

Report on mortality during COVID-19 pandemic

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I mostly followed the research published by Prof. Rob J. Hyndman on his website: <https://robjhyndman.com/hyndsight/forecasting-covid19/>. The main changes are:

1. Fixing minor bugs/typos
2. Updating the input data to the most recent
3. Plotting additional graphs
4. Extending number of plotted years to maximum available
5. Showing number of years plotted on the graph titles

The weekly mortality data is taken from the Human Mortality Database (<https://www.mortality.org/Public/STMF/Outputs/stmf.xlsx>) on the 7th of October 2020. The data on the website is lagging a few weeks but it is still rather current for this report.

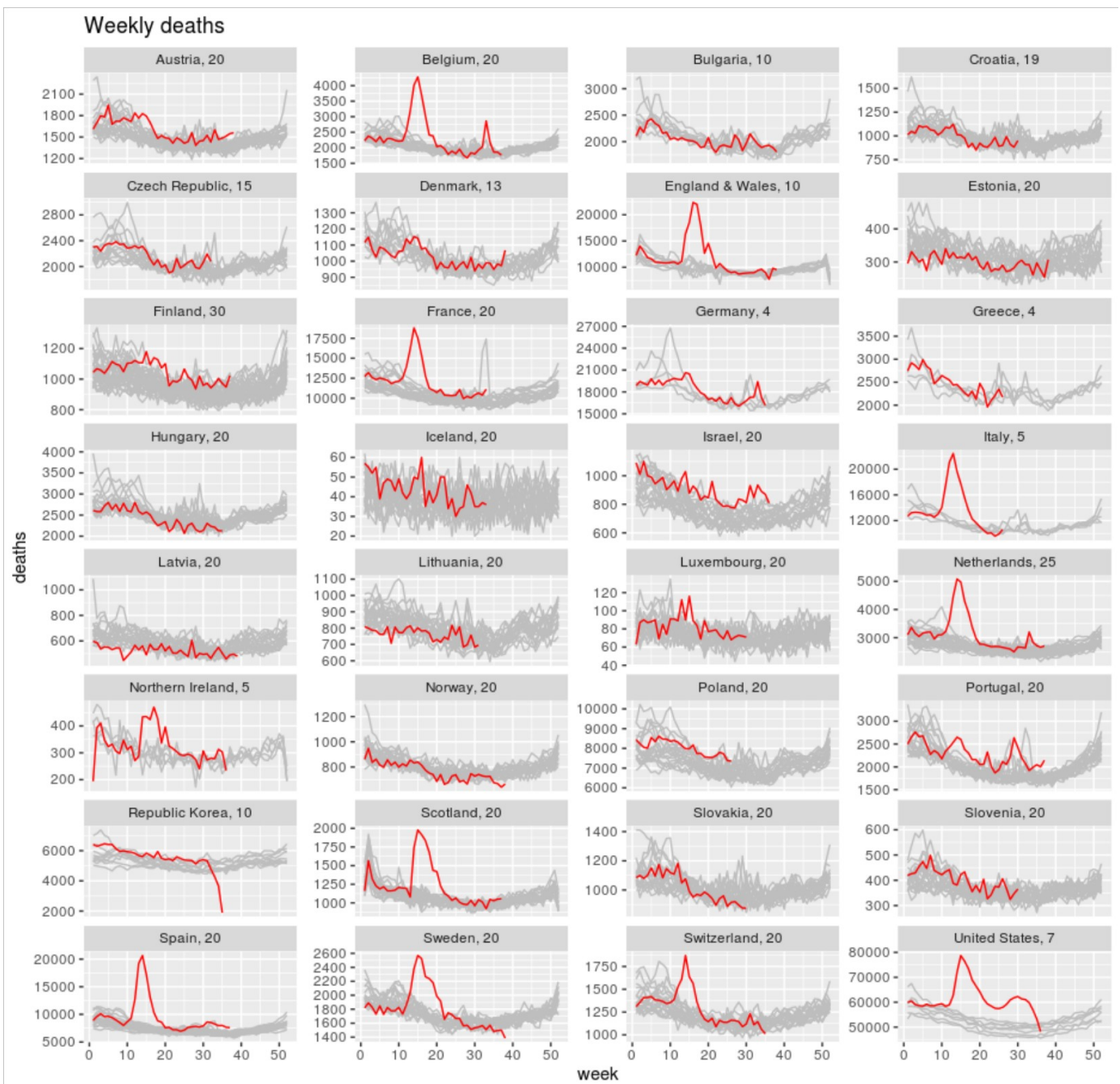
Cleaned data is plotted on the graph below. The cleaning involved removing data about Russia (there is no data about this country in the database for year 2020) and removing one last data point for every country (last points have unreasonable data more often).

