

# 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 “**CoRona vIrus SpaTial aNAlysis**” (*CRISTINA*) which examines the time series progress of COVID-19 events in 177 countries of the world.

## 2 Italy

A series of visualizations for the progress of COVID-19 for **Italy**. We use absolute numbering scale and logarithmic scale to visualize the progress of “*confirmed cases*”, “*deaths*” and “*recovered cases*”. We also indicate the government interventions as dots on top of each line.

### 2.1 Confirmed Cases

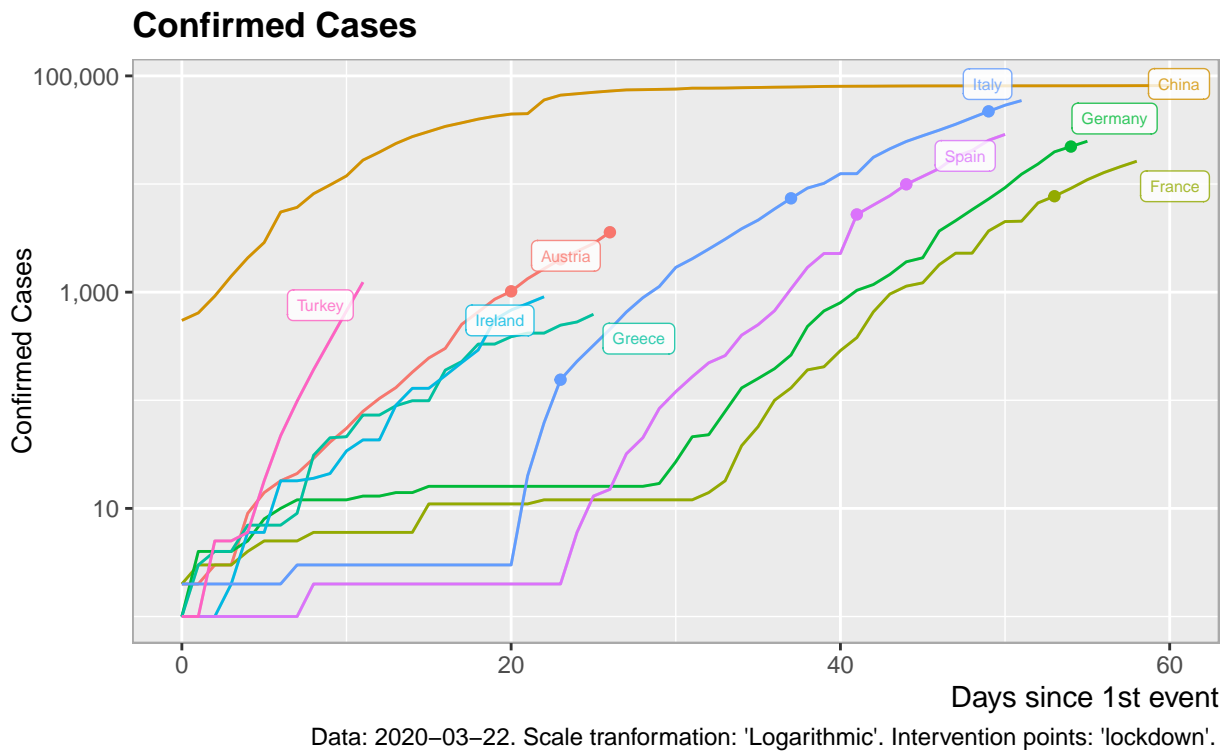


Figure 1: Confirmed Cases

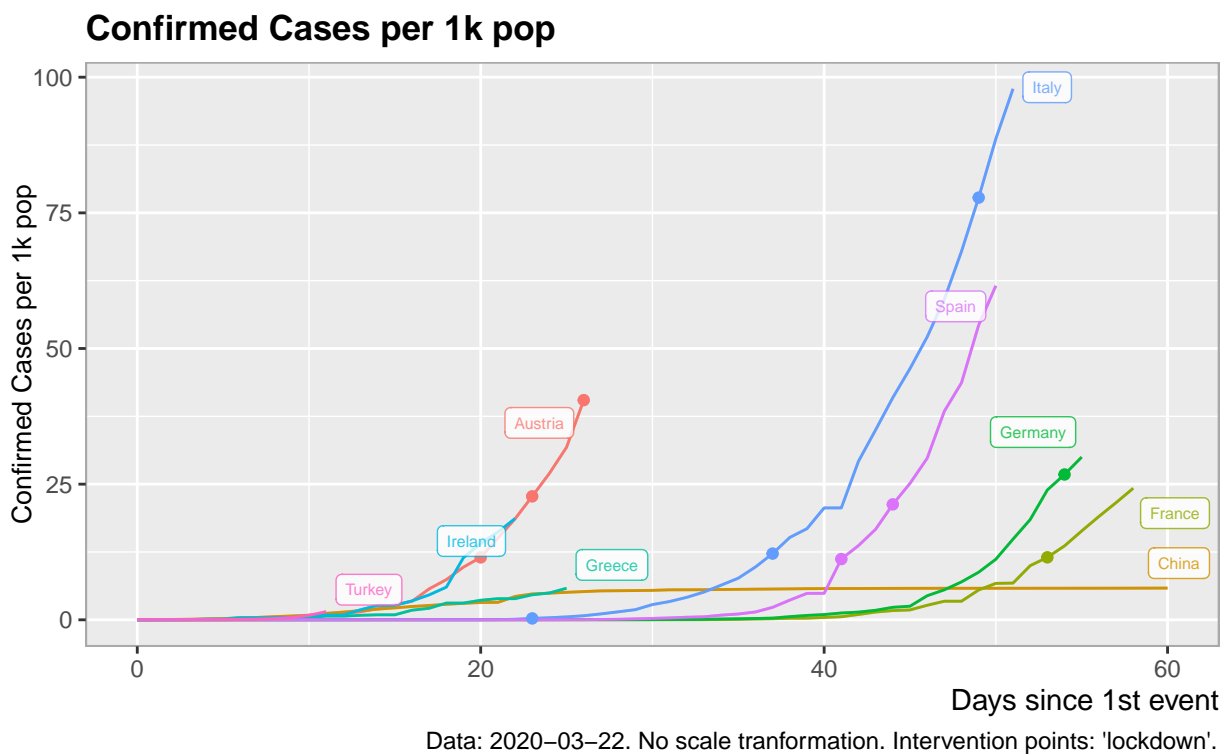


