COVID-19: Countries Wealth, Cases, Deaths and Vaccines 

This blog post is part of the Udacity Data Scientist Nanodegree Program. Code and further analysis can be found in my GitHub Repository or in my Kaggle profile.

Motivation

During the Covid-19 outbreak, lots of amazing dashboards were released - loved them all!

However, I was particularly curious about how the wealth of a country affects the main indicators like the number of cases, deaths and vaccines.

Hope this post helps you gain some insight on that as well!

Dataset

The data used is open source facilitated by the team of Our World in Data. Special thanks to them!

Questions

To begin with, I will state 3 main questions I will try to reply in this blog post:

1. Do Wealthy countries have less cases?
2. Do Wealthy countries have less deaths?
3. Do Wealthy countries have more vaccines? Did they have them earlier?

Hands-on

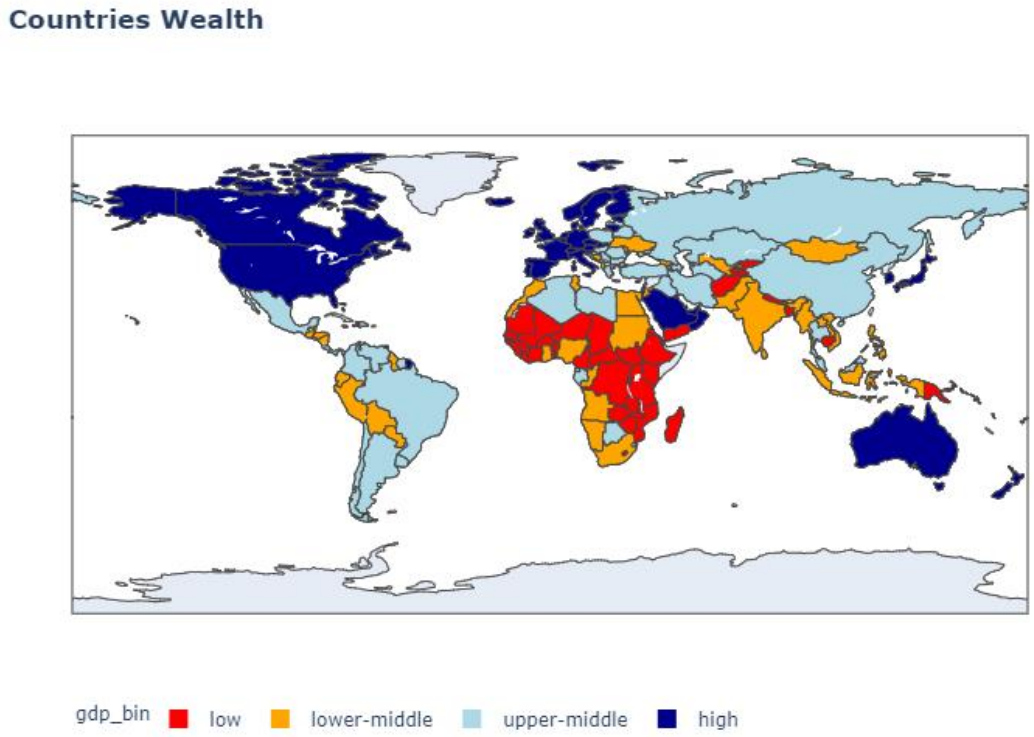
First, we should agree on what do we understand for the wealth of a country. For the purpose of this post, we will use the GDP per capita as a measure for the wealth of a country. The higher the GDP per capita of a country, the wealthier the country.

Additionally, in order to perform a visually straight-forward analysis, we bucketize the GDP per capita for each country into 4 different categories as follows:

1. Low

2. Lower-middle
3. Upper-middle
4. High

The boundaries for each category are defined by the quantiles, hence the *Low* bucket will have the 25% of the countries with the lowest GDP per capita. To make it simpler, we have the list of the countries, we sort it by GDP per capita ascending and the first 25% of the countries will belong to the Low bucket, the second 25% will belong to the *Lower-middle* and so on.

