Covid19 Report

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Contents

1 The *CRISTINA* project

This report is part of a research project "**CoR**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.
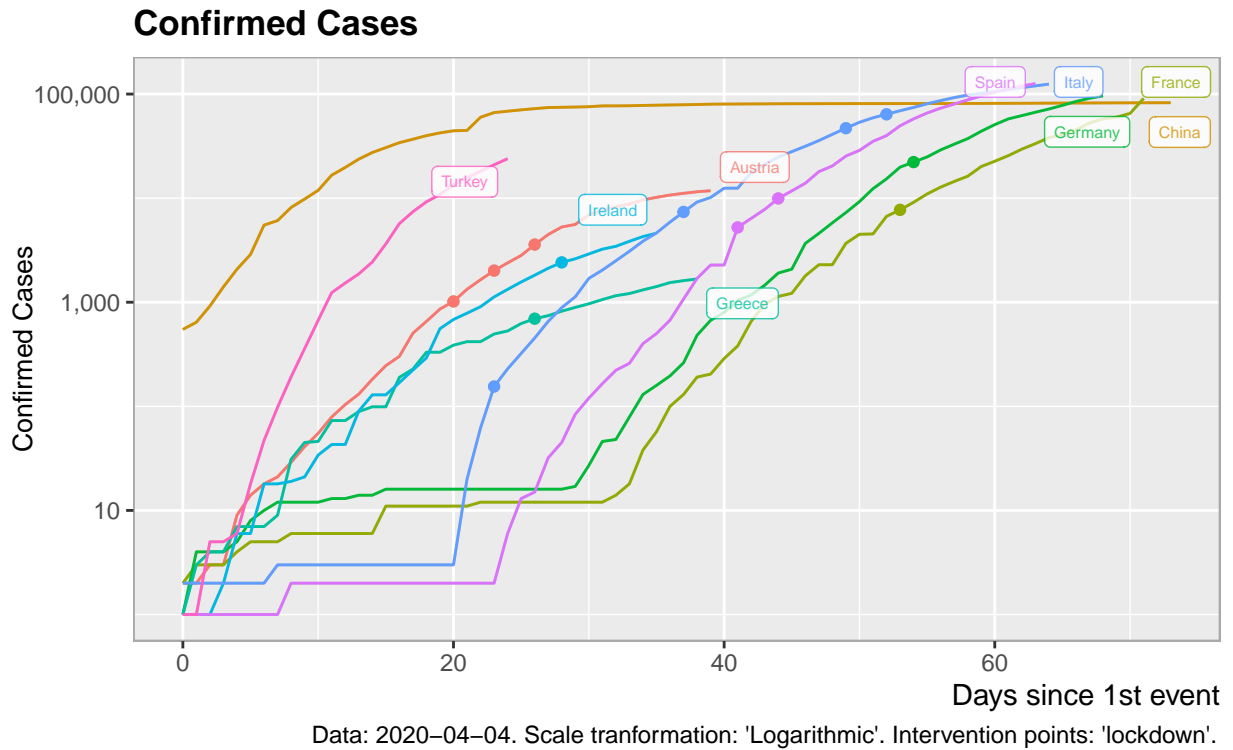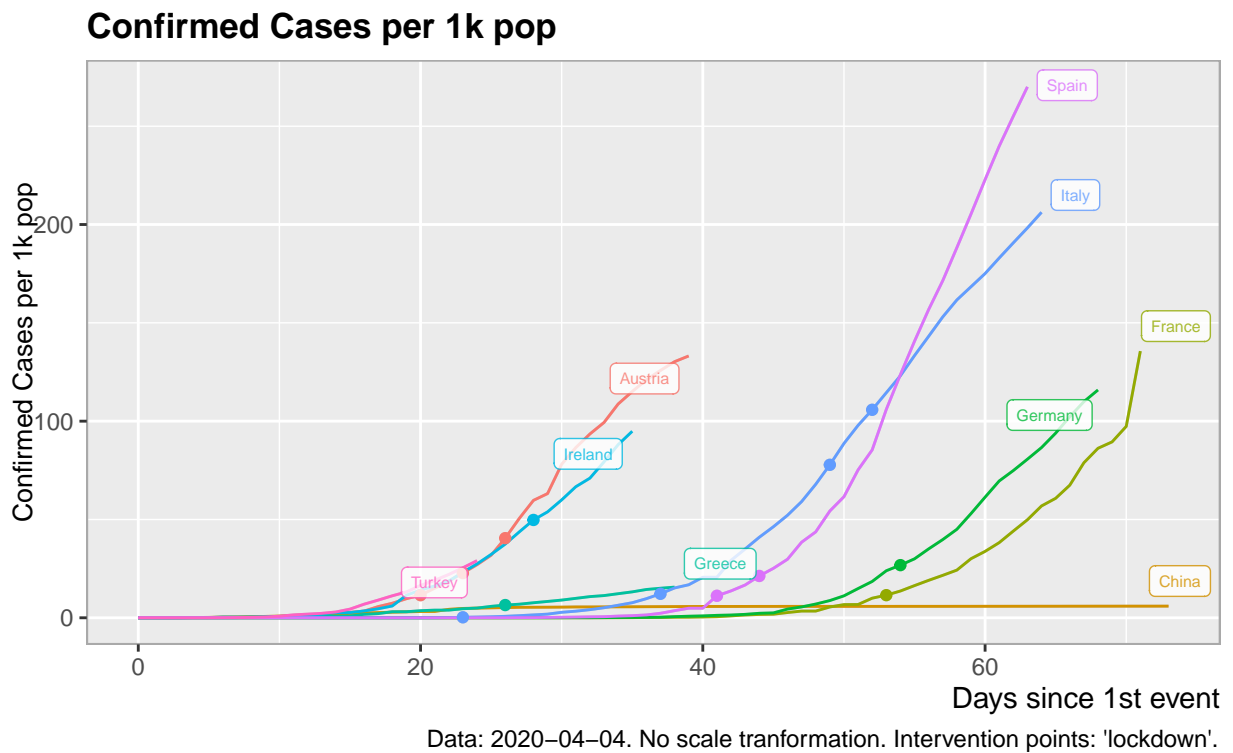
2.1 Confirmed Cases

