Is vaccine the only way to win the covid war?

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1. Abstract

After analysing covid data we have found that vaccine can not win the covid war without other methods are complemented.

2. Introduction

Covid is causing health, economic and social crises on a global scale. Governments around the world are working hard to find a good way to win this covid war. However, some of them are losing the battle. People think that vaccines are the only way to win the covid war. Many time we have heard that vaccines are the only way to win covid war. It makes logical, so most of us have accepted this belief.

However, sometimes facts and beliefs are not exactly same. So we have conducted a study, and found the relationships between vaccination and the number of covid, the number of covid deaths and the number of hospitalisations. As a result that vaccines can not win the covid war without other methods are complemented.

3. Data selection

We selected 9 Western countries with similar political systems, similar medical systems and similar approaches to deal with the covid. These countries are:
Canada, Fiance, Israel, Italy, Norway, Poland, Sweden, United Kingdom and United States.
Those countries have more vaccines than other countries, so their results and experiences come first.

4. Vaccination

The vaccination rate of all countries in the world is increasing day by day. We use three vaccination rates here: ***Full vaccinated***: The percentage of people who have received at least two doses of the vaccine. ***People vaccinated***: the percentage of people who have at lease one dose. ***Total vaccination***: total number of vaccine put people's arm over population, it can be can exceed 100%, because people can get more than one dose. We averaged these 9 countries. Fig.1 is a time series of current vaccination rates.

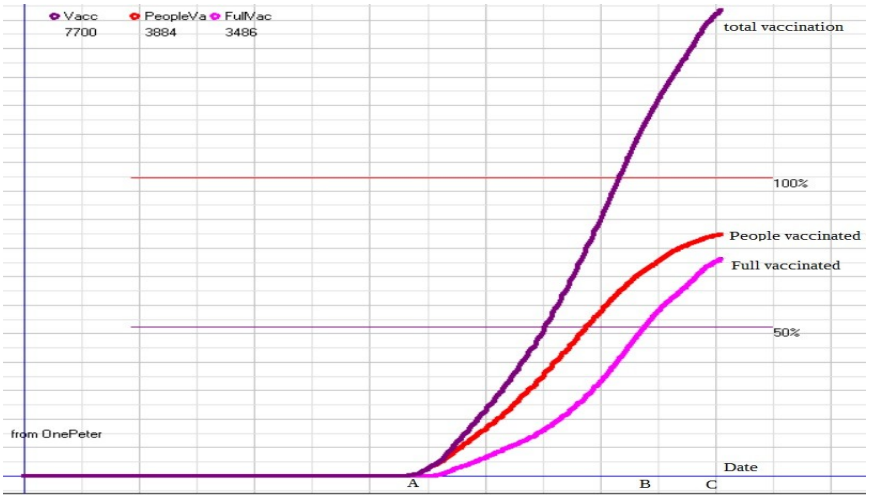

Fig.1 time series of vaccination rates

5. Hospitalisation vs vaccination

We define ***hospitalisation rate*** as the daily number of hospitalisations over population.
We add the average hospitalisation rate for those counties to the graphic.

