

*Hypothesis*

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

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**Abstract:** We found four striking differences in the COVID-19 case fatality rate (CFR). All of these striking differences suggest that, besides vaccination, good isolation of cases, disinfection of their living environments, and maintenance treatment (IDM) are highly effective in mitigating COVID-19. This suggestion is crucial to the global control of the pandemic and consistent with the theoretical functions of IDM in minimizing co-infections with various other pathogens and maintaining human body functions. Accordingly, the risk for China to move away from its zero-COVID policy shall depend on China's control measures. The CFR of COVID-19 in China can remain less than one tenth of that of influenza, namely that COVID-19 can remain "tiny influenza" in China, if the IDM measures are well implemented (e.g., staying at well-disinfected home with good rest for vast mild cases). Otherwise, the CFR of COVID-19 in China can be several times higher than that of influenza, namely that COVID-19 can be "giant influenza" in China. This analysis also clarifies that the COVID-19 CFR shall increase greatly if many asymptomatic or mild COVID cases are isolated together at temporary hospitals.

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

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 relatively low [1], because the COVID-19 CFR in MC has been less than 0.01% or 1/10 of that of influenza (0.12%), no matter whether the value is calculated using MC's data from 1 June 2020 (0.0043%, 4/69867), 1 January 2022 (0.0037%, 2/53380), or 1 March 2022 (0.0057%, 2/46155), to 15 April 2022. Some other experts think the risk shall be high, because the CFR in other regions was much higher, which is the major reason why MC sticks to its extremely costly zero-COVID policy [2]. From 1 June 2020 to 7 April 2022, the CFR was 4,610–14,546% (46.10–145.46 times) higher in the USA, France, Germany, Japan, Hong Kong (HK), and the world outside MC than in MC (Table 1).

The striking differences were mirrored by the marked scenarios that, from 1 March 2022 to 8 April 2022, of the 154,950 infections recently identified in Shanghai, only one showed severe signs and no one died, while dozens or hundreds of COVID-19 cases died daily in HK in the same period [2].

Exploration of the reasons for the striking CFR differences between MC and other regions can be crucial to risk analysis and decision-making to mitigate the devastating pandemic.

**Table 1.** The COVID-19 CFR in some regions from 1 June 2020 to 7 April 2022.

Regions	Deaths	Recovered	The CFR
Mainland China (MC)	4	43,159	0.009%
World outside MC	5,778,629	432,193,804	1.319%
USA	902,404	66,441,210	1.358%
France	114,240	23,712,840	0.479%
Germany	123,173	17,751,471	0.689%
Japan	27,565	6,314,519	0.435%
Hong Kong	8,553	1,100,187	0.777%

We found that MC was superior to the other six regions listed in Table 1 in providing good isolation of cases, good disinfection of their living environments, and good maintenance treatment, as required by its very strict zero-COVID policy, and the healthcare systems in the other six regions were heavily overwhelmed by COVID-19 cases for some time. Theoretically, good maintenance treatment (e.g., using ventilators to aid severe cases to breathe) is crucial to reducing the deaths, and good 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 [3], and more dangerous to elderly people than young people, because the immunity of COVID-19 cases and elderly people has been dampened. Therefore, the measures of isolation of cases, disinfection of their living environments, and maintenance treatment (IDM) can account substantially for the striking CFR differences (46.10–145.46 times).

Besides IDM, data quality can also account substantially for the striking differences. For example, if 80% of the cases and 20% of the deaths in a region were not reported, the reported CRF of this region become 3 and only 3 times higher than the authentic CFR. Notably, almost all the cases in MC were identified and reported after May 2020, as needed for the very strict zero-COVID policy, while only a portion of cases in the other six regions listed in Table 1 were identified and reported, although the COVID-19 data of the USA, France, Germany, Japan, and MC were rated relatively reliable [2].

We analyzed other various factors including climate, living habits, population youngness, human genetics, therapy medications, virus evolution, and increase of herd immunity that can influence the CFR [4–7]. We think all these factors could account partially, but not that substantially, for the striking CFR differences (46.10–145.46 times). For example, if the rate of elderly people is higher by 50% in a region than in MC, its CFR can be higher by around 50% in this region than in MC for this reason, as most COVID-19 deaths were from elderly people.

We found three other solid proofs supporting the crucial effect of IDM.

