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Correspondence

WHO prequalified tocilizumab and vaccine boosters against COVID-19



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Dear Editor,

Until mid-February 2022, more than 416 million individuals were estimated to have been infected with the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), whereas less than six million have died as a result of the viral infection (COVID-19) [1]. Despite its devastating global consequences, the COVID-19 pandemic could be potentially controlled by two additional countermeasures and optimistically be abated by the beginning of 2023. The evolving nature and dynamics of the SARS-CoV-2 variants have shown that countermeasures need to be adapted to mount an effective response against the pandemic. In this correspondence, we highlight these two countermeasures.

The previous COVID-19 waves demonstrated that older adults were the main victims, whereas now children and unvaccinated individuals are frequently infected potentially with more severe disease. High numbers of young children and unvaccinated individuals infected with the Omicron variant (B.1.1.529) in some parts of the world (for example, Iran and USA) reflect the severity and infectivity of the variants of the virus [2–4]. The biological reasons for this rapid rise have yet to be determined while the clinicians are concerned about the recently observed threat to children [5]. Some may argue that children are targeted by the virus because they were not vaccinated along with the rest of the population. Despite some objections to the mass-vaccination of children (for example, in Sweden), existing health policies and directives need to be revised to reduce the rate of the clinically severe COVID-19 documented in the high-risk categories of the populations, including the high-risk children. Sooner or later, schools and mass-gatherings need to be reopened; therefore, young children need to be protected to guarantee their wellbeing. Nonetheless, the pandemic will progress unless a considerable ratio of the world population is immunized regardless of their age either by mass-vaccination or natural infection. Vaccination of children should be accompanied by administration of the booster vaccine doses for adults, mainly aged >50. Administering extra booster doses (fourth and even fifth) of a vaccine against SARS-CoV-2 is an inevitable countermeasure irrespective of age, race, social status, or gender. Whether the fourth or fifth doses of a vaccine will be effective in vulnerable subjects need to be determined. As with antibodies against other infectious agents—whether induced by natural infection, reinfection, or vaccination—levels of neutralizing

antibodies against SARS-CoV-2 do not remain high permanently, and their decreasing levels should be boosted, ideally throughout the population [6]. Until February 21, 2022, only 63.9% of the world population had received at least one dose of a vaccine against SARS-CoV-2 (<https://www.nytimes.com/interactive/2021/world/covid-vaccinations-tracker.html>). During the rest of 2022, this figure will optimistically reach 75%, approaching an acceptable global rate. The 25% unvaccinated proportion of the global population still need to uptake their vaccine doses by the time the fully vaccinated proportion will have already shown low levels of neutralizing antibodies. Taken together, long-term follow-up of individuals is necessary to elucidate how well the fourth and fifth doses of vaccines protect against infection with Omicron or its upcoming sublineages.

Another critical factor for controlling the pandemic is the management of hyperinflammation in patients hospitalized with severe disease, requiring ICU care. Initial evidence obtained from severe COVID-19 cases hospitalized in China indicate that the hyperinflammatory response due to SARS-CoV-2 causes high fatality rates [7,8]. The cytokine storm is characterized by high interleukin-6 levels, clearly associated with unfavorable outcomes in severe COVID-19 cases [9]. Therefore, a monoclonal antibody, tocilizumab, against the receptor for interleukin-6 has been suggested to treat the cytokine storm. Indeed, hundreds of countries routinely administer tocilizumab as anti-arthritis medication [10]. Recent prequalification of tocilizumab by the World Health Organization (WHO) is a starting step to efficiently manage and treat the COVID-19 patients at ICU to ideally reduce the COVID-19 fatality rate [11].

While the future of the pandemic is unclear, administration of vaccine doses additional to the third dose and prescription of tocilizumab may help the international public-health authorities to abate the severe COVID-19 cases and the progression of the pandemic, at least by the beginning of 2023.

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