

Covid19 Report

Dimitris Kavroudakis

Assistant Professor of *Geographical Analysis*,
Department of Geography, University of the Aegean
dimitrisk@aegean.gr
www.dimitrisk.gr

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1 The *CRISTINA* project

This report is part of a research project “**Co**Rona vIrus **Spa**Tial **a**NAlysis” (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

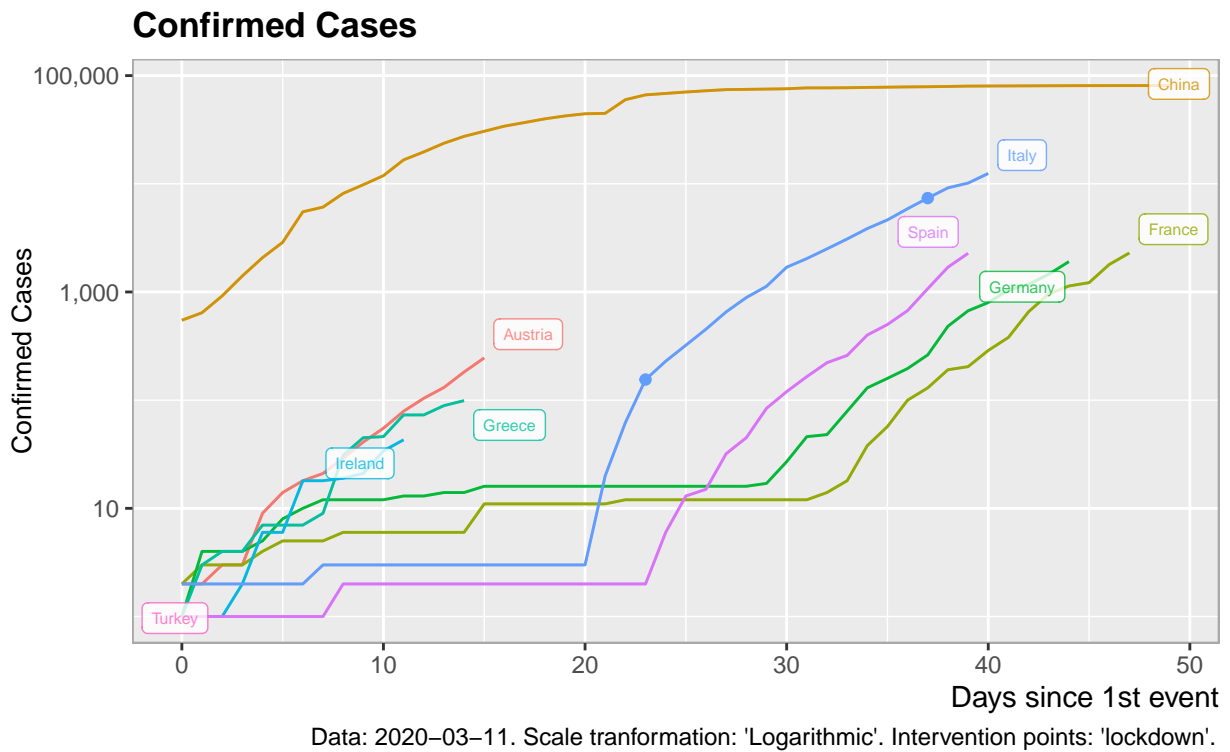


Figure 1: Confirmed Cases

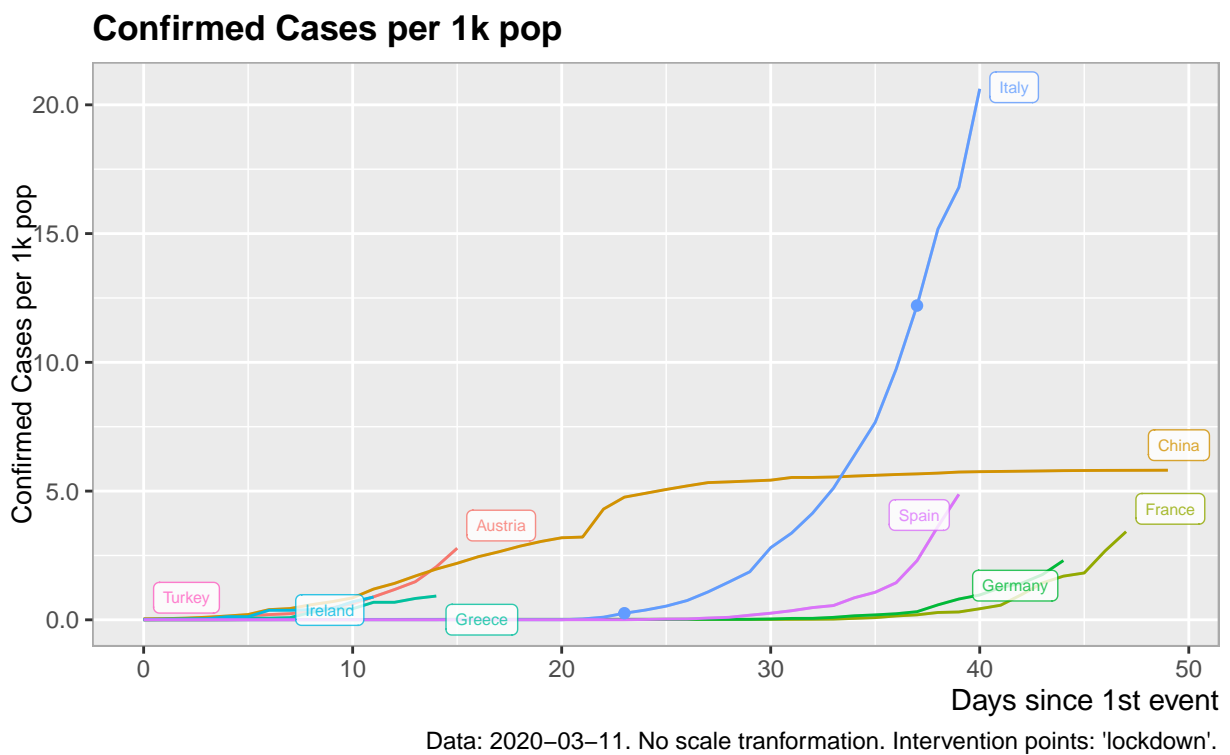


