

Supplementary figures for: Short-lived immunity against pertussis, age-specific routes of transmission, and the utility of a teenage booster vaccine

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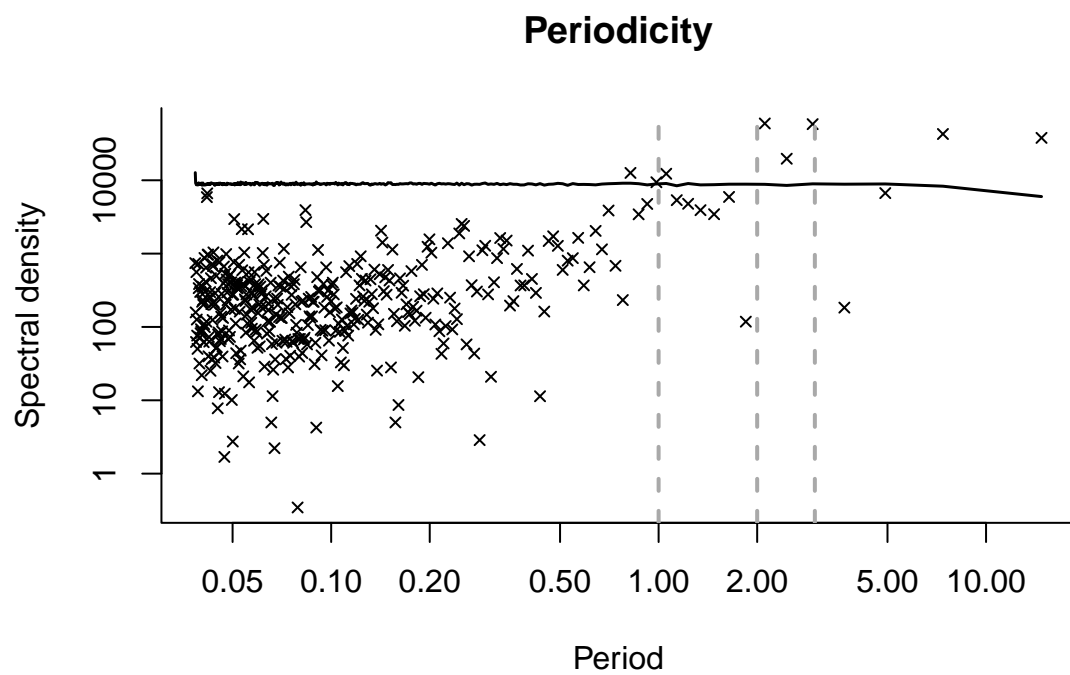