First, the COVID-19 CFR of HK was 2.053% (195/9,499) from 1 June 2020 to 28 February 2021, 68.38 times higher than that in MC, 0.030% (2/6,759), in the same period [2,8]. This 68.38-time difference cannot be explained with data quality, human races, vaccination as mass vaccination started after February 2021 in HK and MC, or infection as most of the cases had not been infected with SARS-CoV-2. Moreover, age distribution could not account for more than 5-time difference in the CFR, as the rate of elderly people infected with COVID-19 was likely less than 5 times higher in HK than in MC in this period. We think the striking difference can only be largely explained with the IDM measures which were implemented much less strictly in HK than in MC [9,10].

Second, the COVID-19 CFR in Hubei province, 6.622% (4,512/68,132), was 8.04 times higher than that in other provinces of MC, 0.824% (122/14,809), before June 2020 [2]. This 8.04-time difference cannot be explained with any reasons, such as human races, vaccination, infection, age distribution, therapy methods, or countries, except IDM, as before June 2020, many COVID-19 cases in Hubei province rather than in other provinces were not well isolated 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 this period.

Third, the COVID-19 CFR in Shanghai was 0.000% (0/3,015) from 1 March 2022 to 14 April 2022, before the city had been fully blocked for two weeks, when the IDM measures could be good or the effect of poor IDM measures had not displayed). In contrast, the CFR increased to 0.490% (48/9,796) from 15 April 2022 to 22 April 2022, after the city had been fully blocked for two weeks, when the IDM measures could not be good due to very strict restrictions and enormous investment required by the zero-COVID policy and the effect of poor IDM measures had displayed [11].

Together, the crucial effect of IDM analyzed above was actually supported by four large “experiments” that excluded multiple confounding factors (Table 2). These “experiments” should have paramount importance to the global control of COVID-19, as they suggest that, besides mass vaccination, the IDM measures are highly effective in mitigating COVID-19, which is consistent with the theoretical functions of IDM in minimizing co-infections and maintaining normal body functions. These “experiments” also suggest that the future risk for MC to live with COVID-19 depends on MC’s control measures: The risk can be low if the IDM measures are well implemented, and the risk can be high if the IDM measures are not well implemented. Since elderly people are more vulnerable to COVID-19 and co-infections, they should be given better IDM, besides vaccination.

**Table 2.** Major confounding factors excluded in the four large “experiments”.

Large “experiments” (MC=mainland China)	Difference in the CFR	Major confounding factors (A–J) excluded
MC vs other regions (1/6/2020–7/4/2022)	46.10–145.46 times	A: human races; B: virus evolution
Hong Kong vs MC (1/6/2020–28/2/2021)	68.38 times	A; B; C: countries; D: vaccination; E: infection history; F: data quality
Hubei vs other MC provinces (>1/6/2020)	8.04 times	A–F; G: age distribution; H: therapy methods; I: regions
Shanghai before vs after 15/4/2022 from 1/3/2022	0.000% vs 0.490%	A–I; J: cities

Although there should be new variants of SARS-CoV-2 in the future, the general declining tendencies in the daily new COVID-19 deaths and in the COVID-19 CFR have been obvious to date, as per a recent analysis [5].

The above analyses elucidate 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 treatment for days, which is also crucial to public health and minimizing their great pressure on the healthcare systems. Therefore, most people should be willing to take the IDM measures for themselves.

The above analysis clarifies that it can be a dangerous fallible pitfall to use temporary hospitals to host many asymptomatic or mild COVID cases together, which may lead to widespread co-infections with various other pathogens and increase greatly the COVID-19 CFR. Notably, temporary hospitals for treating severe COVID-19 cases should be employed, if needed.

The IDM measures are feasible in many regions if well prepared. First, hospitals can provide good IDM for severe COVID-19 cases, which can be relatively rare if vast asymptomatic or mild cases well employ the IDM measures, as per the above analyses and the fact that, from 1 March 2022 to 8 April 2022, of the 154,950 infections recently identified in Shanghai including 43,400 infections confirmed before 2 April 2022, only one showed severe signs and no one died [11]. Second, good maintenance treatment is usually simple for asymptomatic or mild cases, and good isolation of asymptomatic or mild cases can be as simple and inexpensive as staying at home for days, and good disinfection of

their living environments which can be as simple as using soap water to clean their rooms. Multiple studies showed that soap water is effective to remove and/or kill various pathogens [12].

In this report, the CFR was calculated through dividing the total deaths by the total cases with known consequences (deaths or recoveries), using the data from the Worldometer and official sites [2,8]. The ICR was calculated using the official data available online to date [11].

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