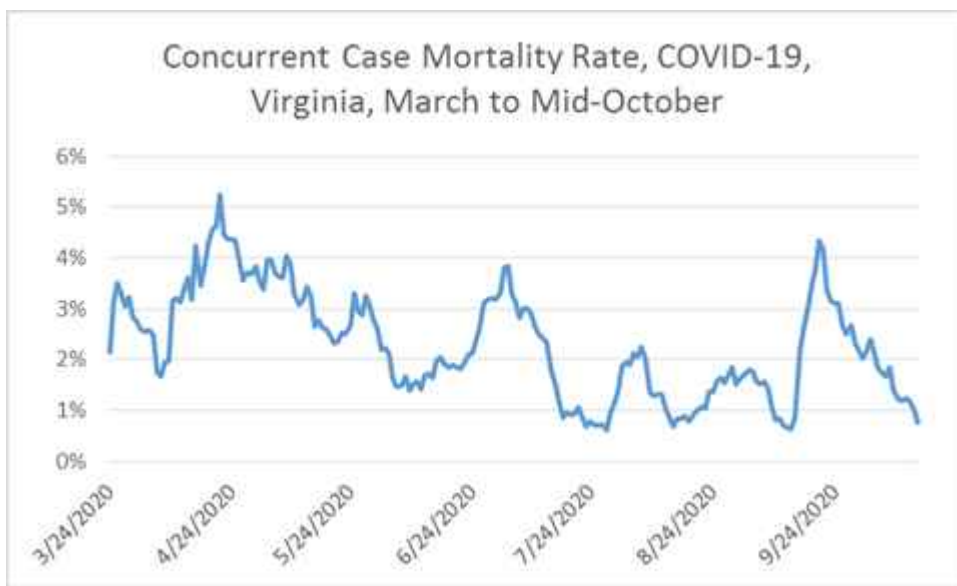


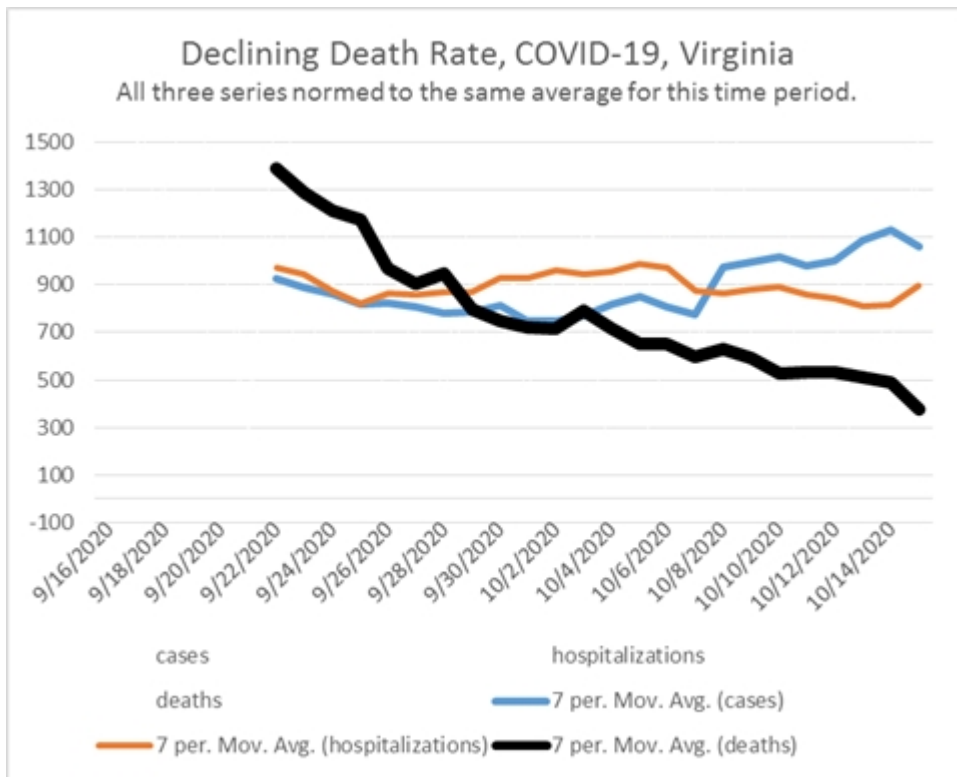
Post #867: RESCINDED. Why is the COVID-19 death rate declining in Virginia?

