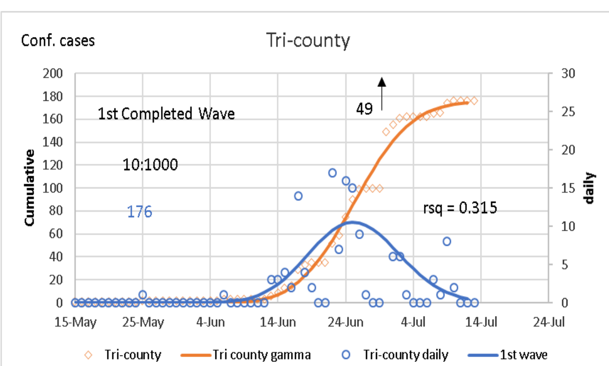
Please refer to accompanying two pdf files of graphs. The estimated number, and the related incidence relative to population, is based on maximums estimated from curve fits. They are subject to change of course, and should not be taken as precise projections, since there is no such thing. Another way to interpret them is as relative indices, that show a locale's progress relative to the others.[1]

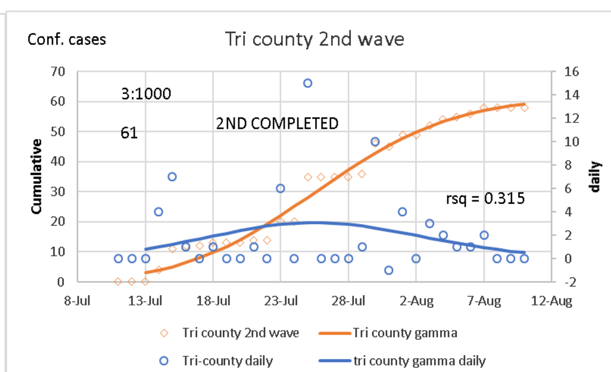
As far as Tri-County (Brewster, Jeff Davis and Presidio counties in Texas) goes, the following tabulation shows what happens if the proposed US or Texas projections for confirmed cases are scaled to our population:

max US daily	64,769	persons
equiv. max Tri-County	3.5	persons
max TX daily	9,172	persons
scaled to Tri-County	5.9	persons
max US cumulative	6,421,297	persons
equiv. max Tri-County	350	persons
incidence	19:1000	
max TX cumulative	700,668	persons
scaled to Tri-County	450	persons
incidence	25:1000	
Tri-County (current)	0:1000	8/20/2020

It's becoming more apparent that scaling should be applied to the time scale, too, based on what we see here. A small population like here may tend to have a lot of small, short waves.

Tri-County completed a wave the beginning of July, and have completed a second, mini one in August.

