

# 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

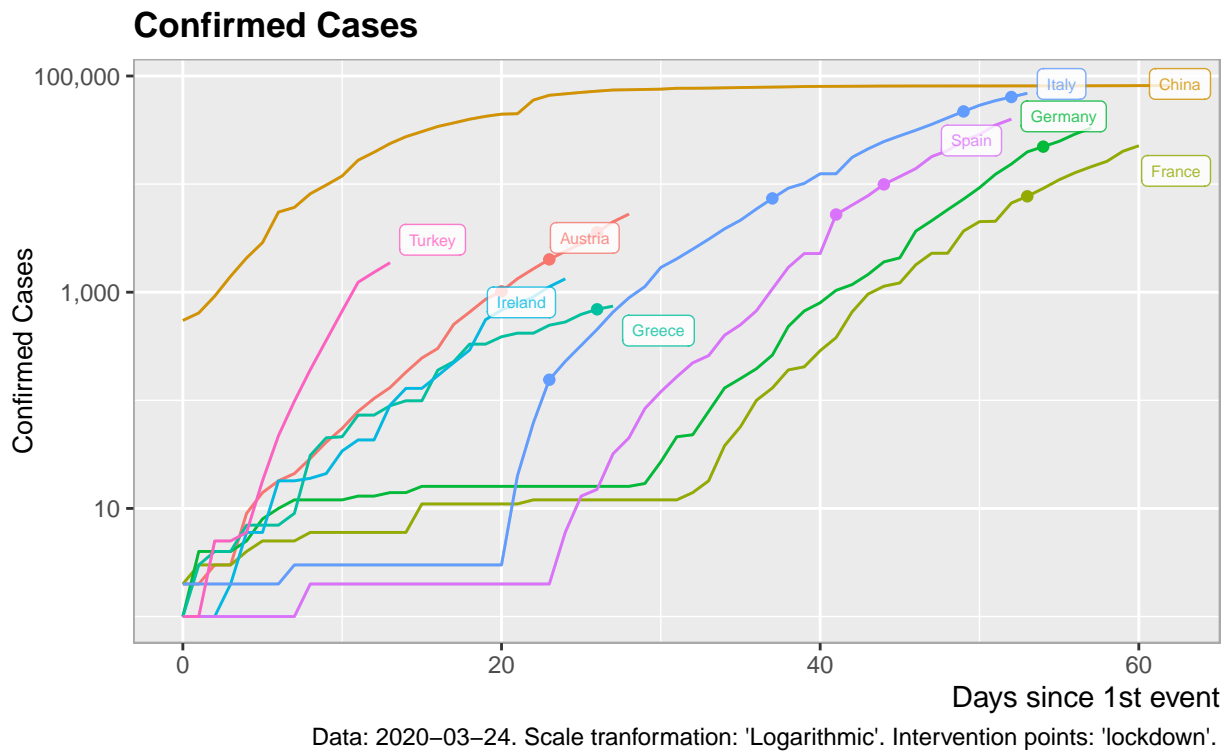


Figure 1: Confirmed Cases

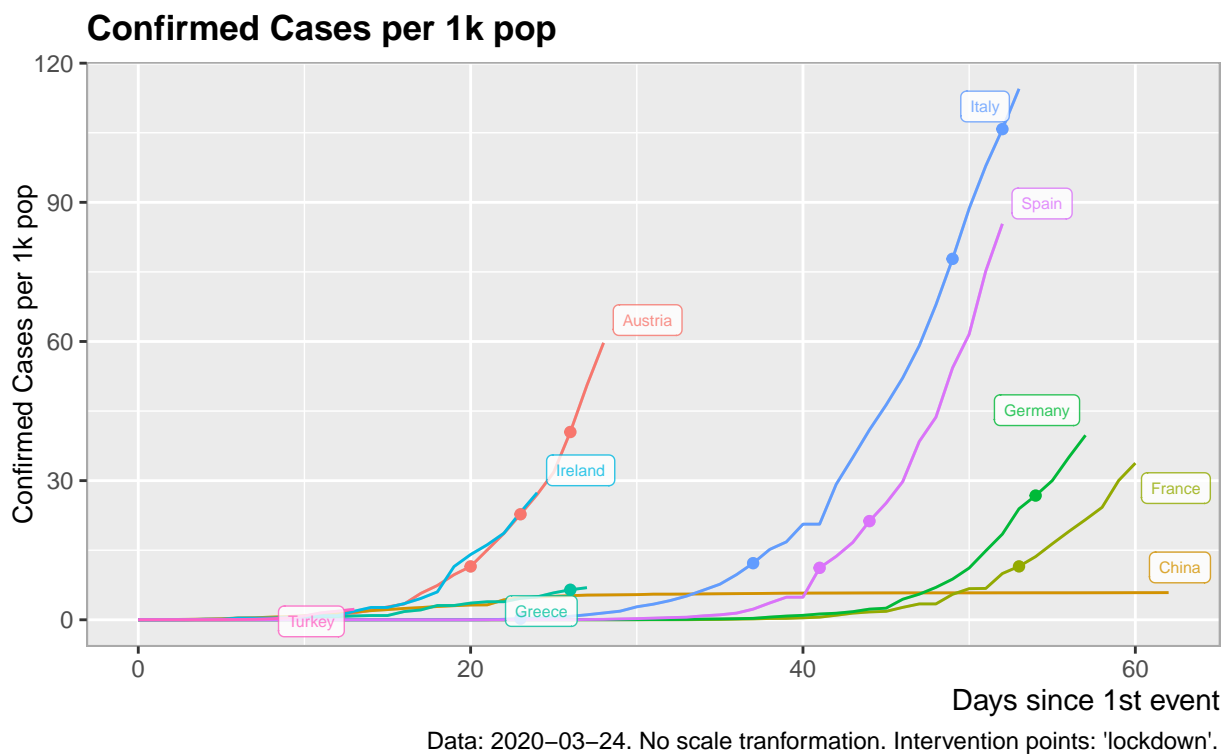


Figure 2: Confirmed Cases by 1000 population

