



DATA 5310

**Effects of Climate Change on
Natural Disasters**

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Introduction

Is climate change
affecting the
frequency and severity
of natural disasters?

If so, can governments
save human lives and
money by reducing
CO2 emissions?



Road Map

The Data: Sources, Cleaning, and Challenges

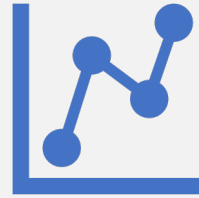
CO2 Emissions: The Global Trend

The Human Cost: Frequency and Severity of Natural Disasters

The Monetary Cost: How much is the US spending?

Conclusion and Future Research

The Data



USED DATA FROM KAGGLE, OUR
WORLD IN DATA, AND DATAHUB



CLEANING/CHALLENGES: DEALING WITH
CONFLICTING DATA SOURCES



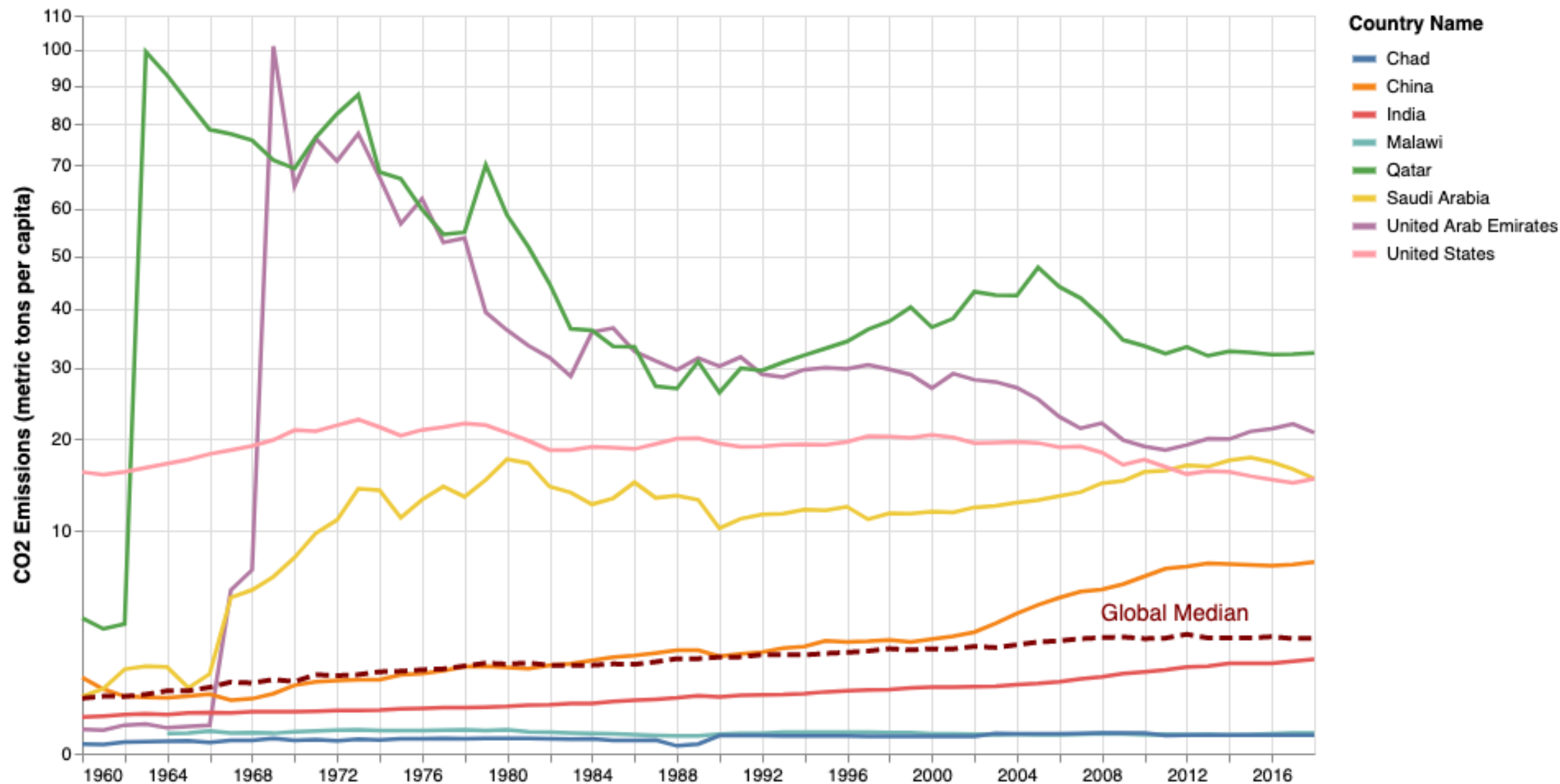
CO₂ EMISSIONS

The Global Trend

Top 15 CO₂ Emitting Countries in 2021

Country Name	CO ₂ Emissions (Metric Tons per Capita) in 2021
Qatar	35.59
Bahrain	26.66
Kuwait	24.97
Trinidad and Tobago	23.68
Brunei	23.53
United Arab Emirates	21.79
New Caledonia	19.10
Saudi Arabia	18.70
Oman	17.92
Australia	15.09
Mongolia	15.03
United States	14.86
Sint Maarten (Dutch part)	14.70
Kazakhstan	14.41
Canada	14.30