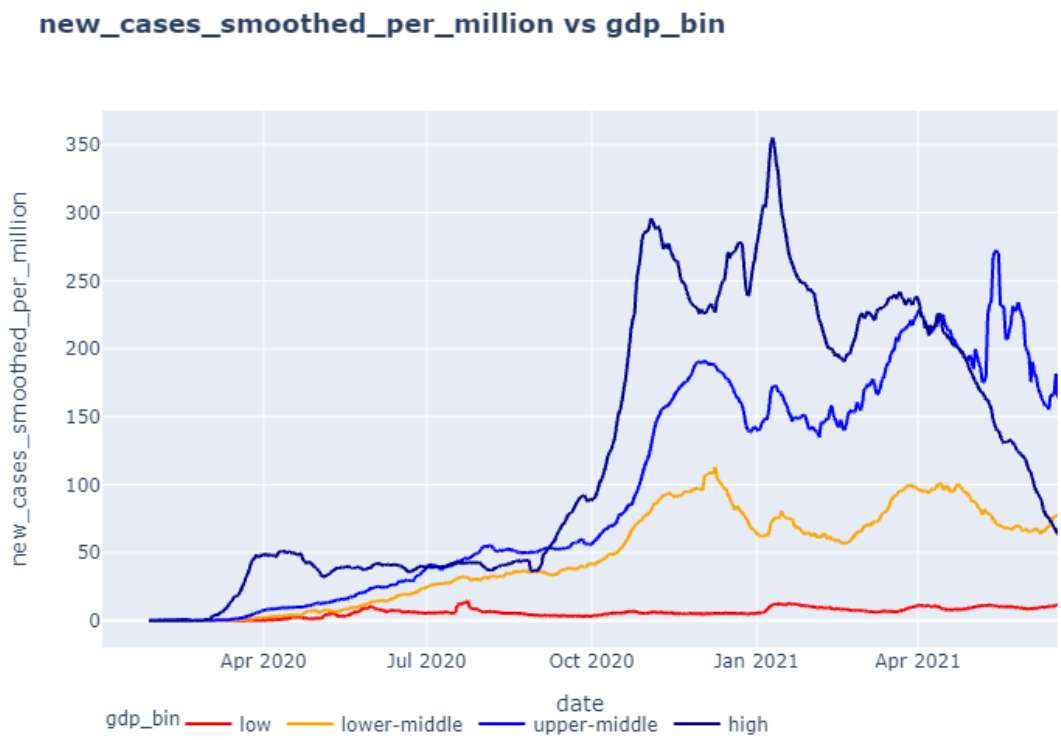


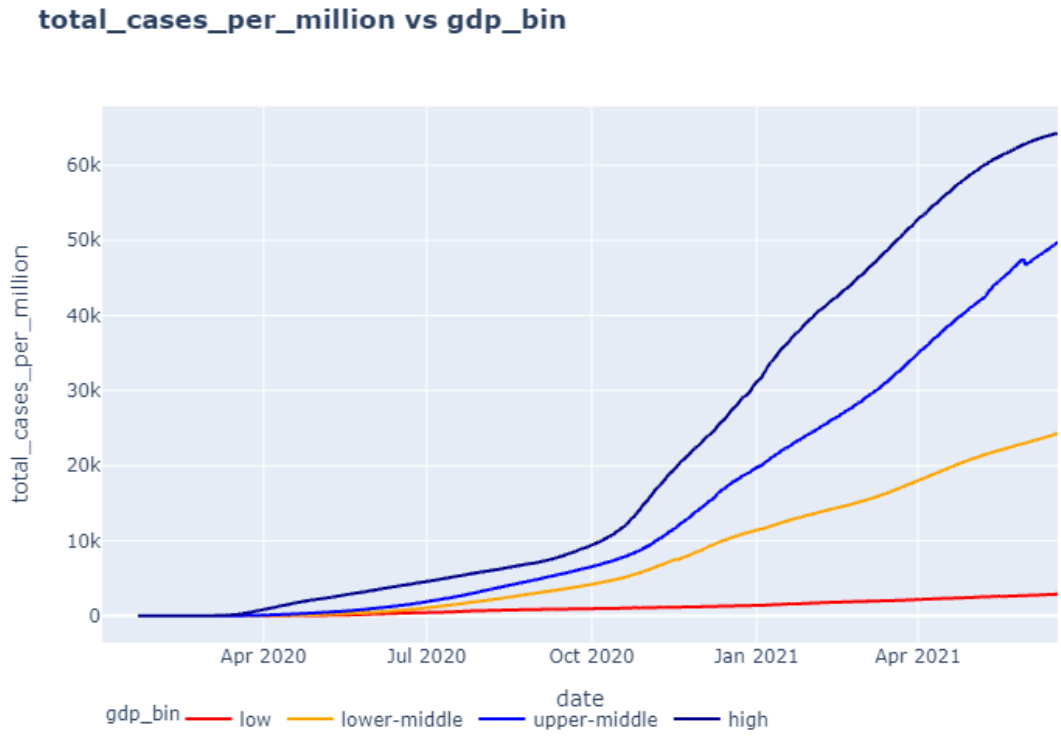
If you're are interested in knowing which country belongs to each bucket, please direct to the notebook.

