Appendix F Explanation of calculation of recruitment from recrudesced females

Recall that a proportion (ψ) of the recovered stage $\left(n_{(7)}\right)$ becomes infectious during t to $t+1$ (section *Process model*). This means that some of the offspring produced by females in this stage can be infected vertically or horizontally, while others can only be infected horizontally. The expression for the number of infected offspring $\left(n_{(4)}\right)$ produced per $n_{(7)}$ female is

$$f_{pos}s_{(7,t)}\left(\underbrace{\psi\left(\phi_t+v-\phi_t v\right)}_{\text{from recrudesced}}+\underbrace{\left(1-\psi\right)\phi_t}_{\text{from healthy}}\right).$$

The expression for the number of uninfected offspring (n_1) produced per $n_{(7)}$ female is

$$f_{pos}s_{(7,t)}\left(\underbrace{\psi\left(1-v\right)\left(1-\phi_t\right)}_{\text{from recrudesced}}+\underbrace{\left(1-\psi\right)\left(1-\phi_t\right)}_{\text{from healthy}}\right).$$