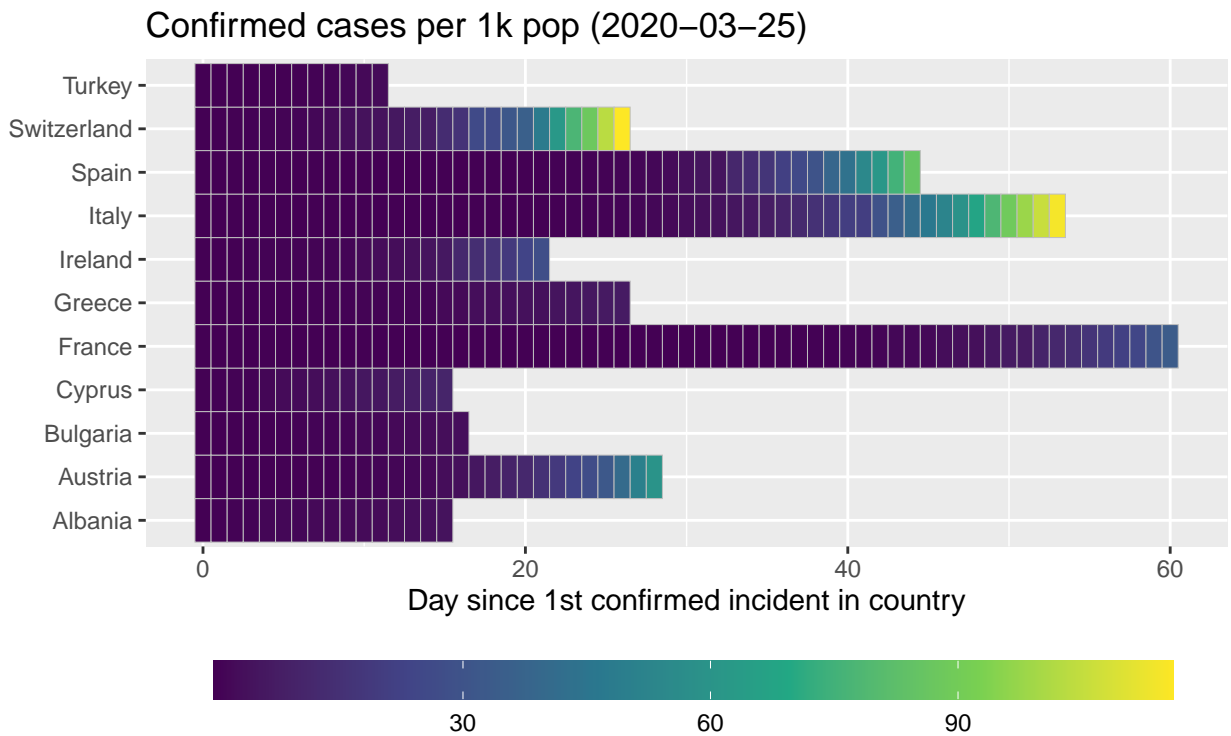


Figure 3: Confirmed Cases by 1000 population

2.2 Deaths

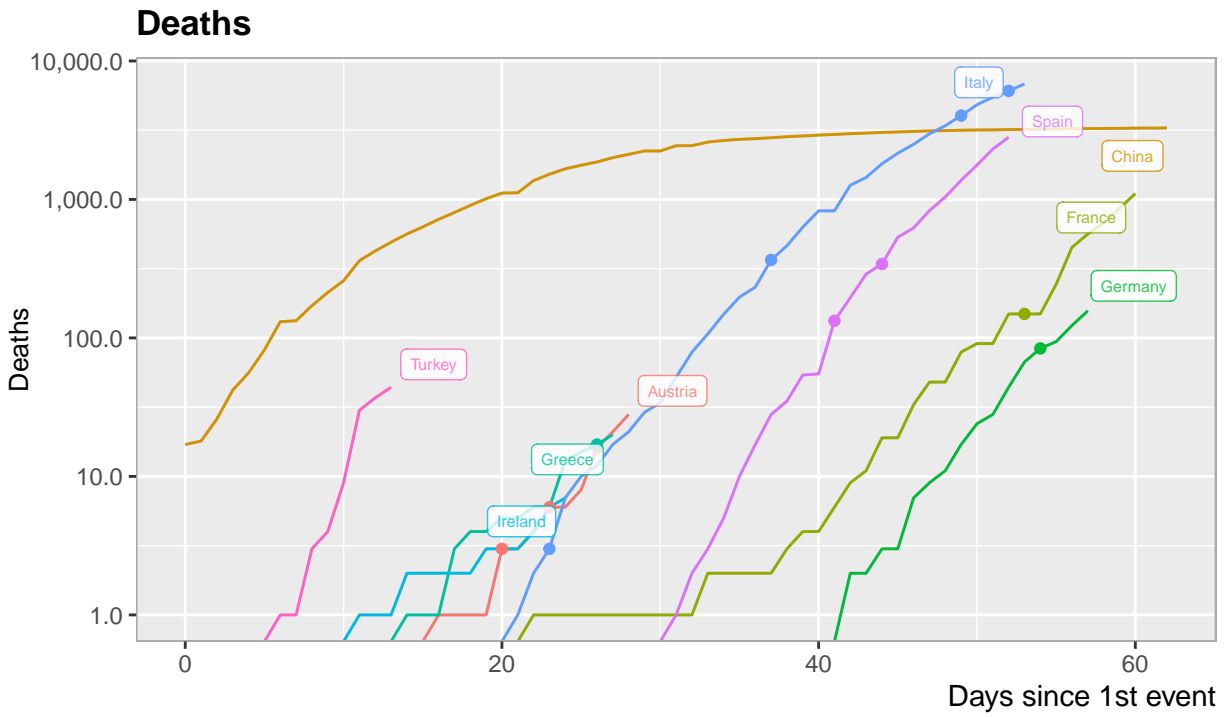


Figure 4: Number of deaths by country

