

Table S2 Sand Fly vector species abundance model selection. AIC and BIC stand, respectively, for Akaike and Bayesian Information Criteria. Best model selection is guided by their minimization. The symbol | indicates the nesting of random factors. Best models are **bolded**.

| Sand Fly Vector Species | Random Factors | Fixed Factors | BIC | AIC |
|-------------------------|------------------------------|---|---------------|---------------|
| <i>Lutzomyia gomezi</i> | Locations Study, Study, Year | ENSO Phase, sampling month, eco-epidemiological environment | 3267.4 | 3341.7 |
| | Locations, Year | ENSO Phase, sampling month, eco-epidemiological environment | 3265.4 | 3335.8 |
| <i>Lu. trapidoi</i> | Locations Study, Study, Year | ENSO Phase, sampling month, eco-epidemiological environment | 3547.3 | 3620.7 |
| | Locations, Year | ENSO Phase, sampling month, eco-epidemiological environment | 3545.3 | 3614.8 |
| <i>Lu. panamensis</i> | Locations Study, Study, Year | ENSO Phase, sampling month, eco-epidemiological environment | 7748.0 | 7820.3 |
| | Locations, Year | ENSO Phase, sampling month, eco-epidemiological environment | 7748.0 | 7816.6 |