Figure 2: Confirmed Cases by 1000 population

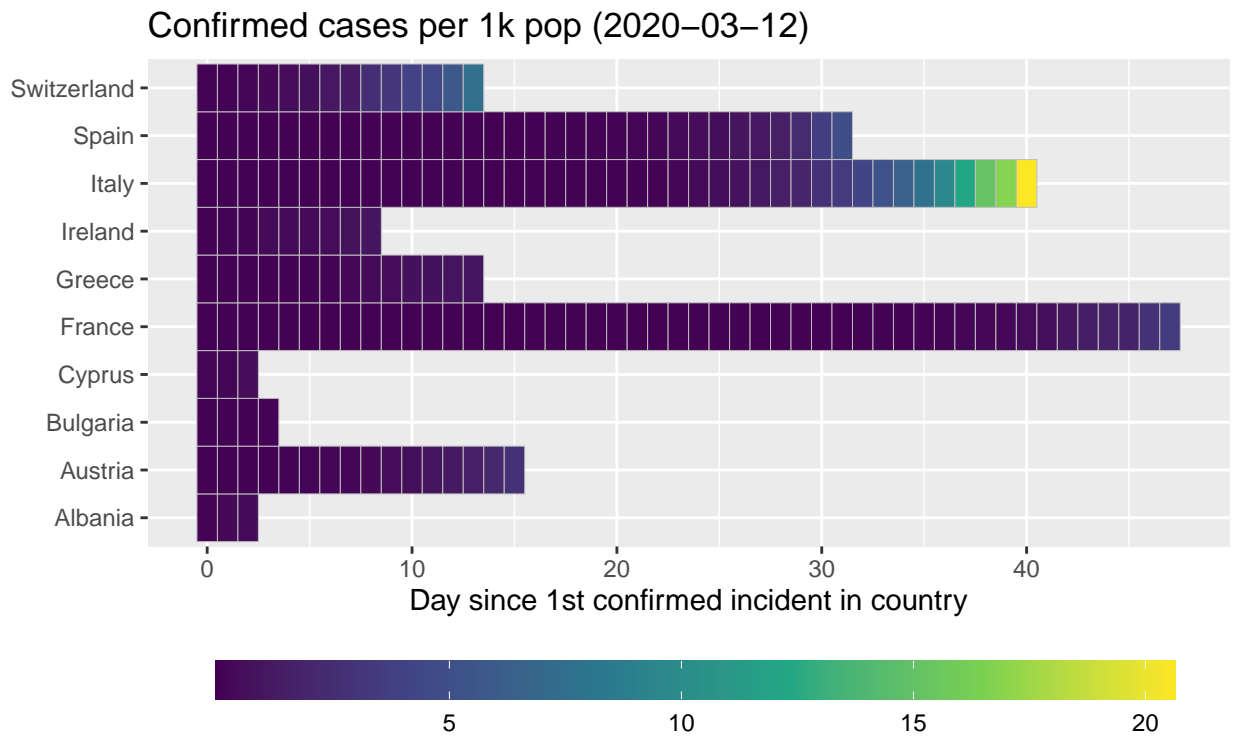


Figure 3: Confirmed Cases by 1000 population

2.2 Deaths

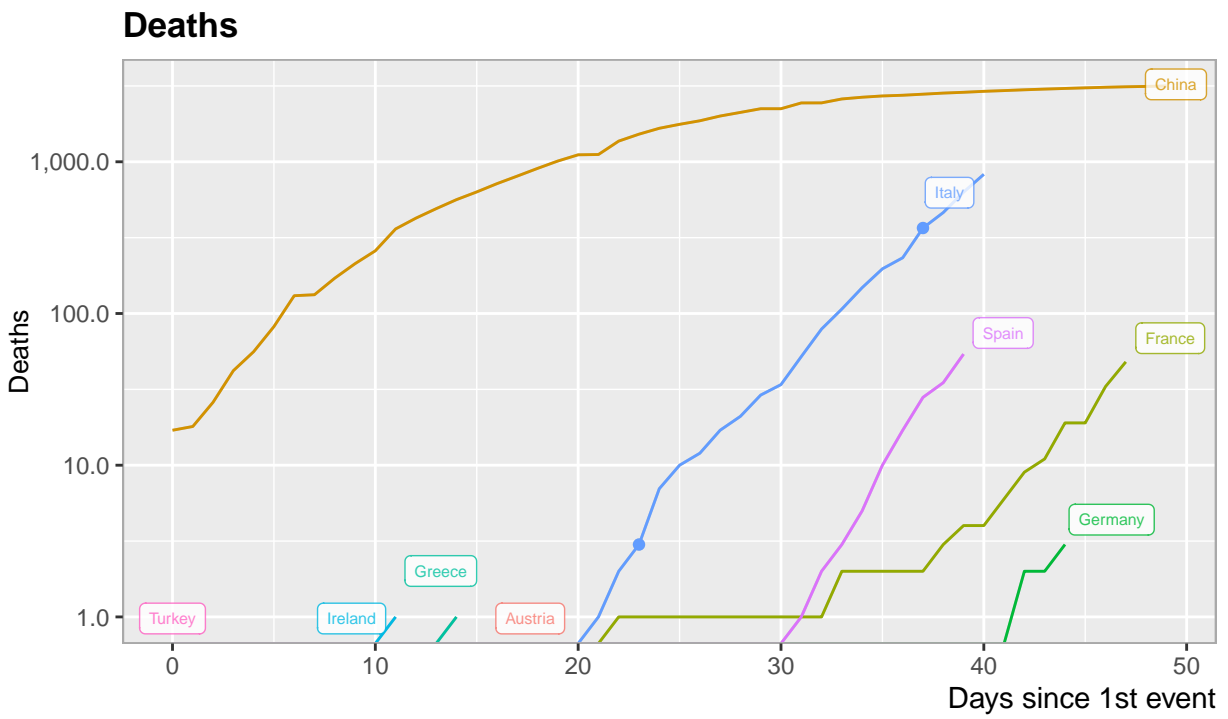


Figure 4: Number of deaths by country

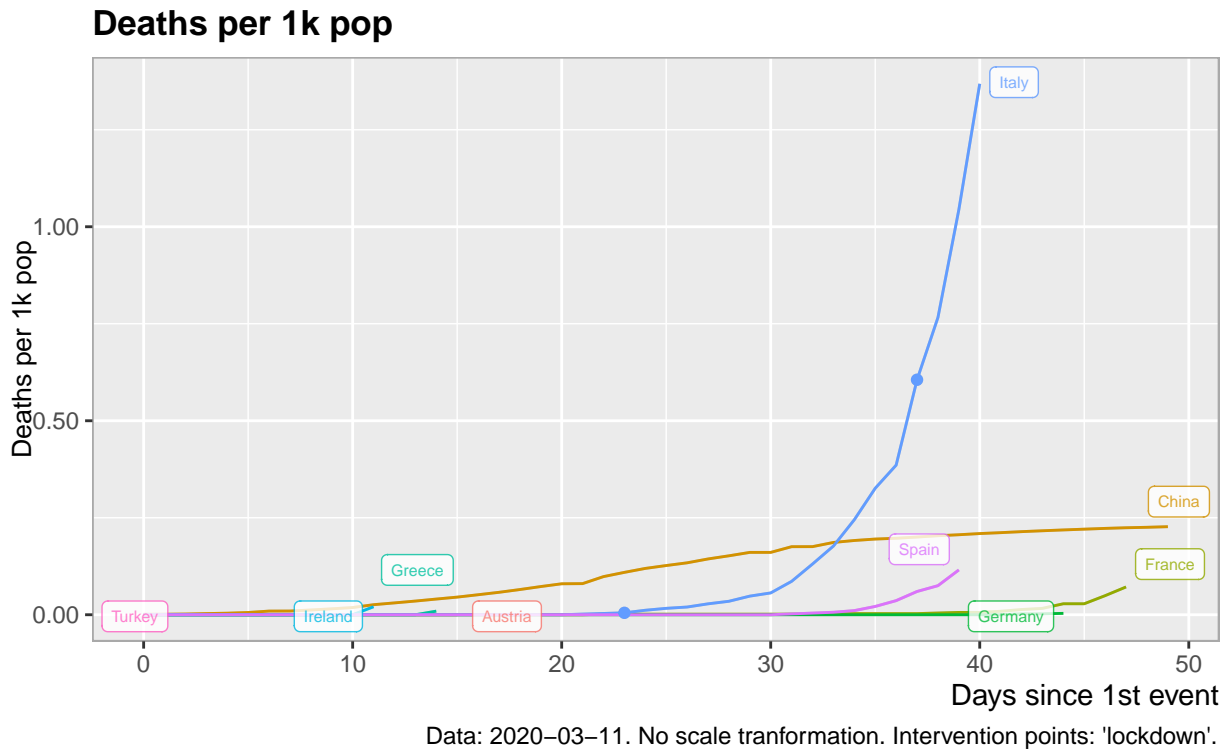