Rescinded. The recent decline in the COVID-19 mortality rate in Virginia falls within the bounds of normal variation. I never would have guessed that, as the number of persons involved should have yielded a stable mortality rate. Not so. Here's the "concurrent" mortality rate (each day's deaths over each day's newly diagnosed cases), shown as a seven-day moving average. The recent "decline" is that last bit on the end, and is clearly within normal variation.



Original short-sighted post follows.

Post #867: RESCINDED. Why is the COVID-19 death rate declining in Virginia?



~~Source: Calculation from counts obtained from the Virginia Department of Health COVID 19 dashboard, 10 15 2020. Black line is deaths, blue and orange are cases and hospitalizations, respectively. These three different data series are normed so that they have the same average value of the time period shown. Hence, there is no label on the Y-axis.~~

~~As I was looking at the Virginia Coronavirus dashboard today, I noted what looked like an unusually sharp drop in deaths. It looked like this:~~

Post #867: RESCINDED. Why is the COVID-19 death rate declining in Virginia?

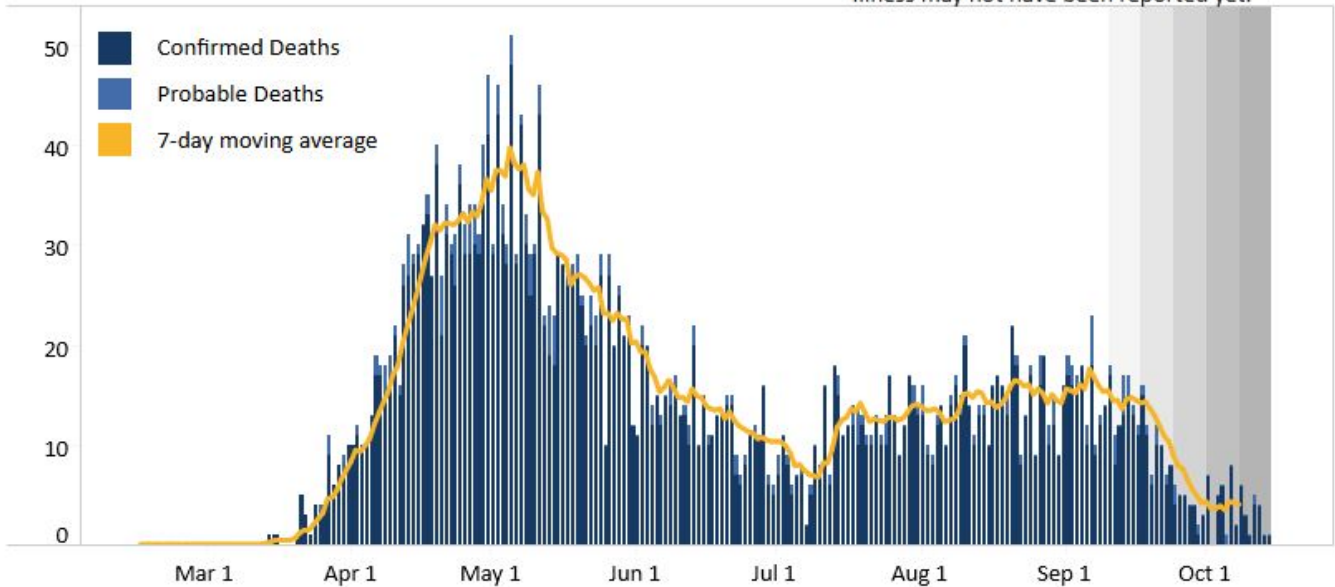
Number of Deaths by Date of Death

Number of deaths by the day of death as written on the death certificate.

(Affects Bar Chart)

(All)

Illness may not have been reported yet.