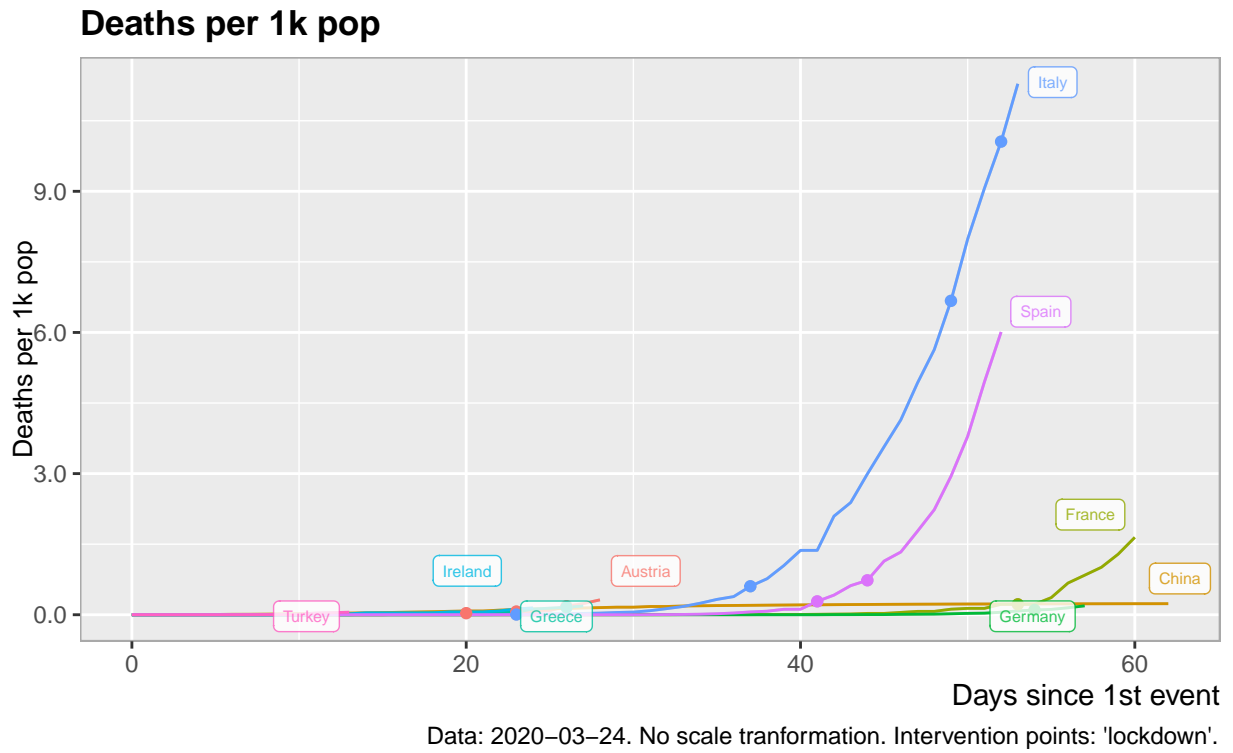


Figure 5: Deaths by 1000 population

### 3 Rate of change over time

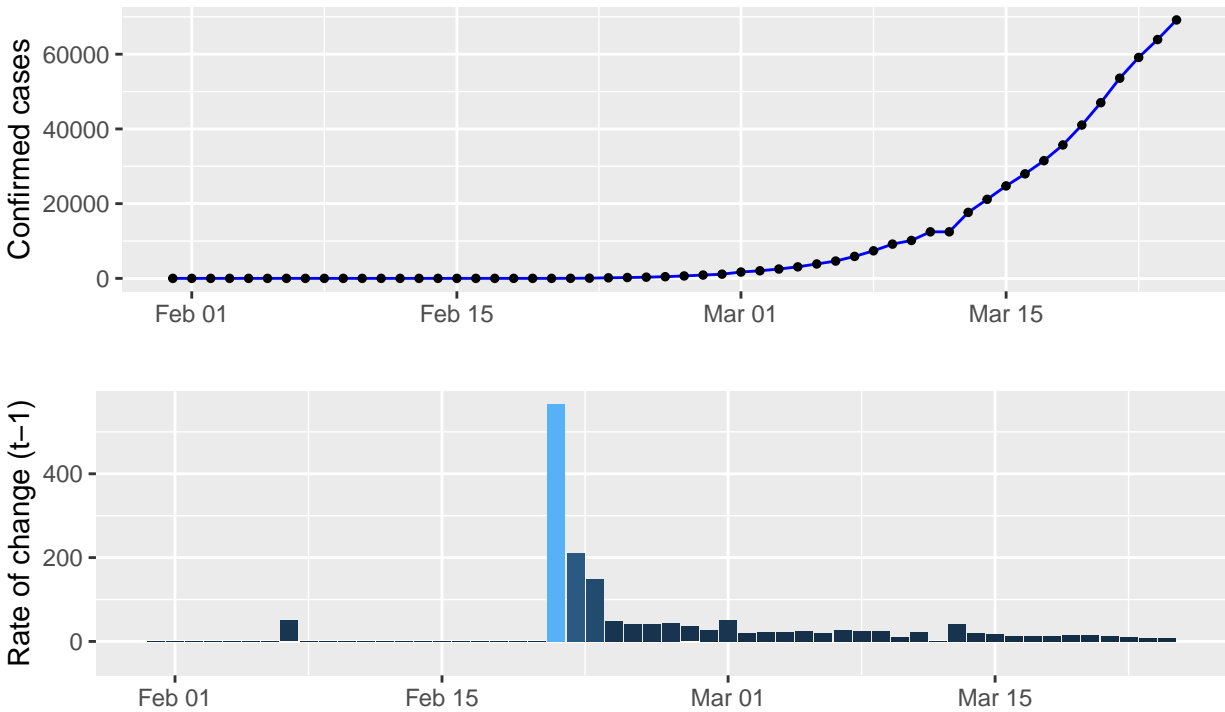


Figure 6: Rate of change of confirmed cases