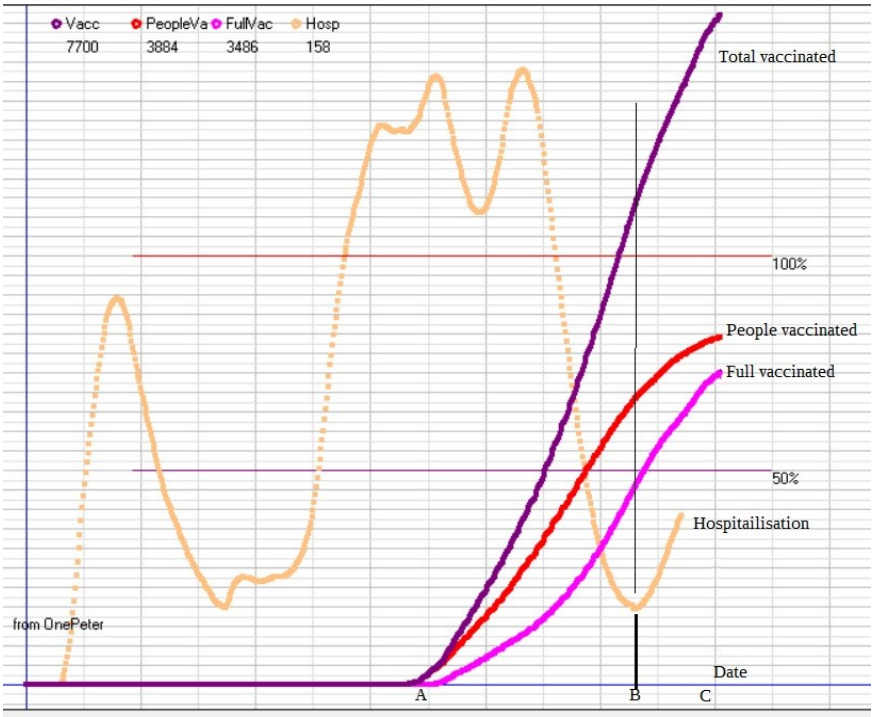

Fig.2 time series of vaccination rates and hospitalisation rate

It can be seen from graphic Fig. 2 during period AB, overall, the hospitalisation rate and the vaccine rate are opposite. However, during period BC, both rates go on the same direction.

Let us put the hospitalisation rate for each each country on the same chart to see what it looks like.

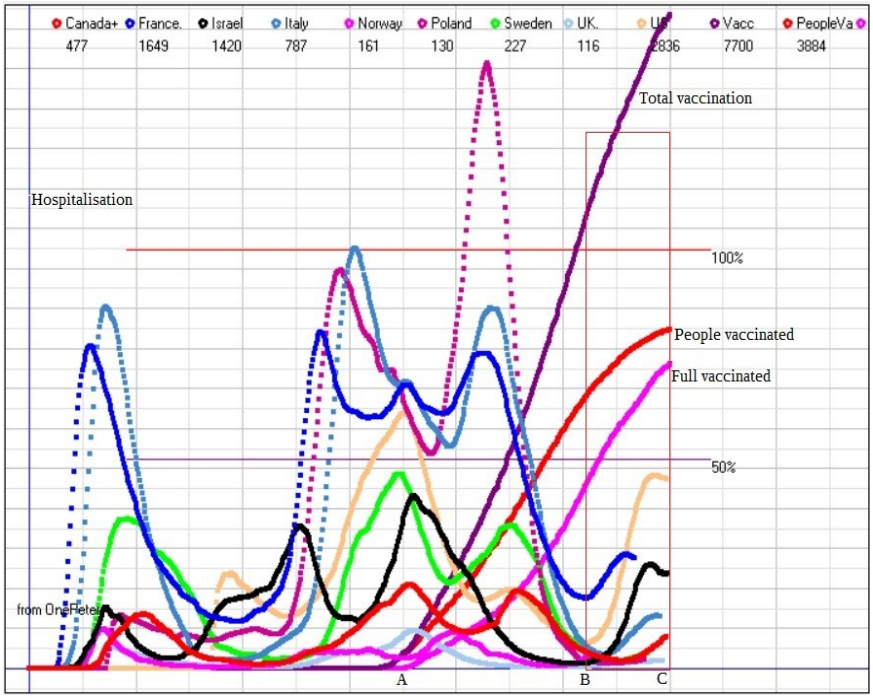

Fig.3 time series of hospitalisation rates and vaccination rate of each country

We are interested in the period when vaccination started at A, and current time at C(middle of September 2021). We found the hospitalisation rates are decreased during period AB, but the rates increased during the period BC. In other words, that vaccine reduced the hospitalisation rate in the early stage of vaccination, but in the later stage, the vaccine did not reduce hospitalisation rate. Our

expectation is that vaccine is the only way to win the covid war. When the vaccination rate increases, the hospitalisation rate should decrease.