Now that we have defined the buckets, let's try to reply the questions.

I will plot 2 graphs for each of the questions. They will show the evolution of Cases, Deaths and Vaccinations in time. The first plot of each, will show the new cases/deaths/vaccinations, while the second one will show the accumulated figures. For all of them, 4 lines will be plotted, one per bucket, calculating their values as the mean of each of the recorded countries belonging to that category. Parallelly, all of them will be pondered by the population of the country, avoiding bias in cases of very large/small countries.

1. Do Wealthy countries have less cases?

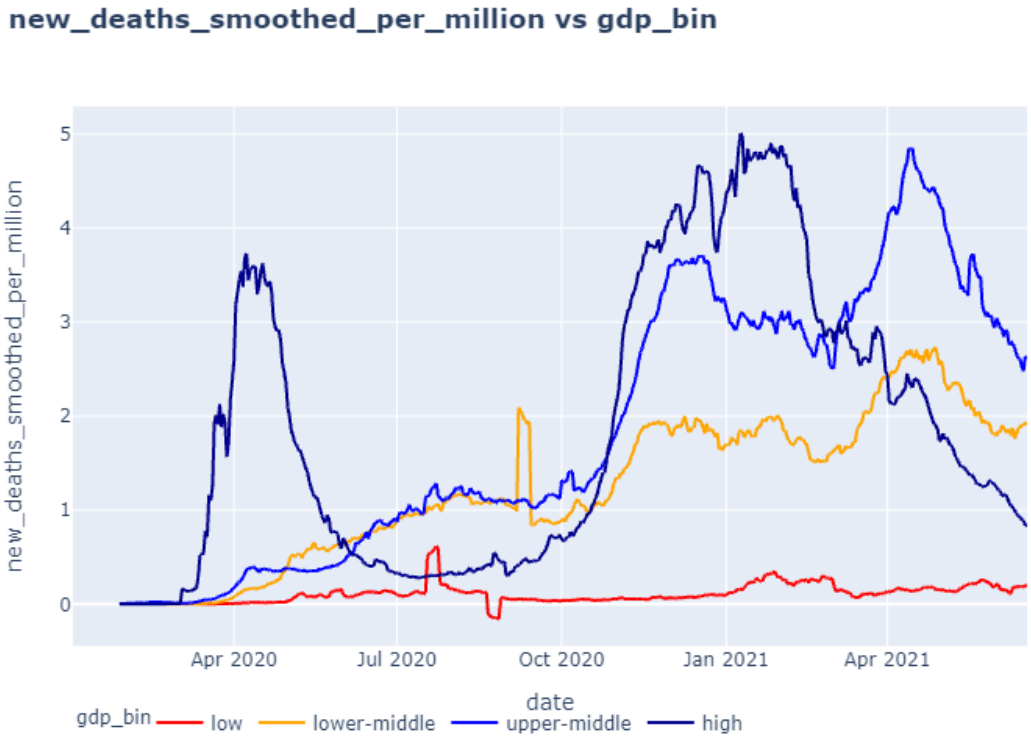


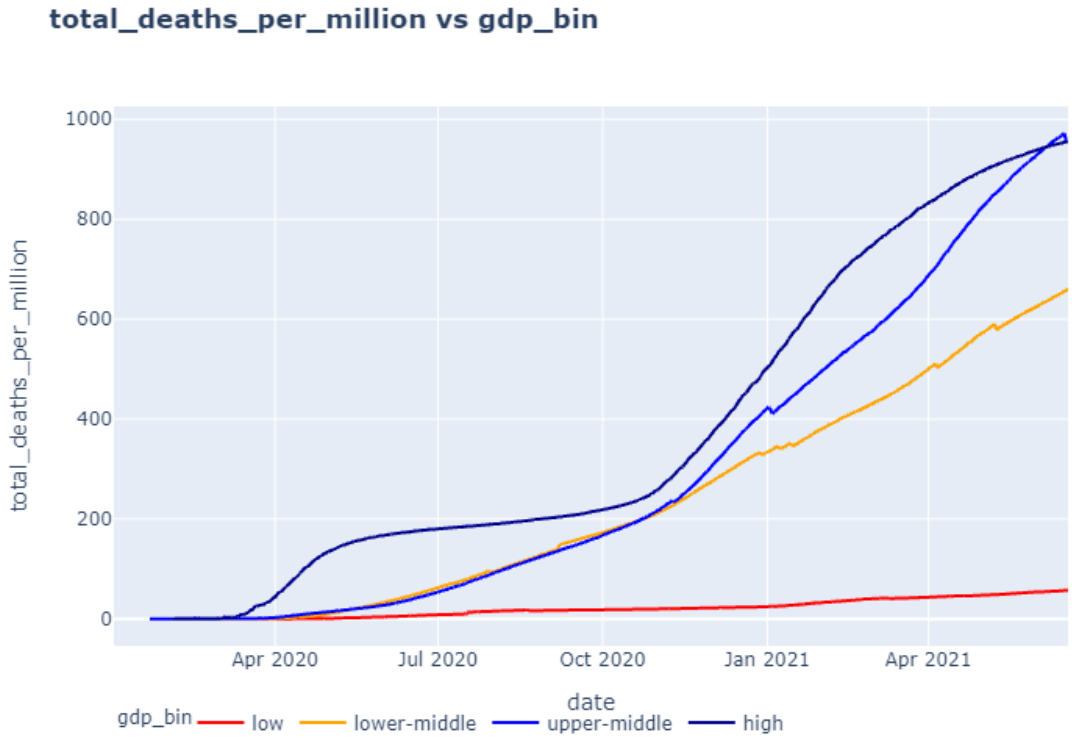


From the above two plots, we can see that the wealthier the country, the earlier it reported Covid19 cases. We can also see that around May2021, there is a drastic reduction on the high-income

countries, possible due to the vaccines. From the second chart, we can see that the high-income countries show more quantity of population tested positive.

