

For COVID-19, what are the priorities of normalized prevention and control strategies?

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SUMMARY The COVID-19 pandemic has ravaged the world for three years. Most countries have adjusted policies and strategies in response to the burden of COVID-19. The severity of COVID-19 seems to be diminishing as the case fatality rate has declined and the number of vaccinated people has increased markedly. Given the large population worldwide, we need to pay attention to the continuing COVID-19 burden. Globally, the number of cases remains at a certain level, and the number of cases is still increasing in China. We also need to deal with shortages of medical resources, antipyretics, and home nursing facilities. SARS-CoV-2 will coexist with humans for a long time, and predicting viral mutations and pandemic trends will be difficult. The reform of the whole public health system is imperative. A comprehensive surveillance system should be created to determine the proportion of various pathogens and to guard against mixed infections of respiratory infectious diseases. A comprehensive response mechanism, including preventive measures and medical treatments, should be created as soon as possible to monitor the status of the epidemic and to deal with the long-term health burden of SARS-CoV-2.

Keywords COVID-19 (SARS-CoV-2 infection), SARS-CoV-2, health burden, surveillance, global health

Three years have passed since the pandemic due to coronavirus disease 2019 (COVID-19) began to ravage the world (1). As of January 5, 2023, over 657 million confirmed cases and over 6.6 million deaths have been reported globally (data from the World Health Organization, WHO) (Figure 1 A,B) (2). Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) continues to mutate and the global pandemic persists; most countries have adjusted policies and strategies in response to the burden of COVID-19. Current efforts to prevent and control COVID-19 have been normalized worldwide.

China has also adjusted its prevention and control policies in accordance with the status of the COVID-19 epidemic. On November 11, 2022, the Joint Prevention and Control Mechanism of the State Council issued 20 new rules that emphasize simplifying categories of COVID-19 risk areas, halting the identification of secondary contacts, ending mass nucleic acid testing in most areas, and a series of strategies. On December 7, 2022, China issued the "10 new measures" to ease COVID-19 related restrictions and to optimize response strategies. This optimization emphasized that patients with asymptomatic or mild cases can choose to be

isolated at home, and negative results of nucleic acid testing are no longer required to enter public places. On December 26, 2022, the National Health Commission announced two significant adjustments. First, pneumonia caused by the novel coronavirus SARS-CoV-2 was renamed SARS-CoV-2 infection (COVID-19). Second, COVID-19 will be managed as a Class B infectious disease as of January 8, 2023 (Figure 2). Quarantine measures will not be imposed on patients infected with the virus, close contacts will not be identified, COVID-risk areas will not be designated, and COVID-19-related quarantines will not be imposed on persons or goods entering the country.

The severity of COVID-19 seems to be diminishing (3). The case fatality rate (CFR) has declined, and the number of vaccinated people has increased markedly. In Singapore, the CFR has fallen from 0.363% during the outbreak of the Delta variant (from June 7, 2021 to January 5, 2022) to 0.045% during the outbreak of the Omicron variant (from January 6, 2022 to November 16, 2022) (data from Singapore's Ministry of Health) (4). As of December 23, 2022, more than 13 billion doses of the vaccine have been administered and more than 5 billion persons have been fully vaccinated (data from

