covid19

March 17, 2020

Analysis of recent coronavirus data for different countries and regions.
Author: Javier Moldon
More info in https://github.com/jmoldon/coronavirus_analysis

1 General statistics

Data comes from Johns Hopkins University at https://github.com/CSSEGISandData/COVID-19 that is updated daily.

1.1 List of most affected countries (sorted by number of confirmed cases)

Country/Region	Province/State	Confirmed	Deaths	Recovered
China	Hubei	67798	3099	55142
Italy		27980	2158	2749
Iran		14991	853	4590
Spain		9942	342	530
Korea, South		8236	75	1137
Germany		7272	17	67
France	France	6633	148	12
Switzerland		2200	14	4
United Kingdom	United Kingdom	1543	55	20
Netherlands	Netherlands	1413	24	2
China	Guangdong	1361	8	1306
Norway		1333	3	1
China	Henan	1273	22	1250
	Zhejiang	1231	1	1216
Sweden		1103	6	1
Belgium		1058	5	1
China	Hunan	1018	4	1014
Austria		1018	3	6
China	Anhui	990	6	984
US	New York	967	10	0

1.2 List of most affected countries/provinces (sorted by number of deaths)

Country/Region	Province/State	Confirmed	Deaths	Recovered
China	Hubei	67798	3099	55142
Italy		27980	2158	2749
Iran		14991	853	4590
Spain		9942	342	530
France	France	6633	148	12
Korea, South		8236	75	1137
United Kingdom	United Kingdom	1543	55	20
US	Washington	904	48	1
Japan		839	27	144
Netherlands	Netherlands	1413	24	2
China	Henan	1273	22	1250
US	King County, WA	83	17	1
Germany		7272	17	67
Switzerland		2200	14	4
China	Heilongjiang	482	13	455
Philippines		142	12	2
US	New York	967	10	0
Iraq		124	10	26
China	Guangdong	1361	8	1306
	Beijing	452	8	360

2 Evolution of cases (Confirmed, Deaths, Active and Recovery) per country

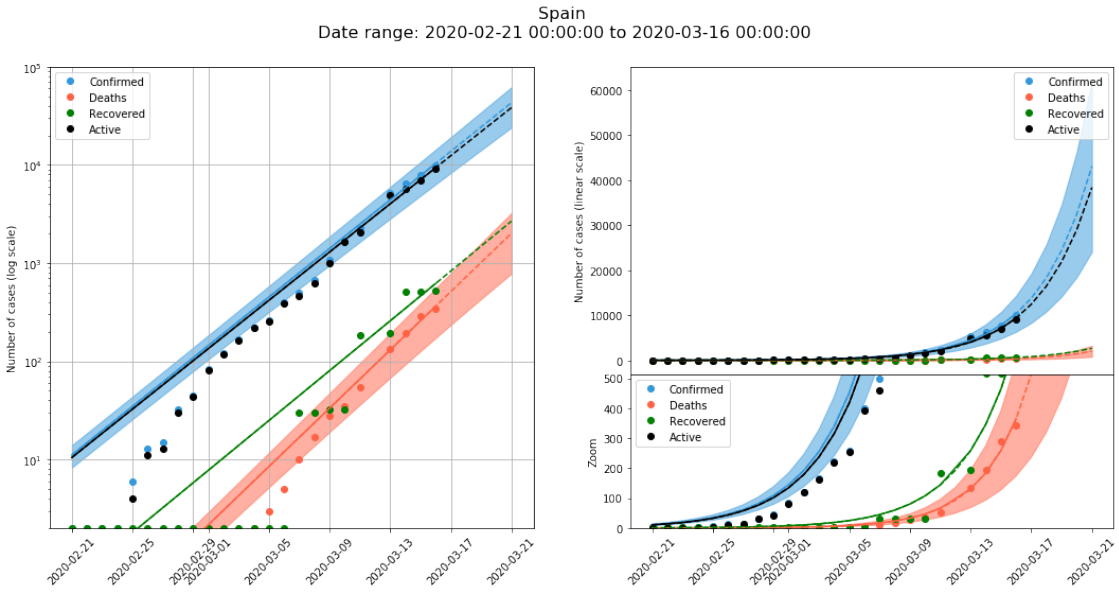
All plots have the same information. Left: log scale, right: linear scale. Bottom-right: is a zoom to show the correct scale for deaths. The straight line is a fit to a logistic growth when possible. If the fit does not converge (low number of points in early stages) a simple exponential is used. The dashed line is a prediction based on the fit.