Figure 2: Confirmed Cases by 1000 population

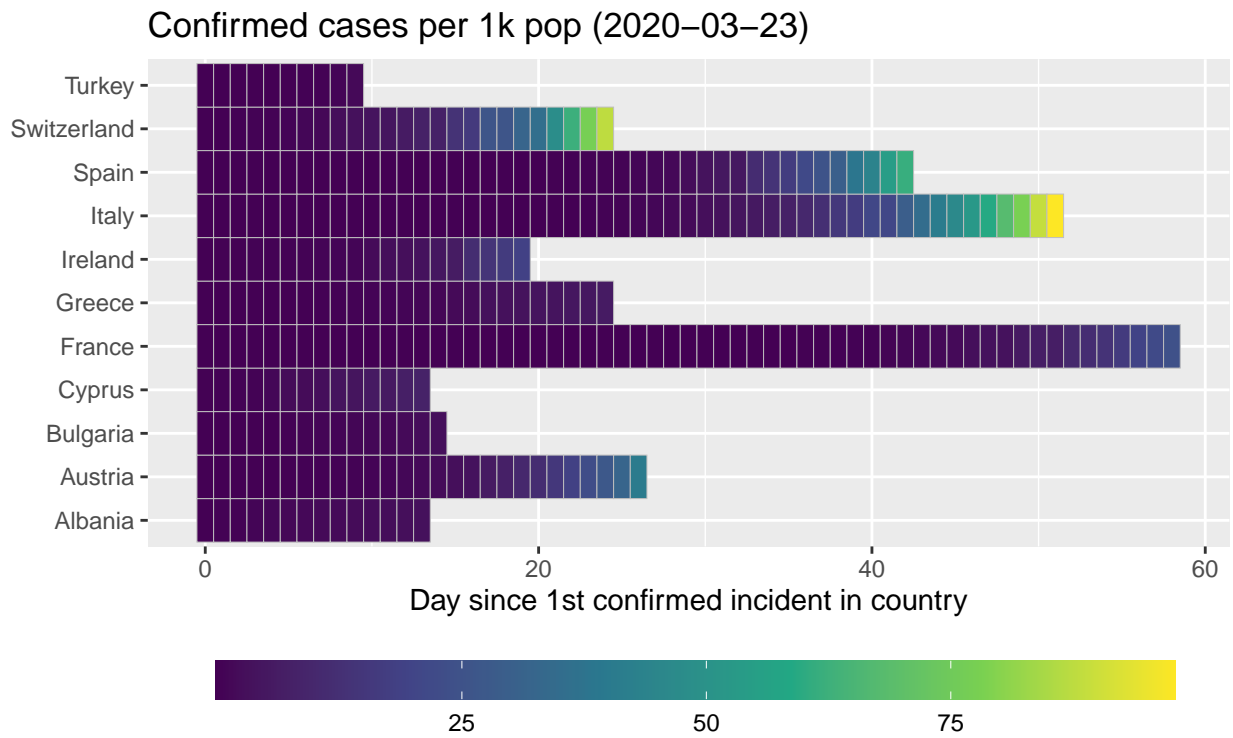


Figure 3: Confirmed Cases by 1000 population

## 2.2 Deaths

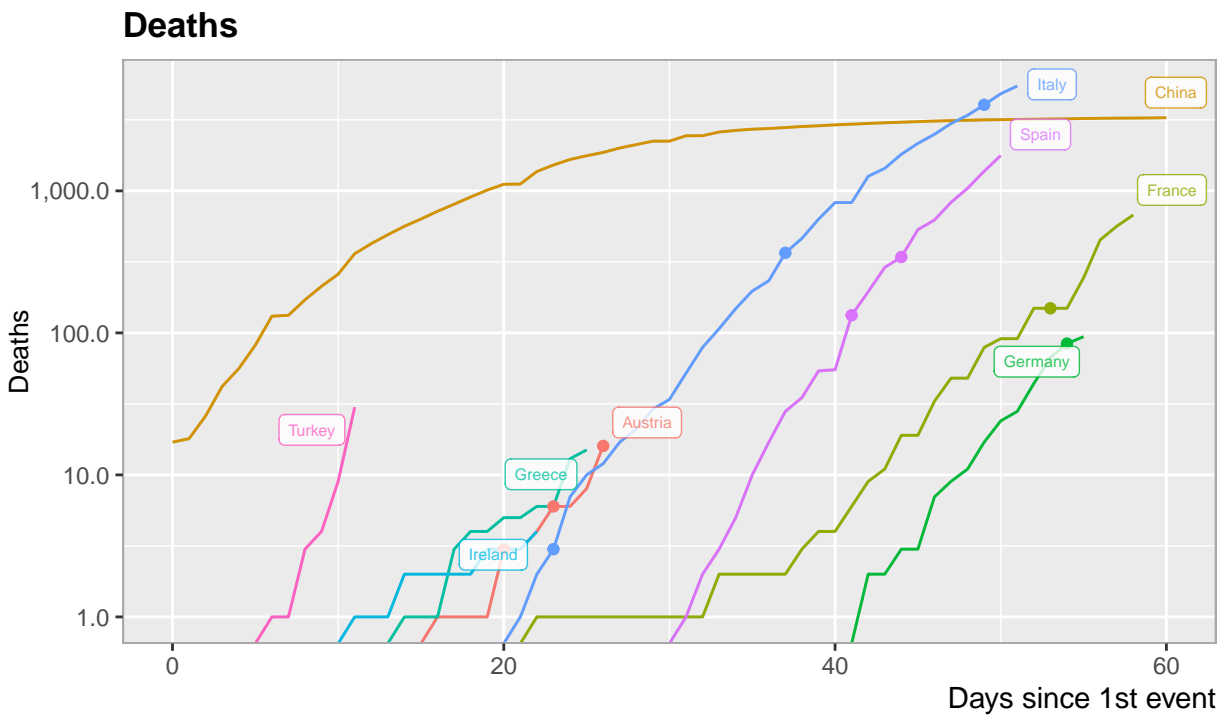


Figure 4: Number of deaths by country

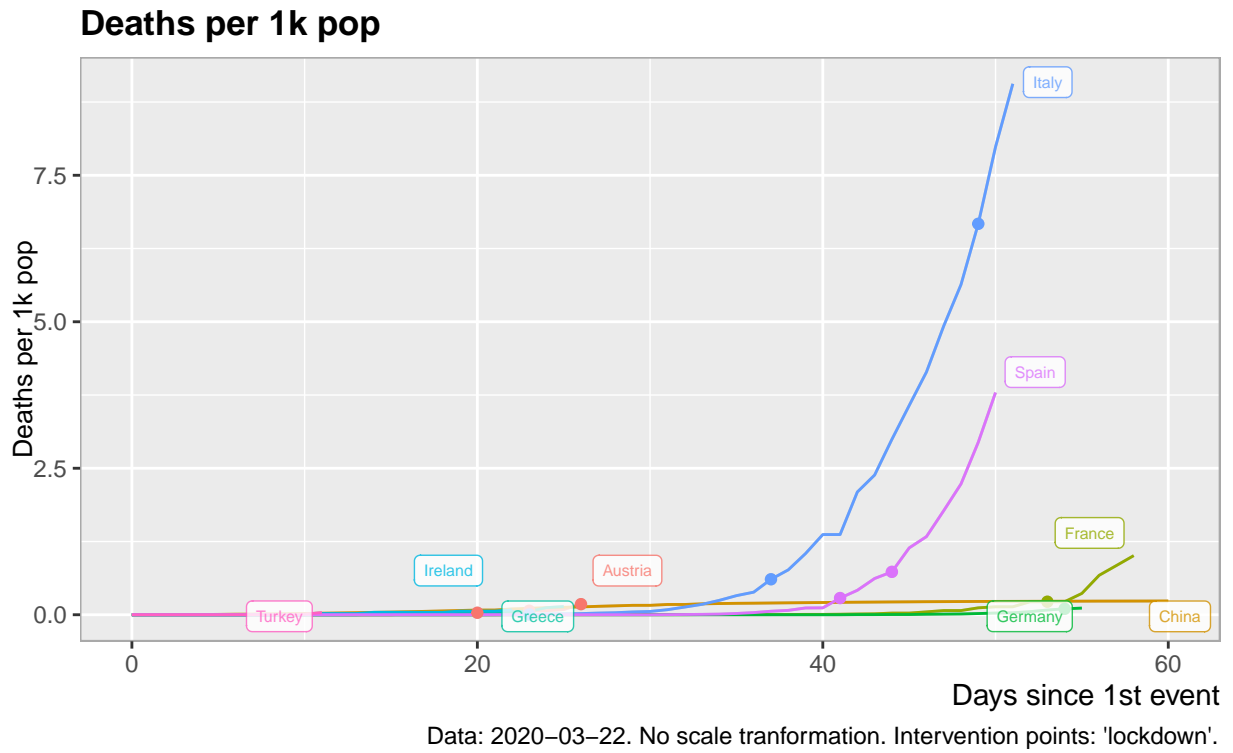


Figure 5: Deaths by 1000 population

