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Emergency Task Force

ETF statement on use of recently updated COVID-19 vaccines

Since the declaration of the COVID-19 pandemic in early 2020, multiple vaccines have been approved in the European Union and elsewhere for the prevention of COVID-19. Early deployment of the first of these vaccines, which were based on the ancestral strain of SARS-CoV-2, played a significant role in curbing the pandemic's effects.[1]

As SARS-CoV-2 circulates and evolves, new SARS-CoV-2 variants continue to emerge with the ability to evade immunity induced by prior infection or vaccination. Consequently, COVID-19 vaccines require regular strain updates, a situation very similar to the regularly updated influenza vaccines.[2]

SARS-CoV-2 evolution

After a lag phase during which the D614G substitution was the most significant change, SARS-CoV-2 evolved further in the human population. Many variants of concern (VOCs) emerged and replaced prior VOCs.[3,4] Some of the new VOCs harboured more than 30 amino acid mutations in the spike protein, with 15 mutations in the receptor-binding domain alone.[5] These changes affected virus transmission (ACE2 receptor binding) and resulted in reduced virus neutralization by pre-existing antibodies,[6] allowing new global waves of infections to occur. The ancestral virus as well as the first variant lineages are no longer circulating in the human population to any meaningful extent.

Immune response to SARS-CoV-2 variants

Updated vaccines expand the breadth of the neutralizing antibody response, targeting emerging variants and boosting the immune response to the ancestral variant.[7] Furthermore preferential re-direction of the neutralizing antibody response towards currently circulating variants could be achieved by repeated exposure to the variants in the absence of simultaneous boosting with the ancestral virus.[8]

T-cell immunity appears to be directed mostly to conserved epitopes still present in the most recent VOCs.[9] To what extent boosting of T-cell immunity by the recently updated or previous versions of the COVID vaccines contributes to protection from the currently circulating strains is not established.

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Updated vaccines and vaccine effectiveness

In a population largely exposed to the virus and/or vaccines, the main focus of vaccination programmes is on single dose re-vaccination. Initially immune responses were boosted by re-vaccination with the ancestral virus vaccine but subsequent campaigns in Europe have used updated vaccines. The first of these updated vaccines were bivalent vaccines targeting a newly emerged Omicron VOC in addition to the ancestral virus. The latest updated vaccines are monovalent vaccines targeting only a more recent VOC, i.e. XBB1.5.

Vaccine effectiveness data have shown that updated vaccines are effective in preventing disease caused by contemporary viral strains. In a head-to-head comparison of ancestral virus vaccines and bivalent ancestral plus Omicron vaccines, recipients of bivalent vaccines had a 12 to 39% additional protection (depending on age) against SARS-CoV-2 Omicron disease.[10] In the same study, extended to include over 2 million participants, the relative vaccine effectiveness of a booster dose of the bivalent vaccines versus a booster dose of ancestral virus vaccines was 42.4% against SARS-CoV-2 infection and 81 to 85% against severe disease or death.[11] Emerging effectiveness data also show evidence of the protection against COVID-19 with the updated XBB.1.5 vaccines.[12,13,14]

In conclusion

EU Member States are recommending that people in the EU/EEA at increased risk for severe COVID-19 disease should be offered vaccination. To provide optimal protection against circulating strains, ETF recommends that the most recently updated COVID-19 vaccines should be used.

The ETF recognizes that, in the future, new COVID-19 vaccines may initially be authorised with a composition that does not match circulating VOCs but reflects the composition of the vaccines used in pre-licensure clinical trials. Whenever this occurs, similarly to influenza, the vaccines are expected to be updated before deployment to reflect recent and/or circulating SARS-CoV-2 variants.

The ETF will continue to evaluate SARS-CoV-2 epidemiological data and provide updated vaccine composition recommendations as appropriate.

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