Shifting Burdens in sub-Saharan Africa: Malaria Risk in a Hotter Climate

**KEY HIGHLIGHTS**

- **TARGET** | Knowing where and when changes in burden are likely to take place offers the opportunity to geographically target monitoring programs to achieve the highest impact with limited resources.

- **ANTICIPATE** | When local populations have little or no immunity to the disease, malaria suitability changes can often lead to epidemic conditions, especially among vulnerable groups such as pregnant women, children, and the elderly. Surveillance data allows for the preparation of a timely response before the outbreak of epidemics and can guide decisions around distribution of malaria services and their use by impacted communities.

- **ADJUST** | Surveillance information offers an opportunity to adjust the investment timeframe to optimize vector control and improve case management. Pinpointing regions where transmission could be reduced lowers the cost of interventions and provides an opportunity to reach pre-elimination or elimination.

**RECOMMENDATIONS AND OPPORTUNITIES FOR ACTION**

Understanding the changing seasonality of malaria, particularly for new areas at risk of transmission or areas where the length of the season may shorten or extend, can help inform malaria programs and policy reach the goal of elimination. Addressing this changing risk profile will require modifying current interventions and designing new ones that can adaptively respond to changing climate conditions. Illustrative opportunities for information action include:

- **TARGET**
  - Knowing where and when changes in burden are likely to take place offers the opportunity to geographically target monitoring programs to achieve the highest impact with limited resources.

- **ANTICIPATE**
  - When local populations have little or no immunity to the disease, malaria suitability changes can often lead to epidemic conditions, especially among vulnerable groups such as pregnant women, children, and the elderly. Surveillance data allows for the preparation of a timely response before the outbreak of epidemics and can guide decisions around distribution of malaria services and their use by impacted communities.

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**REGIONAL HIGHLIGHTS**

- **West Africa**
  - By the 2030s, approximately 47 to 58 million people in West Africa will see reduced endemic (10-12 months) risk due to temperatures exceeding the thermal thresholds for mosquitoes. However, 65 million will remain in marginal to moderate (1-6 months) risk.

- **Highlands of East Africa**
  - By the 2030s, approximately 34-40 million people currently living in areas with no suitability will be at risk from endemic (10-12 months) exposure to transmission in East Africa under both best-case and worst-case climate scenarios.

- **Southern Africa**
  - Between the 2030s and 2050s, rising temperatures will likely add approximately 3 to 26 million people at risk from seasonal (7-9 months) malaria.

- **Central Africa**
  - By the 2030s, areas where seasonal suitability will likely become endemic, thus extending the malaria season will impact more than 10 million people under the best-case climate scenario.

**DEFINING SUITABILITY**

- **Endemic**: 10-12 months
- **Seasonal**: 7-9 months
- **Moderate**: 4-6 months
- **Marginal**: 1-3 months

**PATHWAY OF RISK**

- **TEMPERATURE DRIVES MALARIA SUITABILITY**
  - Temperatures are expected to increase throughout sub-Saharan Africa due to climate change. This may reduce the months of optimal malaria transmission when temperatures become too high, or increase malaria where it was previously too cool for the malaria-carrying Anopheles mosquito.

- **SUIBILITY DRIVES THE NUMBER OF PEOPLE AT RISK**
  - As temperatures rise, more people will be at risk overall in various geographic areas, putting greater emphasis on surveillance, predictive tools, and policy and program responses to address these risks.

- **POSSIBLE CHANGES**
  1. New areas of malaria suitability that were previously unsuitable.
  2. Extension of the number of months for malaria suitability.
  3. Reduction of the number of months for malaria suitability.

This document does not necessarily reflect the views of USAID or the US government. USAID Adaptation Thought Leadership and Assessments (ATLAS) project, September 2019.