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LETTER TO THE EDITOR

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COVID-19 VACCINE — THIRD DOSE, BOOSTER DOSE? WHAT IS IT AND IS IT NECESSARY?

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To the Editor,

let us start with what the third doses of the vaccine are and what are the so-called booster doses. The doses are the same, and yet the difference in terms is very significant. This term is very important because of who receives such a preparation, namely booster doses are offered to people who have received the full course of vaccinations and initially developed a proper reaction to them, but over time this reaction disappeared (see the loss of antibodies), but the third doses are given people whose immune system has not been able to fully respond to the initial full course of immunizations. An increasing number of affluent countries are reaching for the third dose of the COVID-19 vaccine, although the World Health Organization does not recommend such a procedure, further pointing out that 58% of citizens have been vaccinated in wealthy countries, and only 1.3% in the lowest-income countries, which is significant an aspect indicating the very meaning of postponing vaccination, with many experts further pointing to the lack of medical indications for vaccination of the entire population with the third dose, although booster vaccinations are well known to us for other diseases such as whooping cough. Vaccinations are effective in preventing the severe course of COVID-19 in those infected, but their lack of availability in poorer regions of the world will further fuel the emergence of new mutations to which these vaccinations may prove insensitive. However, there are groups where this approach is recommended, including people receiving cancer treatment for HIV-infected tumors or blood cancers, people who have received an organ transplant or are taking immunosuppressants, patients with moderate to severe primary immunodeficiency (DiGeorge or Wiskott-Aldrich syndrome), or people who are taking high doses of corticosteroids or other medications that can suppress the immune system. Examples of the need for a third dose of vaccine in these groups are the transplant study in whom, following the entire course of COVID-19 immunization, 46% have not developed adequate antibody titers (importantly, the study also showed that the antibodies were not produced in 39% of people participating in the study after one dose of the vaccine, but after the second dose of the vaccine, they were already produced and only 17% produced detectable antibodies against the SARS-CoV-2 virus after the first dose) [1]. Among immunocompromised people there is a significantly greater likelihood of breakthrough infection (40–44% of hospitalized breakthrough cases are immunocompromised people) [2,3], unfortunately, they also have lower vaccine efficacy (59–72% of vaccine efficacy among immunocompromised people compared to 90–94% of immunodeficient patients after the second dose) [4–6]. This evidence shows that these groups are particularly vulnerable and should be vac-

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cinated with a third dose of the vaccine as soon as possible to protect them from severe disease and to develop antibodies against them.

In mid-July, Israel was the first country to start administering the third dose of the Pfizer-BioNTech vaccine to immunocompromised adults, including those suffering from certain cancers — now Belgium and Ecuador have also implemented this procedure. In addition, additional vaccination doses may be necessary if inactivated vaccines such as Sinopharm and Sinovac have been previously used due to the lack of antibody production, as shown by studies showing that 25% of people over 60 years of age vaccinated with Sinopharm did not develop antibodies [7]. In many countries, decisions have already been made to vaccinate for the third time people who have received Sinovak before, and Sinopharm includes Indonesia (Moderna), Cambodia, Chile, and the Dominican Republic (AstraZeneca), Turkey, Uruguay, and Bahrain (Pfizer-BioNTech). In the United Arab Emirates, those vaccinated six months earlier with any vaccine can take a third dose of any preparation — Sinopharm or Pfizer-BioNTech. A similar policy was applied by Hungary, where all those vaccinated with the third dose are willing. Due to the declining effectiveness of the Pfizer-BioNTech vaccine due to the delta variant, Israel decided to vaccinate all citizens with a third dose — as a result, more than 14% of citizens have already received a booster injection. In Germany, they will be intended for elderly people who have been vaccinated with AstraZeneca and J&J, and booster doses will only be given with mRNA preparations. A similar situation exists in the UK, France, Austria, Sweden and Canada, Brazil, Switzerland, South Korea, Singapore, and the Philippines. From September 20, all Americans who took Moderna or Pfizer-BioNTech eight months earlier will be given a booster vaccination, which has been widely criticized by many scientists because 2 doses of the vaccine still protect citizens without immunodeficiency from severe disease. Pfizer-BioNTech released data showing that the efficacy of the vaccine against symptomatic COVID-19 decreased from 96% to 83.7% after 6 months. However, this still does not apply to the severe course of the disease. Studies confirm the high effectiveness of the Pfizer-BioNTech vaccine against COVID-19 in the context of protection against hospitalization within 6 months of full vaccination (73% in the context of protection against SARS-CoV-2 infection and 90% in the context of protection against hospital due to COVID-19), also against the delta variant of the novel coronavirus [from 93% (one month after the person was fully vaccinated) to 53% (≥ 4 months after the person was fully vaccinated)]. The reduction in the effectiveness of Pfizer-BioNTech against COVID-19 is most likely due to weakening of the strength of the immune response (humoral/antibody-dependent) over time [8]. Vaccinations play a huge role in preventing the severe course of COVID-19, but highly developed countries should not forget about those poor, who will mutate the virus due to the lack of any vaccinations. Continuing evidence suggests that everyone will receive a booster dose, however, due to the demand and supply of vaccines on the market and the lack of their availability in many regions of the world, the decision should be made — when.

Conflict of interest

All authors declare no conflict of interest.

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