Supplemental Appendix C: Uncertainty in R_0, Full results

Understanding uncertainty in temperature effects on vector-borne disease: A Bayesian approach

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C.1 Brière function for vector competence

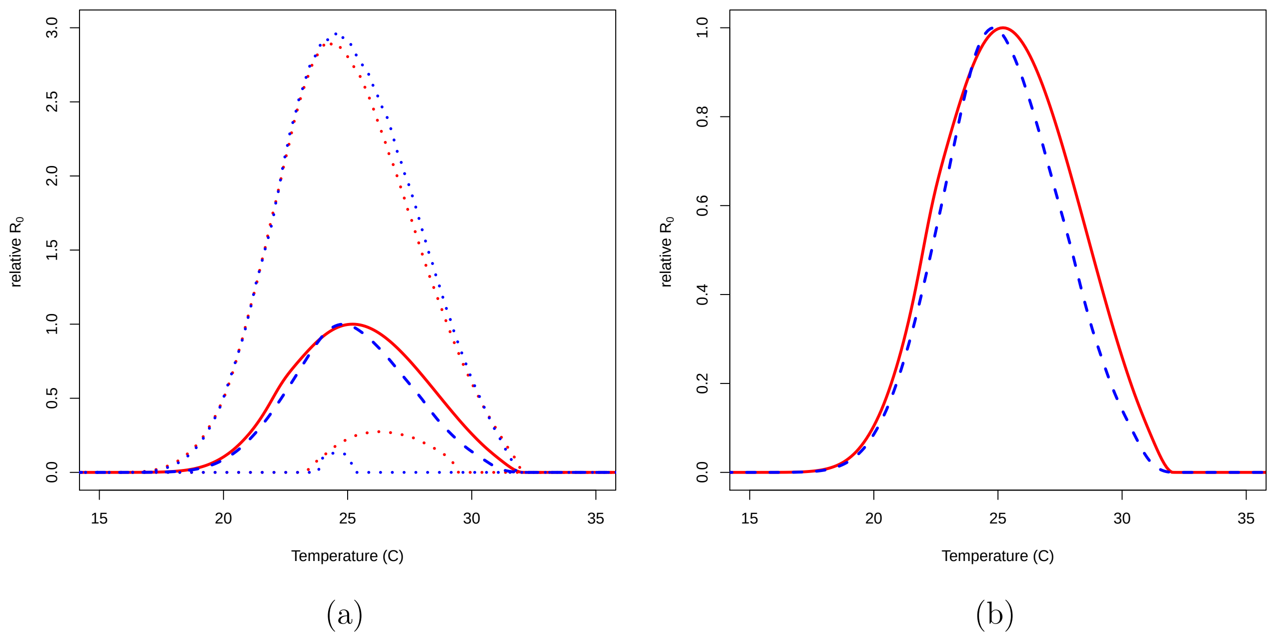


Figure C.1: Relative R_0 (scaled so that the maximum value of the mean is one) assuming a Brière function for vector competence, with uninformative priors on all components (blue, dashed) and informative priors on on components (red, solid). (a) mean R_0 with 95% HPD around each curve is shown as a dotted line. (b) mean R_0 only.

