

O1014 A retrospective cohort study with Lexis expansion of influenza vaccine failure in the tropics: waning effectiveness more than six months after vaccination

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Background: Waning influenza vaccine effectiveness over the course of a temperate climate winter has been reported from a number of test-negative design case-control studies. Little data is available from tropical countries, but with year-round influenza virus activity there is a need for an extended duration of protection after vaccination.

Materials/methods: A retrospective cohort study of adults (aged ≥ 21 years) vaccinated from Jan 2013 to Sept 2017 in Singapore was conducted. Patient records of influenza vaccination were matched with laboratory records of positive influenza PCRs, and administrative data of demographics, co-morbidities and vaccination history. Influenza vaccine failure was defined as hospital admission with positive influenza PCR within 14 to 349 days after vaccination. The follow up period after vaccination was split into six sequential 8-week episodes. Vaccine effectiveness was assessed by comparing the odds for infection 2-8 weeks after vaccination with later episodes using multivariable logistic regression adjusting for patient factors and influenza virus activity.

Results: 47,626 influenza PCR records (6430, 13.5% positive) and 19,298 influenza vaccine records were accessed and matched. 622 (3.2%) influenza vaccinations met protocol definition for influenza vaccine failure. Increasing age, presence of chronic pulmonary disease, recent hospital admission and influenza vaccination within 2 years prior to index vaccine predicted influenza vaccine failure (all $p < 0.01$).

Vaccine effectiveness was stable for the first 180 days after vaccination, but then declined for all 3 influenza strains (relative vaccine effectiveness at week 42-50 for all strains 70.6 (95% confidence intervals: 53.1-94.0); A/H3 74.6 (52.2-107.3); A/H1 36.3 (14.5-85.0); B 83.9 (43.0-167.2), Fig. 1). In sub-group analysis, vaccine effectiveness waned faster in older adults (age > 65 years), those who had received influenza vaccine in the 2 years prior to index and in the presence of chronic pulmonary disease.

Conclusions: Vaccine effectiveness did not persist year-round in this cohort, particularly in individuals at increased risk for severe infection. Investigation of the effectiveness of alternate vaccination strategies in the tropics, such as more immunogenic vaccines or six-monthly administration, are required.

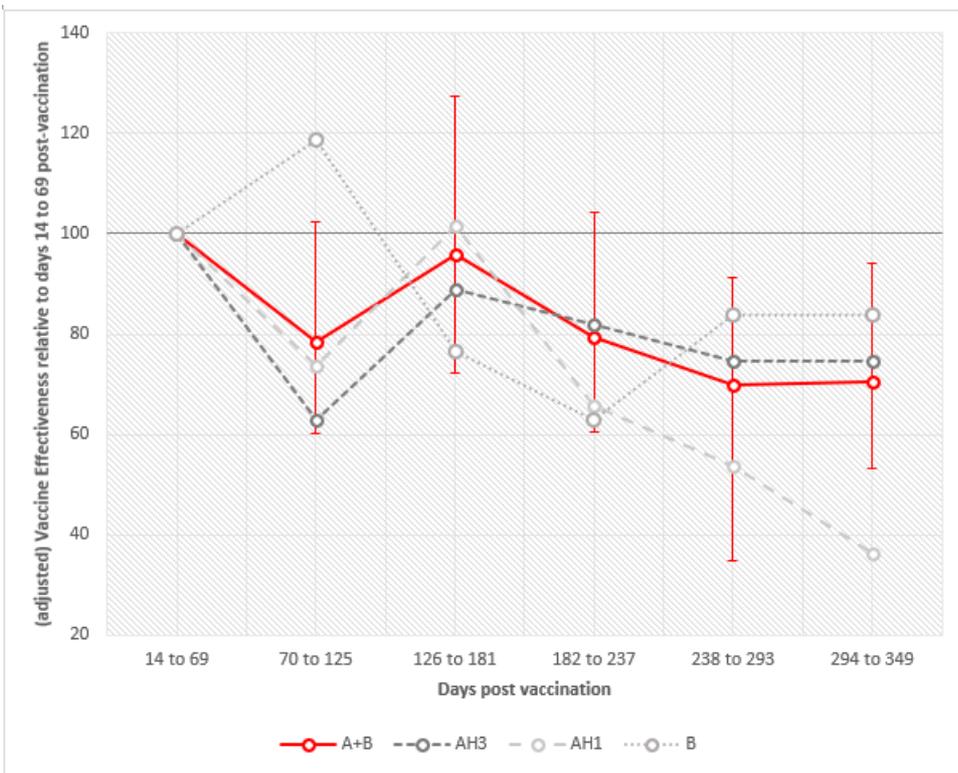


Fig 1: relative vaccine effectiveness by influenza type/subtype and overall with time since vaccination

