



Stringency, COVID, and Related Factors

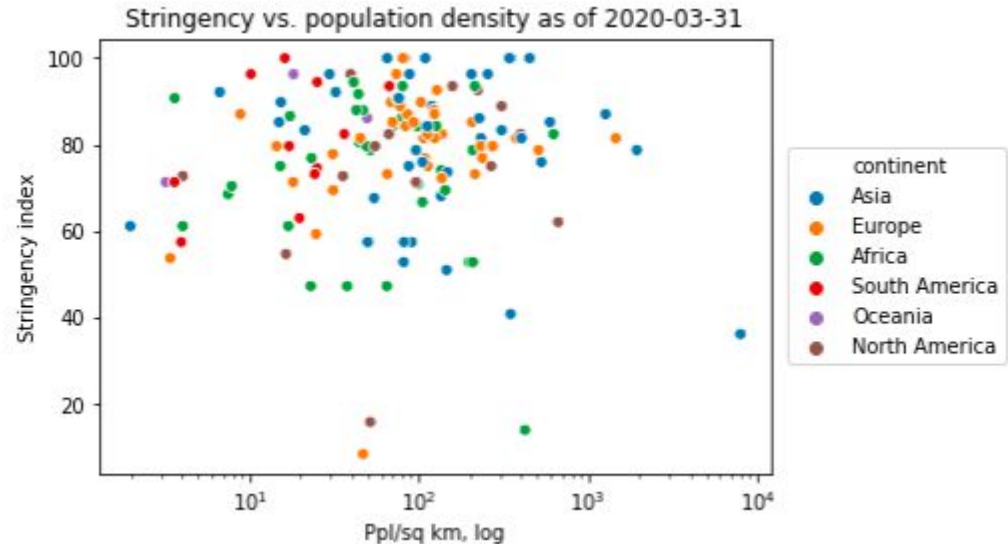
W200: Fall 2021, Benoit section

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In the beginning, we all stayed home...

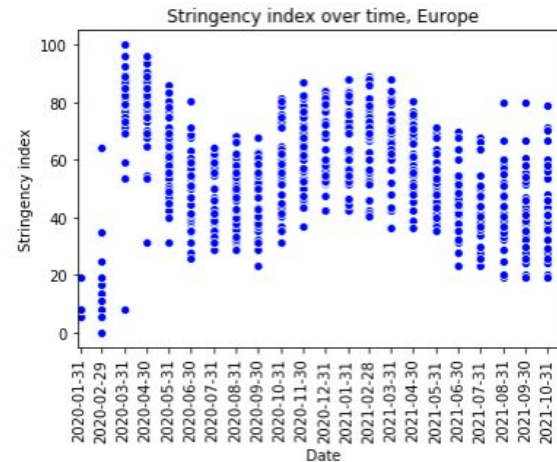
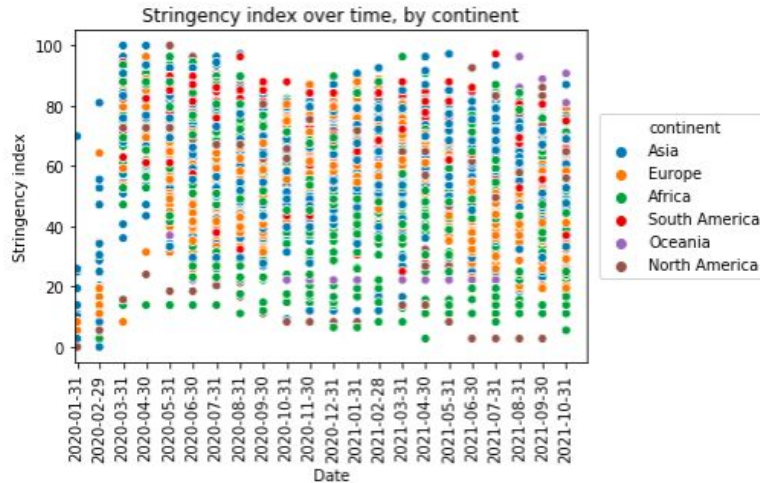
Lockdown stringency varied across the globe.