Confirmed Cases

Data: 2020−04−04. Scale tranformation: 'Logarithmic'. Intervention points: 'lockdown'.

Figure 1: Confirmed Cases

Confirmed Cases per 1k pop

Data: 2020−04−04. No scale tranformation. Intervention points: 'lockdown'.

Figure 2: Confirmed Cases by 1000 population

Confirmed cases per 1k pop (2020−04−05)
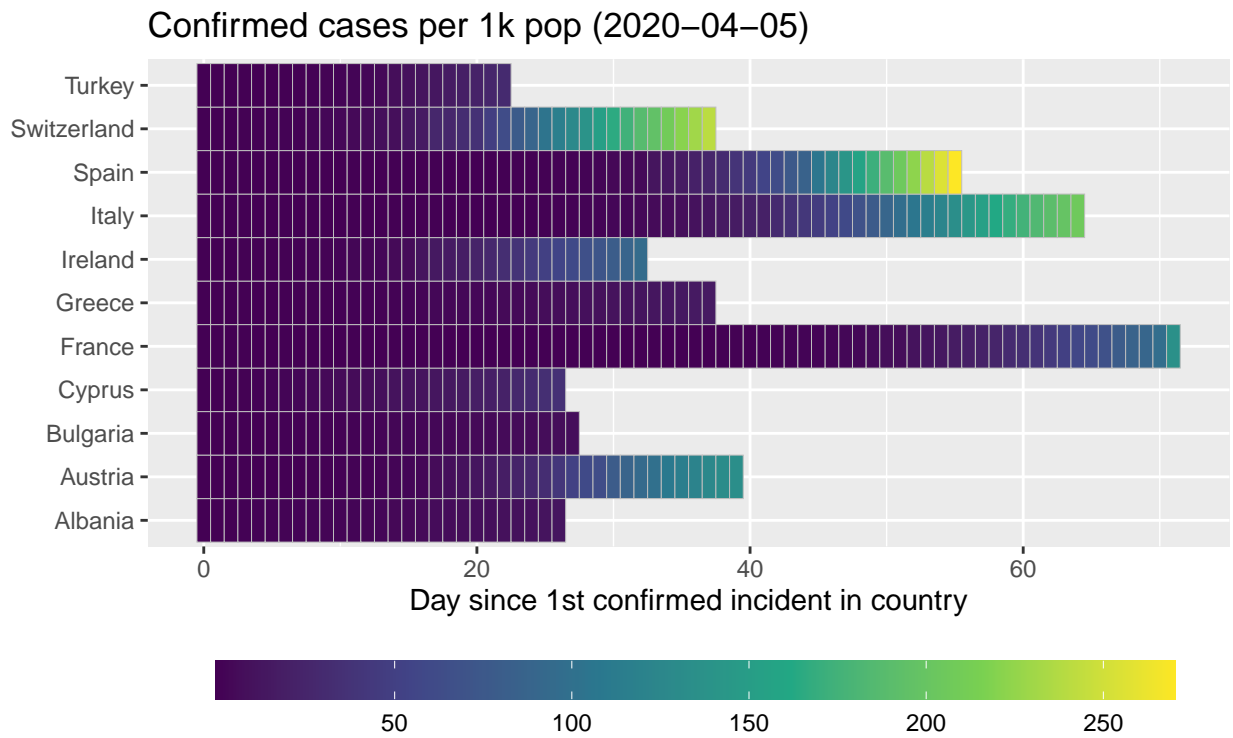
Figure 3: Confirmed Cases by 1000 population

