

Covid19 Report

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

2020-03-12

Contents

1	The <i>CRISTINA</i> project	1
2	Greece	1
2.1	Confirmed Cases	2
2.2	Deaths	3
3	Rate of change over time	4
4	Estimations	5
4.1	ARIMA projection	5
4.2	PROPHET projection	6

1 The *CRISTINA* project

This report is part of a research project “**Co**Rona vIrus **Spa**Tial **aNA**lysis” (CRISTINA) which examines the time series progress of COVID-19 events in 177 countries of the world.

2 Greece

A series of visualizations for the progress of COVID-19 for **Greece**. 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

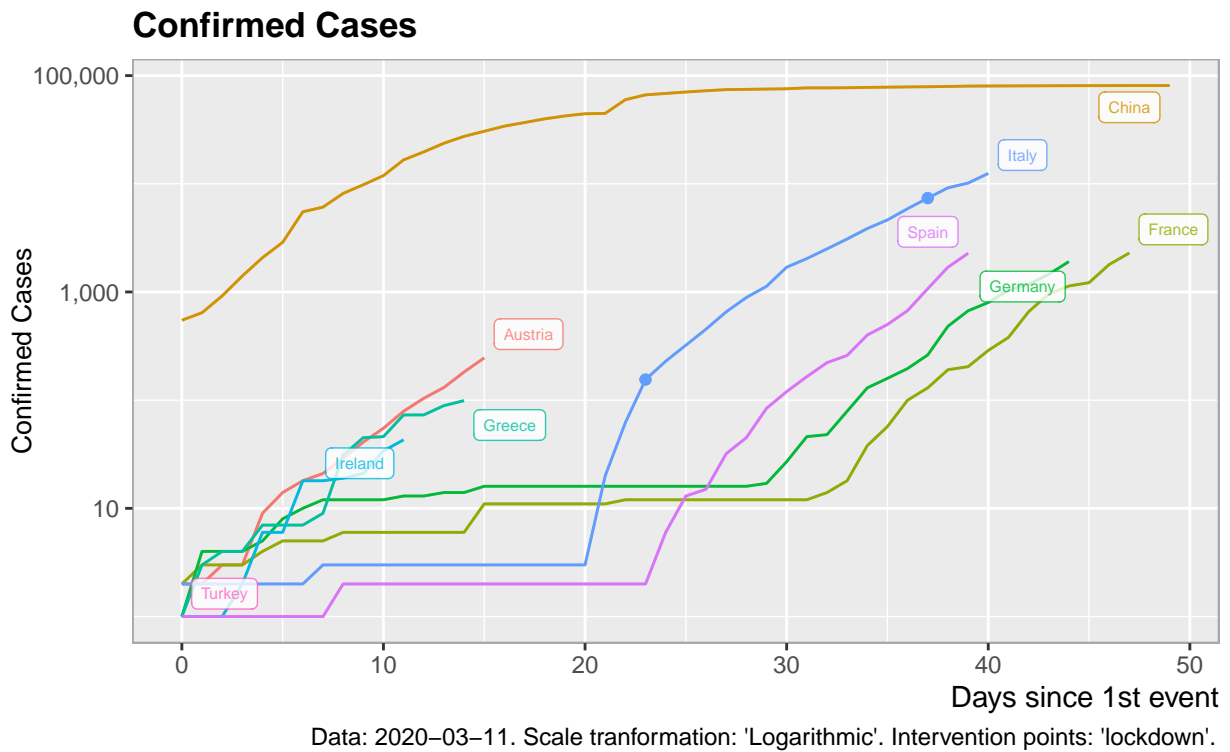