3 Europe

3.1 Spain

5 day prediction

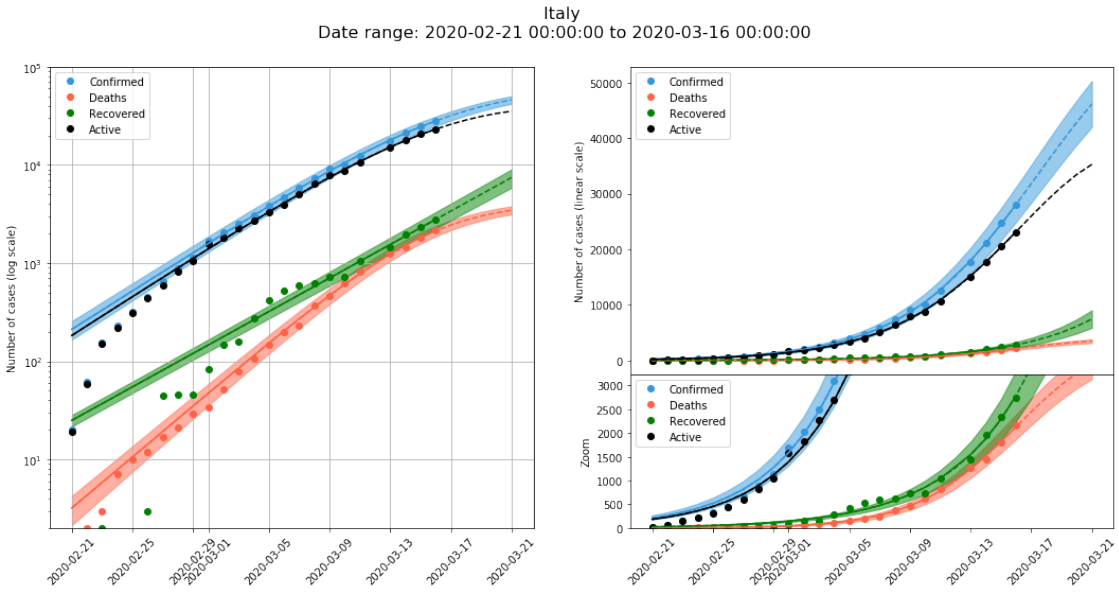
<pandas.io.formats.style.Styler at 0x7fa4eba6a7f0>



