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.
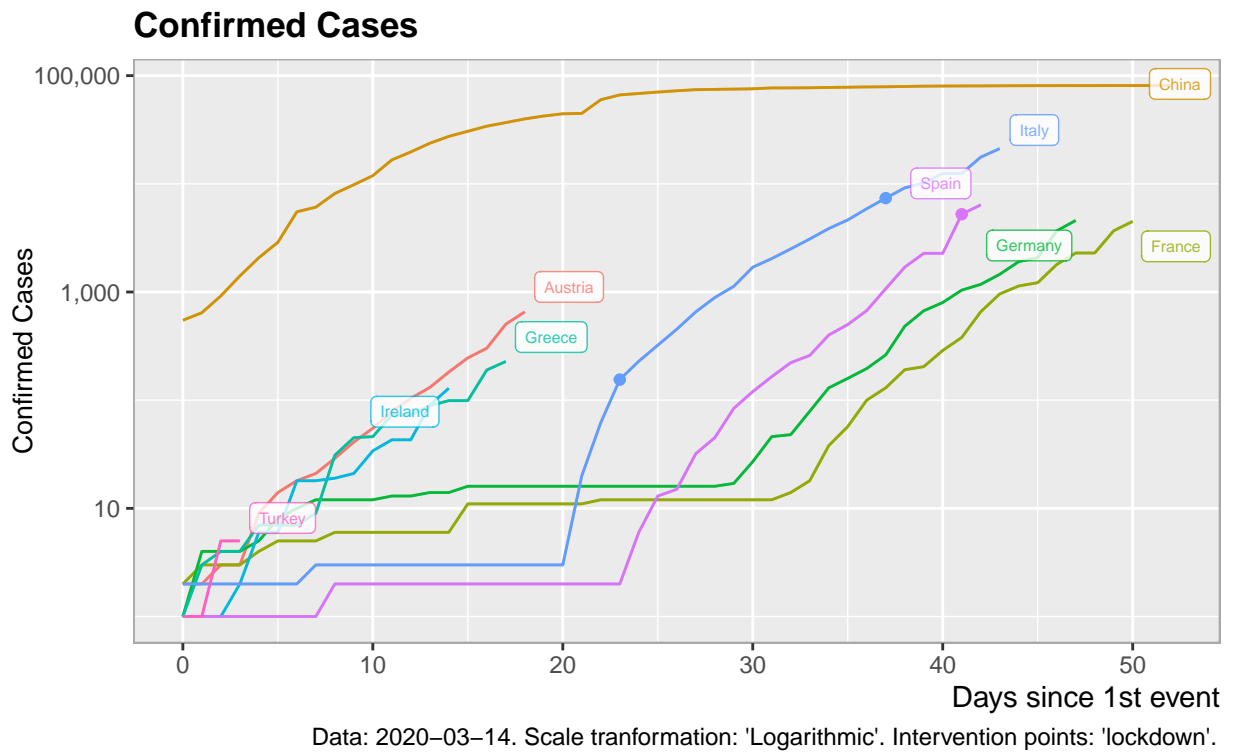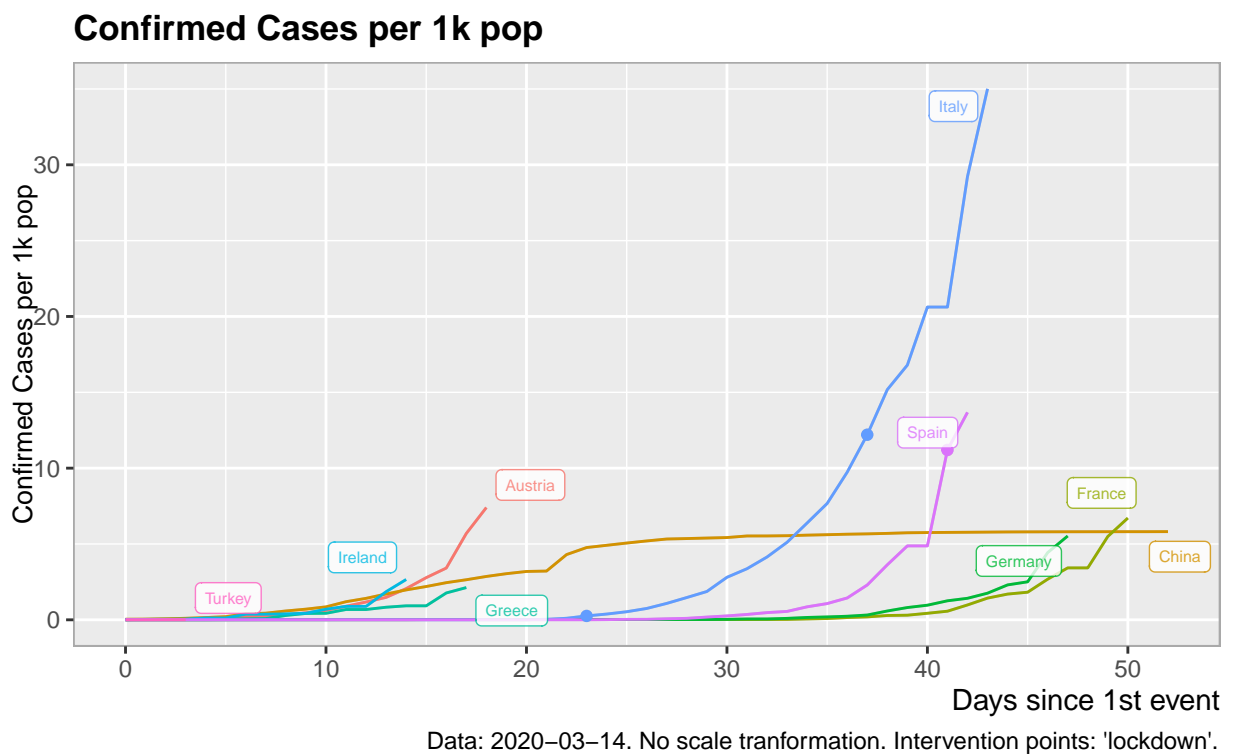
2.1 Confirmed Cases

