

Covid19 Report

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1 The *CRISTINA* project

This report is part of a research project “**CoRona vIrus SpaTial aNAlysis**” (*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 goverment interventions as dots on top of each line.

2.1 Confirmed Cases

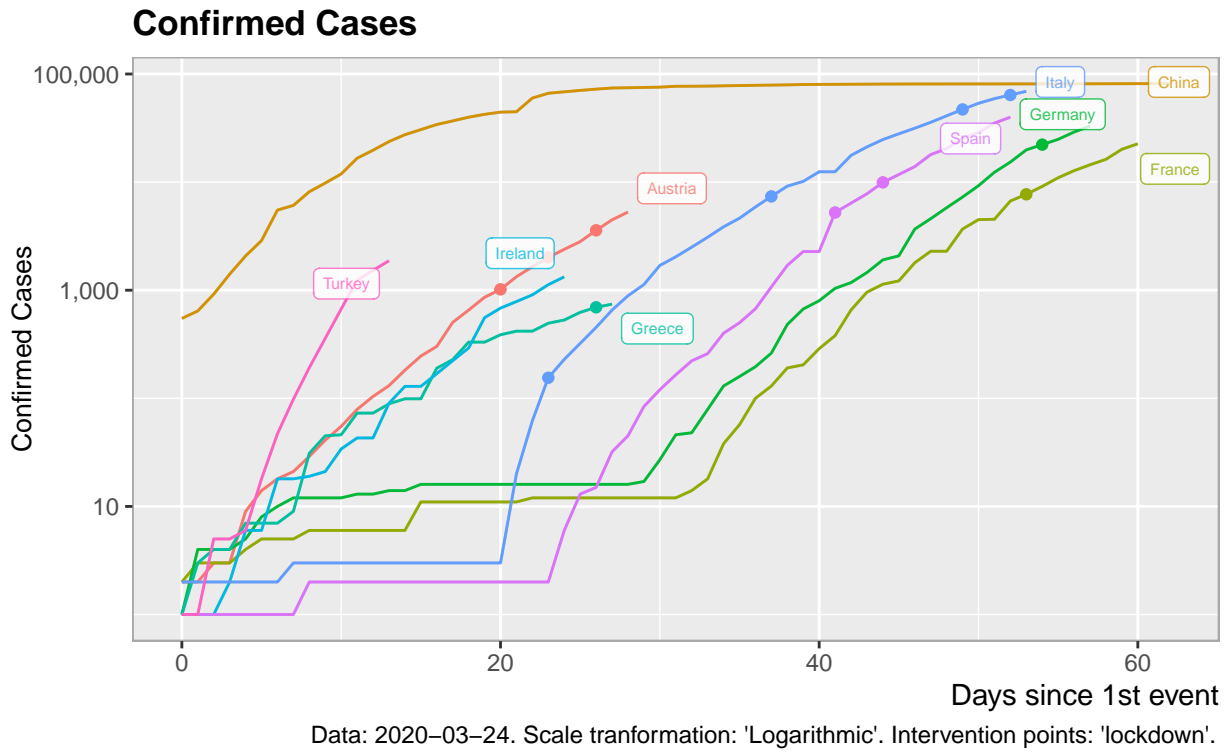


Figure 1: Confirmed Cases

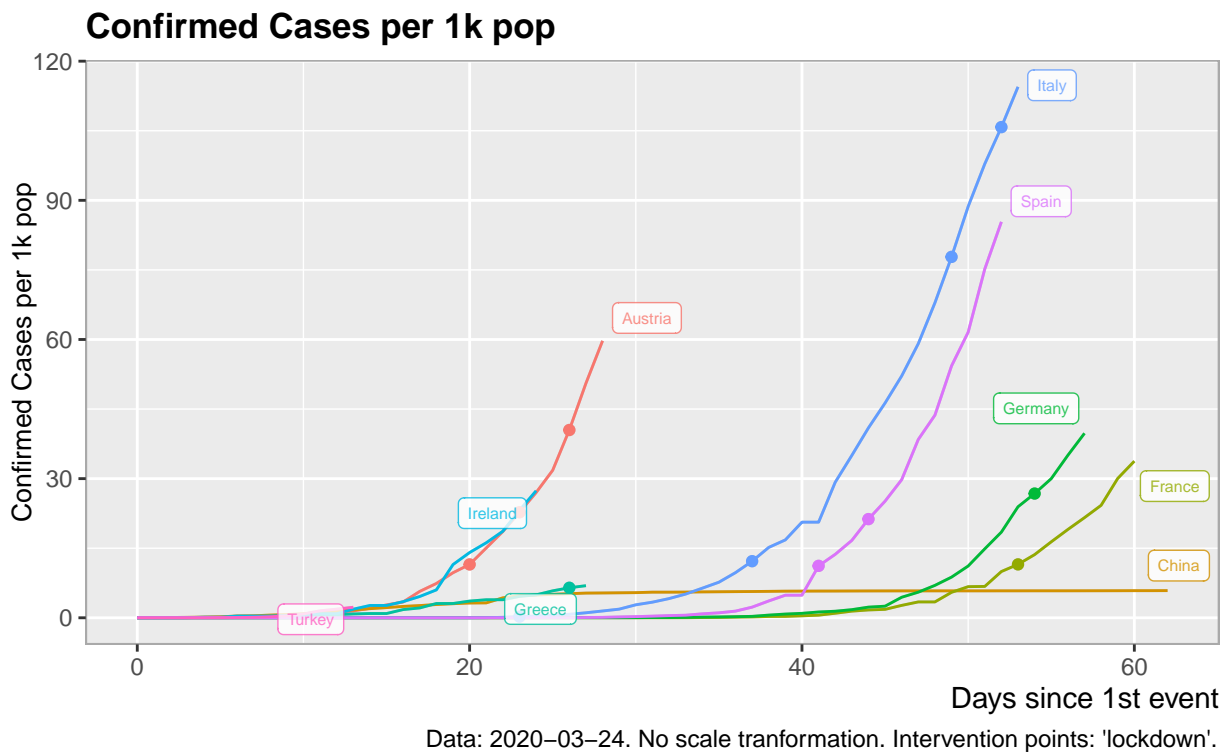


Figure 2: Confirmed Cases by 1000 population

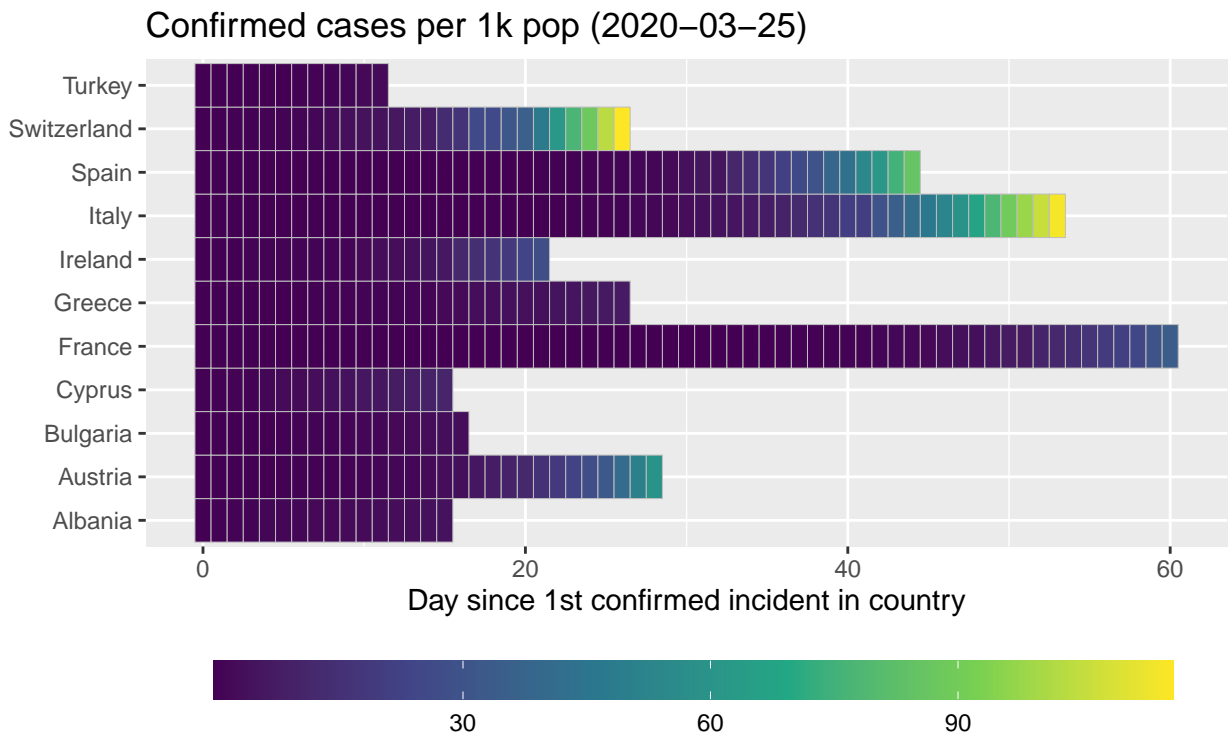