3.2 Italy

5 day prediction

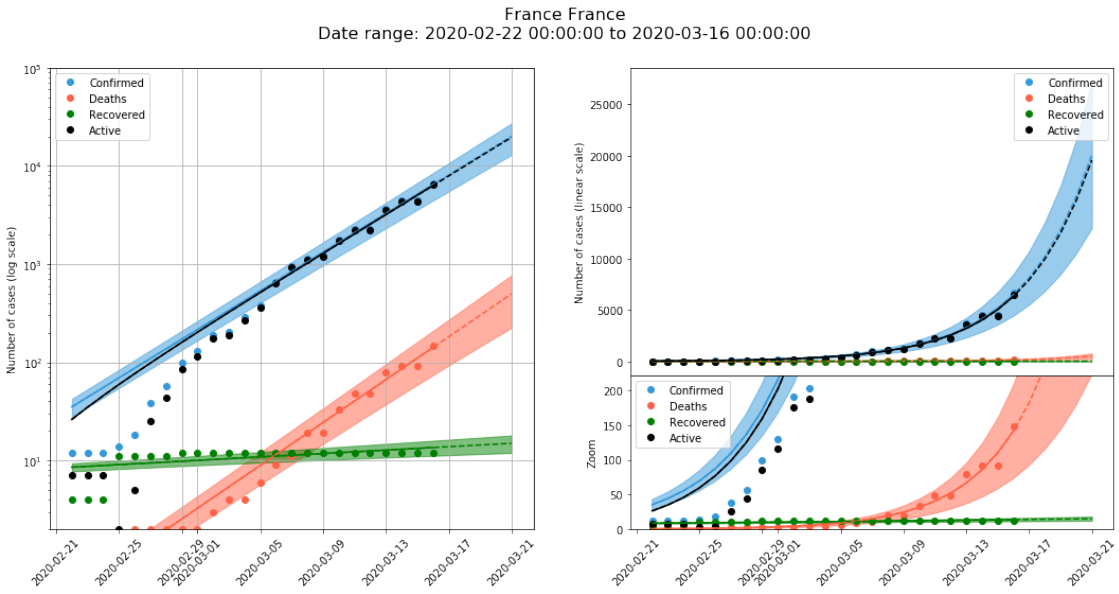
<pandas.io.formats.style.Styler at 0x7fa4e9d2a908>



3.3 France

5 day prediction

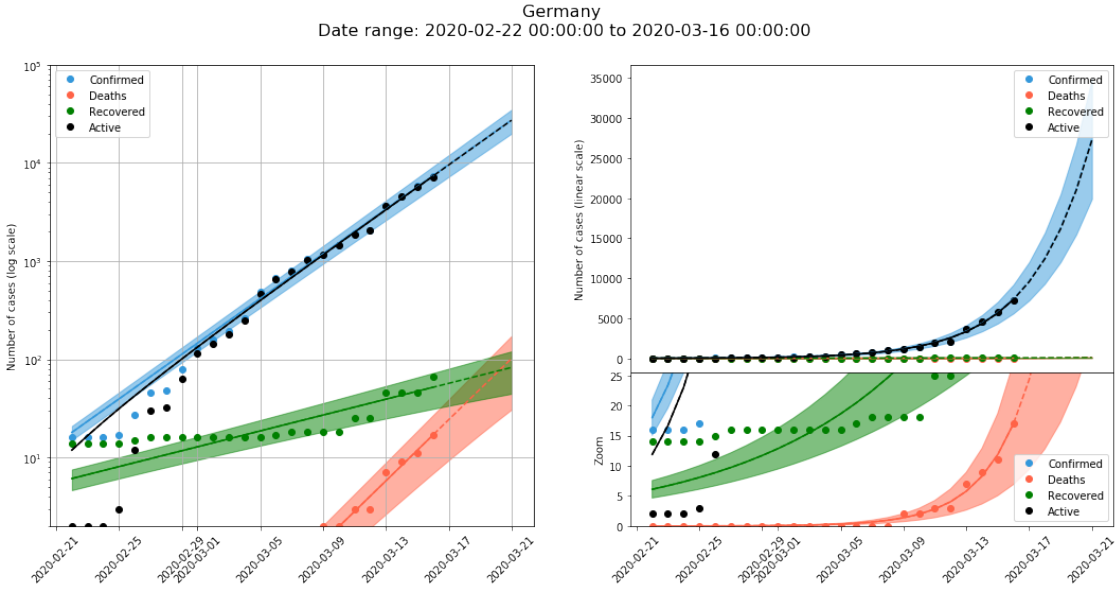
<pandas.io.formats.style.Styler at 0x7fa4eb694e10>