Confirmed Cases

Data: 2020−03−14. Scale tranformation: 'Logarithmic'. Intervention points: 'lockdown'.

Figure 1: Confirmed Cases

Confirmed Cases per 1k pop

Data: 2020−03−14. No scale tranformation. Intervention points: 'lockdown'.

Figure 2: Confirmed Cases by 1000 population

Confirmed cases per 1k pop (2020−03−15)
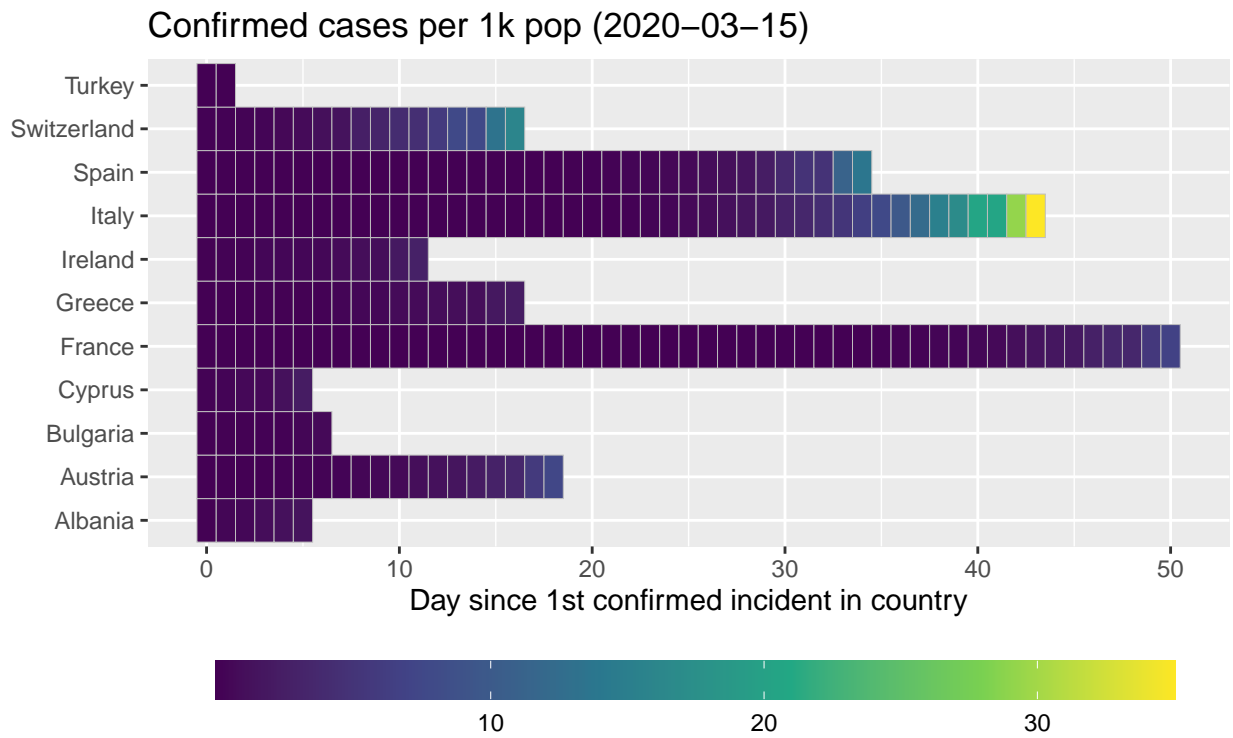
Figure 3: Confirmed Cases by 1000 population

