

Parallel Session 1: Combating COVID-19

T1d - Comparison of Inactivated and mRNA Vaccines for COVID-19

Project 1: Comprehensive assessment of longitudinal vaccine-induced immune responses, safety and potential effectiveness of COVID-19 vaccines

Project 2: Randomized trial of COVID-19 booster vaccinations (Cobovax trial)

Prof Benjamin John COWLING

*Professor and Division Head, Division of Epidemiology and Biostatistics, School of Public Health,
The University of Hong Kong, Hong Kong SAR, China*

Introduction: In early 2020, Hong Kong was one of the first-affected locations by the COVID-19 pandemic outside of mainland China. However, timely public health measures have successfully controlled a number of surges in daily case numbers, and fewer than 12,000 confirmed cases were recorded in the first 18 months of the pandemic. The objective of these studies is to assess the immune responses to COVID-19 vaccines and inform vaccination strategies.

Methods: In COVID1903001, two observational cohorts have been established to study immune responses to COVID-19 vaccines in Hong Kong. The first cohort includes up to 1500 individuals of all ages, followed for up to 4 years after receiving a first dose of COVID-19 vaccination. The second cohort includes up to 1000 older adults, followed for up to 4 years from April 2021. In both cohorts blood samples are collected every 6 months, and the first cohort includes additional blood draws after any dose of vaccination. In COVID19F01, 400 adults who have received two doses of COVID-19 vaccine will be randomly allocated to receive a third dose of either inactivated or mRNA vaccine, with blood samples collected at 1, 6 and 12 months after the 3rd dose. In both studies samples will be tested for antibodies and cellular responses against SARS-CoV-2 to allow quantification of the strength and duration of immune responses to vaccination.

Results: Antibody responses to two doses of mRNA vaccines were on average 10 times higher than antibody responses to two doses of inactivated vaccine. Immediate reactions to inactivated vaccine were milder. Antibody levels declined faster in recipients of the inactivated vaccine, to low levels by 3-6 months.

Conclusion: mRNA vaccines conferred higher antibody titers than inactivated vaccines, but both vaccine technologies improved immunity against COVID-19. Vaccination provides a pathway back to a new normal, by replacing the public health and social measures that have so far prevented large epidemics. However any relaxation of public health measures will only be safe once we can achieve a high level of population immunity, and third doses will likely be required within the next 6 months particularly in individuals who initially received two doses of inactivated vaccine.

Project Number: COVID1903001

Project Number: COVID19F01