3.4 Germany

5 day prediction

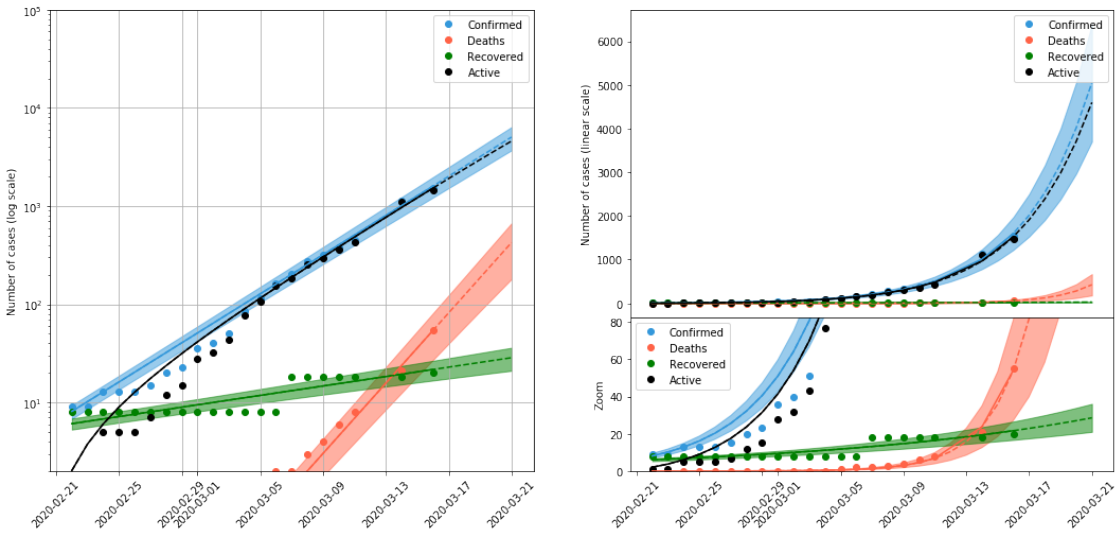
<pandas.io.formats.style.Styler at 0x7fa4ec6df518>



3.5 United Kingdom

5 day prediction

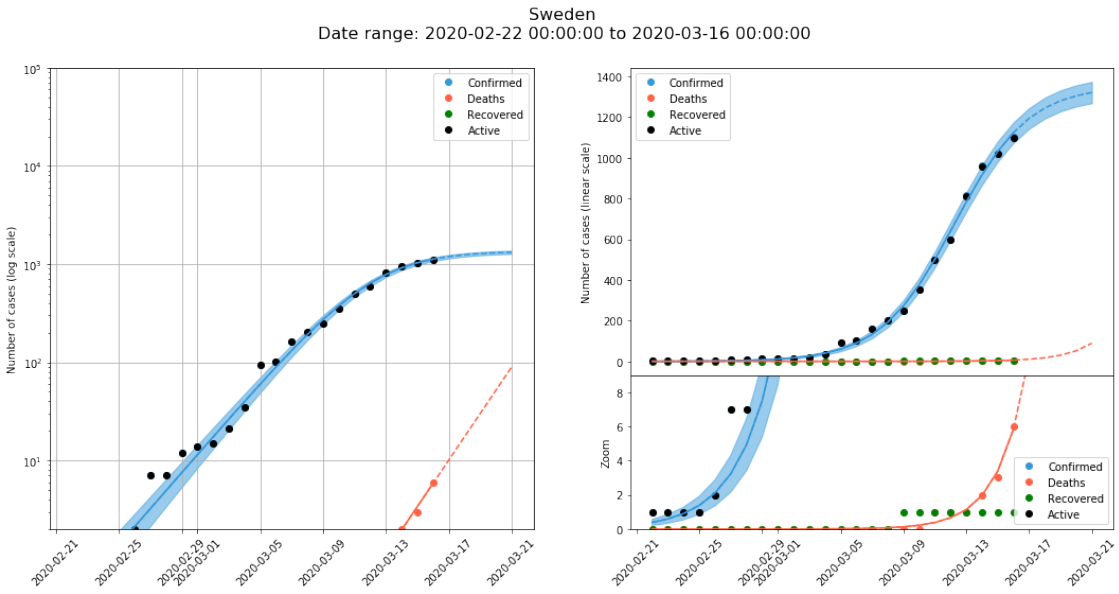
<pandas.io.formats.style.Styler at 0x7fa4eb3b1e48>



