Coronavirus Analysis

March 15, 2020

Analysis of recent coronavirus data for different countries and regions.
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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	Confirmed	Deaths	Recovered
China	67790	3075	52960
Italy	21157	1441	1966
Iran	12729	611	2959
Korea, South	8086	72	510
Spain	6391	195	517
Germany	4585	9	46
France	4469	91	12
Switzerland	1359	13	4
United Kingdom	1140	21	18
Norway	1090	3	1
Sweden	961	2	1
Netherlands	959	12	2
Denmark	827	1	1
Japan	773	22	118
Cruise Ship	706	7	325

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

Country/Region	Province/State	Confirmed	Deaths	Recovered
China	Hubei	67790	3075	52960
Italy		21157	1441	1966
Iran		12729	611	2959
Spain		6391	195	517
France	France	4469	91	12
Korea, South		8086	72	510
US	Washington	572	37	1
China	Henan	1273	22	1250
Japan		773	22	118
United Kingdom	United Kingdom	1140	21	18
US	King County, WA	83	17	1
Switzerland		1359	13	4
China	Heilongjiang	482	13	447
Netherlands		959	12	2
Iraq		110	10	26

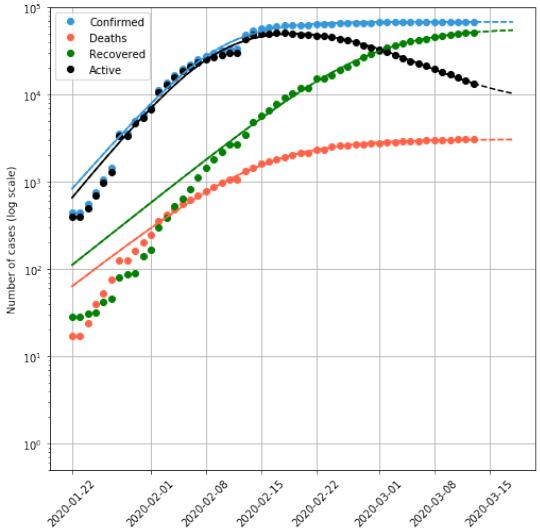
2 Evolution of cases (Confirmed, Deaths, Active and Recovery) per country

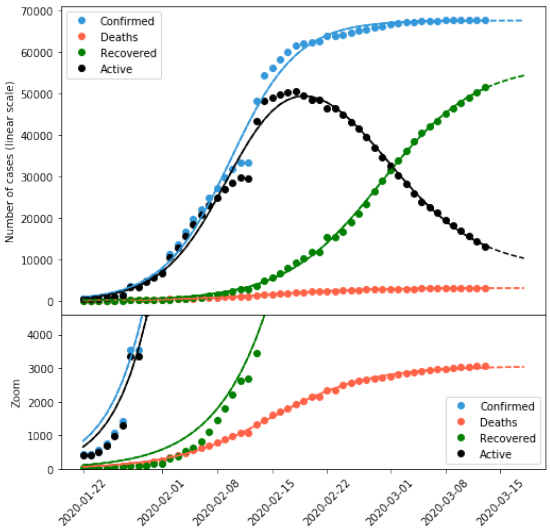
All plots have the same information. Left: log scale, right: linear scale. Bottom-right: is a zoom to show the correct scale for deaths. The straight line is a fit to a logistic growth when possible. If the fit does not converge (low number of points in early stages) a simple exponential is used. The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

2.1 Early onset: China regions

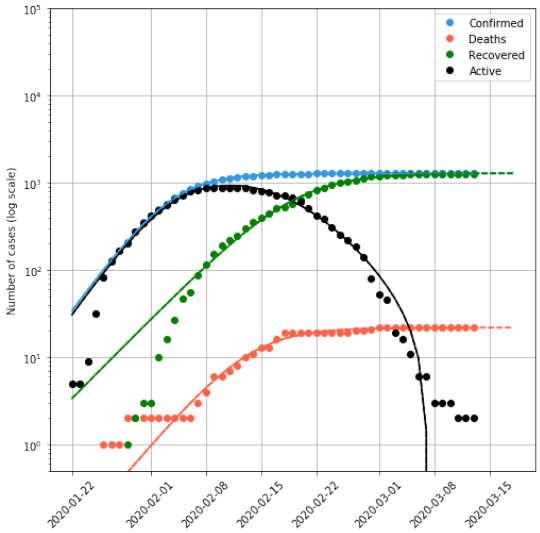
Most of the regions have almost completed the cycle and active cases are disappearing. Note that China Hubei (the original area) has a large number of confirmed cases (70000), but the other regions have very low number of cases, with number around 1200-500 or even less.

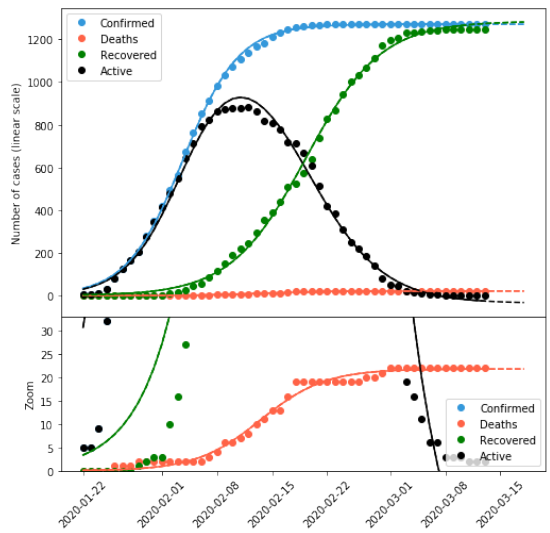
China Hubei
Date range: 2020-01-01 to 2021-03-12



