More

Corona Virus Science

This blog explains some of the science related to the corona virus (COVID-19) e perspective. Most posts contain links to the underlying research.

COVID-19 Model Projections

This page contains graphs with the latest COVID-19 projections for the US from the "Data Trend Model". Previous predictions can be downloaded from Github.

Last model run

April 29, 2020 with Johns Hopkins Data from 4/28/2020.

- **Total deaths predicted by 6/27/2020: 171,461** (yesterday:180,402 until 6/26)
- **Excluding New York & New Jersey: 115,607** (yesterday: 119,558 until 6/26)
- **Predicted daily death on 6/27/2020: 1,576** (~ 95,000 per 2 months)

Summary

Today's numbers are lower than yesterday's numbers again. This reflects relatively low numbers reported by many states yesterday and the day before, which caused downward trend curves for many states. The numbers reported for today (which are not yet used by the model) are higher again, so the predictions tomorrow will probably reflect this.

Looking at what we saw in the last few days, it seems that the model is quite sensitive to "weekend effects": reported case numbers tend to go down on weekends and the beginning of the week, and go up towards the middle and end of the week. The model tries to minimize the effect by using 7-day block averages, looking back and forward 3 days, but that does not work quite as well as expected. The reason is that we try to use the data up to the last day, so that the averages we build for the last day are only based on the last 4 days (since we don't have the numbers for the next 3 days yet). The effect is that the numbers on Mondays and Tuesdays are lower than they would be with true 7-day averages, and higher later in the week. That cause the trend lines to down (respectively up) more than they should.
I plan to look into various ways to reduce this issue. I have already changed the way the cases for the first projection day are calculated; they are now based on the trend line prediction, rather than on the last day's number and the trend line slope. But I may also have to switch to using trailing averages from the last 7 days, instead of centered averages. That would increase the delay of the model somewhat, but increase the stability of forecasts. I'll also look in basing the regression on minimizing absolute differences, rather that the current least-squares approach. Least squares is

great for data with random errors, and it is easy to calculate; but using absolute differences instead handles outliers better, and may therefore be more appropriate for the COVID-19 data. But it requires some programming and evaluation first.

Total projected COVID-19 cases and deaths

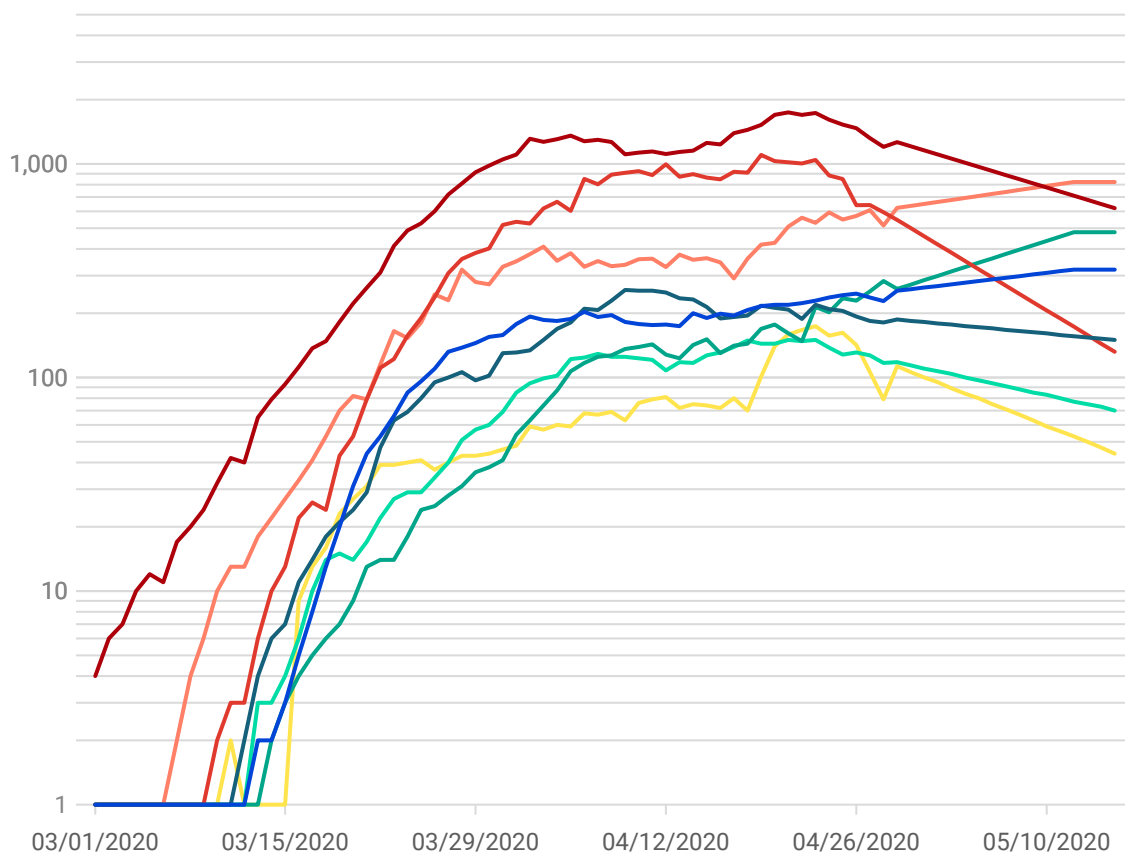Future growth in cases per day limited to 14 days

