Hypothesis

How Risky if China Moves Away from Its Zero-COVID Policy?

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Abstract: There are two contrary opinions regarding the risk if mainland China (MC) moves away from its zero-COVID policy. Some experts think the risk shall be much lower than influenza as per MC's own COVID-19 case fatality rate (CFR), while some other experts think the risk shall be much higher than influenza as per the COVID-19 CFRs of other regions. We elucidate here that this and multiple other striking differences in the CFR between various scenarios all support and substantially resulted from the view that good IDM is highly powerful to mitigate COVID-19, where IDM (isolation-disinfection-maintenance) means isolation of COVID-19 cases from other people, disinfection of their living environments, and health maintenance (e.g., rest, nutrition, breathing). The high effect of good IDM is also supported by the theoretic functions of IDM in minimizing co-infections and maintaining body functions, and the fact that all the 505 COVID-19 deaths reported in MC in 2022 before May 5 died directly of severe underlying diseases with COVID-19. Although it is tough for people in poverty to obtain good IDM, good IDM can be feasible at home for the most mild cases and in hospitals for the most severe cases. Therefore, good IDM can be crucial to mitigating COVID-19 worldwide. It also suggests that the risk for China to end its zero-COVID policy depends on China's control policies or measures. Based on the effect of IDM, the cautious co-existence policy was proposed for COVID-19 control. This policy could reduce the whole death toll in MC because good IDM is non-specific and can reduce deaths of various other diseases. The cautious co-existence policy (non-specific) and the vaccination policy (specific) aid each other to mitigate COVID-19, and they cannot replace each other. Those who are qualified in health for vaccination should be vaccinated against COVID-19 timely.

Keywords: case fatality rate; co-infection; control; COVID-19; pandemic; policy; risk

1. Introduction

There are two contrary opinions regarding the risk if mainland China (MC) moves away from its stringent zero-COVID policy. Some experts think the risk shall be much lower than influenza, because the COVID-19 CFR in MC has been less than 0.01% or 1/10 of that of influenza (0.121%) [1,2] Some other experts think the risk shall be much higher than influenza, because the CFRs in other regions, such as the USA, Japan, Hong Kong (HK), were all much higher than influenza, which is also the major reason why MC sticks to its extremely costly zero-COVID policy [3] We should know the reasons for this striking difference in COVID-19 CFR between MC and other regions before we can judge whether the risk for MC to end its stringent zero-COVID policy.

To date, the COVID-19 pandemic caused by SARS-CoV-2 has led to 6.26 million deaths worldwide, and COVID-19 remains risky to many people worldwide.[1] Therefore, it is desirable to reveal novel and feasible strategies powerful to mitigate COVID-19 from the global battle against COVID-19. Epidemiologically, such strategies can be found if we have identified the reasons for the above striking difference in COVID-19 CFR.

Currently, some scientists support the zero-COVID or blocking policy, and some other scientists support the policy to live with COVID-19 [2,3] Scientists should clarify the

risk and feasibility of each policy and whether there is another policy superior to these two policies, for politicians to make correct decisions.

We explored the answers to the above critical questions through mining of various data of COVID-19 in China and worldwide. These data are virtually the results of multiple large-scale and expensive, life-threatening "human experiments", and hence should be well employed for COVID-19 control.

2. Methods and Materials

The COVID-19 data of MC and other regions were collected from relevant official websites and Worldometer [1, 4–6] The CFR was calculated through dividing the relevant death counts by the counts of cases with known consequences (death or recovery), except for Hong Kong (HK) where the recovery counts were unavailable. The CFR in HK was calculated through dividing the relevant death counts by the case counts of the date 14 days earlier because the death dates were around 14 days later than the case confirmation dates on average [7].

3. Results and Analysis

3.1. CFR difference between MC and other regions

COVID-19 CFR in MC from 1 June 2020 to 7 April 2022 was 0.009% (4/43,163), less than 1/10 of influenza CFR (0.121%) [1,4] By contrast, in the same period, the CFR was 1.358% (902,404/67,343,614) in the USA, 0.479% (114,240/23,827,080) in France, 0.689% (123,173/17,874,644) in Germany, 0.435% (27,565/6,342,084) in Japan, 0.777% (8,553/1,108,740) in Hong Kong (HK), and 1.319% in the whole world outside MC, all 46–145 times higher than that in MC [1,4]

MC is not much superior to all the above other six regions outside MC in climates, human genetics, vaccination-induced immunity, infection-induced immunity, population youngness, or virus virulence [8,9], so none of these factors could account substantially for the striking differences.