6. Daily covid number vs vaccination

Let us compare the daily number of covid with vaccination rate. We cannot directly use daily number of covid, because US has high covid number, but US has a large population, so we define ***daily covid number*** at here as daily covid number divided by the population for each country, then average those countries. And we use 7-day average number to smooth graph. We have Fig. 4.

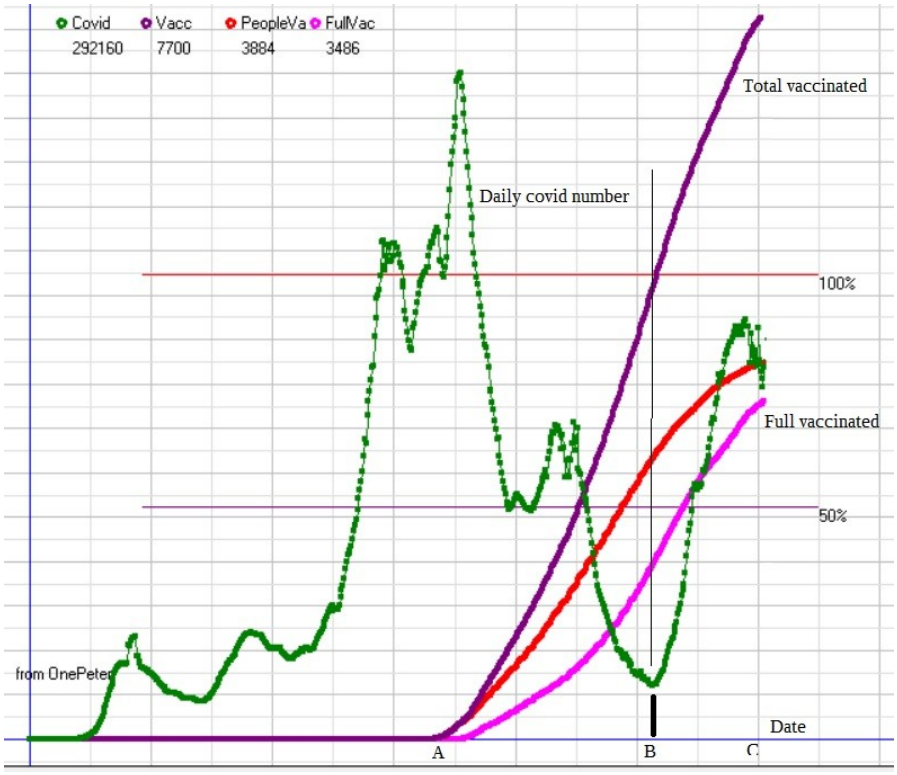

Fig.4 time series of vaccination rate and daily covid number

From graphic Fig. 4 we can see that during the period AB, overall, covid daily number and the vaccination rate were opposite directions. However, during the period BC, covid daily number and the vaccination rate moved in the same direction.

7. Daily covid death number vs vaccination

Let us compare daily covid death number with vaccination rate. We define daily covid death number at here as daily covid death number divided by population for each country, then average those 9 countries. we use 7-day-average figures to smooth graphic. We have Fig. 5.

From Fig. 5 we can see that during the period AB, overall, the daily covid death number and the vaccination rate were in opposite directions. However, induring the period BC, the covid daily death number and the vaccination rate tended to be the same.

