

Conditional predictions actual cases A (formerly I) for Germany, based on data until Jan. 20, 2021

The sharpening of the containment measures of Dec 16 (close down of shops, contact reductions) turned out surprisingly effective, although its immediate effects were counteracted in the second half of December by the Christmas and new year activities. In the medium range (data of January 2021) the reproduction rate went down from roughly $R \approx 1.1$ to 1.14 in early December by about 30 % to $R \approx 0.8$ in mid January. The resulting effects for the numbers of actual infected and a conditional prediction for the next 30 days are shown below. The conditions are: No essential change of contact behaviour during the time of lockdown until February 15 and proportion of the new virus mutant (B 1.1.7) at the order of 1 % at the beginning of January (similar to values in Switzerland).

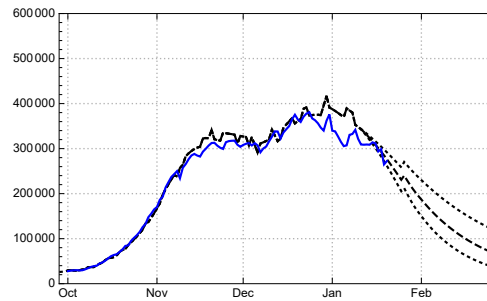


FIGURE 1. Conditional prediction for the number of actual infections A based on data (JHU) available at Jan 21, 2021 (data until Jan 20), last reproduction rate $R \approx 0.8$; JHU data blue, model values black dashed. Condition of prediction: no essential change of reproduction rate of early January 2021. Dotted: boundary of interval 1σ interval for variability of reproduction rates since January 3.

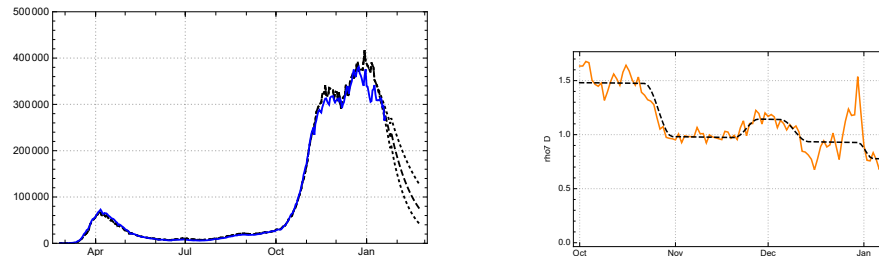


FIGURE 2. Left: SEPAR model (formerly SEPIR) for the number of actual infections A since March 2020; JHU blue, model values black dashed. Right: reproduction numbers (orange) on the basis of JHU data for daily new infected; model reproduction rates black dashed.

Conditional predictions actual cases I for Germany, based on data until Dec. 12 , 2020

A comparison with the conditional prediction of Nov. 26, shows that in mid November the reproduction number started to increase again from about 0.98 in early November to $R = 1.12$ at the end of the month. Accordingly the number of actual infected started to rise again since the second week of December. It would rise to about $I_{act} \approx 500k$, at the end of the year, if no measures were taken. The new containment measures announced for Dec 16 will hopefully reduce the increase by an unknown amount. We show here two assumption (red dotted lines): reduction of contact rates by 10 % respectively 30 %.

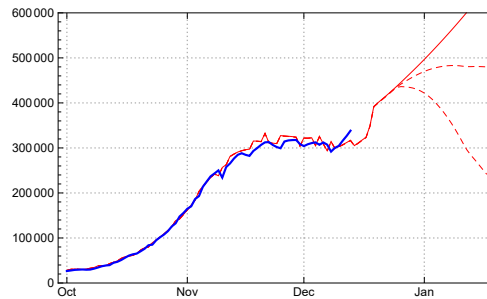


FIGURE 1. Conditional prediction for the number of actual infections I based on data (JHU) available at Dec 13, 2020 (data until Dec 12), last SEPIR reproduction rate $R = 1.12$; JHU data blue, model values solid red for continuation with reproduction rate of early December. Dotted: assumption that extension of partial lockdown announced for Dec 16 reduces reproduction rate by 10 %, respectively 30 %.