It also changed over time as the pandemic progressed.

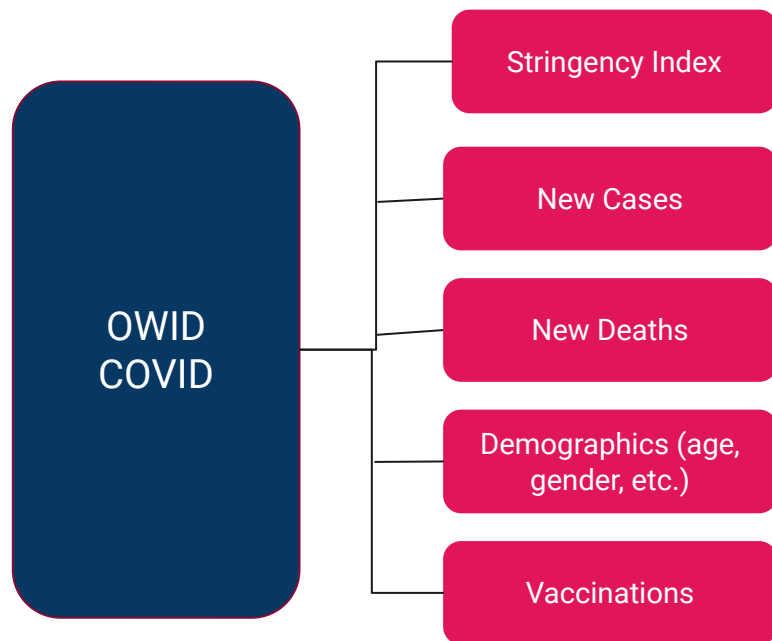


The Research Question

How did stringency vary across countries over time, and did it exhibit relationships with vaccination, COVID severity, and demographic factors?



Data



Our World in Data

Research and data to make progress against the world's largest problems

Metrics	Source	Updated	Countries
Vaccinations	Official data collated by the Our World in Data team	Daily	218
Tests & positivity	Official data collated by the Our World in Data team	Weekly	139
Hospital & ICU	Official data collated by the Our World in Data team	Weekly	39
Confirmed cases	JHU CSSE COVID-19 Data	Daily	196
Confirmed deaths	JHU CSSE COVID-19 Data	Daily	196
Reproduction rate	Arroyo-Marioli F, Bullano F, Kucinskas S, Rondón-Moreno C	Daily	185
Policy responses	Oxford COVID-19 Government Response Tracker	Daily	186
Other variables of interest	International organizations (UN, World Bank, OECD, IHME...)	Fixed	241

Data Cleaning

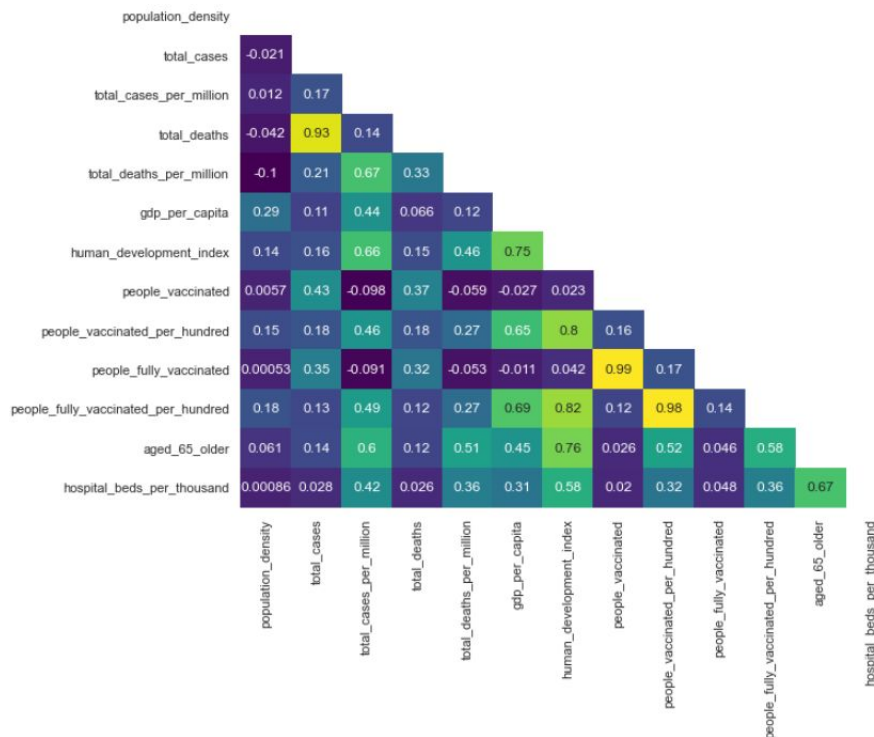
We went through a series of data cleaning steps to preserve meaningful data without dramatically reducing our dataset size.