CO2 Emissions per Year

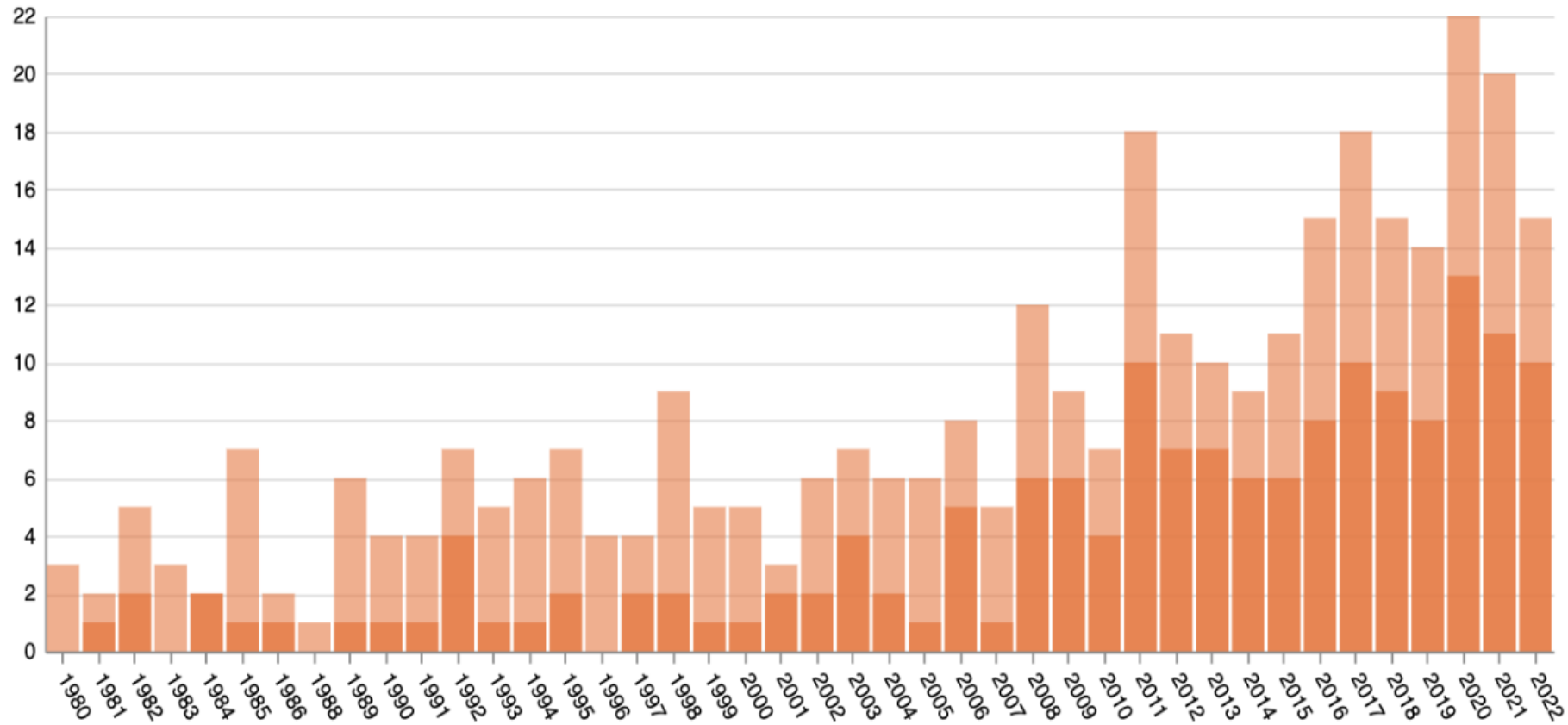




The Human Cost

Frequency and Severity of Natural
Disasters

Count of Disasters in the US per Year

