

Covid19 Report

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1 The *CRISTINA* project

This report is part of a research project “**Co**Rona vIrus **Spa**Tial **a**NAlysis” (CRISTINA) which examines the time series progress of COVID-19 events in 177 countries of the world.

2 France

A series of visualizations for the progress of COVID-19 for **France**. 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

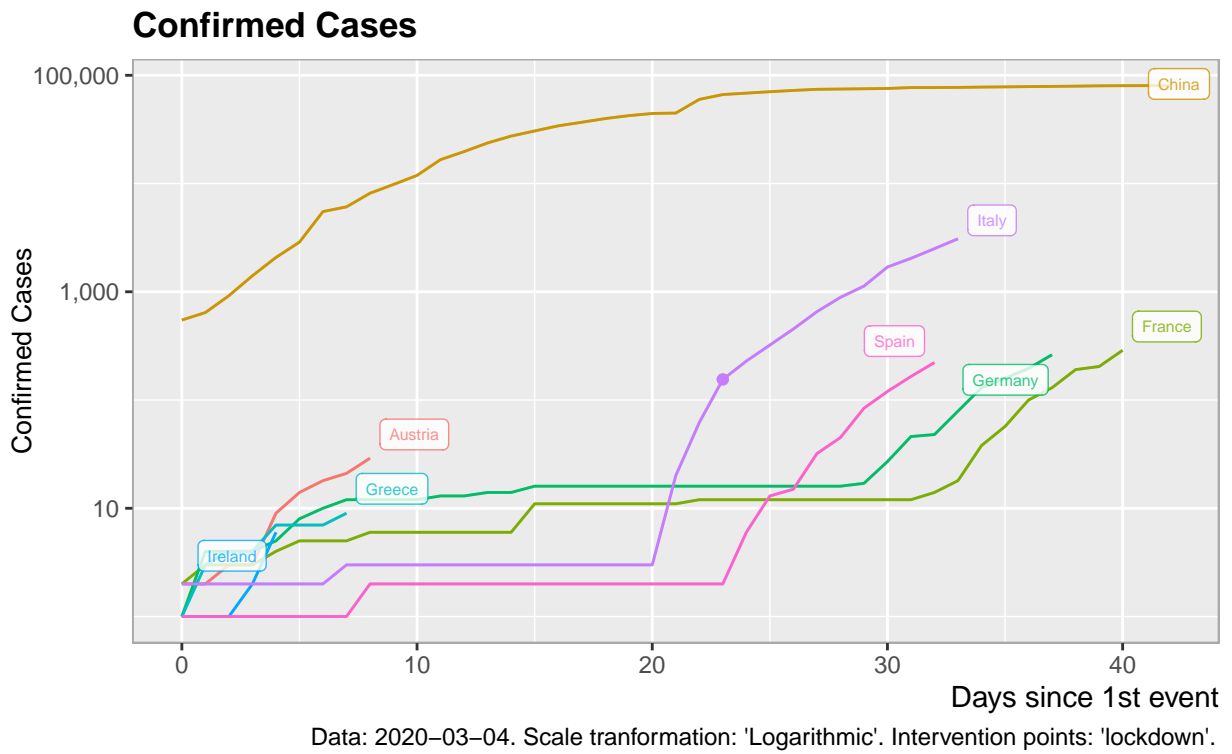


Figure 1: Confirmed Cases

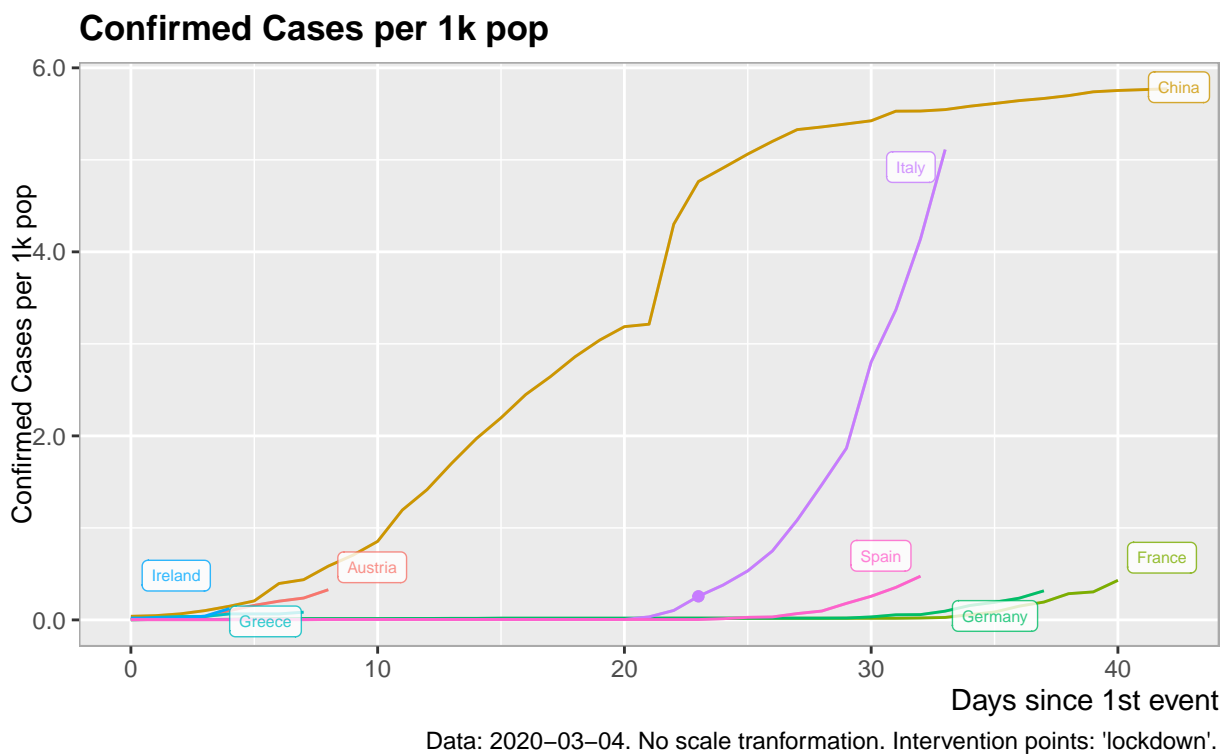