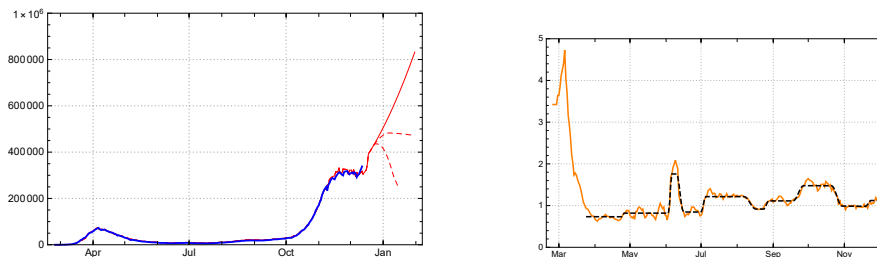


FIGURE 2. Left: SEPIR model for the number of actual infections I since March 2020; JHU blue, model values red. Right: SEPIR reproduction numbers (red) on the basis of JHU data for daily new infected.

Conditional predictions actual cases I for Germany, data until Nov. 25, 2020

A comparison with the conditional prediction of Nov. 10, shows that the present situation is close to the most pessimistic variant foreseen in our last outlook (top left). The measures decided Nov. 25 by the German authorities are minor and will be put into place on Dec. 1. We do not expect noticeable effects from them; we therefore show here only what can be expected from extrapolating the last calculable reproduction rate into the near future.

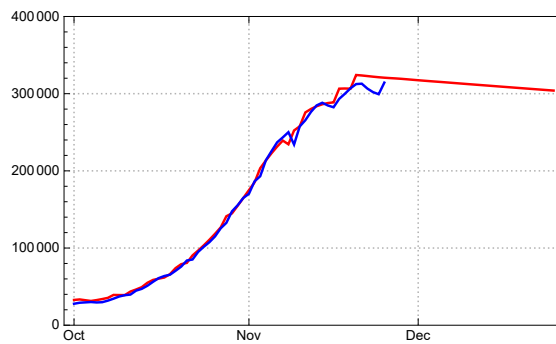


FIGURE 1. Conditional prediction for the number of actual infections I based on data (JHU) available at Nov 26, 2020 (data until Nov 25), last SEPIR reproduction rate $R = 0.99$; JHU data blue, model values red.

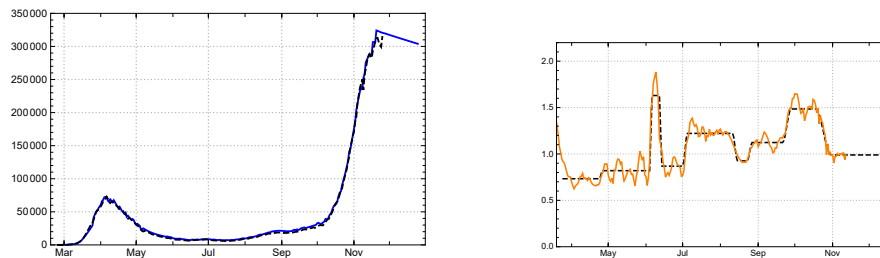


FIGURE 2. Left: SEPIR model for the number of actual infections I based on data until Nov 25, 2020; JHU data black dashed, model values blue. Right: SEPIR reproduction numbers (orange) on the basis of JHU data for daily new infected, model values with constancy intervals black dashed.