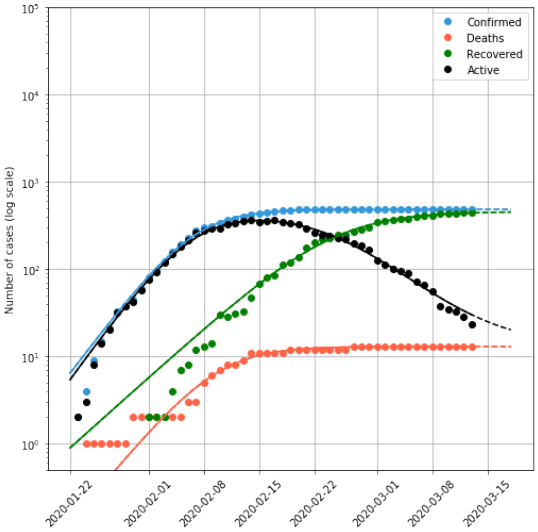


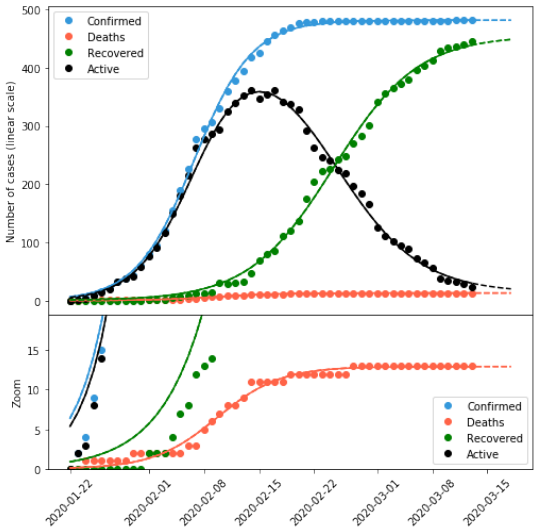
China Henan
Date range: 2020-01-01 to 2021-03-12



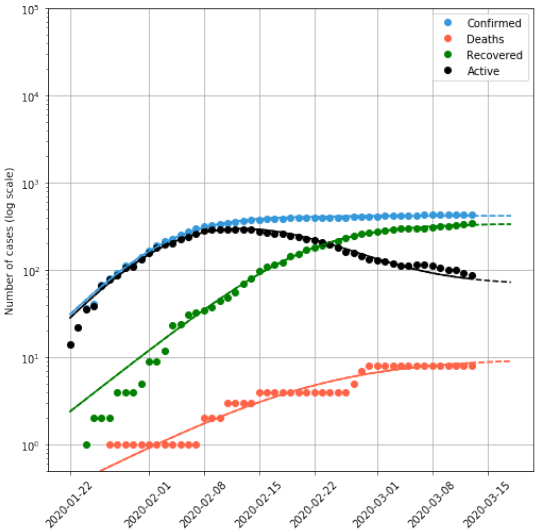


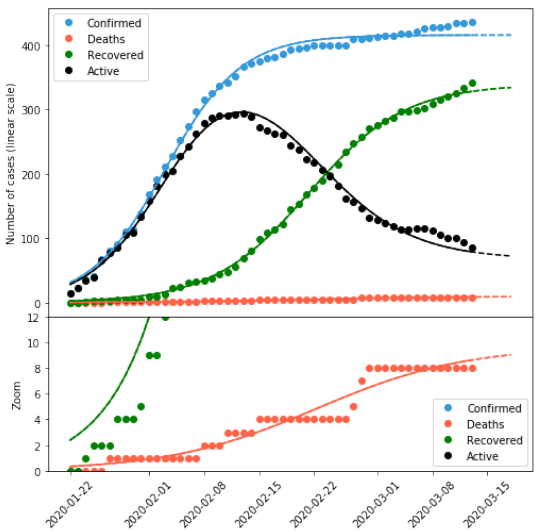
China Heilongjiang
Date range: 2020-01-01 to 2021-03-12