3.6 Sweden

5 day prediction

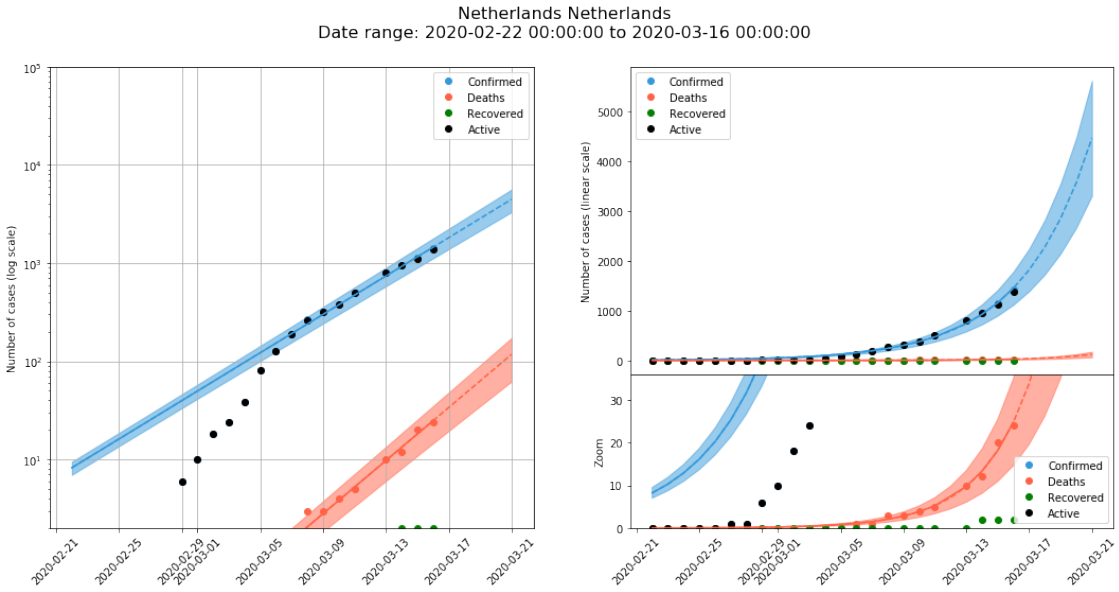
<pandas.io.formats.style.Styler at 0x7fa4eb5ca160>



3.7 Netherlands

5 day prediction

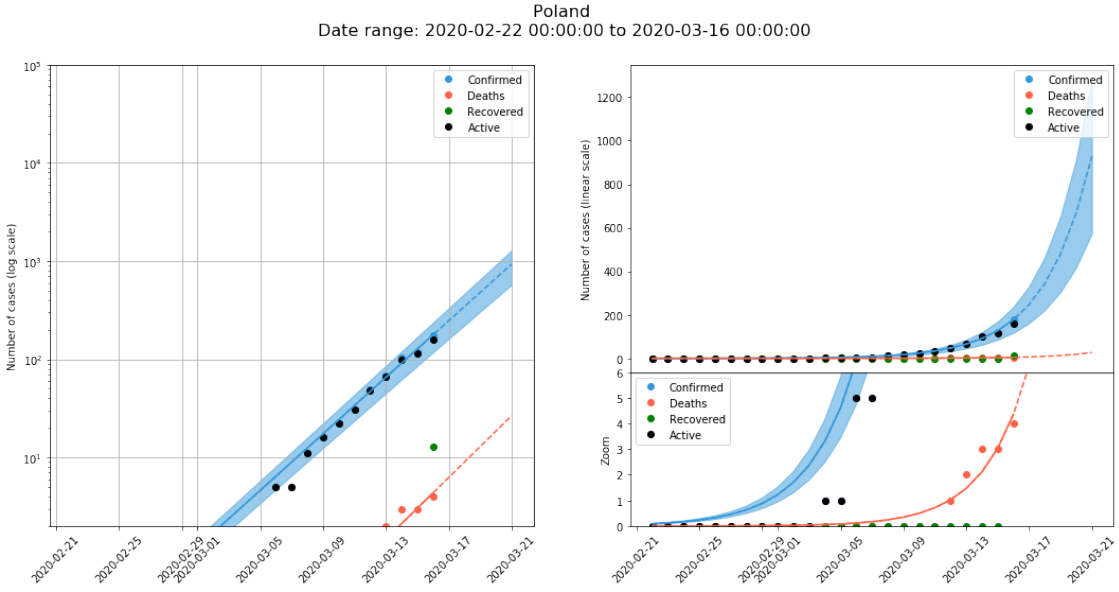
<pandas.io.formats.style.Styler at 0x7fa4eb9c5860>