Figure 2: Confirmed Cases by 1000 population

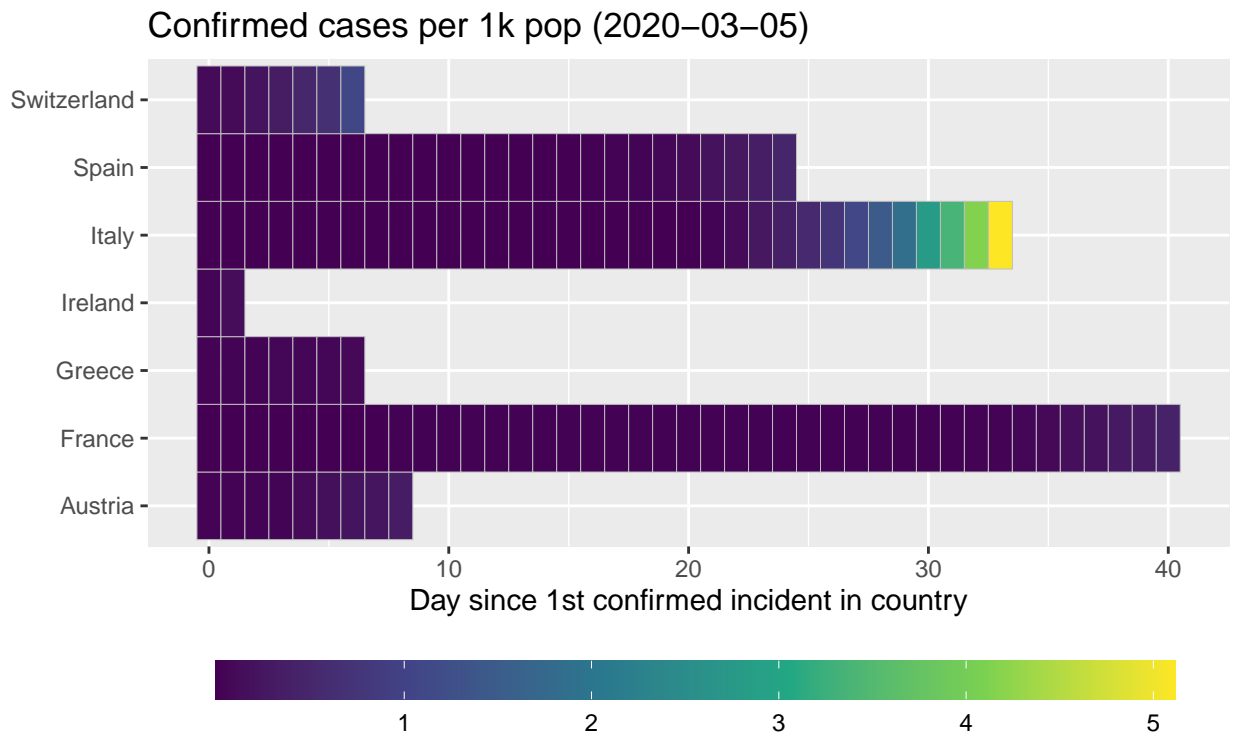
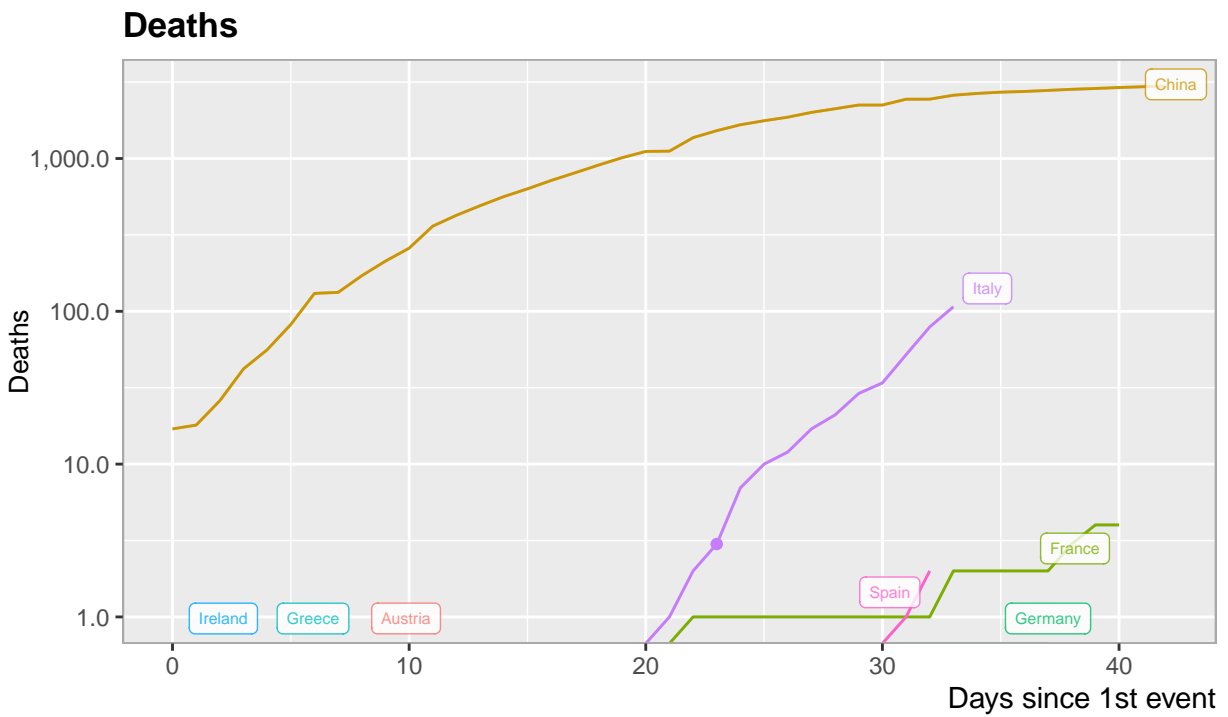


Figure 3: Confirmed Cases by 1000 population

2.2 Deaths



Data: 2020-03-04. Scale tranformation: 'Logarithmic'. Intervention points: 'lockdown'.