Figure 5: Deaths by 1000 population

3 Rate of change over time

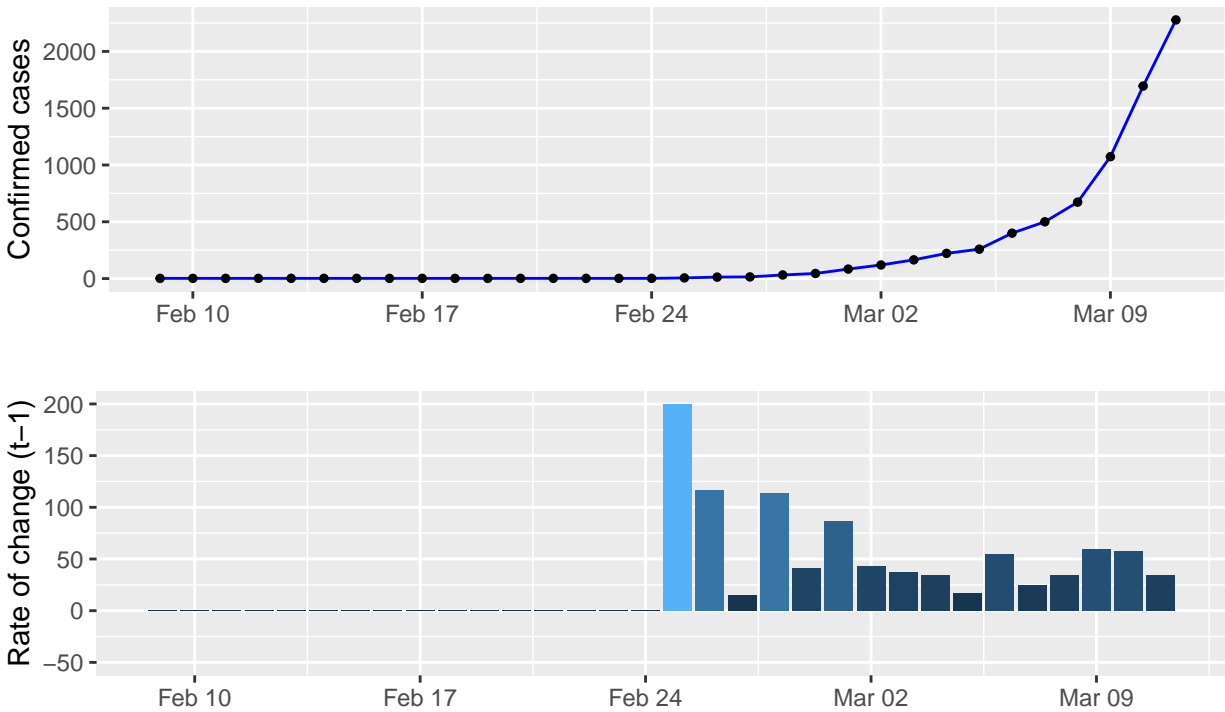


Figure 6: Rate of change of confirmed cases

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

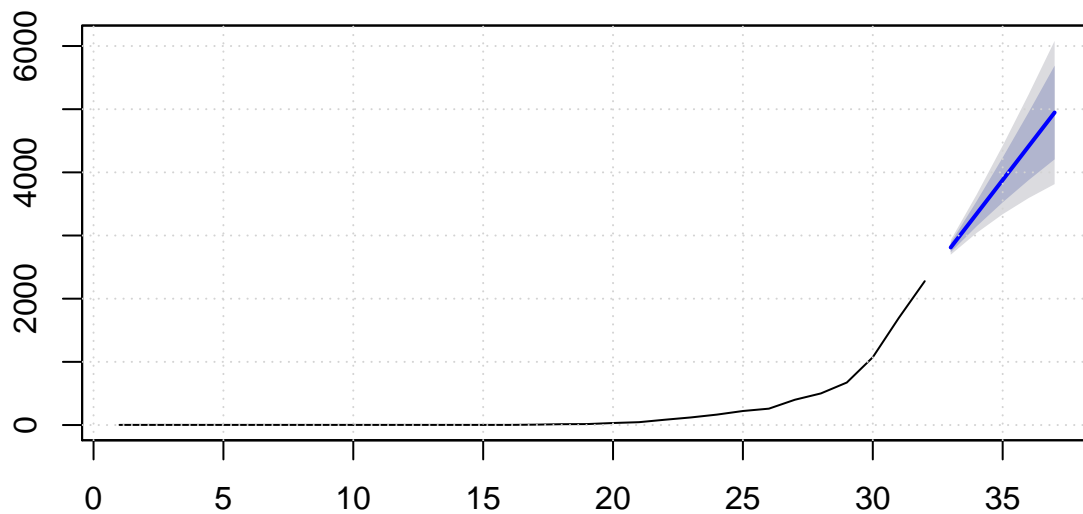


Figure 7: ARIMA projection

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

	Estimation	Confidence 95% (Low)	Confidence 95% (High)
t+1 (2020-03-12)	2811	2696	2926
t+2 (2020-03-13)	3345	3041	3649
t+3 (2020-03-14)	3879	3337	4421
t+4 (2020-03-15)	4413	3593	5234
t+5 (2020-03-16)	4947	3814	6081

