

Point cloud estimations on the effect of vaccination rates with COVID-19 cases and hospital admissions in Malaysia

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ABSTRACT

Introduction: This study evaluated the influence of vaccination rates on the propagation effect of COVID-19 cases and hospital admission by states in Malaysia. **Methods:** State-wise ecological analysis was conducted between 1 January 2021 and 30 June 2022 within three major phases of pandemic control measures in the country. Data was obtained from the official government open-source portal and aggregated at the state level. We computed variation metrics that cover vaccination rates attributed directly to COVID-19 incident cases and hospital admissions for each state in Malaysia within the interpretations of the coefficient of determination (R²) values. Through mathematical computations, we used linear regression equations $Y = B + aX$ to deduce the expected rise or decrease of COVID-19 cases or hospital admissions as per increase for a unit change in vaccination rates. **Results:** At a significance level of 5%, the rate at which vaccinations explained the control of COVID-19 cases during Movement Control Order (MCO), Total Lockdown, National Recovery Phases 1, 2, and 3, and during the endemic phases was 35.2%, 12.4%, 3.9%, 11.8%, 27.9%, and 59.5% respectively. Similarly, at a significance level of 5%, the rate at which vaccinations explained the control of COVID-19 hospital admissions during Movement Control Order (MCO), Total Lockdown, National Recovery Phases 1, 2, and 3, and during the endemic phases was 1.5%, 12.4%, 48.2%, 0.06%, 48.2%, and 51.7% respectively. **Conclusion:** At the countrywide level, it was found that vaccinations had significantly suppressed the spread of COVID-19 cases and controlled hospital admissions over time.