GFCS Consultative Forum
(14-16 Nov. 2011)

GFCs Consultation Meeting, WHO HQ
Nzioka S.M (WHO, KCO)
Outline

• Background
• Project Coverage
• Findings
• Challenges
• Next steps
Effects of climate change include:

- Increase in water and vector borne diseases
- Malnutrition and livestock starvation
- Land degradation

Climate sensitive disease epidemics have become frequent in the recent past. Examples include:

- Rift valley fever
- Meningitis
- Cholera
- Malaria
Background (..2)

Influencing factors

Climate Change and Variability

Risks factors

Environmental and Human risks

Interventions

Adaptation

Mitigation

Short term measures

Long term measures
Global environment facility (GEF) through UNDP and WHO is supporting pilot projects in a number of countries to address some of the adverse effects associated with climate change.

Kenya is one of the 7 countries

- Barbados,
- Bhutan,
- China,
- Fiji,
- Jordan,
- Kenya,
- Uzbekistan
Project outcomes

• **OUTCOME 1:** An early warning and response system with timely information on likely incidence of climate-sensitive health risks established

• **OUTCOME 2:** Capacity of health sector institutions to respond to climate-sensitive health risks based on early warning information improved

• **OUTCOME 3:** Disease prevention measures piloted in areas of heightened health risk due to climate change
Topography of the Highland Malaria-Study Sites, TransNzoia, Nandi, Kericho and Kisii

LEGEND
SITES
Elevations
- < 1,400m
- 1,400 - 1,600m
- 1,600 - 1,800m
- 1,800 - 2,000m
- 2,000 - 2,200m
- 2,200 - 2,400m
- 2,400 - 2,600m
- > 2,600m

TRANS-NZOIA Epi Zone

NANDI Epi Zone

KERICHO Epi Zone

KISII Epi Zone
Monthly Prevalence (Malaria)
Monthly Variability (Rainfall)
Monthly Variability (Temp)
Statistical models are mathematical representations, or simulations, of an actual situation or process.

- Extrinsic factors – determine malaria epidemic start-up e.g. climate variables
- Intrinsic factors – sustains malaria epidemics e.g. no. of positive cases (auto-correction)
- NB/ both influence vectoral capacity
### Model Validation

#### Predicted Malaria Epidemics (3 Months lead Model) * Observed Malaria Epidemics after 3 Months (Lab Confirmed Total/1000 Mid-yr population) Crosstabulation

<table>
<thead>
<tr>
<th></th>
<th>Observed Malaria Epidemics after 3 Months (Lab Confirmed Total/1000 Mid-yr population)</th>
<th>No Epidemic</th>
<th>Yes Epidemic</th>
<th>Total</th>
<th>P-value (2-sided)</th>
<th>Sensitivity</th>
<th>Specificity</th>
<th>Positive Predictive Value</th>
<th>Epidemic Prevalence</th>
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<tbody>
<tr>
<td><strong>Kericho</strong></td>
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<tr>
<td>Predicted Malaria Epidemics</td>
<td>(3 Months lead Model)</td>
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<tr>
<td></td>
<td></td>
<td>Yes Epidemic</td>
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<td>4</td>
<td>10</td>
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<td><strong>Kisii</strong></td>
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<tr>
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<td><strong>Nandi</strong></td>
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<td><strong>Transnzoia</strong></td>
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</table>

Chi-square test (Fisher's) H0: The two test (model and reference) are independent (not associated)

Sensitivity = proportion of total True epidemic counts correctly identified by the model (TP/TP + FN)

Specificity = proportion of total None epidemic counts correctly identified by the model (TN/TN + FP)
Experience in Data Mgt

• Health data mgt
• Meteorological Data mgt
• Capacity assessment
• Interfacing