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 26, 2020 with Johns Hopkins Data from 4/26/2020.

- **Total deaths predicted by 6/24/2020: 218,271**(yesterday: 182,092 until 6/21)
- **Excluding New York & New Jersey: 162,121** (yesterday: 142,481 until 6/21)
- **Predicted daily death on 6/24/2020: 2,354** (~ 140,000 per 2 months)

Summary

Today's model runs and total reflect several changes:

- Total are reported 60 days in the future, so they are expected to increase slightly every day. For the last few days, the totals were reported with a fixed end date of 6/21
- The time-adjusted CFR used in the model was increased to 7.95% with a time offset of 9 days to reflect the observed CFR for a 9-day delay of deaths. This change brings the predicted numbers for today closer to the actual numbers, but also results in an increase of about 10% in predicted deaths.
- Data smoothing now uses 7-day block averages, rather than 3-day averages as before. This should reduced daily changes in the model that are mostly due to day-to-day reporting differences.

The increased number of tests done in the last few days should result in a gradual reduction of the time-adjusted CFR. If testing would indeed capture *all* infected persons, then the time-adjusted CFR should drop down to the infection fatality rate, which is estimated to be between 0.4% and 1%. The current CFR of 7.95% reflects that so far, only about 1 of 8 to 1 of 20 infected persons has been tested in the US.

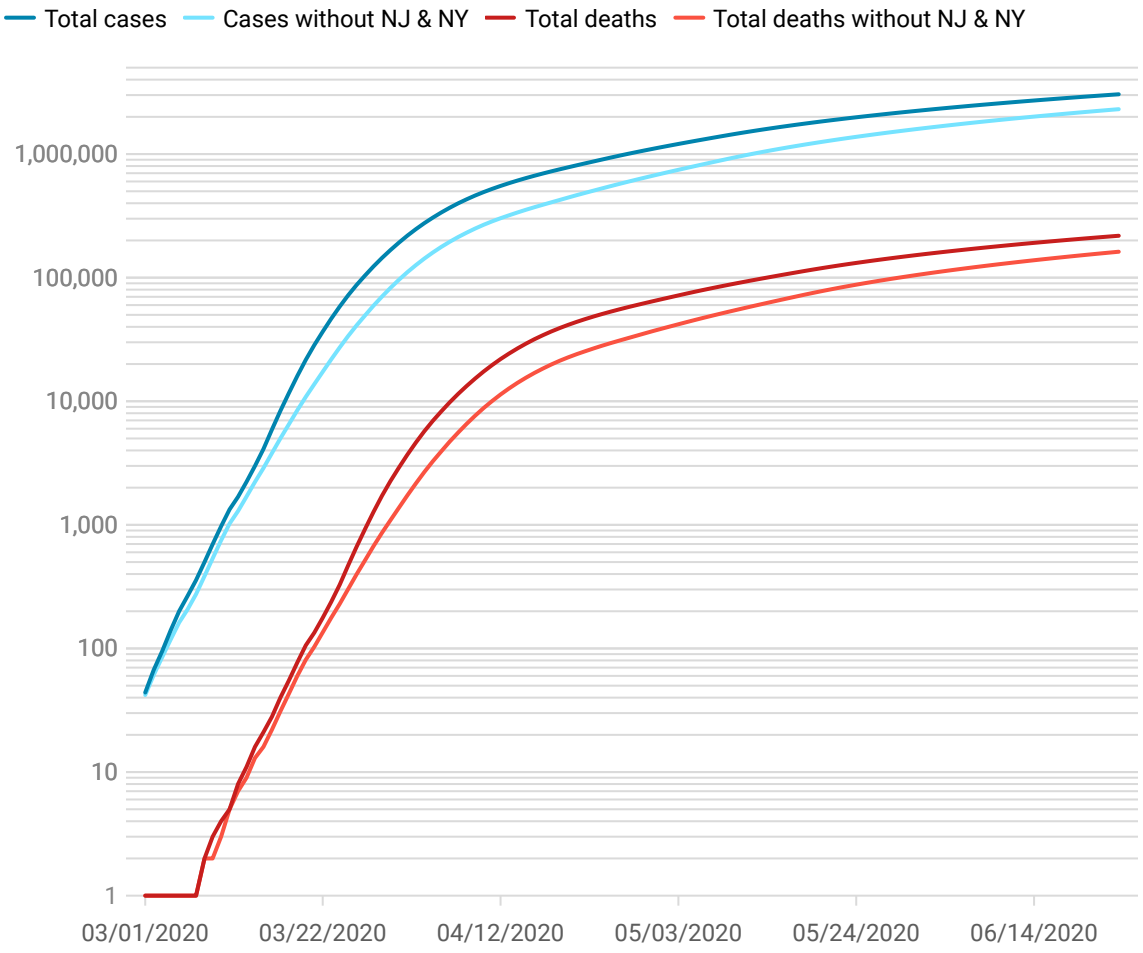
Since changes in today's predictions are large due to the model changes, I will skip the detailed discussion of observed changes in predictions today. But one note: a lot of the increase today in from **New York**'s curve not decreasing as rapidly as yesterday. That reflects an uptick in new