* Includes both people with a positive test (Confirmed), and symptomatic with a known exposure to COVID-19 (Probable).
** Hospitalization status at time case was investigated by VDH. This underrepresents the total number of hospitalizations in Virginia.
† VDH adopted the updated CDC COVID-19 confirmed and probable surveillance case definitions on August 27, 2020. Found here: <https://wwwn.cdc.gov/nndss/conditions/coronavirus-disease-2019-covid-19/case-definition/2020/08/05/>
Source: Cases - Virginia Electronic Disease Surveillance System (VEDSS), data entered by 5:00 PM the prior day.

~~That graph is hard to interpret due to those gray bars at the end. Here, the Commonwealth reports by date of death on the death certificate. The numbers will trail off, at the end, because death certificates for recent days haven't been reported.~~

~~That said, ignoring that last little dropoff, that seems to be a fairly steep decline in deaths in the past few weeks, given that (as far as I know) not much else was happening, for coronavirus in Virginia. (E.g., Post #856 and many earlier similar posts).~~

~~And so, I decided to download the data and do the calculation based on deaths tabulated by *date the death certificate was processed*, not the actual date of death. And that's the graph at the top of the posting. I checked some older vintages of the files, and those counts do not change over time as the data ages in. The number of death certificates reported on October 1 remains the number reported on October 1, whether you are looking at data from October~~

Post #867: RESCINDED. Why is the COVID-19 death rate declining
in Virginia?

~~1 or from October 15.~~

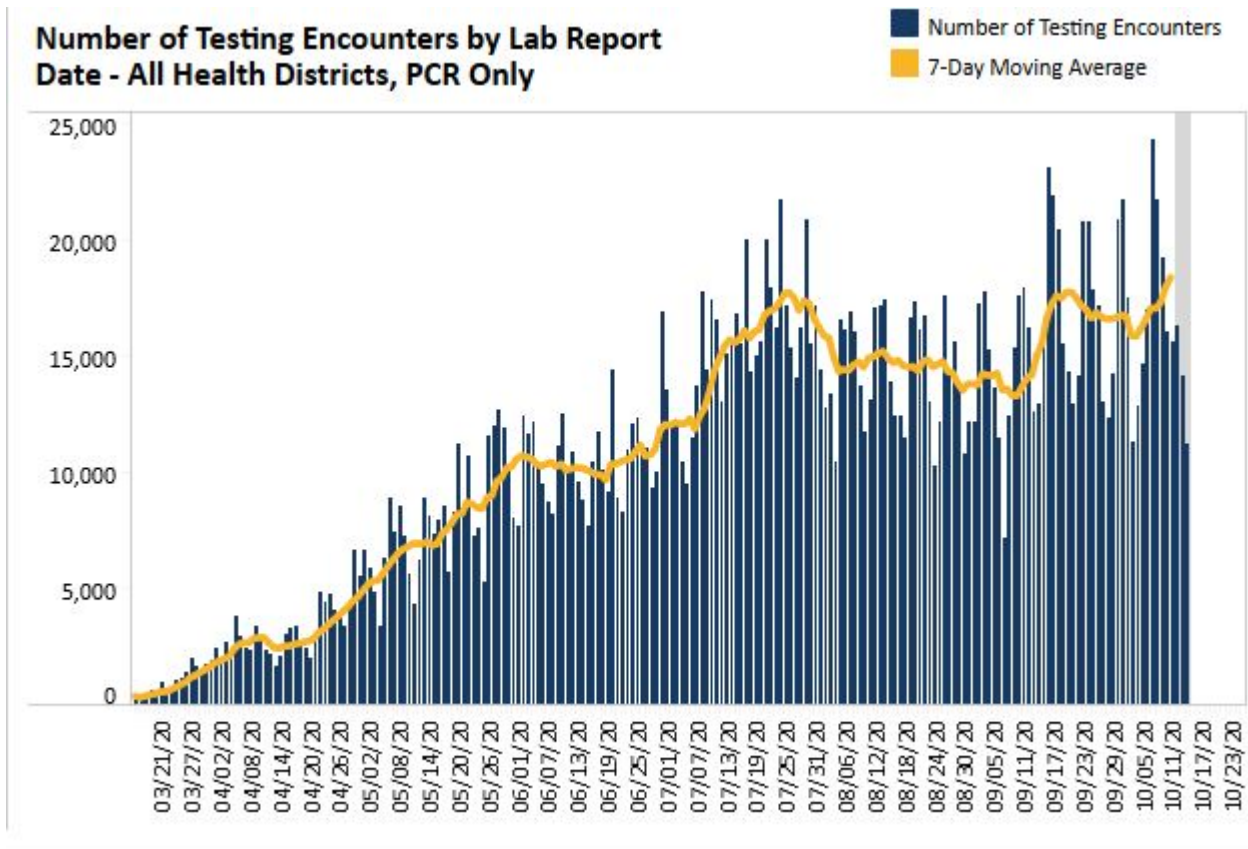
~~In order to display cases, hospitalizations, and deaths on the same graph, I “normed” all the data so that the average value for each series was the same, over this time period. So that doesn’t show the absolute value of hospitalizations or deaths. But it does correctly show the trends.~~

