

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

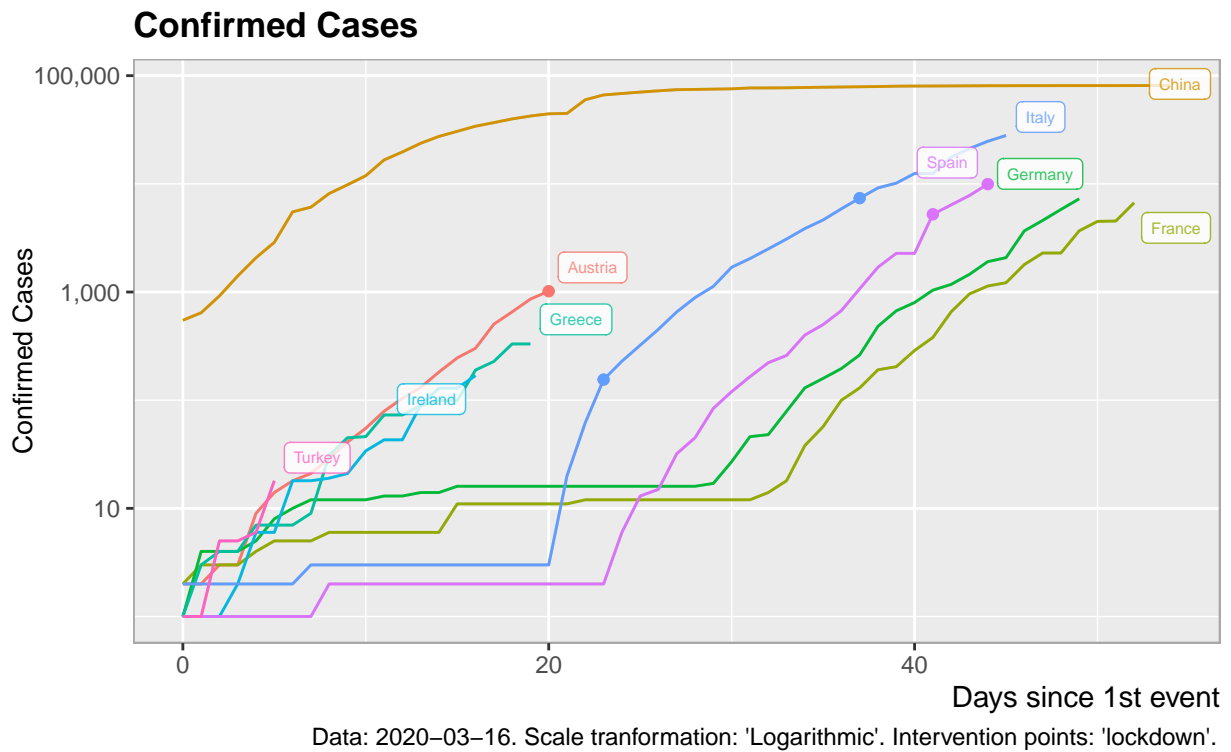


Figure 1: Confirmed Cases

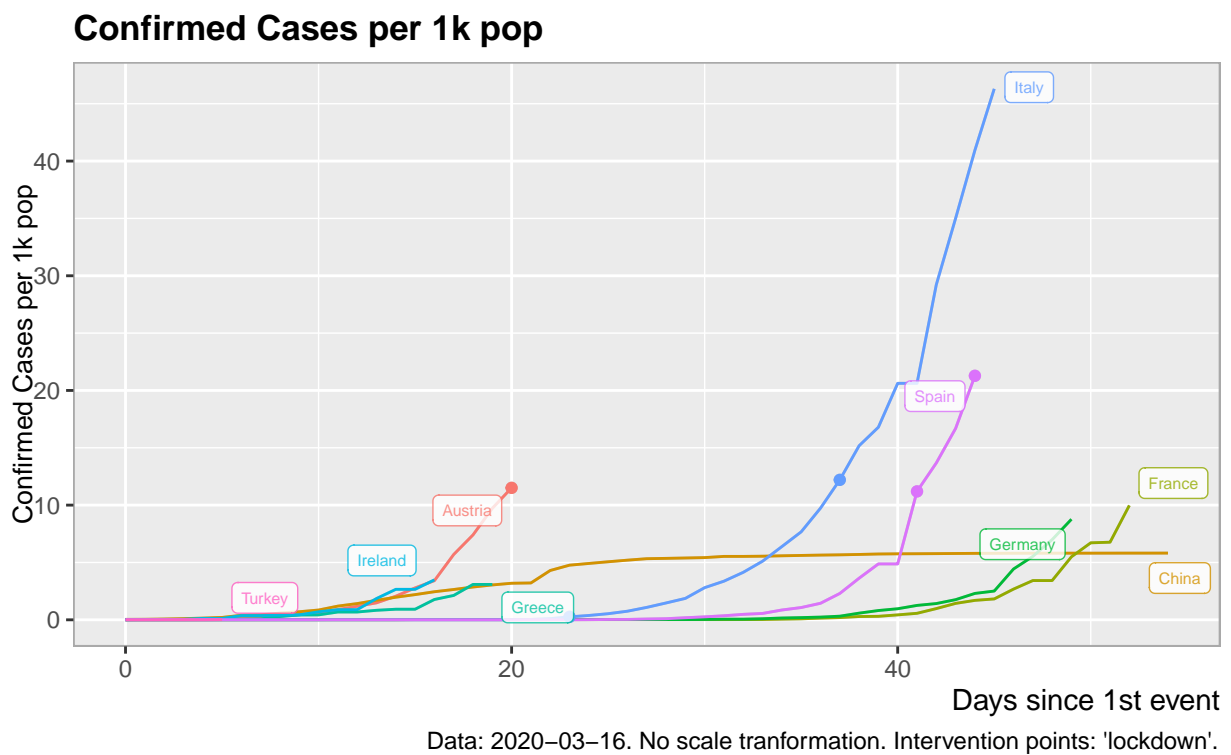


Figure 2: Confirmed Cases by 1000 population