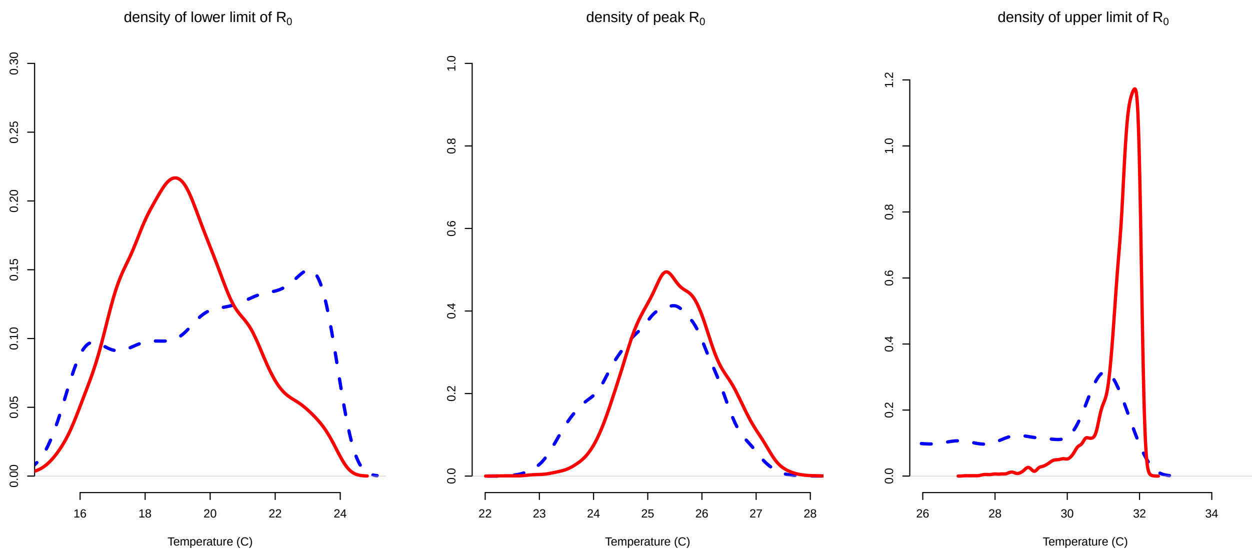
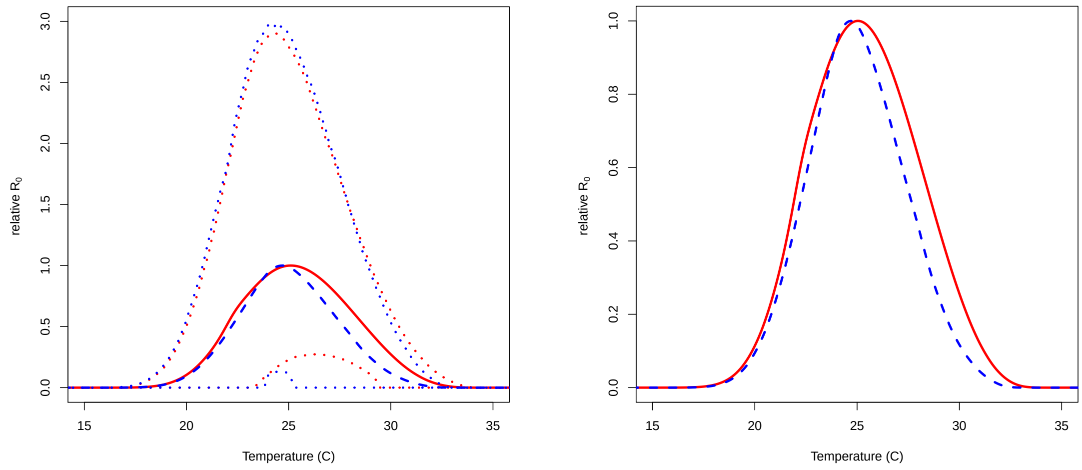


Figure C.2: Smoothed posterior distributions of the temperatures corresponding to the (left) lower limit of R_0, (middle) peak of R_0, (right) upper limit of R_0 all assuming Brière function for vector competence. Case with uninformative prior is shown as a blue dashed line and with informative prior as a solid red line.

C.2 Quadratic function for vector competence



(a) (b)

Figure C.3: Relative R_0 (scaled so that the maximum value of the mean is one) assuming a quadratic function for vector competence, with uninformative priors on all components (blue, dashed) and informative priors on on components (red, solid). (a) mean R_0 with 95% HPD around each curve is shown as a dotted line. (b) mean R_0 only.