Data Exploration

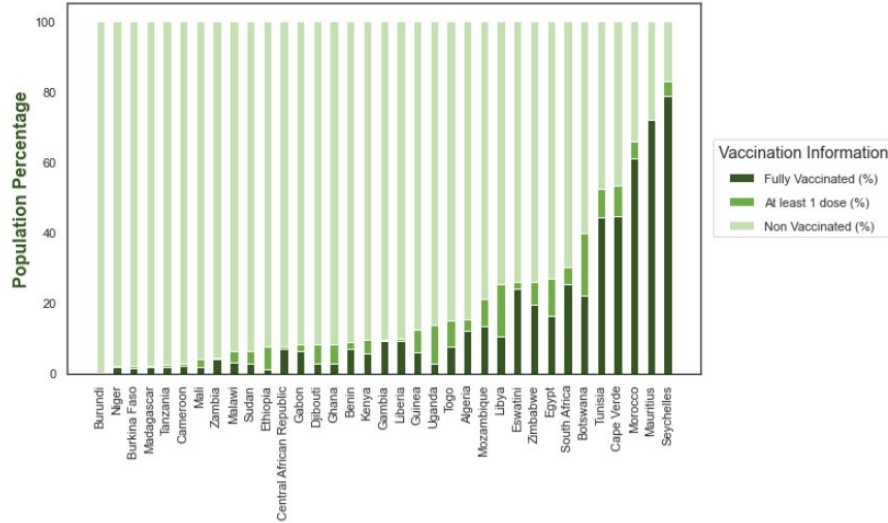
We created different grouping methods: by country, by specific dates (month endings), by continent and later by stringency group.

By doing this we were able to see that there were also high correlations between variables other than stringency, our main variable of interest.