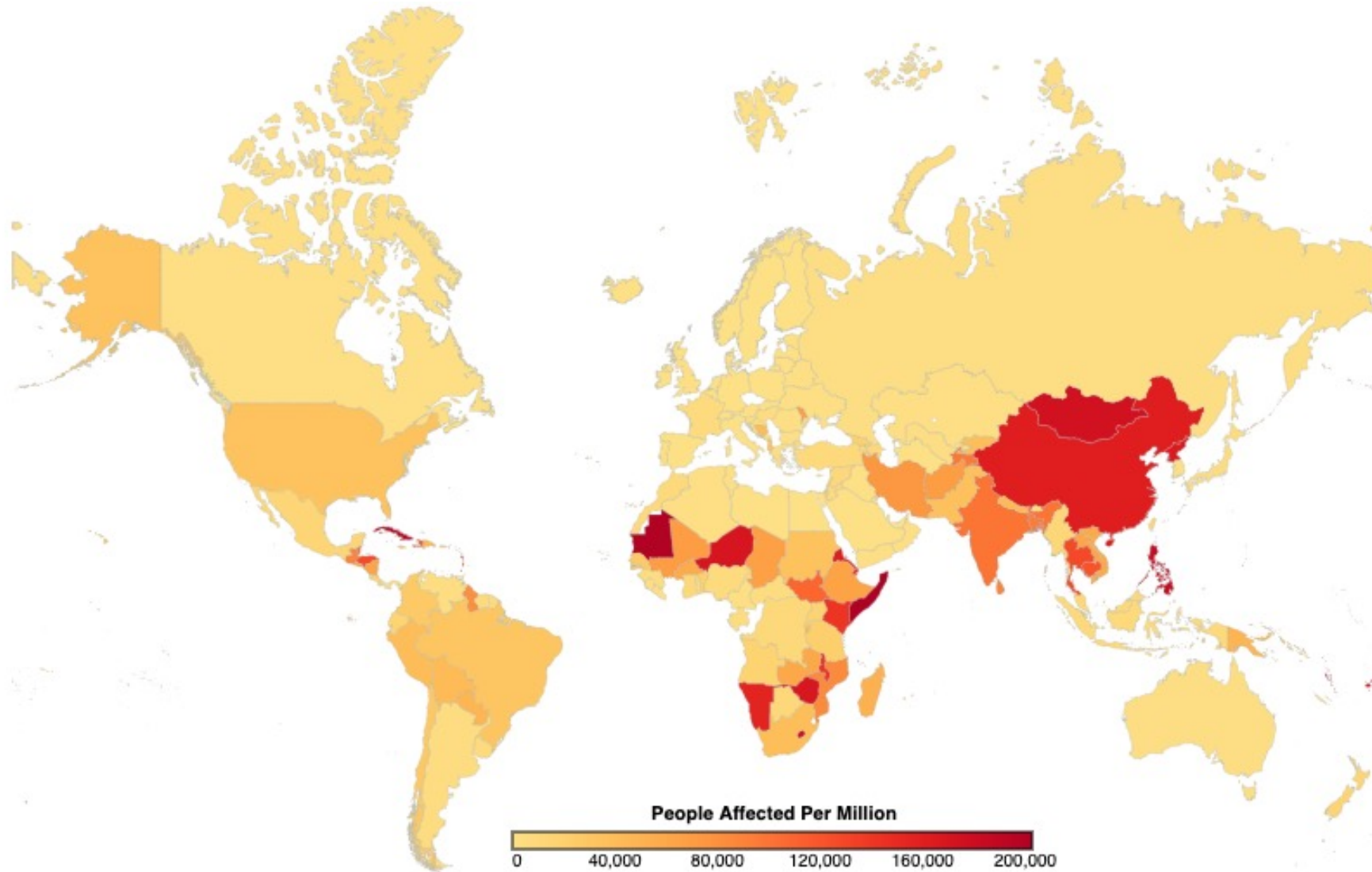


Select_Disaster

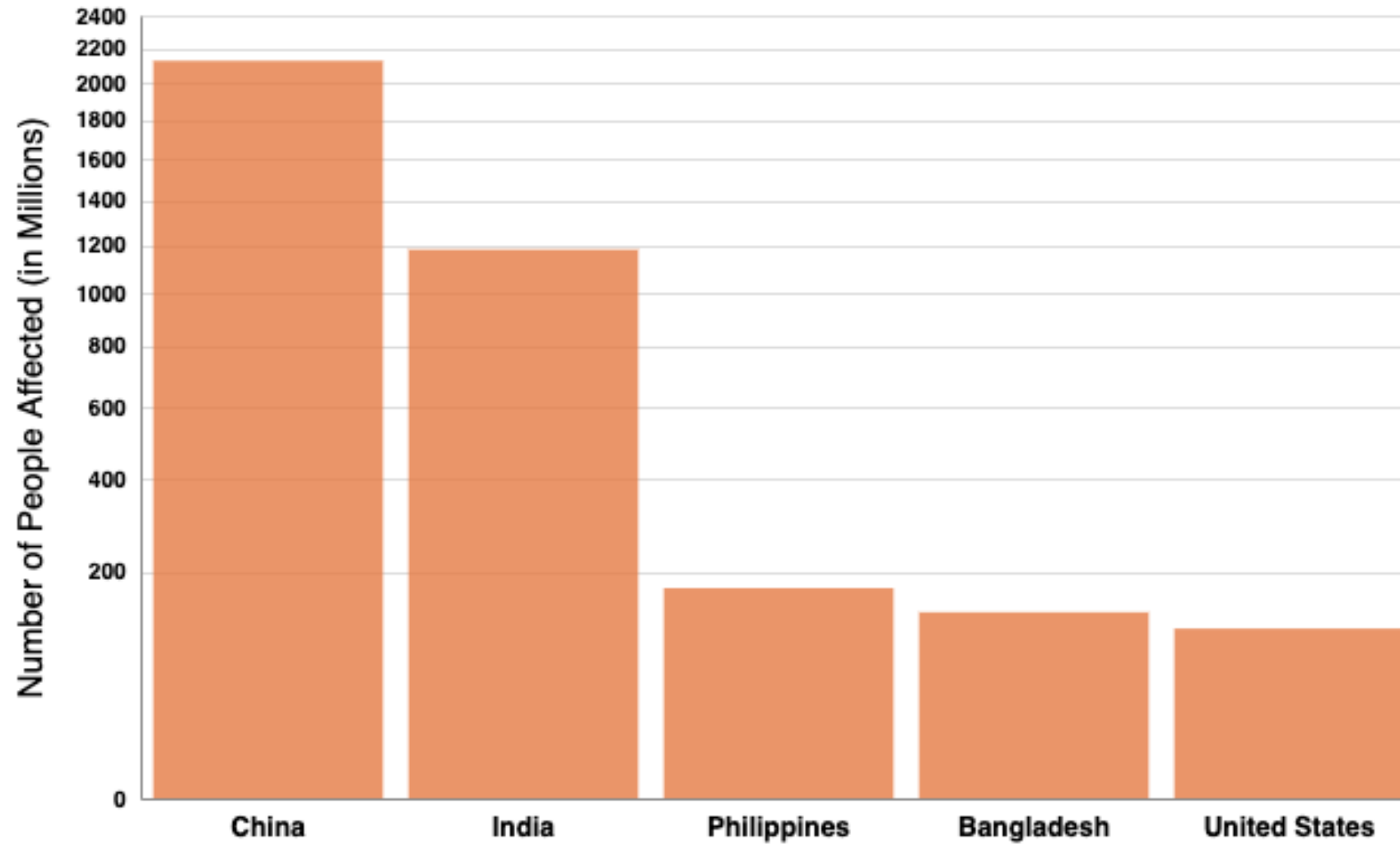
Severe Storm



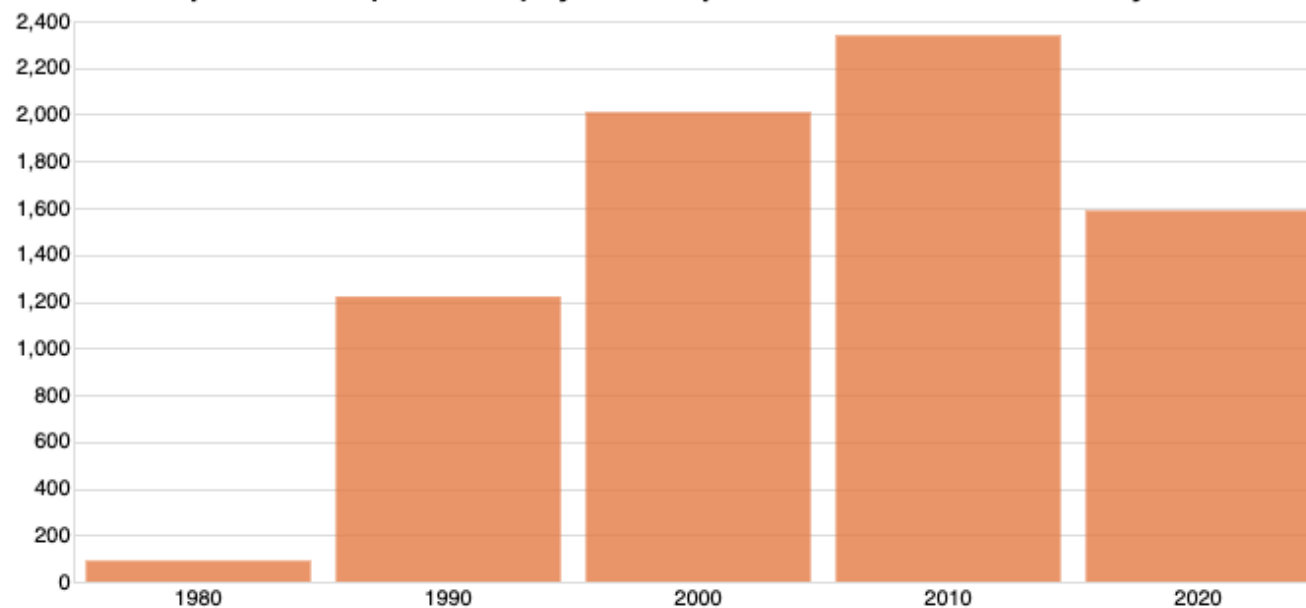
People Affected By Disasters Globally Per Million