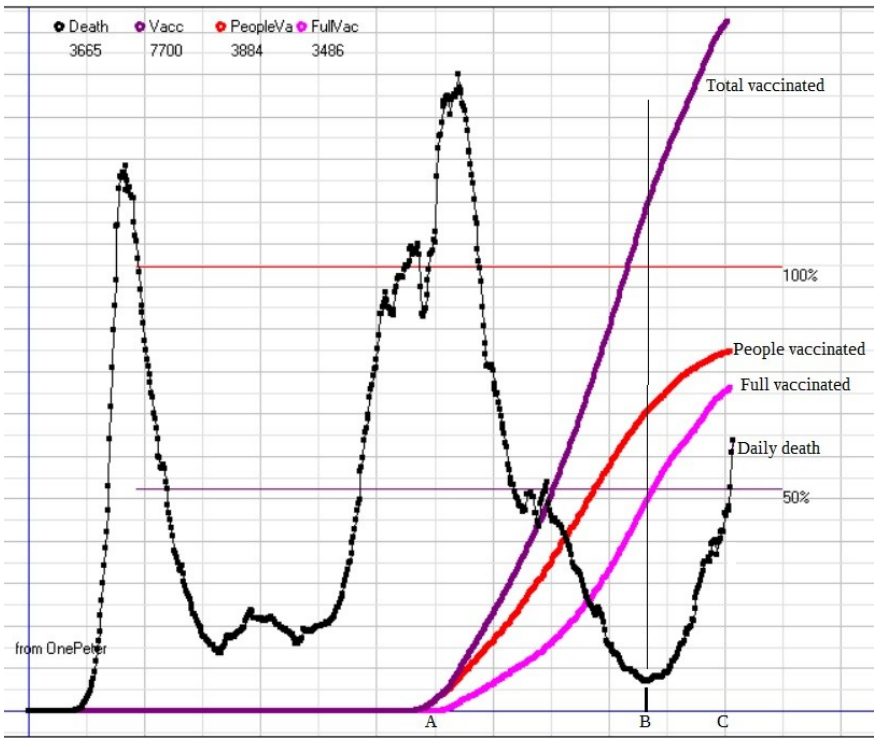

Fig.5 time series of vaccination rate and daily covid death number

8. Covid death rate vs vaccination

Let us compare the covid death rate with the vaccination rate. First, we define ***covid death rate*** as the total number deaths divided by total covid number in each country, then average those 9 counties.

We have Fig. 6.

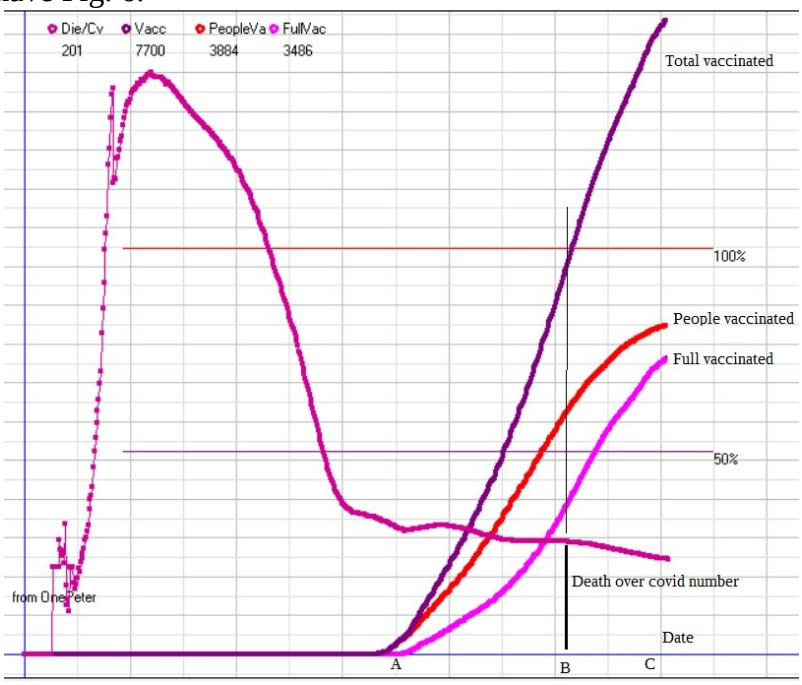

Fig.6 time series of vaccination rate and covid death rate

From Fig. 6, we can see that during period AB and BC, the covid death rate and the vaccination rate are opposite. What does this mean?

