Corona Analysis

Samuel Knapp - samuel.k@gmx.de

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Download data

Population data

Population data taken from wikipedia: https://en.wikipedia.org/wiki/List_of_countries_and_dependencies_by_population. Most numbers are from national or UN annual projections.

Projection range of population data:

```
## [1] "2015-10-15"
```

```
## [1] "2020-07-01"
```

Covid-19 data

Data were downloaded from the github repository of the Johns Hopkins University. These are the same data, from which the famous GIS world map is created. See: https://github.com/CSSEGISandData/COVID-19.

Newest date

```
## [1] "2020-06-07"
```

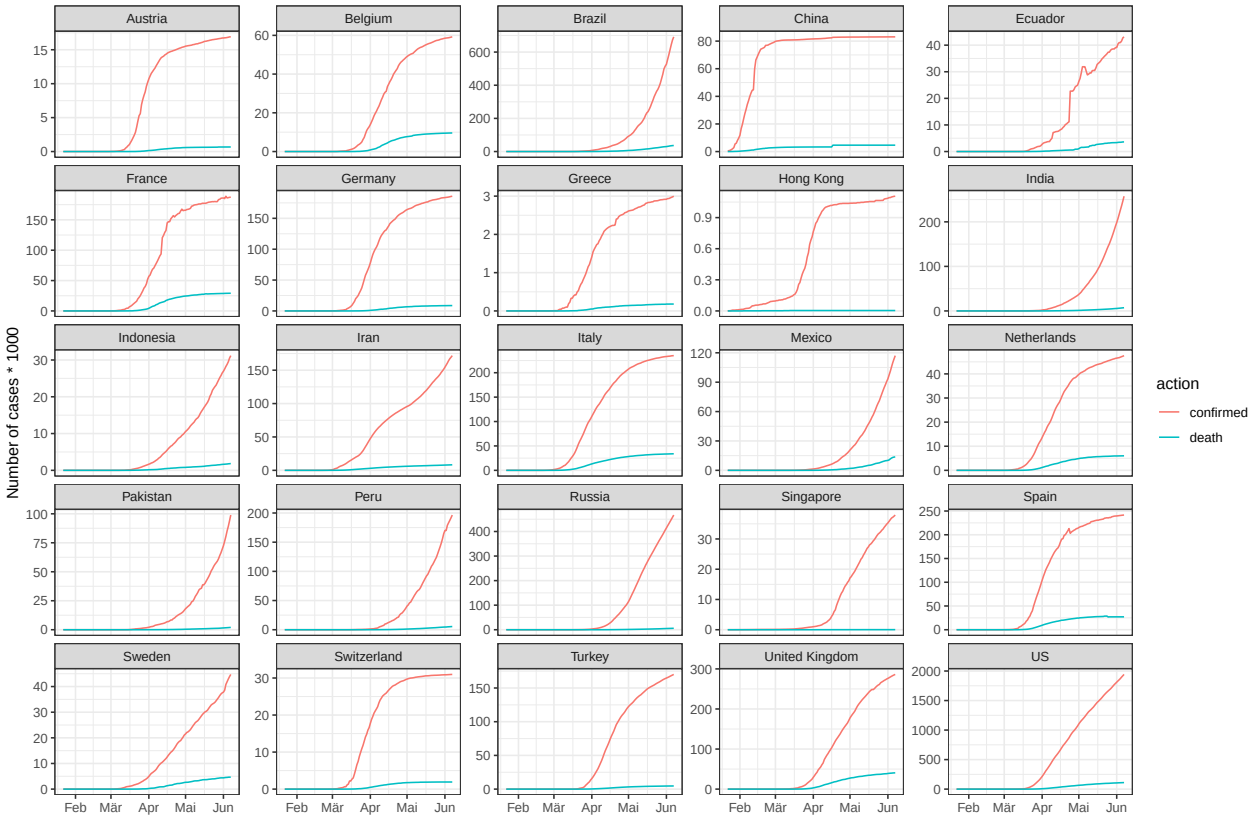
Selected countries

The following countries were set to be included: Germany, Switzerland, Hong Kong, Singapore, Sweden, Austria, Greece. Additionally, 18 countries with the highest number of confirmed cases were added.