## 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

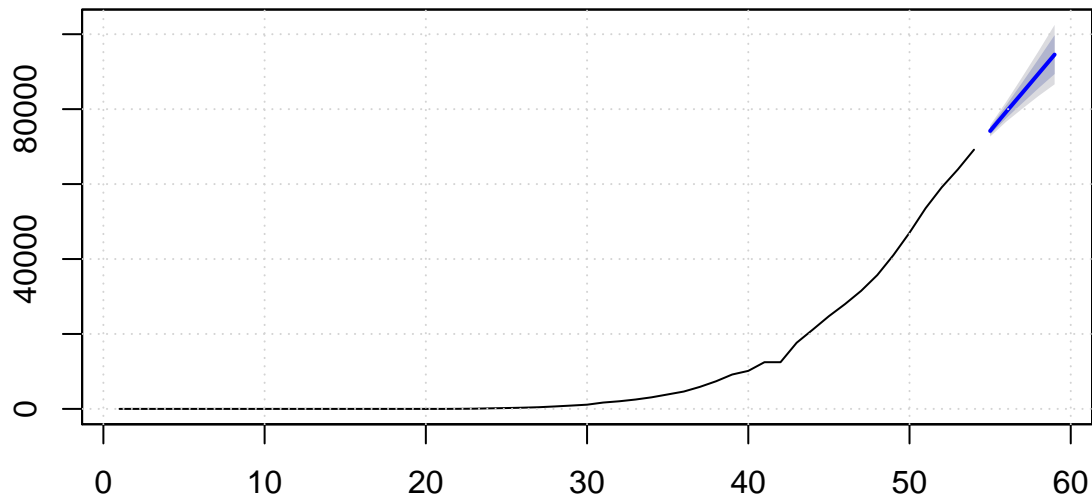


Figure 7: ARIMA projection

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

	Estimation	Confidence 95% (Low)	Confidence 95% (High)
<b>t+1 (2020-03-25)</b>	74176	72677	75675
<b>t+2 (2020-03-26)</b>	79310	76660	81961
<b>t+3 (2020-03-27)</b>	84372	80130	88614
<b>t+4 (2020-03-28)</b>	89473	83504	95443
<b>t+5 (2020-03-29)</b>	94553	86624	102482