Figure 1: Confirmed Cases

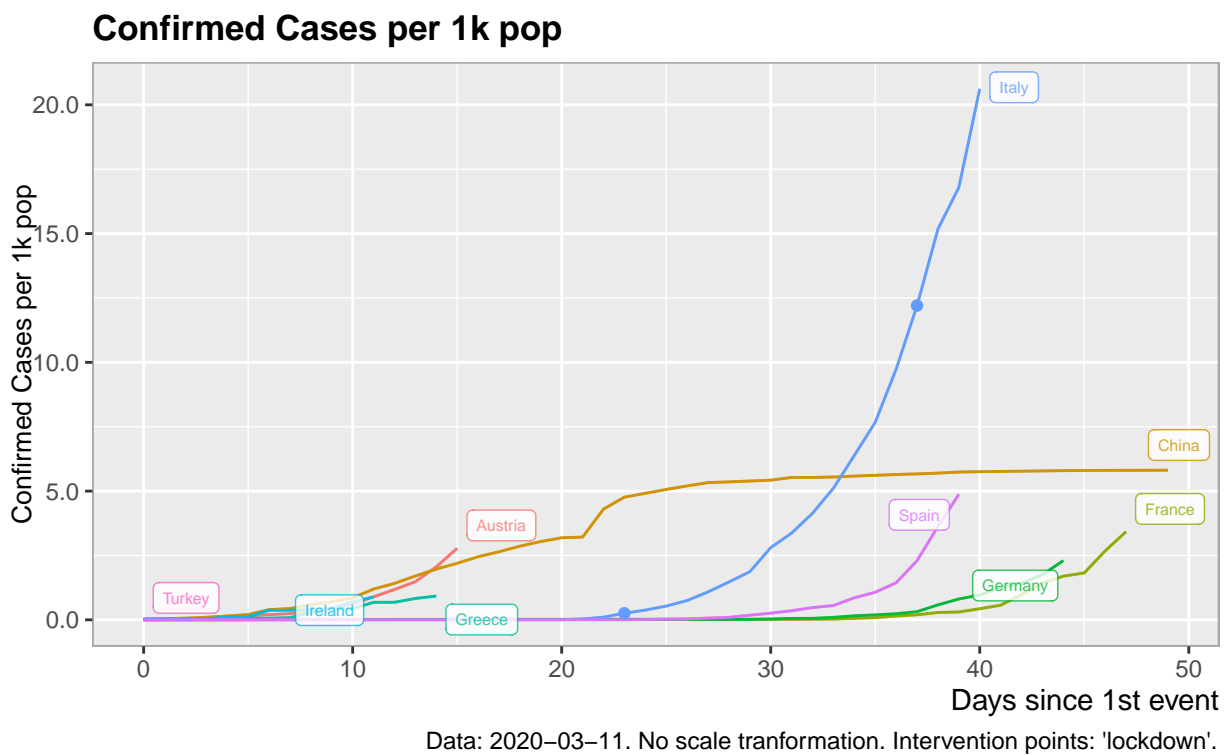


Figure 2: Confirmed Cases by 1000 population

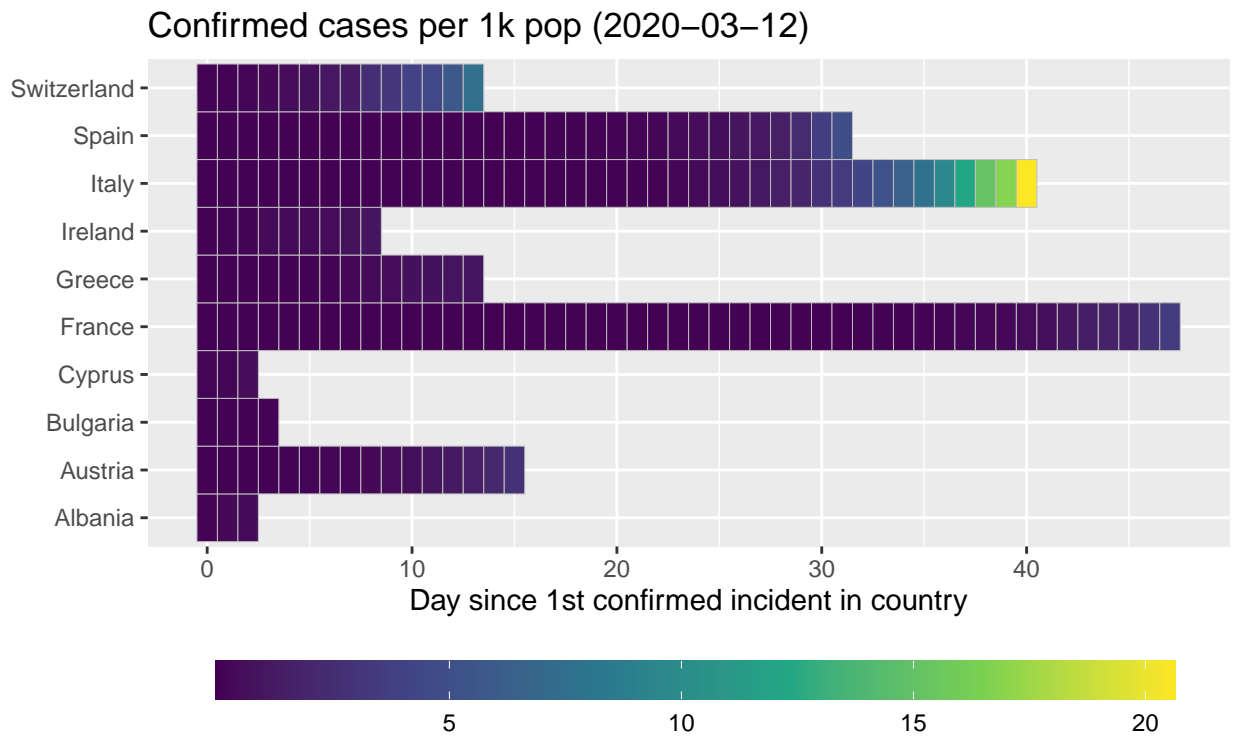


Figure 3: Confirmed Cases by 1000 population

2.2 Deaths

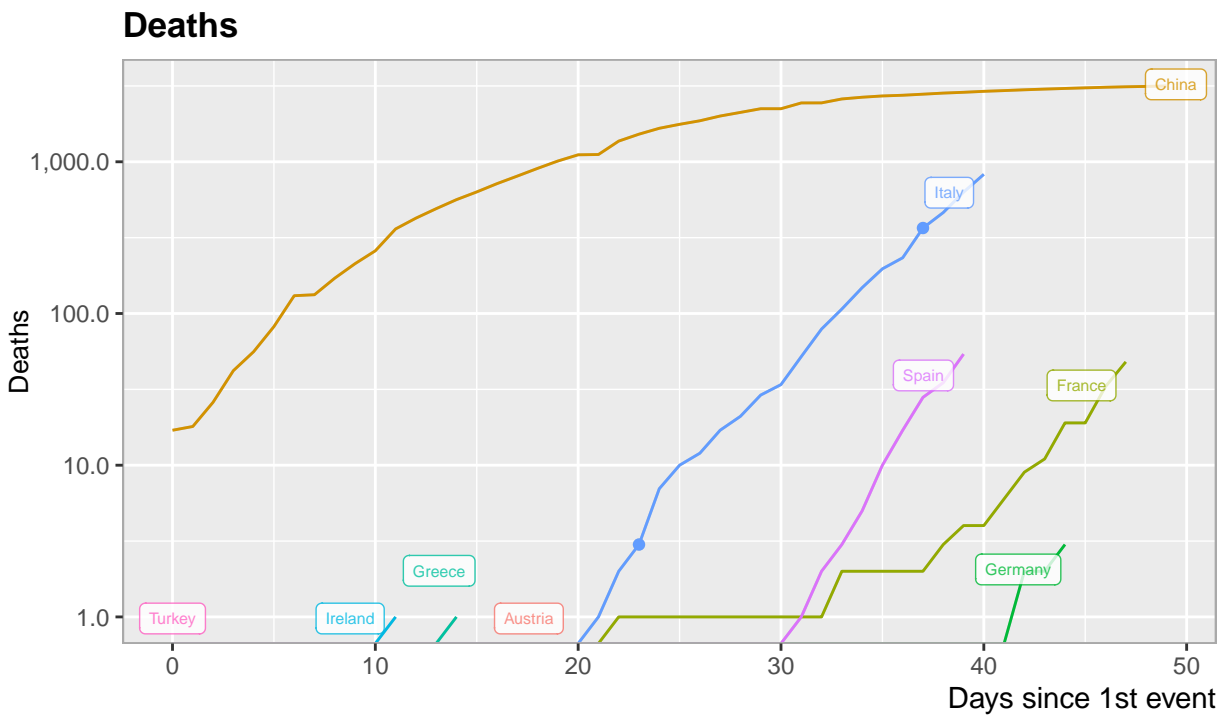


Figure 4: Number of deaths by country

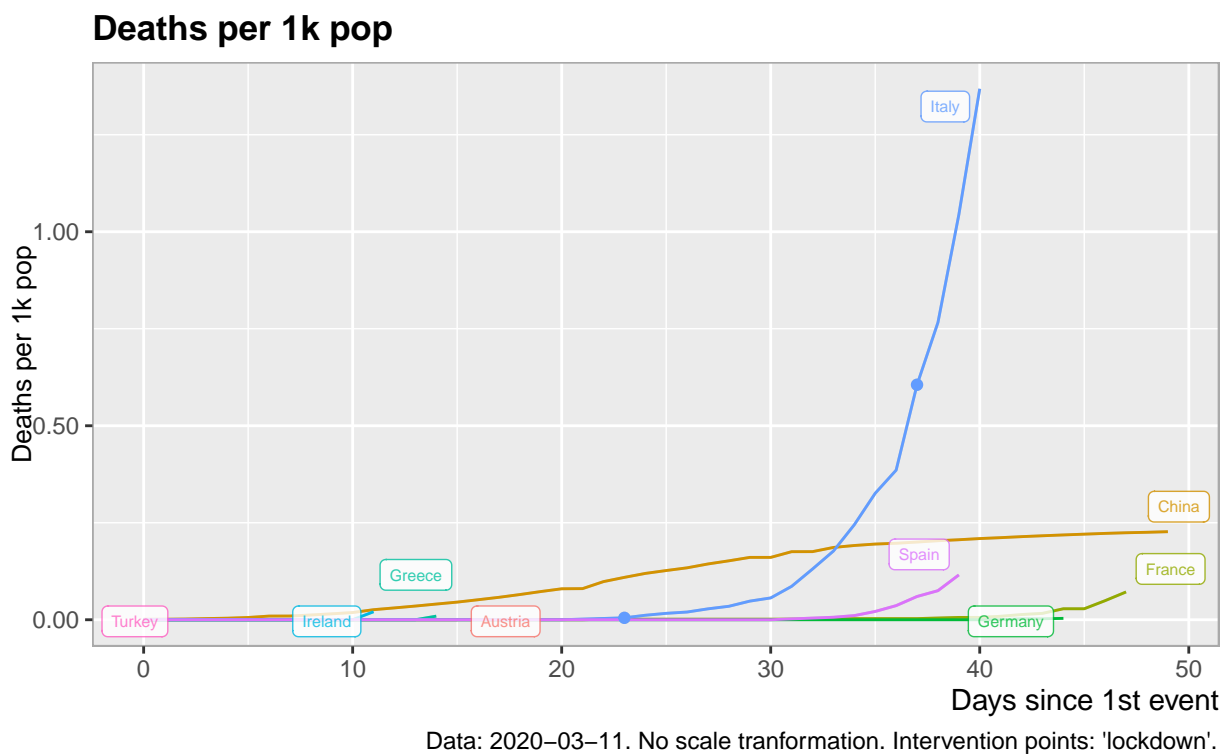


