

Reinfection rate and protection effectiveness from past infection among healthcare workers in public tertiary hospitals in Malaysia: A prospective cohort study

Koh Karina¹, Lee Jen Ven¹, Yang Su Lan², Yen Chia How³, Chand Avinash Kumar⁴, Mat Ripen Adiratna⁵, Mohamed Nur Eliza¹, Abdul Rahim Nur Aisyah¹, Varaalakshmy Gokilavanan¹, Raj Kumar Sevalingam¹, Kalaiarasu M. Peariasamy⁶

¹Clinical Research Centre, Hospital Kuala Lumpur, Ministry of Health Malaysia, ²Centre for Clinical Epidemiology, Institute for Clinical Research, National Institutes of Health, Ministry of Health Malaysia, ³Clinical Research Centre, Hospital Queen Elizabeth II, Ministry of Health Malaysia, ⁴Occupational Health Department, Hospital Queen Elizabeth, Ministry of Health Malaysia, ⁵Allergy & Immunology Research Centre, Institute for Medical Research, National Institutes of Health, Ministry of Health Malaysia, ⁶Institute for Clinical Research, National Institutes of Health, Ministry of Health Malaysia

ABSTRACT

Introduction: As of 29 July 2022, SARS-CoV-2 has infected 4.7 million Malaysians. Reinfection, defined as a new infection 90 days from initial infection is now rising due to the emergence of new variants. Studies have shown that healthcare workers (HCW) are 3.4 times more likely to test positive for COVID-19. This study aims to describe the reinfection rate of COVID-19 and protection effectiveness (PE) from past infection among HCWs in public hospitals in Malaysia. **Methods:** A prospective cohort study was conducted from March 2021. HCWs were followed up to determine the post BNT162b2 vaccination humoral response to SARS-CoV-2. Additionally, participants were prompted to self-report a positive COVID-19 result. Reinfection rates were calculated using the total number of patients who had a prior infection as denominator. Infection rates were analysed at a pre-determined period throughout our follow-up. Protection offered by prior infection was calculated as one minus the ratio of infection rate for COVID-19 positive patients and COVID-19 naive patients ($1 - RR \times 100\%$). **Results:** In this cohort, the cumulative incidence rate for SARS-CoV-2 is 44.6% (246/551). Reinfection rate is 6.5% (16/246). The PE at 3 and 6 months were 100% respectively while the PE at 9 and 12 months were 72.1% and 56.2%. **Conclusion:** Past infection offers 100% protection against reinfection up to 6 months but this protection steadily declines with the emergence of Omicron variant, even among vaccinated and boosted individuals. As variant-specific vaccines are still in development, reducing exposure and compliance to COVID-19 prevention guidelines are imperative to avoid infection.