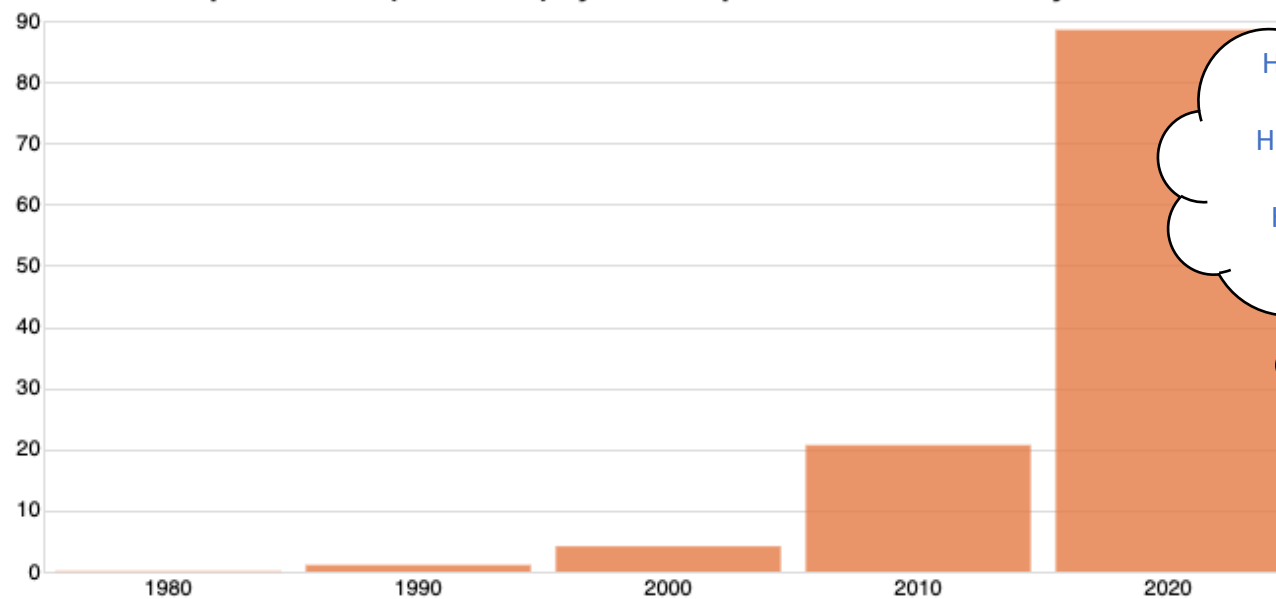
Top 5 Countries with Most People Affected in the last Two Decades