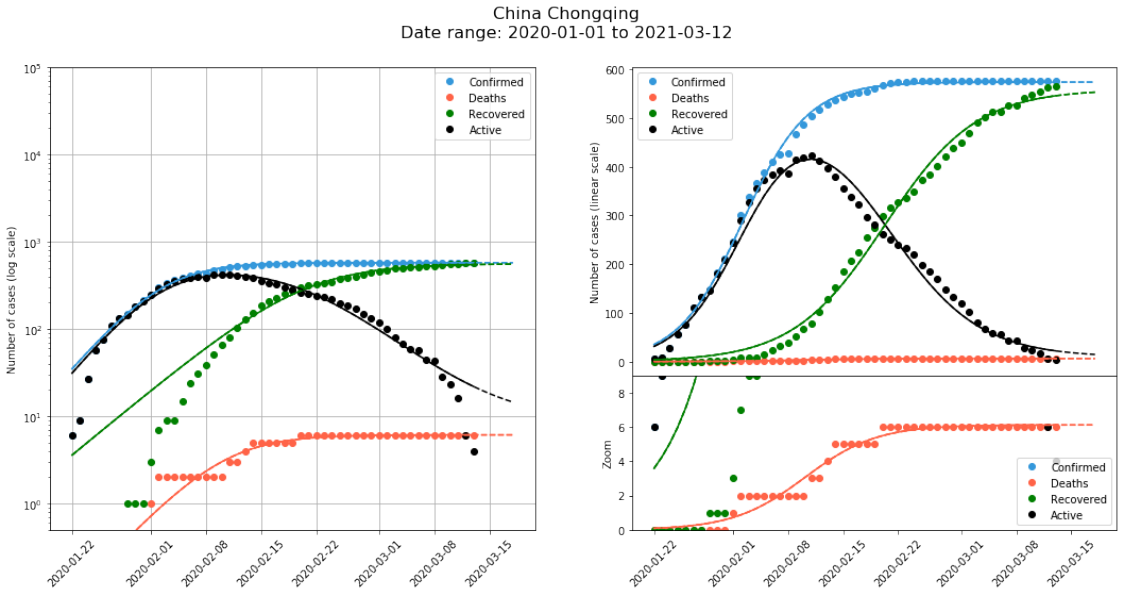




China Beijing
Date range: 2020-01-01 to 2021-03-12





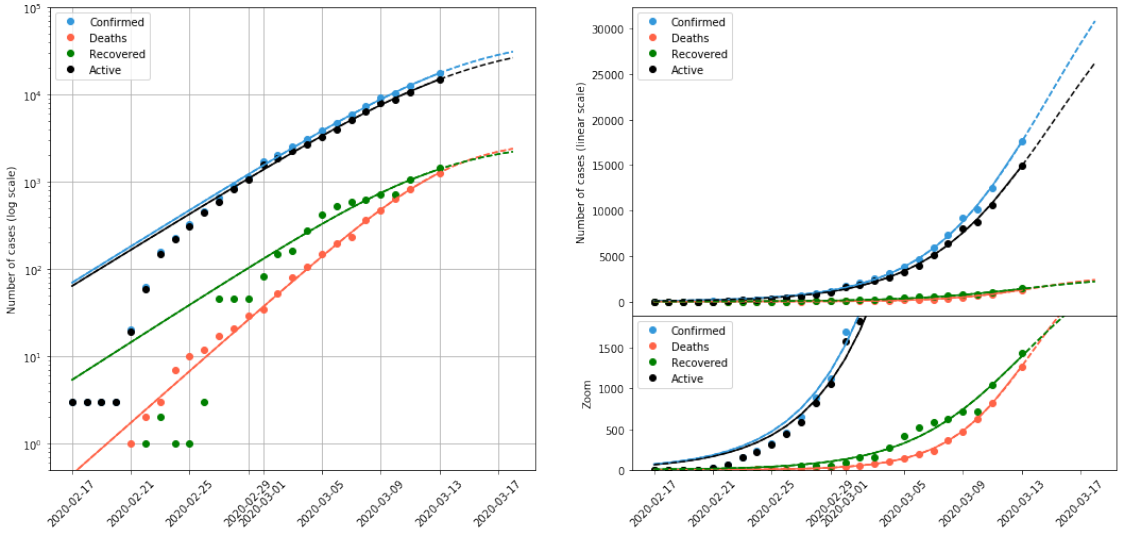


2.2 Europe

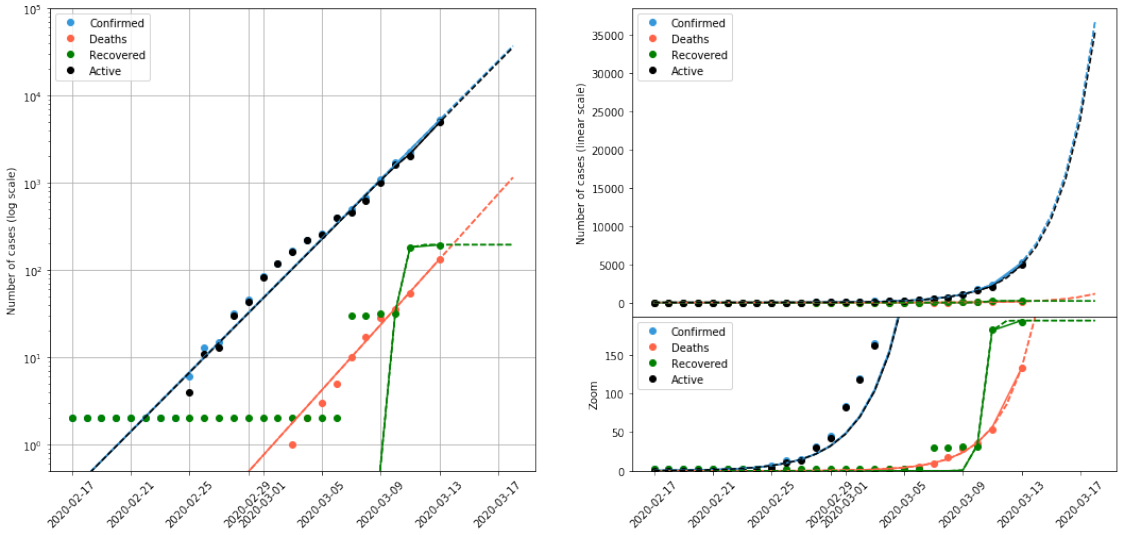
The number of confirmed cases and deaths is very high in countries like Italy, Spain and France. Note high rate of deaths, much higher than in , which is still in very exponential stage with some signs of flattening.