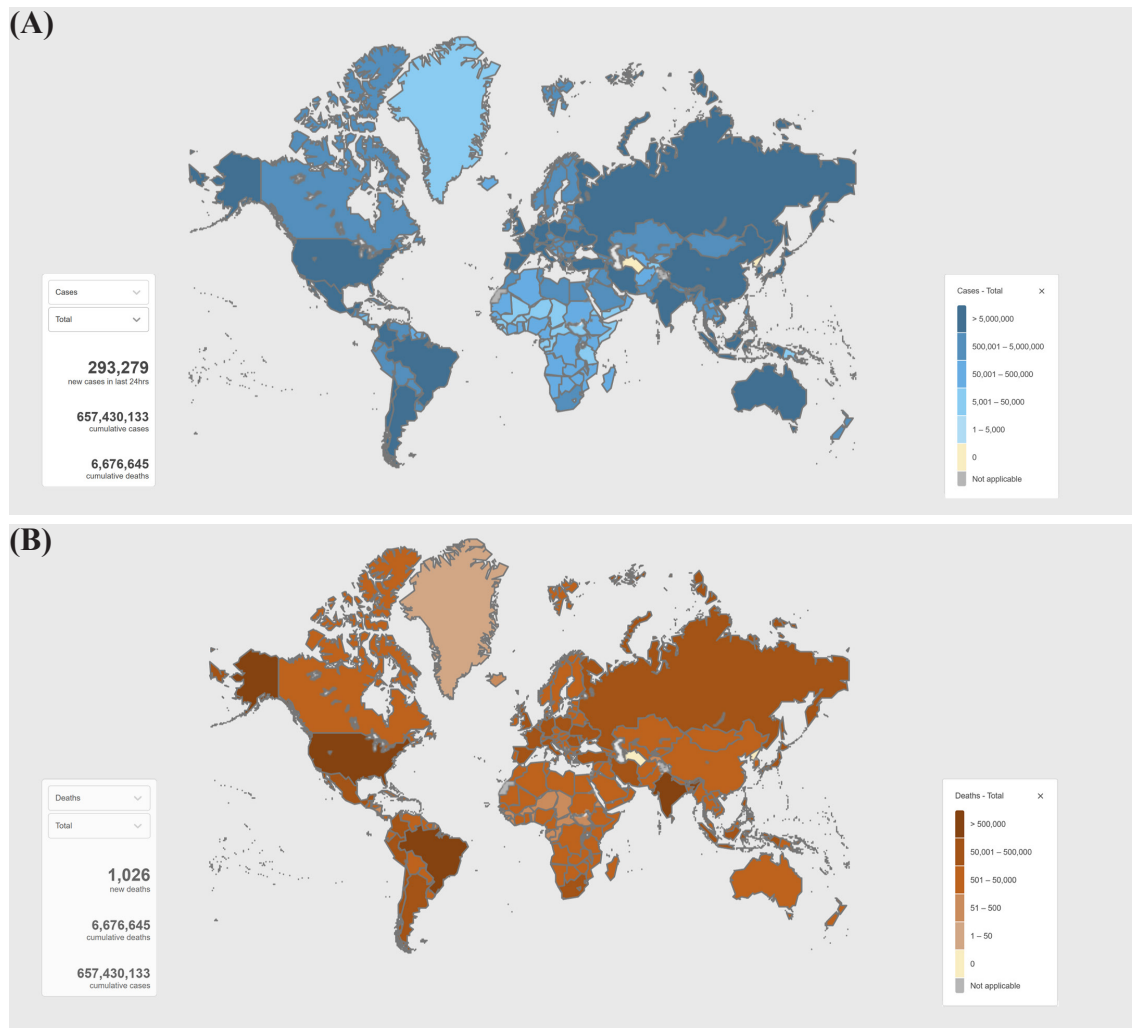


Figure 1. (A) Global confirmed cases of COVID-19 reported to the WHO as January 5, 2023; (B) Global deaths due to COVID-19 reported to the WHO as January 5, 2023. As of 4:33 PM CET on January 5, 2023, there have been 657,430,133 confirmed cases of COVID-19 globally, including 6,676,645 deaths, reported to the WHO.

the WHO) (5).

Given the large population worldwide, we need to pay attention to the continuing COVID-19 burden. Over 13.7 million cases and over 40,000 new fatalities were reported globally in four weeks before December 18, 2022, and the number of cases has remained at a certain level (data from the WHO) (6). The number of cases is still increasing in China. According to an online survey (the second such survey) in Sichuan Province on December 24, 2022, 100,679 of 158,506 respondents reported testing positive according to a nucleic acid or antigen test (7). The rate of infection (63.52%) had risen 16.53% since the first survey (46.93%) on December 19, 2022. As of December 30, 2022, the estimated rate of infection in Hainan Province reached 50% (8). As of December 31, 2022, 66,298 confirmed cases were reported on the Chinese mainland, 2,718 (4.10%) of which were severe cases (9). The proportion of severe cases remains at low. In big cities like Beijing and Shanghai, the infection has peaked as the number of visits to fever clinics and emergency calls for ambulances have decreased. The proportion of severe

cases may peak in the near future. Infection may soon peak in rural areas. Responses should be devised in advance.