Figure 1: Supplemental figure: periodicity

Difference from 0–6 month olds: 1 yr period

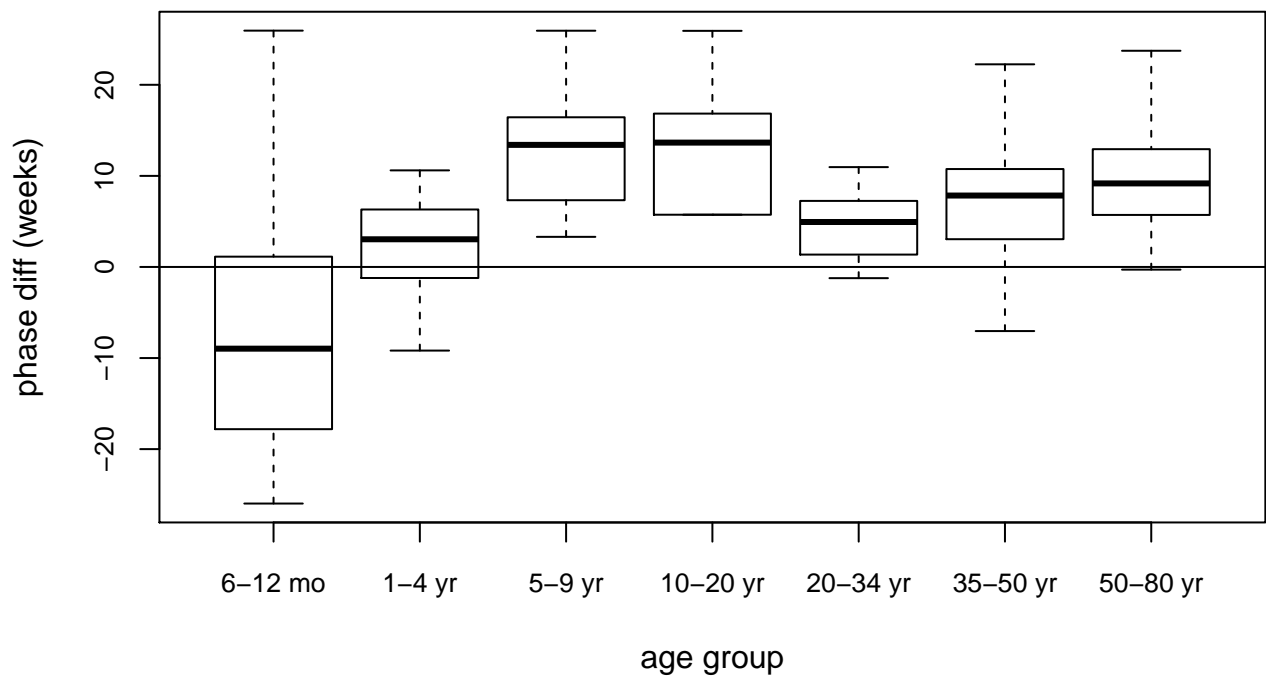


Figure 2: Supplemental figure: phase

Hazards by cohort

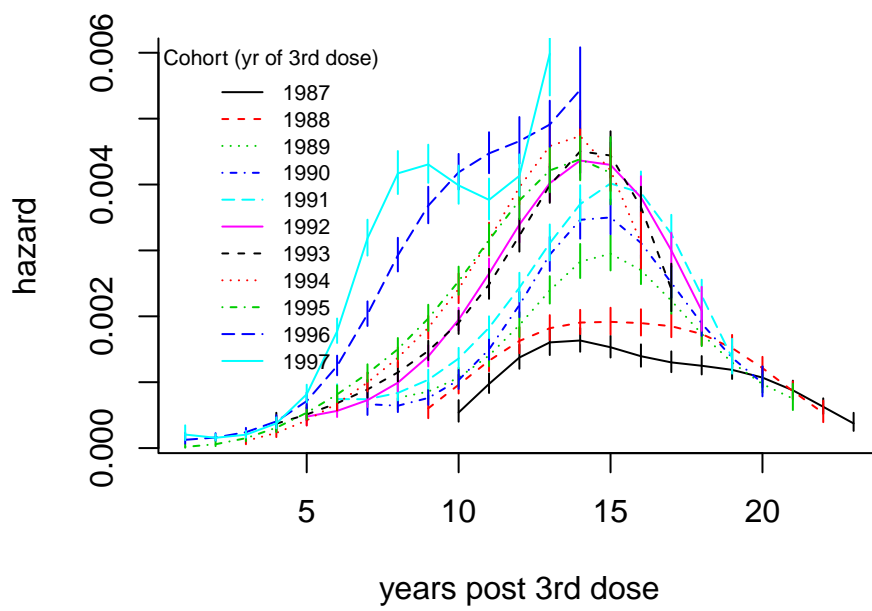


Figure 3: Supplemental figure: Hazards

Predicted proportion, no waning

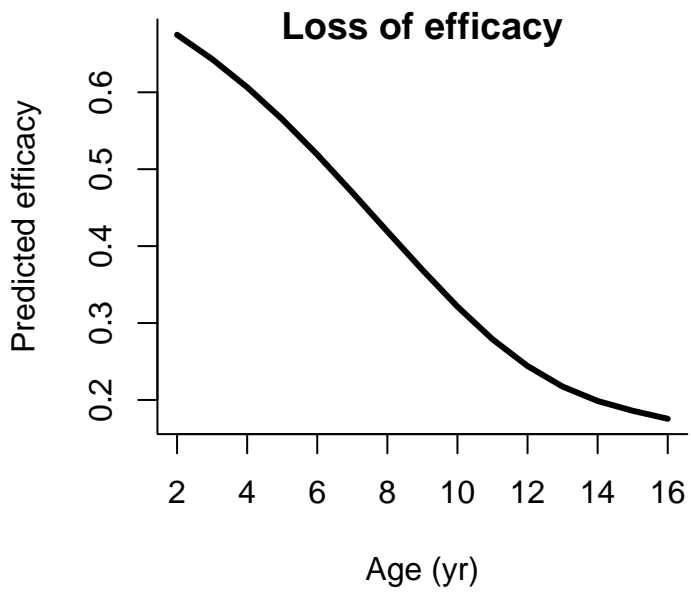
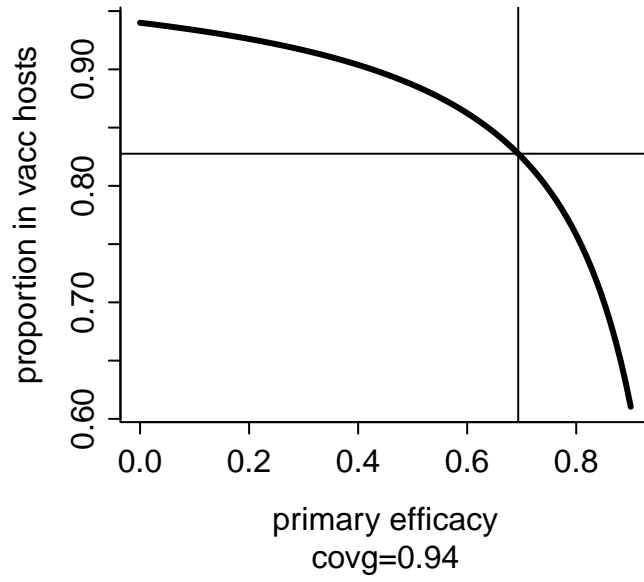


Figure 4: Supplemental figure: Hazards

Non-parametric waning estimate

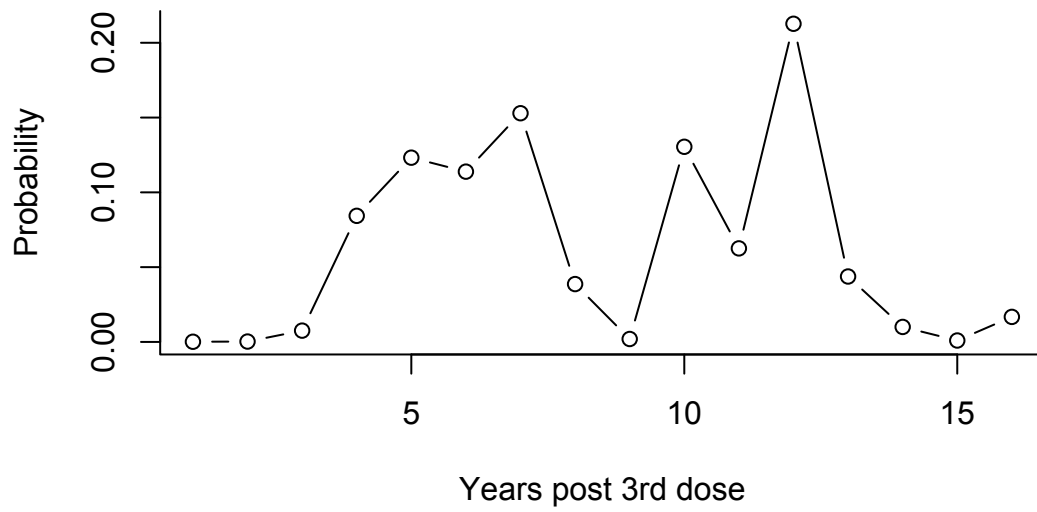


Figure 5: Supplemental figure: Nonparametric estimate of immune waning

Figure 1

Spectral analysis of the full time series, aggregated weekly. The solid black line shows the 99th percentile of 10,000 permutations. Points (x's) above that line are indicative of significant periodicity. Dashed gray lines show the location of the 1, 2 and 3 year periods.

Figure 2

Phase difference from the 0-6 month old infants taken from the annual signal in the data using wavelet phase analysis.

Figure 3

Same as figure 5b but for earlier cohorts.

Figure 4

The top panel shows the proportion of cases expected in vaccinated hosts as a function of the primary vaccine efficacy in the absence of waning immunity, according to equation 1 in materials and methods. The horizontal line shows the proportion of 1-2 year old cases in vaccinated hosts, corresponding to approximately 70% vaccine efficacy. The lower panel shows how the predicted efficacy decays in older age groups that have higher proportions of cases in vaccinated hosts.

Figure 5

The non-parametric waning of immunity kernel.