COVID-19
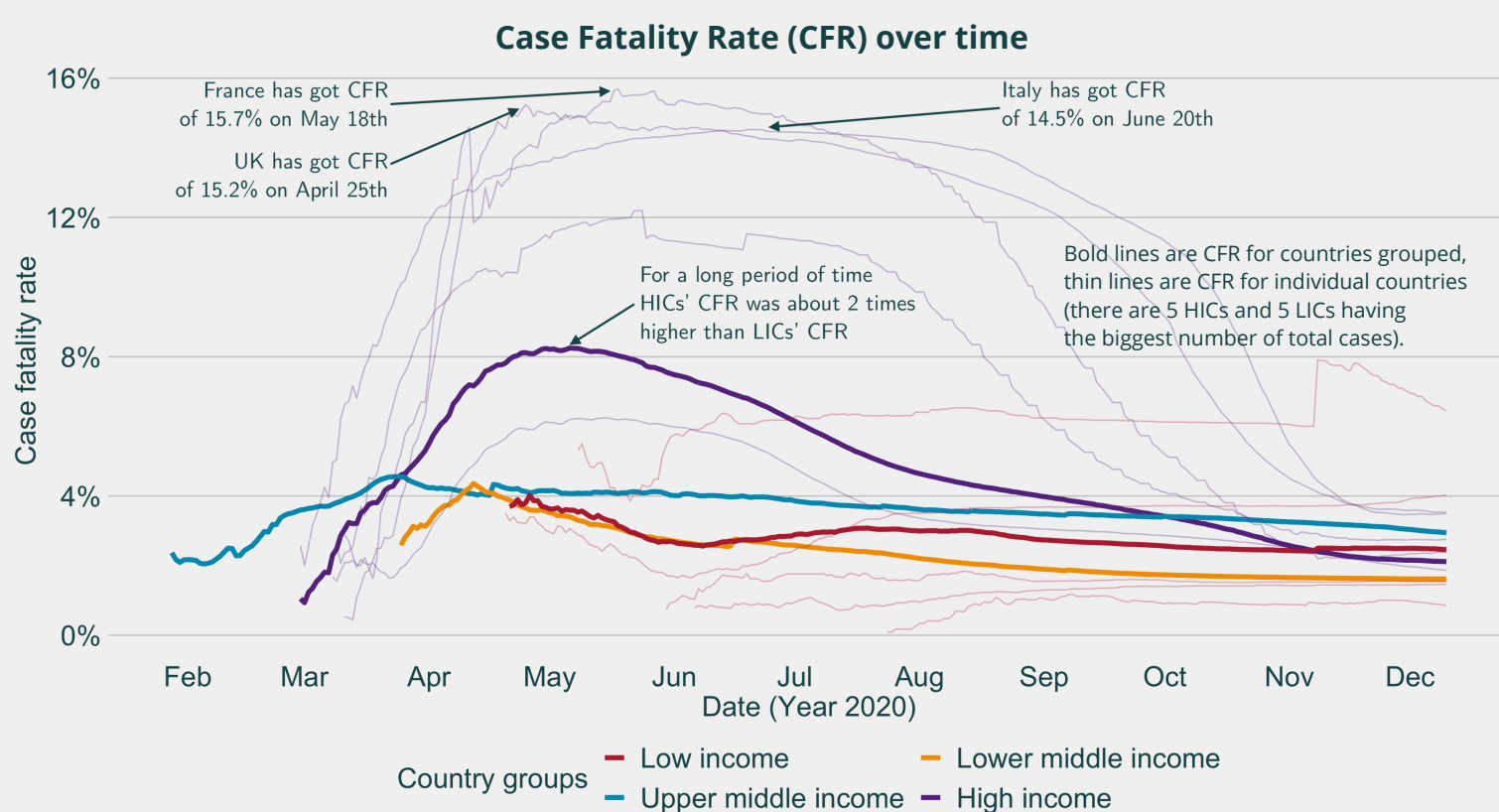