DAY 246 OF THE COVID 19 PANDEMIC

It is now eight months and nearly a million world-wide deaths later that the Corona Virus was first declared a world-wide health pandemic by the World Health Organization. It is also the date (January 22, 2020) that I started recording the daily cumulative world-wide deaths from this Covid 19 virus which attacks mainly the pulmonary system and can cause death in a matter of days after exposure. The raw data on this pandemic has been obtained mainly from-

https://www.worldometers.info/coronavirus/

and-
https://coronavirus.jhu.edu/

It is our purpose below to condense the raw data found in these sources into a single graph of cumulative world-wide deaths D(t) deaths versus time t in days. The presentation will allow us to use a linear approximation to make the prediction that 244,440 US deaths will occur by election day of Nov.3rd.

In my studies on the Covid 19 Virus reported here and in earlier articles, I have been mainly concentrating on the cumulative number of world-wide deaths realizing that the pandemic is a world-wide phenomenon. I am ignoring numbers such as new cases as these correlate directly with reported deaths. Data for the US follows by just taking 21% of the world's value. Thus today we find the cumulative world death value D(t)=988,502 compared to 207,540 for the US alone. A measure of the death rate per capita at the present date is given by the ratio-

$$R= \frac{number\ of cumulative\ deaths\ in\ a\ \ country}{populatiom\ of\ the\ country}$$

A brief table follows-

Country	Population in Millions	Covid 19 Deaths	R x 10^4

USA	328.2	208021	6.33
Germany	83.02	9530	1.15
Italy	60.36	35801	5.37
UK	66.65	41936	6.29
Brazil	209.5	140040	6.62
Mexico	126.6	75439	5.96
Sweden	10.23	5880	6.72
Russia	144.5	20056	1.39
Spain	46.54	31232	6.71

Except for Germany and Russia, which have relatively smaller death rates, the present death rate per capita lies at about 0.0006. That is , 6 out of every 10,000 people will have died .The closeness of these values for different countries gives strong support to the fact that this a world-wide pandemic similar to the one seen back in 1918 (Spanish Flu}. One expects R to increase progressively as the pandemic continues. I point out that I have skipped the R values for China [R=3.33x10^-(6)] and South Korea [7.07x10^(-6)] from the above table as these two values are highly suspect lying two orders of magnitude lower than the table average.

If we plot the daily data of world-wide Covid 19 cumulative Deaths[D(t)] versus time t since the beginning of the pandemic on January 22 of this year, we get the following curve shown in red-

CUMULATIVE WORLD-WIDE DEATHS FROM THE CORONA VIRUS

$D(t) = -320000 + 5300t$

exact value

D(t)

t=days since Jan.22
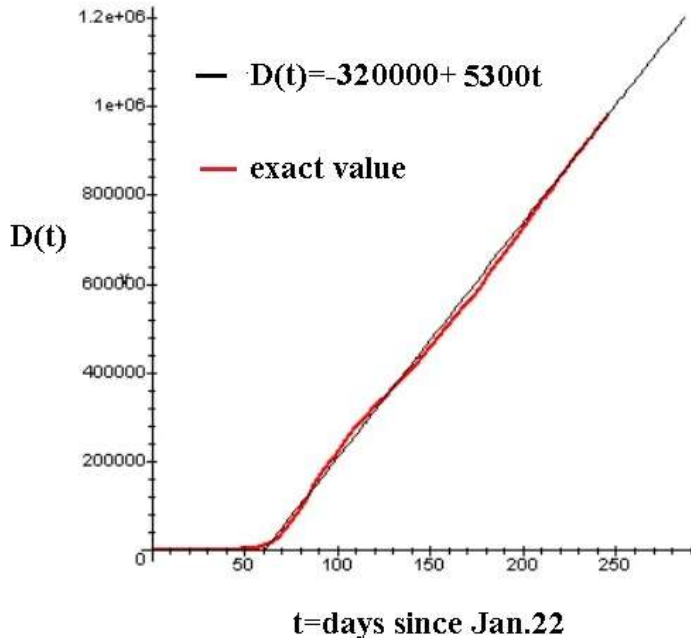
As the graph shows, during the early stages until about t=60 the early trend followed an exponential behavior but after that including up to the present the value of D(t) versus t shows a linear behavior(black line) well approximated by –

$$D(t) = -320000 + 5300\,t$$

It shows that the pandemic deaths indicate no signs of slowing down despite of all the optimistic talk by the CDC and White House officials being fed to the public about coming vaccines and possible herd immunity. One will know when things have finally turned around when the red curve starts turning sharply to the right away from the linear curve in the above graph.

Finally, since D(t) lies along a linear trajectory we can make a few predictions about D(t) into the future. Here is a table I have constructed using the above formula predicting future cumulative Covid 19 deaths in the US over the next few months-

Occasion	t	Est. Deaths, USA only
Today	246	206,000
Nov.3rd Election	280	244,440
New Year, Jan 1	344	314,559
One Year, Jan22,2021	366	339,045

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