### 3 Rate of change over time

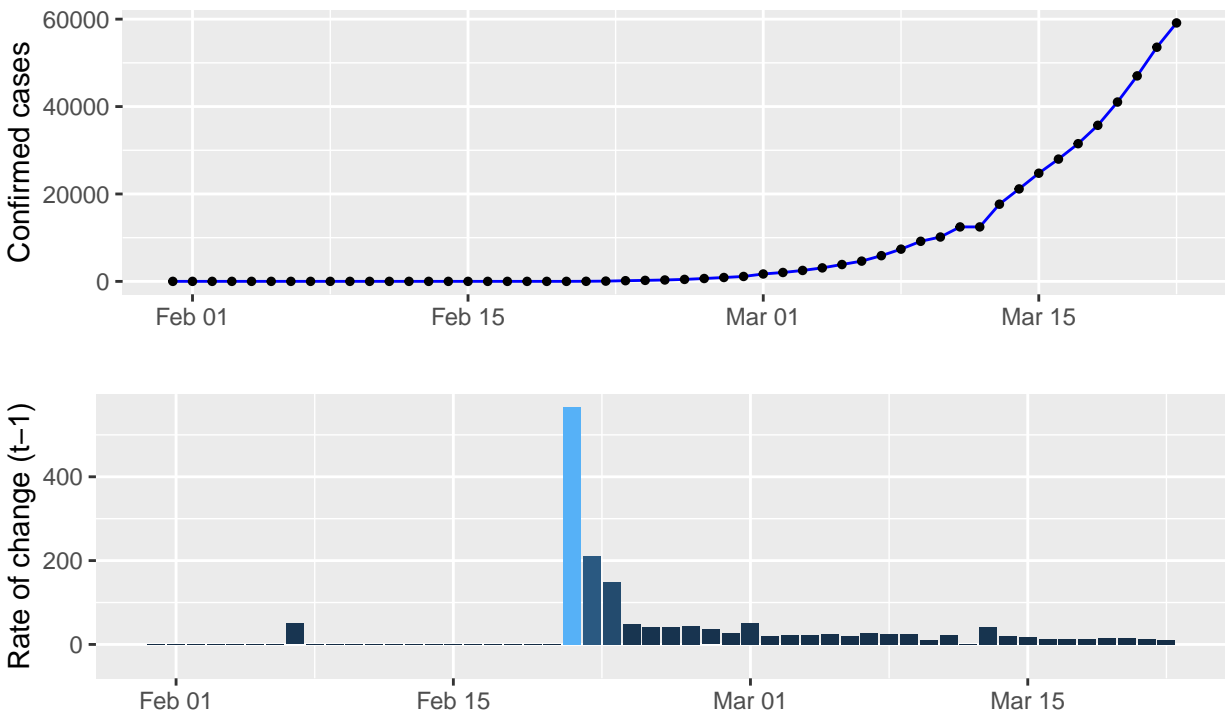


Figure 6: Rate of change of confirmed cases

## 4 Estimations

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

### 4.1 ARIMA projection

#### Projection of 'confirmed' cases for 5 ahead

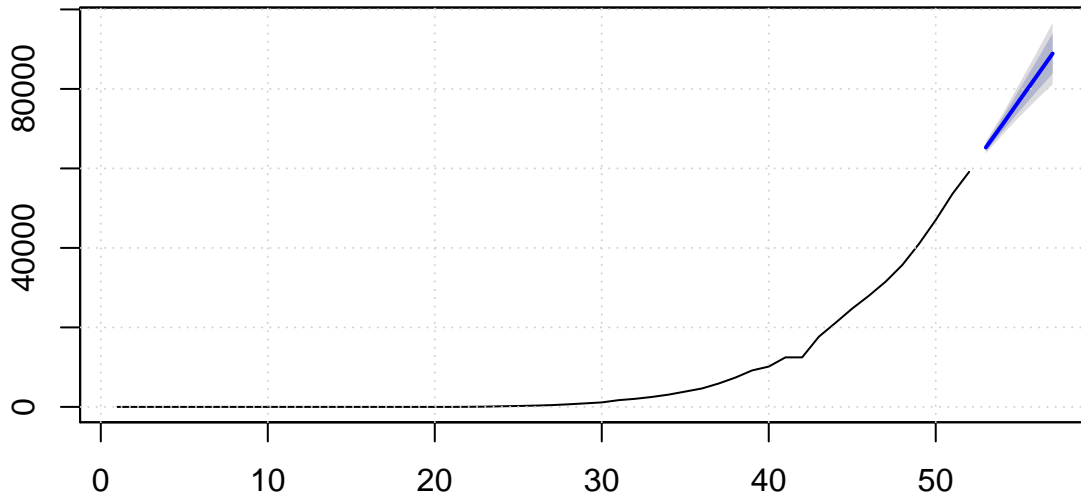


Figure 7: ARIMA projection

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

	Estimation	Confidence 95% (Low)	Confidence 95% (High)
<b>t+1 (2020-03-23)</b>	65268	63786	66751
<b>t+2 (2020-03-24)</b>	71073	68488	73657
<b>t+3 (2020-03-25)</b>	77063	72921	81205
<b>t+4 (2020-03-26)</b>	82947	77134	88760
<b>t+5 (2020-03-27)</b>	88892	81173	96612

