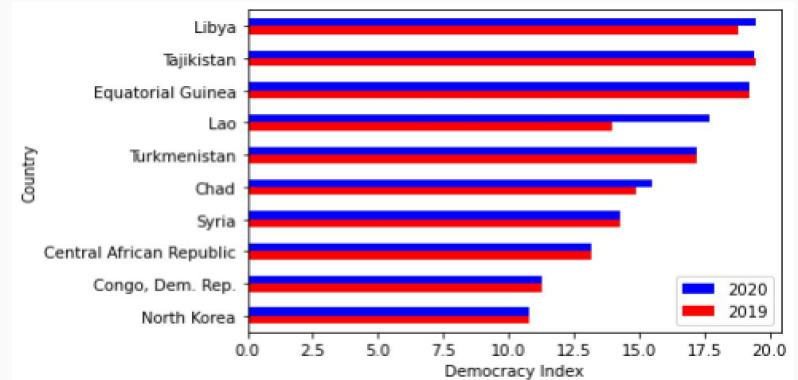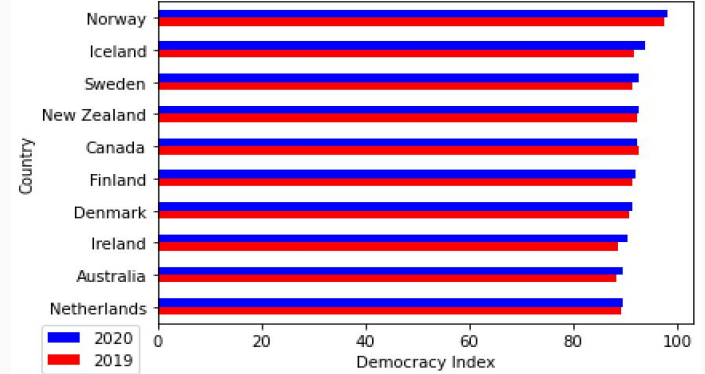 - ➢ Are there better indicators/predictors for the spread of covid-19?

How can we use this knowledge to better prepare for future pandemics?

Thank you for listening!