In general, more days will be needed for a more accurate fit and prediction, but we are still in a high-growth phase.
2020-03-15: Italy seems to start showing a flattening of the Death curve, finally! 2020-03-15: Spain shows a weird behaviour in the early Confirmed cases. For all countries, the first data points are below the fitted curve, but Spain is the other way, and there seems to be a change in the rate of new cases on about March 07. Something happened a week before to cause this significant change?

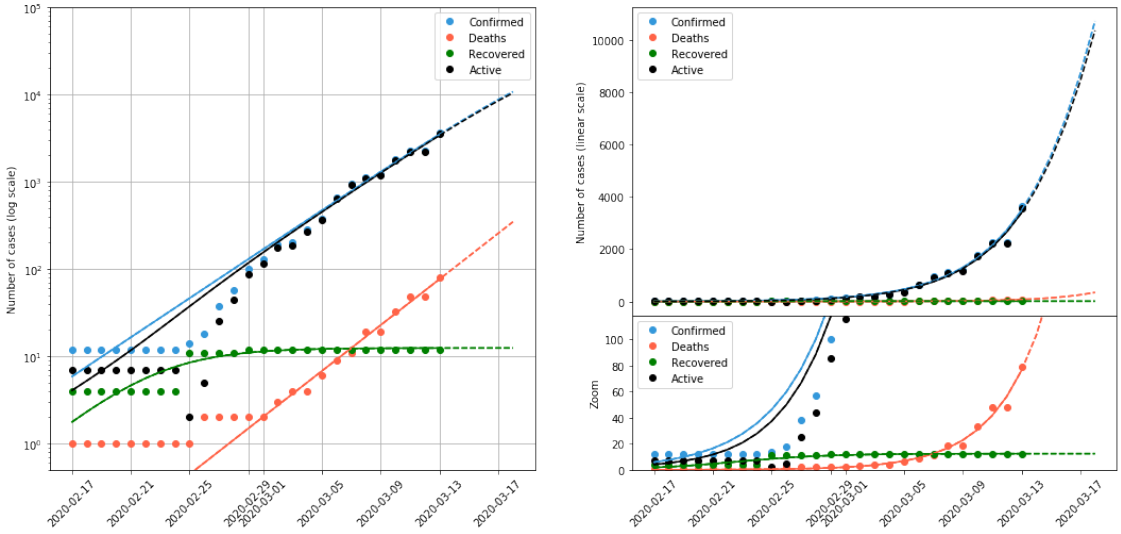
Italy
Date range: 2020-02-17 to 2021-03-12



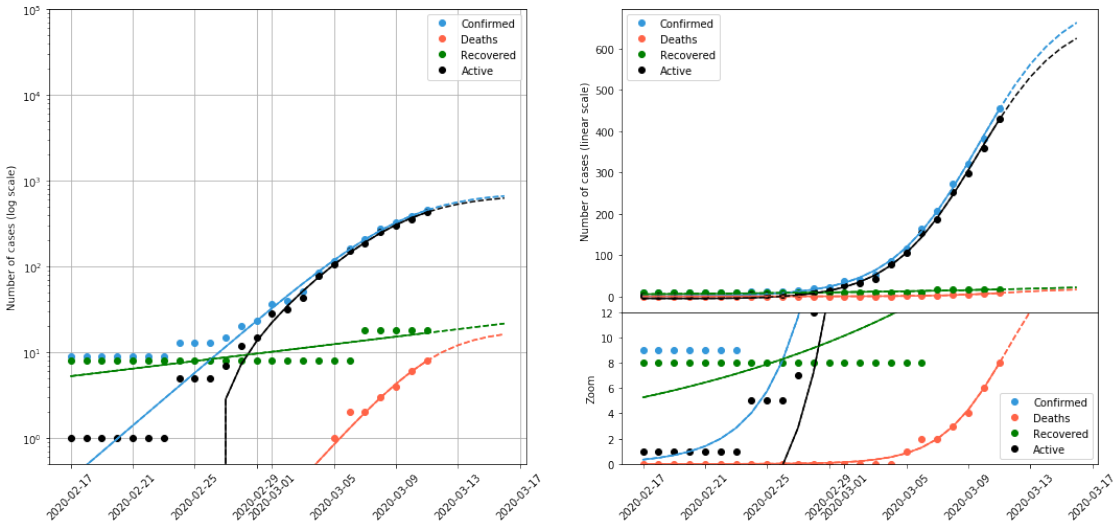
Spain
Date range: 2020-02-17 to 2021-03-12

