The strategies for the new round of COVID-19 pandemic

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Abstract: The high rate of reinfection of the Omicron variant suggests that we are in a new round of the COVID-19 pandemic. Review of the population death rates of countries around the world for the previous round proves that my predictions for COVID-19 strategies are correct. Performance of strategies for the previous round can serve as references for the new round. The primary reason for the failure of the COVID-19 responses is the failure of the system strategy of flattening the curve or social distancing. When the coronavirus is widespread, the reverse quarantine strategy is recommended to put the pandemic under control in about two months. Worldwide coordination is necessary to completely eliminate the coronavirus for a zero COVID status.

We know that the coronavirus is under constant mutation. When the mutation is big enough that natural immunity cannot recognize the virus anymore, we call it a major mutation that starts a new round of the pandemic. The Omicron variant is a major mutation for a new round of the pandemic. A significant number of people previously infected and therefore acquired natural immunity got reinfected with the Omicron variant. In the United States, the Omicron variant became dominant around the middle of December 2021. The death from the Omicron variant started about two weeks later or around January 1, 2022.

Table 1 is the estimates of different COVID-19 strategies for US that I predicted in April 2020. According to data from worldometers.info, the number of deaths due to COVID-19 in the previous round of the pandemic is 850,000, in agreement with the predicted number of 600,000 to 1,000,000 for the flattening the curve strategy.

Table 1 Estimates of different COVID-19 strategies for US

Strategy	Population death rate	Number of deaths	Time, month
Quarantine	<0.001%	<3,000	~2
Reverse quarantine	0.002%–0.02%	6,000–60,000	~2
Lockdown	0.0001%–0.02%	300–60,000	~2
Doing nothing	~0.03%	~100,000	~2
Herd immunity	0.05%–0.1%	150,000–300,000	~2
Flattening the curve	0.2%–0.3%	600,000–1,000,000	~24

If we look at countries with the lowest population death rates in the world, they fall into either the category of quarantine or the category of reverse quarantine. Quarantine is the traditional strategy to fight a pandemic, and it can be cost-effective if implemented at the

initial stage. A well-executed quarantine strategy can achieve a population death rate below 0.001%. However, one has to keep a constant vigilance to isolate all the infected people, otherwise the strategy may fail, as what have happened in Vietnam.

It would be a surprise to many people that among the countries with the lowest population death rates are about 50 Africa countries. For example, Nigeria has a population death rate of 15 in one million, while the corresponding number is 3,023 in one million in the United States. There is a difference of over 200 times. The younger population in Nigeria is a factor, but the major reason is the doing nothing strategy, a spontaneous version of reverse quarantine characterized by a high infection rate and a low population death rate. In fact, people in many cities in the United States have also adopted a spontaneous reverse quarantine strategy for the Omicron variant, against the recommendations of the federal government. This is evident from the high infection rate with a peak width of about two months and the low death rate.

As a result of the flattening the curve strategy, over one million people have died directly due to the virus in the United States, and more people have died indirectly as a result of the wrong response to the pandemic. The economic losses are on the order of trillions of dollars. The consequences are felt by ordinary people as high inflation. When the government took the wrong strategy of flattening the curve, the experts and resources were not used effectively. If the reverse quarantine strategy were adopted, the pandemic would have been under control in about two months. The reverse quarantine strategy would have saved over one million lives in the United States alone, and largely avoided the huge economic losses.

It took me only a few minutes to realize that the flattening the curve strategy was a wrong strategy for the COVID-19 pandemic, after watching a video of Dr. Fauci explaining the flattening the curve strategy. The prediction of the number of deaths by the government also was far off from the actual data. However, it took tremendous efforts to get the strategic predictions right. It is a complex system like a big puzzle, and you only know you are right after you have figured out the whole picture. One needs a broad background and a high capacity of judgment. For example, the number of reported cases is often far below the actual cases. As it happened, I just have the right background, such as transportation, urban conditions, and modeling. I have lived in many cities in United States, Europe, and China. I can make sense of what reported in China, Europe, and United States. A medical degree is not a necessary background for strategic predictions. Incidentally, the best short-term predictions were from Youyang Gu, an independent data scientist. One also needs to think from first principles. The government experts are smart people. If one takes the same approach, one will not do any better. As it happened, it is my strength to think from first principles as an Edison-type inventor or system inventor. Another strength of an inventor is to know what is right or wrong since an inventor deals with wrong ideas on a daily basis. When someone asked Edison, "How did it feel to fail 10,000 times?" Edison replied, " I didn't fail 10,000 times, but have successfully found 10,000 ways that will not work."