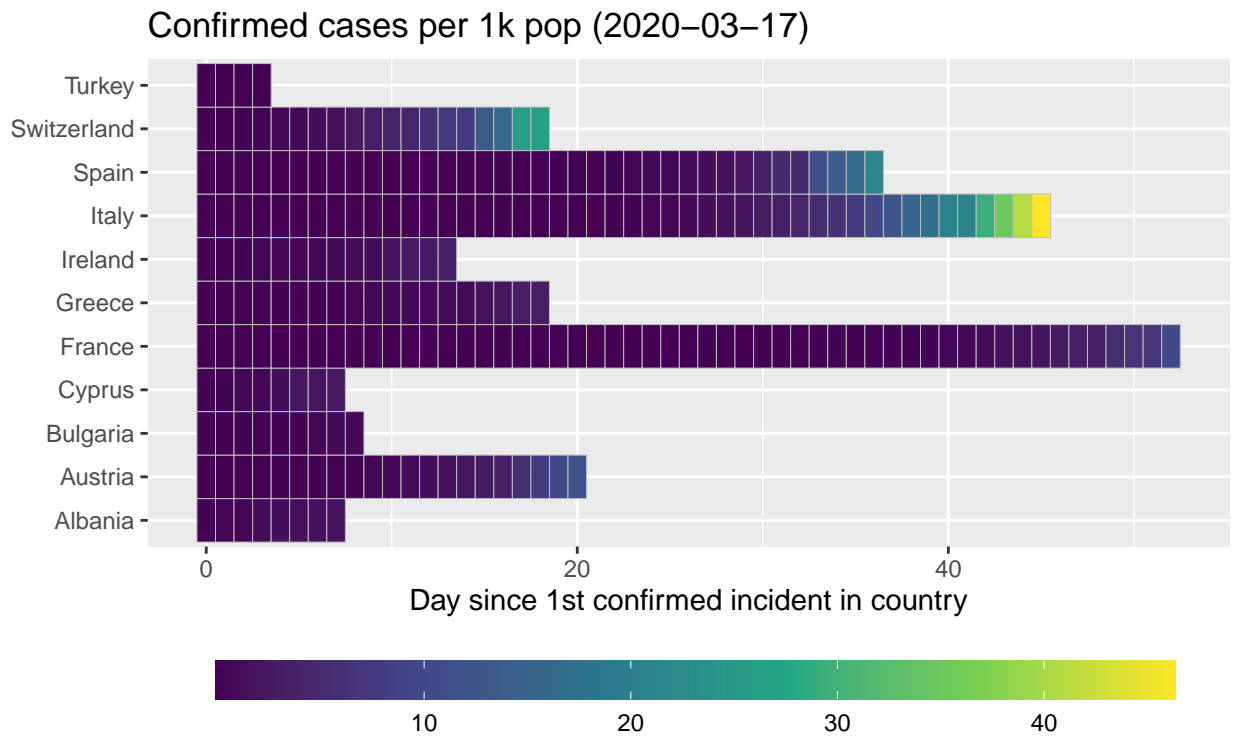


Figure 3: Confirmed Cases by 1000 population

2.2 Deaths

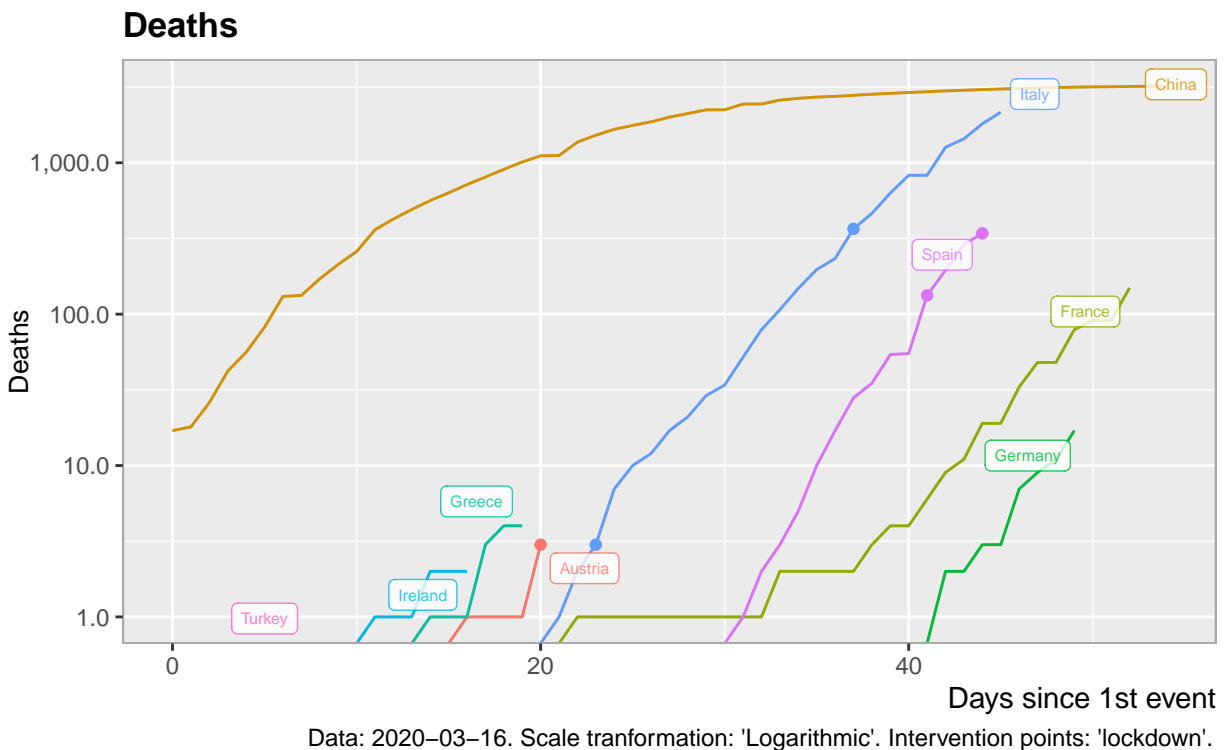


Figure 4: Number of deaths by country