cases in the last few days. However, this uptick seems to be the **result of more testing**, rather than a real increase in the transmission rate. During the peak of the epidemic in NY, NY did about 20,000 tests per day, and had about 10,000 positives. In the last few days, NY did between 25,000 and 46,000 tests per day, and had about 6,000 to 8,000 positives. More tests will "discover" a higher percentage of the infections. This will reduce the apparent case-fatality rate (currently almost 8%) over time, bringing it closer to the infection fatality rate (probably 0.5-1%).

Other states have seen similar small upticks in confirmed cases that are *probably* due to more testing. The increase on testing means that one of the important underlying assumptions of the model is not valid: that things are basically in a steady state. **Increased testing will result in over-prediction of deaths by the model** as it is now. I plan to modify the model to take testing into account to correct for this.

Total projected COVID-19 cases and deaths

Future growth in cases per day limited to 14 days



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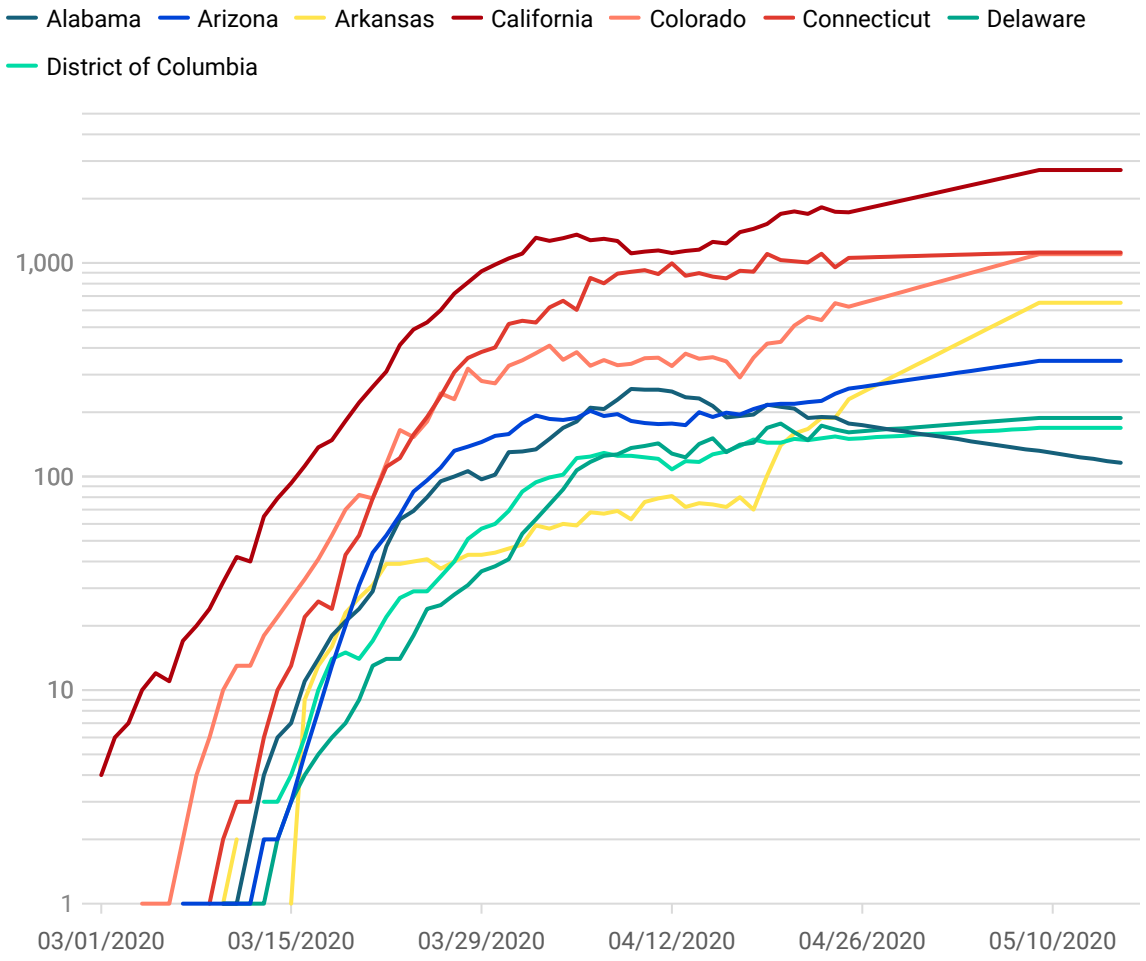
Actual and projected daily COVID-19 cases by state (AL-DC)