People Affected (in Millions) by Catastrophes Around the World in every Decade

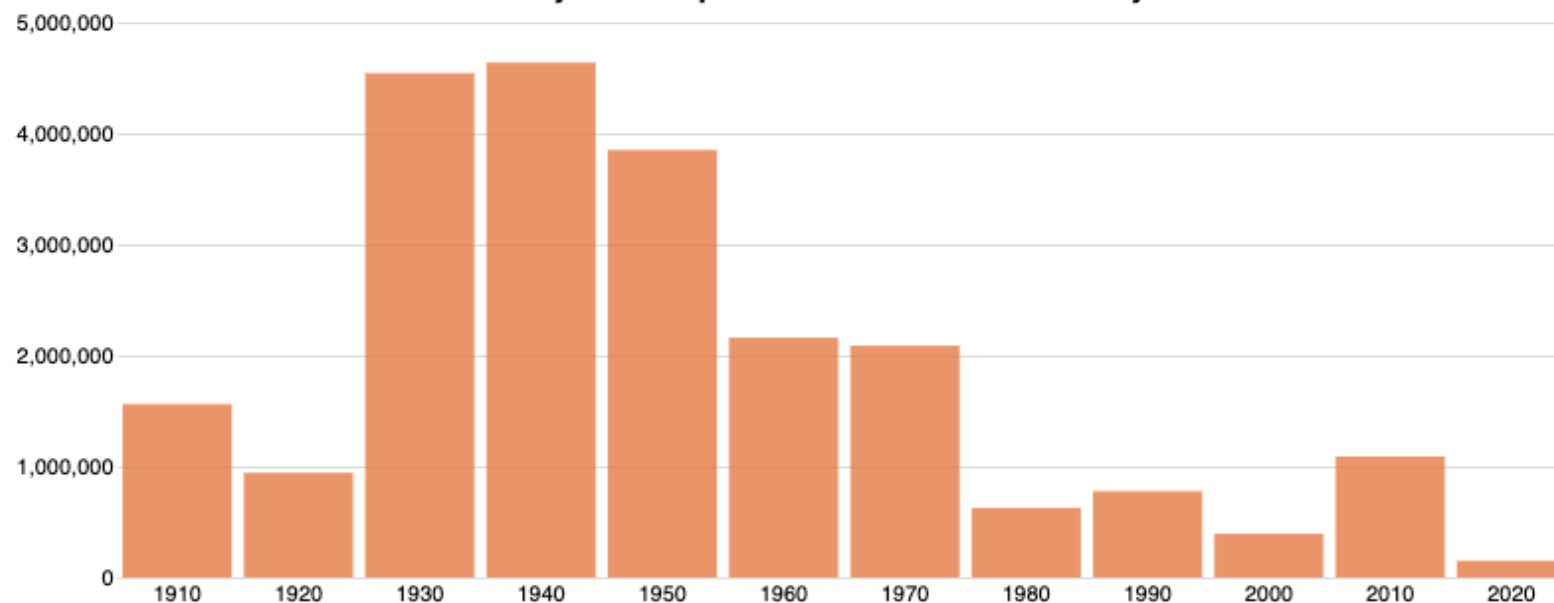


People Affected (in Millions) by Catastrophes in the USA in every Decade

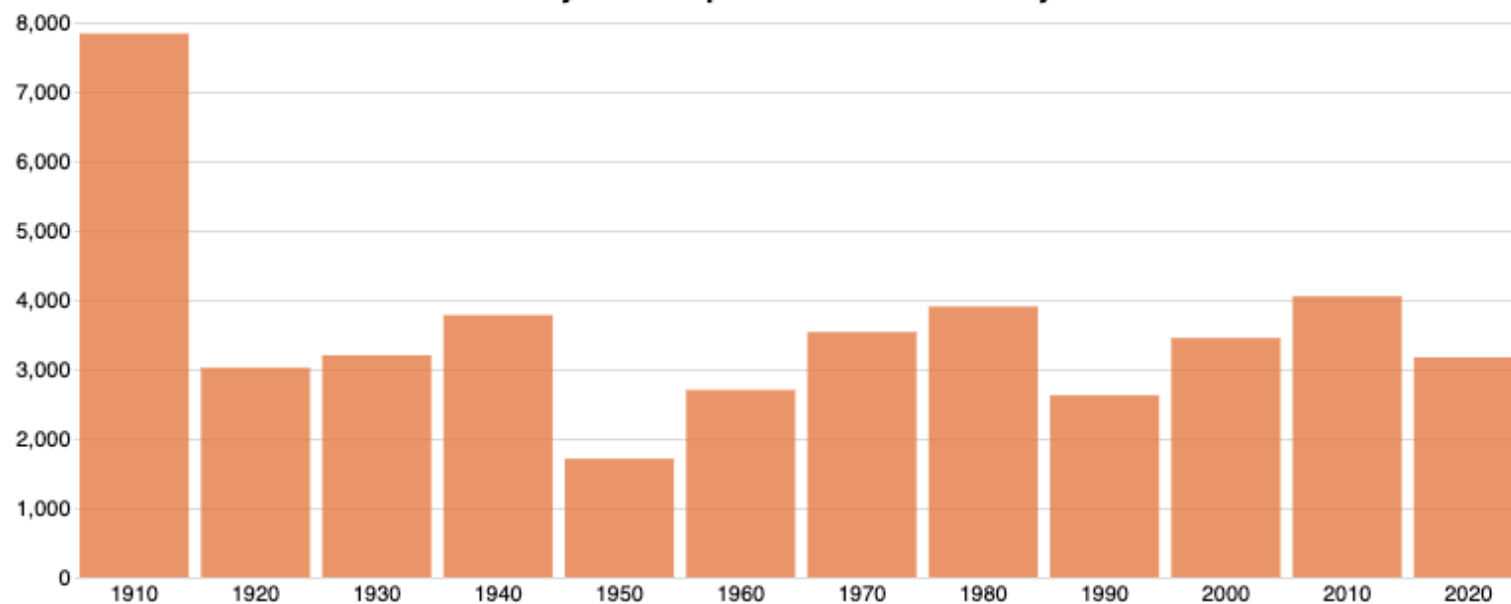


