Effectiveness of Homologous and Heterologous AZD1222, CoronaVac, and BNT162b2 Booster Vaccine Against SARS-CoV-2 Infection, and Severe COVID-19

Comparing the Delta- and Omicron-Dominant Periods in Malaysia

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Context and Methodology

Test-Negative Design (infection) and **Retrospective Cohort** (severe) using **nationally-comprehensive** data on outcomes, vaccination, and automated contact tracing in Malaysia, which has a **diverse vaccine portfolio**, covering those primary vaccinated in 1 Jul to 30 Sep 2021, and boosted in 27 Oct 2021 to 4 Feb 2022.

Marginal VEs from logistic regressions, adjusting for age, sex, ethnicity, comorbidities, number of times traced, and number of times tested pre-observation.

GitHub Repo: Replication

https://github.com/suahjl/mysboosters-omicrondelta1q-expansion

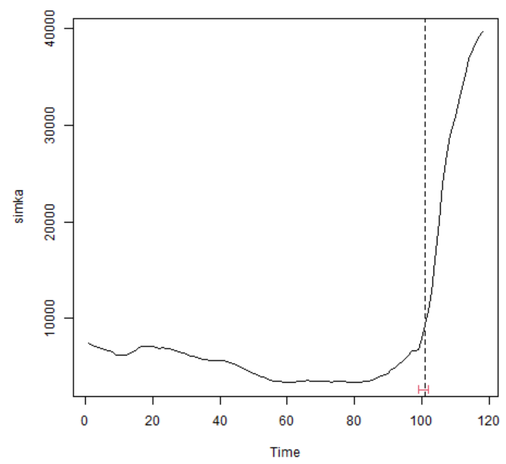
TL;DR

- First-generation COVID-19 vaccines are less effective against Omicron than Delta SARS-CoV-2 infection
- Going into endemicity, policymakers must ensure low mortality risk
- Boosters demonstrated exceptional protection against severe COVID-19
- Close surveillance is warranted to ensure adequate protection amongst comorbid individuals

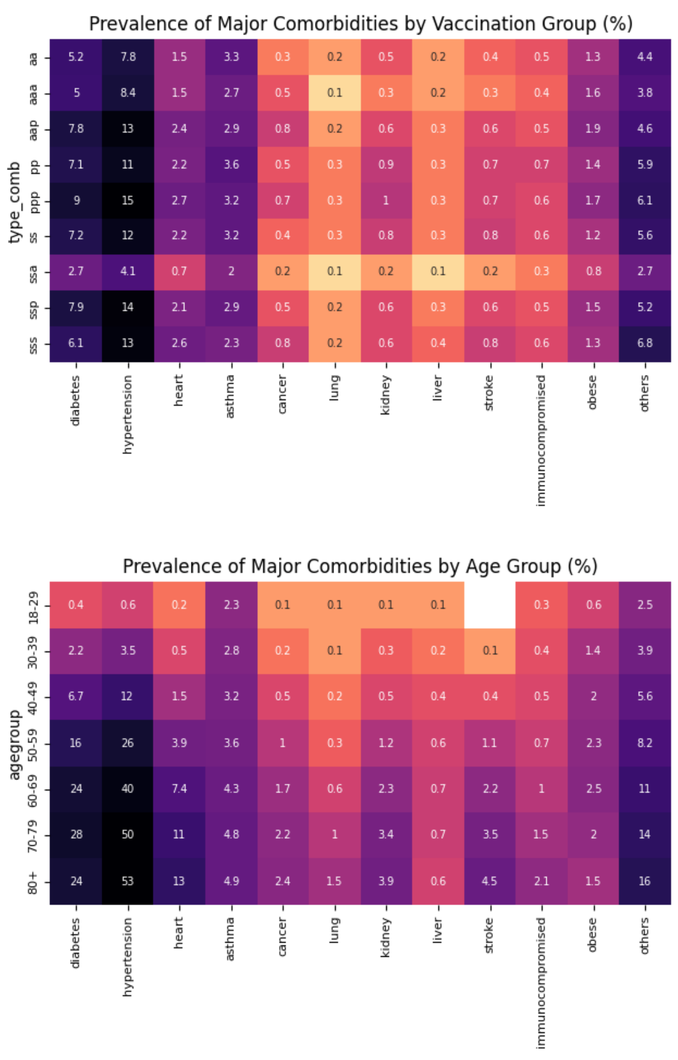
Delta-Omicron **Breakpoint**

Analysis taken from Suah et al (2022; 10.1080/22221751.2022.2072773)

Figure: Supervised SARS-CoV-2 Positive Tests & Bai-Perron Breakpoint Estimate



Prevalence of Comorbidities



Delta-Dominant (27 Oct 2021 - 4 Feb 2022)

Figure: mVE against SARS-CoV-2 Infection (Ref: 2x BNT162b2; PP)

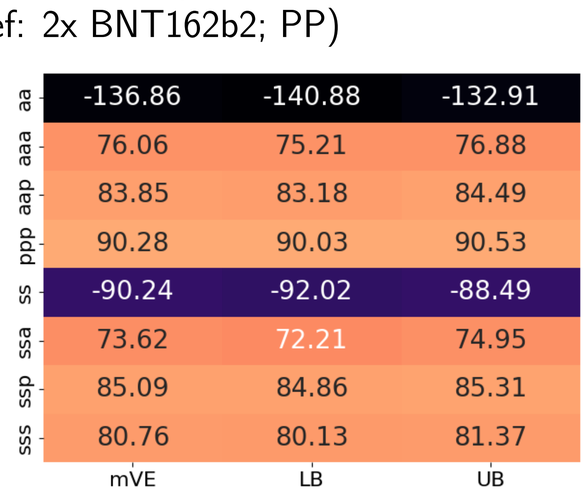


Figure: mVE against COVID-19 ICU Admission (Ref: 2x BNT162b2; PP)

