

Sudden upsurge of COVID-19 cases in China: A global threat

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Abstract

The ongoing COVID-19 pandemic has led to an unprecedented global health crisis with a significant impact on people's daily lives. Despite dealing with the pandemic for over three years, the situation still remains uncertain, with the emergence of new variants posing a threat to the population's health. China's dynamic zero-COVID policy was initiated in August 2021, to control the rapid spread of the novel virus, which proved successful. However, the policy's draconian approach and severe economic ramifications led to widespread protests and civil unrest, ultimately compelling the Chinese government to lift imposed restrictions. The emergence of the new Omicron variant, which has shown high transmissibility and a decrease in vaccine efficacy, has posed a new challenge in the fight against COVID-19. The abandonment of the zero-COVID policy has resulted in an increase in COVID-19 cases in China, with lack of natural hybrid immunity being one of the primary contributing factors. The situation requires close monitoring, and effective measures should be implemented to control the spread of the virus and mitigate its impact on people's lives.

Introduction

The ongoing COVID-19 pandemic has been an enduring and unrelenting global health crisis, with a tenacious grip on the global population. As of April 26, 2023, the confirmed number of COVID-19 cases stood at an alarming 764,474,387, with a reported 6,915,286 deaths and as of 24 April 2023, a total of 13,343,360,939 vaccine doses have been administered. The pandemic has left an indelible mark on our world, significantly impacting our daily lives. Despite over three years of dealing with the pandemic, the situation remains far from resolved.¹

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Current situation in China

According to the WHO, the number of daily cases in China in October was between 40,000-50,000 cases per day which decreased to 20,000-30,000 in November. On December 10th 2022, 463,471 new cases were recorded. On 23rd of December daily cases peaked up to 7 million per day. Further the daily cases started reducing until the end of January with the spike of the death toll of 4432 deaths recorded on January 5th 2023.¹

China's Dynamic Zero-COVID policy

After implementing an effective control strategy China decided to gradually shift to the "Dynamic Zero-Covid Policy" which was adapted in August 2021. According to a study conducted by Ma et al. the dynamic zero-COVID policy was an essential step in controlling the rapid spread of the novel virus in China.² According to the data on 30-11-22 there were 9,666,674 total cases in China whereas USA had a total case of 97,300,648¹, which is a vast difference considering the fact that China has almost 4.5 times the population of USA.³ Though the zero-COVID strategy succeed in controlling the cases, the draconian nature of the policy led to civil unrest and protests, ultimately playing a pivotal role in influencing the government's decision to lift the imposed restrictions.^{4,5} The removal of the policy was also influenced by its substantial impact on the economy, which is believed to have resulted in a 3.1% decline in China's GDP⁶. On December 7th, 2022, China revised its dynamic zero-COVID policy to allow more travel during the Chinese New Year, which had led to a surge in cases throughout the country.⁷

New Variant

The novel SARS-CoV-2 virus is in a continuous process of mutations and leading to newer variants with increasing morbidity. The highly transmissible Omicron variant, along with its new sub-variants, has emerged due to a mutation in the S-protein, which affects antibody evasion and increases affinity for the ACE-2 receptor binding site. This variant has reduced the effectiveness of current vaccines.⁸⁻¹⁰ A study conducted by Pan et al. concluded that there were no new variants found during upsurge and all the genomes belonged to the existing 123 Pango lineages. The BA.5.2 and BA.7 were found to be the dominant subvariants affecting about 90% of the population.¹¹ The BA.7 variant was found to be highly transmissible when compared to other Omicron variants. The R0 value of this new variant was found to be between 10-18.6 whereas the other omicron variants have shown an average of 5.8.¹² Owing to this high transmissibility rate, it has been classified as variants being monitored (VBM).¹³

Vaccination in China

In China, the immunization campaign against SARS-CoV-2 entailed the administration of domestically produced inactivated vaccines such as Sinopharm and Sinovac.¹⁴ According to Phase 3 clinical trials, the Sinopharm vaccine showed an efficacy of 79% against symptomatic COVID-19 and COVID-19-related hospitalizations, with no reported deaths.¹⁵

However, recent studies have found up to 30 mutations in the spike protein's RBD, which have diminished the vaccine's effectiveness against the Omicron variant, leading to a breakthrough infections have occurred in vaccinated individuals, indicating that the current vaccines on the market are not effective against the mutated variant.⁸

The vaccination rates of elderly in China are low with 92.3% in ≥ 60 years old out of which 88% has taken the first dose and 72.2% have received the booster dose whereas in the age group of ≥ 80 years only 72% elderly have had their first dose and 47.1% have had their booster dose.¹⁶ Furthermore, WHO recommended a three-

dose schedule of inactivated vaccines for >60 years where only 40% received the third dose by November 2022 in age group of >80 .¹

Herd Immunity and Waning of immunity

With less than 2 million cases reported by China during its 3 years of dynamic Zero-COVID policy it prevented appropriate exposure to the virus to develop natural immunity of both cell-mediated and humoral type which is more effective in providing protection against the infection compared to vaccine induced immunity¹⁷ along with that there is waning immunity from vaccination along with the low rates of booster doses (40% in >80 year). Thus, poor natural immunity from absence of previous infections leading to an extremely low herd immunity increased the susceptibility of the population for a massive outbreak.¹⁸ In a study by Carol Ho-Yan Fong et al. patients with herd immunity had a higher titre of nAb against BA.2 and BA.5 strain than those who were only vaccinated.¹⁹

In another study conducted by Bobrovitz N et al. found that for both the patients who were previously infected and with hybrid immunity showed waning nature of protection against omicron variant²⁰.

Expert Opinion

There are multiple causal factors intertwined together which led to the sudden rise in cases in China. Even though the zero covid policy had initially controlled the spike in cases during the pandemic, it waned the population immunity and decreased the herd immunity. With the new omicron variant there was an increased exposure of the populous to the highly transmissible virus especially after the removal of the Dynamic zero-COVID policy. With up to 3 years of pandemic there was low herd immunity in the populous owing to decreased vaccination rates, decrease uptake of booster doses and decreased exposure to the virus, the population's immune system was unprepared for the new variant which not only had decreased protection from the vaccines in the market but also had an increased capability to escape the immune system. The novel variant showed an increased morbidity and superadding with the low herd immunity of the populous, the spread of the virus at a rapid pace was inevitable.

The domestically produced vaccines showed lower efficacy rates compared to those developed internationally⁸. It may be advisable to allocate more research resources towards the development of more effective vaccines, and consider allowing the use of international vaccines to address the potential limitations of the current vaccine used, this would improve the overall effectiveness of China's immunisation efforts and contribute to the global fight against the COVID-19 pandemic.

Conclusion

Multiple interdependent contributing factors, such as the appearance of the highly contagious Omicron variant, declining vaccination rates, and the easing of the Dynamic zero-COVID policy, can be attributed for the abrupt increase in COVID-19 cases in China. The population's low level of herd immunity and the ineffectiveness of domestically made vaccines both added to the virus's rapid spread.

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