

# 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 government interventions as dots on top of each line.

### 2.1 Confirmed Cases

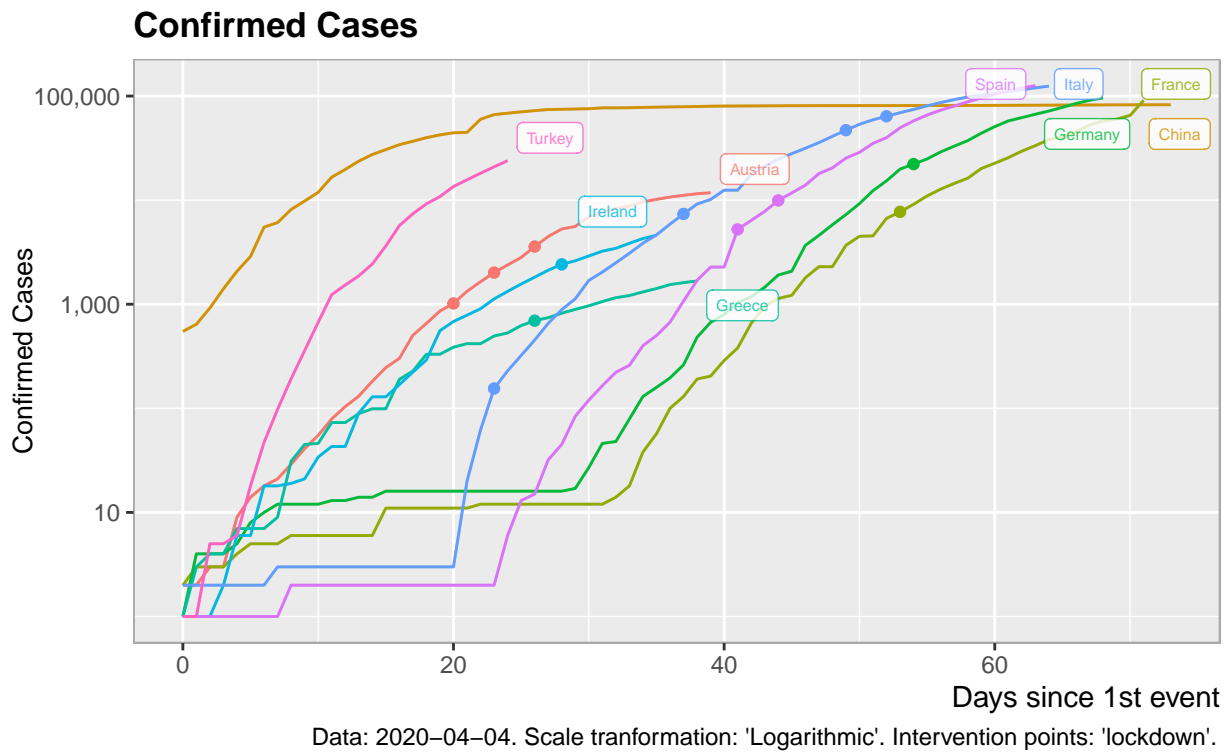


Figure 1: Confirmed Cases

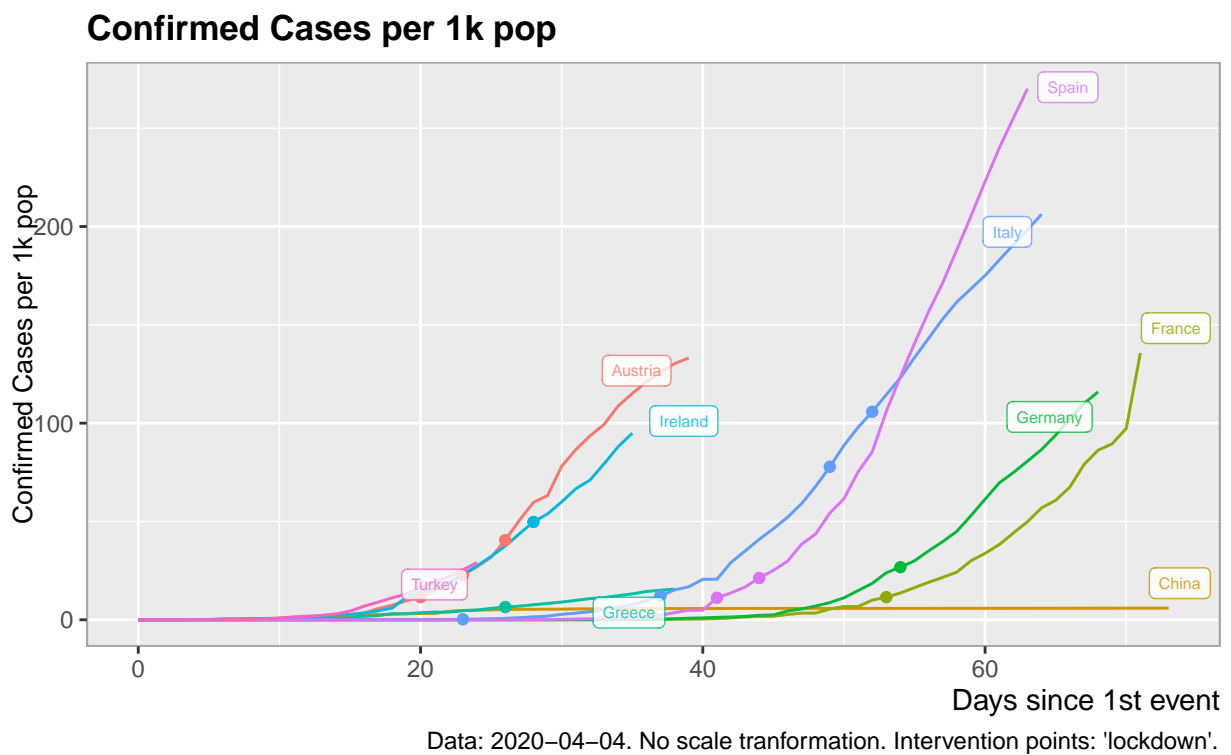