Mathematically, if 80% of the cases and 20% of the deaths in a region were not reported, the CRF of this region becomes 3 and only 3 times higher than its authentic value. Meanwhile, almost all COVID-19 cases in MC were identified and reported after May 2020, as needed for the strict zero-COVID policy, and the COVID-19 data of the USA, France, Germany, Japan, and MC were rated reliable [10]. Therefore, data quality could account partially, but not substantially, for the above striking differences.

We then suspected **IDM** (isolation-disinfection-maintenance), namely isolation of cases from other people and environments, disinfection of their living environments, and body maintenance (e.g., rest, nutrition, and breathing). MC was superior to the above other six regions outside MC in providing good IDM for each COVID-19 case as required by its stringent zero-COVID policy, when only a few people were infected with COVID-19 (Figure **1**). Theoretically, health maintenance is crucial to reducing stress, diseases, and deaths, and isolation of cases and disinfection of their living environments can minimize co-infections with various other pathogens. Co-infections can be more dangerous to COVID-19 cases than to healthy people [11], because the immunity of COVID-19 cases has been dampened. Therefore, IDM could account substantially for the striking CFR differences.

3.2. Other evidence supporting the effect of IDM

We found three other striking differences in the CFR supporting and mainly resulting from the high effect of IDM to mitigate COVID-19 (Figure **1**).

First, the COVID-19 CFR in HK was 2.053% (195/9,499) from 1 June 2020 to 28 February 2021, 67 times higher than that in MC, 0.030% (2/6,759), in the same period.[1,4] This 67-time difference cannot be explained with vaccination as mass vaccination started after February 2021 in HK and MC. By contrast, IDM was implemented more stringently in MC than in HK where COVID-19 cases can go out frequently [12,13].

Second, the COVID-19 CFR in Hubei province, 6.622% (4,512/68,132), was 7 times higher than that in other provinces of MC, 0.824% (122/14,809), before June 2020 [4]. This 7-time difference can be well explained with IDM, as many COVID-19 cases in Hubei province were not well isolated with good healthcare in well disinfected environments because too many cases in Hubei province, particularly in the city of Wuhan, overwhelmed the healthcare systems for some time during that period [4].

Third, Shanghai was fully blocked from 1 April 2022 to quash the viral transmission from too many COVID-19 infections [4,5]. Many infected people were managed to live together in the same large spaces of many temporary hospitals, and many residents encountered shortage of food and healthcare services [3,14], both contrary to IDM (Figure **1**). The COVID-19 CFR in Shanghai was 0.000% (0/3,015) from 1 March 2022 to 14 April 2022, when IDM was good or poor IDM had not displayed their effect on CFR. The CFR increased to 1.402% (422/30,093), 10.6 times higher than influenza CFR, from 15 April 2022 to 30 April 2022, when poor IDM had lasted for 2–4 weeks [5]. This striking CFR difference in Shanghai in the two adjacent periods could confirm the high effect of IDM to mitigate COVID-19, as these two adjacent periods differed in none of any known confounding factors that can affect the CFR substantially [8,9], except IDM.

Together, various striking CFR differences all support that good IDM is highly powerful to mitigate COVID-19. Good IDM could reduce COVID-19 CFR by 88% (as per the above CFR difference between Hubei and other provinces) to 100% (as per the above CFR difference in Shanghai between two adjacent periods). The high effect of IDM to mitigate COVID-19 is consistent with the theoretical functions of IDM and also supported by the fact that all the 505 COVID-19 deaths reported in MC in 2022 before May 5 died directly of severe underlying diseases rather than COVID-19 [5].

3.3. Feasibility of IDM

Usually hospitals can provide good IDM for severe COVID-19 cases, which can be relatively rare if almost all cases employ good IDM, as per the above analysis. Meanwhile, vast asymptomatic or mild cases can be isolated and maintained at disinfected home to obtain good IDM, and they can obtain healthcare advice through online or community clinical services.[5] Therefore, good IDM is feasible in many regions worldwide, although it is tough for many people in poverty to obtain good IDM.