2.2 Deaths

Deaths

Data: 2020−03−14. Scale tranformation: 'Logarithmic'. Intervention points: 'lockdown'.

Figure 4: Number of deaths by country

Deaths per 1k pop

Data: 2020−03−14. No scale tranformation. Intervention points: 'lockdown'.
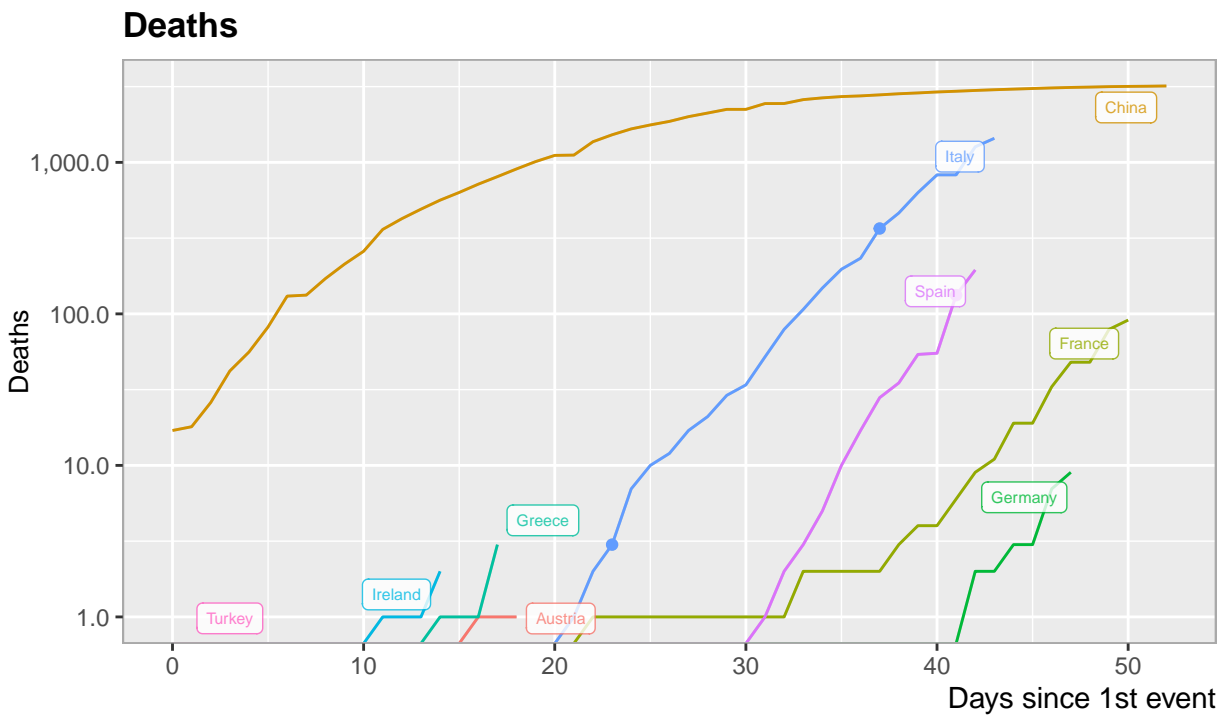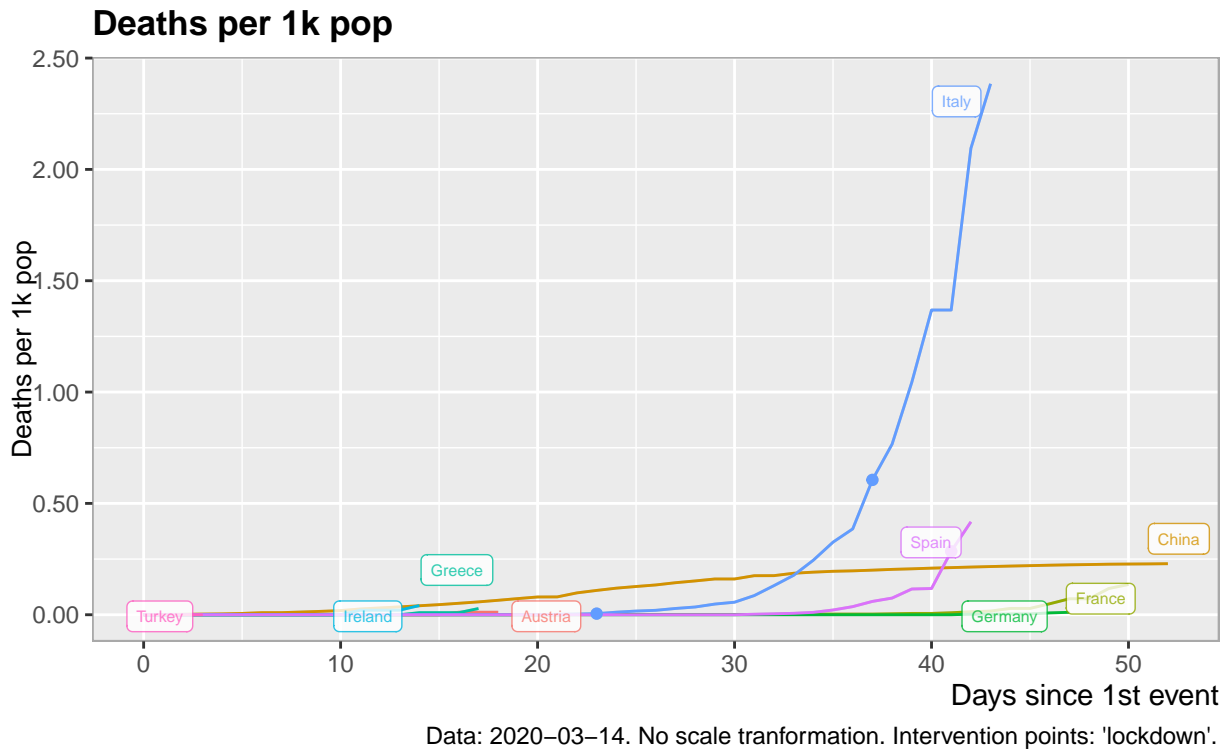
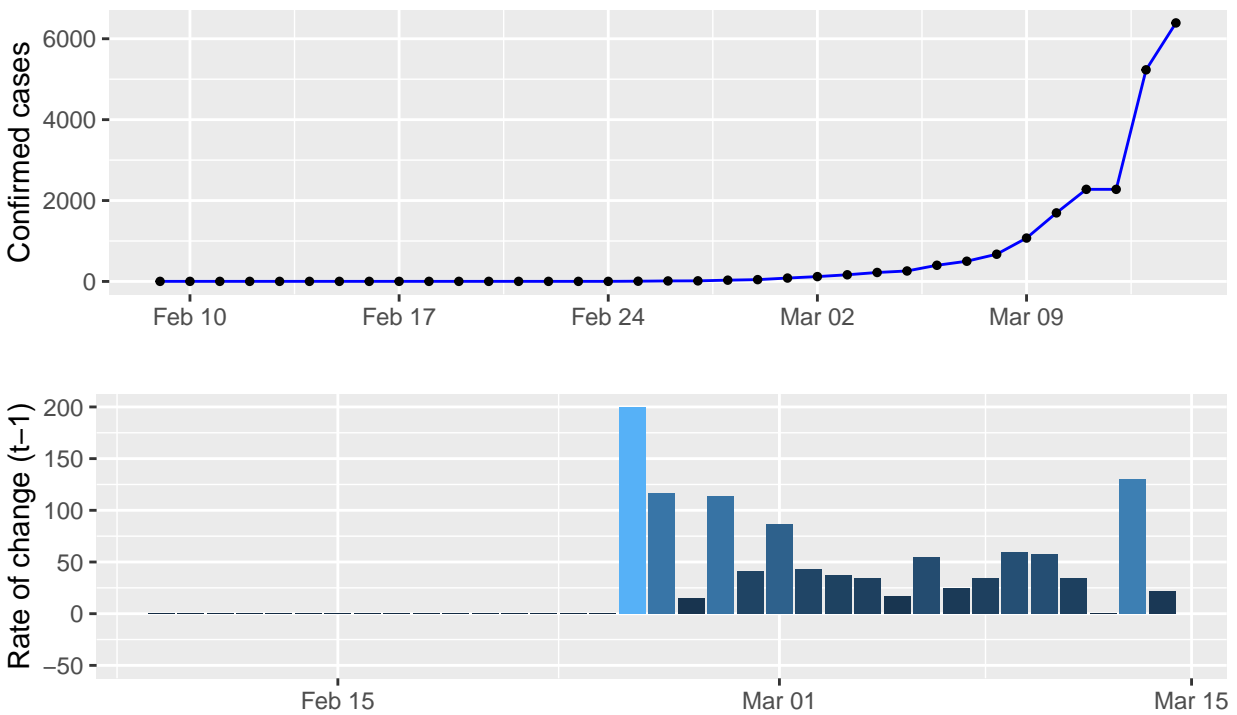Figure 5: Deaths by 1000 population

