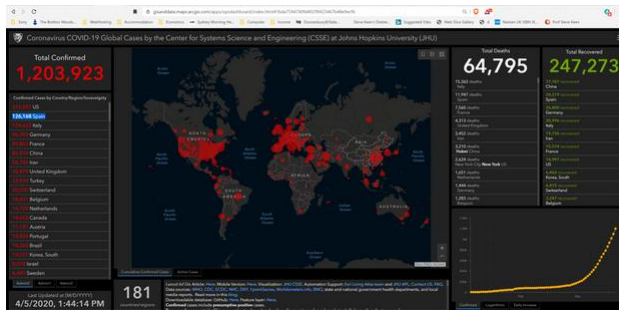


PM Update April 5, 2020

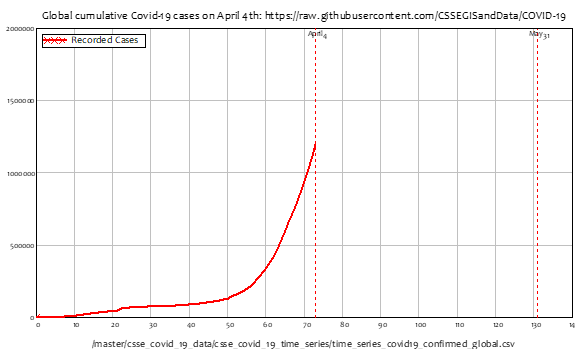
Covid 19 Risk: Getting Your Head Around Exponential Growth, Steve Keen



<https://gisanddata.maps.arcgis.com/apps/opsdashboard/index.html#/bda7594740fd40299423467b48e9ecf6>

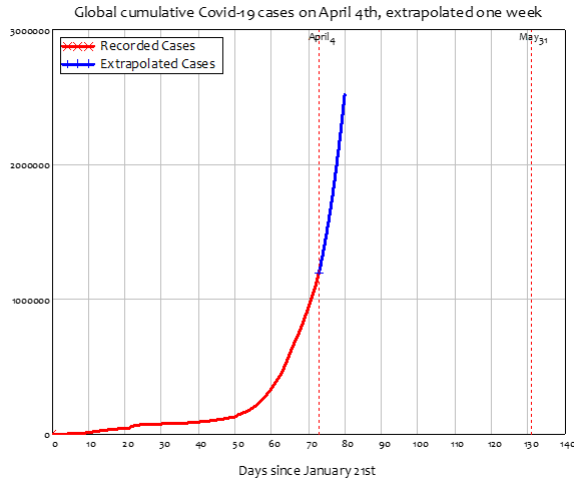
A lot of people still don't seem to get the concept of exponential growth, even though we've had over two months of watching an exponential process unfold with the Coronavirus. I hope some simple illustrations using current data might help.

John Hopkins University is doing an excellent job of collating the cumulative number of cases reported around the world with its GIS database Coronavirus COVID-19 Global Cases by the Center for Systems Science and Engineering (CSSE) at Johns Hopkins University (JHU). They've made the [raw time series data available too](#). Aggregated to the world level, this is what cumulative COVID-19 cases looked like as of late on April 4th:



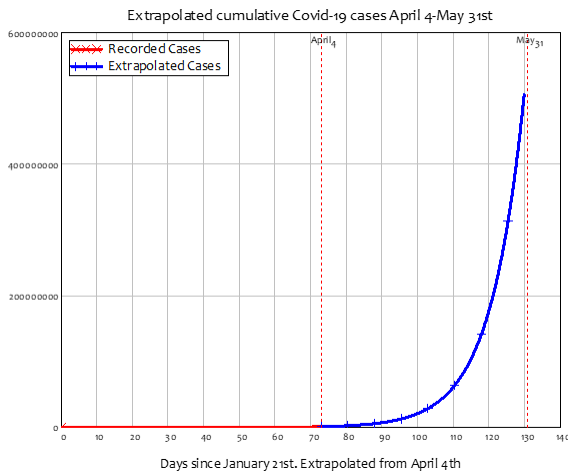
This is simply the total number of recorded cases, which includes tested cases where the carrier has only mild symptoms, people who got the disease way back when it began and have since recovered, those who have died, those who are still in intensive care, etc. The global total was just over 1.2 million on April 4th.

A simple regression of this data onto an exponential function yields the prediction that, if the rate of transmission and the rate of doubling of the disease reflects what has happened to date from January 21st, when the JHU time series begins, in a week's time there will be twice as many cases: 2.5 million compared to today's 1.2 million.



That's a lot of cases, but it's still way short of the total world population of about 7.5 billion. It took about ten weeks to go from 555 cases (the number recorded on January 21st at the start of this data series) to over 1 million. How long will it take to get to a significant number compared to the planet's population—say, half a billion cases?

It will take about another 8 weeks.



The red line in each of these graphs is the same red line.

Now only a fraction of those infected are going to be current cases—basically, those who were identified in the preceding 2-4 weeks—and only a fraction of those—perhaps about 20%--are going to require hospitalization. But that's still a huge number of people, far more than can be handled in the world's emergency medical facilities.

This is why this disease is not "just another flu". It is far more contagious (and we also don't have any innate resistance to it). We have to "Flatten the curve", we can't cope with the number of cases doubling every week, as is the case now.