— Total cases   — Cases without NJ & NY   — Total deaths   — Total deaths without NJ & NY
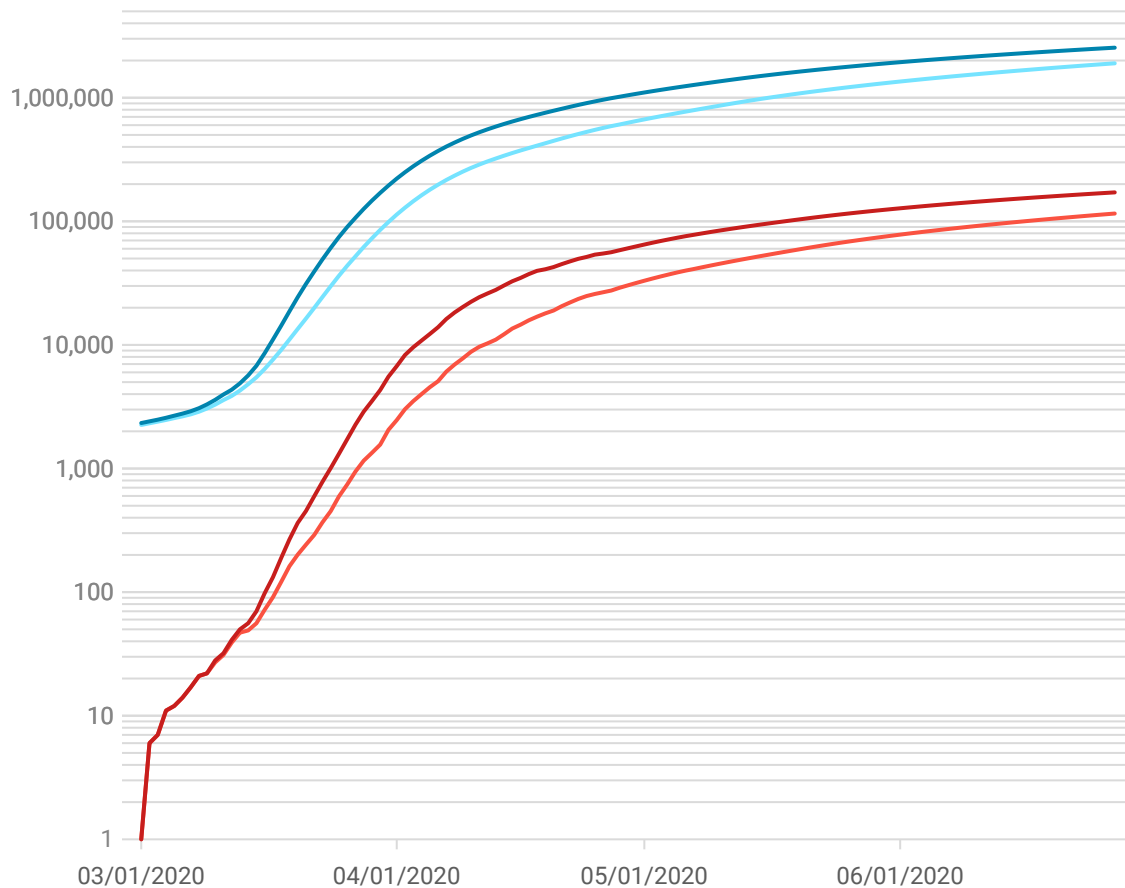
Get the data • Created with Datawrapper

Actual and projected daily COVID-19 cases by state (AL-DC)

