

# 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 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 goverment interventions as dots on top of each line.

2.1 Confirmed Cases

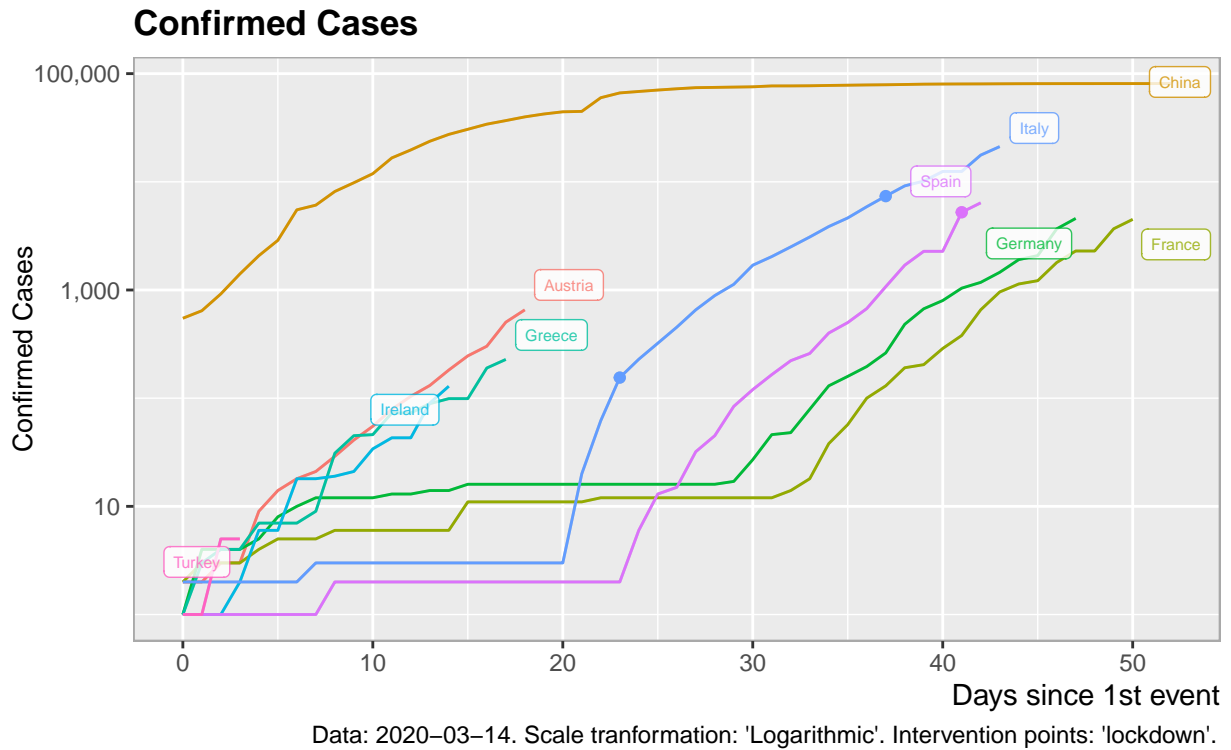


Figure 1: Confirmed Cases