Regardless of the trends in the rate of infection or the proportion of severe cases, the sheer number of patients, and especially these with severe cases, will strain medical resources like intensive care units (ICU) or converted ICU beds. A peak in infection will also strain the supply of antipyretics and medical equipment at home nursing facilities (like thermometers and oximeters) all over the world (10). Moreover, the strain on medical resources and the shortage of drugs and related home care equipment will pose psychological challenges to the public without proper guidance.

The transmissibility of COVID-19 continues to increase as SARS-CoV-2 mutates. This is another hidden danger. The effective reproduction number (R_e) of BA.4 and BA.5 are respectively 1.19 and 1.21 times that of BA.2 (11). The global spread of respiratory infectious diseases like COVID-19 has already become the norm, and a global response framework needs to be seriously considered.

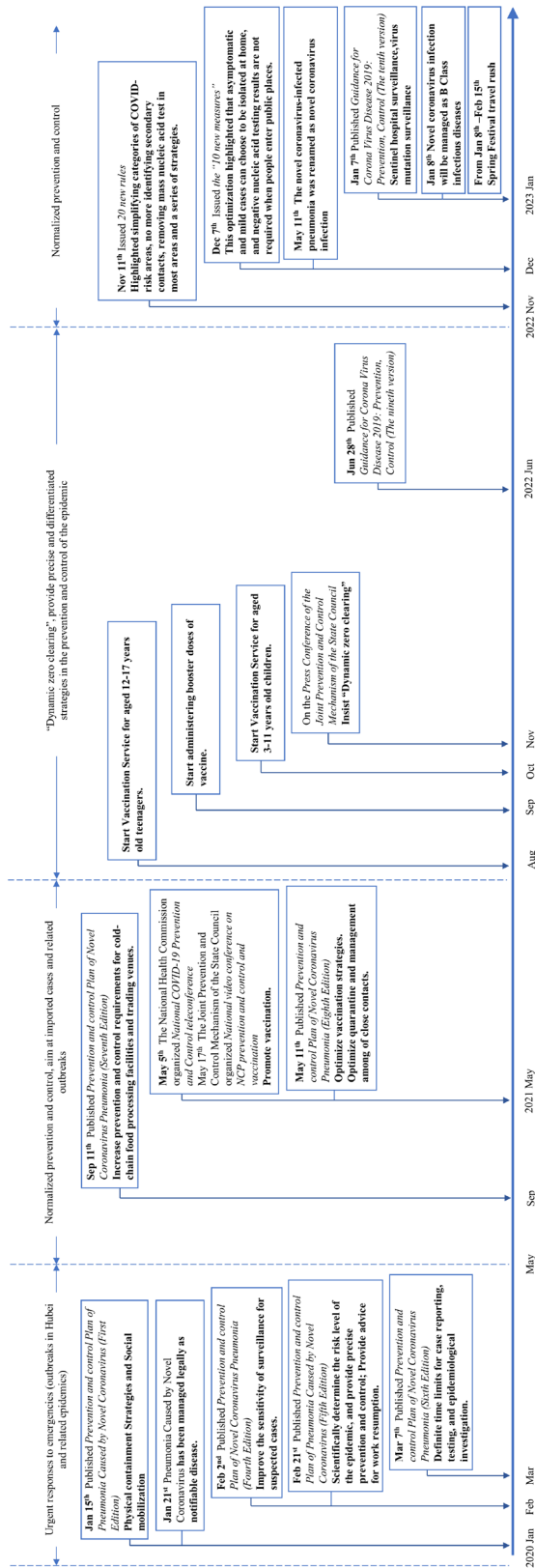


Figure 2. Prevention and control processes and strategies to combat COVID-19 in China since 2020.