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
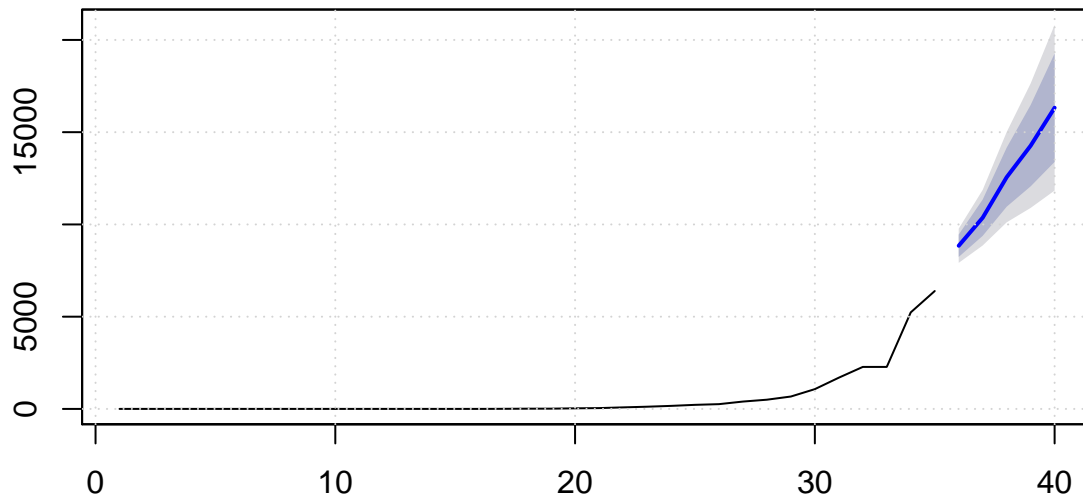
Projection of 'confirmed' cases for 5 ahead

