Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

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Letter to the Editor

China's 'dynamic zero COVID-19 strategy' will face greater challenges in the future

Dear editor,

Recently, an article in your journal discovered that there existed high amounts of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) in aerosols exhaled by patients with Omicron variant infection.[1] As of April 1st, 2022, a total of 486,761,597 cases have been confirmed worldwide, amounting to a death toll of 6142,735 (WHO, Coronavirus disease 2019 Situation Report, April 1, 2022). Due to natural selection, the Omicron variant of SARS-CoV-2 has rapidly replaced the Delta variant as the predominant circulating strain.[2] Since the epidemic had changed to regional sporadic outbreaks in China, the government continued adhering to the 'dynamic zero COVID-19 strategy', which had effectively controlled the domestic spread of the virus after the initial outbreak in 2019. However, in the past two months, cases of the new variant of the Omicron strain named subtype BA.2 have been reported in several regions of China, which has brought new challenges to China's epidemic prevention.[3,4]

Since the first Omicron strain was isolated in China on December 9th, 2021, the spread of the virus had accelerated significantly, but it had been quickly contained as a result of the 'dynamic zero COVID-19 strategy'.[5] Nevertheless, China starts seeing successive outbreaks in its urban centers since March, among which are cities of Shanghai and Shenzhen. The different outcomes of the local outbreaks in the two economic centers present us empirical evidence of the efficacy of different approaches to epidemic prevention and control. Responding to the rapid rise in confirmed cases, the local government of Shenzhen resolutely adopted the 'dynamic zero COVID-19 strategy' from the onset and placed the city under lockdown for one week starting March 14th, 2022. The daily number of newly confirmed cases dropped significantly after the third day of the lockdown. As of April 3rd, the number of new cases in Shenzhen is gradually approaching zero (Fig. 1). By contrast, with similar situation in the early stage, the local leadership of Shanghai first adopted a more laxed approach by trying to isolate individual origins of outbreak and not going into city-wide lockdown. The result from this approach has proven to be unsatisfactory. Shanghai's handling of the COVID-19 pandemic before the current wave had been rather efficient and precise, but it failed to contain the highly transmissible Omicron variant. The daily number of new cases in Shanghai had exceeded 2000 since March 25th, 2022, with the number continuing to increase exponentially. On March 28th, 2022, the local government officially switched to the dynamic zero COVID-19 strategy and adopted a partitioned lockdown policy for epidemic prevention. As a direct result from this policy-change, the number of confirmed cases in Shanghai had been gradually peaked four days after the implementation of the strategy (Fig. 1).

To sum up, it seems that the 'dynamic zero COVID-19 strategy' is still the most effective and applicable epidemic prevention model for China. This strategy can achieve maximum prevention and control effects while minimizing social cost by handling sporadic cases and clustered epidemics with relative speed and efficiency. Lockdown has been proven to be the most effective way to prevent and control the epidemic, but it does come with significant losses. The losses caused by each lockdown are not exclusively macroeconomics costs. After the entire community is put on pause, the cost of restarting social activities can also be very high. Furthermore, medical staff–one of the most important elements in the 'dynamic zero COVID-19 strategy'—feel the brunt of the storm during lockdown. While China's medical system has been competent in dealing with the pandemic, frequent lockdowns can still overstretch its medical capability and bring high pressure on medical resources. At present, it is not only necessary but also urgent to let cities and regions that have the necessary resources and determination to actively explore novel models of effective prevention and control while maintain the overall success story of China's epidemic prevention and control,. Under the currently severe international epidemic situation, it is obvious that human beings will have to coexist with SARS-CoV-2 for the foreseeable future.. While the results might have been disappointing, Shanghai's epidemic prevention model is a great example of how big cities should actively explore new ways with which government can stifle the spread of the virus without going into lockdowns. Should a new attempt be proven to be effective, it will become a blueprint of a new model for national epidemic prevention.