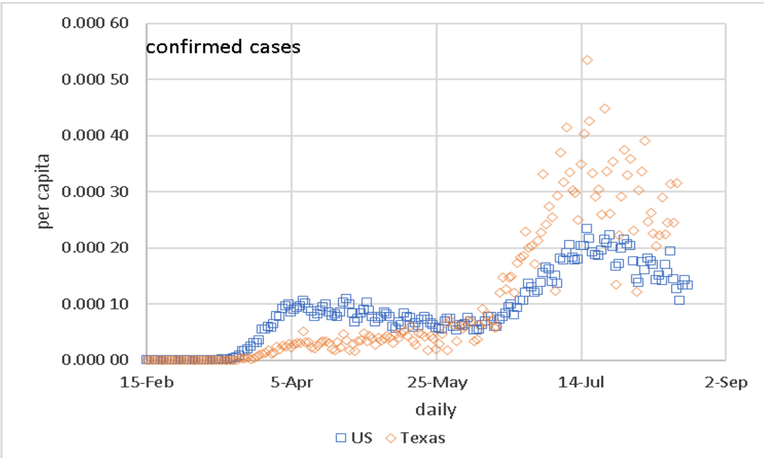




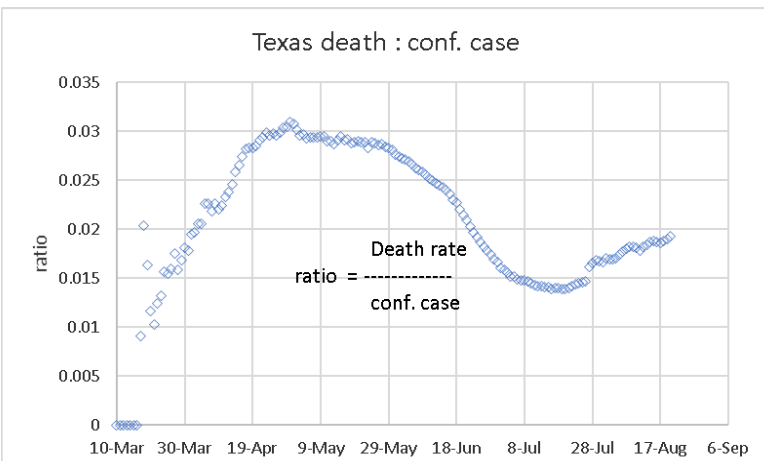
[1] Data all from publicly available Github site: https://github.com/CSSEGISandData/COVID-19

Comments

If Texas and the USA confirmed cases are plotted as daily data concurrently, on a per capita basis, here is what you see:



Both have a definite turnaround in a good direction. Mortality also looks in a good place (in the sense it could be a lot worse). Arizona has a similar curve, although no doubt they have a higher proportion of retired, elderly people that don't handle CV-19 very well.



Hopefully we won't screw up the recent positive trend again (see early June Texas derailment). Your mom taught you to cover your mouth when you coughed as a act of consideration for others so you wouldn't spread germs. That is all wearing a mask does, except more effectively, since this virus is stronger than the usual germs. What is so hard to understand about that?

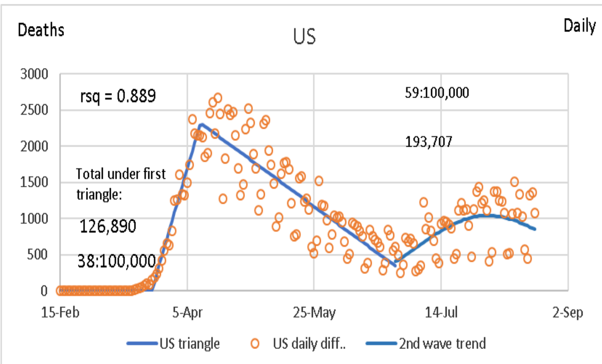
Another good thing to do is avoid enclosed areas with low or no ventilation where there are lots of people. This would include most restaurants and bars. Or step up the air changes in such places. But instead, we gripe about the government telling us what to do, or criticize it for not doing anything, not sure which is more irritating.

COVID-19 deaths

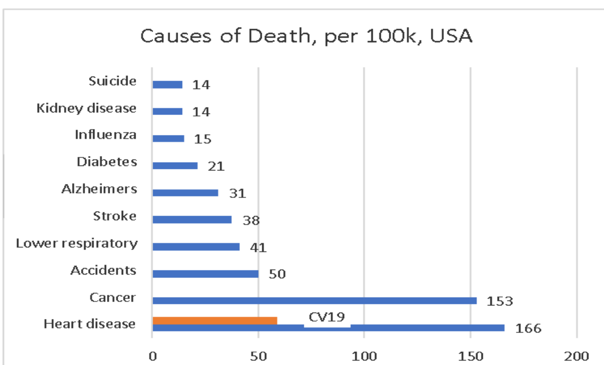
A point of comparison:

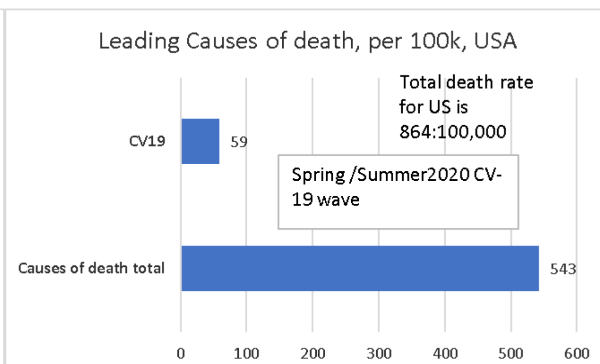
In 1920, the population of the US was 105 million. It is estimated that 500,000 people in the US died from the Spanish Flu epidemic in those years. This is a death rate of around 480 per 100k.

