Covid19 Report

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Contents

1 The *CRISTINA* project

This report is part of a research project "**C**o**R**ona v**I**rus **S**pa**TI**al a**NA**lysis" (CRISTINA) which examines the time series progress of COVID-19 events in 177 countries of the world.

2 Spain

A series of visualizations for the progress of COVID-19 for **Spain**. We use absolute numbering scale and logarithmic scale to visualize the progress of "*confirmed cases*","*deaths*" and "*recovered cases*". We also indicate the gonverment interventions as dots on top of each line.
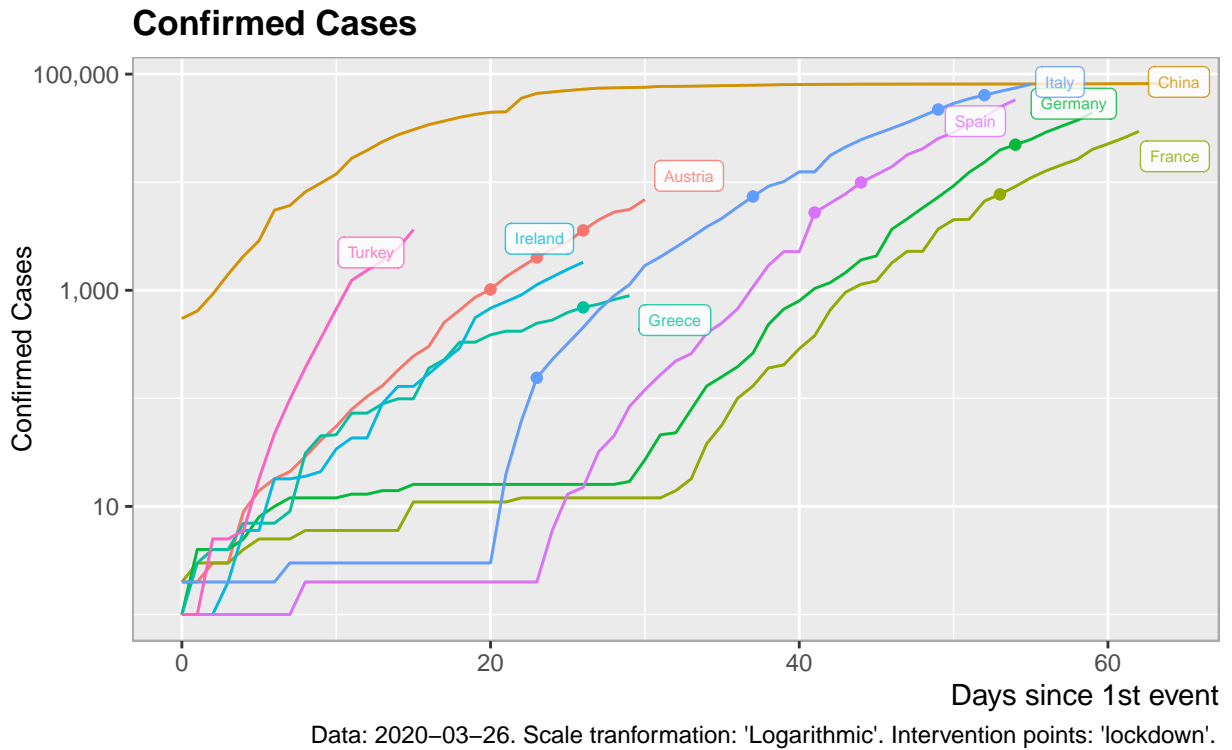
2.1   Confirmed Cases