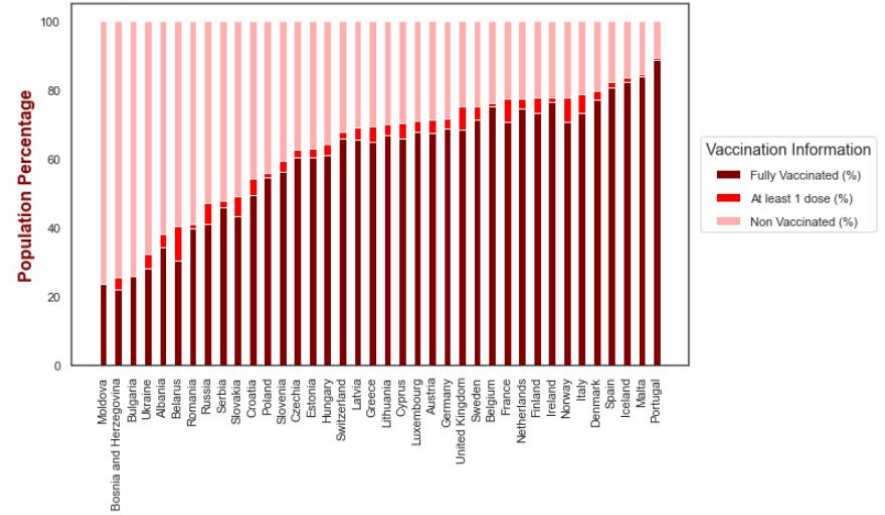


Data Exploration

Africa - Vaccination Information

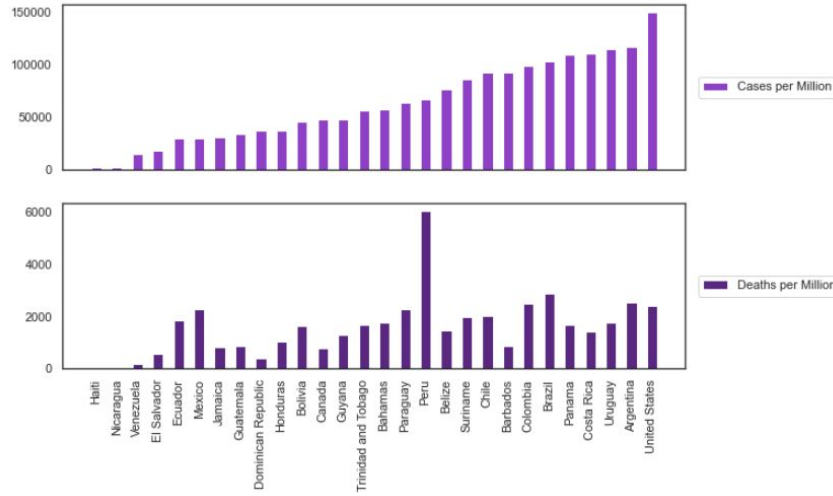


Europe - Vaccination Information

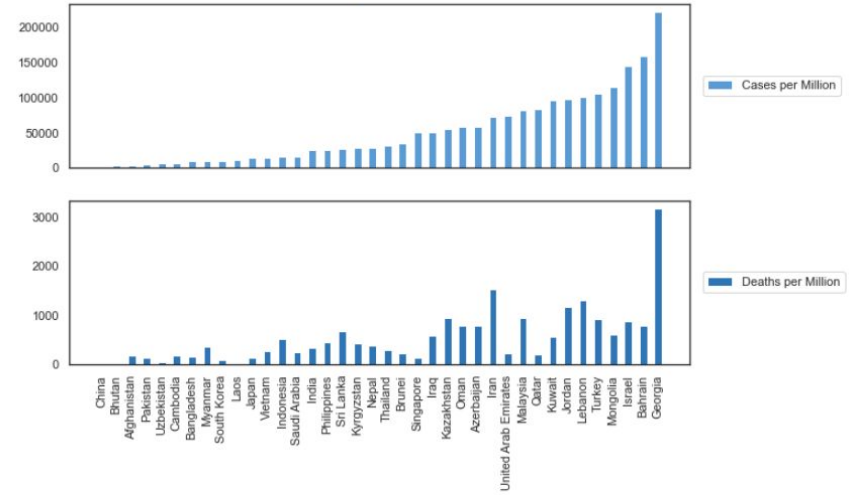


Data Exploration

America - Cases & Deaths per million



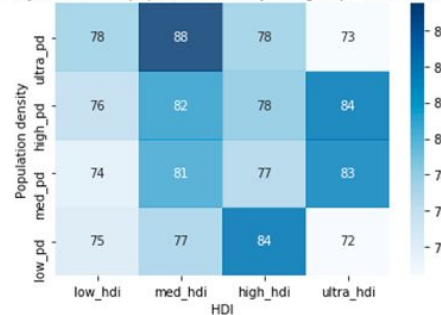
Asia - Cases & Deaths per million



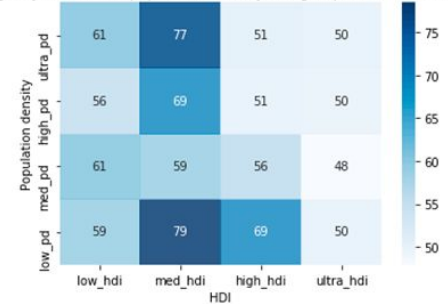
Population Density and HDI

- Population density itself did not exhibit strong relationship with stringency
- Human development index showed pattern with stringency
- More developed countries had more flexibility
- Least developed countries generally were quite lax