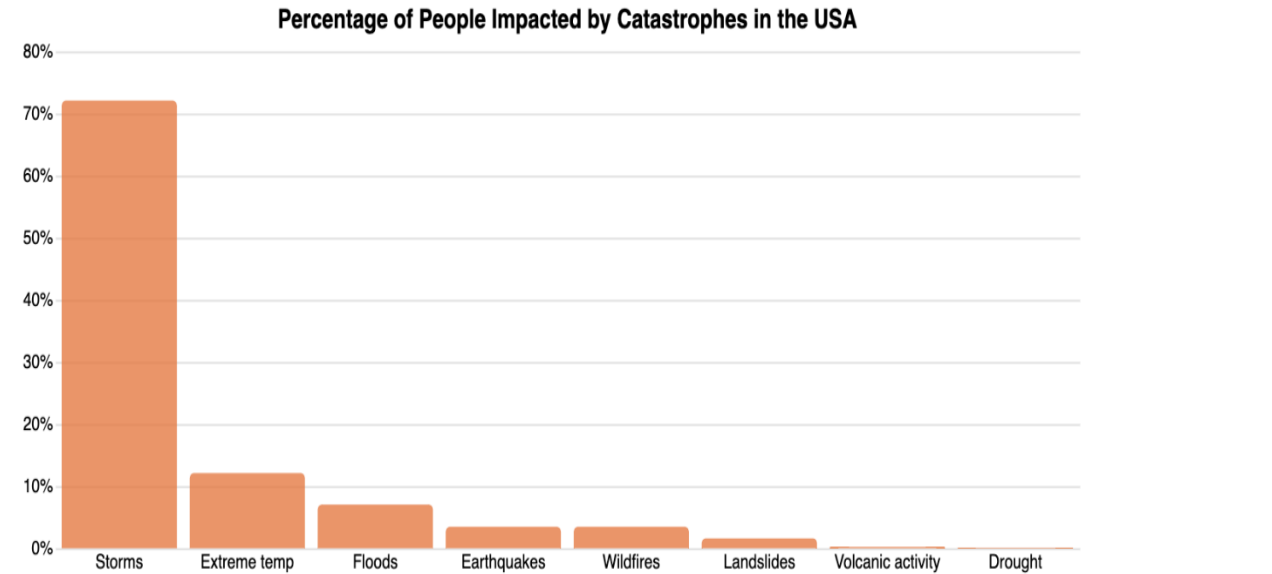
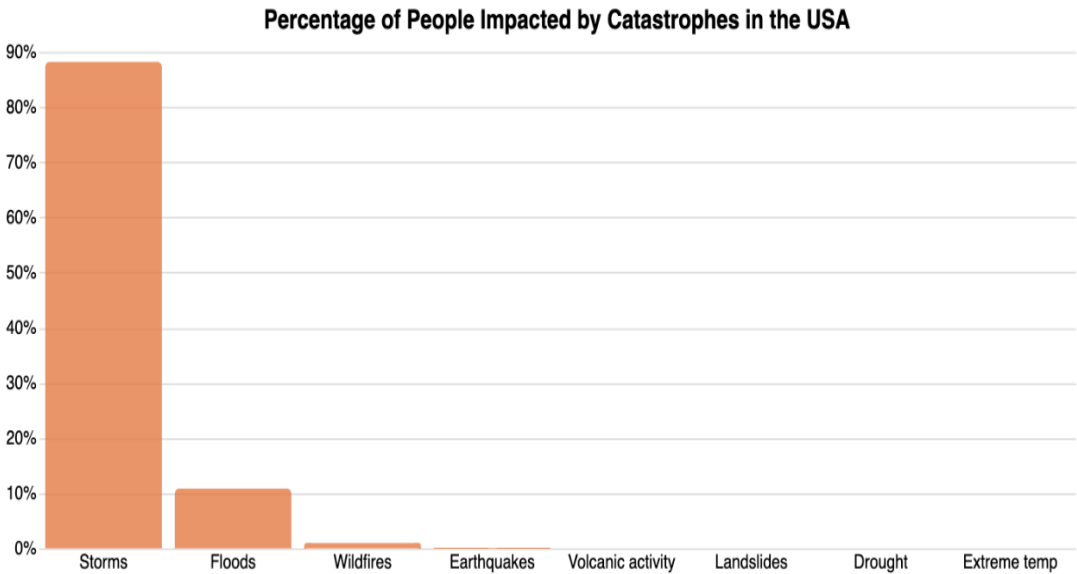
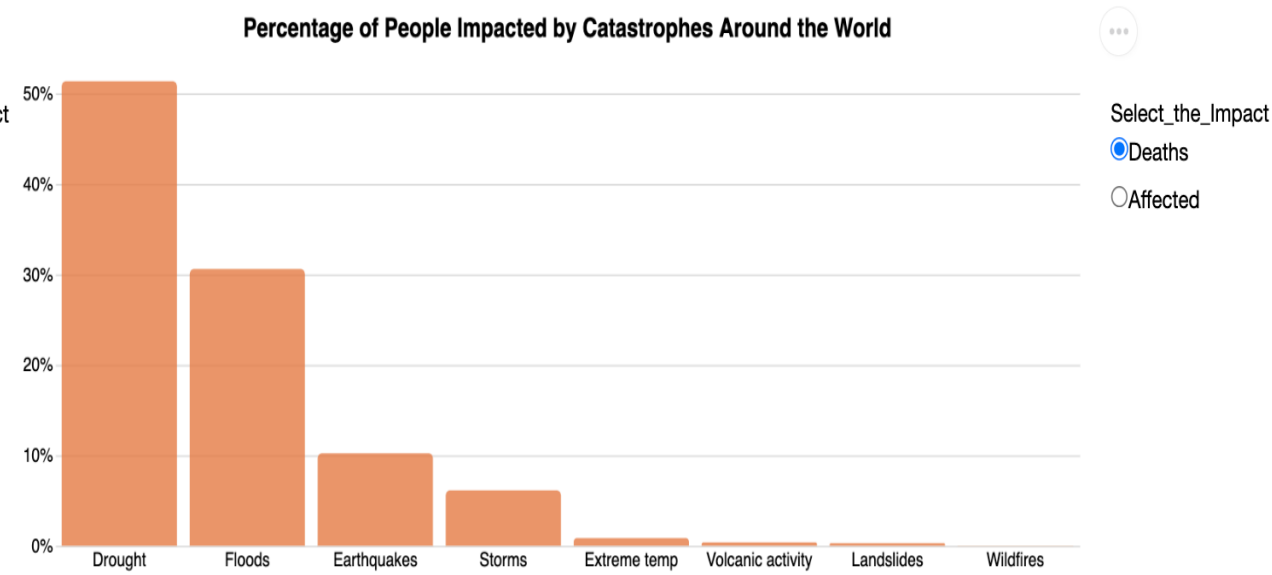
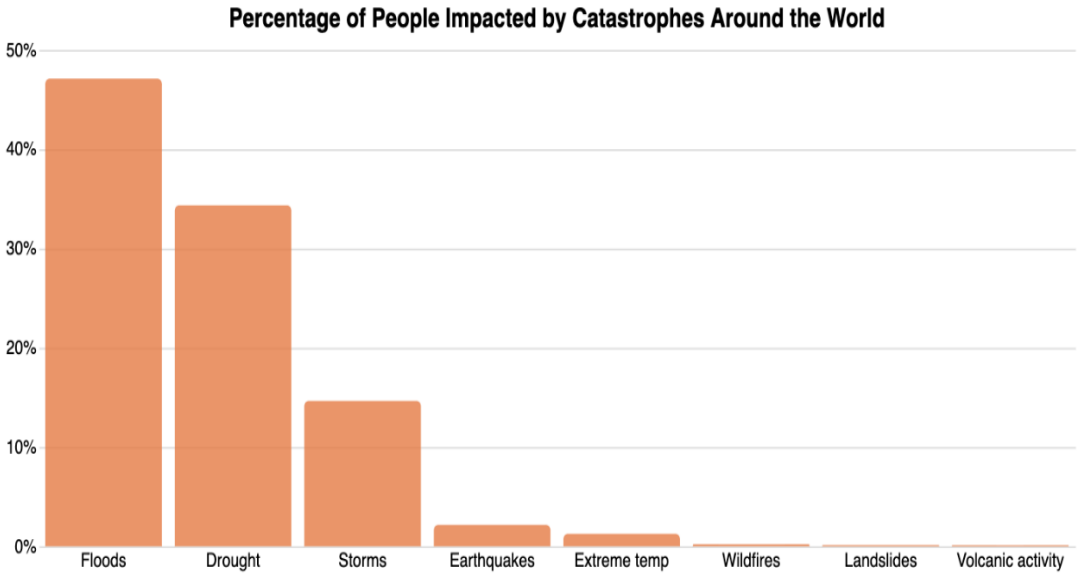
Hurricane Sandy
(2012)
Hurricane Harvey
(2017)
Hurricane Irma
(2017)

