Supplemental Tables.

Table S1. Results of logistic regression on epidemic behavior. Entries in bold are the 5 smallest p-values for each *Tempc*.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| *Tempc* | 10 | | 16 | | 22 | |
| Parameter | coefficient | *p* | coefficient | *p* | coefficient | *p* |
| intercept | -3.03E+00 | 2.32E-01 | 5.84E+00 | 1.25E-02 | -3.61E+00 | 1.54E-01 |
| *Tmean* | **-9.53E-02** | **1.08E-01** | **-2.54E-01** | **2.07E-05** | **2.81E-01** | **1.93E-05** |
| *tcrit* | 2.24E-03 | 1.43E-01 | 1.42E-03 | 3.25E-01 | **3.02E-03** | **5.94E-02** |
| *balb* | 1.40E+00 | 2.73E-01 | -9.20E-02 | 9.38E-01 | -8.56E-01 | 5.09E-01 |
| *βalb* | -1.93E-01 | 8.80E-01 | 1.68E+00 | 1.62E-01 | 1.99E+00 | 1.41E-01 |
| *αalb* | -1.33E-02 | 7.38E-01 | -4.56E-02 | 2.14E-01 | -1.24E-02 | 7.53E-01 |
| *μsl,alb* | -2.25E+00 | 6.72E-01 | -4.27E+00 | 3.97E-01 | 1.95E+00 | 7.26E-01 |
| *γsl,alb* | 3.12E+01 | 5.21E-01 | 7.23E+00 | 8.73E-01 | 2.07E+00 | 9.66E-01 |
| *ρmax,alb* | **1.00E-04** | **8.35E-03** | 4.70E-05 | 1.77E-01 | **-6.70E-05** | **8.22E-02** |
| *baeg* | **2.69E+00** | **3.61E-02** | 1.89E+00 | 1.09E-01 | 5.99E-01 | 6.42E-01 |
| *βaeg* | **5.35E+00** | **6.44E-05** | **2.58E+00** | **3.13E-02** | 7.35E-01 | 5.75E-01 |
| *αaeg* | **-3.35E-01** | **7.76E-02** | **-4.69E-01** | **1.05E-02** | -3.17E-01 | 1.09E-01 |
| *μsl,aeg* | -3.76E+00 | 4.84E-01 | **-1.15E+01** | **2.40E-02** | **-1.15E+01** | **4.44E-02** |
| *γsl,aeg* | 1.66E+01 | 7.20E-01 | -3.14E+00 | 9.42E-01 | -4.55E+01 | 3.53E-01 |
| *ρmax,aeg* | 4.50E-05 | 2.01E-01 | **1.27E-04** | **5.35E-04** | **7.90E-05** | **3.76E-02** |
| *iv* | -1.33E-03 | 9.19E-01 | -2.36E-02 | 6.38E-02 | -2.14E-02 | 1.21E-01 |

Table S2. Results of regression on *MaxHi* (epidemic runs only). Entries in bold are the 5 smallest p-values for each *Tempc*.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| *Tempc* | 10 | | 16 | | 22 | |
| Parameter | coefficient | *p* | coefficient | *p* | coefficient | *p* |
| intercept | -5.49E+03 | 7.64E-01 | 3.60E+04 | 8.24E-03 | 4.40E+04 | 4.66E-05 |
| *Tmean* | -4.37E+02 | 3.11E-01 | -8.61E+02 | 1.37E-02 | **-9.19E+02** | **1.40E-03** |
| *tcrit* | -1.27E+01 | 3.46E-01 | 5.59E+00 | 5.05E-01 | **-1.99E+01** | **9.88E-03** |
| *balb* | -4.38E+03 | 6.24E-01 | 7.01E+03 | 3.01E-01 | 4.66E+03 | 4.10E-01 |
| *βalb* | **2.13E+04** | **2.92E-02** | 9.90E+03 | 1.58E-01 | 6.98E+03 | 2.23E-01 |
| *αalb* | **-1.17E+03** | **9.00E-05** | **-6.61E+02** | **3.77E-03** | -1.17E+02 | 4.90E-01 |
| *μsl,alb* | 4.46E+04 | 2.18E-01 | -3.50E+04 | 2.27E-01 | 1.01E+04 | 6.60E-01 |
| *γsl,alb* | 5.86E+05 | 1.45E-01 | -1.68E+05 | 5.16E-01 | -1.13E+05 | 6.05E-01 |
| *ρmax,alb* | 5.57E-02 | 8.36E-01 | 2.69E-02 | 8.94E-01 | 1.68E-01 | 3.26E-01 |
| *baeg* | 1.46E+04 | 1.49E-01 | **1.69E+04** | **9.96E-03** | **1.39E+04** | **1.37E-02** |
| *βaeg* | **3.11E+04** | **1.59E-03** | **2.07E+04** | **2.46E-03** | **1.70E+04** | **2.00E-03** |
| *αaeg* | **-7.25E+03** | **2.60E-06** | **-5.66E+03** | **1.00E-07** | **-2.31E+03** | **5.44E-03** |
| *μsl,aeg* | 3.96E+04 | 2.96E-01 | -5.64E+04 | 5.08E-02 | -4.46E+04 | 6.11E-02 |
| *γsl,aeg* | 3.50E+05 | 3.12E-01 | 1.06E+05 | 6.74E-01 | -7.44E+04 | 7.02E-01 |
| *ρmax,aeg* | **1.28E+00** | **2.94E-05** | **9.37E-01** | **1.20E-06** | 3.72E-01 | 2.07E-02 |
| *iv* | 1.04E+02 | 3.01E-01 | -6.94E+00 | 9.23E-01 | -2.19E+01 | 7.04E-01 |

