

# Enhanced immunity against to SARS-CoV-2 in returning ex-patriot Chinese

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## Abstract

**Background** Global COVID-19 vaccination programs effectively contain the fast spread of the SARS-CoV-2. Characteristic the immunity status of returned populations will favor for understanding the achievement of herd immunity and long-term management of COVID-19 in China. **Methods** Returning travellers were recruited from 7 quarantine stations in Guangzhou, China. The immunity statuses of participants were determined through Competitive ELISA, Micro-Neutralization Assay and Enzyme-Linked FluoroSpot Assay. **Results** A total of 272 subjects were involved in questionnaire survey, in which 235 (86.4%) were returning ex-patriot Chinese and 37 (13.6%) were foreigners. Blood and throat swabs specimens were collected from each of 108 returning ex-patriot Chinese. The neutralizing antibody against SARS-CoV-2 was detected in ~90% of returning ex-patriot Chinese, either in the primary or the homologous and heterologous booster vaccination group. The serum NAb titers of them were significantly decreased against SARS-CoV-2 Omicron BA.5, BF.7, BQ.1 and XBB.1 compare with prototype virus. However, memory T cell responses including specific IFN- $\gamma$  and IL-2 were no differences in either group. Smoking, drinking, SARS-CoV-2 infection, COVID-19 vaccination, and the time interval between last vaccination and the sampling were independent influencing factors for NAb titers against prototype SARS-CoV-2 and variants of concerns. The dose of vaccination was the unique common influencing factor for Omicron variants. **Conclusions** The herd immunity was established in returning ex-patriot Chinese who exposure to the complicated infection and vaccination circumstance. Domestic residents will benefit from booster of COVID-19 vaccines either in homologous and heterologous vaccination after re-opening of China, as well as breakthrough infection.

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