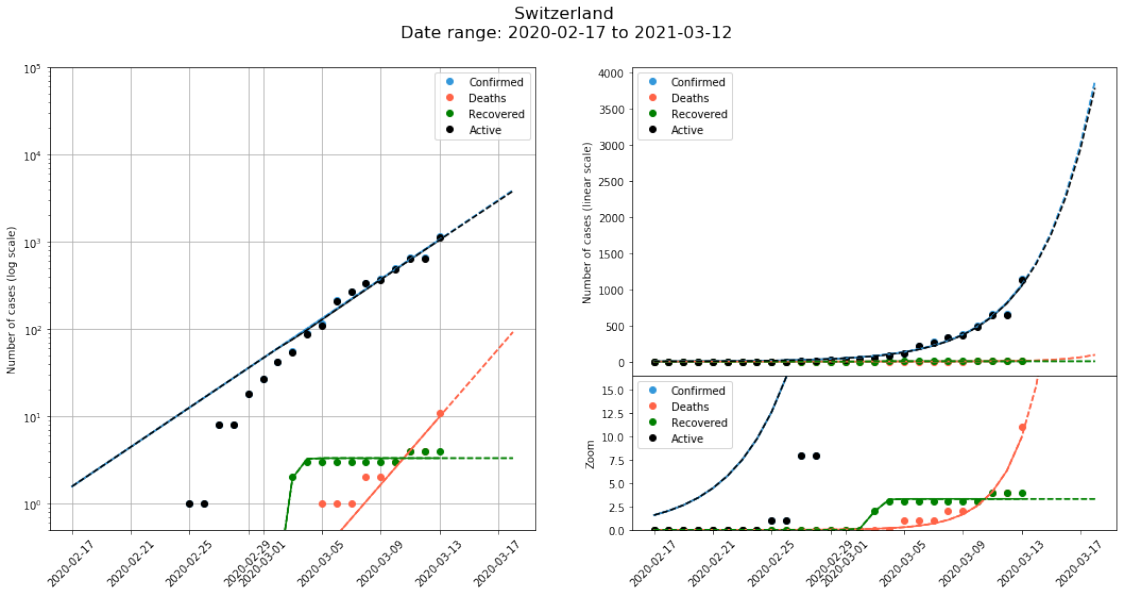


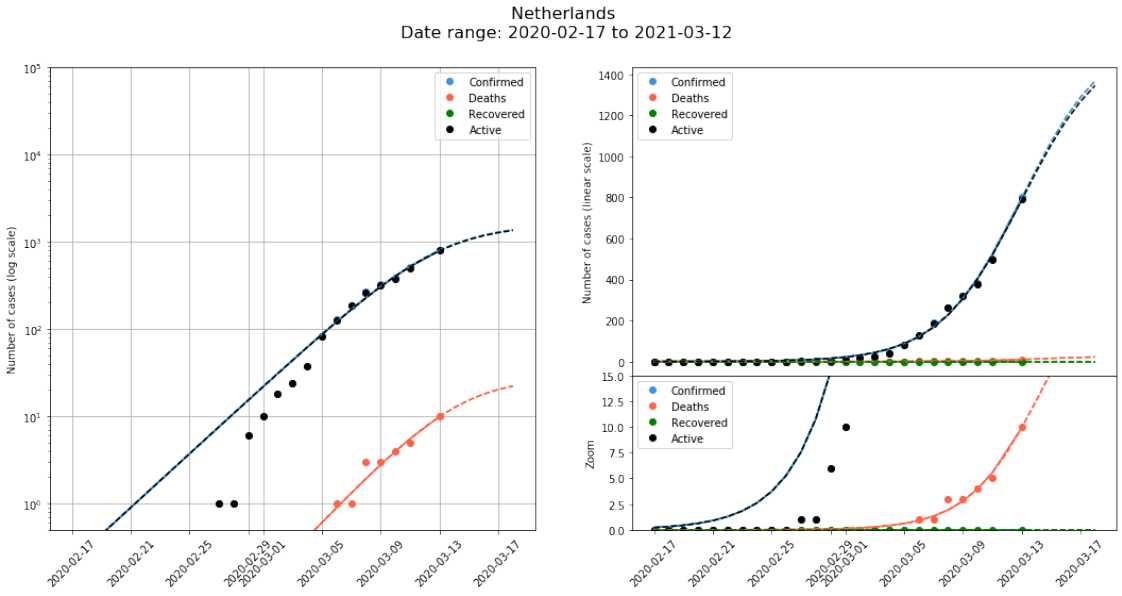
France France
Date range: 2020-02-17 to 2021-03-12