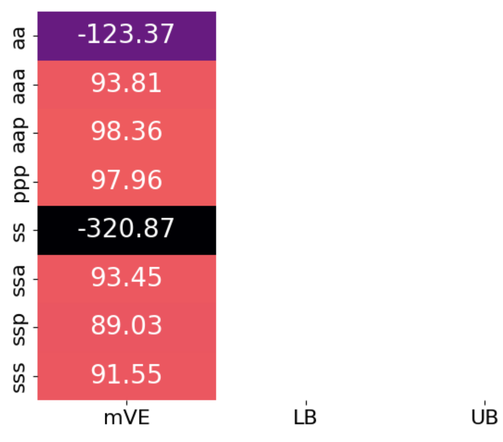
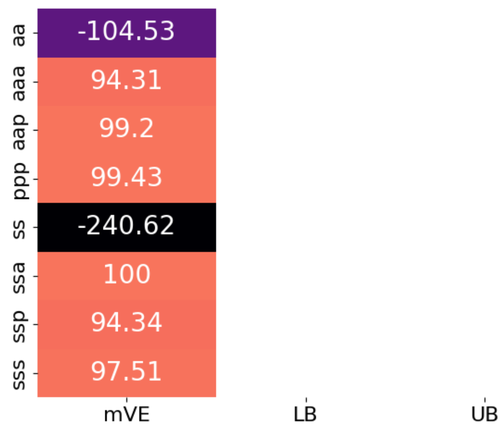


Figure: mVE against COVID-19 Death (Ref: 2x BNT162b2; PP)



Omicron-Dominant (5 Feb 2022 - 22 Feb 2022)

Figure: mVE against SARS-CoV-2 Infection (Ref: 2x BNT162b2; PP)

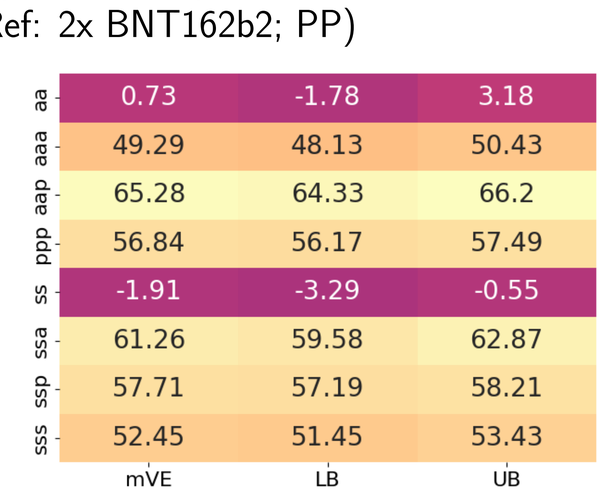


Figure: mVE against COVID-19 ICU Admission (Ref: 2x BNT162b2; PP)

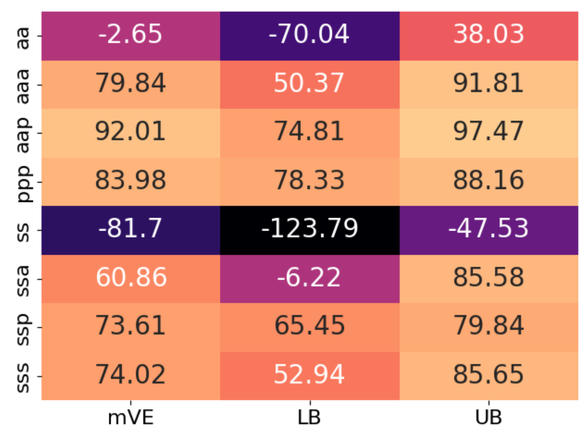
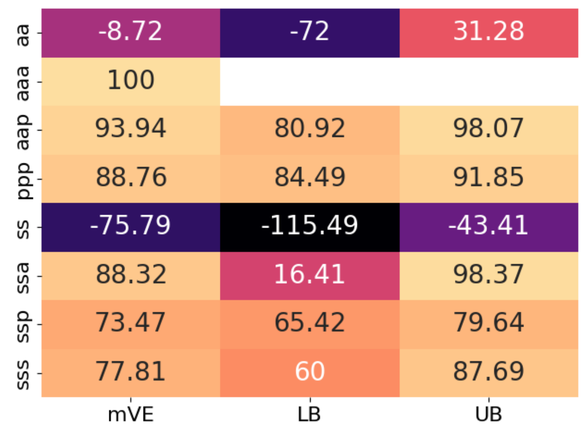


Figure: mVE against COVID-19 Death (Ref: 2x BNT162b2; PP)



Ethical Consideration

This is part of The Real-World Evaluation of COVID-19 Vaccines under the Malaysia National COVID-19 Immunization Programme (**RECoVaM**) study registered in the National Medical Research Register (**NMRR-21-1660-60697**). Ethical approval was granted by the Medical Research and Ethics Committee (MREC), Ministry of Health, Malaysia.