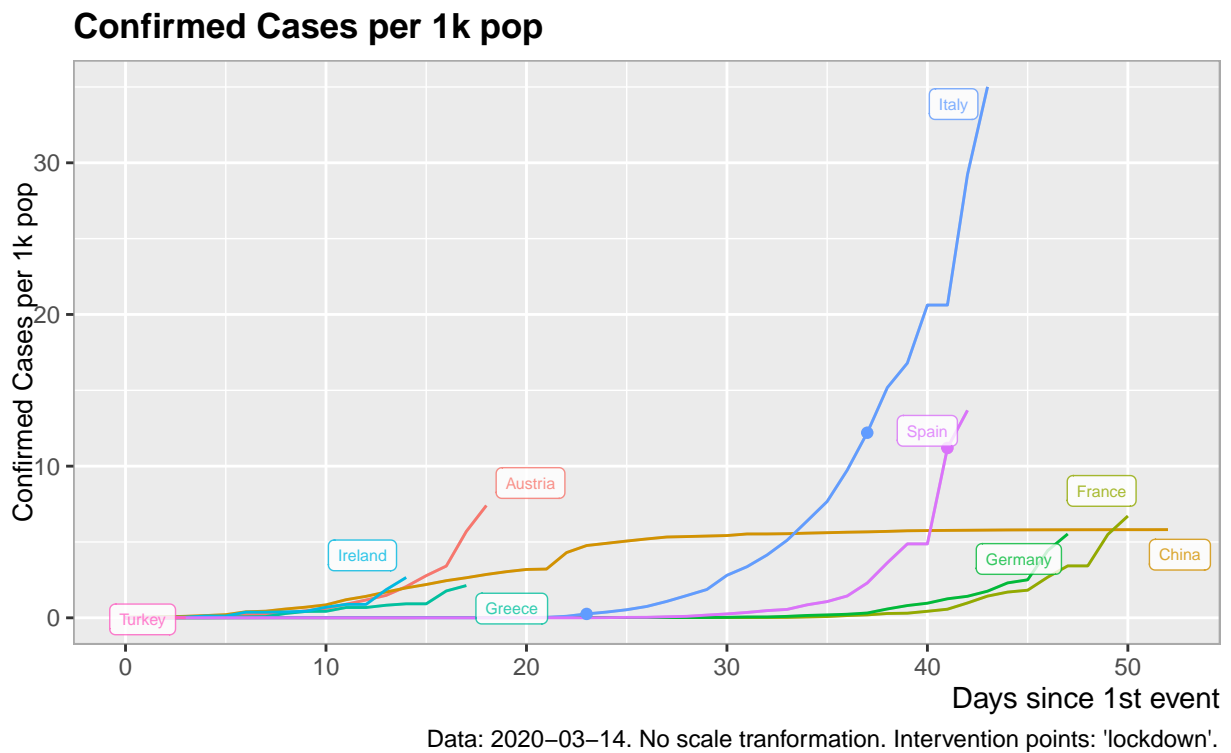


Figure 2: Confirmed Cases by 1000 population

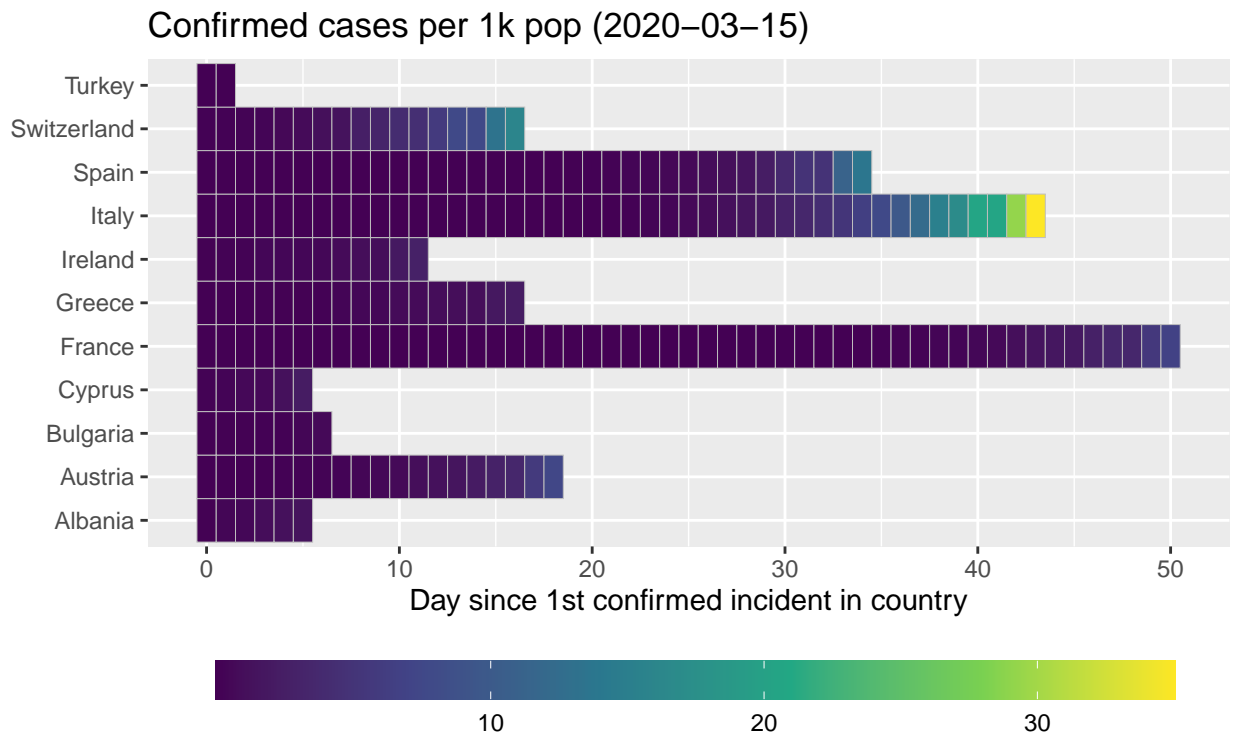


Figure 3: Confirmed Cases by 1000 population

2.2 Deaths

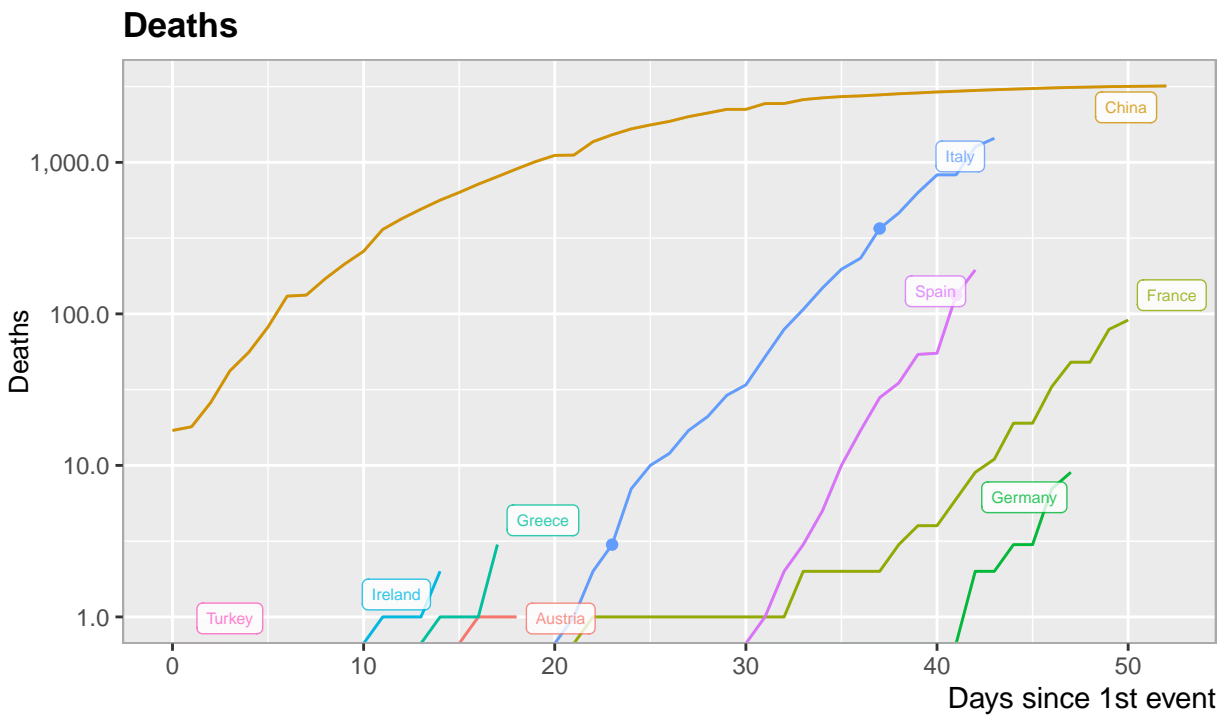


Figure 4: Number of deaths by country