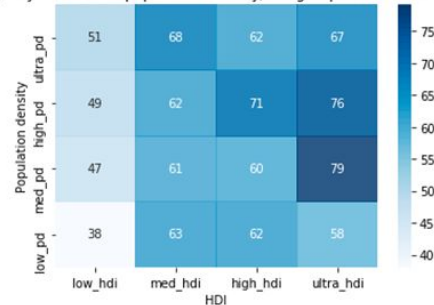
Stringency in different population density/HDI groups as of 2020-03-31



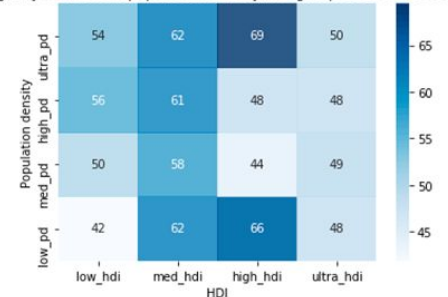
Stringency in different population density/HDI groups as of 2020-08-31



Stringency in different population density/HDI groups as of 2021-01-31

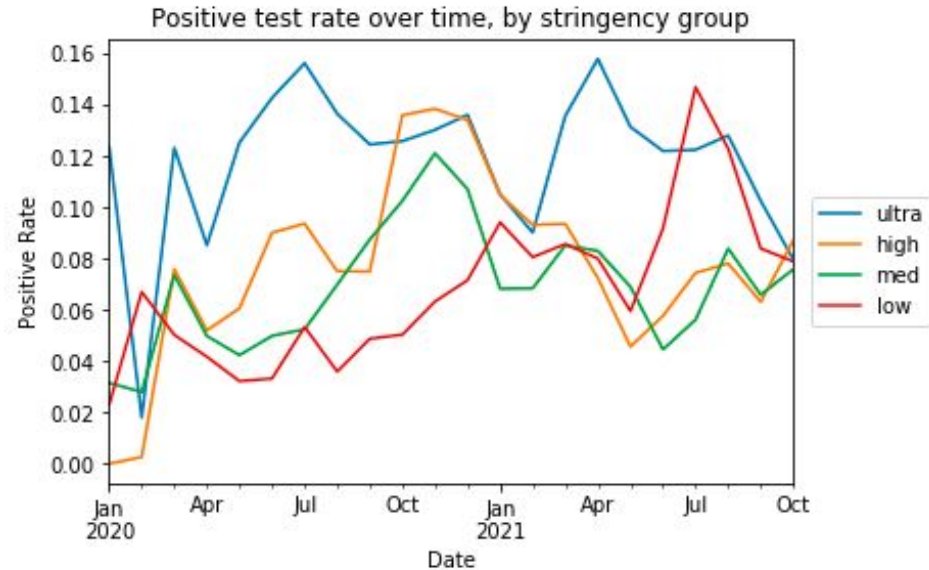


Stringency in different population density/HDI groups as of 2021-06-30



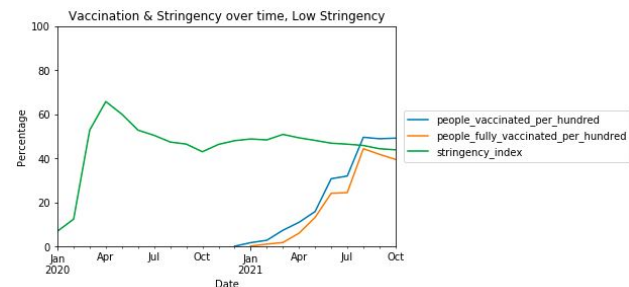
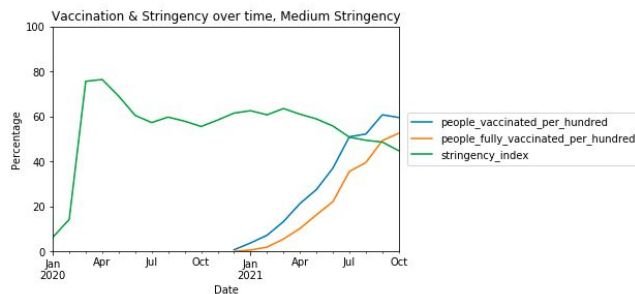
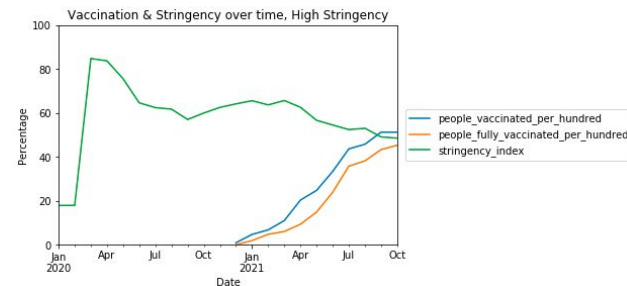