To deal with the large number of people who are about to be infected, the government should continue to create a hierarchical medical system as soon as possible. Many rural and community health service centers (CHS) require training and guidance to enhance primary care. Medical facilities at all levels need to stock a certain amount of antivirals, and pharmaceutical companies should plan to enhance their production capacity of drugs. The scale of departments of critical care medicine and respiratory medicine at medical facilities should be increased appropriately to accommodate more patients. The government should also pay attention to the tide of public opinion on medical treatment. Timely and transparent explanations from the authorities can provide credible guidance and psychological relief for the public.

Due to the mutation of SARS-CoV-2, existing vaccines barely prevent infection. However, medical professionals all agree that people who have been fully vaccinated have a lower risk of severe illness, hospitalization, and death from COVID-19 than those who are unvaccinated or not fully vaccinated. Vaccination should still be encouraged for the elderly population. Having been fully vaccinated and having received boosters, individuals who are over 80 years old with underlying conditions should receive the fifth heterologous dose as soon as possible. The mRNA vaccine is also recommended for the public to better guard against the pandemic. When the vaccine is less effective at protecting against infection and it only protects against severe illness, attention should also be paid to how to encourage the public's willingness (and especially the elderly) to receive a booster (12, 13).

Non-pharmaceutical interventions (NPIs) should still be emphasized, and especially in key places with vulnerable population (such as nursing homes for the elderly and schools) and at important times when public travel increases (such as New Year's Day and Spring Festival). As the Spring Festival approaches and people return to their hometowns, gatherings of people in rural areas should be restricted to delay the peak of infection and severe illness. Classic preventive measures, such as wearing a mask, social distancing, and hand hygiene, have always been considered effective at preventing and controlling various infectious diseases, and especially in the early stage of an outbreak or pandemic in the absence of vaccines or other effective medicines (14, 15).

As prevention and control becomes normalized, a national or even an international surveillance system for COVID-19 should be created. Simply depending on the influenza surveillance system is insufficient because SARS-CoV-2 is more contagious and causes more serious symptoms, so medical and prevention efforts should be integrated. First, sentinel hospital surveillance can be conducted based on the national influenza surveillance system. Nucleic acid or antigen testing can be implemented among outpatient or emergency cases

of influenza-like illness (ILI) and inpatients with severe acute respiratory infection (SARI) at sentinel hospitals. Second, symptoms should be monitored in nursing facilities for the elderly, social welfare institutions, schools, and other key places. In addition, entities and institutions should promptly report clusters of cases, and centers for disease control and prevention (CDC) should promptly conduct field investigations and implement an epidemic response.

On the one hand, etiological surveillance should ascertain the spectrum of respiratory pathogens, including SARS-CoV-2 and the influenza virus, to determine the proportion of various pathogens and to guard against mixed infections of respiratory infectious diseases such as influenza and COVID-19. On the other hand, we should pay attention to the current status of strains around the world. The XBB variant has been detected among people entering China. We need to pay attention as to whether it will become a prevalent strain (16).

We should see if preventive interventions by the CDC system have promoted public health at the front line of clinical treatment. The reform of the whole CDC system is imperative. The CDC system should focus on two types of emerging infectious diseases (EIDs) (one is respiratory infectious diseases like COVID-19 and the other is vector-borne and zoonotic diseases like monkeypox), and it should mainly work on monitoring, providing an early warning, and facilitating emergency control of emergent acute infectious diseases. The government should foster personnel and provide material and financial support to the CDC system.

To avoid disasters like COVID-19, China's experience in containing the pandemic warrants further recognition (1). It proved that we need to pay adequate attention to infectious diseases in their early stages. Relying solely on conventional public health measures and utilizing new technologies such as nucleic acid testing and mobile communications, we are fully capable of eliminating an infectious disease early and locally and eliminating its risk of becoming a worldwide pandemic despite the absence of vaccines and specific drugs.

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