United Kingdom United Kingdom
Date range: 2020-02-17 to 2021-03-12



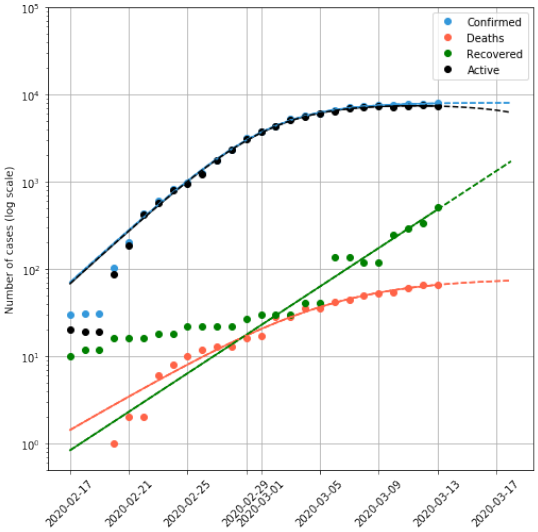


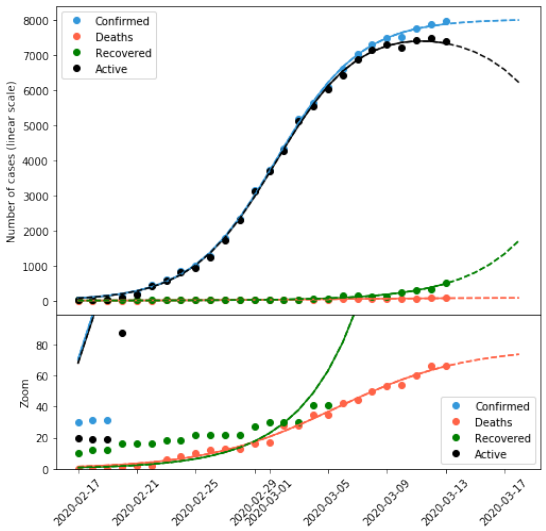


2.3 Other countries in Asia

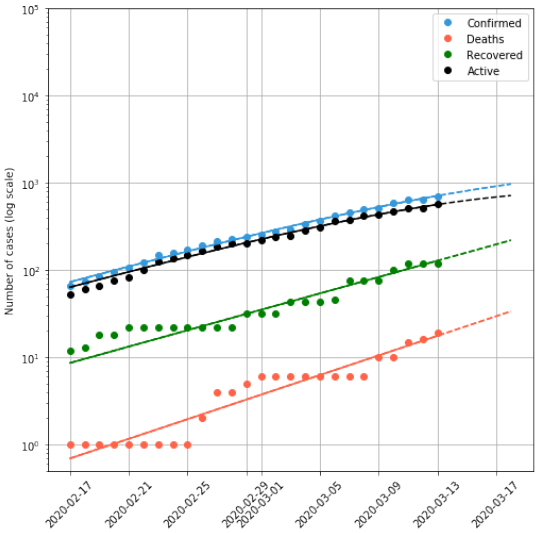
South Korea has a remarkable recovery rate, with many cases and a reduced number of deaths. Japan growth is moderate, much smaller than in European countries. Iran is showing hints of flattening, although it is curious that the number of recoveries has significantly slowed down while the number of deaths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

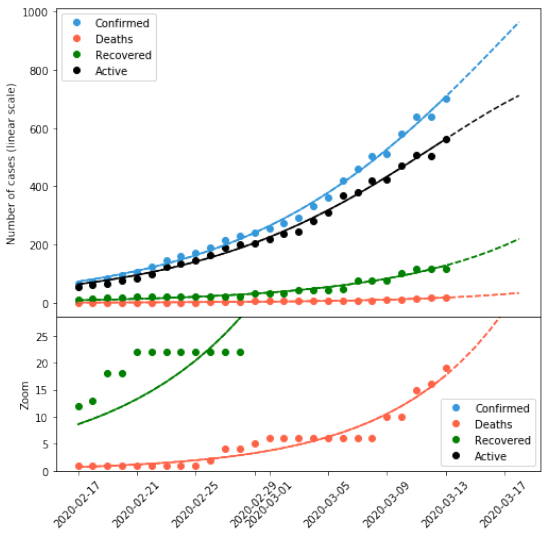
Korea, South
Date range: 2020-02-17 to 2021-03-12