The above analysis elucidates that it is highly beneficial to their own health for asymptomatic or mild cases to stay at home with good disinfection of their rooms and good maintenance of their health for days, which is also crucial to public health and minimizing their great pressure on the healthcare systems. This can aid people to manage good IDM actively for themselves.

3.4. COVID-19 control policies and risk of China to end the zero-COVID policy

The above analysis suggests that the risk for China to move away from its zero-COVID policy shall depend on China's control policies or measures (Figure **1**): The COVID-19 CFR in China can be less than 1/10 of influenza CFR again, if IDM is well implemented (i.e., the cautious co-existence policy in Figure **1**); otherwise, the COVID-19 CFR in China can be several times higher than that of influenza (i.e., the simple co-existence policy in Figure **1**). The above analysis also suggests that the zero-COVID policy can be highly risky if too many people have been infected with COVID-19 (Figure **1**). As per the cautious co-existence policy in Figure **1**, many people shall be infected with the virus, and the future COVID-19 risk shall decline due to substantial increase of infection-induced immunity [15,16]. In contrast, the zero-COVID policy shall lead to increase of the future COVID-19 risk for rapid decline of vaccination-induced immunity.

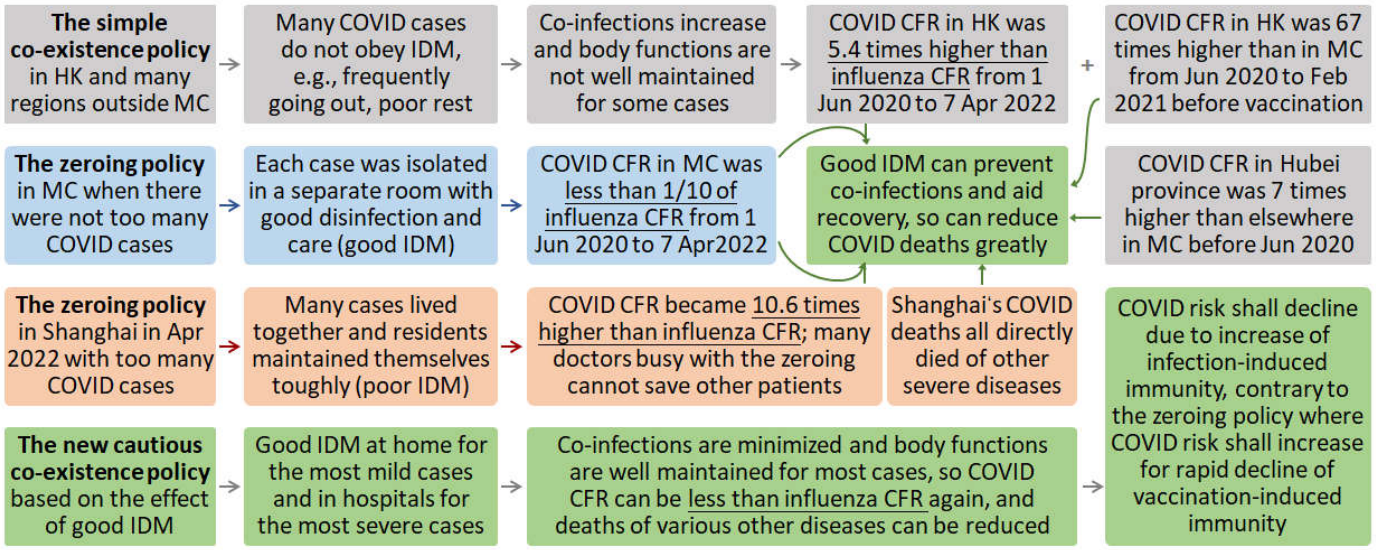

Figure 1. Comparison of three COVID control policies. MC: mainland China; HK: Hong Kong; CFR: case fatality rate; IDM: isolation-disinfection-maintenance. Green arrows show some evidence supporting that good IDM can reduce COVID deaths greatly. Blue arrows and red arrows clarify when the zero-COVID policy is feasible or highly risky. The simple co-existence policy lets floods kill many people with no precise resistance, and the zeroing policy blocks floods with continuous great efforts to protect people. The new cautious con-existence policy transfers people to highlands with careful protection, and then orderly discharges floods which can irrigate farm fields (enhancing specific immunity through mild infections). The total deaths can be reduced as good IDM is non-specific and can reduce deaths of various other diseases for the same reason. IDM is non-specific and different from specific vaccination, but they aid each other to reduce COVID deaths.