~~And so, in the last month, with almost no change in the level of new cases per day, or new hospitalizations per day, the (concurrent) mortality rate for COVID-19 cases in Virginia has fallen more than in half.~~

~~Why? What’s particularly odd is that there’s been no change in hospitalizations. What is it, then that has resulted in the same number of people being sick enough to be hospitalized, but not sick enough to die?~~

~~It’s not due to more testing. You can just look at the Commonwealth’s graph of testing to see that. There’s been nothing like a big enough change in testing rates to result in a halving of the concurrent case mortality rate (deaths per newly diagnosed case). And in any event, if that were the driver, concurrent hospitalization rate would have fallen in half as well.~~

Post #867: RESCINDED. Why is the COVID-19 death rate declining in Virginia?

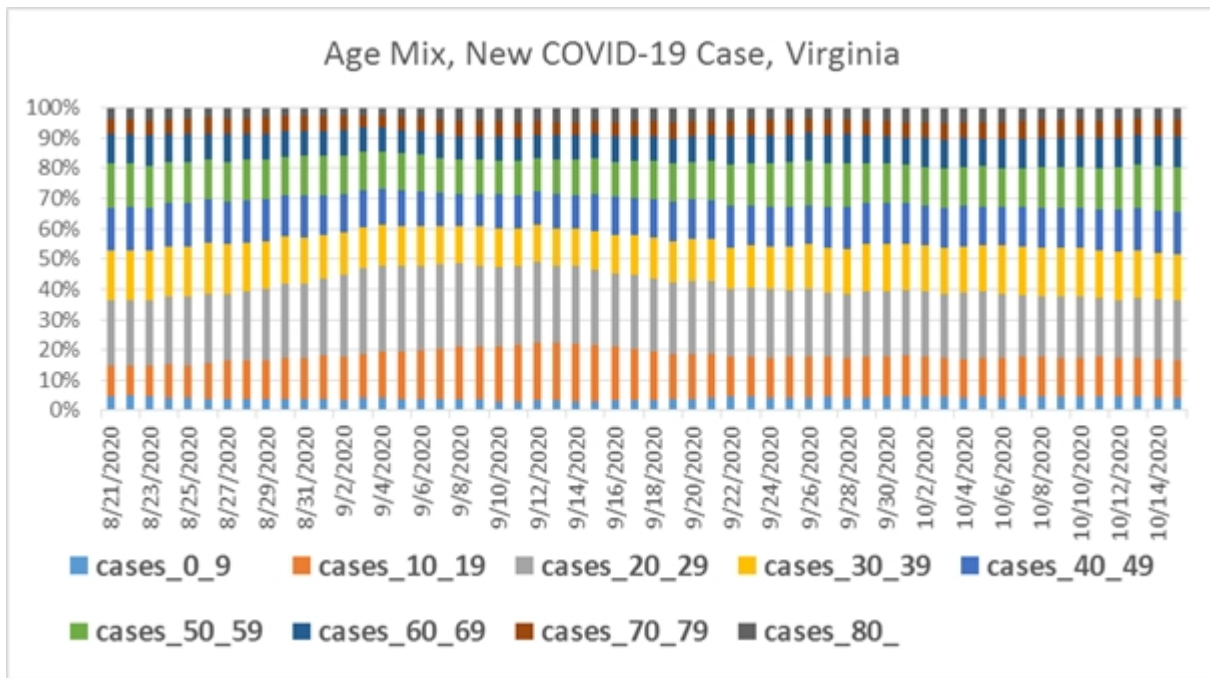


~~There's only one more thing I can test with the data, and that's the possibility for this to be due to a shift in the age of new cases. Mortality rates ramp up steeply with age. Even a modest shift toward younger cases would strongly affect the estimated mortality rate.~~

~~Here, I should be careful, as it takes some considerable time, on average, to die from COVID-19. Hence, the deaths reported on (say) 10/15/2020 might reflect, on average, cases diagnosed (say) three weeks earlier. But given the magnitude of the decline, if it's due to a shift in age mix, that should be obvious, even with the "lag and smearing" of the timing.~~

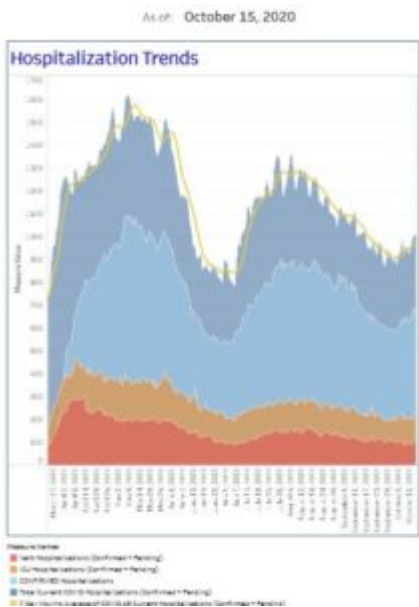
~~But, in fact, there has been so little change in the age mix of cases, of late, that I don't think it's worth doing anything more than plotting that. Like so. Looks pretty stable to me. By eye, nowhere near enough in change in average age to drop the mortality rate in half. if anything, over the last month, there's been a slight decline in proportion of cases in the lower ages.~~

Post #867: RESCINDED. Why is the COVID-19 death rate declining in Virginia?