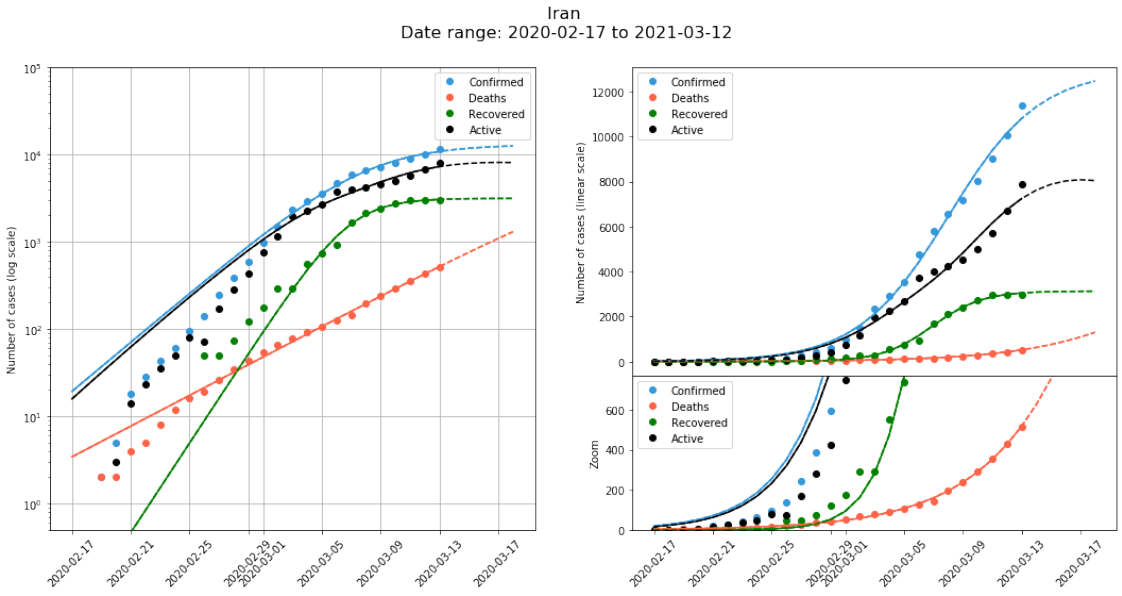




Japan
Date range: 2020-02-17 to 2021-03-12

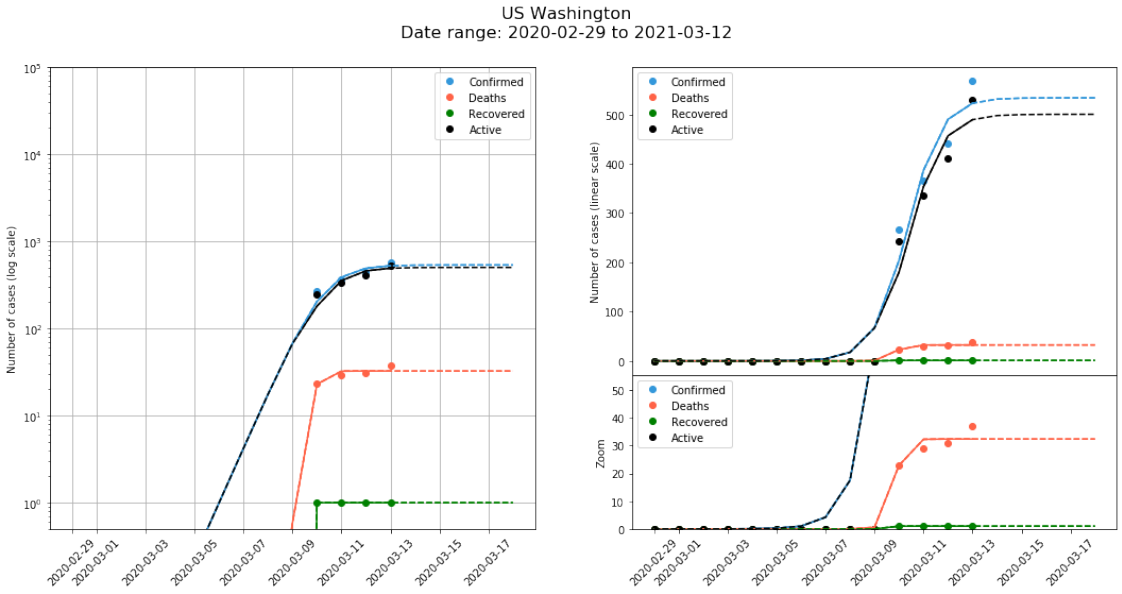




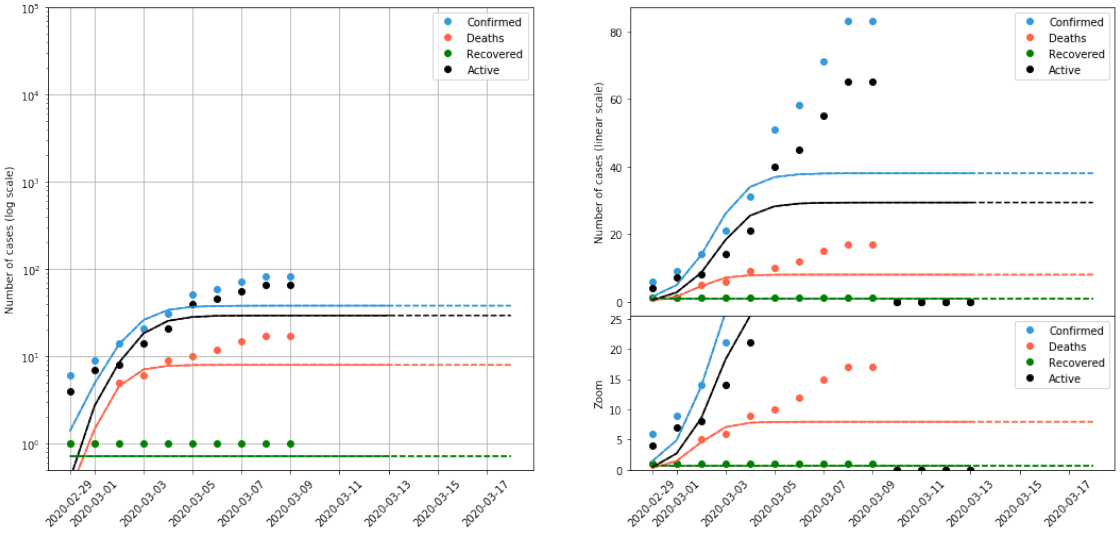


3 United States

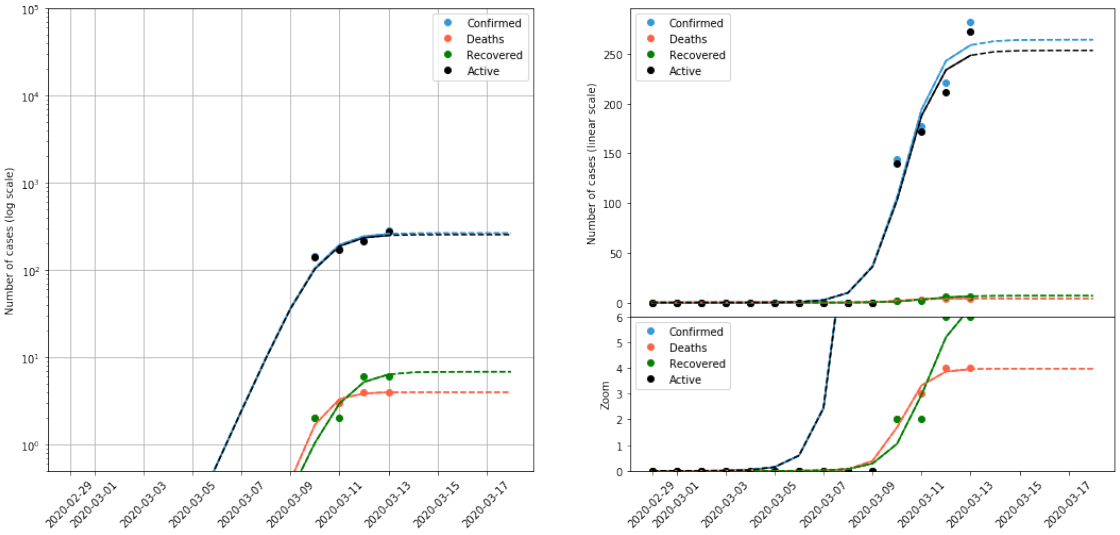
The number of days with cases is still very low, and the fits are not very informative.