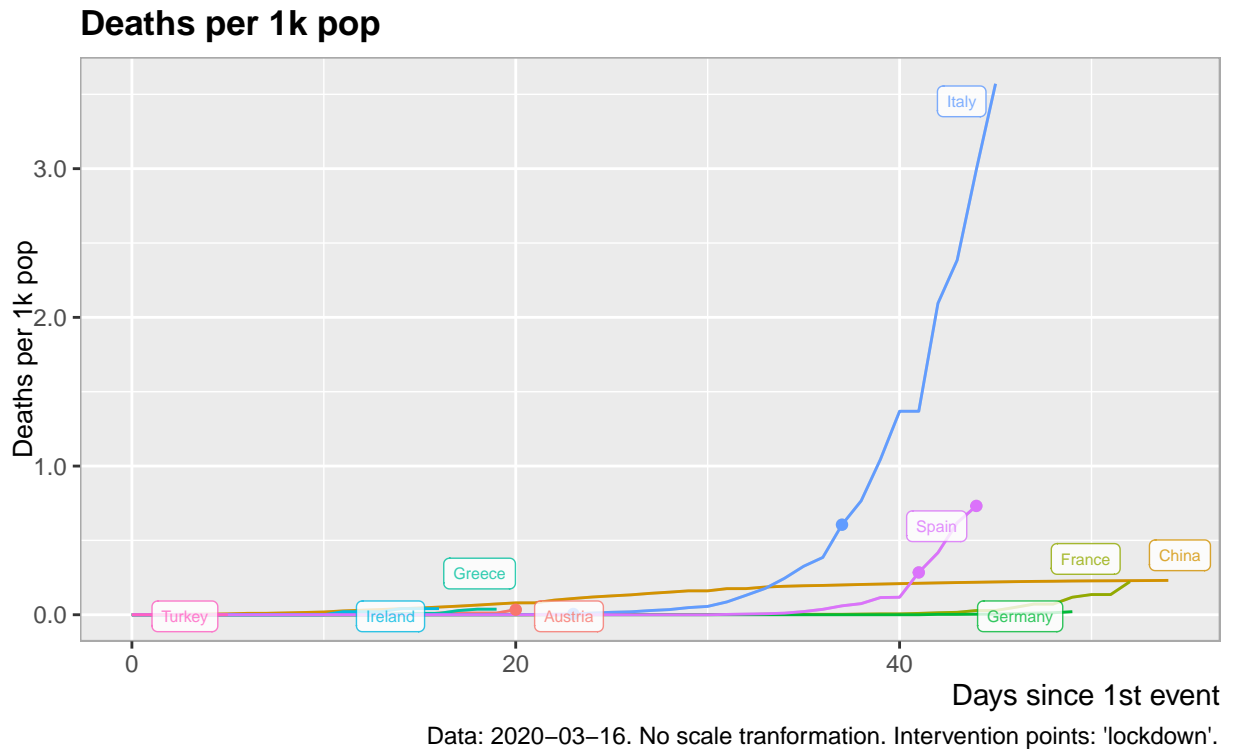


Figure 5: Deaths by 1000 population

3 Rate of change over time

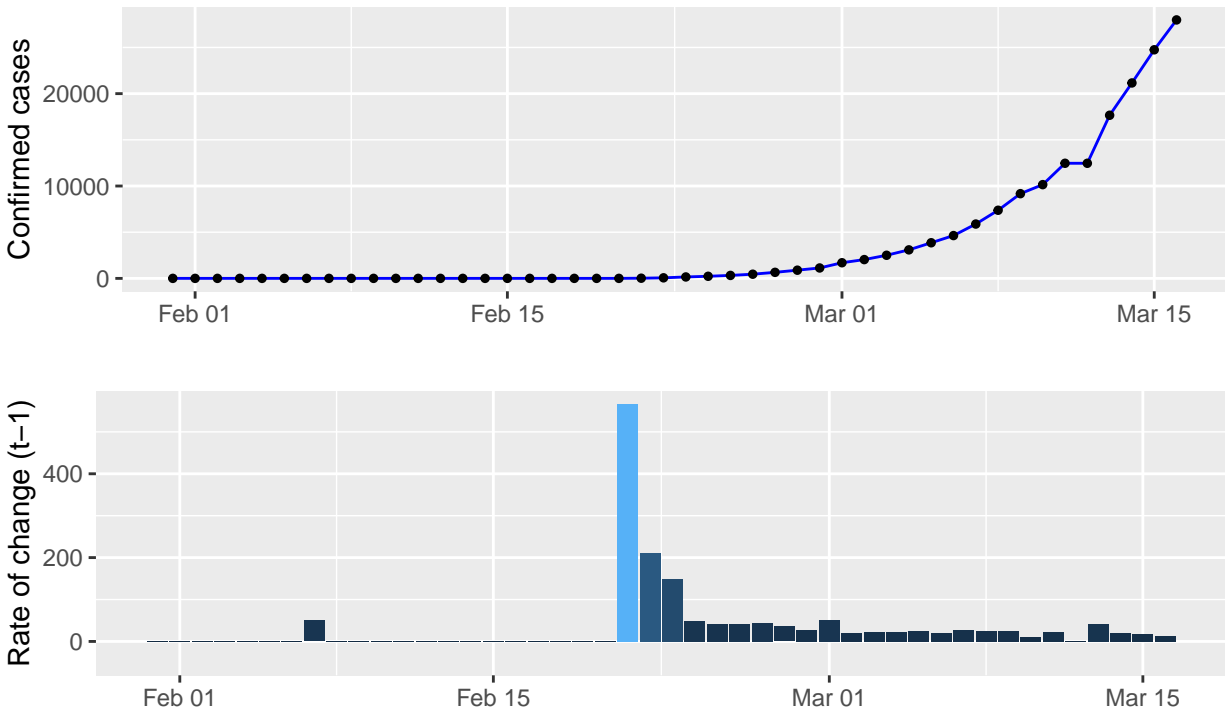


Figure 6: Rate of change of confirmed cases

