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Dynamic zero COVID policy in the fight against COVID



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On April 11, 2022, the authorities in Shanghai, China, announced that they would ease the citywide lockdown. Residents in zones that have reported no new cases of COVID-19 for 2 weeks were granted permission to leave their homes, on condition that they restrict their movements to specific areas. "After a long period of lockdown, it is understandable that people want to go out and get some air, and they need to go shopping for food and medicine and go for medical treatment", stated city health official Wu Qianyu. "But if lots of people gather in a disorderly way, it will cause hidden dangers to our epidemic prevention work."

25 million people live in Shanghai. The city went into full lockdown on April 5, 2022. The decision was made in pursuit of the national "dynamic zero COVID" policy, which deploys mass testing and strict quarantine measures to stamp out any outbreak of COVID-19 before it can spread. Shanghai registered more than 23 000 new cases of COVID-19 for April 11. Fewer than 1000 of these cases were symptomatic. The city has not reported any deaths from COVID-19 during the current wave, which is being driven by the highly transmissible omicron variant. Reports have emerged of children who test positive for SARS-CoV-2 being separated from their parents. City dwellers have complained of food shortages and difficulties in securing delivery slots for essential supplies. Video footage has circulated of people yelling in frustration from their balconies.

The municipal authorities in Shanghai had hoped to address the outbreak without a full lockdown. In March, they established localised restrictions. But these proved insufficient to stem the rising number of new infections. Other Chinese cities have taken a stricter approach. Xi'an, which is home to 13 million people,

went into lockdown late last year after mass testing detected 127 infections with SARS-CoV-2. In January, 2022, Yuzhou locked down its 1.1 million population after detecting three asymptomatic cases of COVID-19. At the time of writing, around 200 million people in more than 20 cities in China were under full or partial lockdown.

The rest of the world has mostly adopted a strategy of living with SARS-CoV-2. Yanzhong Huang is a senior fellow for global health at the US-based think tank, the Council on Foreign Relations (New York City, NY, USA). "The Chinese government has placed a high premium on the politics of the pandemic response", he explained. "From this perspective, the debate between zero COVID and co-existence with the virus becomes a competition between two political systems, which raises the stakes for any decision in Beijing as to whether to pivot away from their approach."

Besides, China's policy has been enormously successful. Throughout the entire course of the pandemic, the country of 1.4 billion people has reported 1 655 477 cases of COVID-19 and 13 524 deaths. The USA, whose population is less than a quarter the size, has seen over 80 million cases and almost 1 million deaths. From mid-April, 2020, to March, 2022, just two people in China died from COVID-19. The nation's economy grew by a healthy 8.1% last year.

China Daily is an English-language news outlet owned by the publicity department of China's ruling Communist Party. It has reported the results from modelling studies undertaken by the Chinese Centre for Disease Control and Prevention showing that if China adopted the American strategy for tackling COVID-19, it would result in at least 637 000 daily infections, including more than 22 000 cases of severe disease. "Can you imagine

the devastating impact a rapidly burgeoning number of critically ill patients would have on China's medical system and society?", asked the news anchor. "This is why China is doubling down on its time-tested dynamic clearance strategy that emphasises early detection, reporting, quarantine and treatment."

Events in Hong Kong have amply demonstrated the mayhem that omicron is capable of causing. SARS-CoV-2 infections started to surge in the city of 7.5 million people in January, 2022. By March, when cases peaked, Hong Kong was seeing more deaths from COVID-19 per million population than any country had registered at any time during the pandemic. Isolation facilities have been overwhelmed. Mortuaries have not had space to accommodate all the bodies. There have been reports of shortages of coffins.

Hong Kong is designated as a special administrative region of China. It has followed the zero COVID policy of the central government in Beijing. New arrivals to Hong Kong have been required to quarantine and flights from high-risk nations have been suspended. Last year, the city recorded fewer than 4000 cases of COVID-19. 80% of the population have received two doses of the COVID-19 vaccines and 40% have received the booster jab. But coverage has been uneven. When omicron struck, less than a third



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For the pre-print on vaccine effectiveness of two and three doses of BNT162b2 and CoronaVac see *MedRxiv* 2022; published online March 22. DOI: 10.1101/2022.03.22.22272769

of city residents older than 80 years had been fully vaccinated. Vaccination rates among people living in care homes were under a fifth.