2. Do Wealthy countries have less deaths?

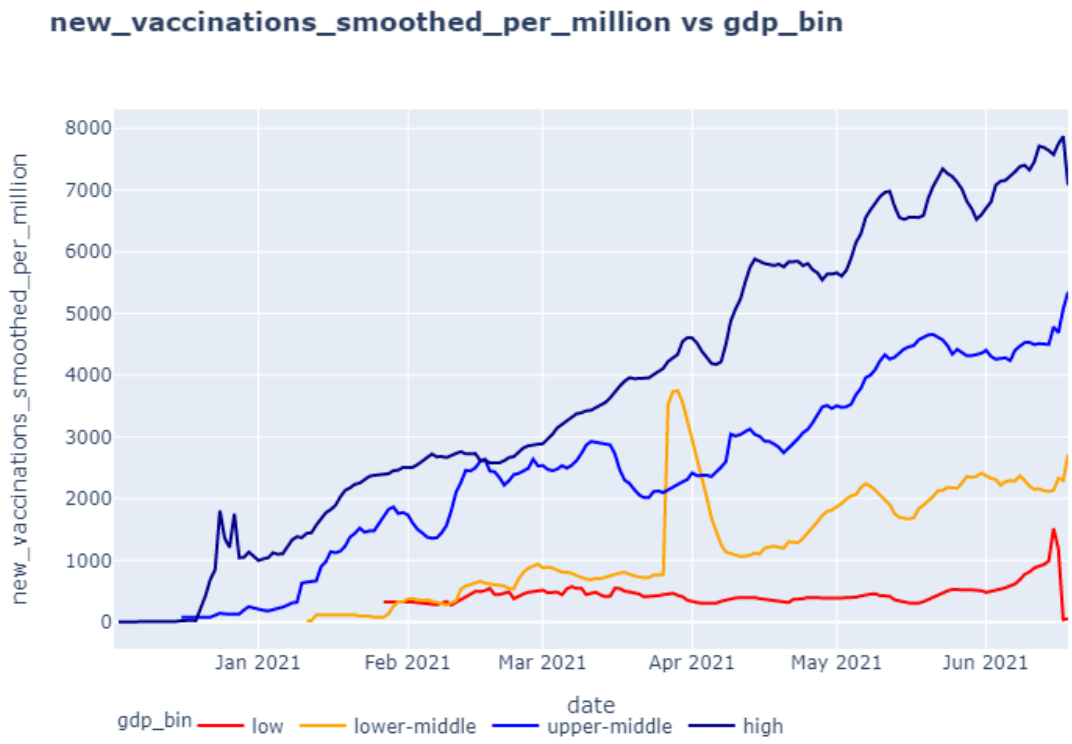


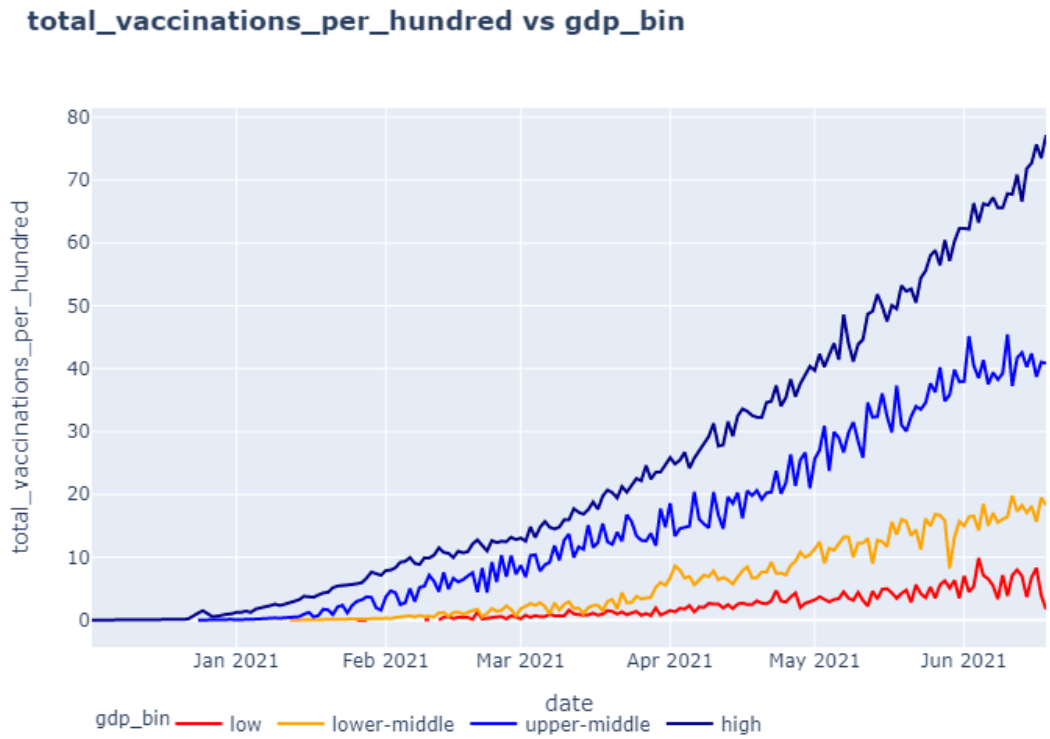


When it comes to deaths, we can see a big and early spike for high-income countries with a drastically reduction around July2020. Again, in January2021 they presented more deaths than other lower income countries.

Something that caught my attention in the two plots, is the significantly lower deaths in the lowest income countries. A possible explanation could be that the figures do not reflect what actually happened / is happening in reality.

3. Do Wealthy countries have more vaccines? Did they have them earlier?





For vaccinations, we can see again higher numbers for high-income countries. It is not only clear that they are having more vaccines than the lower groups, but also that they started to have them earlier. This may be attributable, among other causes, to the fact that some high-income countries were the firsts ones to develop the vaccine (prioritizing their own population), or also that these countries were able to pay higher prices in order to get the shots sooner.

Conclusion

To sum up, wealthier countries reported a higher number of cases, deaths and vaccines. Furthermore, the wealthier the country, the earlier the vaccination processes started.

Disclaimer

Even though the Our World in Data team made a fantastic job gathering and wrangling the data, the conclusions could not reflect the reality due to countries measuring/reporting in different ways, applying different tests criteria's, etc.

Documentation and Further investigation

Code for this research is open source, you can find it in my GitHub Repository or in my Kaggle profile. You may also find additional visualizations and conclusions. Kindly note that this is an ongoing project and data is live, so some modifications/improvements may occur.

Thanks for reading!