Confirmed Cases

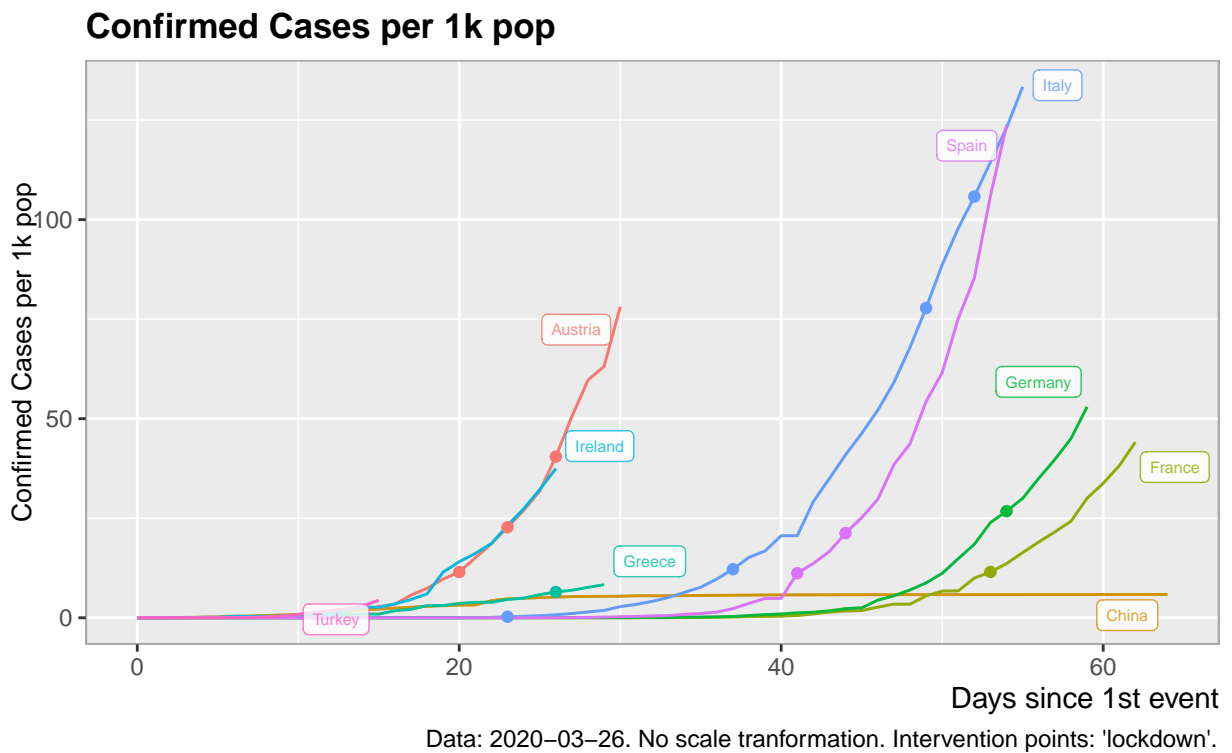
Data: 2020−03−26. Scale tranformation: 'Logarithmic'. Intervention points: 'lockdown'.

Figure 1: Confirmed Cases

Confirmed Cases per 1k pop

Data: 2020−03−26. No scale tranformation. Intervention points: 'lockdown'.

Figure 2: Confirmed Cases by 1000 population

Confirmed cases per 1k pop (2020−03−27)
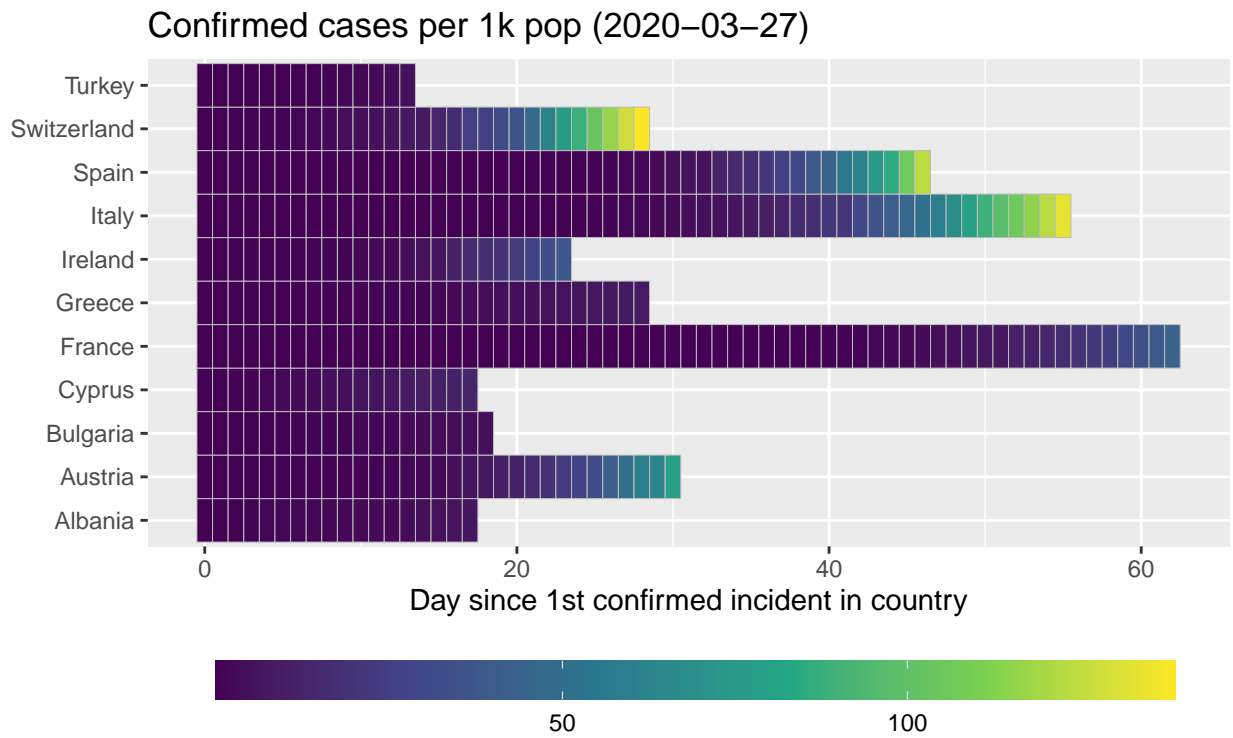
Figure 3: Confirmed Cases by 1000 population