Actual numbers

The number of confirmed and death cases for each day.

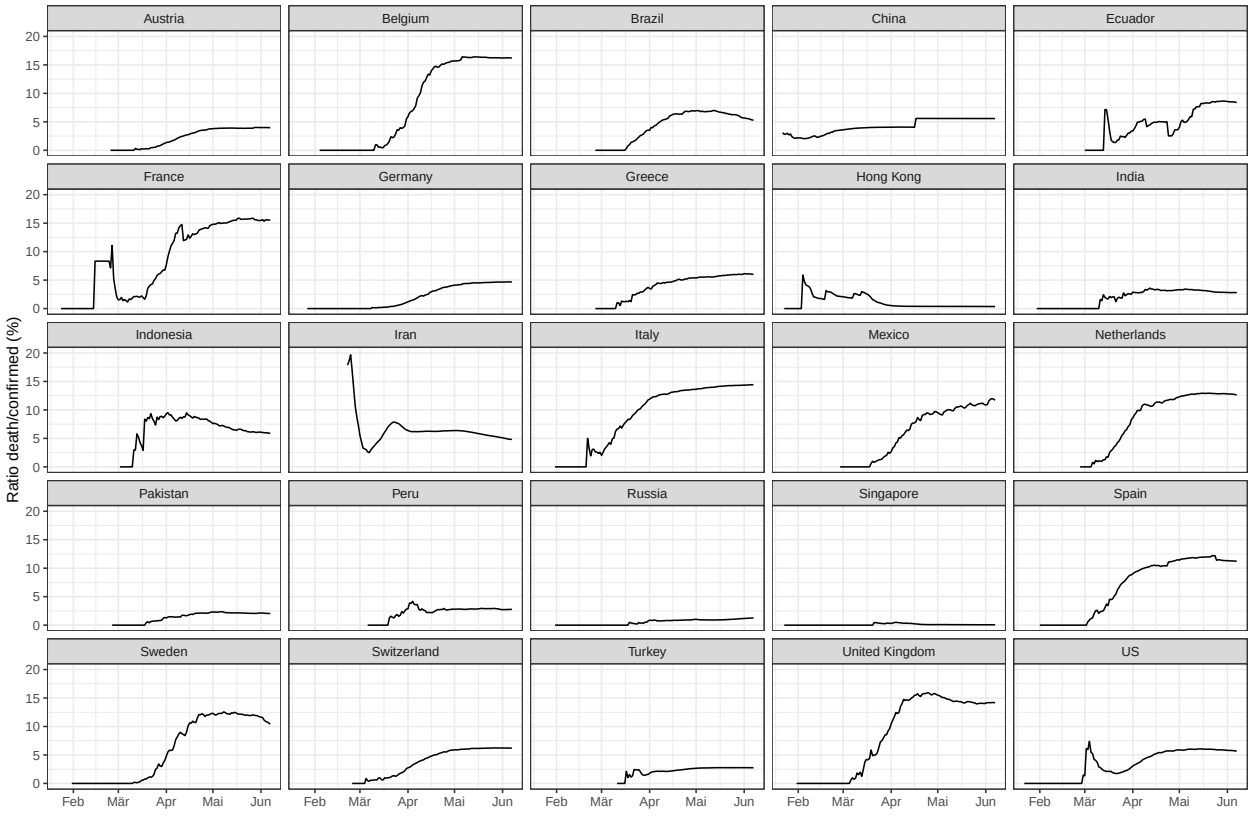
Hong Kong and Singapore both show two phases of linear growth. South Korea first had an exponential growth and then turned into linear growth.



Ratio of death to infected

Simply the ratio of reported deaths divided by number of confirmed cases for each day. Interesting to see that this ratio increases i most countries. A particularly sharp increase can be observed for countries that start to struggle: Italy, Spain, and Belgium. However, this calculation is probably too simple, as it does not take account of recovered cases.

Note, that in Italy last points are not in plot anymore.