The USA CV-19 death statistic is based on a triangular distribution, combined with a later gamma distribution curve fit of US deaths that generates a cumulative maximum for the two combined (minus their overlap). It appears the downturn in daily confirmed cases is reducing the pool of potential deaths, and so the death estimates are decreasing, too, which is good news:



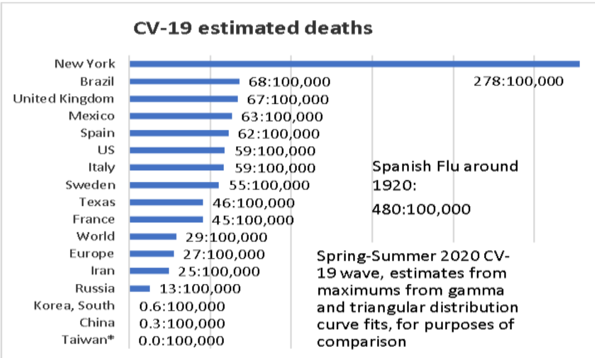
A few months ago the Wall Street Journal published data on annual causes of death which is plotted with the USA CV-19 death statistics. The possible death value is plotted as deaths per 100,000 with WSJ data of annual averages of leading causes:

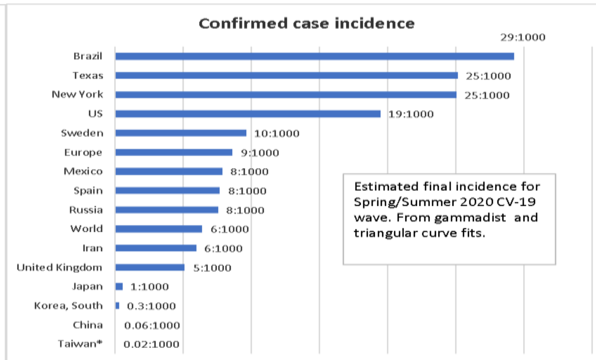




It's right up there with the major killers, although it's known many who died from CV-19 already had these potentially fatal issues. It's not clear where dying from old age fits here, either. It's interesting to read off the mortality tables the IRS uses that the expected age of death is 77.3 yrs (median is 80.3) and the mortality for that age, for the year, is 2,663:100,000! The sub-total from there to the end of the table is 62% of the entire table, which could be used to reduce all the numbers above by that amount (including CV-19 fatalities), assuming that everyone who lives pasts the expected age automatically is categorized as dying from old age and nothing else. Distributive property from arithmetic guarantees the same relative weight of CV-19 to leading causes of death, however.

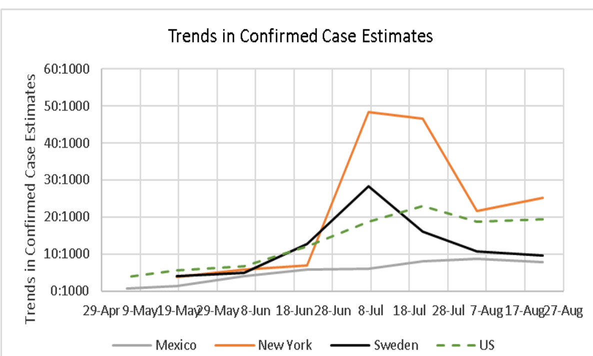
What follows are some comparative tabulations of these estimates. As you can see, NYC had about half the death rate as the Spanish Flu disaster in the 1920s. But that doesn't make the current situation good. Texas finally reached a daily maximum, which affected the estimate in a positive way. Good news is Iran hit a turnaround point, which also drastically changed its death estimate, downward. Japan has been struggling as of late, but a lot better than we are, nonetheless.

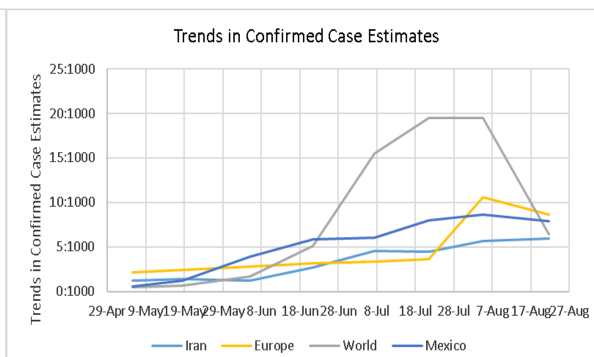




Trends in Confirmed Case Estimates

The confirmed case estimates are based on the maximum value parameter of a curve fit for a *completed* epidemic wave. A way to look at this is this estimate is what it *would* be, if the data followed a gamma (or other distribution). Historically that's what they tend to do, but you can see plenty of examples here where the data suddenly diverged (e.g. US, World, Texas, etc.). Still, it's a useful way to characterize it. The curve fit has been based on data that was in the process of being completed for the Spring/Summer 2020 CV-19 wave, so it's to be expected that the estimates might change. Here are confirmed case trends for a few select countries:



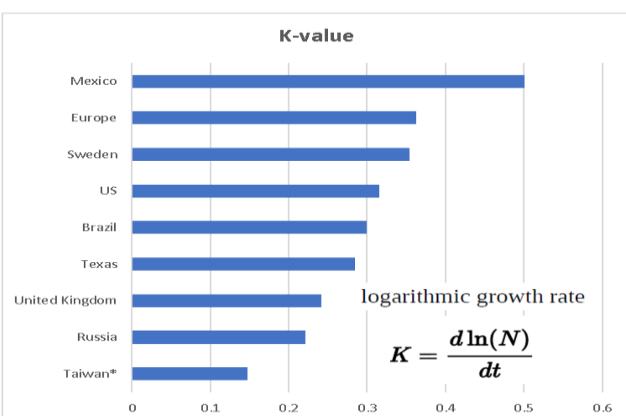


Explanation of statistic used for comparative purposes:

Often the generation of confirmed cases or deaths tend to be in a gamma distribution, which is a slightly skewed bell-shaped curve. Other times a triangular distribution better describes what's happening. A least squares procedure is used to get the closest fit to the data. Generally, the data is provided in a *cumulative* format, so the number increases each day, until the wave is over, at which point it is at its maximum and no longer changes. This can be converted to a daily format just by finding the difference between each pair of successive days. In mathematical terms, the daily format is the time derivative of the cumulative format. In any case, the area under the daily curve is identical to the last, largest and unchanging value in the cumulative format. This is the value that is used here as a comparative statistic, on a per capita basis, for a completed curve. Each locale's "wave" has a different beginning, develops at a different rate, so comparison of values on a particular date among any given datasets doesn't tell you much, which is how most of this data is usually presented.

Cases are usually described as incidents per thousandths; deaths are described as incidents per hundred thousandths. In this way, one can get a better feel for the relative performance of locales, as long as the current population figure is available. It's also a way to gauge one's own personal risk. Keep in mind this statistic can and will change over time, not as a direct result of increasing cases or deaths, but because of the possible change in shape of the distribution. In some cases, particularly with the US, the distribution was changed from a gamma to a triangular because it fit better, which also changed the comparative statistic. It should be thought a qualitative measure, since it's impossible to put error bounds on it, at least in its earlier stages before the inflection point.

R_o[2]: If one can find the exponential part of the cumulative growth curve (a short section near the beginning of the curve that loses validity if less than N = 100 people), one finds the growth rate constant for an exponential, which is $K = d \ln(N) / dt$. (If plotted on semi-log scale, look for a straight line section near the beginning; K is its slope.) $R_o = e^{K\tau}$ where τ is the average infectious period for each person. Doubling time is also often mentioned. Reduce K by reducing contacts, reduce τ by isolation of infected individuals, for example. Here are some K values:



Example ($R_o = 2.6$, $K_{TX} = 0.284$ / day)

$$R_o = e^{K\cdot\tau}$$

$$\tau = \frac{\ln(R_o)}{K} \quad , \quad \frac{\ln(2.6)}{0.284} = 3.4 \quad \text{days infectivity}$$

Example, doubling time:

$$2 = (1\cdot e)^{K\cdot\tau}$$

$$\tau = \frac{\ln(2)}{K} \quad \frac{\ln(2)}{.284} = 2.4 \quad \text{days}$$

[2] Basic Reproduction Rate. R_o is a measure of transmissibility: $R_o < 1$, disease disappears; $R_o = 1$, it's endemic; $R_o >$ 1, epidemic. R_o is mentioned a lot in this epidemic, along with flattening of curves, with not a lot of understanding or relevance. The real trick is figuring out the *effective* reproduction rate, R_e.