2.2 Deaths

Deaths

Data: 2020−03−26. Scale tranformation: 'Logarithmic'. Intervention points: 'lockdown'.

Figure 4: Number of deaths by country

Deaths per 1k pop

Data: 2020−03−26. No scale tranformation. Intervention points: 'lockdown'.
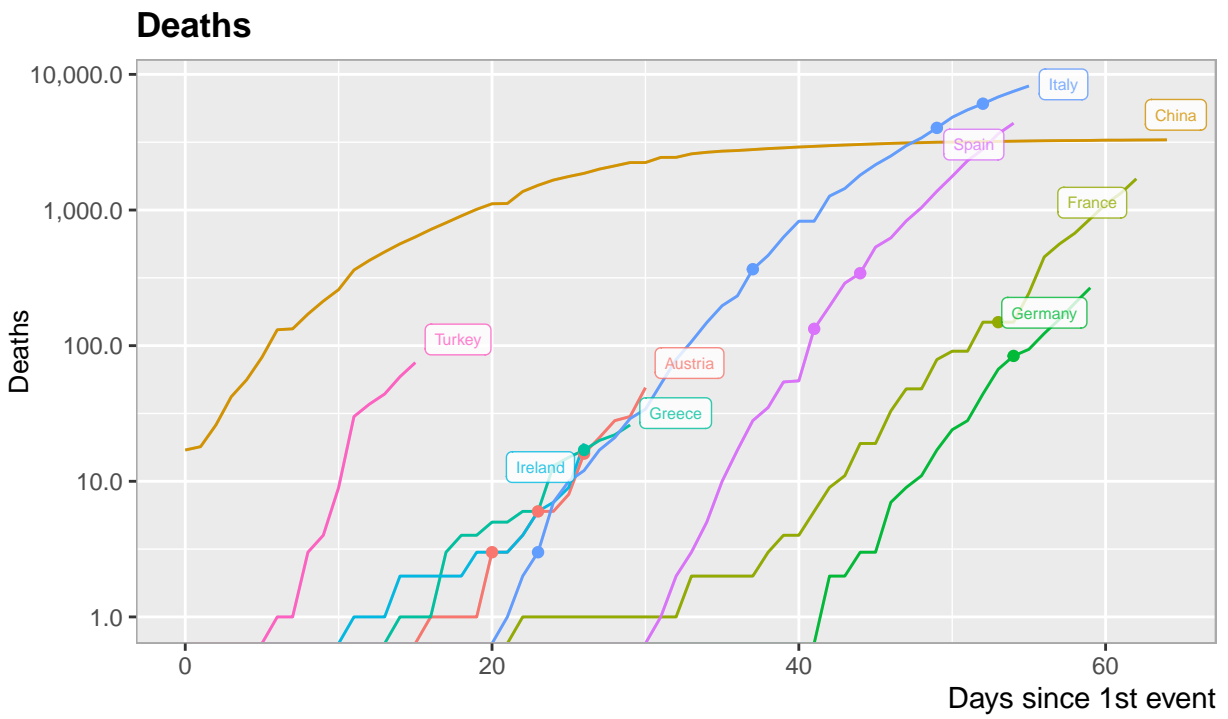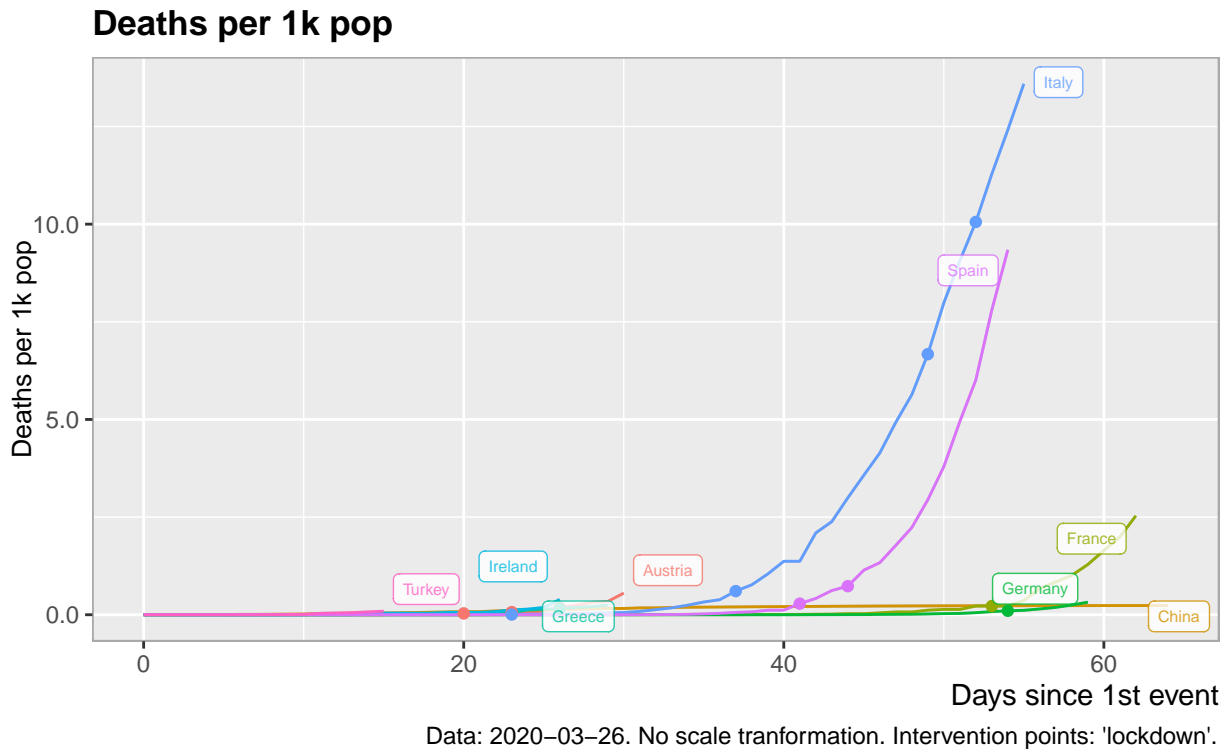
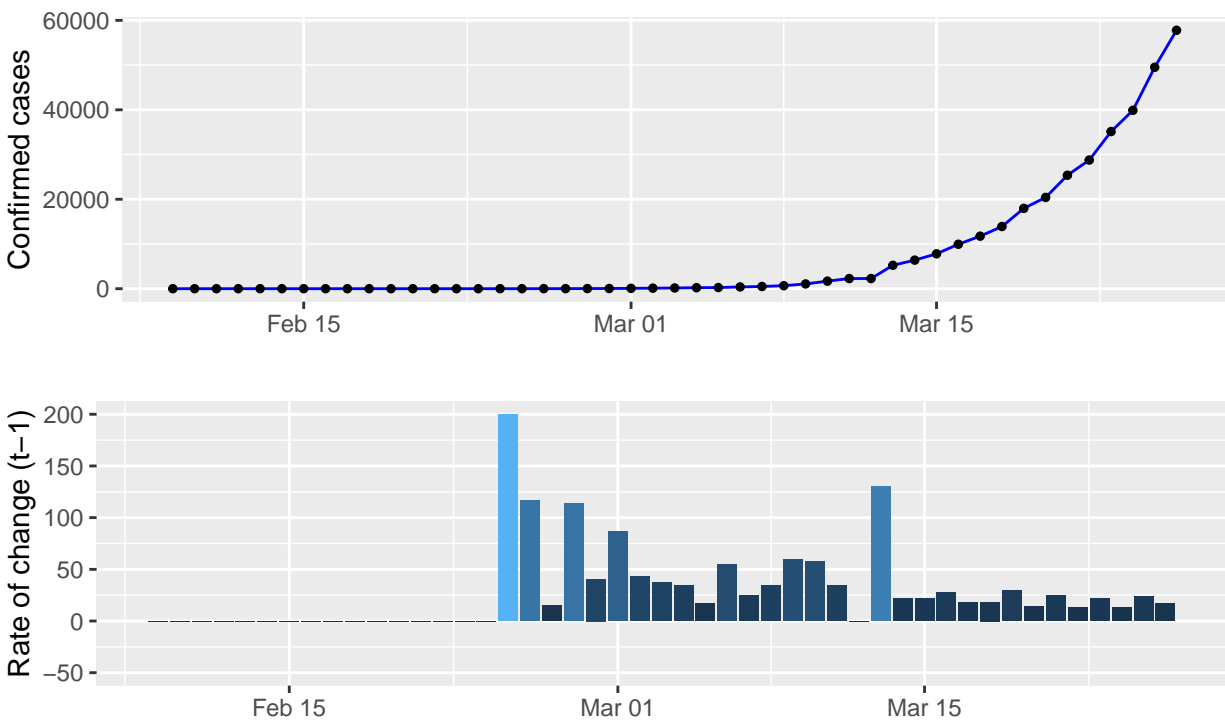Figure 5: Deaths by 1000 population