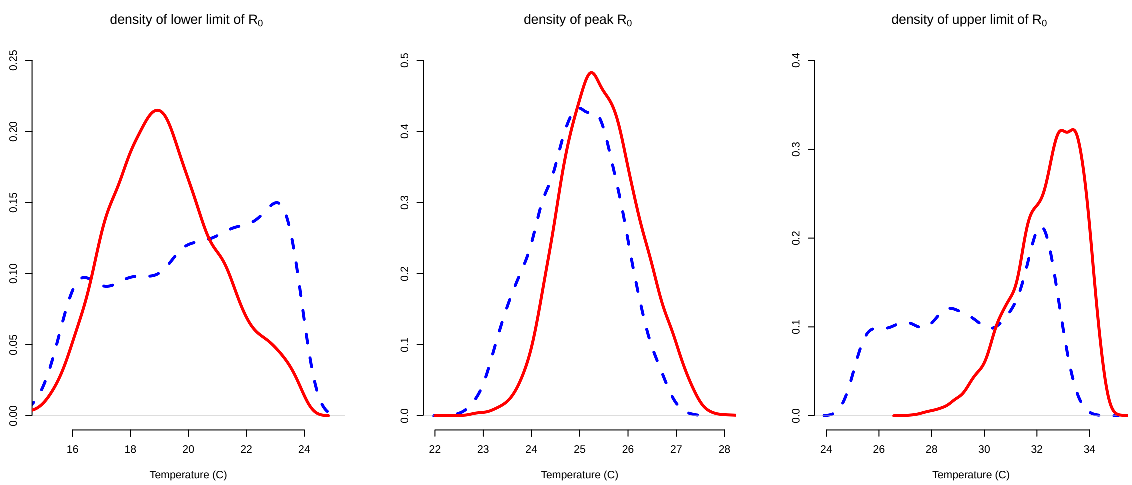


Figure C.4: Smoothed posterior distributions of the temperatures corresponding to the (left) lower limit of R_0, (middle) peak of R_0, (right) upper limit of R_0 all assuming a quadratic function for vector competence. Case with uninformative prior is shown as a blue dashed line and with informative prior as a solid red line.

C.3 Comparing results for vector competence modeled with Brière and Quadratic functions