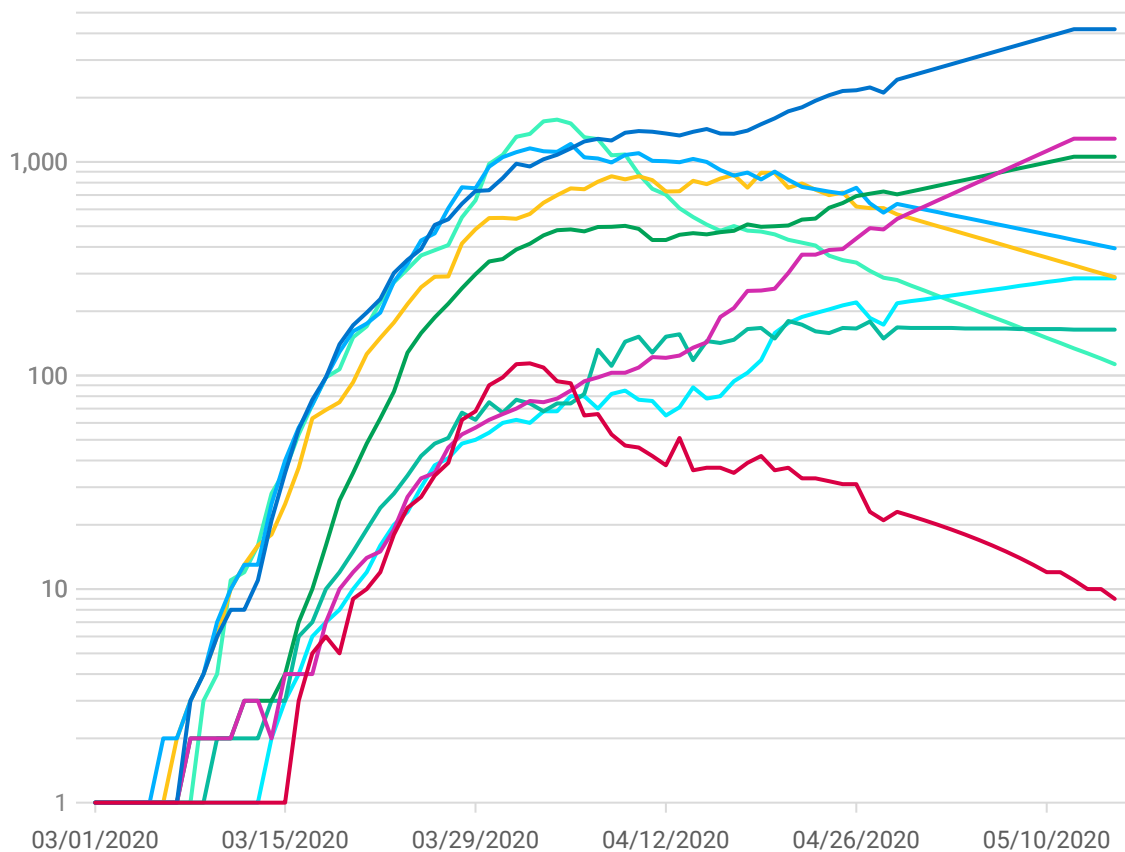— Alabama — Arizona — Arkansas — California — Colorado — Connecticut — Delaware
— District of Columbia