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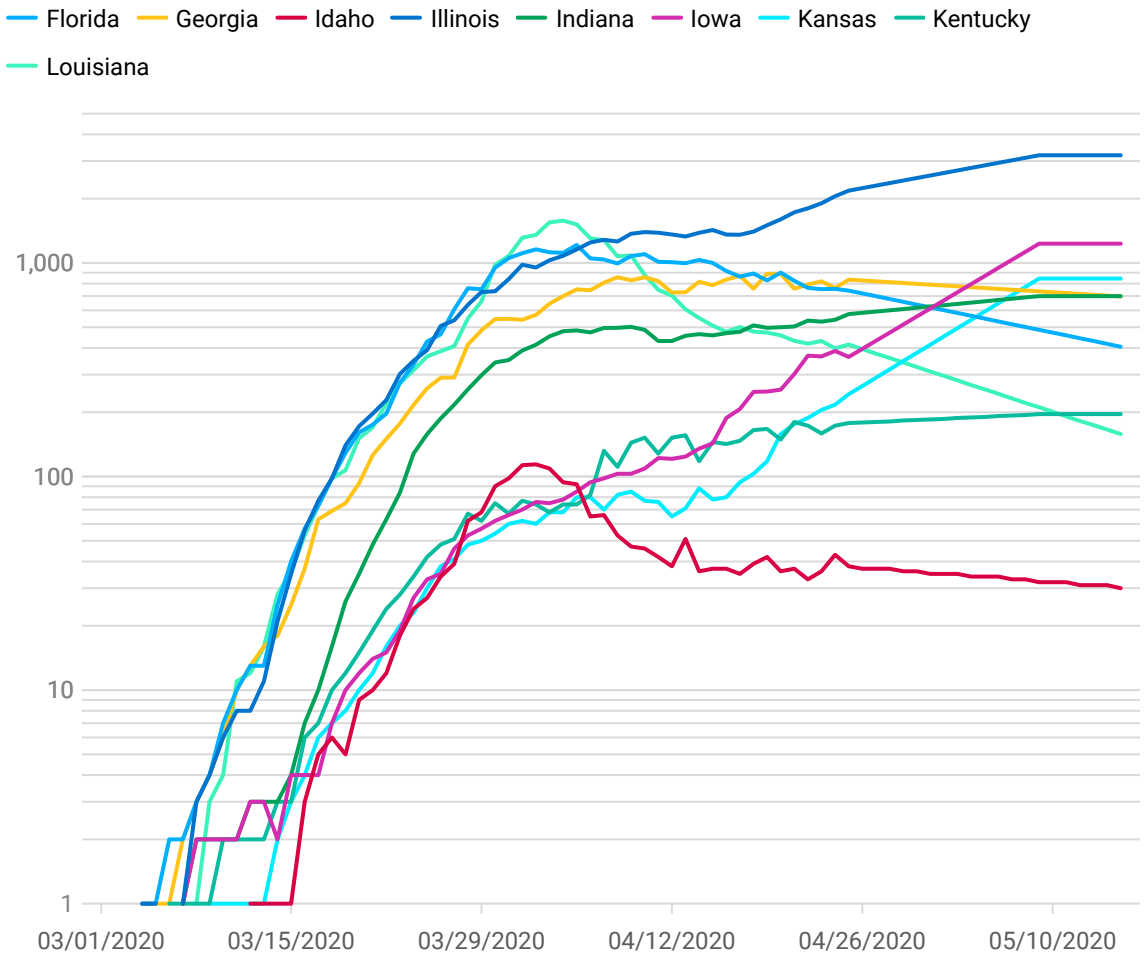
Actual and projected daily COVID-19 cases by state (FL-LA)