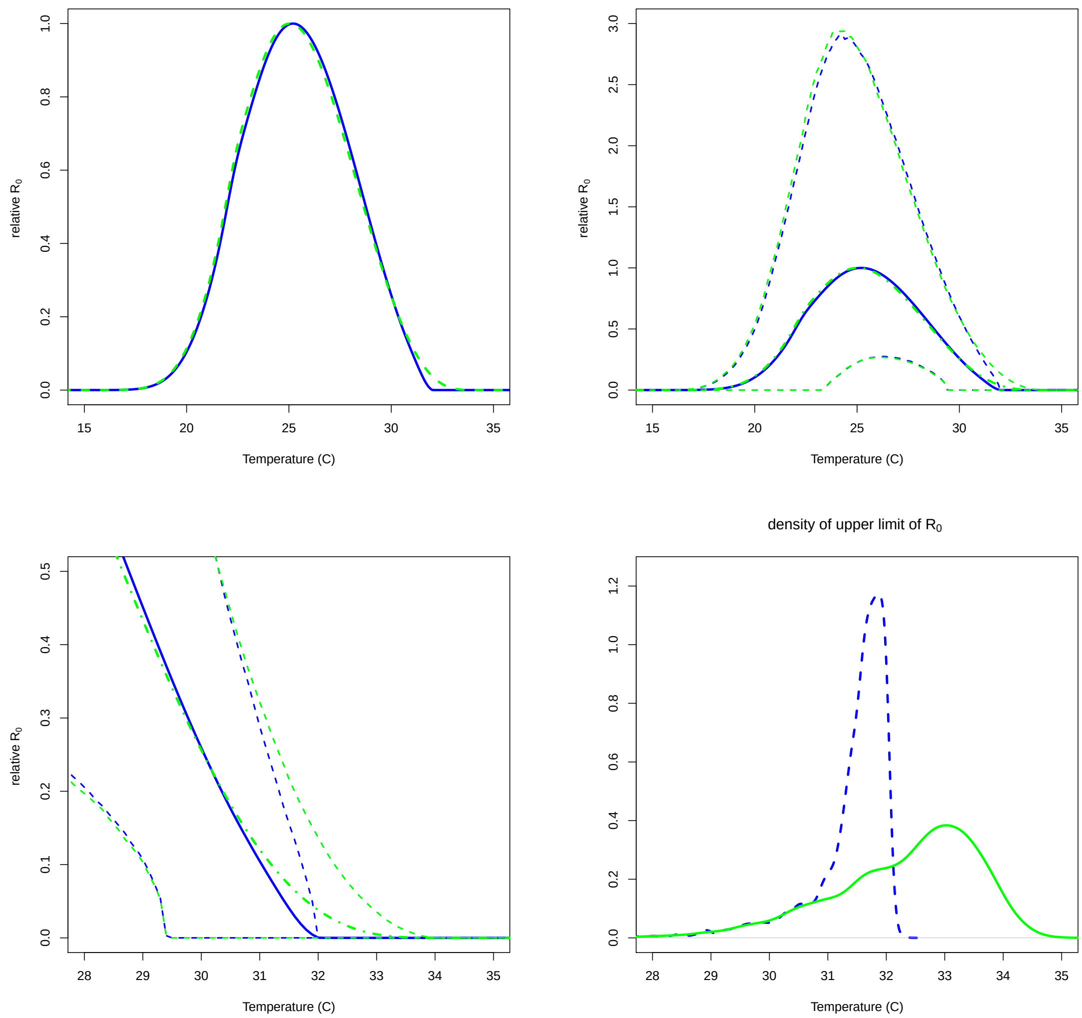
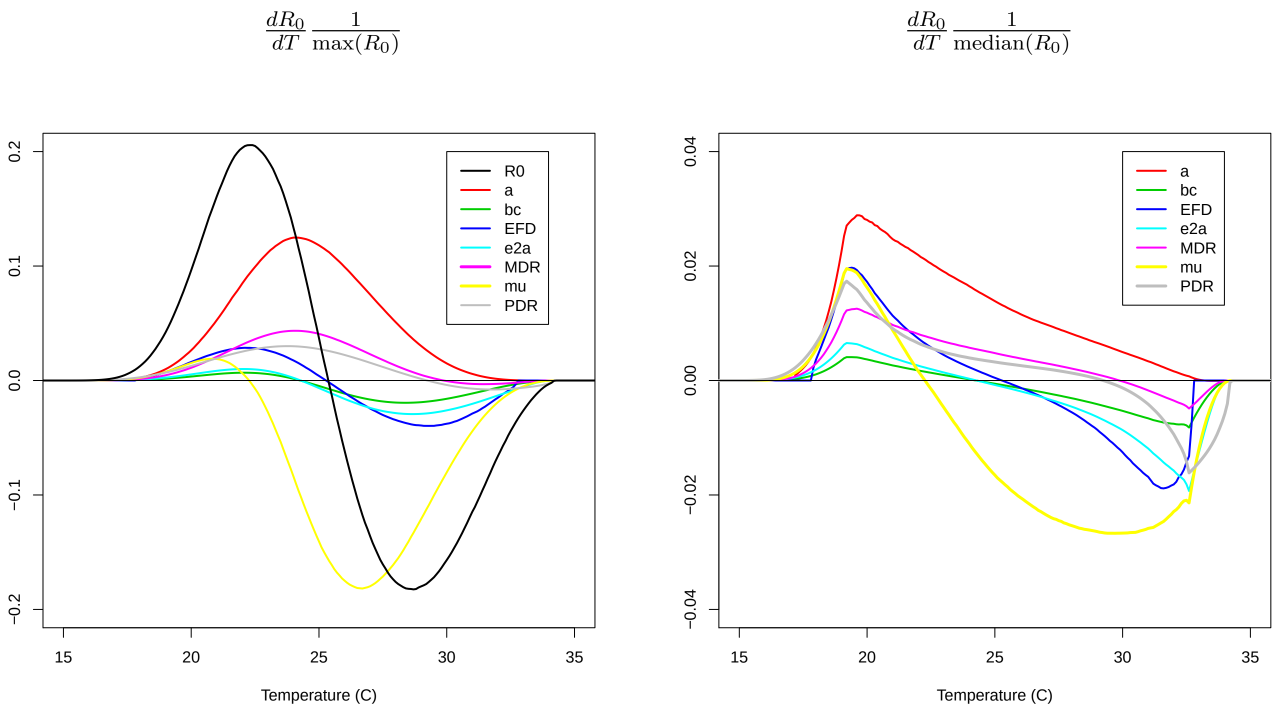