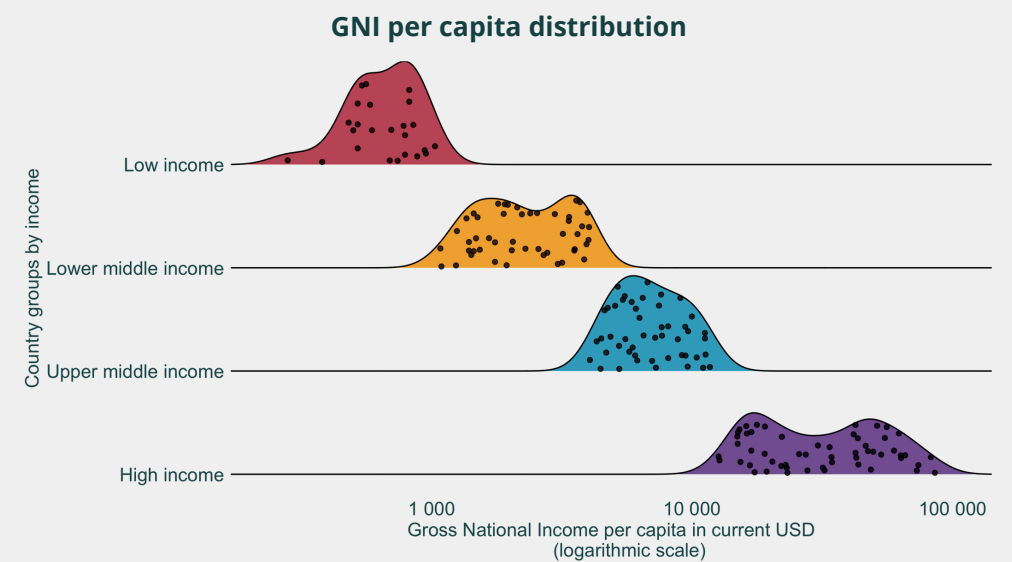
THE PANDEMIC IN RICH AND POOR COUNTRIES

