

COVID-19 vaccine effectiveness against hospitalization due to SARS-CoV-2: A test negative design study based on SARI sentinel surveillance in Spain

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Abstract

Background: With the emergence of SARS-CoV-2, influenza surveillance systems in Spain were transformed into a new syndromic sentinel surveillance system. The Acute Respiratory Infection Surveillance System (SiVIRA in Spanish) is based on a sentinel network for Acute Respiratory Infection (ARI) surveillance in Primary care, and a network of sentinel hospitals for Severe ARI (SARI) surveillance in hospitals. **Methods:** Using a test-negative design and data from SARI admissions notified to SiVIRA between January 1 and October 3, 2021, we estimated COVID-19 VE against hospitalization, by age group, vaccine type, time since vaccination and SARS-CoV-2 variant. **Results:** VE was 89% (95% CI: 83-93) against COVID-19 hospitalization overall in persons aged 20 years and older. VE was higher for mRNA vaccines, and lower for those aged 80 years and older, with a decrease in protection beyond 3 months of completing vaccination, and a further decrease after 5 months. We found no

differences between periods with circulation of Alpha or Delta SARS-CoV-2 variants, although variant-specific VE was slightly higher against Alpha. Conclusions: The SiVIRA surveillance system, with a network of sentinel hospitals in Spain was able to describe clinical and epidemiological characteristics of SARI hospitalizations, monitor the circulation of SARS-CoV-2 and other respiratory viruses, and provide data to measure the effectiveness of COVID-19 vaccination in the population under surveillance. Our results add to evidence of high VE of mRNA vaccines against severe COVID-19 and waning protection with time since vaccination.

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