Figure C.5: Relative R_0 (scaled so that the maximum value of the mean is 1) calculated with informative priors on all components. With Brière response for vector competence (blue) and quadratic response for vector competence (green)

bc function	priors	lower limit	peak	upper limit
Brière	uninformative	20.08 (15.9 – 23.9)	25.16 (23.4 – 26.8)	29.23 (25.2 – 31.7)
Brière	informative	19.24 (15.8 – 23.0)	25.51 (24.0 – 27.0)	31.43 (29.9 – 32.1)
quad	uninformative	20.08 (15.9 – 23.9)	24.94 (23.2 – 26.4)	29.57 (25.3 – 32.9)
quad	informative	19.24 (15.8 – 23.0)	25.36 (23.9 – 26.7)	32.3 (29.9 – 34.4)

Table C.1: Mean and 95% Highest Posterior Density (HPD) interval for the lower limit, peak value, and upper limit of R_0 for different amounts of prior information. TOP - Brière fit for bc; Bottom - Quadratic fit for bc

C.4 Sensitivity of R_0 to temperature



(a) (b)

Figure C.6: (a) Median value of the sensitivity of R_0 to temperature overall and by component, scaled to the maximum value of the posterior mean of R_0 (b) Median value of the sensitivity of R_0 to temperature by component, scaled by 10× the posterior median of R_0 plus a small correction (to avoid division by zero).

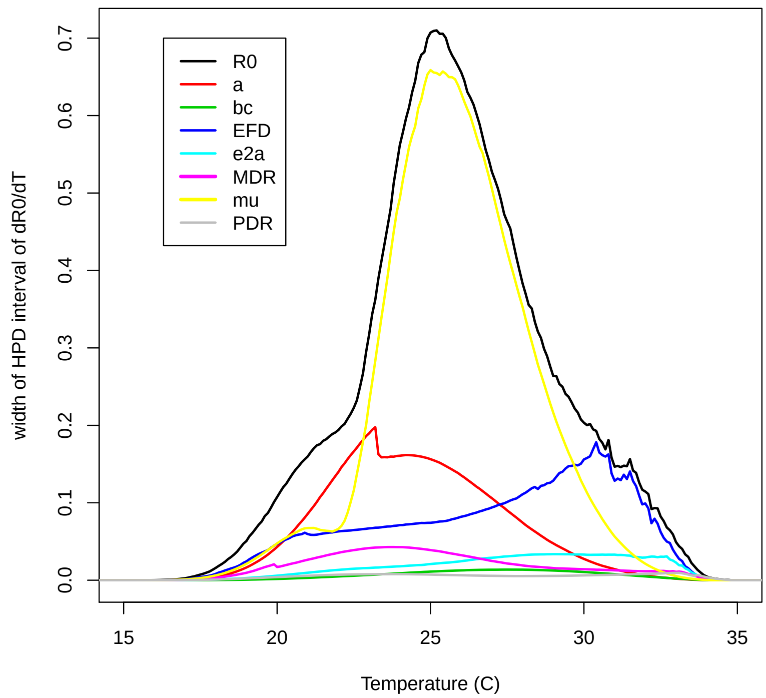


Figure C.7: Highest Posterior Density (HPD) interval of the sensitivity of R_0 to temperature, by component, and scaled by the maximum value of the posterior mean of R_0.