Deaths by Catastrophes Around the World in every Decade



Deaths by Catastrophes in the USA in every Decade





Percentages are based off the total count from the year 1980 to 2022

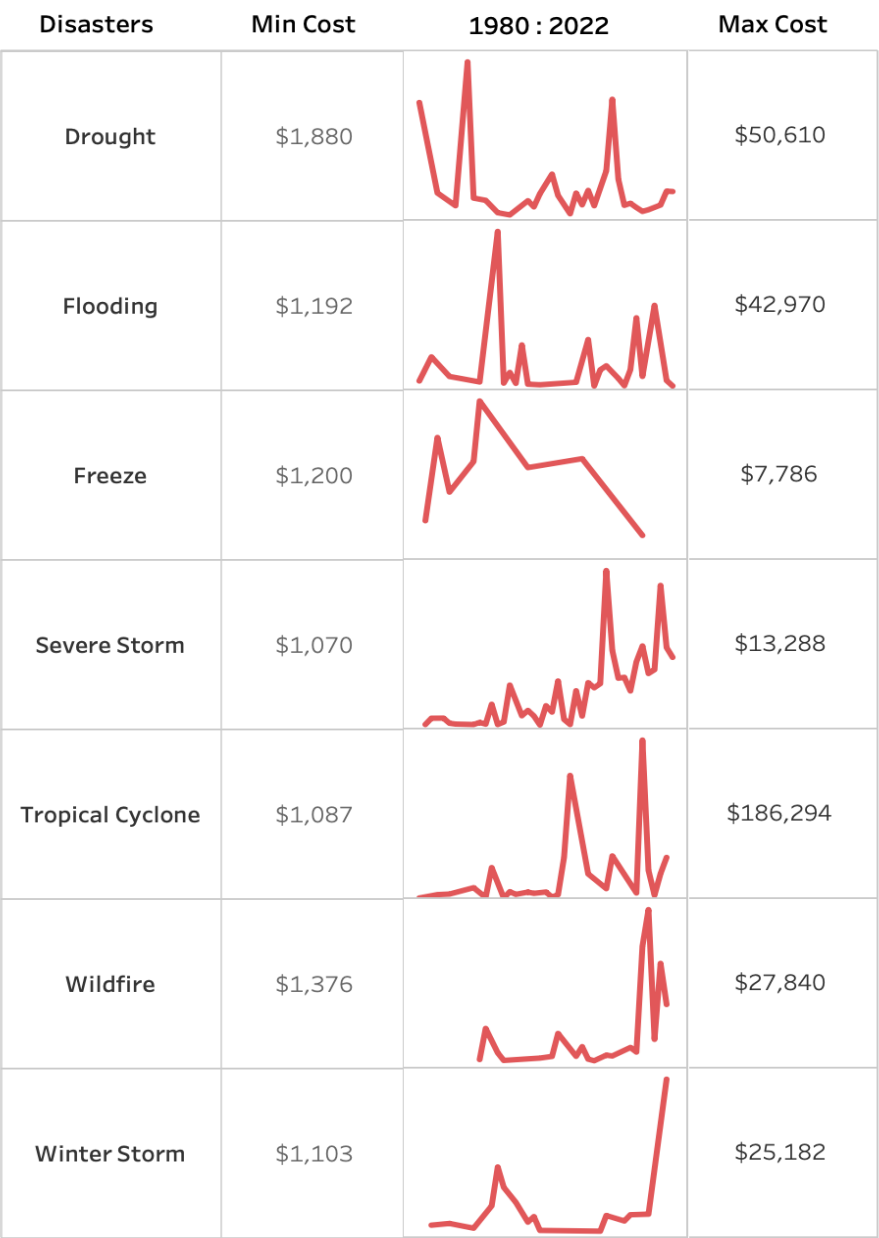
Percentages are based off the total count from the year 1980 to 2022



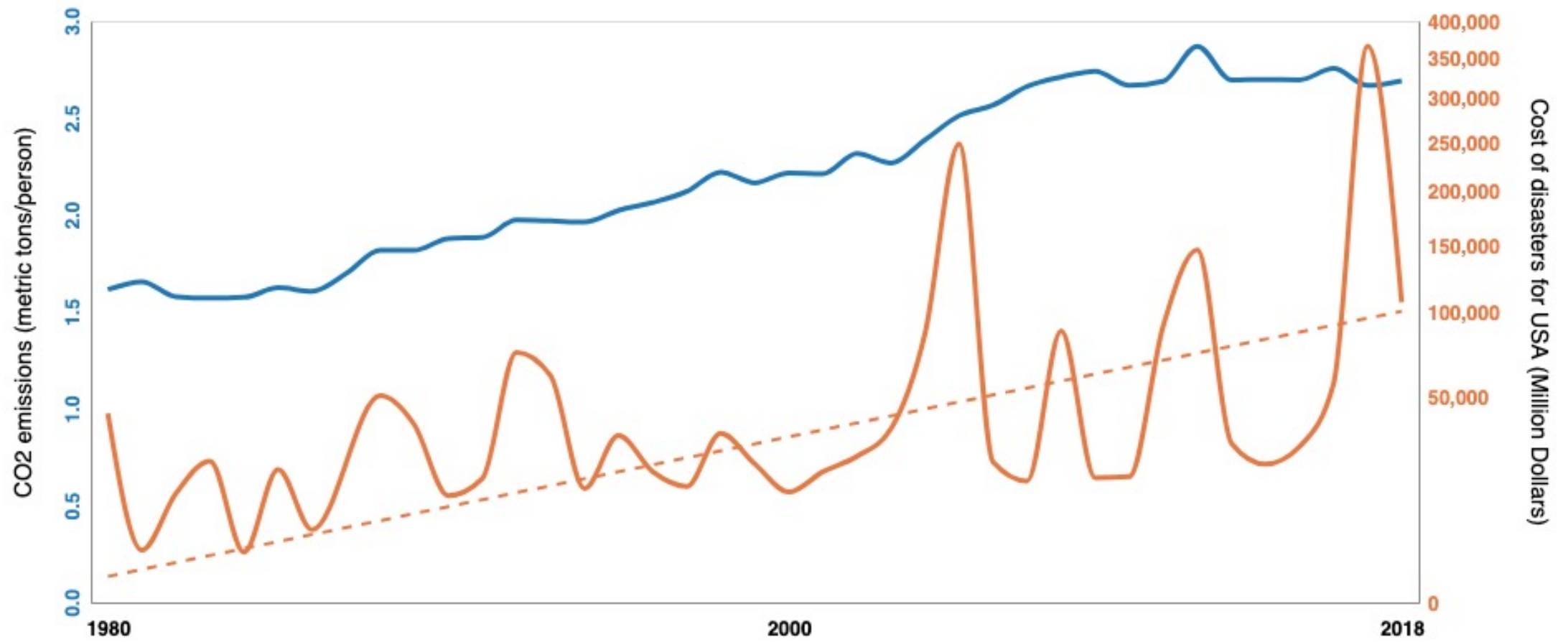
The Monetary Cost

How much is the
US spending?