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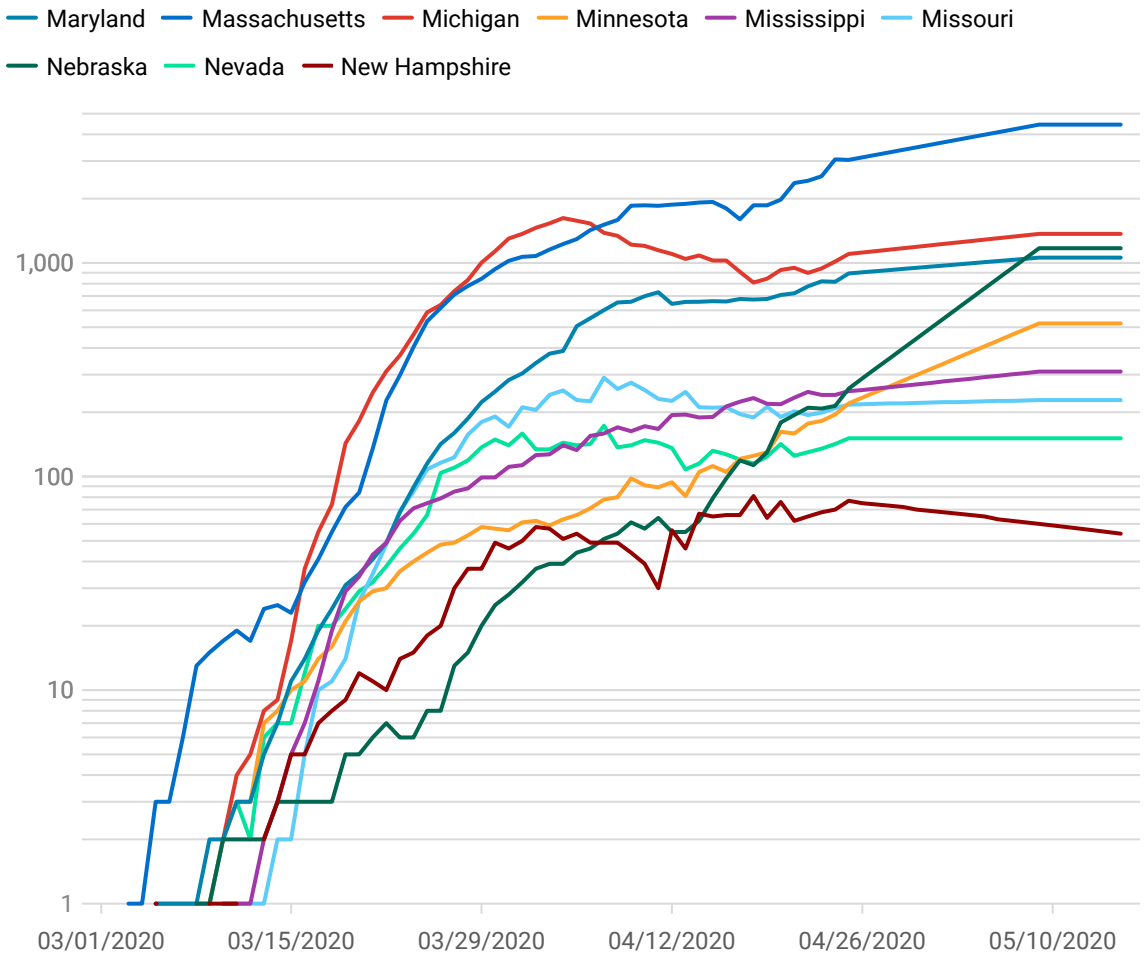
Actual and projected daily COVID-19 cases by state (MD-NH)