Lastly, a new mutant strain—the XE strain of SARS-CoV-2—which is a recombinant variant of Omicron BA.1 and BA.2 strain, has been detected in the UK. A government study of the 637 confirmed cases has found that the XE strain spreads 9.8% faster than the BA.2 strain (the UK Health Security Agency reported, www.gov.uk). With the experience of epidemic prevention models in Shanghai and Shenzhen, China's dynamic zero COVID-19 strategy may face greater challenges in the future. When trying to control the pandemic, the priority should be to both maintain the necessary level of economic activities required for sustain growth and suppressing virus outbreaks. The continuous development of the epidemic requires corresponding prevention and control strategies to respond rapidly. At present, China is also actively exploring epidemic prevention policies to ensure people's health and sustainable social development in the new era of the epidemic. In today's global response to COVID-19, no country can survive alone. The real victory over COVID-19 will require concerted efforts from around the globe. To that end, new models of epidemic prevention explored by China will provide valuable experience for epidemic prevention and control around the world.

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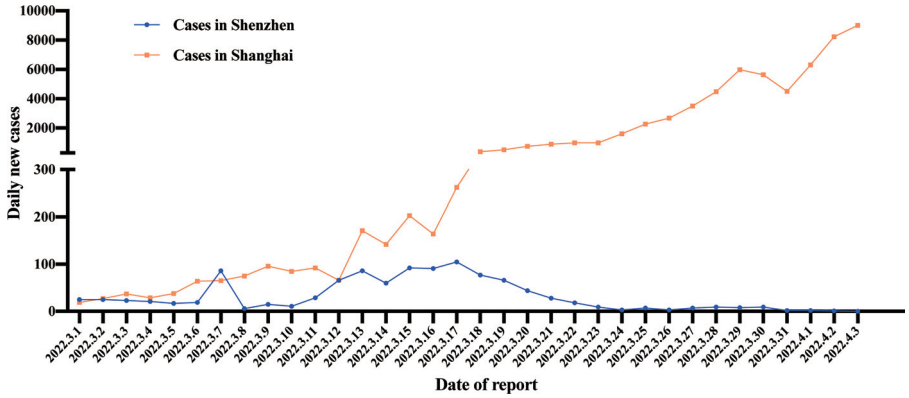

Fig. 1. Daily new cases of COVID-19 in Shenzhan and Shanghai. (updated on April 3rd, 2022). Data for all cases are from National Health Commission of the People's Republic of China (http://www.nhc.gov.cn).

Declaration of Competing Interest

None.

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References

1. Zheng J, Wang Z, Li J, Zhang Y, Jiang L, Fu Y, Jin Y, Cheng H, Li J, Chen Z, et al. High amounts of SARS-CoV-2 in aerosols exhaled by patients with Omicron variant infection. *J Infect* 2022. doi:10.1016/j.jinf.2022.02.015.
2. Karim S, Karim QA. Omicron SARS-CoV-2 variant: a new chapter in the COVID-19 pandemic. *Lancet* 2021;**398**:2126–8. doi:10.1016/S0140-6736(21)02758-6.
3. Cheng VC, Ip JD, Chu AW, Tam AR, Chan WM, Abdullah S, Chan BP, Wong SC, Kwan MY, Chua GT, et al. Rapid spread of SARS-CoV-2 Omicron subvariant BA.2 in a single-source community outbreak. *Clin Infect Dis* 2022. doi:10.1093/cid/ciac203.
4. Mahase E. Omicron sub-lineage BA.2 may have "substantial growth advantage," UKHSA reports. *BMJ* 2022;**376**:o263. doi:10.1136/bmj.o263.
5. Sun H, Li H, Huang S, Shi L, Xing Z, Shen J. Case report of China/Tianjin's first novel coronavirus variant Omicron. *Iran J Immunol* 2022;**19**:11. doi:10.22034/IJI.2022.94050.2278.

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