New cases

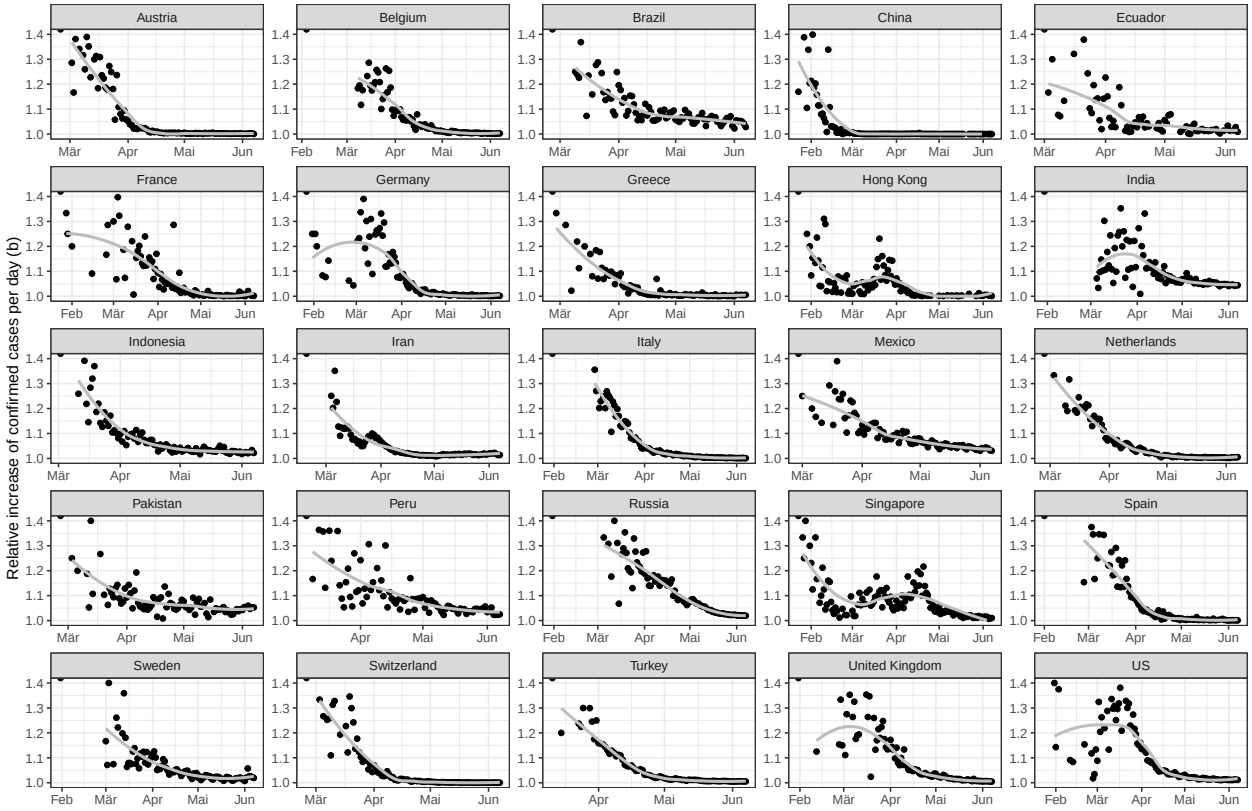
Simply the daily increase of confirmed cases.

Relative increase per day

A relative increase of e.g. b=1.2 indicates that the number of confirmed cases increases by 20% in one day, e.g. from 1000 to 1200. This number (b) can be related to the number of days needed for doubling the number of confirmed cases by $b^x = 2$, with x as the number of days. The following shows the relation of b to x. The sometimes mentioned aim of a doubling time of ten days thus corresponds to $b \approx 1.07$.

b	NumberOfDays
1.05	14.21
1.10	7.27
1.15	4.96
1.20	3.80
1.25	3.11
1.30	2.64
1.35	2.31
1.40	2.06

While the relative increase was at around $b \approx 1.3$ to $b \approx 1.4$ (meaning a doubling of confirmed cases every 2 to 2.6 days), this rate has dropped to around $b \approx 1.1$ in most countries. This might be most probably due to the imposed measures.



