Attached is an excel file on which you will find an extrapolative forecast of "confirmed" COVID-19 cases for Clark County, Nevada to April 25th. It uses input data on daily cases from the Southern Nevada Health District (SNHD) as reported from March 18th to March 27th (documentation and input data are in the attached file). This projection is the "baseline." It uses a simple geometric extrapolative model (described in the attached excel file). It shows that by April 25th we can expect nearly 100,000 cases of "confirmed" COVID-19 in Clark County, Nevada. Given that these are only "confirmed" cases, the likely number of total cases may be far higher, given the low level of testing so far.

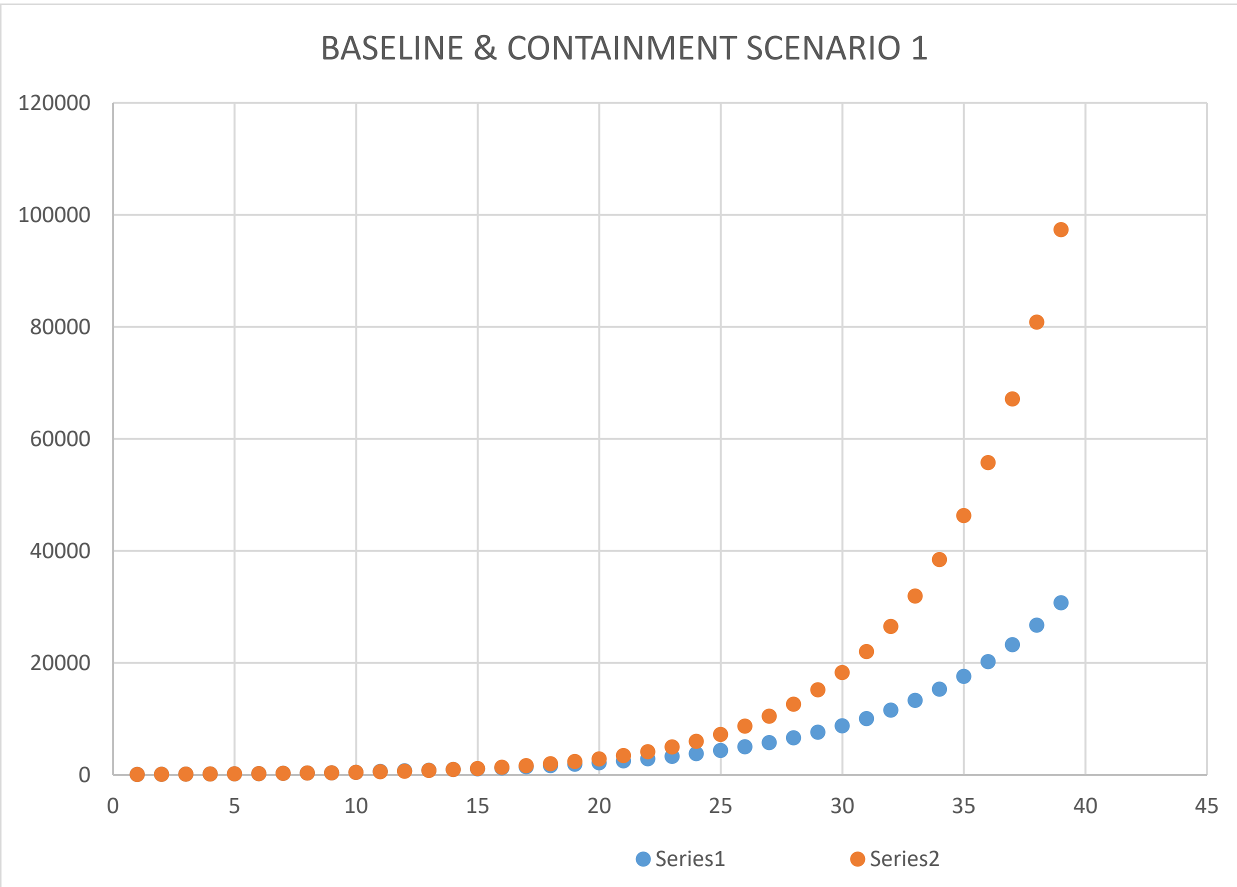
This baseline forecast reflects the conditions that were occurring during the base period, March 18th to 27th. Steve Sisolak, the Governor of Nevada issued a "stay at home order" on the 17th, which included the closing of all non-essential businesses. As such, the forecast reflects the first week that Nevada was under this order but still too early to really see its effects. So, from that perspective it may be on the high side. On the other hand, this same period likely reflects too few of the actual people who were infected. So, given that, it is likely too low. It appears that testing was done at roughly the same rate during the base period so that should not be a factor. Given all of this and everything else I can think of, I view this as a "baseline" that shows the minimum number of confirmed cases we can expect if closures and stay at home orders were not issued (or followed). It is sobering to think that there could be nearly 100,000 cases on April 25th.

