## **Covid-19 Model for Major US Cities**

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Late yesterday, the updated Worldometer data (https://www.worldometers.info/coronavirus) showed that US covid-19 deaths for March 22 had spiked to 118 (see **Figure 1**), which prompted me to take a much closer look at the pattern of China deaths, which are almost all reported to have taken place in the epicenter of Wuhan (population 11 million). As shown in **Figure 2**, these data fit a normal distribution, with an overall mortality of 0.03% (as a percentage of total Wuhan population), a standard deviation of 10 days, and a peak of 37 days after the first reported death.

Applying this same model to the top 20 US metropolitan areas (**Figure 3**) results in a plausible fit to what has been observed thus far, and suggests the overall peak death rate will occur a little less than a month from now, on April 21. China largely kept the virus isolated within the Wuhan area, but that is unfortunately not what happened here in the US, as we obviously have a very different society. The result is a predicted death toll at the high end of our normal flu season, 37,500, among just these top 20 metro areas.

This is only a model. As the saying goes: "All models are wrong - some are useful." So we know this model is wrong, but we don't know if it is useful. Nevertheless, perhaps it helps calibrate expectations for what is likely to come here in the US in the coming weeks.



Figure 1. Covid-19 deaths per day in the US (source: Worldometer).



Figure 2. Normal distribution model for daily covid-19 death rates in China.



data observed thus far for the US overlaid at the lower left of the chart.