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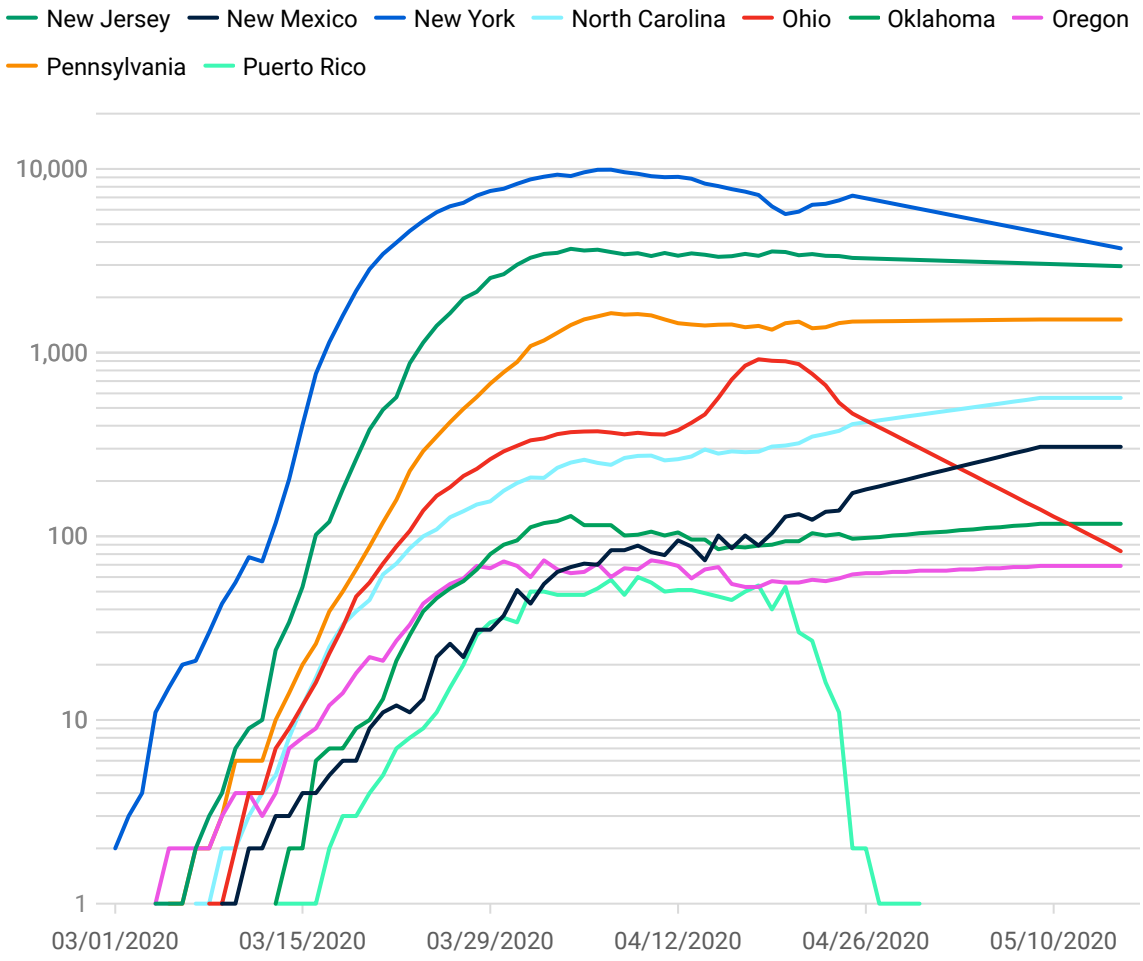
Actual and projected daily COVID-19 cases by state (NM-PR)



