

Authors: Cha-Shien Yen¹, Chia-ping Su¹, Ming-Tsan Liu², Wen-Yueh Cheng², Chi-Tai Fang^{3,4}, Jen-Hsiang Chuang⁵

Affiliation(s) of each author:

¹Field Epidemiology Training Program, Taiwan Centers for Disease Control, Taipei, Taiwan

²Center for Diagnostics and Vaccine Development, Taiwan Centers for Disease Control, Taipei, Taiwan

³Department of Internal Medicine, National Taiwan University Hospital and National Taiwan University College of Medicine, Taipei, Taiwan

⁴Institute of Epidemiology and Preventive Medicine, College of Public Health, National Taiwan University, Taipei, Taiwan

⁵Deputy Director-General, Taiwan Centers for Disease Control, Taipei, Taiwan

The nationwide seroprevalence of SARS-CoV-2-specific antibodies among blood donors—Taiwan, April–July, 2021

Background

Because SARS-CoV-2 infections can be asymptomatic or mildly symptomatic, the number of such infections could be underestimated. Since May 2021, COVID-19 cases and hospitalizations have increased significantly in Taiwan, and sustained community transmission has been highly suspected. We conducted a seroprevalence study of SARS-CoV-2 antibodies to estimate the proportion of SARS-CoV-2 infections and the proportion of vaccinated persons in the community.

Methods

We randomly collected 500 serum specimens from blood donors weekly from six regions over the main island of Taiwan from April 25, 2021, to July 3, 2021. We tested the specimens for SARS-CoV-2 antibodies to nucleoprotein (N) and spike (S) proteins, using the Elecsys® Anti-SARS-CoV-2 total antibody assay (Roche Diagnostics). The presence of N protein antibody was confirmed with western blotting. Infection-induced seroprevalence was defined as the prevalence of both S and N antibodies in the population. The prevalence of only S antibodies in the population was defined as vaccination-induced seroprevalence. The seroprevalence was compared to COVID-19 case report rates and vaccination rates during the same time period.

Results

Among 5,000 donor samples tested, only one (0.02%; 95% confidence interval [CI],

0–0.06%) from the Taipei region was positive for both N and S protein antibodies. At that time, the cumulative COVID-19 case report rate was 0.09% in the Taipei region and 0.03% among the Taiwanese population aged 17 to 65 years. The vaccination-induced seroprevalence was 5.2% (258 of 5,000; 95% CI, 4.6–5.8%). At least 5.8% of the population in Taiwan had received at least one dose of COVID-19 vaccine by June 19, 2021.

Conclusion

The infection-induced seroprevalence of SARS-CoV-2 antibodies among blood donors was compatible with the case report rate in Taiwan. Therefore, the majority of blood donors remained uninfected during the COVID-19 pandemic. Promoting COVID-19 vaccine should be prioritized. Seroprevalence surveillance could be useful for estimating the disease burden and evaluating the impact of vaccination programs.