Figure 3: Confirmed Cases by 1000 population

2.2 Deaths

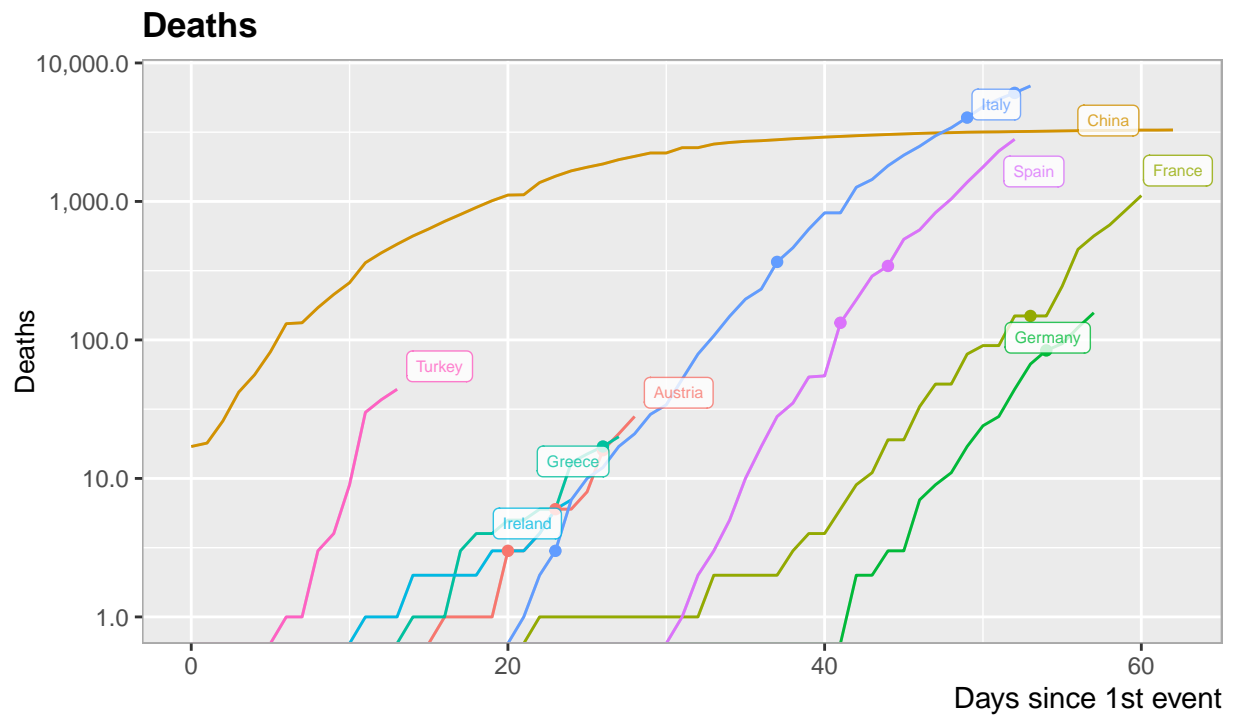


Figure 4: Number of deaths by country

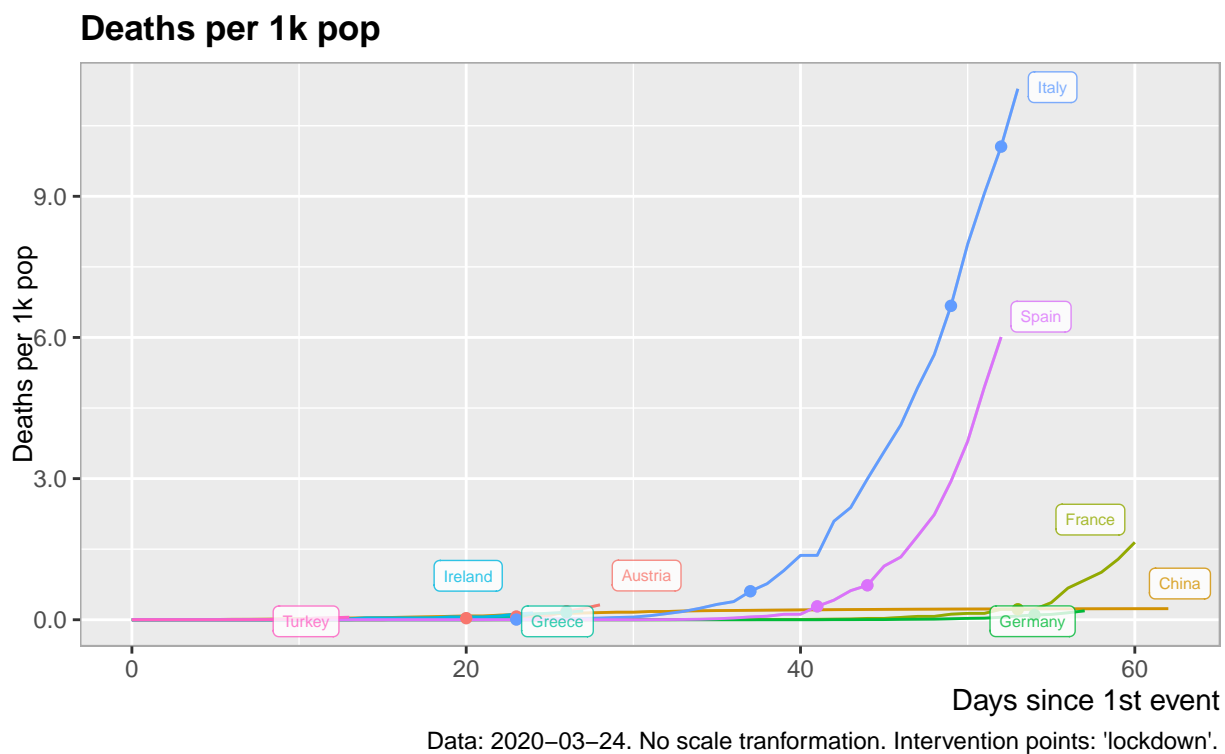


Figure 5: Deaths by 1000 population

3 Rate of change over time