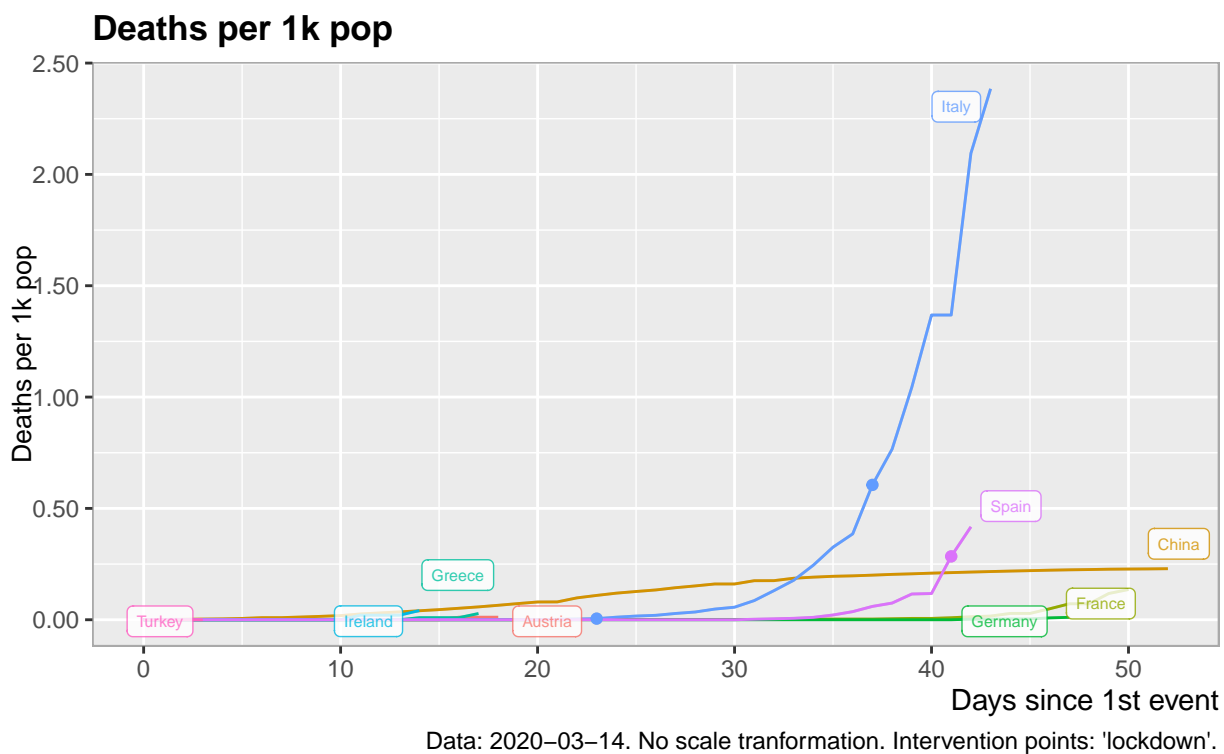


Figure 5: Deaths by 1000 population

### 3 Rate of change over time

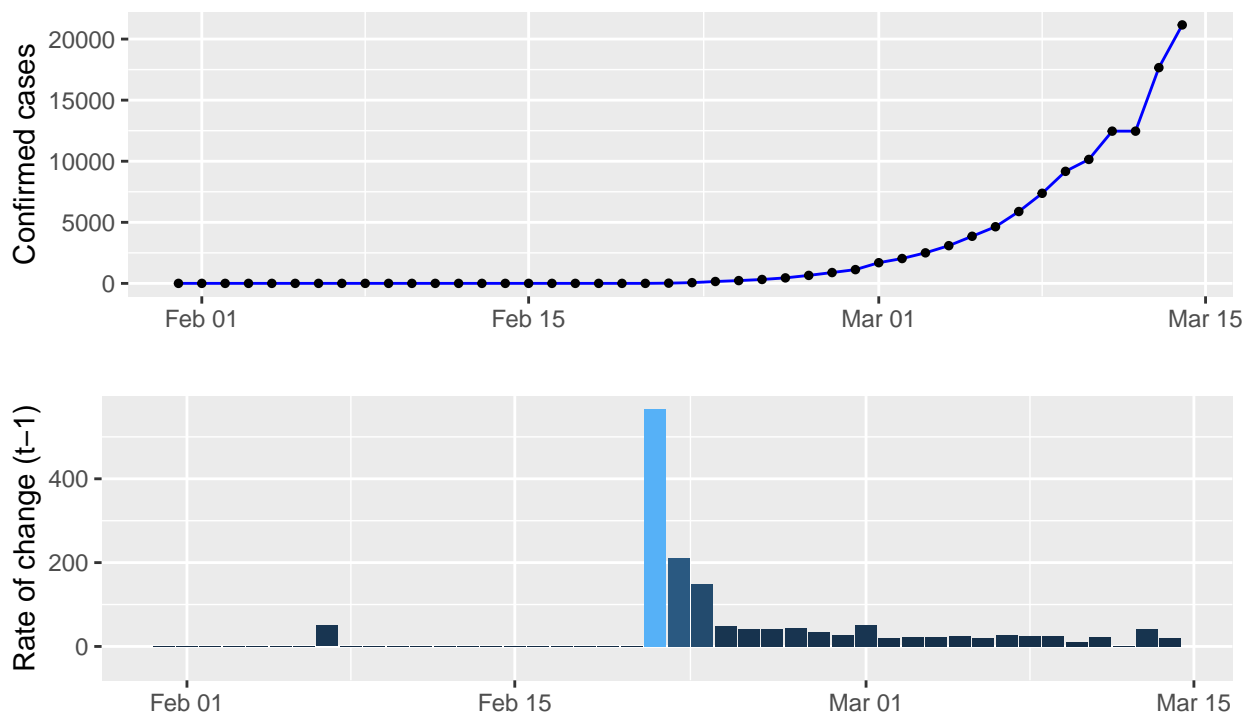


Figure 6: Rate of change of confirmed cases