Figure 4: Number of deaths by country

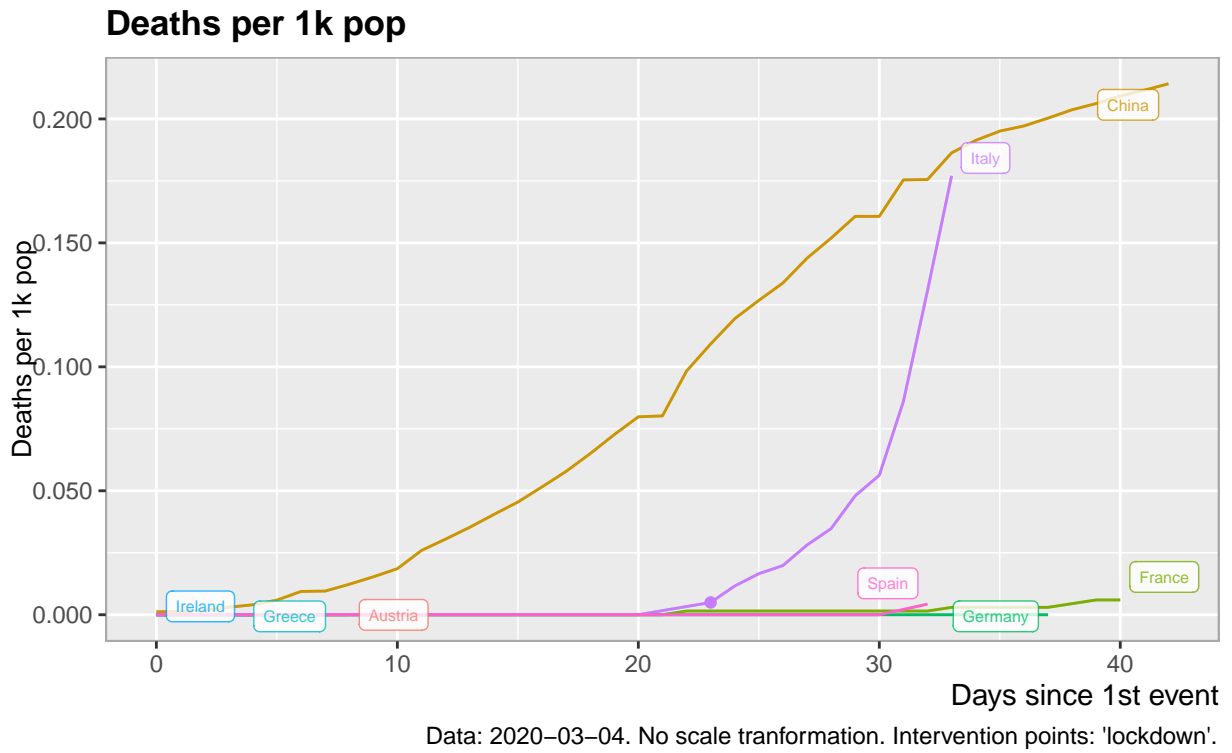


Figure 5: Deaths by 1000 population

3 Rate of change over time

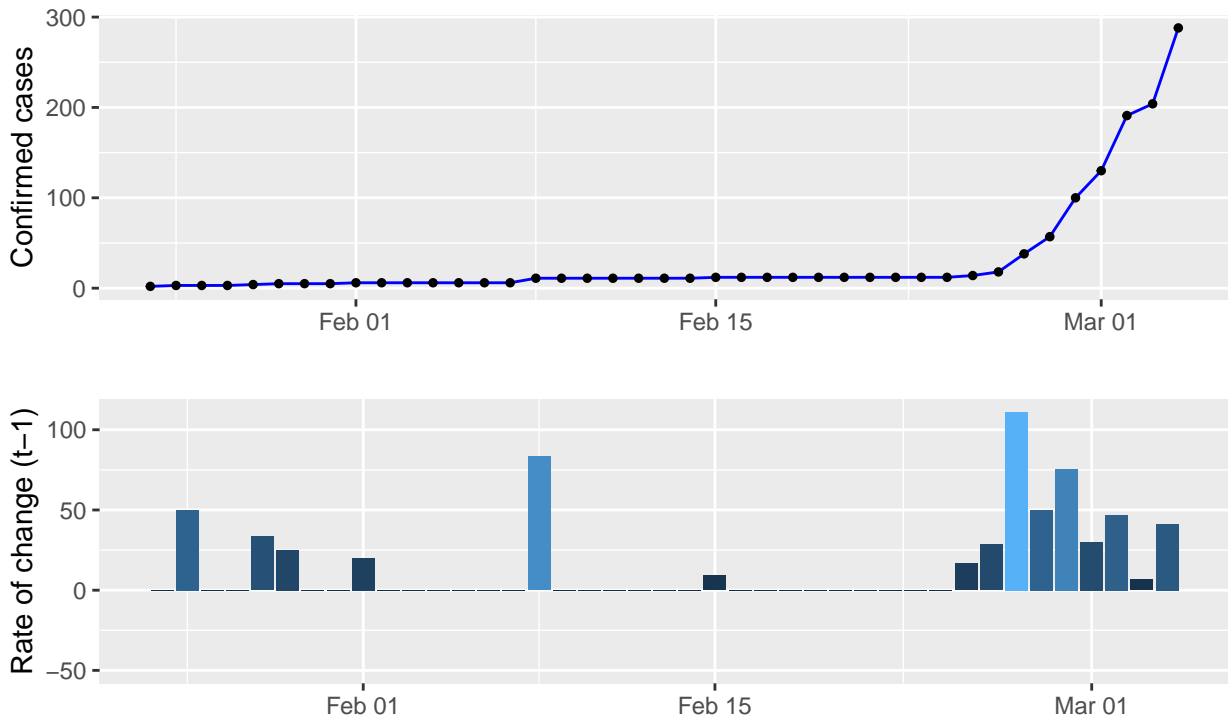


Figure 6: Rate of change of confirmed cases

4 Estimations

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

4.1 ARIMA projection

Projection of 'confirmed' cases for 5 ahead

