



# A commentary on ‘Possible threat of the Omicron subvariant BF.7 to FIH Hockey World Cup 2023 in particular and the South-East Asia Region in general’

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Dear Editor,

With tremendous attraction, we have thoroughly investigated the article entitled ‘Possible threat of the Omicron subvariant BF.7 to FIH Hockey World Cup 2023 in particular and the South-East Asia Region in general’ by Mohapatra *et al.*<sup>[1]</sup>. Ever since COVID-19 first appeared in Wuhan, China, in late 2019, the novel coronavirus is rapidly spreading and continues to evolve and produce different variants mainly due to genetic mutation. Principally attributable to their distinct characteristics of rapid transmissibility, severity of infection, immune escape and collective effect on public health, certain variants of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) are designated variants of concern (VOCs) by the World Health Organization, which consists of Alpha, Beta, Gamma, Delta, and Omicron<sup>[1]</sup>. Omicron is a variant currently dominant globally, accounting for over 98% of the viruses shared by the Global Initiative on Sharing All Influenza Data (GISAID)<sup>[2]</sup>. The Omicron variant of SARS-CoV-2, which emerged in late 2021, has rapidly evolved a number of variants and subvariants including BQ.1, BQ.1.1, BA.1, BA.2, BA.2, BA.2.75.2, BA.3, BA.4.6, BA.5.11, BA.5.2.39, BE.5/6/7/8, BF.7, BF.33, BQ.1.24, CA.3.1, CM.7, DB.1, XBB, and DD.1<sup>[3]</sup>. Some severe Omicron

subvariants pose huge public health risks as they continue to evade vaccine-induced and infection-induced immunity and alter the virus biology, and the WHO designated them as ‘Omicron subvariants under monitoring’ to signal to public health authorities globally, which VOC lineages may require prioritized attention and monitoring. As of 20 November 2022, the Omicron subvariants under monitoring (sVUM) includes BA.5 [with Spike (S) gene mutations of R346X, K444X, V445X, N450D or N460X], BA.2.75 (BA.2 with S mutations of K147E, W152R, F157L, I210V, G257S, D339H, G446S, N460K), BA.4.6 (BA.4 with S mutations of R346T or N658S), XBB (BA.2 with S mutations of V83A, Y144-, H146Q, Q183E, V213E, G252V, G339H, R346T, L368I, V445P, G446S, N460K, F486S, or F490S) and BA.2.3.20 (BA.2 with S mutations of M153T, N164K, H245N, G257D, K444R, N450D, L452M, N460K, or E484R). Among the commonest BA.5 Omicron sVUM, BF.7 subvariant, with additional R346T mutations, is known to be a severe form<sup>[1]</sup>. The current surge in the COVID-19 reports by Omicron subvariant BF.7 (also known as BA.5.2.1.7) in China and other countries is triggering a global alarm. Since late September 2022, cases of SARS-CoV-2 Omicron BF.7 (BA.5.2.1.7), a subvariant (sub-lineage) of BA.5, have been on the rise, and is responsible for the ongoing resurgence of cases in China. Similarly, it has also been reported from Denmark, Belgium, France, Germany, Mongolia, Norway, India, the United Kingdom, and the United States, leading to another COVID-19 case spike so as to aggravate the COVID-19 pandemic and create a fourth pandemic wave<sup>[2,4]</sup>. There have been reports from the WHO stating BF.7 is circulating at an incredibly intense level around the world and could be the next dominant variant<sup>[5]</sup>. According to recent reports from China, BF.7 has numerous concerning characteristics compared to the other Omicron subvariants, such as strong infection ability, high immune-evasion potential, shorter incubation period, and ability to infect vaccinated individuals, and those who have had previous COVID infection<sup>[6]</sup>. For instance, BF.7 has an R0, or basic reproduction number, of 10–18.6. This means an infected person will transmit the virus to an average of 10–18.6 other people without containment measures, compared to other Omicron variants and/or Delta VOC, which have an average R0 of 5–6<sup>[7]</sup>. The signs and symptoms of BF.7 infection principally involve upper respiratory symptoms which are similar to those associated with other omicron subvariants. Alongside, affected individuals may present with fever, sore throat, cough, fatigue, and runny nose, and some patients may also experience gastrointestinal symptoms such as diarrhea and vomiting<sup>[5]</sup>. BF.7, similarly to the other evolved Omicron subvariants, is able to escape immunity from prior

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infection or available vaccination. Furthermore, BF.7 carries a unique form of mutation, R346T on its spike protein, which is directly linked with its enhanced capacity of escaping neutralizing antibodies generated by previous infection or vaccines<sup>[8]</sup>. For instance, a recent study surveyed the neutralization of BF.7 in serum from triple-vaccinated healthcare workers, as well as patients infected during the omicron BA.1 and BA.5 waves of the pandemic, and revealed that BF.7 was resistant to neutralization (with 4.4-fold higher neutralization resistance than the original variant), mainly attributed to the expression of R346T mutation<sup>[9]</sup>.

Despite the huge upsurge reported only from China, and it seems to be remaining fairly steady in other countries including India, the U.K., the U.S., Germany, Belgium, Denmark, France, and many others, the abrupt escalation, immune-evasion characteristics and rapid transmissibility of BF.7 is so worrisome and may bring the world's fourth pandemic wave. The rate of infection, in fact, is heightened among elderly individuals, and among areas that lift zero-COVID policy restrictions too soon. For instance, a recent study from China concluded that if infections rise as rapidly as expected because of the easing of zero-COVID policy restrictions, hospitals will be overwhelmed, resulting in approximately one million deaths over the next few months. Furthermore, according to the study, if 85% of the population receives a booster fourth dose of the COVID-19 vaccine instead of the inactivated virus vaccine, it could slow the rise in infections and reduce the number of severe infections and deaths by up to 35%<sup>[9]</sup>.

To enhance the medical countermeasures to rapidly respond to the emerging Omicron sublineages and future VOCs, the best way demands the continuous update and development of effective vaccines, antivirals, rapid molecular diagnostic tools, and in combination with keeping surveillance activities up, to play a decisive role. The key is that there is a need to rapidly achieve global vaccination coverage rates, thereby preventing possible future outbreaks. It is evident that the strongest weapon we still have to combat variants of SARS-CoV-2 is immunization. Thus, new forms of vaccine such as the recently approved bivalent boosters (other than inactivated vaccines), which target omicron alongside the original SARS-CoV-2, are so promising to tackle outbreaks of emerging variants and subvariants including BF.7 and other future VOCs, essentially among immunocompromised and vulnerable populations (those aged > 60 years).

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### Author contribution

M.B., M.S., and J.A.: conceptualization; M.B. and M.S.: investigation; M.S. and M.B.: writing – original draft; J.A. and M.B.: writing – review and editing.

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### Data availability statement

All data are available in the manuscript.

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