Figure 2: Confirmed Cases by 1000 population

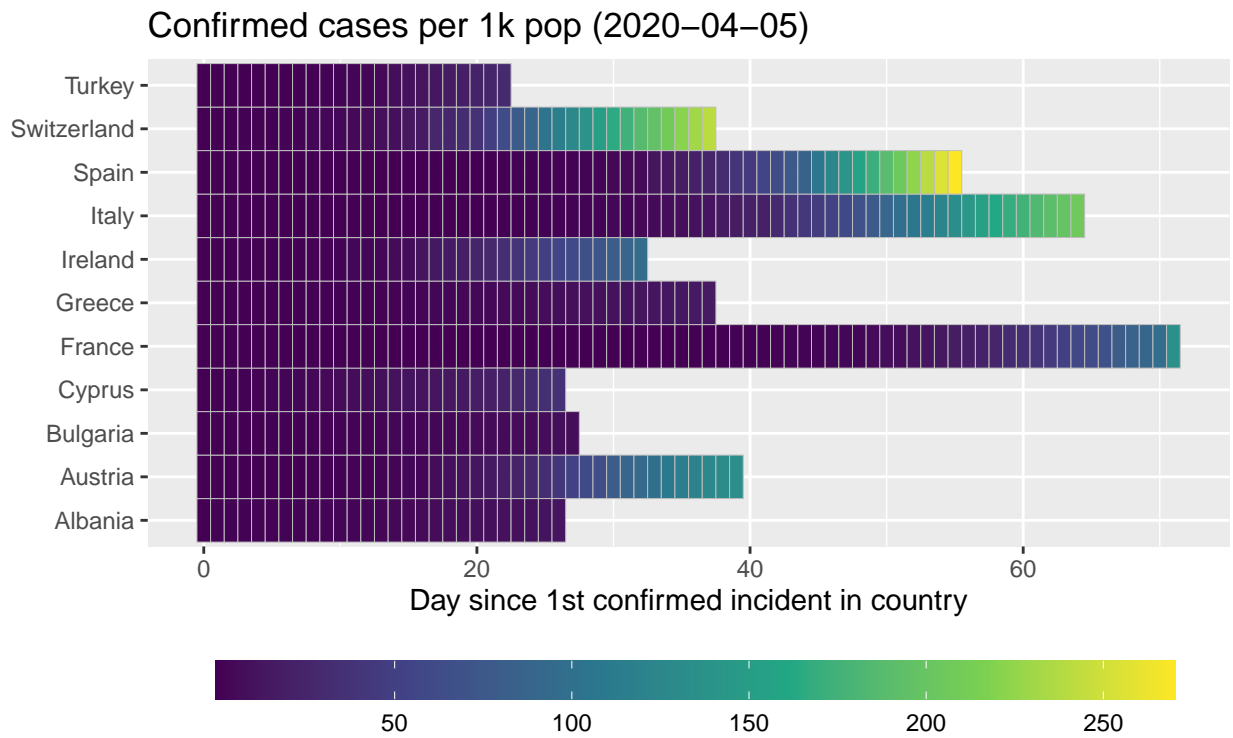


Figure 3: Confirmed Cases by 1000 population

## 2.2 Deaths

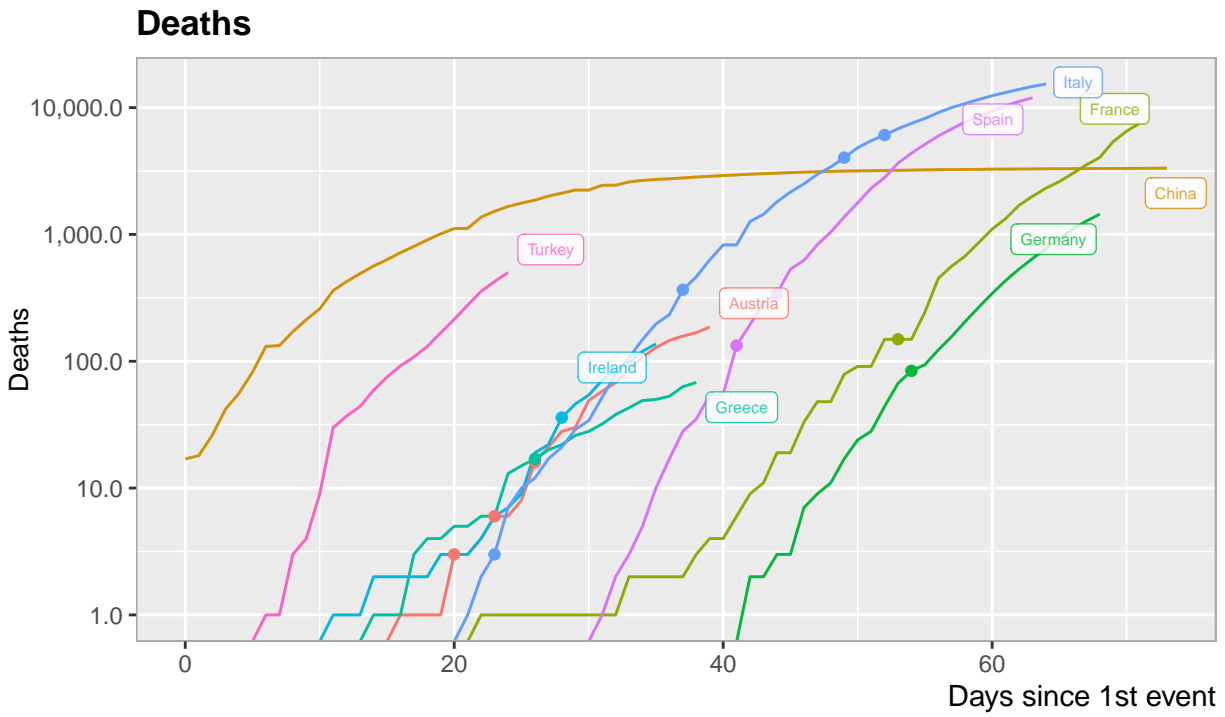