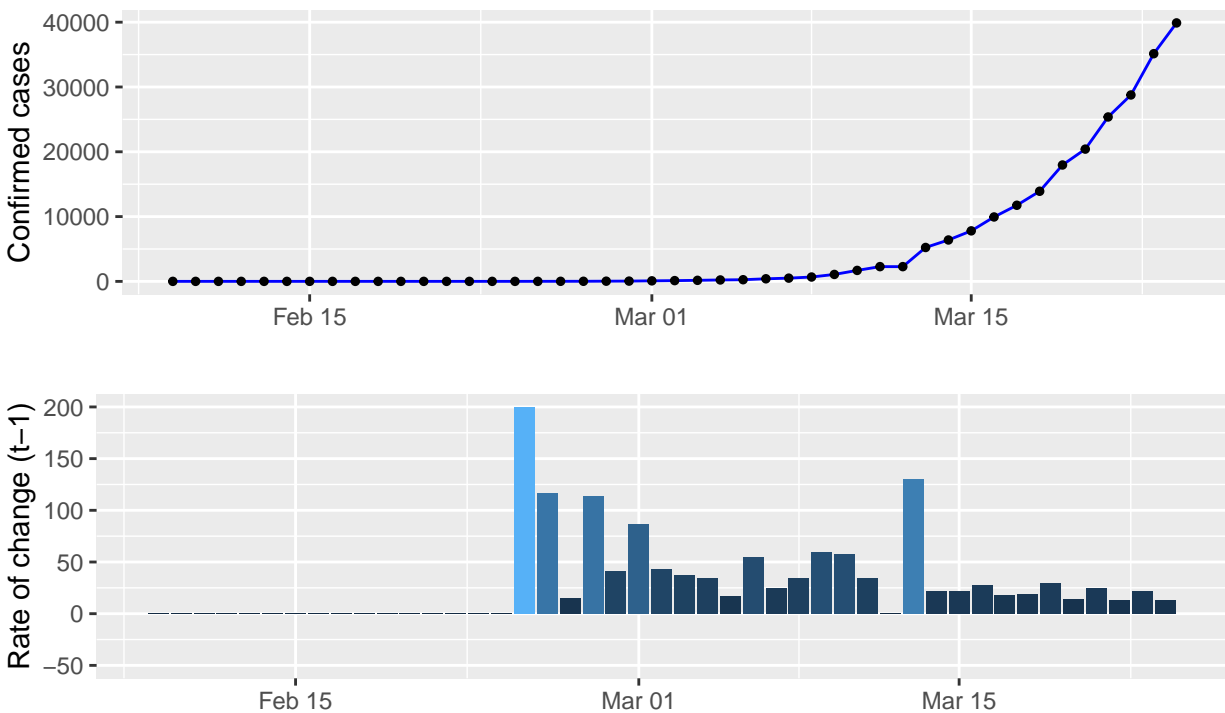


Figure 6: Rate of change of confirmed cases

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

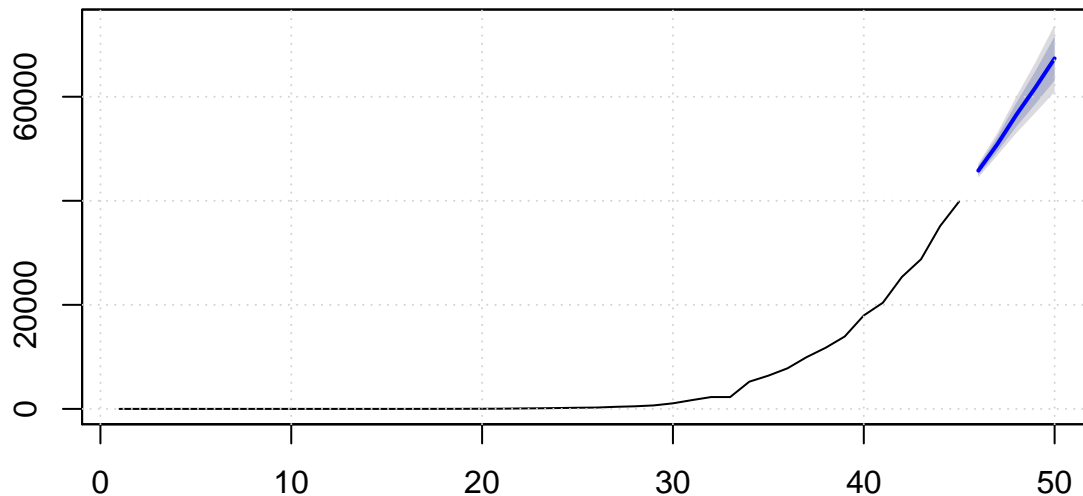


Figure 7: ARIMA projection

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

	Estimation	Confidence 95% (Low)	Confidence 95% (High)
t+1 (2020-03-25)	45803	44471	47135
t+2 (2020-03-26)	50877	48715	53038
t+3 (2020-03-27)	56559	53048	60071
t+4 (2020-03-28)	61803	56963	66643
t+5 (2020-03-29)	67364	60919	73809