The only other evidence I can get is quite indirect, and requires that you understand a little bit of logic about hospitalizations. For a given number of new hospitalizations per day, the shorter the average length of stay, the fewer total people will be in the hospital, at any one time.

Post #867: RESCINDED. Why is the COVID-19 death rate declining in Virginia?



Source:—VHHA. —And I think that’s been happening. —Here’s a graph from the Virginia Hospital and Healthcare Association. While the Commonwealth shows roughly constant new hospitalization rates of late, the VHHA shows declining total number of cases in the hospital on any given day. That suggests lower average length of stay, which would be consistent with a higher fraction of cases getting well enough to be discharges, rather than dying in the hospital.

That leaves a lot of other potential explanations. —Might be a shift in which hospitals are treating the patients. —Might be that change in the standard protocols for care are saving hospitalized patients across the board. (E.g., early administration of dexamethasone to suppress immune system over reaction.) —Might be something else. —I’ve heard the (unproven and untested) hypothesis that greater adherence to mask use is reducing mortality rates (and increasing rates of asymptomatic cases) by reducing the initial dose of virus received by newly infected individuals (Post #792).

All I can say is, since sometime around September 1, the concurrent mortality rate for COVID-19 in Virginia has fallen by more than 50%. —But nothing else about the reported data — volume of cases, level of testing, number of new hospitalizations, or age mix of new cases — has changed.

In any case, I think this reduction in mortality is large enough, and has gone on long enough, that it’s unlikely to be some simple artifact of the data or data reporting process in Virginia.

Post #867: RESCINDED. Why is the COVID-19 death rate declining
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~~That's an interesting fact in its own right. But I sure wish I knew why this was happening.~~

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