Table S3. Results of regression on *lag* (epidemic runs only). Entries in bold are the 5 smallest p-values for each *Tempc*.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| *Tempc* | 10 | | 16 | | 22 | |
| Parameter | coefficient | *p* | coefficient | *p* | coefficient | *p* |
| intercept | 1.08E+02 | 3.30E-01 | 1.51E+02 | 6.56E-02 | -1.40E+01 | 5.61E-01 |
| *Tmean* | **-5.94E+00** | **2.45E-02** | -2.26E+00 | 2.81E-01 | **2.99E+00** | **7.88E-06** |
| *tcrit* | -8.69E-02 | 2.83E-01 | -7.66E-02 | 1.33E-01 | -3.36E-02 | 5.64E-02 |
| *balb* | **-1.14E+02** | **3.75E-02** | -2.17E+01 | 5.96E-01 | -1.06E+01 | 4.14E-01 |
| *βalb* | **8.56E+01** | **1.40E-01** | -1.38E+01 | 7.45E-01 | 9.08E+00 | 4.88E-01 |
| *αalb* | -1.62E+00 | 3.38E-01 | **3.11E+00** | **2.34E-02** | 3.31E-01 | 3.95E-01 |
| *μsl,alb* | -1.83E+01 | 9.33E-01 | **-4.54E+02** | **1.06E-02** | 2.35E+01 | 6.56E-01 |
| *γsl,alb* | **3.56E+03** | **1.41E-01** | 1.05E+03 | 5.01E-01 | -4.27E+02 | 3.94E-01 |
| *ρmax,alb* | -5.83E-05 | 9.71E-01 | **-4.44E-03** | **3.93E-04** | **-9.95E-04** | **1.18E-02** |
| *baeg* | 3.21E+00 | 9.57E-01 | -1.02E+01 | 7.94E-01 | -4.15E+00 | 7.46E-01 |
| *βaeg* | **1.20E+02** | **3.83E-02** | -2.64E+01 | 5.16E-01 | **-3.77E+01** | **2.70E-03** |
| *αaeg* | 8.27E+00 | 3.28E-01 | **1.87E+01** | **2.59E-03** | **5.34E+00** | **4.99E-03** |
| *μsl,aeg* | -3.13E+02 | 1.71E-01 | 1.41E+02 | 4.17E-01 | 1.12E+02 | 4.10E-02 |
| *γsl,aeg* | 2.77E+03 | 1.84E-01 | 5.23E+02 | 7.31E-01 | 3.72E+01 | 9.34E-01 |
| *ρmax,aeg* | -1.14E-03 | 5.06E-01 | **-2.65E-03** | **1.86E-02** | **-1.18E-03** | **1.46E-03** |
| *iv* | 3.98E-01 | 5.09E-01 | 7.73E-02 | 8.60E-01 | -6.25E-02 | 6.37E-01 |

Table S4. Increasing epidemics with *Tempc*. All possible combinations of not epidemic (0) and epidemic (1) across the 3 sets shown, with the number and proportion of the total runs (250) showing that combination. Within individual run sets, epidemics were more likely as *Tempc* increased.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Epidemic in *Tempc*** | | |  |  |
| **10** | **16** | **22** | **#runs** | **proportion** |
| 0 | 0 | 0 | 24 | 0.096 |
| 0 | 0 | 1 | 80 | 0.32 |
| 0 | 1 | 1 | 41 | 0.164 |
| 0 | 1 | 0 | 30 | 0.12 |
| 1 | 0 | 0 | 11 | 0.044 |
| 1 | 0 | 1 | 0 | 0 |
| 1 | 1 | 0 | 7 | 0.028 |
| 1 | 1 | 1 | 57 | 0.228 |

Table S5. Increasing size of epidemics with *Tempc*. Possible combinations of *MaxHi* across the 3 *Tempc* sets for different combinations of *epi* = 1 (epidemic) or 0 (not epidemic), where at least 2 were epidemic. For each combination of presence/absence of epidemics, the size of the epidemic increased with *Tempc*

|  |  |
| --- | --- |
| ***MaxHi* relative size for *Tempc* values** | **# runs** |
| **all epidemic (*epi* =1)** |  |
| 10>16>22 | 2 |
| 10>16<22 | 2 |
| 10<16>22 | 5 |
| 10<16<22 | 48 |
| **10, 16 *epi* =1; 22 *epi* =0** |  |
| 10>22 | 2 |
| 10<22 | 5 |
| **10 *epi* =0; 16, 22 *epi* =1** |  |
| 16>22 | 9 |
| 16<22 | 32 |

Table S6. Parameter values for simulations shown in Figures 3 and 4.

|  |  |  |
| --- | --- | --- |
|  | run# | |
| Parameter | 67 | 249 |
| *Tmean* | 19.850 | 22.746 |
| *tcrit* | 144.273 | 118.893 |
| *iv* | 19.703 | 37.978 |
| *balb* | 0.305 | 0.280 |
| *βalb* | 0.389 | 0.461 |
| *αalb* | 7.833 | 14.942 |
| *μsl,alb* | 0.095 | 0.083 |
| *γsl,alb* | 0.015 | 0.018 |
| *ρmax,alb* | 3786.963 | 6551.880 |
| *baeg* | 0.351 | 0.630 |
| *βaeg* | 0.407 | 0.309 |
| *αaeg* | 2.090 | 2.755 |
| *μsl,aeg* | 0.095 | 0.114 |
| *γsl,aeg* | 0.012 | 0.008 |
| *ρmax,aeg* | 9303.730 | 1957.701 |