3 Rate of change over time

Figure 6: Rate of change of confirmed cases

4 Estimations

We estimate the future projection of *confirmed cases* for the next 5 days in Spain with two methods.

4.1 ARIMA projection
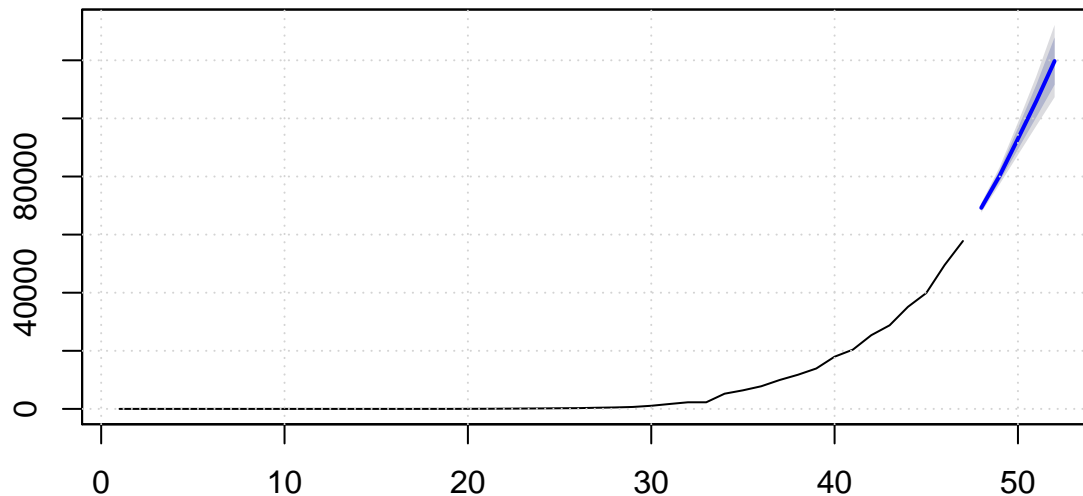
Projection of 'confirmed' cases for 5 ahead

Figure 7: ARIMA projection

Table 1: ARIMA of 'confirmed cases' for 5 days ahead

	Estimation	Confidence 95% (Low)	Confidence 95% (High)
t+1 (2020-03-27)	69228	67601	70855
t+2 (2020-03-28)	80267	77324	83209
t+3 (2020-03-29)	93000	87428	98573
t+4 (2020-03-30)	105965	97438	114491
t+5 (2020-03-31)	119750	107306	132193

- The estimated proportion of cases detected is 0.49%.

