

For my daughters:

April 13, 2020

The Coronavirus Pandemic

A Look Ahead

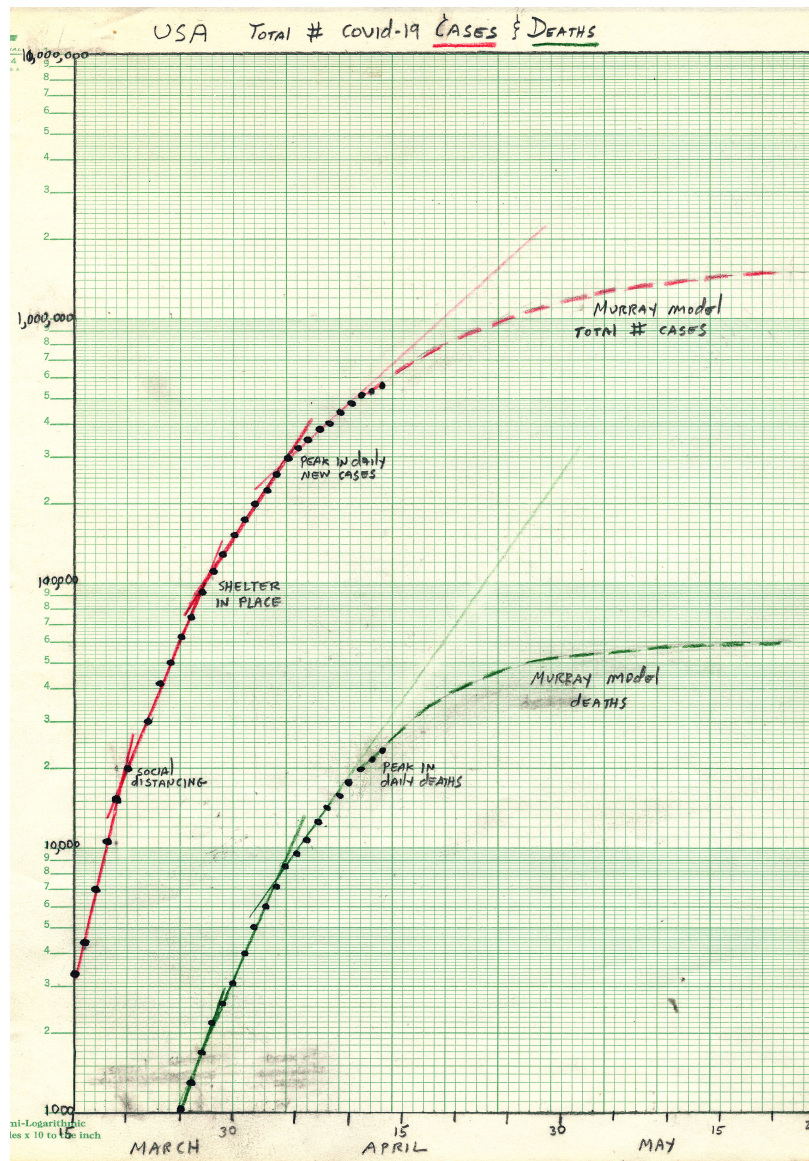
We live in a time of face masks. When we look back on these days, that is the image that will stick. I will think not of time alone in the house (I spend my days in my basement office anyway), but of my girls fighting off covid-19 – wearing face masks:



In these dark days it's great to be part of a vibrant family. Our hour-long ZOOM on Easter does wonderful things for my faith in life. We are all muddling along, apart but somehow together (Caitlin, invisible in this photo, was talking along with all of us). We are family.