After MC takes the cautious co-existence policy, if 10% COVID cases will not manage good IDM for themselves, and their COVID CFR will be as high as that in Japan from 1 June 1 to 7 April 2022 (0.435%) (here the Japan's CFR was selected because Japan's CFR was rated reliable [10]), and the remaining 90% cases will manage good IDM for themselves, and their COVID CFR will be as high as in MC in the same period (0.009%), then the CFR in MC shall be around 0.052%, or around 1/2 of influenza CFR. Again, from the fact that all the 505 COVID-19 deaths reported in MC in 2022 to date died directly of other diseases, the most COVID-19 deaths after MC takes the cautious co-existence policy will die directly of other diseases rather than COVID-19.

In recent years, the annual hospitalization toll in MC is around 250 million and the annual death in MC is around 10 million [17]. If MC takes the cautious co-existence policy, and the CFR in MC is around 0.052% (60% of the deaths should also die even if they are not infected with COVID-19)as estimated above, and the rate of severe cases who need hospitalization among the total infections is 0.520% (10 times of the CFR), and the rate of symptomatic cases among the total infections is 40%, and 1 billion people are to be infected with COVID-19 in the first year, then 5.2 million people shall become severe cases (these people shall increase the annual hospitalization toll in MC by 2.1%), and 520,000 people shall die of other diseases with COVID-19 (60% these people shall die no matter whether even if they are not infected with COVID-19, and so COVID-19 shall increase the annual death toll in MC by 2.1%). Meanwhile, as proof in principle and as suggested by the data of various listed infectious diseases in MC, good non-specific IDM can reduce deaths of various diseases [18], and hence the annual death toll in MC, as a whole, can decline due to the cautious co-existence policy. Furthermore, the cautious co-existence policy is much more economical than the zero-COVID policy in the long run (Figure **1**), and the zero-COVID policy could lead to significant increase of the deaths of various other diseases, if too many people infected with COVID-19 have to be isolated together in temporary hospitals and almost all traditional hospitals are occupied for mild COVID-19 cases (Figure **1**) [3].

3.5. Effect of traditional Chinese medications (TCMs) in IDM

We cannot confirm the individual effect of isolation, disinfection, and health maintenance in IDM to reduce COVID-19 deaths, so we integrate them into the single concept of IDM. Similarly, TCMs are widely used in MC for health maintenance, but we cannot confirm the effect of TCMs to reduce COVID-19 deaths, so we also integrate the effect of TCMs into the concept IDM.

It is tough to confirm the effect of TCMs for COVID-19 therapy through large-scale and randomized, double-blind clinical trials, because the randomized blank control group without any therapy should not be established for medical ethics, particularly when COVID-19 was rather pathogenic in 2020 and 2021 [4–7], and patients can differentiate TCMs from placebos easily from their colors, odors, and flavors. It is our view that TCMs have a profound role in Chinese society and can relieve respiratory symptoms through adjusting human immunity rather than direct inhibiting the virus replication [2,19,20].

4. Conclusion

It is desirable to reveal novel and feasible strategies highly powerful to mitigate COVID-19, which remains risky to many people worldwide. It is also desirable to predict correctly the risk if China moves away from its stringent zero-COVID policy. In this report, we elucidate that good IDM is highly powerful to mitigate COVID-19, based on striking differences in COVID-19 CFRs between various scenarios, the theoretic functions of IDM in minimizing co-infections and maintaining body functions, and the fact that all the COVID-19 deaths reported in MC in 2022 to date died directly of severe diseases other than COVID-19. Although it is tough for many people in poverty to obtain good IDM, good IDM can be feasible for the most cases worldwide. Therefore, this non-specific strategy that could reduce COVID-19 deaths by 88–100% is crucial to mitigating COVID-19 worldwide.

This report also suggests that the risk for China to end its zero-COVID policy depends on China's control policies or measures. If China moves away from the zero-COVID policy to the cautious co-existence policy which is based on good IDM, the whole death toll in China could decline rather than increase because good IDM is non-specific and can reduce deaths of various other diseases.

Notably, the cautious co-existence policy (non-specific) and the vaccination policy (specific) aid each other to mitigate COVID-19, and they cannot replace each other. Those who are qualified in health for vaccination should be vaccinated with effective COVID-19 vaccines in timely.

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