Figure 4: Number of deaths by country

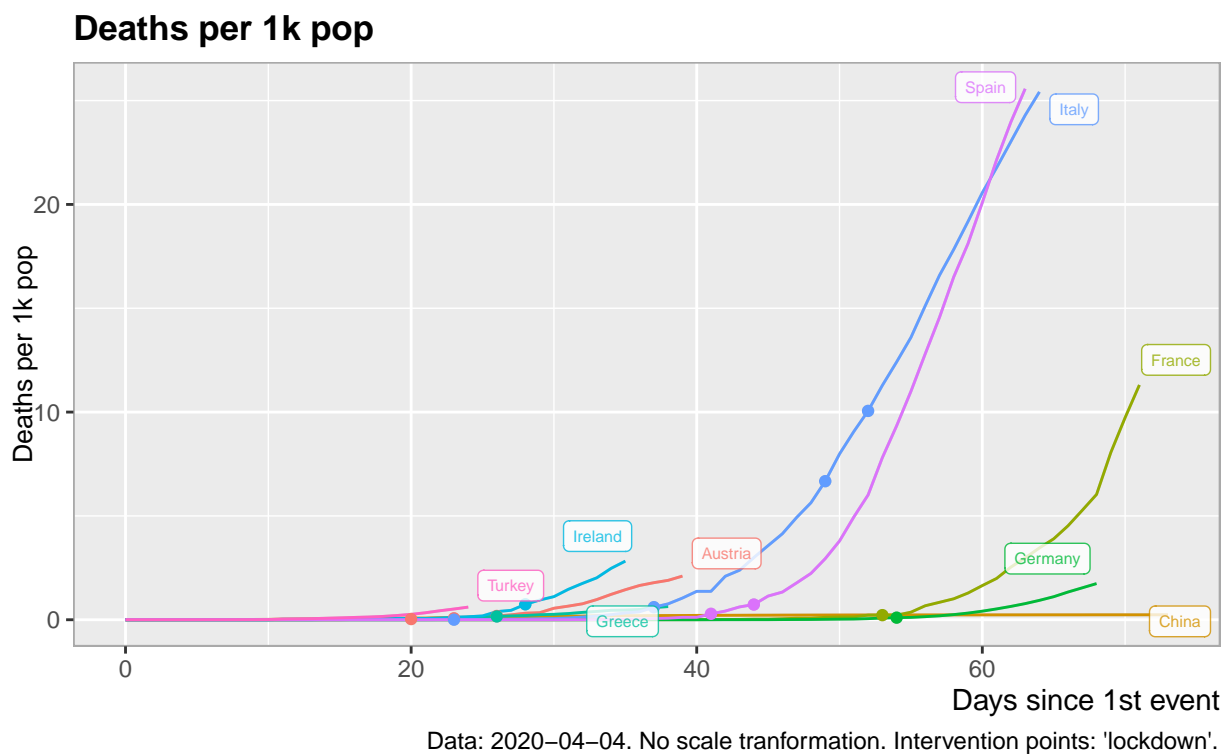


Figure 5: Deaths by 1000 population

### 3 Rate of change over time

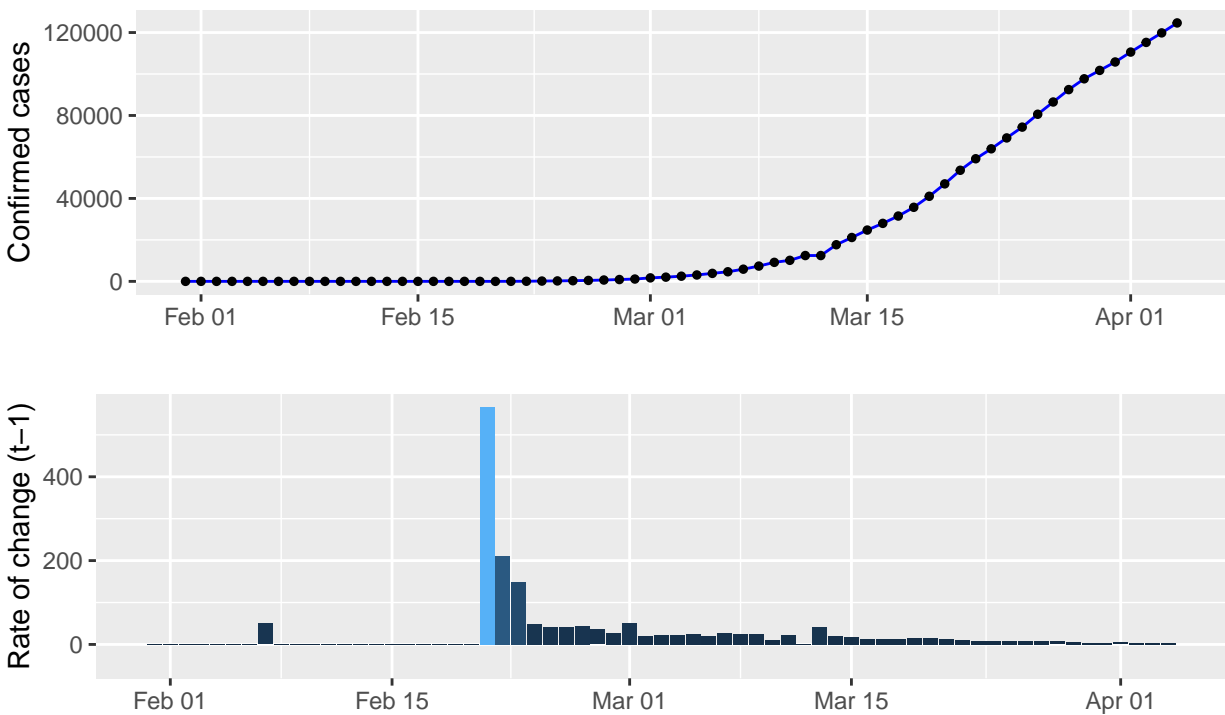


Figure 6: Rate of change of confirmed cases