Conditional predictions actual cases I for Germany, data until Nov. 10, 2020

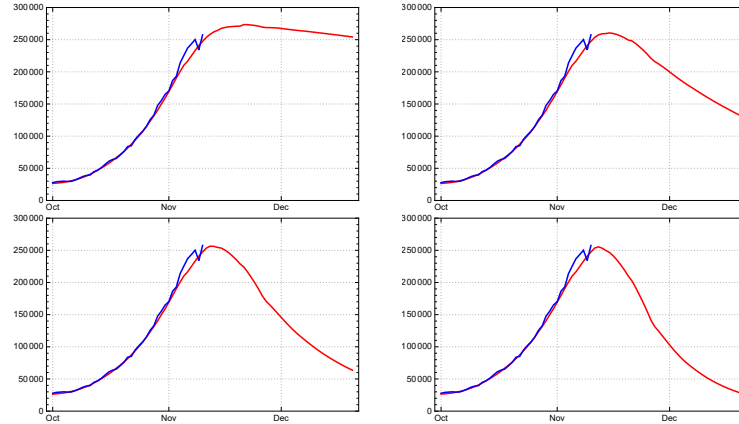


FIGURE 1. Conditional prediction for the number of daily new infections I_{new} based on data (JHU) available at Nov 11, 2020 (data until Nov 10, last SEPIR reproduction rate $R = 1.11$).[†] Blue JHU data, solid red line model values. Assumptions: Top left, government measures enacted Nov. 2 reduce reproduction rate by 10 % to $R=0.999$. Top right: reduction by 20 % to $R=0.89$. Bottom left: reduction by 30 % to $R=0.78$. Bottom right: reduction by 40 % to $R=0.67$.

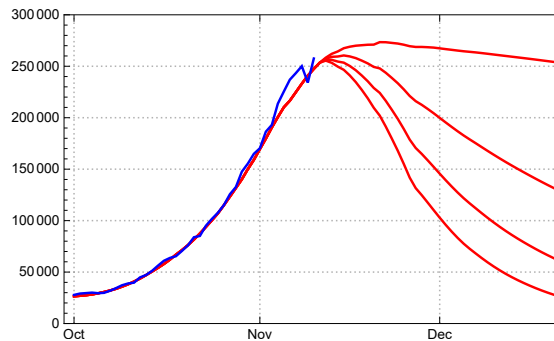


FIGURE 2. Results of all 4 assumed conditions in one (see above figure). With our parameter values the predicted date for the peak of actual infections is to be expected between Nov. 12 (for 40 % scenario) and Nov. 21 (for 10 % scenario).

[†]The date of the last available reproduction rate R is Oct, 28, i.e. 11 days later than the one of the prediction on the following page. The reduction of R in this time interval may be due to a *change of behaviour* under strong public announcement, added by a *beginning overload of test capacities*.

Conditional predictions actual cases I for Germany, Oct. 31, 2020

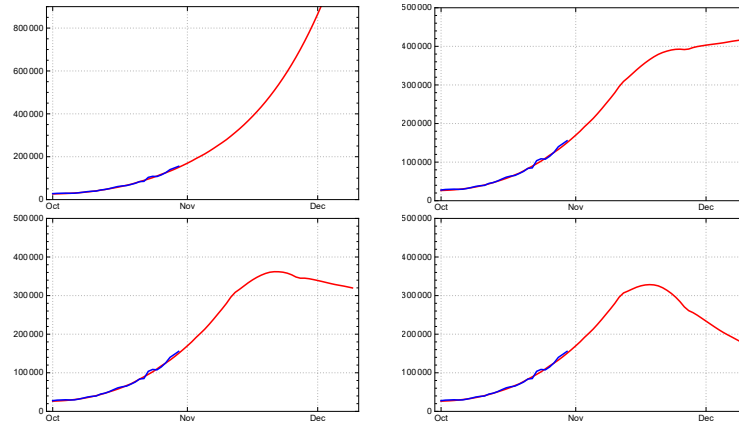


FIGURE 1. Conditional prediction for the number of daily new infections I_{new} based on data (JHU) available at Oct 31, 2020 (last SEPIR reproduction rate $R = 1.39$). Blue JHU data, solid red line model values. Assumptions: Top left, government measures enacted Nov. 2 reduce reproduction rate by 10 % to $R=1.25$. Top right: reduction by 25 % to $R=1.04$. Bottom left: reduction by 30 % to $R=0.97$. Bottom right: reduction by 40 % to $R=0.83$.