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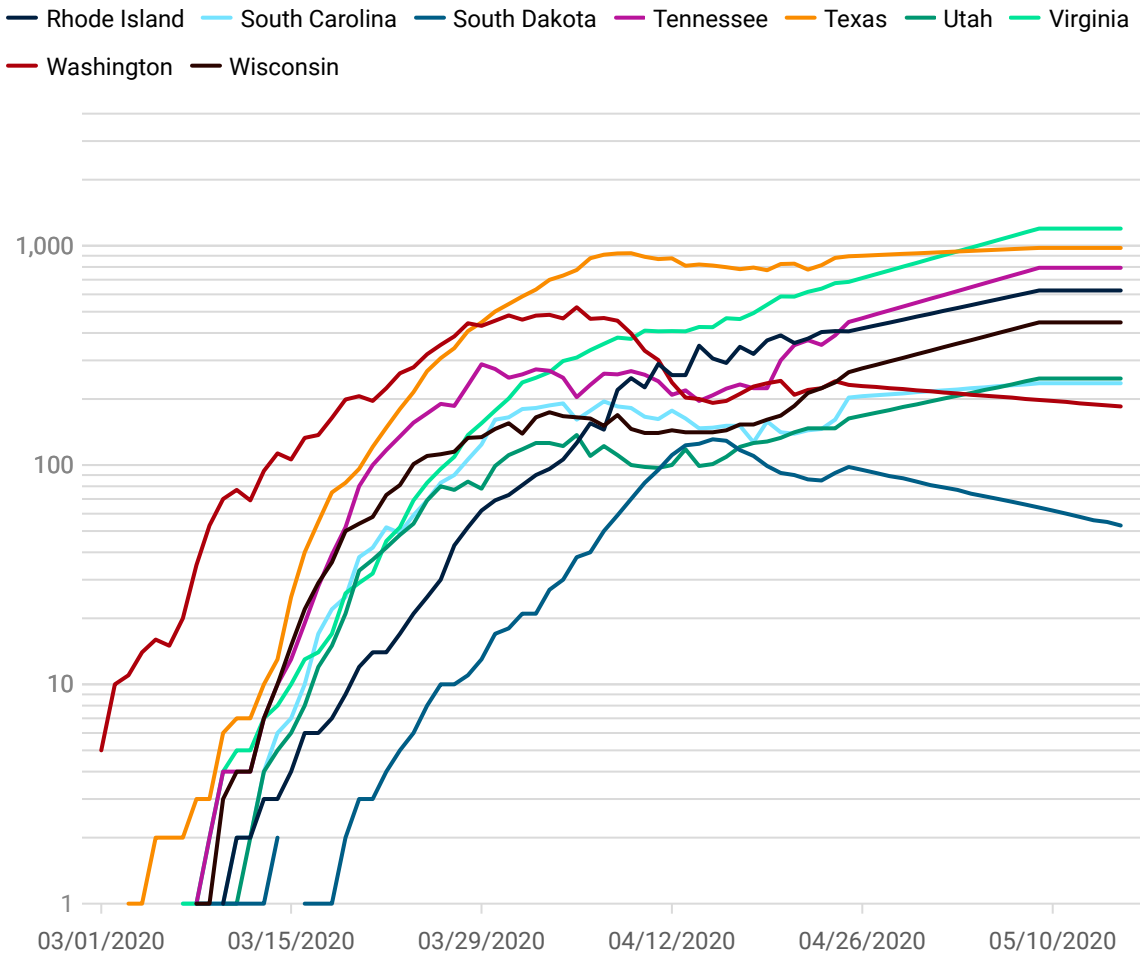
Actual and projected daily COVID-19 cases by state (RI-WI)



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