Figure 5: Deaths by 1000 population

3 Rate of change over time

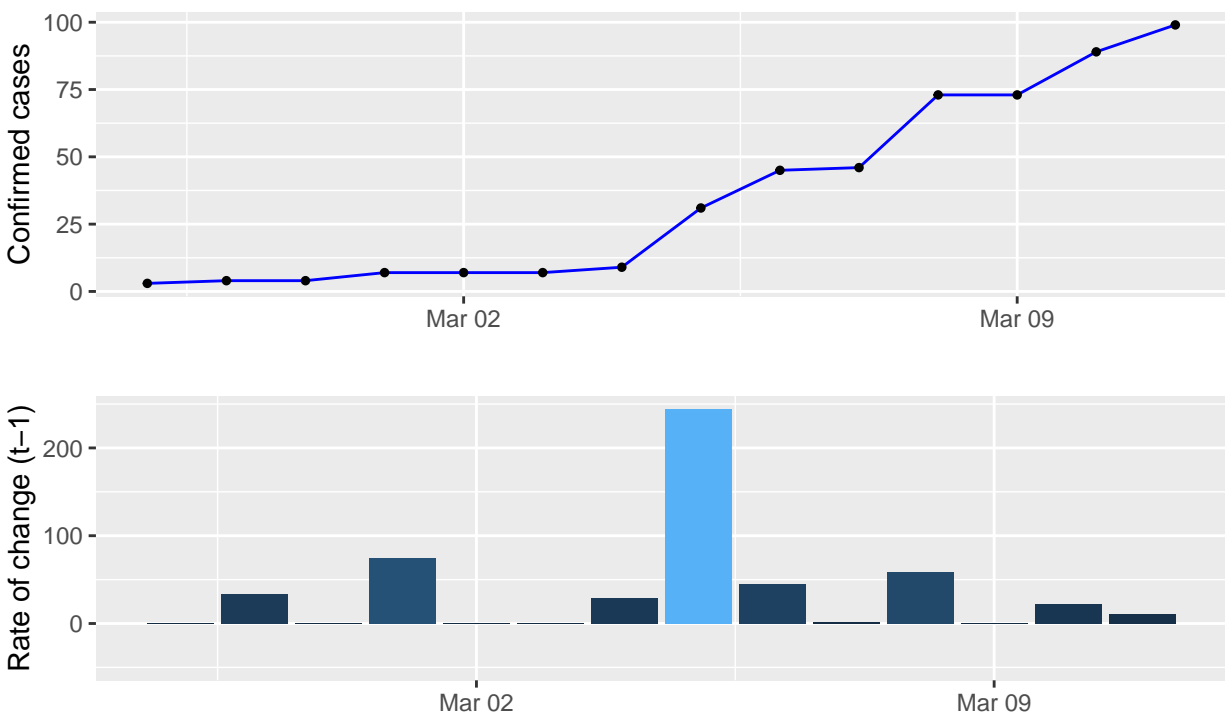


Figure 6: Rate of change of confirmed cases

4 Estimations

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

4.1 ARIMA projection

Projection of 'confirmed' cases for 5 ahead

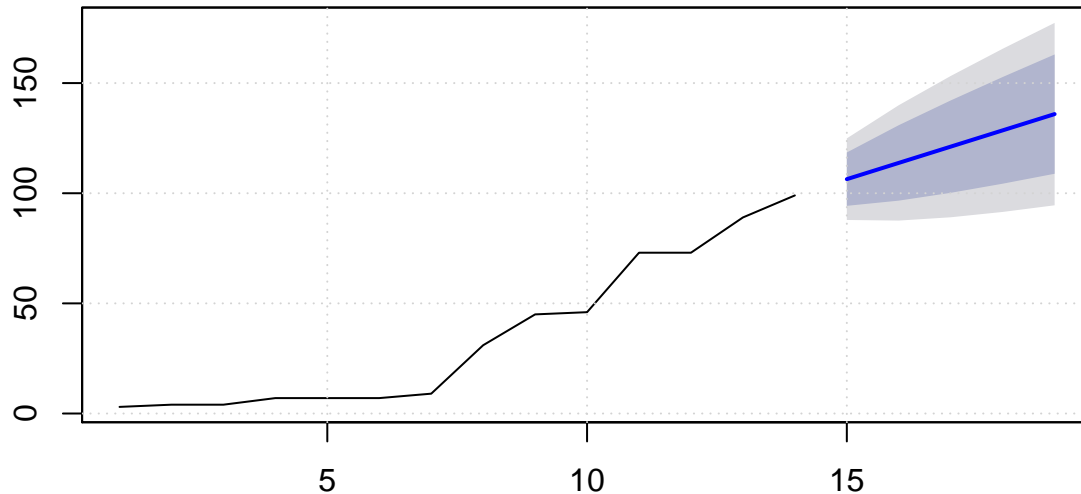


Figure 7: ARIMA projection

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

	Estimation	Confidence 95% (Low)	Confidence 95% (High)
t+1 (2020-03-12)	106.4	87.87	124.9
t+2 (2020-03-13)	113.8	87.58	140
t+3 (2020-03-14)	121.2	89.08	153.2
t+4 (2020-03-15)	128.5	91.5	165.6
t+5 (2020-03-16)	135.9	94.52	177.3