- We cannot estimate the detection percentage yet. We need more data.
- With data up to 2020-03-11 in Spain we have 2277 confirmed cases and 54 deaths.
- Estimated doubling time (based on 5 days time window) is approximately 1.8 days

4.2 PROPHET projection

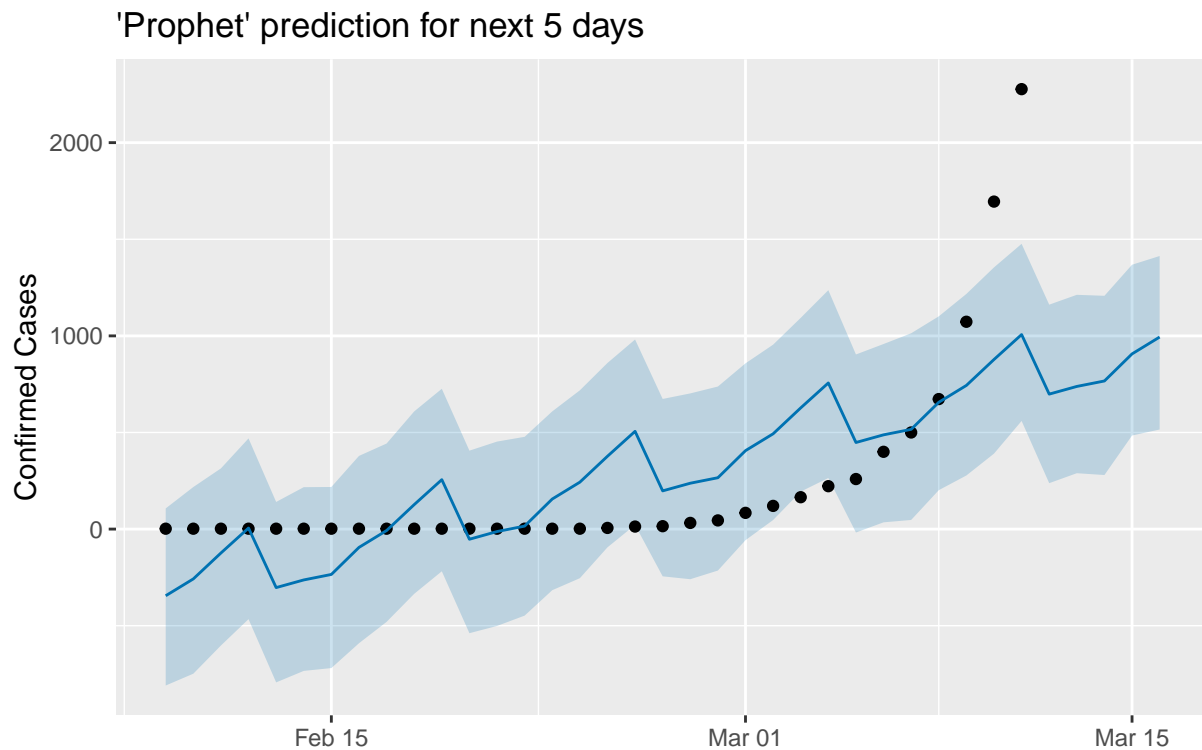


Figure 8: PROPHET Projection of confirmed cases over the next 5 days for Spain

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

	Future_Date	Estimation	Confidence 95% (Low)	Confidence 95% (High)
t+1	2020-03-12	698.6	237.7	1162
t+2	2020-03-13	738.2	289.2	1213
t+3	2020-03-14	766.6	279.8	1207
t+4	2020-03-15	906.7	484.2	1368
t+5	2020-03-16	993.9	515.4	1413