Get the data • Created with Datawrapper

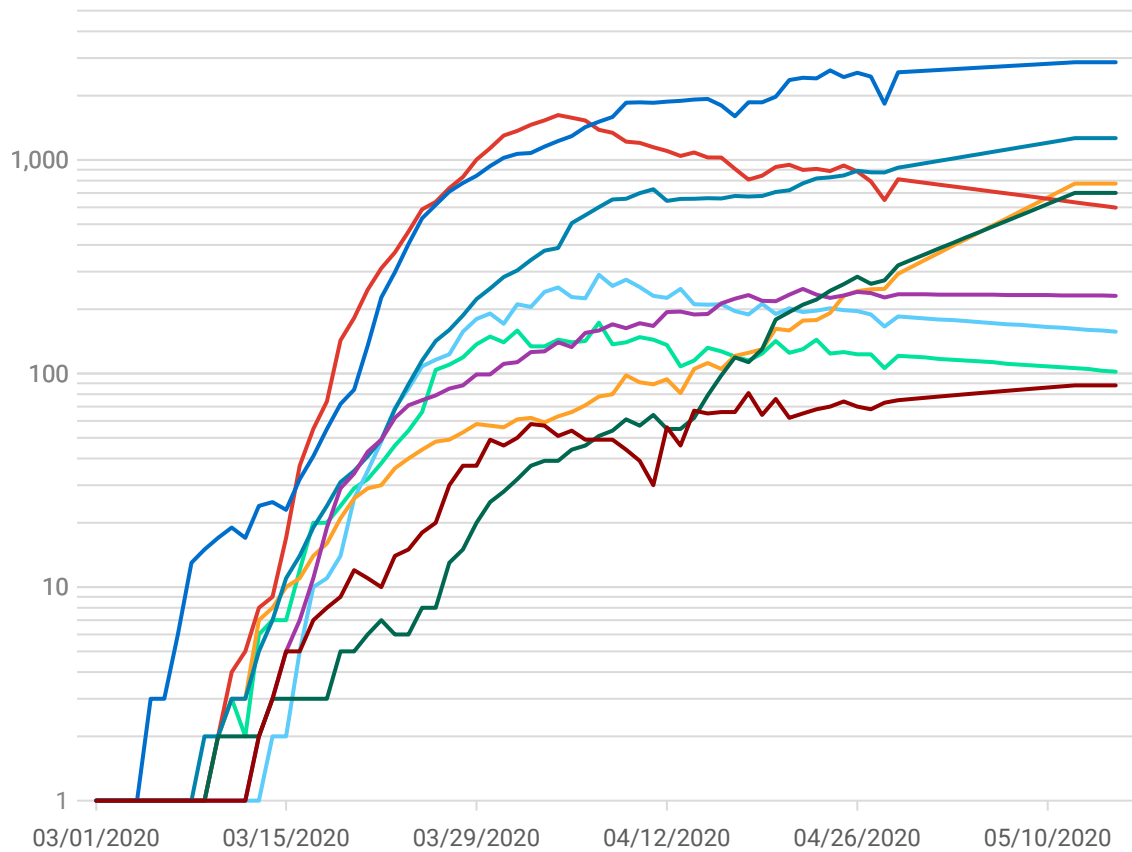# Actual and projected daily COVID-19 cases by state (FL-LA)

— Florida   — Georgia   — Idaho   — Illinois   — Indiana   — Iowa   — Kansas   — Kentucky
— Louisiana

Get the data • Created with Datawrapper

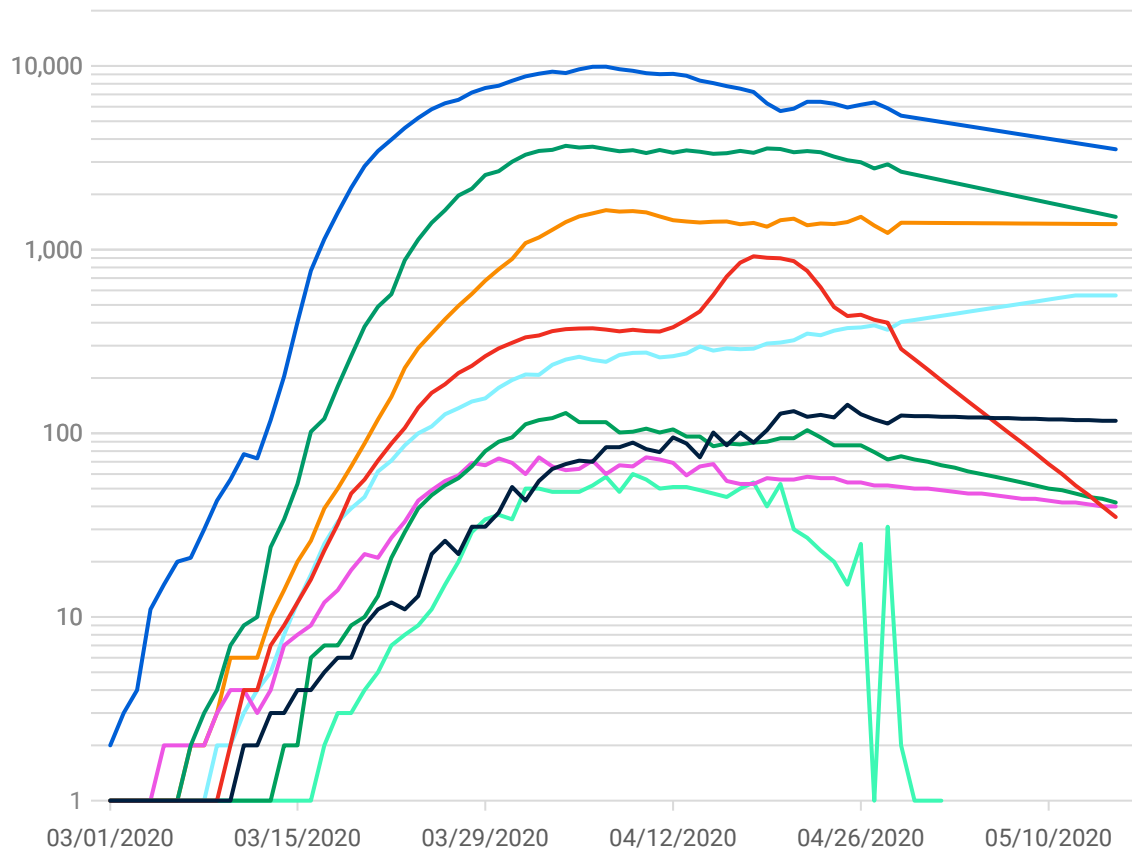# Actual and projected daily COVID-19 cases by state (MD-NH)