- We cannot estimate the detection percentage yet. We need more data.
- With data up to 2020-03-11 in Greece we have 99 confirmed cases and 1 deaths.
- Estimated doubling time (based on 5 days time window) is aproximatly 4 days

4.2 PROPHET projection

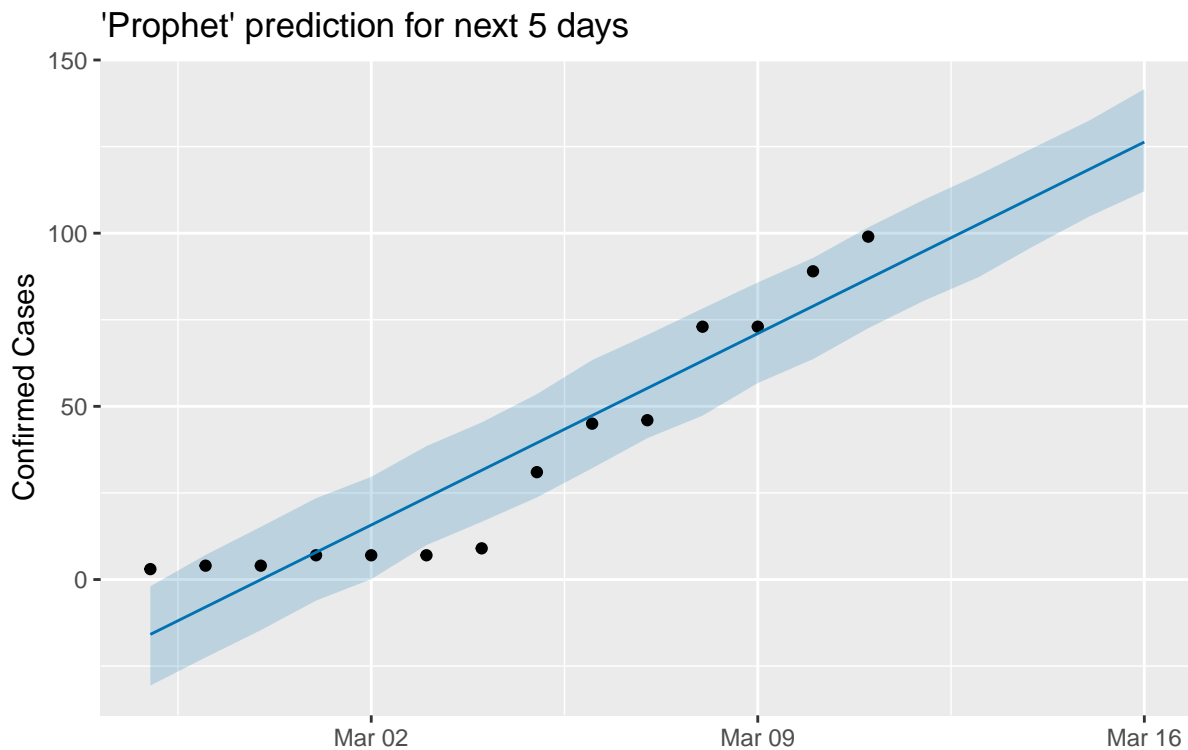


Figure 8: PROPHET Projection of confirmed cases over the next 5 days for Greece

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

	Future_Date	Estimation	Confidence 95% (Low)	Confidence 95% (High)
t+1	2020-03-12	94.72	80.42	109.6
t+2	2020-03-13	102.6	87.31	116.9
t+3	2020-03-14	110.5	96.3	124.7
t+4	2020-03-15	118.4	104.8	132.5
t+5	2020-03-16	126.3	112.1	141.6