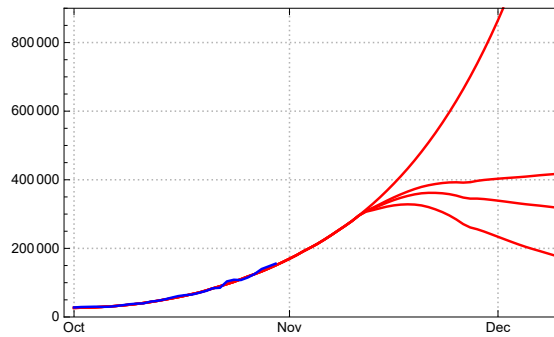


FIGURE 2. Results of all 4 assumed conditions in one (see above figure). With our parameter values the predicted date for the peak of actual infections for the third and last scenario is to be expected about Nov. 18.

Conditional predictions actual cases I for Germany Oct. 22, 2020

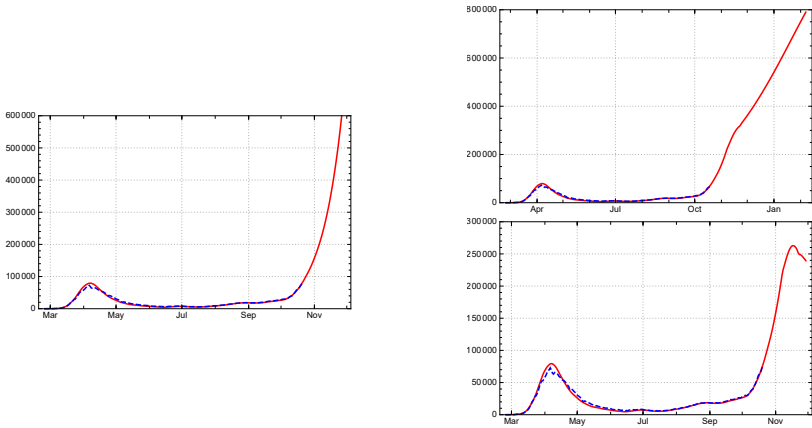


FIGURE 1. Conditional prediction for the number of actual cases I based on data (JHU) available at Oct 21, 2020. Dashed blue JHU data, solid red line model values. Left: 1st reduction of reproduction rate $R= 1.45$ by 5 % to $R= 1.38$ at Oct 16. Top right: 2nd reduction by 20 % to $R=1.10$ at Oct 30. Bottom right: 2nd reduction by 30 % to $R=0.94$ at Oct 30.

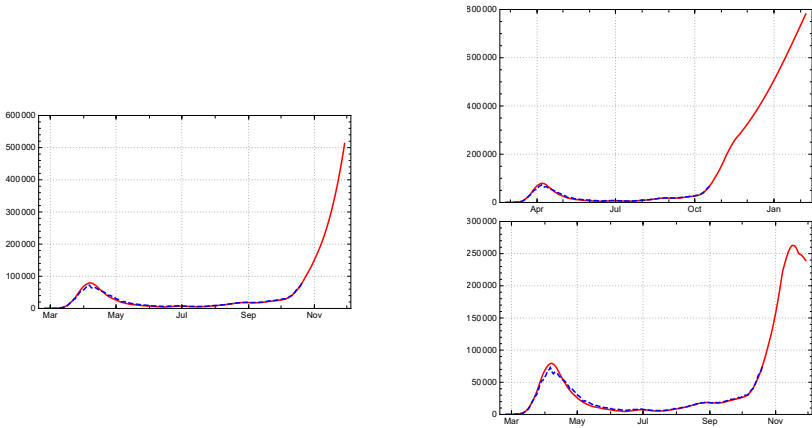


FIGURE 2. Conditional prediction for the number of actual cases I based on data (JHU) available at Oct 21, 2020. Dashed blue JHU data, solid red line model values. Left: 1st reduction of reproduction rate $R= 1.4$ by 10 % to $R= 1.30$ at Oct 16. Top right: 2nd reduction by 15 % to $R=1.11$ at Oct 30. Bottom right: 2nd reduction by 25 % to $R=0.98$ at Oct 30.