## 4 Estimations

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

### 4.1 ARIMA projection

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

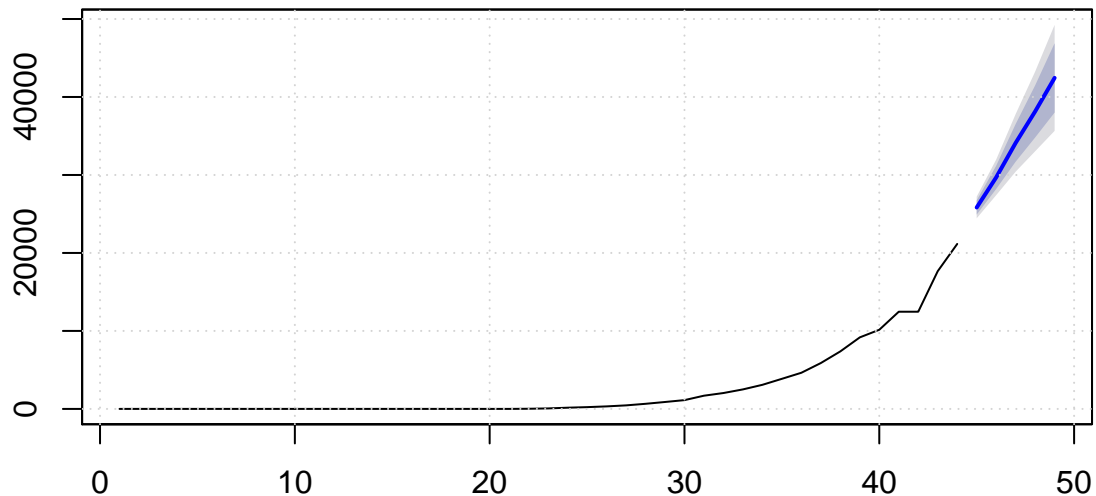


Figure 7: ARIMA projection

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

	Estimation	Confidence 95% (Low)	Confidence 95% (High)
<b>t+1 (2020-03-15)</b>	25831	24446	27216
<b>t+2 (2020-03-16)</b>	29691	27410	31971
<b>t+3 (2020-03-17)</b>	34114	30423	37804
<b>t+4 (2020-03-18)</b>	38147	33039	43255
<b>t+5 (2020-03-19)</b>	42450	35655	49244

