

ooo66 Bridging Serological and Molecular Outcomes of Measles, Mumps and Rubella (MMR) Vaccination in an Adult Population

Eugenia Ong¹, Esther Gan¹, Rukie de Alwis¹, Ong Xinmei¹, Raphael Zellweger¹, Jenny Low², Ooi Eng Eong¹

¹Duke-NUS Medical School, ²Singapore General Hospital

Aims: Vaccines are important tools in preventing morbidity and mortality from childhood diseases. Inclusion of the measles, mumps and rubella (MMR) vaccine in childhood immunization programmes has eliminated frequent epidemics of these diseases; high vaccine coverage coupled with high efficacy rates resulted in high herd immunity levels to reduce disease incidence. However, the duration of long-term immunity against these viruses is unknown and waning immunity in the adult population could reduce herd immunity levels below those needed to prevent disease outbreaks.

Methodology: To assess immunity in an adult population, we prospectively enrolled 100 healthcare workers without MMR vaccination records. Antibody concentrations to MMR were assessed at baseline (prior to vaccination) and 1 month following MMR vaccination. Virological and genomic investigations were performed on nucleic acids extracted from whole blood before and following vaccination.

Result: At baseline, we observed seronegativity against mumps in 20% of vaccinees, twice as much as the proportion of our study population with seronegativity against measles and rubella. 19.6% and 29.9% of subjects showed (>2-fold) increase in mumps and rubella antibodies, respectively, after MMR vaccination in adult healthcare workers. Although viremia was not detected in any of our subjects, the dominance of innate immune rather than B-cell signatures in the population with boosting compared to those without suggests active mumps and rubella vaccine virus infection.

Conclusion: Our findings suggest that increasing the positive serology cut-offs for mumps and rubella are needed to identify populations that should be boosted to ensure herd immunity.