Since I last wrote you 2 weeks ago, the coronavirus pandemic under which we cover seems to be approaching its peak. While the daily numbers are still grim -- to date, over half a million Americans have been infected with covid-19 and over 20,000 have died, with 2 thousand more dying each day -- the rate of increase is slowing. The general form of the epidemic continues to follow the so-called Murray model (developed by Chris Murray of the University of Washington's Institute for Health Metrics and Evaluation [IHME] and used by the White House pandemic team). The graph below shows the model predictions (dashed lines) and the actual data (black dots) for the "number-of-cases" line (red) and the "death" line (green):

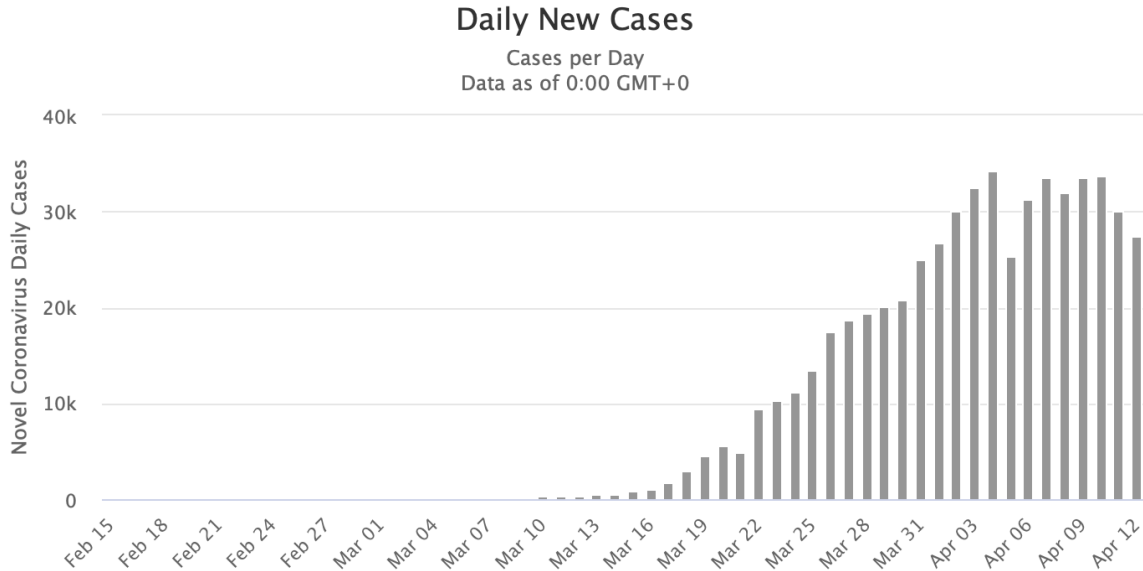


Don't be fooled by the gentle curves of the red and green dashed lines as they flatten out -- this is a log plot, and we are only a third of the way home. Focus on where the lines end up by mid-May: The Murray model predicts that eventually some 1.5 million Americans will be infected with covid-19, and 60,000 will die of it -- three times today's numbers.

The Plateau

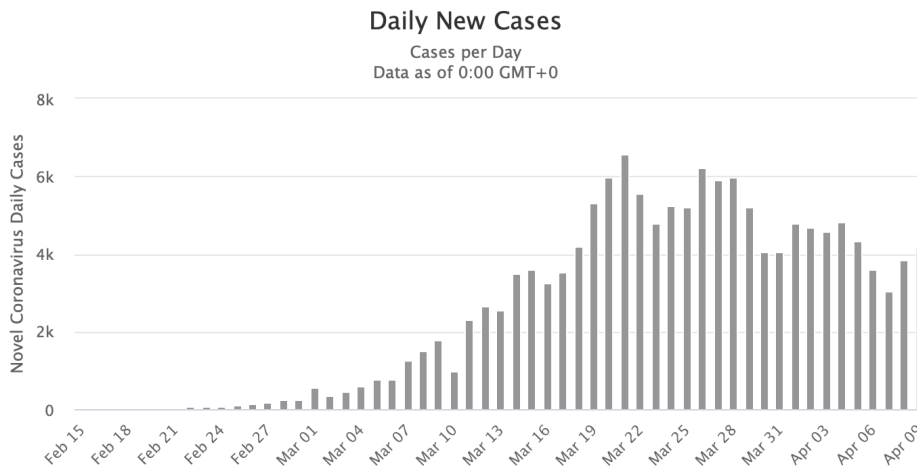
Two weeks ago we had just reached the peak of new daily cases and, based on what had happened in Italy and Spain I predicted that the number of new cases each day would not drop as quickly as it had risen, but instead would continue at near-peak values for some time (a plateau) before beginning to slowly fall, with about 2/3 of total cases coming after the peak. Is that what is happening? Yep.