- With data up to 2020-03-26 in Spain we have 57786 confirmed cases and 4365 deaths.

- Estimated doubling time (based on 5 days time window) is aproximatly 4 days
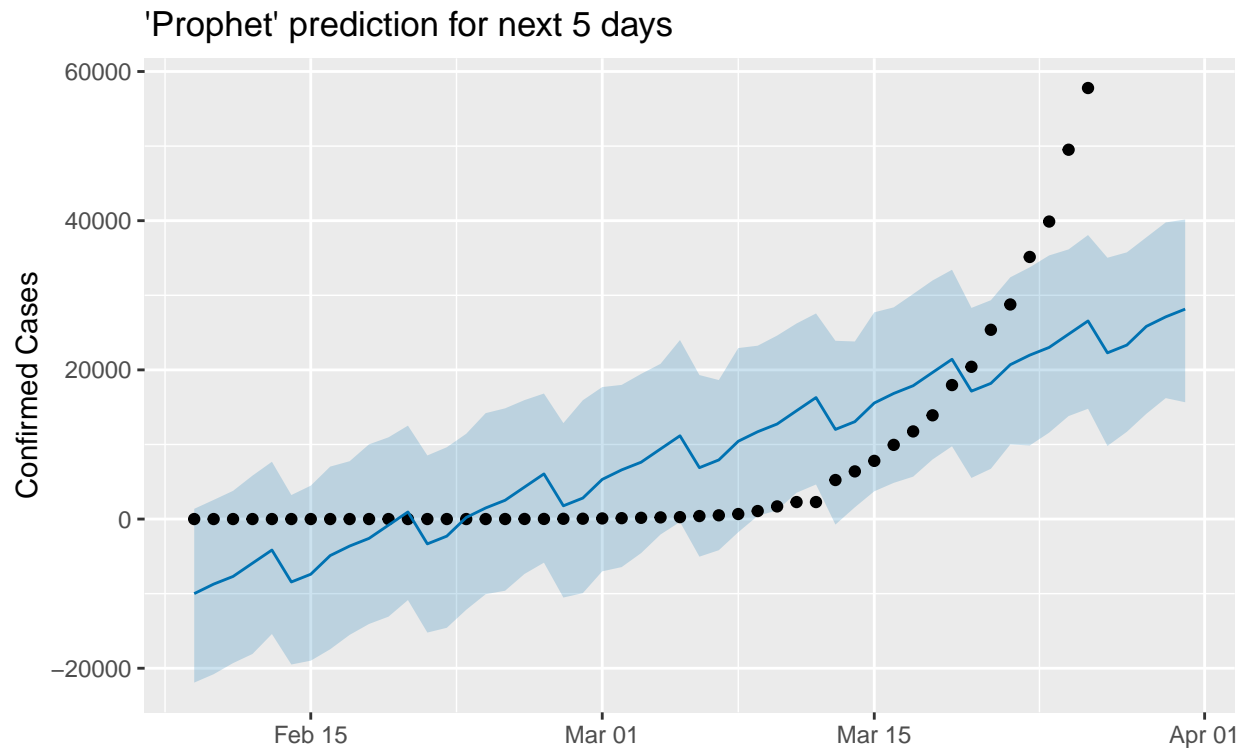
4.2 PROPHET projection

Figure 8: PROPHET Projection of confirmed cases over the next 5 days for Spain

Table 2: PROPHET of 'confirmed cases' for 5 days ahead for Spain

	Future_Date	Estimation	Confidence 95% (Low)	Confidence 95% (High)
t+1	2020-03-27	22284	9799	35033
t+2	2020-03-28	23326	11700	35760
t+3	2020-03-29	25831	14107	37769
t+4	2020-03-30	27111	16212	39770
t+5	2020-03-31	28146	15659	40158