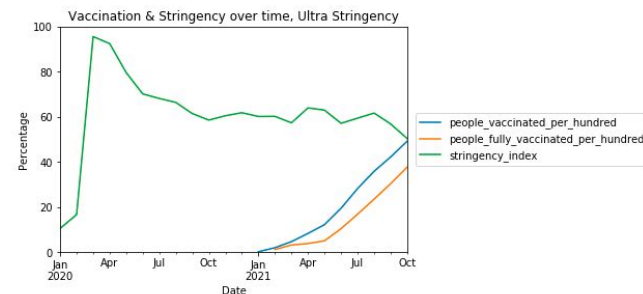
Positive Test Rate

- Positive test rate measures the share of COVID tests that are positive
- Regardless of initial stringency level, positive test rate seem to converge by Oct 2021
- However, countries did not remain in same stringency level overtime, so cannot draw conclusions



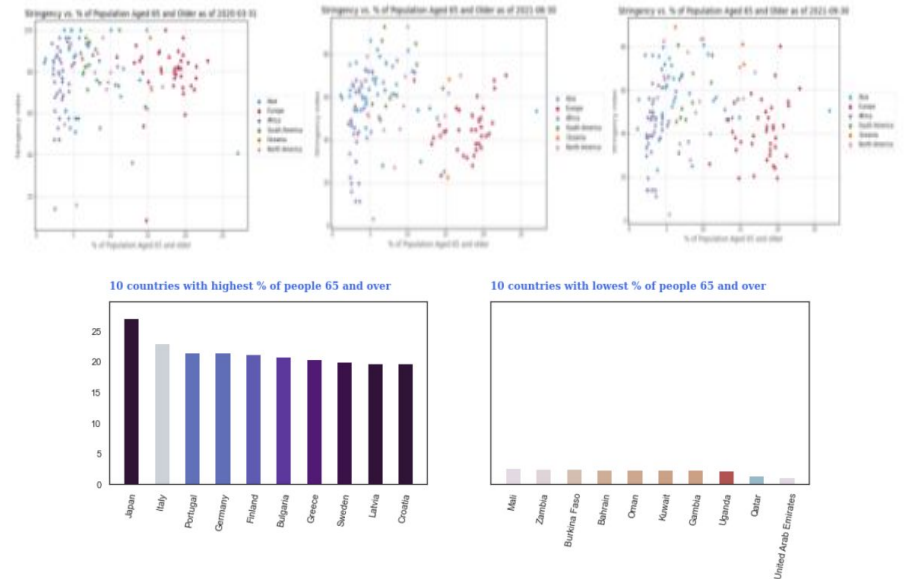
Vaccinations

- As vaccination rose, generally stringency relaxed
- Trends seemed to converge despite different initial stringency policy
- However, largest relaxation seem to occur prior to vaccinations