- The estimated proportion of cases detected is 1.55%.
- With data up to 2020-03-24 in Italy we have 69176 confirmed cases and 6820 deaths.
- Estimated doubling time (based on 5 days time window) is approximately 7.3 days

## 4.2 PROPHET projection

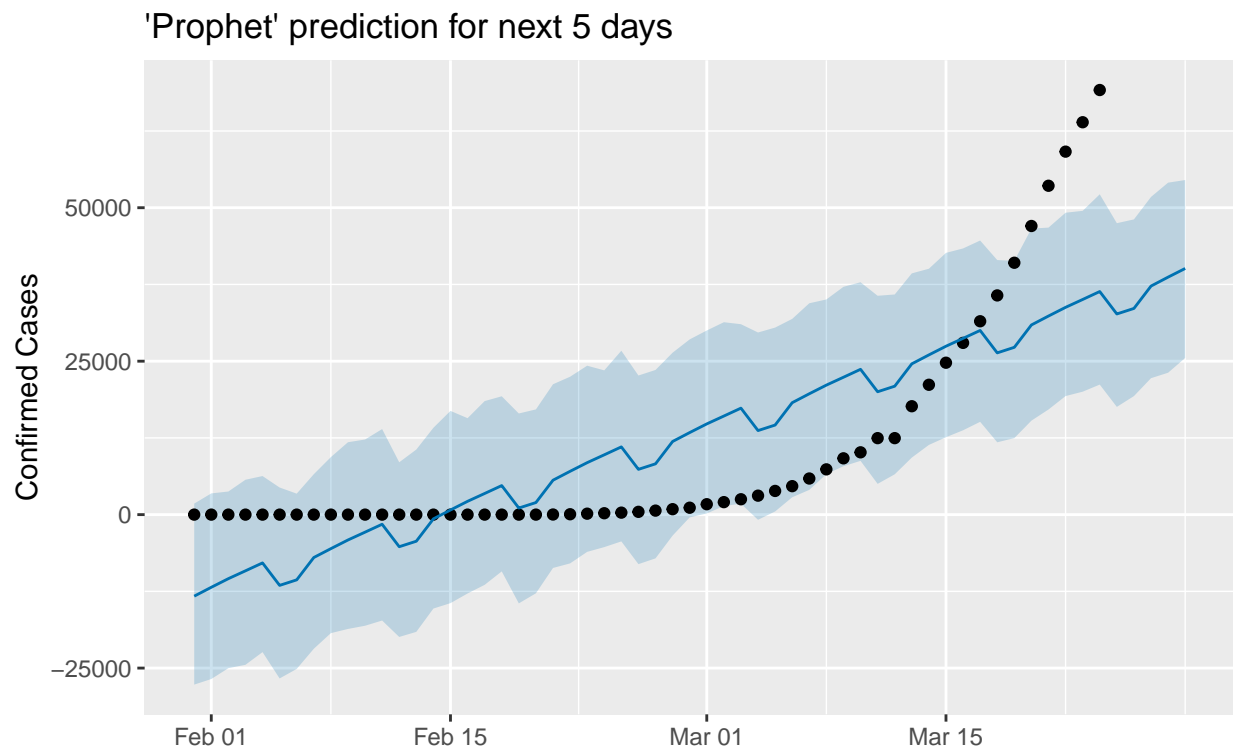


Figure 8: PROPHET Projection of confirmed cases over the next 5 days for Italy

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>	2020-03-25	32690	17551	47483
<b>t+2</b>	2020-03-26	33593	19312	48099
<b>t+3</b>	2020-03-27	37239	22232	51763
<b>t+4</b>	2020-03-28	38690	23119	54086
<b>t+5</b>	2020-03-29	40106	25525	54510