The graph below shows weekly deaths for every country (except Russia). On Y axis is the number of deaths, on X axis are weeks from 1 to 52. Years before 2020 are plotted in grey, year 2020 is plotted in red. Current week is 41 and the data is lagging a few weeks (lags are different for every country). The title of every graph consists of two parts:

1. Country name
2. Number of years before 2020 plotted on the graph

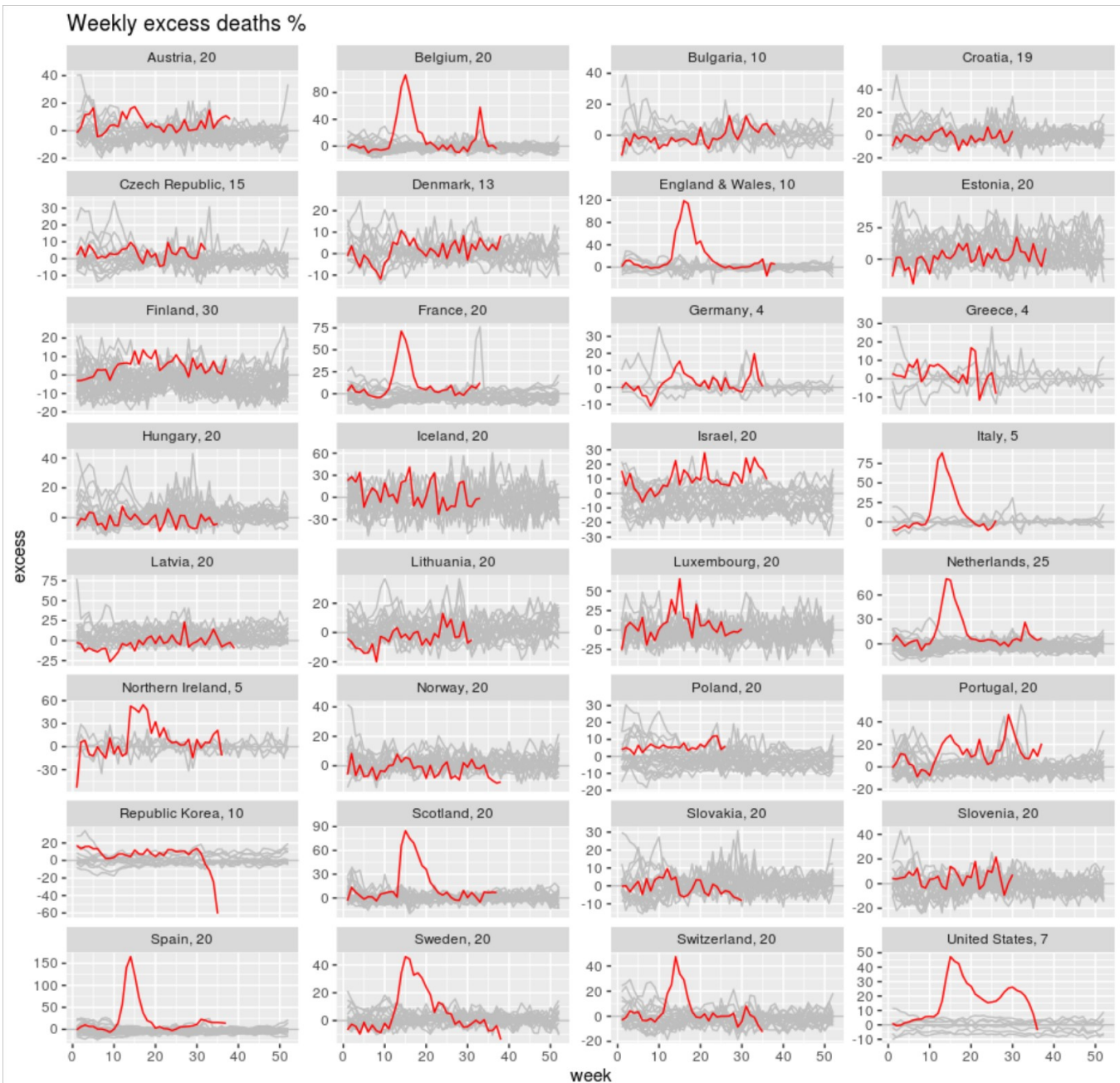
On quite a few graphs we can see considerable spikes in number of deaths starting approximately at week 10 year 2020. These spikes are mostly pronounced for Belgium, England and Wales, France, Italy, Netherlands, Scotland, Spain, Sweden, Switzerland and the United States. It is rather reasonable (knowing the most recent news) to attribute these spikes to COVID-19 outbreaks.