— Maryland   — Massachusetts   — Michigan   — Minnesota   — Mississippi   — Missouri

— Nebraska   — Nevada   — New Hampshire

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Actual and projected daily COVID-19 cases by state (NM-PR)
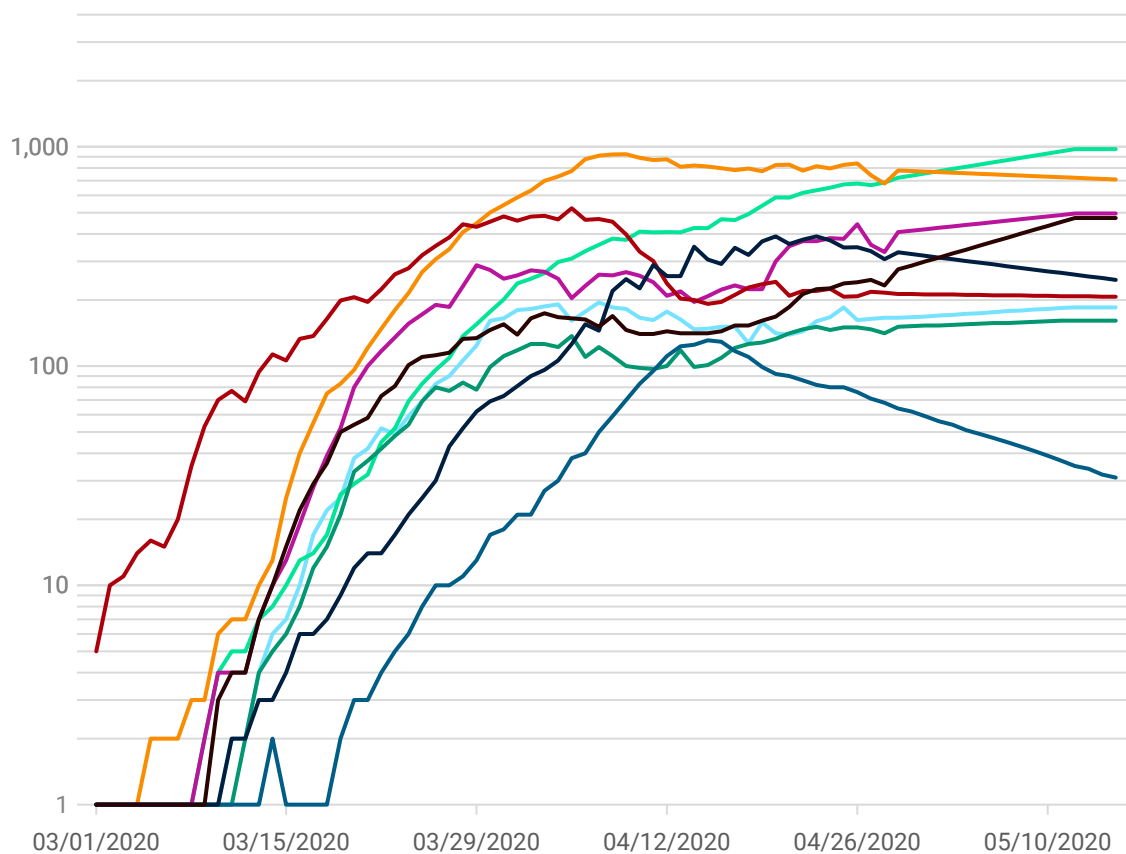
— New Jersey — New Mexico — New York — North Carolina — Ohio — Oklahoma — Oregon
— Pennsylvania — Puerto Rico

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Actual and projected daily COVID-19 cases by state (RI-WI)

— Rhode Island — South Carolina — South Dakota — Tennessee — Texas — Utah — Virginia
— Washington — Wisconsin

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