

Evolution of seroprevalence to SARS-CoV-2 in blood donors in Sarajevo Canton, Federation of Bosnia and Herzegovina: cross-sectional and longitudinal studies

Sanjin Musa¹, Elma Catovic Baralija², Veronica Ivey Sawin¹, Anthony Nardone³, Mirza Palo⁴, Sinisa Skocibusic¹, Mia Blazevic¹, Seila Cilovic Lagarija¹, Gorana Ahmetovic-Karic², Alma Ljuca², Sanela Dostovic-Halilovic², Rozalija Nedic¹, Lorenzo Subissi⁵, Rawi Ibrahim⁶, Golubinka Boshevaska⁶, Isabel Bergeri⁵, Richard Pebody⁶, and Aisling VAUGHAN⁶

¹Institute of Public Health of the Federation of Bosnia and Herzegovina

²Institute for Transfusion Medicine of the Federation of Bosnia and Herzegovina

³Epiconcept SAS

⁴World Health Organization Office in Bosnia and Herzegovina

⁵World Health Organization

⁶World Health Organization Regional Office for Europe

October 18, 2022

Abstract

Background Sarajevo Canton in the Federation of Bosnia and Herzegovina has recorded several waves of high SARS-CoV-2 transmission and has struggled to reach adequate vaccination coverage. We describe the evolution of infection- and vaccine-induced SARS-CoV-2 antibody response and persistence. Methods We conducted repeated cross-sectional analyses of blood donors aged 18-65 years in Sarajevo Canton in November-December 2020 and 2021. We analyzed serum samples for anti-nucleocapsid (anti-N) and anti-spike (anti-S) antibodies. To assess immune durability, we conducted longitudinal analyses of seropositive participants at 6 and 12 months. Results 1015 participants were included in Phase 1 (November-December 2020), and 1152 in Phase 2 (November-December 2021). Seroprevalence increased significantly from 19.2% (95% CI: 17.2-21.4%) in Phase 1 to 91.6% (95% CI: 89.8-93.1%) in Phase 2. Anti-S IgG titers were significantly higher among vaccinated (58.5%) than unvaccinated infected participants across vaccine products ($p < 0.001$), though highest among those who received an mRNA vaccine. At 6 months, 78/82 (95.1%) participants maintained anti-spike seropositivity; at 12 months, 58/58 (100.0%) participants were seropositive and 33 (56.9%) had completed the primary vaccine series within 6 months. Among 11 unvaccinated participants who were not reinfected at 12 months, anti-S IgG declined from median 770.1 (IQR 615.0-1321.7) to 290.8 (IQR 175.7-400.3). Anti-N IgG antibodies waned earlier; from 35.4% seropositive at 6 months to 24.1% at 12 months. Conclusions SARS-CoV-2 seroprevalence increased significantly over 12 months from end of 2020 to end of 2021. Although individuals with previous infection may have residual protection, COVID-19 vaccination is vital to strengthening population immunity.

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