In a reverse quarantine strategy, healthy people will live a normal life, and businesses stay open as they wish. Only people at risk are voluntarily isolated and protected. The

coronavirus will run its natural course in the population of healthy people, and in about two months the coronavirus will no longer be able to find a host to sustain the infection process. Then we have reached a zero COVID status and everybody is safe to have a normal life.

Let me use a simple two-group model to explain the reverse quarantine strategy. In reverse quarantine, people are voluntarily divided into two groups: a normal group of healthy people and an at-risk group for protection. The probability of death for people in the normal group is about 2 in 100,000, comparable to the annual death probability from everyday risks like choking or falling, and five times less than the annual death probability from car accidents in the United States. One can get a sense of this reasonable estimate from the low population death rate of kids and the low population death rate of 1.5 in 100,000 in Nigeria. The number of death in the normal group is linearly proportional to the number of infections. For such a low risk, one does not need to do anything.

The number of people in the at-risk group is estimated at 1.7% of the population for the United States. This is the number of people who would die if exposed to the coronavirus. Although we cannot pinpoint the individuals at risk, we know that they have preexisting conditions and we also roughly know their distribution in the population (mostly older than 65 years). The number of death in the at-risk group depends on how well they are protected and is not linearly proportional to the number of infections in the normal group. As a result, the case fatality rate, an important parameter for many models, is no longer meaningful for COVID-19 and changes erratically over a wide range. In practice, at least 10% of the population will be in reverse quarantine. The more people in reverse quarantine, the better the result of reducing the numbers of deaths and hospitalizations.

In essence, the reverse quarantine strategy is to let healthy people in the normal group get infected as quickly as possible to eradicate the virus from the population. This actually helps to protect people in the at-risk group by reducing the time of possible exposure. The natural infection in the normal group takes about two month to finish, and will infect 15% to 60% of the population. Any social distancing measures are counter-productive for the normal group but insufficient for the protection of the at-risk group. As I learned from my early experience at dangerous working environment, a false safety is the worst safety. People in the at-risk group should adopt voluntary reverse quarantine rather than social distancing. Therefore, the government should lift all mandatory social distancing measures.

It should be noted that the reverse quarantine strategy can reach a zero COVID status but this is not herd immunity. The spread of the virus stops before reaching the threshold of herd immunity. Incoming virus can still start a new wave of infections. Therefore, we need simultaneously coordinated actions around the world to eliminate the virus.

We have seen implementation failures of quarantine strategy and lockdown strategy in the previous round of the pandemic. For example, Vietnam had successfully deployed the quarantine strategy for one and half years but eventually failed and fell into a status of

flattening the curve strategy. A better remedy is to quickly switch to the reverse quarantine strategy when the quarantine strategy just starts to fail.

We should not live with the virus. If we live with the virus, sooner or later the virus will get all the people in the at-risk group. That means four million more people will die in the United States alone. If the virus becomes more deadly in the mutation process, it will become even more disastrous. We should eradicate the virus as soon as possible (in about two months) by either quarantine or reverse quarantine. We should not be complacent when the infection rate is low, as a surge of the virus will come. Only a zero COVID world is safe for everybody. We have eradicated the SARS virus before in 2003. We should be able to do the same thing with this coronavirus closely related to the SARS virus.

The strategic suggestions for the new round of pandemic:

1. Change from flattening the curve strategy to reverse quarantine strategy.
   Lift all social distancing measures.
   Change the public mindset from social distancing to reverse quarantine. Without such a change of mindset, one will still get the result of flattening the curve strategy even after government restrictions are lifted, as shown in UK and Denmark.

2. Worldwide coordination to eliminate the coronavirus for a zero COVID status.
   Declare zero COVID status city by city, country by country.
   Strict restriction of international travel to stop the spread of the coronavirus into zero COVID regions.

Dr. Hengning Wu is an Edison-type inventor or system inventor from first principles. Since 2000, his focus has been fundamental ideas that will either start a new industry or open up a new direction for an industry.

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