

Supplementary Table S1. Schematic description of the HB model used

Stochastic and deterministic nodes:

For each plot/year observation:

n = number of observed trees this year

n1 = number of observed trees last year

k = number of damaged trees this year

k1 = number of damaged trees last year

d = value for the covariate

y = 0/1, endemic/outbreak this year (unobserved)

y1 = 0/1, endemic/outbreak last year (unobserved)

$k \sim \text{Binomial}(\mu, n)$

$k1 \sim \text{Binomial}(\mu1, n1)$

$\text{logit}(\mu) = \alpha(\text{sitetype}, y)$

$\text{logit}(\mu1) = \alpha(\text{sitetype}, y1)$

$y \sim \text{Binomial}(P, 1)$

$y1 \sim \text{Binomial}(Q, 1)$

$\text{logit}(P) = (\beta(\text{sitetype}, y1) + \gamma * d) * (1 - y1) + \beta(\text{sitetype}, y1) * y1$

Priors:

For each sitetype:

$\alpha(\text{sitetype}, 0) \sim N(-4.55, 1/0.3)$

$\alpha(\text{sitetype}, 1) \sim N(0, 1/0.2)$

$\beta(\text{sitetype}, 0) \sim N(-4.55, 1/0.5)$

$\beta(\text{sitetype}, 1) \sim N(0, 1/0.2)$

$\gamma \sim N(0, 1e6)$

Q=0.03