9. What is the role of vaccine?

When the vaccination rate rises, the mortality rate (here, the covid death rate) is decreasing. Vaccines only focus on individuals, not the entire population. In other words, this is the role of vaccine. For the covid war of the whole population we must seeking other methods[3].

If vaccines are the only way to win the covid war, then when the vaccination rate rises, the number of covid (Fig. 4), the number of covid deaths (Fig. 5), and the hospitalisation rate (Fig. 1) should always decrease. In fact, this is not the case.

10.When is the time vaccination rate rise and covid gets worsen?

First we need define what is worsen. We define ***worsen*** as average daily covid number increasing, hospitalisation rate increasing, the covid death number increasing. From graphic we can see that they are showing an upward trend.

Let us put all the graphics together and find out the date B. Then find out the vaccination rates.

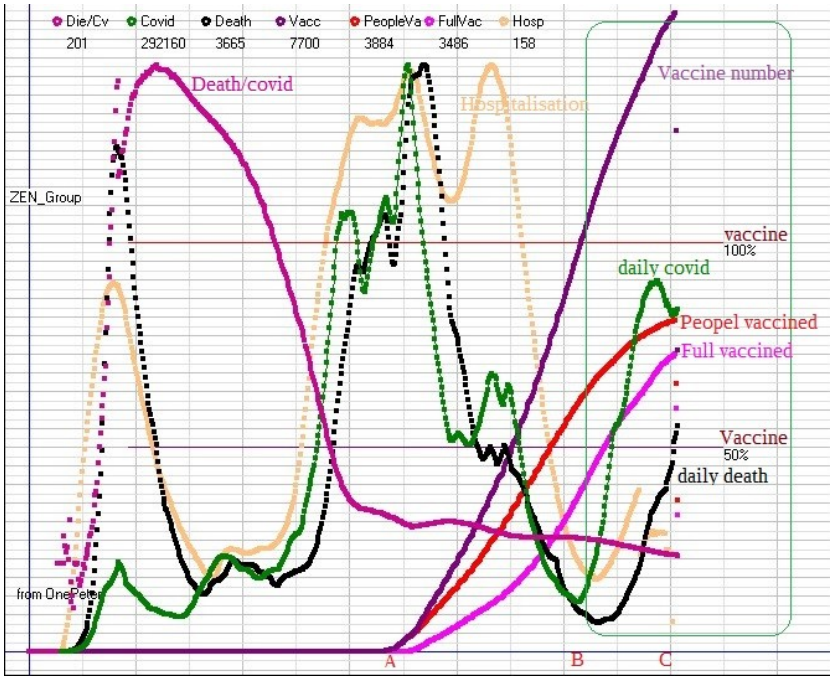

Fig.7 time series of vaccination rate and daily covid number, daily covid death number and hospitalisation rate

The following is the approximate vaccination rate when the covid began to worsen from time B. We use 7-day average of daily covid, death and hospitalisation rate for each country.

Country	Total Vaccinated(%)	People vaccinated(%)	Full vaccinated(%)
Canada	123	70	52
France	81	50	30
Israel	121	62	58
Italy	97	60	39
Norway	61	36	25
Poland	88	47	43
Sweden	96	59	37
UK	91	56	35
US	95	53	45
Average	**117**	**70**	**49**

The full vaccination rates in Canada and Israel exceed 50%, so the total number of vaccinations exceeds 100%. From the above table we found that when about 50% of full vaccinated and 70% of people vaccinated, the covid situation is worsen even vaccination rate continues to rise.

11. Details of individual countries.

Let us now look at individual countries to see their patterns.