Figure 7: ARIMA projection

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

	Estimation	Confidence 95% (Low)	Confidence 95% (High)
t+1 (2020-03-15)	8845	7918	9773
t+2 (2020-03-16)	10365	8860	11871
t+3 (2020-03-17)	12559	10113	15005
t+4 (2020-03-18)	14267	10896	17638
t+5 (2020-03-19)	16325	11836	20815

- The estimated proportion of cases detected is 0.17%.

- With data up to 2020-03-14 in Spain we have 6391 confirmed cases and 195 deaths.

- Estimated doubling time (based on 5 days time window) is aproximatly 2 days
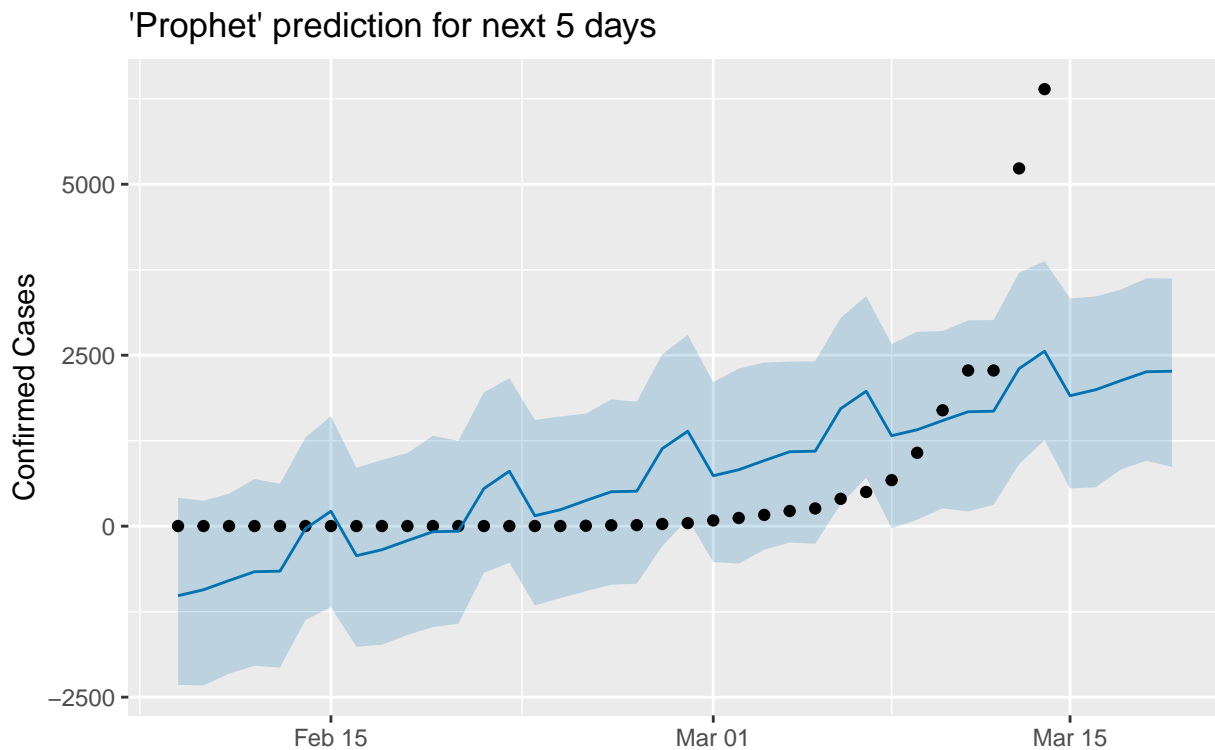
4.2 PROPHET projection

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	2020-03-15	1908	551.3	3332
t+2	2020-03-16	1995	568.7	3359
t+3	2020-03-17	2129	830.4	3460
t+4	2020-03-18	2258	956.2	3625
t+5	2020-03-19	2266	866.2	3623