## 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

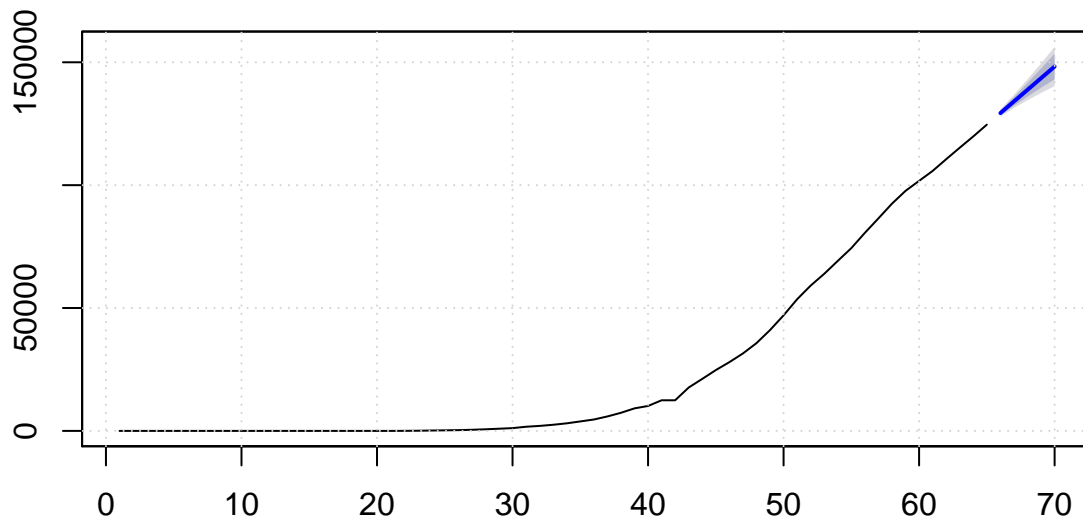


Figure 7: ARIMA projection

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

	Estimation	Confidence 95% (Low)	Confidence 95% (High)
<b>t+1 (2020-04-05)</b>	129329	127859	130799
<b>t+2 (2020-04-06)</b>	134079	131419	136739
<b>t+3 (2020-04-07)</b>	138803	134549	143057
<b>t+4 (2020-04-08)</b>	143539	137528	149551
<b>t+5 (2020-04-09)</b>	148270	140281	156259