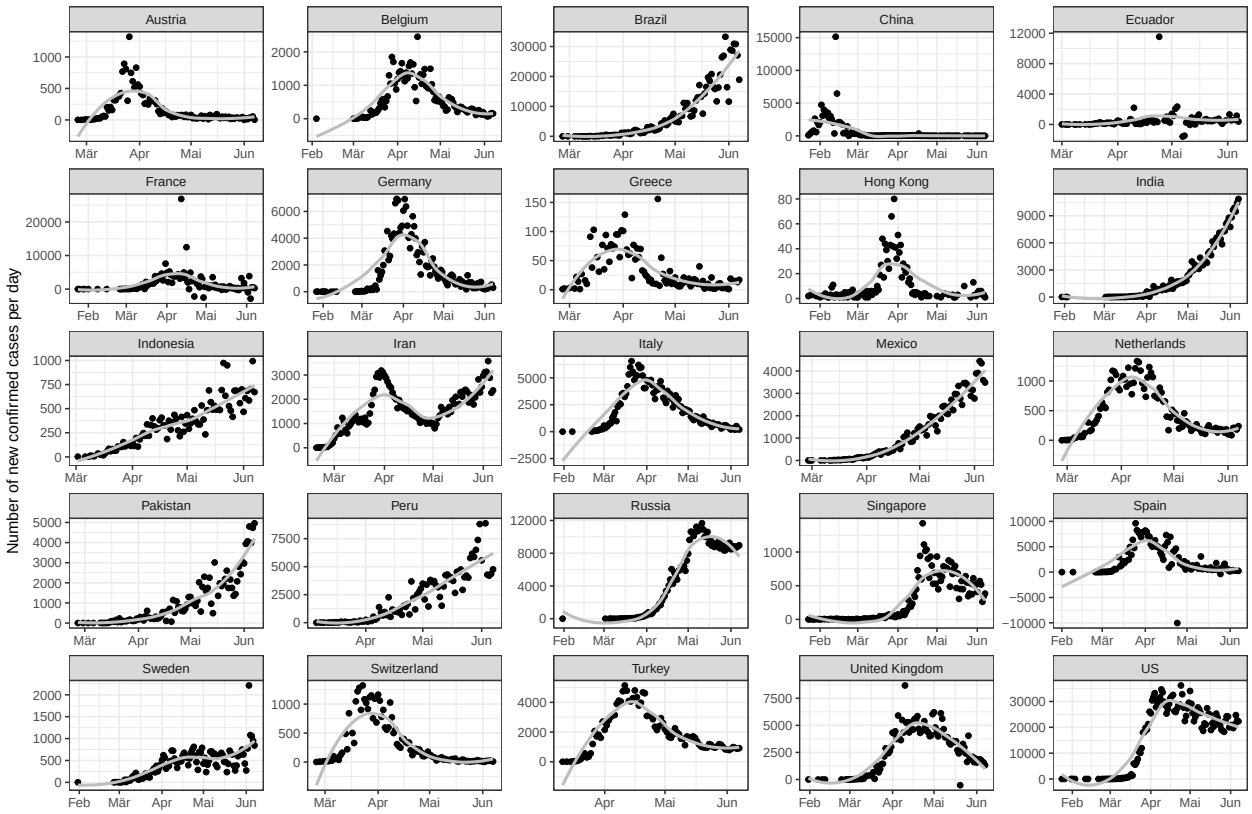
Absolute increase

Absolute numbers

For the capacity of the health systems, it is more important to look at the absolute numbers of new confirmed cases. The aim should be to get a constant number of new cases at a niveau which can be handled by the health system.