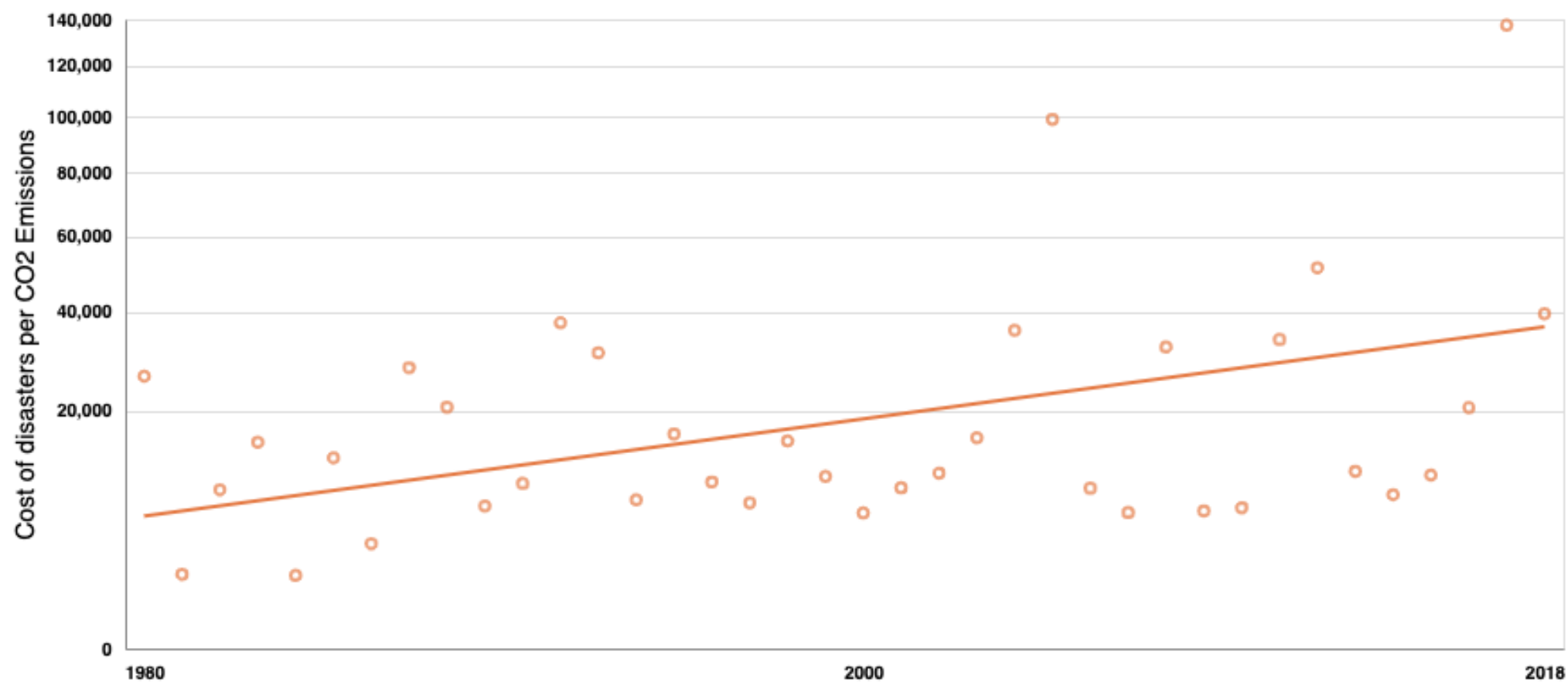
Trend of the Amount (In Million Dollars) spent by the US government on Catastrophes



Yearly Global CO2 Emissions and Total Cost of Disaster for the USA



Yearly Economic Costs per CO2 Emission for the USA



Cost of Disasters per CO2 emissions is calculated as Cost (in Millions US Dollars) per CO2 emissions (Metric Tons per Capita)

Conclusions

Increasing trends in CO2 emissions, counts of natural disasters, number of people affected by disasters, and monetary cost

Potential to save lives, improve lives, and save billions of \$ by reducing CO2 emissions

Future research: establish causal relationships, how disaster relief is used, data collection issues to address

Questions?



References

1. NOAA National Centers for Environmental Information (NCEI) U.S. Billion-Dollar Weather and Climate Disasters (2022). <https://www.ncei.noaa.gov/access/billions/>, DOI: [10.25921/stkw-7w73](https://doi.org/10.25921/stkw-7w73)

2. *Centre for research on the epidemiology of disasters: Centre for research on the epidemiology of disasters* (no date) *Centre for Research on the Epidemiology of Disasters / Centre for Research on the Epidemiology of Disasters*. Available at: <https://www.cred.be/publications>

3. Paper, D.A. (2020) *How climate change contributed to the Australian bushfires, Double A Paper Supplier*. Available at: <https://us.doubleapaper.com/home/climate-change-australian-bushfires/>

Data Sources

CO2 Emissions:

- <https://www.kaggle.com/datasets/kkhandekar/co2-emissions-1960-2018>

US Billion Dollar Disasters:

- <https://www.kaggle.com/datasets/michaelbryantds/billiondollar-disasters>

Our World In Data Natural Disasters and CO2 Emissions:

- <https://ourworldindata.org/natural-disasters>

CO2 Emissions 2021

- <https://ourworldindata.org/grapher/co-emissions-per-capita>

World map GeoJSON files:

- [Country Polygons as GeoJSON - Dataset - DataHub - Frictionless Data](#)