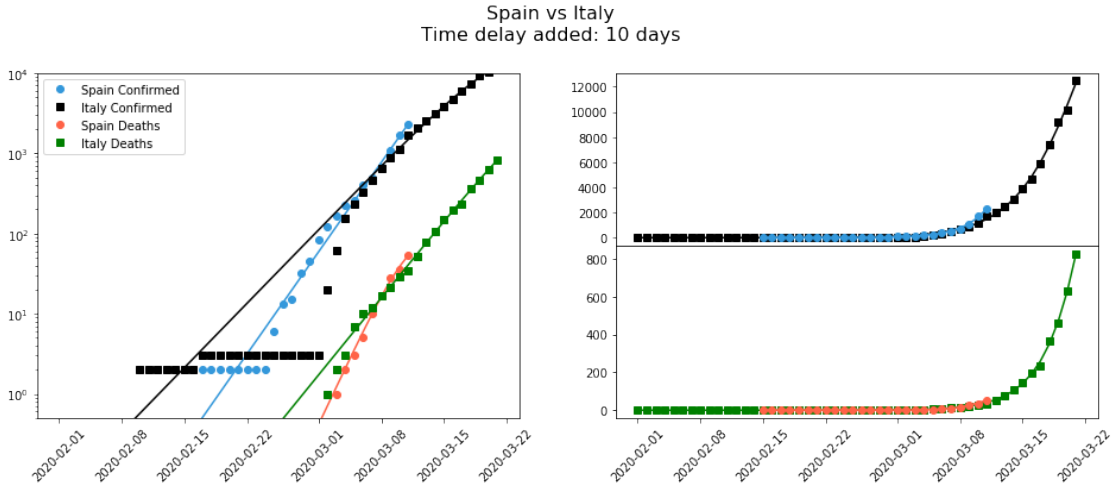
US King County, WA
Date range: 2020-02-29 to 2021-03-12

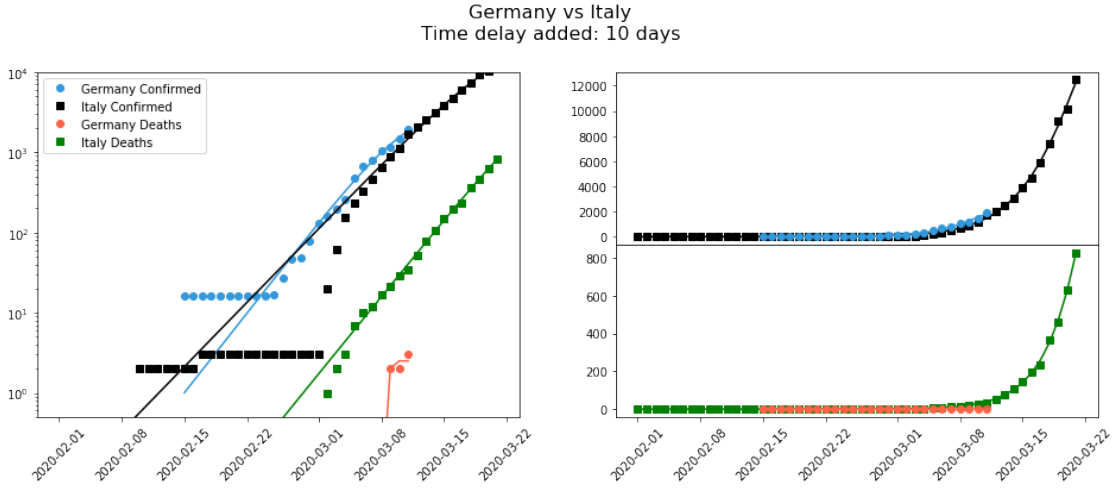


US California
Date range: 2020-02-29 to 2021-03-12

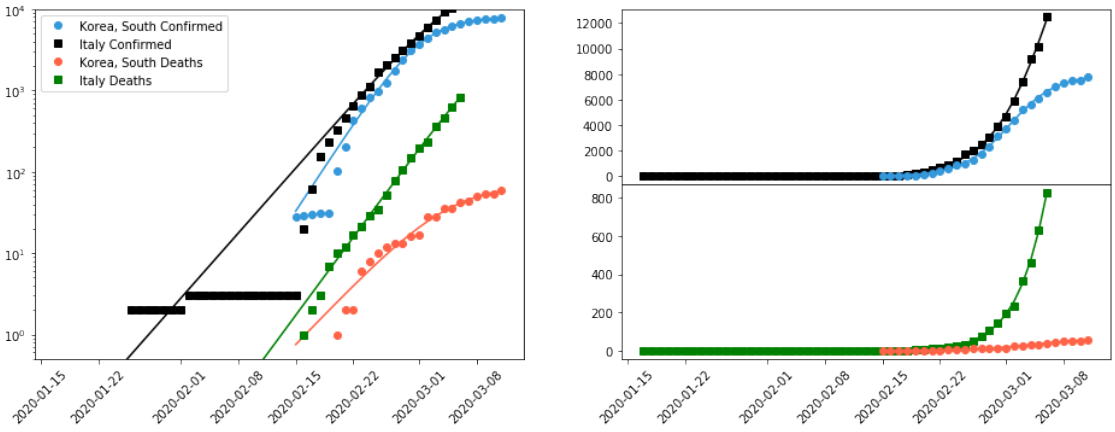


4 Comparison of two countries, with a manual time delay to align them





Korea, South vs Italy
Time delay added: -5 days



Spain vs China
Time delay added: 45 days