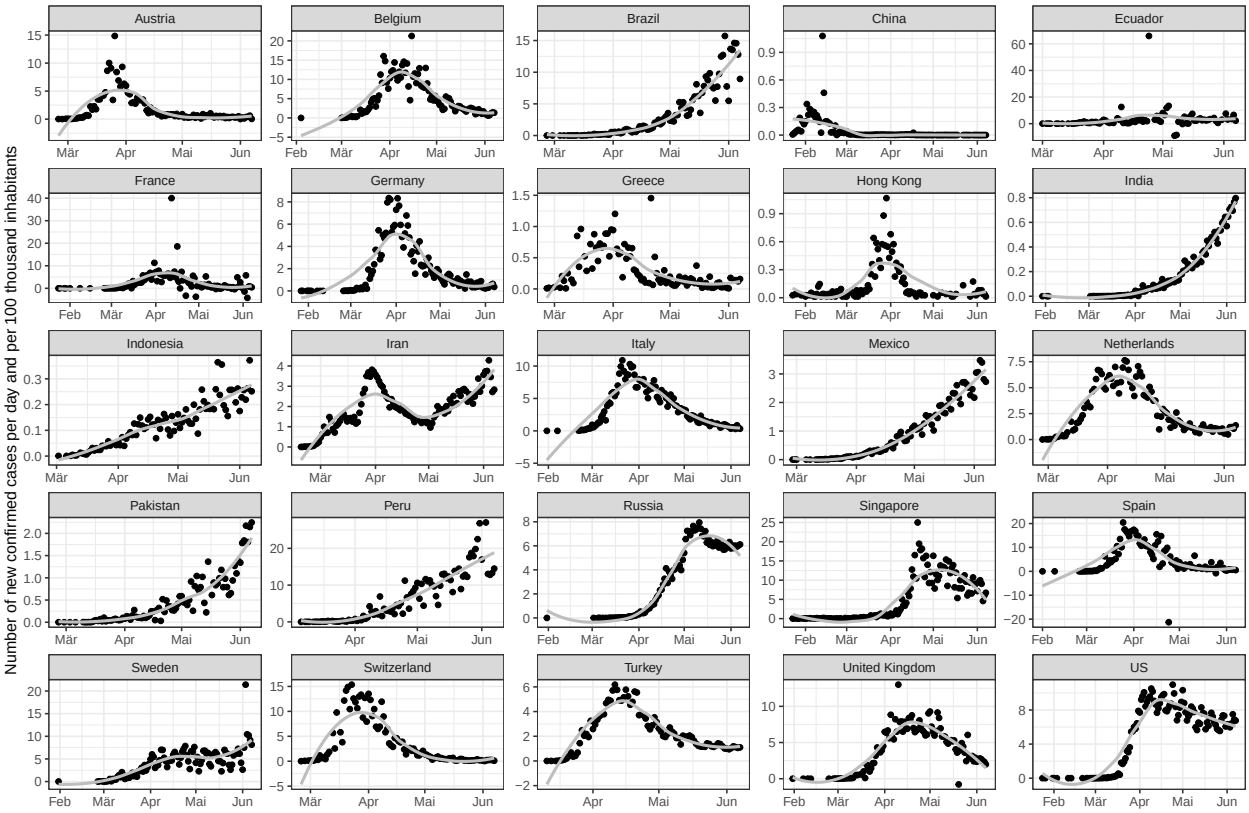
Austria and Switzerland have managed to drop the increase to a constant level. In many other countries (also Germany) the daily increases are still increasing.

In South Korea it can be nicely see how the exponential growth was lowered to a linear growth. This could/should be the aim...



As number per 100 thousand inhabitants

Relating the absolute number of new cases to the total population per country. All in similar range, but still different. Not sure about the interpretation.



Percentage of population

Number of confirmed cases (most recent day) divided by the total population.

country	RatioPercent
Qatar	2.461
San Marino	2.027
Andorra	1.099
Bahrain	0.957
Kuwait	0.721
Chile	0.702
Singapore	0.665
Luxembourg	0.645
Peru	0.599
US	0.589
Belarus	0.517
Belgium	0.513
Spain	0.513
Ireland	0.512
Maldives	0.508
Iceland	0.494
Armenia	0.444
Sweden	0.432
United Kingdom	0.428
United Arab Emirates	0.392
Djibouti	0.390
Italy	0.390
Panama	0.389
Oman	0.363
Moldova	0.362
Switzerland	0.360
Portugal	0.338
Brazil	0.327
Russia	0.318
Saudi Arabia	0.298
France	0.282
Netherlands	0.272
Monaco	0.260
Ecuador	0.246
Germany	0.223
Liechtenstein	0.212
Iran	0.206
Denmark	0.205
Turkey	0.205
Israel	0.194
Austria	0.190
Dominican Republic	0.189
Serbia	0.170
Norway	0.159
Estonia	0.146
North Macedonia	0.146
Gabon	0.143
Malta	0.127