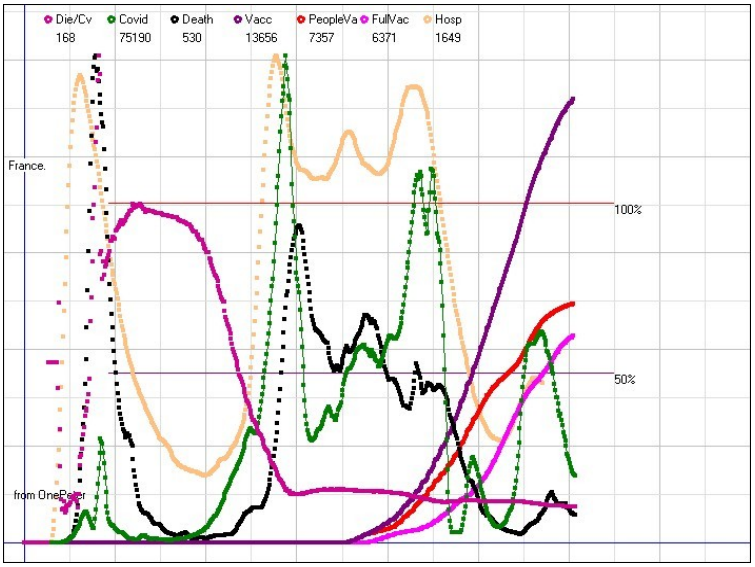

Fig. 8 France

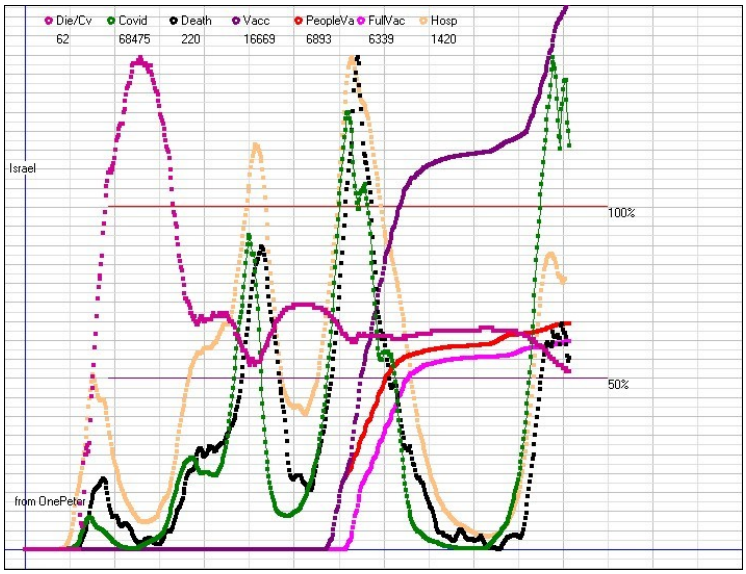

Fig.9 Israel

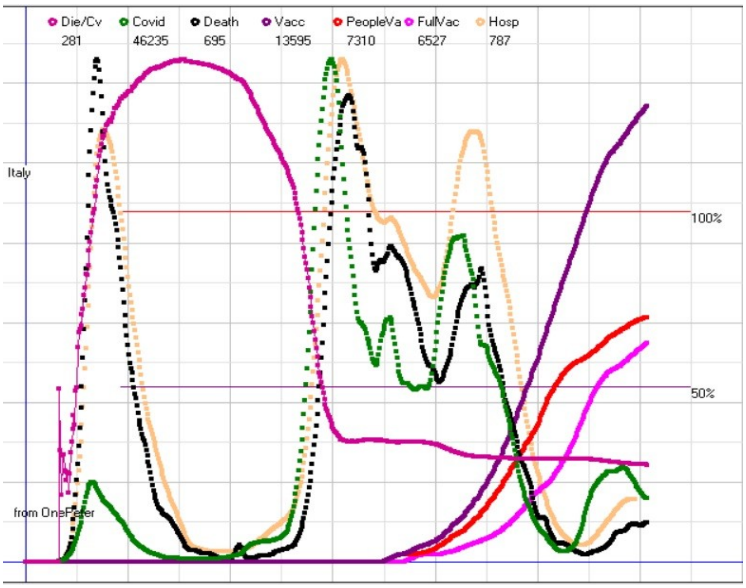

Fig.10 Italy

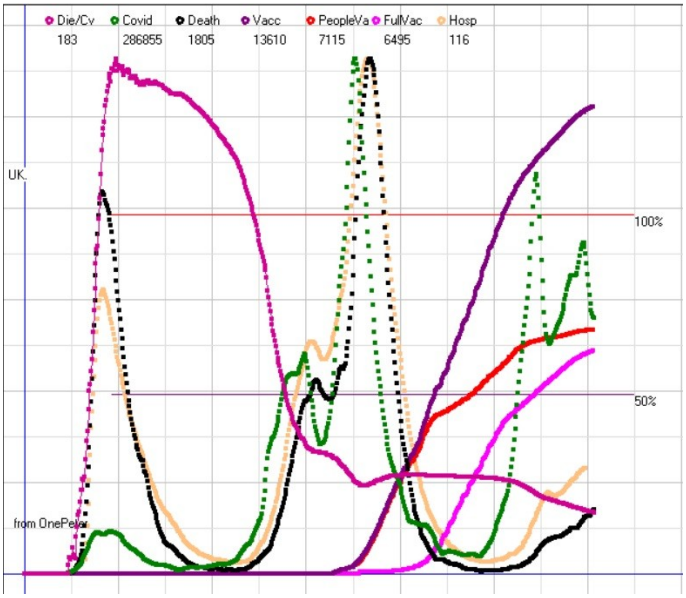

Fig.11 UK

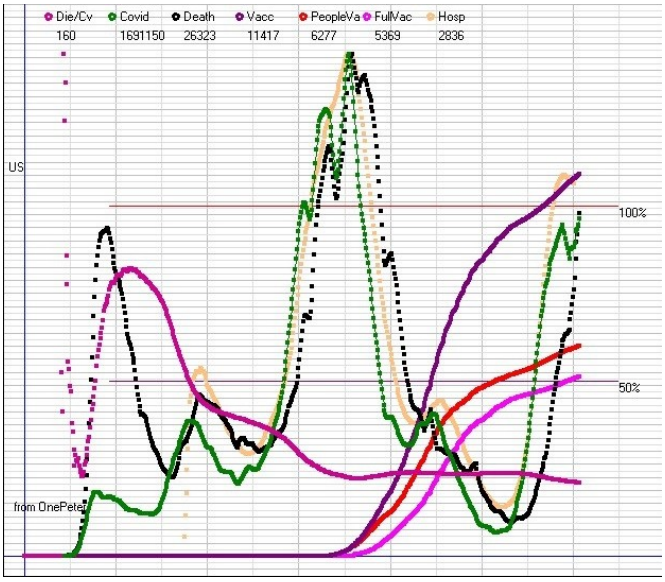

Fig.12 US

Those counties have a similar pattern.

12. Conclusion

From the above analysis and comparison, it is concluded that the vaccine can reduce covid severity for individuals, but it cannot eliminate covid as a whole. If other elimination methods are not used, the covid will continue to spread, it attacks unvaccinated children and other people with underlying health conditions. It still causes serious health, economic and social problems.

In order to win the covid war, we need eliminate covid methods, and at the same time carry out more vaccinations to reduce the severity of covid. We can follow a method and strategy *An effective method to eliminate covid*[3] and *How to lockdown virus instead of entire community[4]*

References

[1] data source from https://proxy.hxlstandard.org
[2] data source from https://data.humdata.org
[3] Peter, Smith, An_effective_method_to_eliminate_covid
[4] Peter, Smith, How_to_lockdown_virus_instead_of_entire_community