Electronic supplementary material for the following paper:

The elephant-livestock interface modulates anthrax suitability in India

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Figure S1. The distribution of the environmental layers used in the modelling of the anthrax niche. Distribution of anthrax outbreaks documented by the Pro-MED mail surveillance mechanism between 2000 and 2018 is also shown (black dots). All maps are displayed only for the purposes of depicting the distribution of disease occurrence and risk, and do not reflect the authors’ assertion of territory or borders of any sovereign country including India. All maps created in R (v. 3.3.1).



Table S2. Maxent model comparisons using the area under the receiver operating characteristic curves (AUC), the Akaike information criteria (AIC), and the covariate rankings. The AUC for each model is based on testing against an independent sample of laboratory-confirmed anthrax outbreaks, while the AIC is derived from a Poisson point process. Rankings are based on the permutation importance of each covariate and its contribution, reported as a percentage, to the loss function during the fitting of the Maxent model.

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| --- | --- | --- | --- | --- | --- | --- | --- |
| Predicted anthrax suitability models | AIC | AUC | Rank 1 (%) | Rank 2 (%) | Rank 3 (%) | Rank 4 (%) | Rank 5 (%) |
| **Model 1: Climate only model** |  | | | | | | |
| *5 arc-minutes* | 234 | 81% | PT-α (84.1) | Annual temperature (15.9) | NOT APPLICABLE | | |
| *30 arc-minutes* | 255 | 80% | PT-α (90.8) | Annual temperature (9.2) |
| **Model 2: Soil chemistry only model** |  | | | | | | |
| *5 arc-minutes* | 324 | 73% | Soil pH (70.6) | Soil organic carbon (29.4) | NOT APPLICABLE | | |
| *30 arc-minutes* | 353 | 73% | Soil pH (87.4) | Soil organic carbon (12.6) |
| **Model 3: Forest change only model** |  | | | | | | |
| *5 arc-minutes* | 325 | 69% | 1900-2000 forest change (100) | NOT APPLICABLE | | | |
| *30 arc-minutes* | 345 | 72% | 1900-2000 forest change (100) |
| **Model 4: Biotic only model** |  | | | | | | |
| *5 arc-minutes* | 250 | 81% | Elephant-livestock (87.6) | Livestock (12.4) | NOT APPLICABLE | | |
| *30 arc-minutes* | 294 | 83% | Elephant-livestock (89.6) | Livestock (10.4) |
| **Model 5: Abiotic only model** |  | | | | | | |
| *5 arc-minutes* | 232 | 86% | PT-α (65.8) | Soil pH (12.8) | Soil organic carbon (8.8) | 1900-2000 forest change (6.3) | Annual temperature (6.2) |
| *30 arc-minutes* | 257 | 81% | Soil pH (38.6) | PT-α (33.0) | 1900-2000 forest change (18.4) | Soil organic carbon (5.9) | Annual temperature (4.2) |
| **Model 6: Full model** |  | | | | | | |
| *5 arc-minutes* | 216 | 89% | Elephant-livestock (67.7) | Livestock density (10.5) | PT-α (7.1) | Soil pH (4.7) | 1900-2000 forest change (4.0) |
| *30 arc-minutes* | 255 | 86% | Elephant-livestock (61.5) | Soil pH (9.2) | 1900-2000 forest change (8.0) | Livestock density (8.0) | Annual temperature (5.7) |
| **Model 7: Model 6 - livestock density** |  | | | | | | |
| *5 arc-minutes* | 228 | 87% | Elephant-livestock (52.3) | PT-α (19.7) | Soil organic carbon (12.7) | 1900-2000 forest change (5.7) | Annual temperature (4.9) |
| *30 arc-minutes* | 256 | 86% | Elephant-livestock (51.7) | Soil pH (16.9) | 1900-2000 forest change (11.3) | Soil organic carbon (10.3) | PT-α (5.7) |

Figure S3. The distribution of predicted anthrax suitability from each model presented in S2 Table 1. All maps are displayed only for the purposes of depicting the distribution of disease occurrence and risk, and do not reflect the authors’ assertion of territory or borders of any sovereign country including India. All maps created in R (v. 3.3.1).



Figure S4. The Maxent model with the jackknife variable selection procedure comparing each covariate’s lone contribution to the training gain (blue) to its effect on training gain when the covariate is withheld from the model (red).



Figure S5. Predicted anthrax suitability with elephant outbreaks removed from the training data. All maps are displayed only for the purposes of depicting the distribution of disease occurrence and risk, and do not reflect the authors’ assertion of territory or borders of any sovereign country including India. All maps created in R (v. 3.3.1).