Sources

- COVID-19 database - Our World in Data's project which attempts to aggregate global daily data relevant to the COVID-19 pandemic and its effects, including metrics from "number of deaths" or "number of tests" to "stringency of lockdown measures" or "number of female smokers",
- Countries classification by income - The World Bank,
- GNI per capita in 2019 - The World Bank,
- Annual percent change of GDP - The International Monetary Fund.

What are "rich" and "poor" countries?

The World Bank classifies the world's economies into four groups:
- low income countries (**LIC**s),
- lower-middle income countries (**LMIC**s),
- upper-middle income countries (**UPIC**s),
- high-income income countries (**HIC**s).

The classifications are updated each year and are based on GNI (Gross National Income) per capita in current USD of the previous year (in this case - 2019).

GNI per capita distribution

Case Fatality Rate (CFR) over time

France has got CFR of 15.7% on May 18th

UK has got CFR of 15.2% on April 25th

Italy has got CFR of 14.5% on June 20th

For a long period of time HICs' CFR was about 2 times higher than LICs' CFR

Bold lines are CFR for countries grouped, thin lines are CFR for individual countries (there are 5 HICs and 5 LICs having the biggest number of total cases).

Country groups: Low income — Lower middle income — Upper middle income — High income

Case fatality rate

Compared to lower income countries, **HIC**s have had much greater **CFR**. This might be attributed to overflowing hospitals, as a lot of **HIC**s have been more affected by the virus probably due to a greater flow of people.
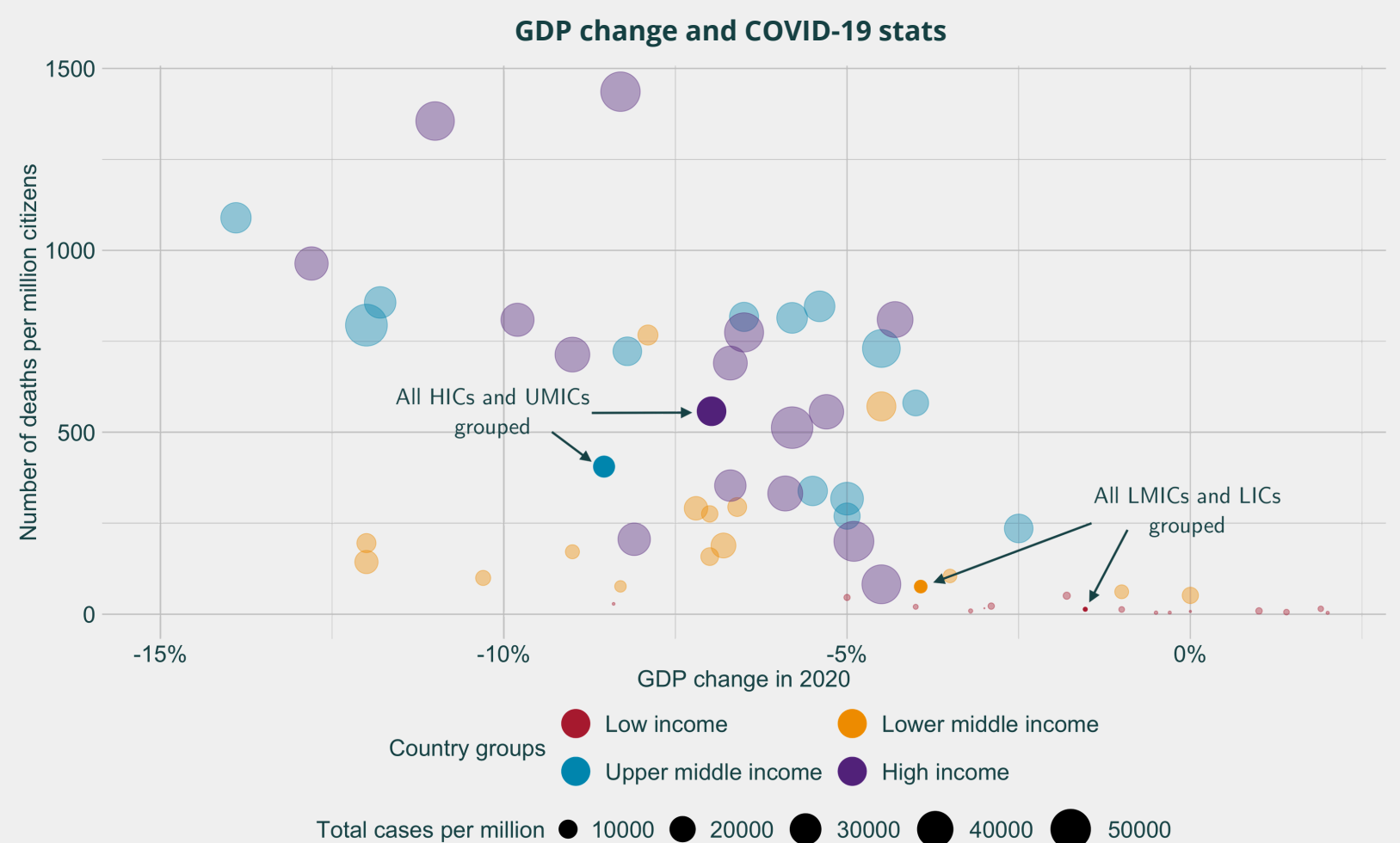
Additionally, **LIC**s and **LMIC**s often being rural and not as intraconnected, have had lower infection rates, which flattened the curve for them.