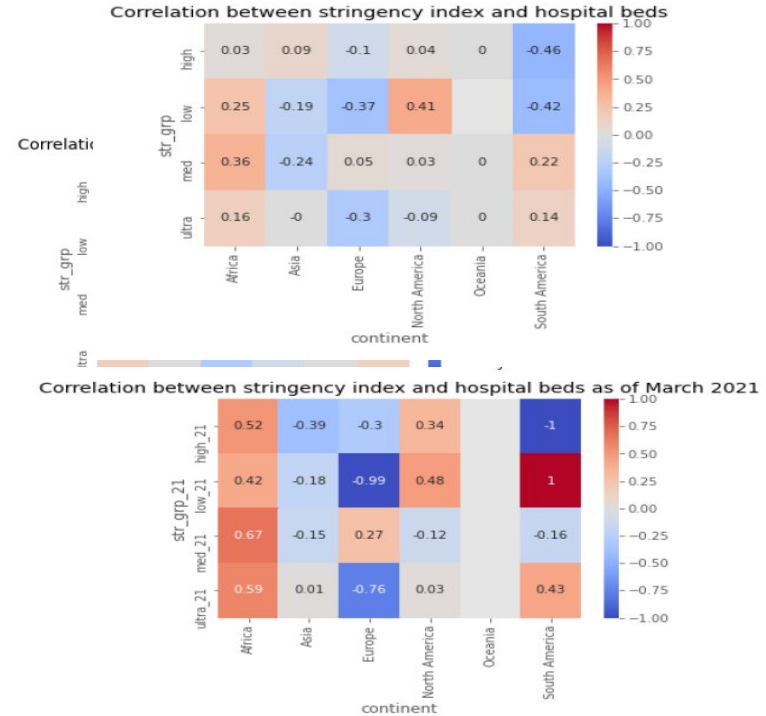
Population ages 65 and above

- Overall, Europe has the oldest population of any region, followed by Northern America and wealthy countries in Asia, while Africa has by far the youngest
- Initial stringency policy for countries with high and medium percentage of population 65 and older were about the same, while Africa had more relaxed policies in place
- Stringency relaxed in Europe and North America as the elderly population has been vaccinated



Hospital Beds

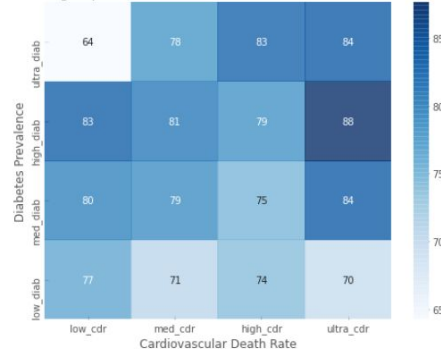
- At the beginning of the pandemic, there was no strong correlation between hospital beds and stringency index, as many countries adopted strict lockdowns
- In March 2021, we see a strong correlation between the stringency index vs. the number of hospital beds in Europe and South America



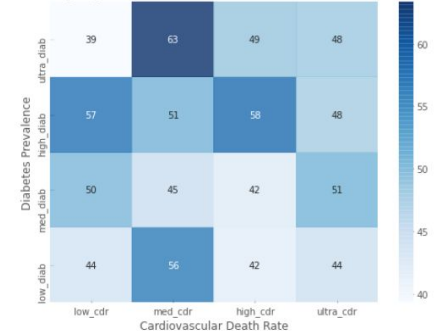
Cardiovascular death rate and diabetes prevalence

- The countries with a high percentage of patients with diabetes implemented strict lockdowns at the beginning of the pandemic
- Over time, generally stringency relaxed

Stringency in different groups with Diabetes and Cardiovascular diseases as of 2020-03-31



Stringency in different groups with Diabetes and Cardiovascular diseases as of 2021-09-30



Conclusion

Stringency varied across all the countries and changed over time without correlating with any particular variable.

Our study could build a foundation for studies on the effectiveness of lockdown as a strategy for future pandemic policy.