- The estimated proportion of cases detected is 4.24%.
- With data up to 2020-04-04 in Italy we have 124632 confirmed cases and 15362 deaths.
- Estimated doubling time (based on 5 days time window) is approximately 17 days

## 4.2 PROPHET projection

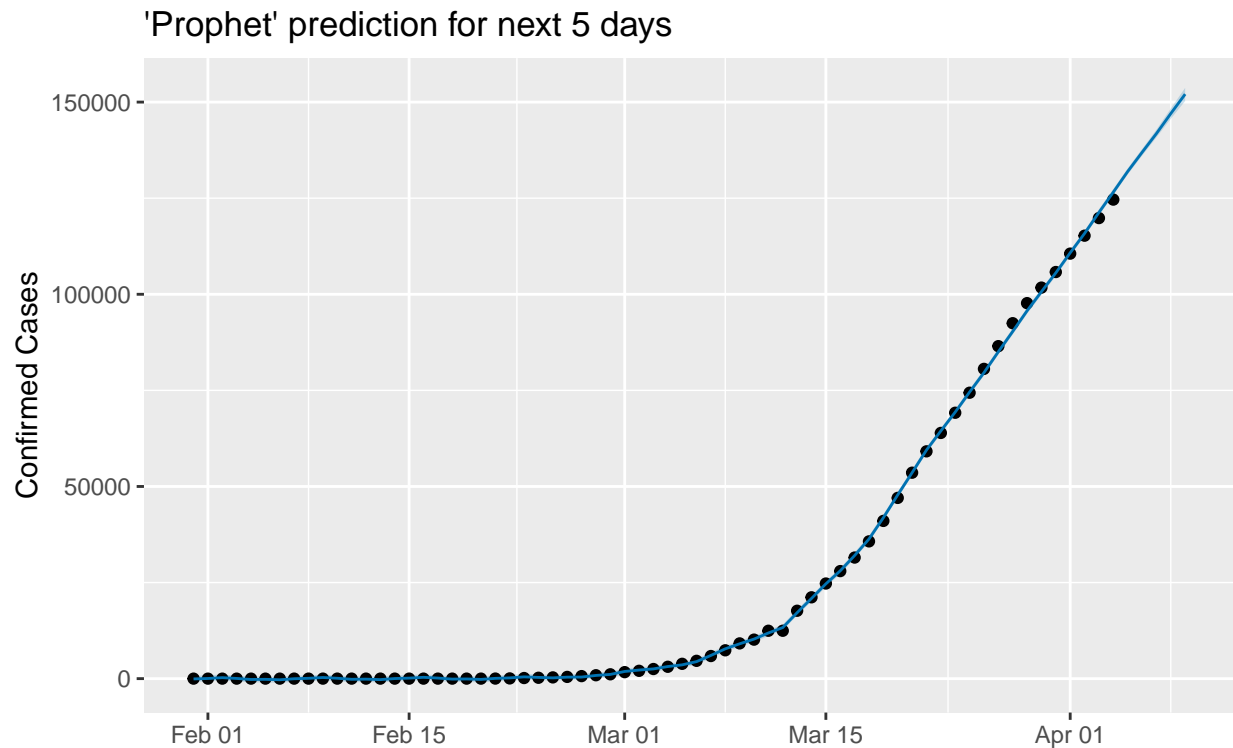


Figure 8: PROPHET Projection of confirmed cases over the next 5 days for Italy

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>	2020-04-05	131936	131135	132738
<b>t+2</b>	2020-04-06	136909	136026	137784
<b>t+3</b>	2020-04-07	141807	140781	142823
<b>t+4</b>	2020-04-08	147019	145649	148328
<b>t+5</b>	2020-04-09	152066	150274	153708