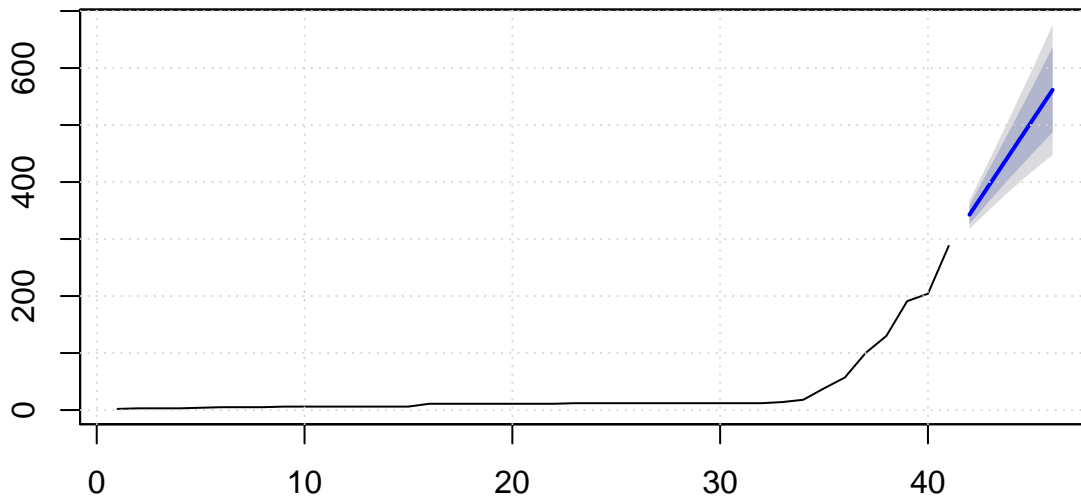


Figure 7: ARIMA projection

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

	Estimation	Confidence 95% (Low)	Confidence 95% (High)
t+1 (2020-03-05)	342.7	317.7	367.8
t+2 (2020-03-06)	397.5	353.1	441.9
t+3 (2020-03-07)	452.2	386.6	517.8
t+4 (2020-03-08)	506.9	418.1	595.7
t+5 (2020-03-09)	561.7	447.7	675.7

