Additional file 7. $\hat{R}_o = 1$ conditions in $T_{\text{wet}} - T_{\text{on}}$ space. Figure S7.

$\hat{R}_o = 1$ conditions in $T_{\text{wet}} - T_{\text{on}}$ space

Conditions for $\hat{R}_o = 1$ — the critical value for malaria endemics — at various $T_{\text{wet}}$, $T_{\text{on}}$, $X_{\text{dist}}$, and temperature were shown in the dimension-less space of $D_1$ and $D_2$ in Fig. 3, revealing a universality. The same conditions for $\hat{R}_o = 1$ were plotted on the plane of $T_{\text{wet}}$ and $T_{\text{on}}$ as contour lines in Fig. S7. Fig. S7A shows the contour lines of $\hat{R}_o = 1$ for different $X_{\text{dist}}$ values at a fixed temperature of 27 °C. Fig. S7B shows the contour lines of $\hat{R}_o = 1$ for different temperatures at $X_{\text{dist}} = 100$ m. The figures illustrate that the conditions for stable malaria transmission depends on $T_{\text{wet}}$, $T_{\text{on}}$, $X_{\text{dist}}$, and temperature, and that the interplay of these variables is complex. The large dimension and non-linearity of malaria transmission determinants highlight the utility of the predictive theory.

Fig. S7: $\hat{R}_o = 1$ contour lines on the plane of $T_{\text{on}}$ and $T_{\text{wet}}$. (A) $\hat{R}_o = 1$ contour lines for different $X_{\text{dist}}$ on the plane of $T_{\text{on}}$ and $T_{\text{wet}}$ at 27 °C. Observed points for $\hat{R}_o = 1$ (circles) were fitted with natural logarithmic functions (solid lines) on the $T_{\text{wet}}$–$T_{\text{on}}$ space for each $X_{\text{dist}}$. (B) $\hat{R}_o = 1$ contour lines for different temperature on the plane of $T_{\text{on}}$ and $T_{\text{wet}}$ at $X_{\text{dist}} = 100$ m. Observed points for $\hat{R}_o = 1$ (circles) were fitted with natural logarithmic functions (solid lines) on the $T_{\text{wet}}$–$T_{\text{on}}$ space for each temperature.