3.8 Poland

5 day prediction

<pandas.io.formats.style.Styler at 0x7fa4eb954b38>



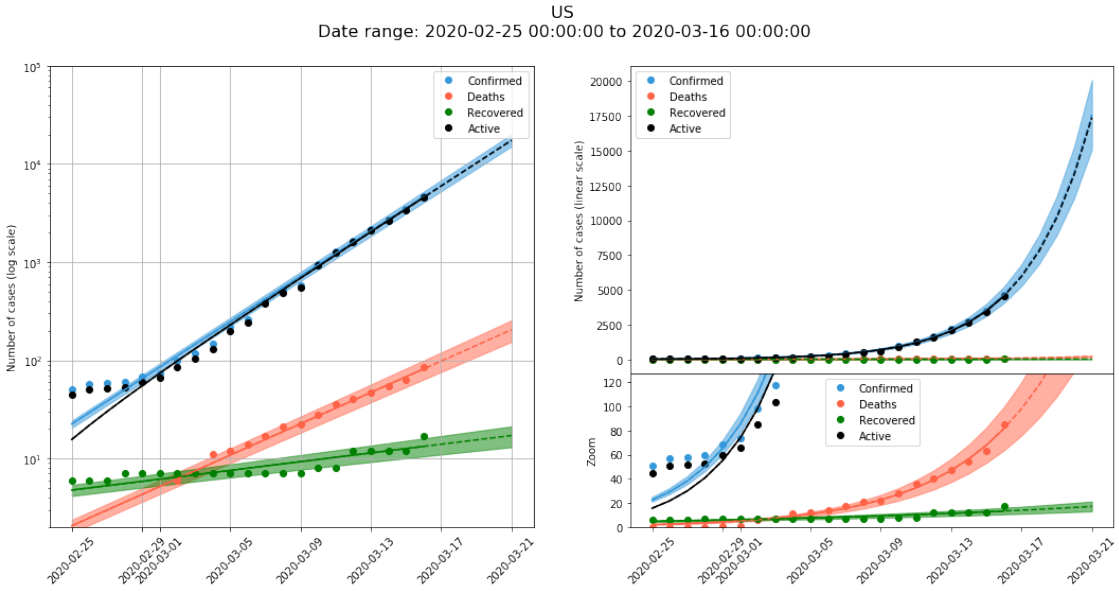
4 United States

I use the combined data for all the states combined

```
<class 'pandas._libs.tslibs.timestamps.Timestamp'>
```