- The estimated proportion of cases detected is 9.9%.
- With data up to 2020-03-04 in France we have 288 confirmed cases and 4 deaths.
- Estimated doubling time (based on 5 days time window) is approximately 2.7 days

4.2 PROPHET projection

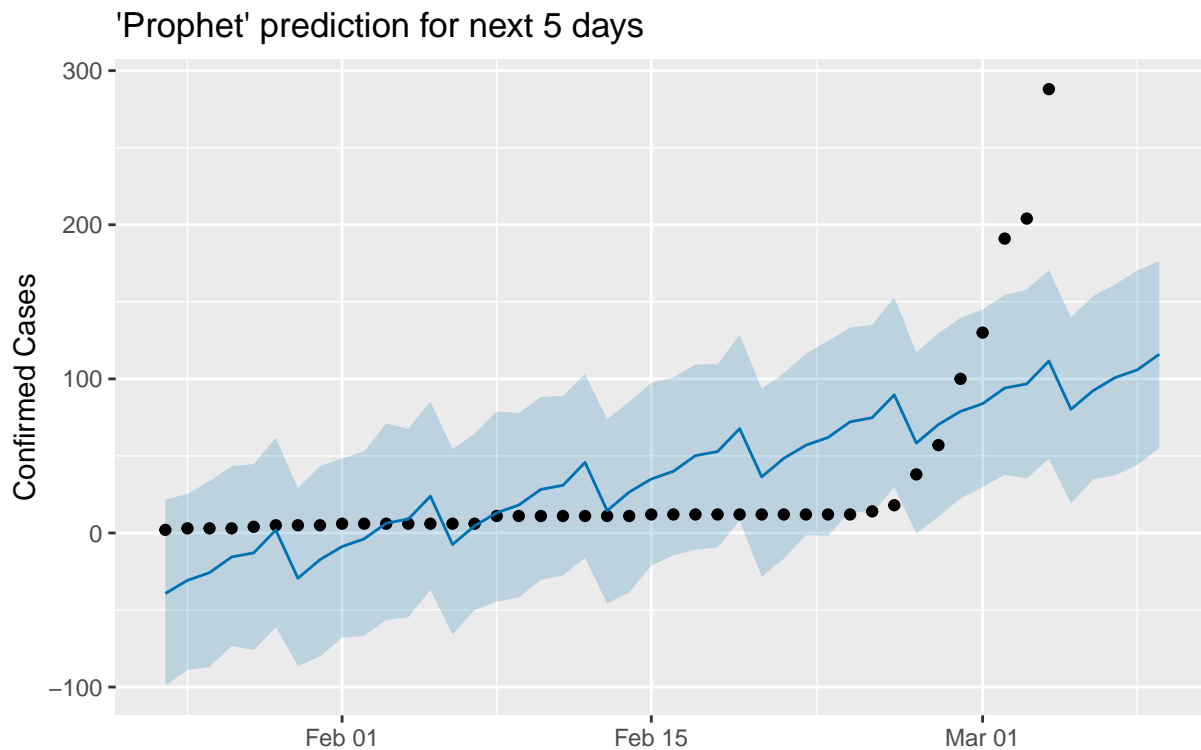


Figure 8: PROPHET Projection of confirmed cases over the next 5 days for France

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

	Future_Date	Estimation	Confidence 95% (Low)	Confidence 95% (High)
t+1	2020-03-05	80.25	19.1	139.9
t+2	2020-03-06	92.31	34.73	153.7
t+3	2020-03-07	100.8	37.38	161.3
t+4	2020-03-08	105.8	44.04	170.2
t+5	2020-03-09	116	55.17	176.3