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

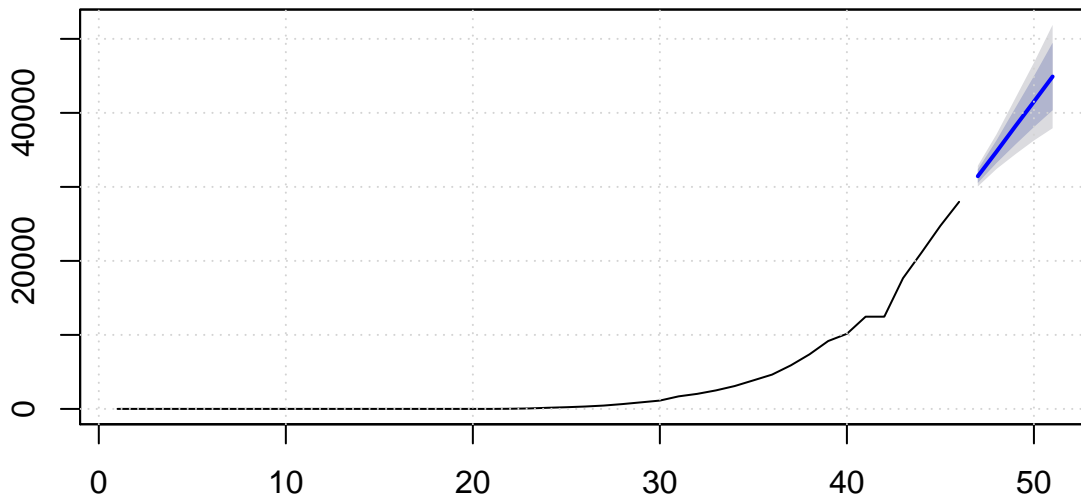


Figure 7: ARIMA projection

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

	Estimation	Confidence 95% (Low)	Confidence 95% (High)
t+1 (2020-03-17)	31444	30052	32836
t+2 (2020-03-18)	34759	32416	37101
t+3 (2020-03-19)	38170	34396	41943
t+4 (2020-03-20)	41518	36265	46772
t+5 (2020-03-21)	44908	37927	51888