- The estimated proportion of cases detected is 0.44%.
- With data up to 2020-03-24 in Spain we have 39885 confirmed cases and 2808 deaths.
- Estimated doubling time (based on 5 days time window) is approximately 4.2 days

4.2 PROPHET projection

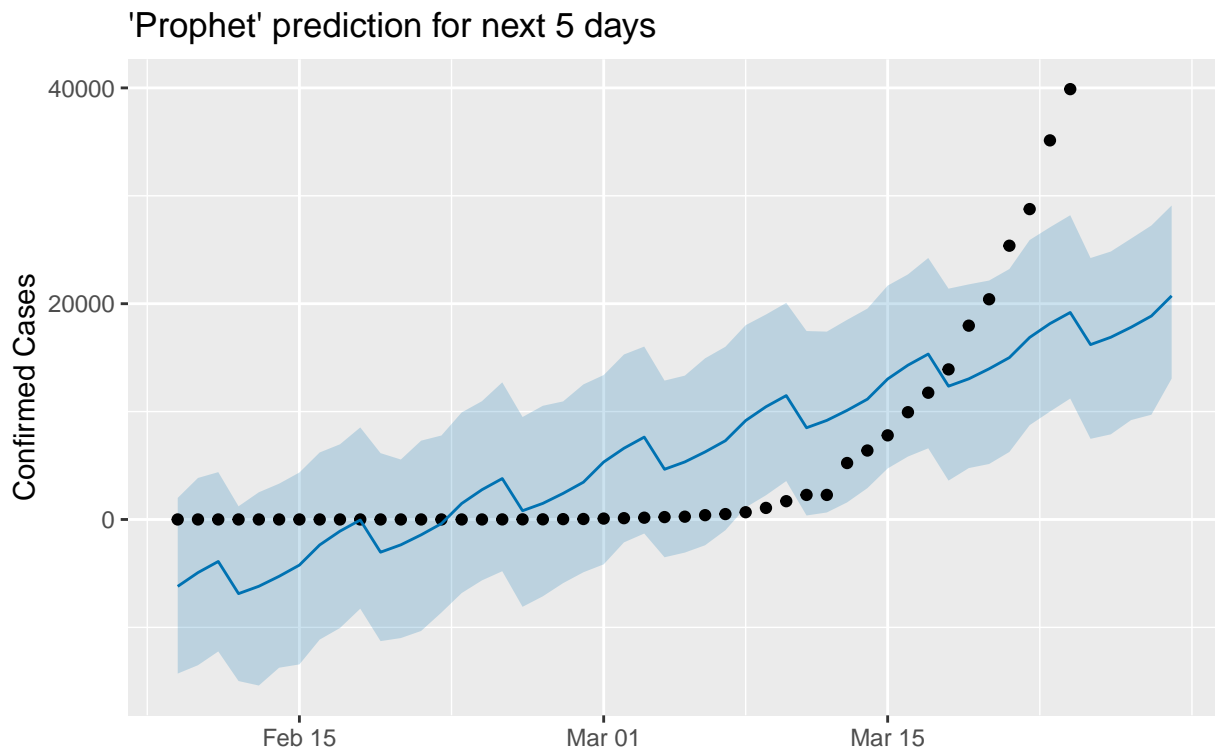


Figure 8: PROPHET Projection of confirmed cases over the next 5 days for Spain

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

	Future_Date	Estimation	Confidence 95% (Low)	Confidence 95% (High)
t+1	2020-03-25	16207	7475	24234
t+2	2020-03-26	16890	7891	24833
t+3	2020-03-27	17818	9213	26036
t+4	2020-03-28	18858	9709	27247
t+5	2020-03-29	20728	13055	29099