The simple model goes out one month because that is approximately when one would expect a surge given that the input data represents the early stages of the disease largely in the absence of meaningful interventions. To go out much further one would start to see numbers that exceed the population of Clark County (approximately 2.2 million), which is not possible in reality but is possible with a simple geometric model. I believe setting about one month as the forecast horizon is realistic when the input data represent the early stages of the disease for a given area largely in the absence of interventions.

Thus, the baseline model is intended to provide an approximate idea of the numbers to expect at the peak of the surge for Clark County in that it provides an idea of the number of new cases that can be expected in the absence of meaningful interventions such as "shut-downs." That is, the peak of the surge could be expected in about a month after the onset of cases in non-special populations (those not heavily impacted by admin quarters populations such as college dorms, prisons, military bases).

The baseline is useful, but what about the effect of containment interventions? This can be done by using updated data that are recorded as a containment strategy takes effect. For example, with the Clark County data, I would expect to see at least initial effects of the Governor's shutdown order by early April. This means that you could recalculate the rate of increase and use that to generate an alternative forecast, one under a containment scenario. The same horizon used for the baseline can be used for this alternative scenario and you could then have a graph showing two projections: (1) the baseline projection based on the initial data largely or wholly in the absence of intervention measures aimed at controlling the spread of the virus and (2) a subsequent projection using updated data that reflect the effects of intervention measures to contain the spread of the virus. That is, one uses more recent points to calculate the rate of increase.

Here is an example The graph below shows the baseline (series 1) with the rate of increase found from the initial data, 1.20, along with a hypothetical scenario (series 2) in which the rate of increase in Clark County is reduced from 1.20 to 1.15 as found hypothetically, say, from March 26th to April 4th. This results in a reduction of the peak number of confirmed cases from 97,345 under the baseline on April 25th to 30,718 under the hypothetical containment scenario.



The alternative projection scenario has the same horizon as the baseline, but with the baseline in hand as the 'worst case" surge peak, we can see the reduction in the rate of increase shown by the more current data (reflecting the effects of the containment intervention), the picture from the alternative scenario emerges of a "flattened" peak due to containment and other mitigation measures. As such, it is the latter I would start using for actual "surge peak" planning. Again, the method is simple and one only needs daily data that represent the initial days of the infection hitting before containment measures took effect (The baseline) and then data for every day thereafter (as the containment extends) to see if it is (hopefully) flattening the curve (hypothetical scenario 1 in this example).

As the actual data to, say, April 5th or so become available, I will be creating actual containment scenario projections with them and they will replace the hypothetical scenario shown in the graph.

Because both the baseline and the alternative projections are based on the simple geometric model, they are neither intended nor designed to provide information beyond the surge peak. At some point such information would be useful and different models would need to be employed to do this. However, the major point here is that with a simple extrapolative model and minimal data points an idea of the surge peak under no containment (baseline) can be compared to a surge peak that incorporates data under a containment scenario and the latter could be used for planning for surge peak needs.

Keep in mind that this exercise is not meant to be definitive, but suggestive. There are many ways that demographers can contribute to the effort to deal with the COVID-19 pandemic and forecasting the surge peak is only one possibility. Even here, other methods can used, some of which are likely to be more useful than a simple geometric extrapolative model. In addition, we have a lot to offer about COVID-19 results in terms of age structure and gender, not to mention population density, race and ethnicity, and underlying health conditions.