Daily New Cases in the United States



So what's next? When might it start to drop off a bit? I don't know. It's all reading tea leaves. Still, taking a look at Italy, I would expect the numbers to begin to drift down in coming weeks, especially given how almost perfectly similar in form the two epidemics are:

Daily New Cases in Italy

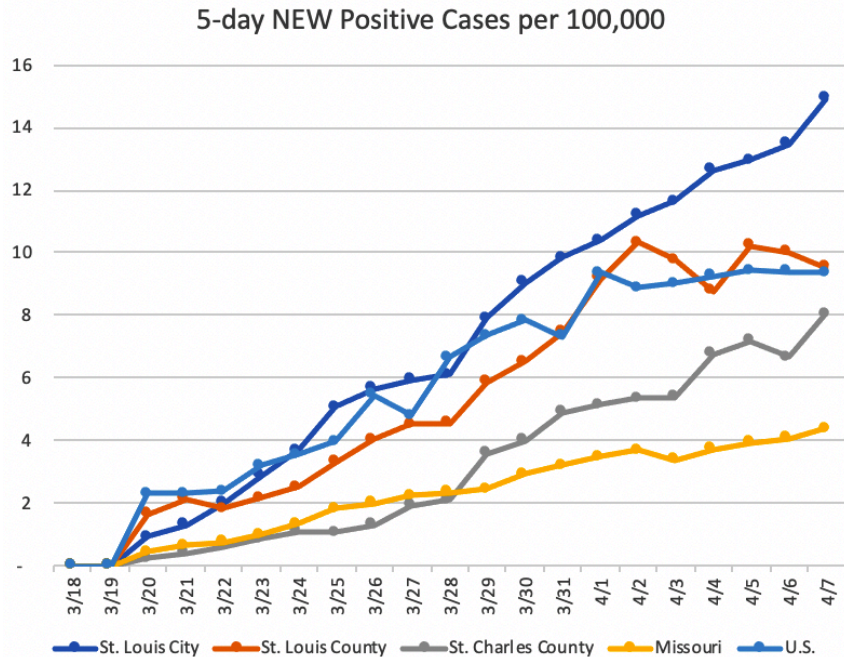


So What About Us?

All over the country, people are following the social distancing guidelines and lock-down procedures have been instituted in most large cities. Get a load of downtown Los Angeles at noon on April 7:

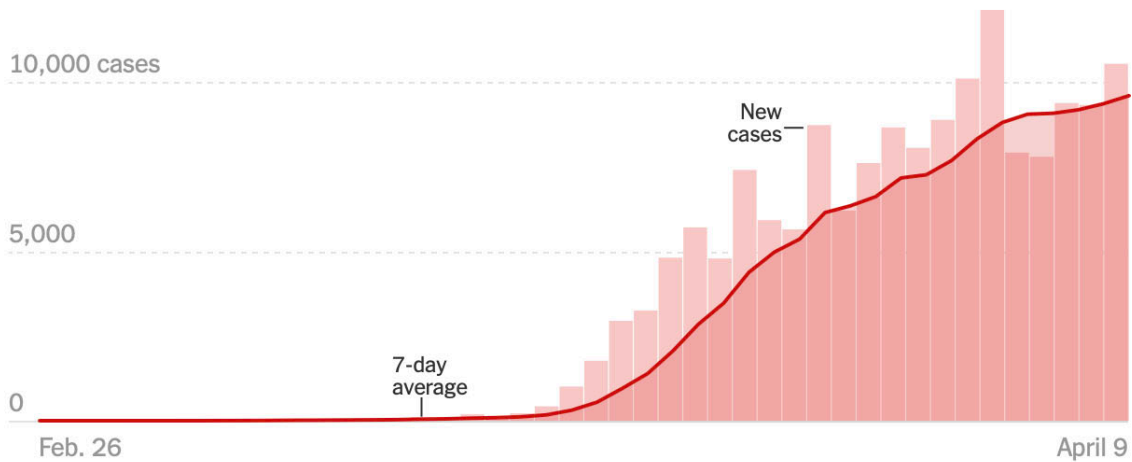


We are doing fine in St Louis county, with businesses and schools shut down tight. The total number of covid-19 cases that have been reported in St. Louis county so far approaches 1.4 per thousand, with the numbers of new cases per day peaking in early April at 1 per ten thousand:



Of course New York City is still the nation’s hot spot. The bad news is that you, Nikki, are living there. The good news is that things are beginning to plateau out in NYC– still dangerous, but no longer getting worse:

New reported cases by day in New York

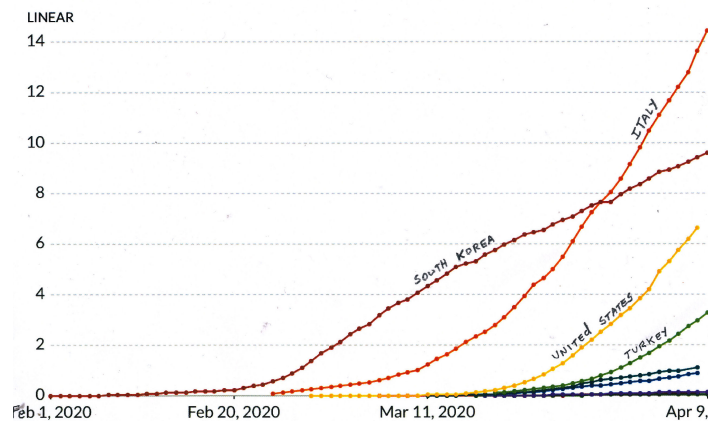


So When Do We Go Back to Work?

It should probably not come as a surprise that a business-oriented government would have begun to chafe at the continued damage to the economy that social distancing and shelter-in-place continue to inflict. Trump is proposing to “reopen the country” on May 1, 2020. Is this too soon? The Murray model with which I started this letter predicted 1.5 million cases and 20,000 deaths – if we continue to keep people apart! If we let individuals close enough to infect one another, all bets are off. “There is no doubt you are going to see [more] cases.”(Fauci)

So how close together is too close? We don’t have enough testing of the general public to answer this question -- no one knows how many people carry the virus without showing any symptoms. Our amount of testing is increasing, but only after a terrible start relative to what other countries like Italy and South Korea have been able to do:

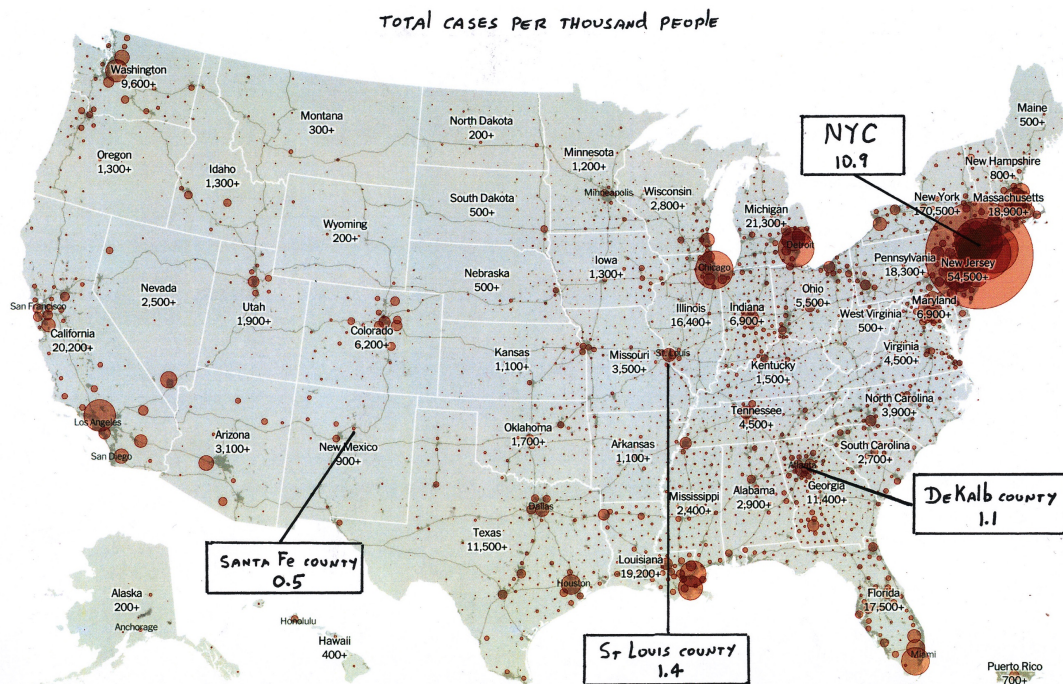
Total tests for COVID-19 per thousand people



The bottom line is that we cannot safely relax social distancing until we are carrying out widespread baseline surveillance, to identify exactly who carries the virus and who does not. This will require many hundreds of thousands of tests monthly of randomly chosen individuals, mostly of people who exhibit no symptoms. Anyone who gives a “positive” would then have to be isolated for two-three weeks, and those people who contacted them recently would have to be tested as well (on average, the CDC says we will have to test five people per confirmed case). So we are talking millions of tests monthly. But we are just getting started manufacturing rapid testing, and are months away from being able to marshal the required number of tests. We are also months (probably many months) away from developing and clinically testing a therapeutic medicine to treat covid-19 infected individuals.

Unfortunately our federal government feels it must make this decision now, in the absence of such general population testing data or therapeutic medicine, because of the massive damage being done to the country’s economy with nearly a quarter of the population out of work (matching unemployment during the great depression of the 1930s). So what is the best we can hope for in that soon-to-be-announced decision? Clearly the danger of reigniting this fire is less in Idaho than in New York. Major cities should not be relaxed until the end of their outbreaks. That has to be the bottom line. Any relaxing must be confined to less urban areas -- while people living in New York City may in real danger, people living in New Mexico are not.

Outside of densely-populated cities like New York, Detroit, and New Orleans, it’s not the numbers of people but their density that determines the danger of the virus passing from one person to another. So we should be looking at the level of infection in counties, not cities. In the counties where there are fewer people, a lessening of restrictions may be in order. How to define “fewer” becomes the point of the needle. Never one to fear leaping onto the head of a needle, I would suggest one case per thousand people. For our family, that lets Caitlin free. If we relax the limit a bit further, to one-and-a-half cases per thousand, Susie and Ben in Atlanta are released, with their baby girl Jed able to learn to walk outside safely. Barb and I can also cavort. Only Nikki is not yet free..



What will our government elect to do? We will know soon. The federal government can issue guidelines, but it's the state governors who call the shots. The governor of Texas, Greg Abbott, issued an executive order this week reopening many businesses in that state. Other governors will no doubt follow suite, especially if the President issues new guidelines encouraging going back to work. Different governors are taking a different tack – Governor Pritzker of Illinois has closed all the state's public schools till next fall. We will have to just wait and see. As your father, I would advise my daughters to do as mom and I will do and ignore any governmental direction to relax social distancing. Keep things battened down until June 1, just as we as a family have planned. And on that good day Clan Johnson shall party.

Love you all. Be safe.

Dad