2.2 Deaths

Deaths

Data: 2020−04−04. Scale tranformation: 'Logarithmic'. Intervention points: 'lockdown'.

Figure 4: Number of deaths by country

Deaths per 1k pop

Data: 2020−04−04. No scale tranformation. Intervention points: 'lockdown'.
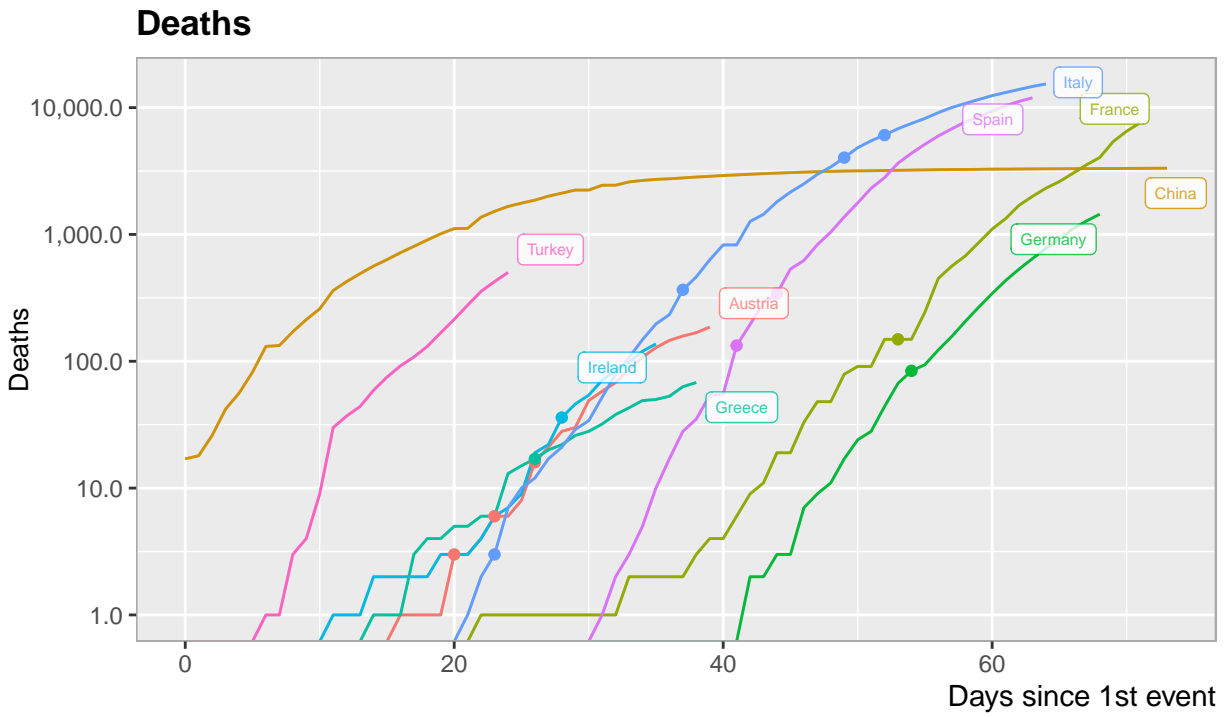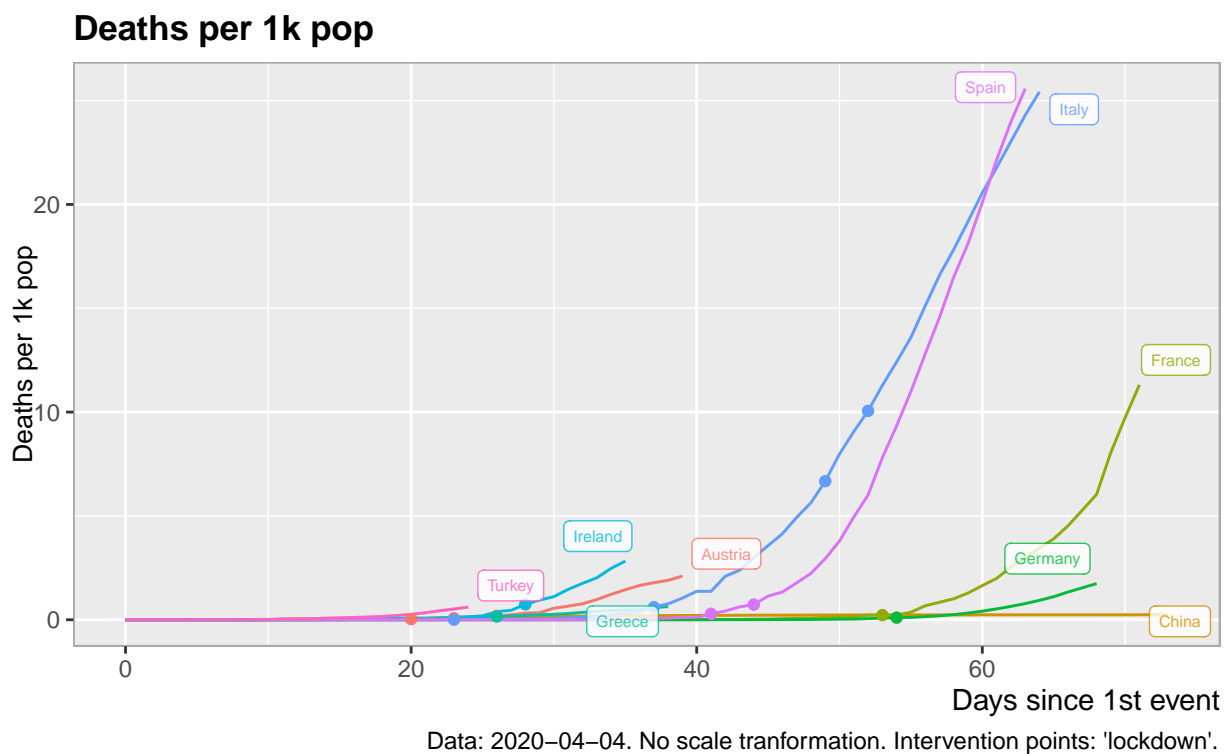
Figure 5: Deaths by 1000 population
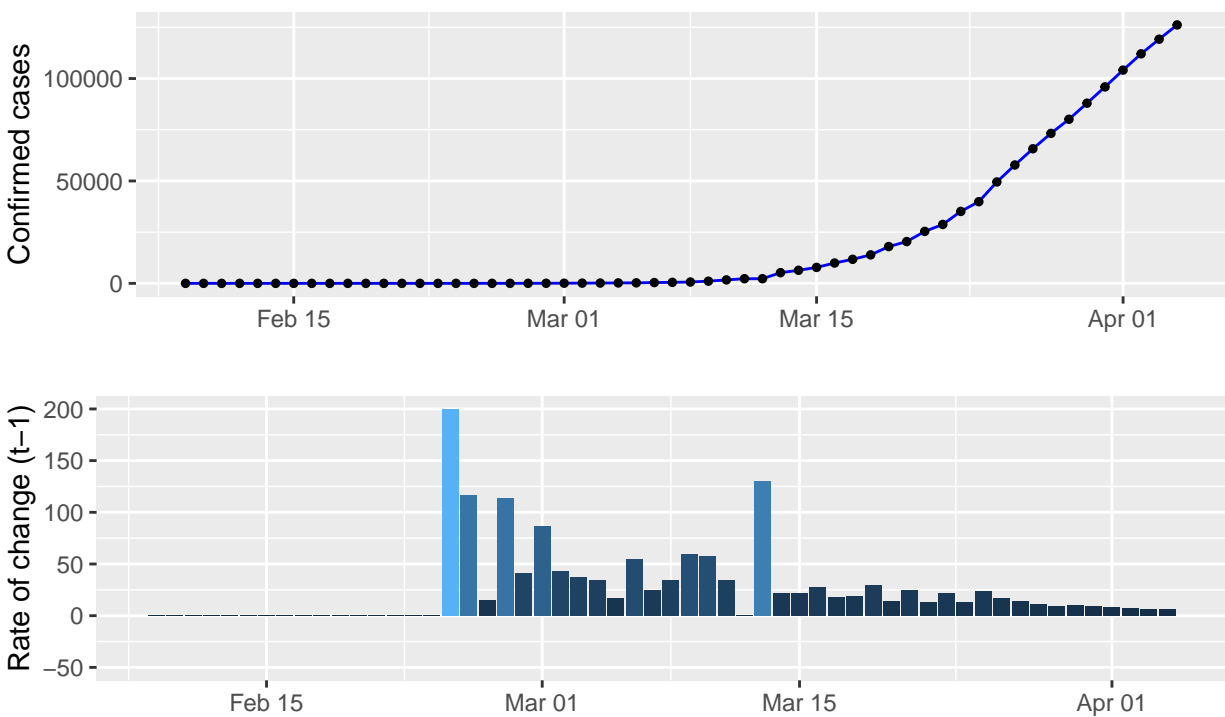
3   Rate of change over time