- The estimated proportion of cases detected is 0.79%.
- With data up to 2020-03-16 in Italy we have 27980 confirmed cases and 2158 deaths.
- Estimated doubling time (based on 5 days time window) is approximately 3.5 days

4.2 PROPHET projection

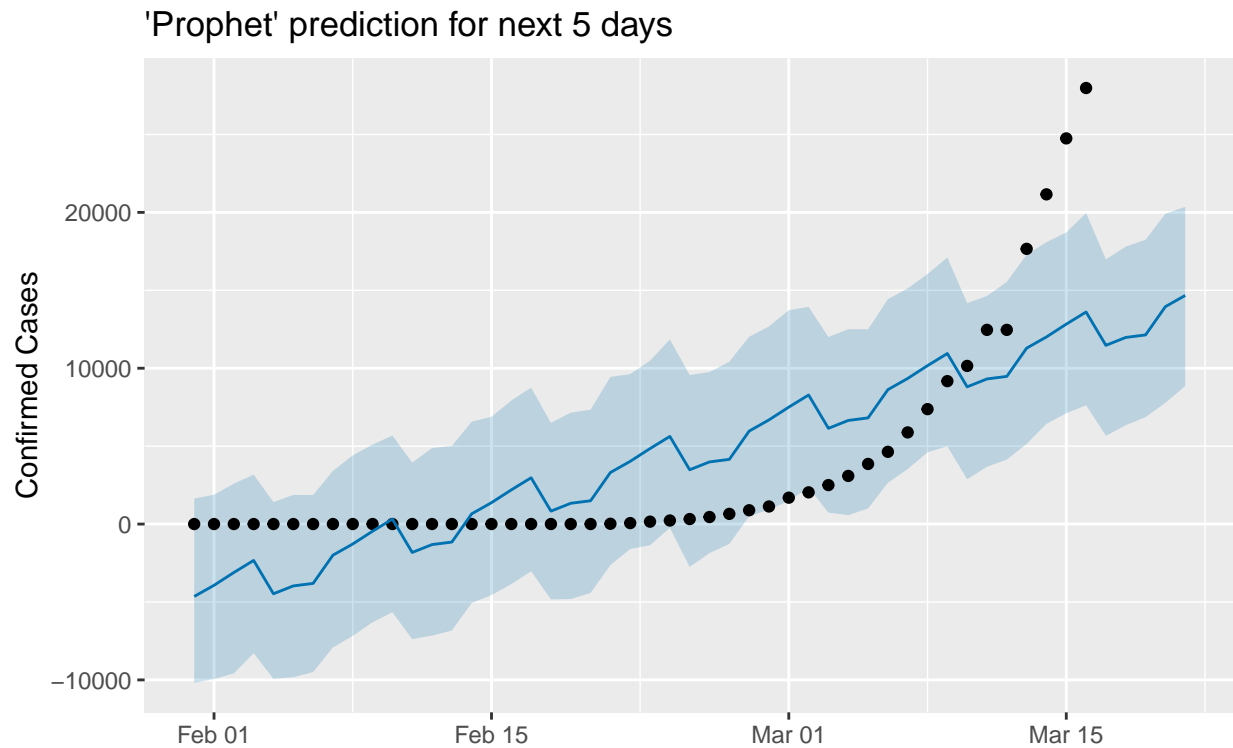


Figure 8: PROPHET Projection of confirmed cases over the next 5 days for Italy

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

	Future_Date	Estimation	Confidence 95% (Low)	Confidence 95% (High)
t+1	2020-03-17	11469	5665	16988
t+2	2020-03-18	11975	6338	17803
t+3	2020-03-19	12138	6863	18245
t+4	2020-03-20	13952	7783	19910
t+5	2020-03-21	14670	8854	20357