As of April 6, 2022, the ongoing fifth wave of COVID-19 had killed 8247 individuals in Hong Kong, 74% of whom had not received a single dose of vaccine. Care homes for disabled people and the elderly have accounted for 55% of deaths. Several hundred such facilities in Hong Kong have reported COVID-19 outbreaks. "Omicron has a reputation for being milder, but that is only the case if you are vaccinated", points out Martin Hibberd, professor of emerging infectious diseases at London School of Hygiene & Tropical Medicine (London, UK). "If you are not vaccinated, as we have seen in Hong Kong, it can be deadly."

The advent of omicron, and its even more transmissible subvariant BA.2, has highlighted the limitations of China's strategy. "There is a tension between zero COVID and vaccinating the priority groups", said Huang. "Zero COVID does not differentiate between severe and mild infections. That in part explains why China did not take a proactive approach to vaccinating the elderly, who are the most likely to get very sick. All Zero COVID is concerned about is the number of infections."

88% of the Chinese population have been fully vaccinated against COVID-19. But just half of citizens aged 80 years and older have received both doses of the vaccine, and only a fifth have received the booster dose. Zhengming Chen is professor of epidemiology at the University of Oxford (Oxford, UK). He noted that China's vaccination drive has focused on those at the highest risk of infection, rather than those at the highest risk of adverse consequences were they to become infected. The country contains around

52 million people over the age of 60 years who have yet to be fully vaccinated against COVID-19.

Huang suspects that vaccine nationalism lies behind China's refusal to approve either the Moderna or the Pfizer BioNTech mRNA vaccines. Instead, it has rolled out two inactivated vaccines, one produced by Sinovac, the other by the state-owned company, Sinopharm. The phase 3 trial for the Sinopharm vaccine found that two doses had an efficacy rate of 79% against symptomatic disease. The Sinovac product showed an efficacy of 51% against symptomatic disease, barely high enough to receive emergency approval from WHO.

Moreover, the Sinopharm trial was not powered to examine efficacy in populations aged over 60 years. "The Chinese vaccines have not really been tested against clinically high-risk or elderly patients", said Chen. He pointed out that the initial approvals listed a dozen contraindications, including in people older than 60 years. The number was subsequently reduced to six, but faith in the vaccines had been shaken. "There are parallels between the experiences of Hong Kong and mainland China, in that many elderly people in both places are reluctant to take the vaccines because they are worried about adverse events", added Huang.

A study by researchers at the University of Hong Kong concluded that the two doses of the Sinovac COVID-19 vaccine had efficacy rates of 60% against severe disease and 67% against fatal disease, in populations aged 80 years and older. Adding the booster dose pushed both rates above 95%. The study has not been peer reviewed.

If the zero COVID policy were to be discontinued before China was able to fully vaccinate, and probably boost, an adequate number of its elderly and otherwise vulnerable populations,

the country would face a substantial burden of morbidity and mortality. "Zero COVID meant that not enough elderly people were vaccinated, but that left China with no option but to continue with zero COVID", said Huang. "The policy became its own justification." The absence of sizeable outbreaks of COVID-19 over the past 2 years has left the population with little infection-generated immunity.

"Australia and New Zealand went for zero COVID, but they used the quiet time when they had very few cases to achieve high levels of vaccination, especially in vulnerable groups. It does not look like China has done this, so opening up is a far riskier proposition", Hibberd told *The Lancet Respiratory Medicine*.

"Omicron is a major disease and it is very transmissible", stressed Chen. "China does not have much choice as to how it tackles this wave. If it relaxes its restrictions, there will inevitably be a huge number of infections and deaths." There is no gatekeeper in China's health-care system. Patients are free to simply turn up at hospital. "If China suddenly decides to adopt the policy of living with the virus, the health-care system would be overwhelmed", said Chen. The change in messaging could also be tricky. For over 2 years, the Chinese population have been warned that COVID-19 is an extremely dangerous disease that must be eradicated.

As things stand, commitment to zero COVID remains strong among the Chinese Communist Party. But nothing is set in stone. "As vaccines, treatment, and quarantine measures improve in the future, it is very possible that China may adjust its COVID-19 policies", affirmed the presenter on *China Daily*. "But the country wants to do it scientifically, responsibly, and at its own pace."

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