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
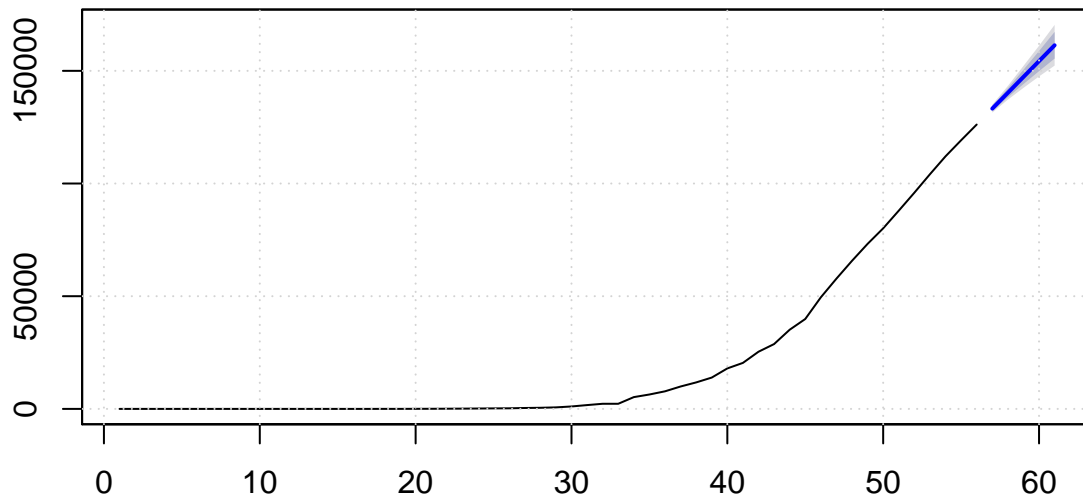
Projection of 'confirmed' cases for 5 ahead

Figure 7: ARIMA projection

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

	Estimation	Confidence 95% (Low)	Confidence 95% (High)
t+1 (2020-04-05)	133236	131477	134994
t+2 (2020-04-06)	140244	137217	143272
t+3 (2020-04-07)	147288	142429	152148
t+4 (2020-04-08)	154311	147509	161113
t+5 (2020-04-09)	161347	152313	170380

- The estimated proportion of cases detected is 1.91%.