Sadly, the data might not represent the actual situation in **LIC**s and **LMIC**s countries accurately, as those countries might not have tested their patients for the virus and might have just recorded virus-related deaths as regular deaths in many cases.
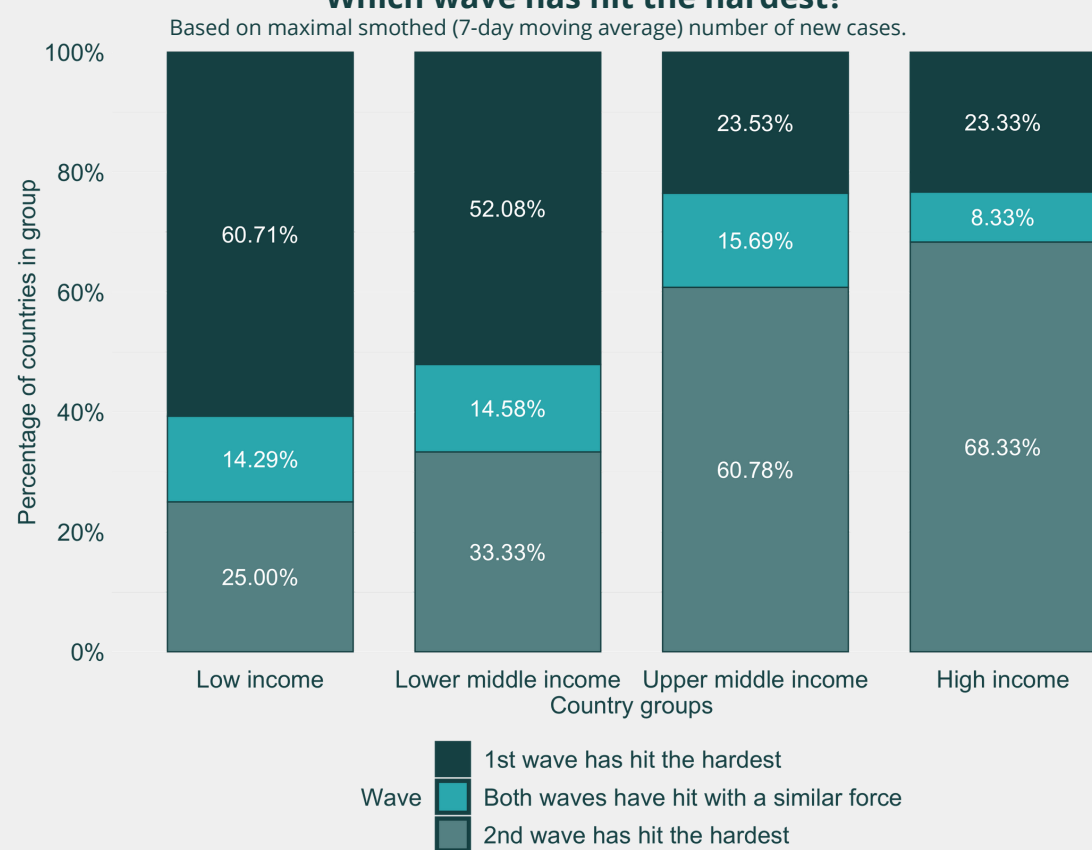
GDP change and COVID-19

As expected, the amount of deaths due to the virus appears correlated to the change in the GDP.

Due to **HIC**s and **UMIC**s getting affected the most, they have lost the most in GDP, but while not affected as hard by the virus, some **LMC**s have seen massive losses in their economies due to the reduced consumption of their exports in richer countries.

GDP change and COVID-19 stats

All HICs and UMICs grouped

All LMICs and LICs grouped

Country groups: Low income — Lower middle income — Upper middle income — High income

Total cases per million: 10000 20000 30000 40000 50000

Which wave has hit the hardest?

Based on maximal smothed (7-day moving average) number of new cases.

Wave:
- 1st wave has hit the hardest
- Both waves have hit with a similar force
- 2nd wave has hit the hardest

COVID-19 wave sizes comparison

Surprisingly, **HIC**s and **UMIC**s tended to be affected more by the second wave. This might be attributed to them getting affected more in general, or to the countries' residents getting too acustomed to the presence of the virus.

The swift response to the first wave might have caused some civil unrest in the better-off countries, which also could have contributed to the second wave hitting harder.

Faculty of Mathematics and Information Science
Warsaw University of Technology

Mateusz Krzyziński
Mateusz Ziemła
Mikołaj Spytek