It should be noted that latest data points in the graph of the Republic of Korea deaths look unreasonable, they represent very low numbers, and I have no good explanation of this except that it can be an error in the data.



It would be much more convenient to plot the data as an excess of deaths. This is done in the graph below.

The “normal” amount of deaths is taken as the median of the last 10 years (or as many available in the data before 2020). Then the “normal” deaths are subtracted from every year and the result is presented as percentage of the “normal” deaths.



The last graph shows that excess of deaths jumped in some weeks by about 160% in Spain, 120% in England and Wales, 90% in Belgium, Italy, Scotland, 70% in France, Netherlands, 50% in Sweden, Switzerland and United States. This explains many sad video reports from some of these countries showing hospitals full of patients, funerals, multiple graves, etc.

Other countries had no jumps or they are not so pronounced taking into account variability of deaths during previous years (different for every graph). It can be explained by:

1. Preventive measures which shielded the most vulnerable part of population (Germany? Finland? Denmark?)
2. Better and more available for public health system (Germany? Finland? Denmark?)
3. High wealth of the whole population (Germany? Finland? Denmark?)
4. Younger population

5. Healthy habits, low obesity of the population, healthier population in general, etc.
6. Other unknown factors

According to the mortality graphs, for Austria, Bulgaria, Croatia, Czech Republic, Denmark, Germany, Estonia, Finland, Greece, Hungary, Iceland, Israel, Latvia, Lithuania, Luxembourg, Norway, Poland, Portugal, Republic Korea, Slovakia, and Slovenia COVID-19 pandemic is definitely not a “once in 100 years event” but more like a seasonal flu event. It might be because of reasonable governments strategies, good health systems and some other, currently unknown to me, factors.

Other observations and thoughts:

1. During past 20 years France had a moment when mortality jumped same high as during COVID-19 outbreak.
2. During past 4 years Germany had jumps in mortality higher than during COVID-19 outbreak.
3. Switzerland and Sweden had considerable spikes in deaths during beginning of COVID-19 outbreak, but the average yearly mortality will probably be similar to some of the previous 20 years (COVID-19 spike is narrow and some previous spikes are lower but wider).
4. Sweden had no lockdown and their restrictions were very reasonable, the country continued to work, etc. The latest mortality rates look very “normal”.
5. Denmark had very reasonable, not very restrictive measures (currently, people are travelling to Switzerland and Sweden for example) but still enjoying very low mortality rates.

All in all, I can speculate that reasonable government measures, good health system, high wealth and health of the population, and maybe some other factors lead to low mortality during the COVID-19 time.