- With data up to 2020-04-04 in Spain we have 126168 confirmed cases and 11947 deaths.

- Estimated doubling time (based on 5 days time window) is aproximatly 10.1 days
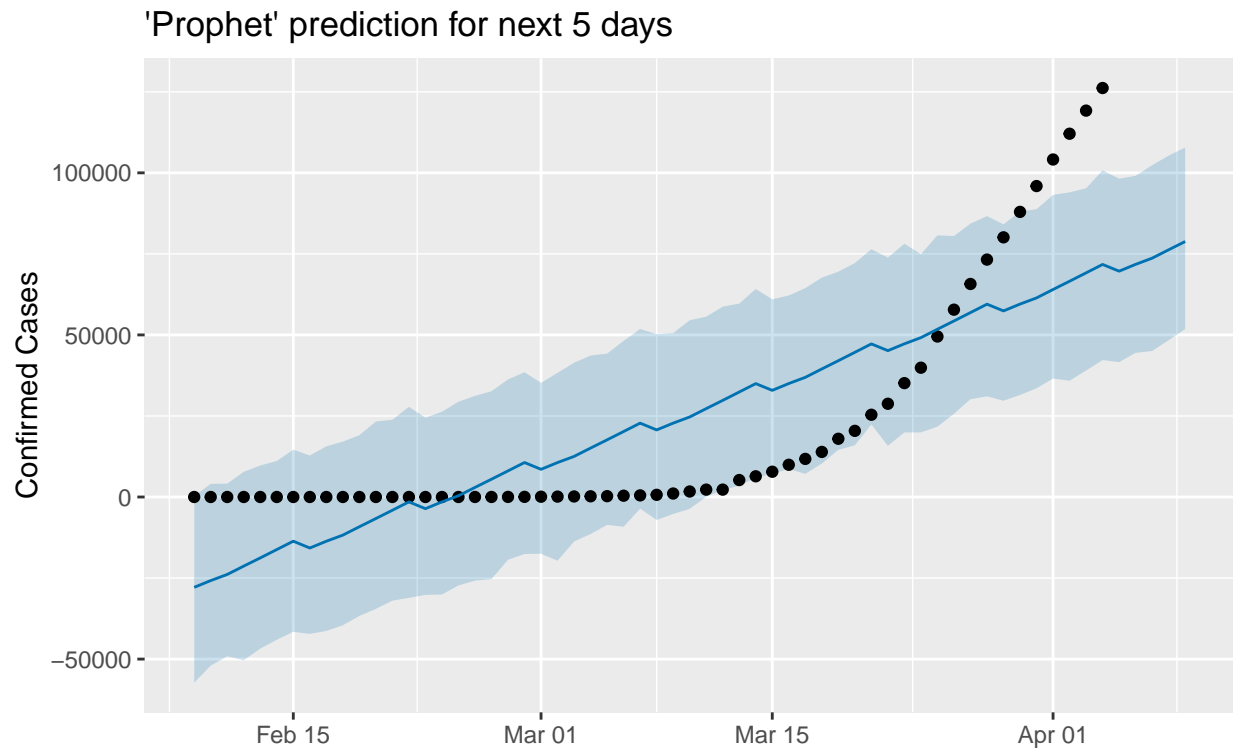
4.2   PROPHET projection

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	2020-04-05	69661	41614	98190
t+2	2020-04-06	71770	44474	99088
t+3	2020-04-07	73679	45029	102363
t+4	2020-04-08	76268	48368	105321
t+5	2020-04-09	78817	51815	107812