- The estimated proportion of cases detected is 0.61%.
- With data up to 2020-03-14 in Italy we have 21157 confirmed cases and 1441 deaths.
- Estimated doubling time (based on 5 days time window) is approximately 3.8 days

## 4.2 PROPHET projection

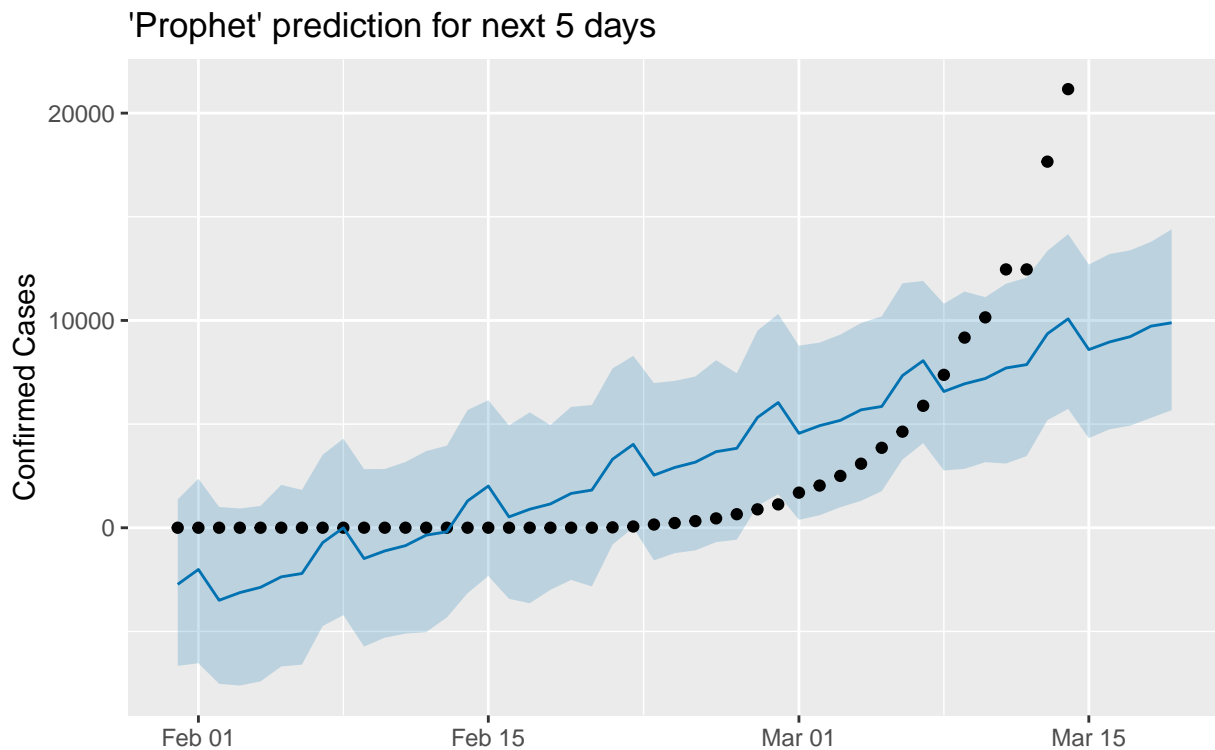


Figure 8: PROPHET Projection of confirmed cases over the next 5 days for Italy

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>	2020-03-15	8592	4324	12697
<b>t+2</b>	2020-03-16	8962	4750	13203
<b>t+3</b>	2020-03-17	9219	4927	13383
<b>t+4</b>	2020-03-18	9725	5300	13790
<b>t+5</b>	2020-03-19	9888	5672	14393