5 day prediction

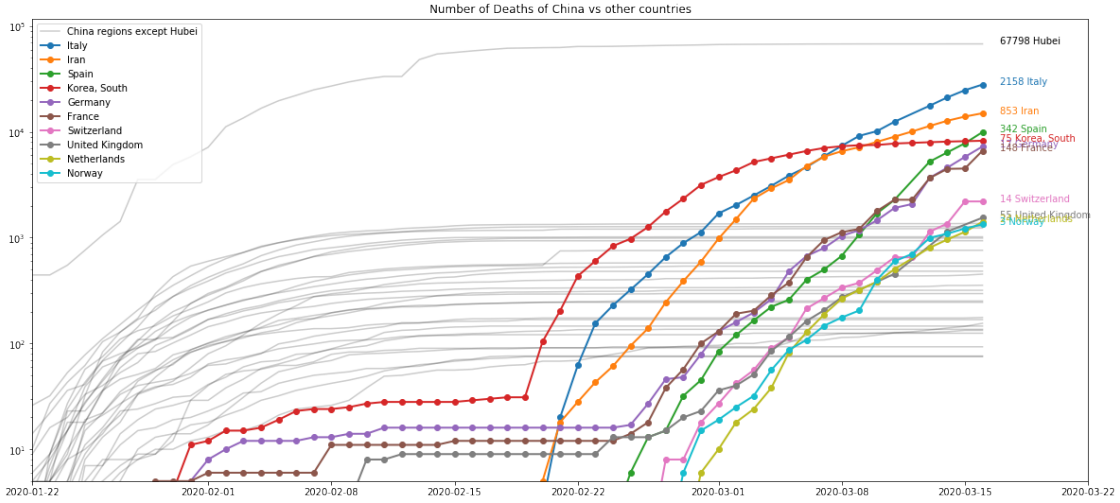
```
<pandas.io.formats.style.Styler at 0x7fa4ea054d68>
```



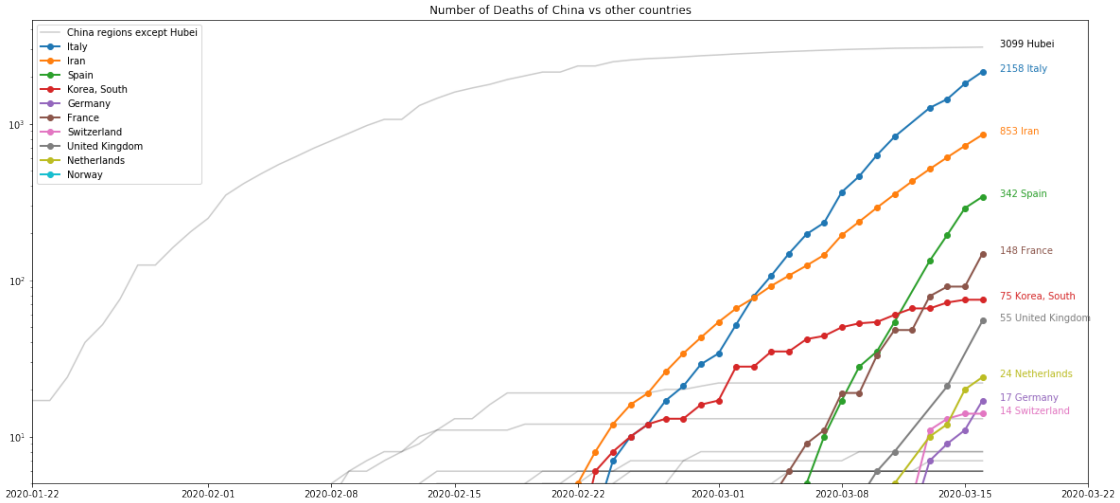
5 Comparison of growth China Regions vs Other countries

These plots show the importance of rapid response and efficient control measures of infected people in China. Except for Hubei region, where the expansion of the virus was unexpected, the other regions have a very reduced number of Deaths in total. The other countries, especially in Europe, even with a month for preparation, shows very high infection and death rates.

5.0.1 Deaths



5.0.2 Deaths



6 Comparison of different countries, with a manual time delay to align them

6.1 Early onset: China regions

Most of the regions have almost completed the cycle and active cases are disappearing. Note that China Hubei (the original area) has a large number of confirmed cases (70000), but the other regions have very low number of cases, with number around 1200-500 or even less.

6.2 Other countries in Asia

South Korea has a remarkable recovery rate, with many cases and a reduced number of deaths. Japan growth is moderate, much smaller than in European countries. Iran is showing hints of flattening, although it is curious that the number of recoveries has significantly slowed down while the number of deaths still follow a very exponential trend.