- The estimated proportion of cases detected is 1.36%.
- With data up to 2020-03-22 in Italy we have 59138 confirmed cases and 5476 deaths.
- Estimated doubling time (based on 5 days time window) is approximately 5.4 days

## 4.2 PROPHET projection

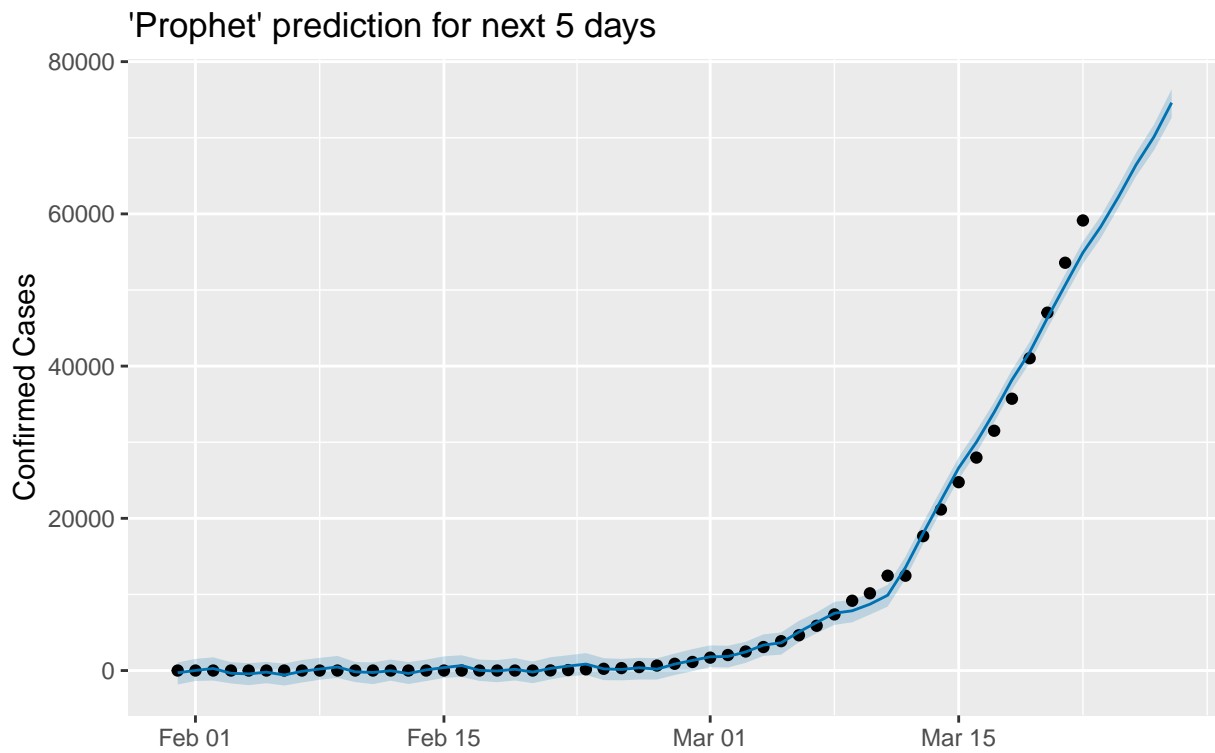


Figure 8: PROPHET Projection of confirmed cases over the next 5 days for Italy

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

	Future_Date	Estimation	Confidence 95% (Low)	Confidence 95% (High)
<b>t+1</b>	2020-03-23	58298	56775	59702
<b>t+2</b>	2020-03-24	62230	60806	63742
<b>t+3</b>	2020-03-25	66472	64952	68045
<b>t+4</b>	2020-03-26	70116	68331	71735
<b>t+5</b>	2020-03-27	74609	72627	76390