Republic of Kenya

KENYA METEOROLOGICAL DEPARTMENT

Republic of Kenya

MINISTRY OF HEALTH

MALARIA EPIDEMIC EARLY WARNING PREDICTION SYSTEM FOR WESTERN KENYA HIGHLAND FOR AUGUST 2024

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1. Summary

The model outputs for the malaria epidemic early prediction system for the western highlands of Kenya indicate **high risk** of Malaria in Kakamega and Nandi in the months of August 2024 and September 2024

2. Model Outputs

2.1 Malaria epidemic early prediction system for Kakamega

Table 1 below shows the malaria epidemic early prediction system for Kakamega for August 2024.

Table 1: MALARIA EPIDEMIC EARLY PREDICTION SYSTEM: KAKAMEGA

Yr.	Month	Tmax	Mean Tmax	Tmax Deviation /anomaly	R/fall (mm)	R/fall Code	Tmax Deviation /anomaly Code	Additive % Risk
2024	01	27.6	28.3	-0.7	239.5	4	0	36.4
2024	02	29.7	29.2	0.5	83.1	0	1	0.0
2024	03	31.3	29.1	2.2	156.7	1	9	9.1
2024	04	28.2	27.3	0.9	329.6	6	1	68.2
2024	05	29.1	26.4	2.7	419.5	6	9	31.8
2024	06	28.1	25.8	2.3	247.4	4	9	59.1
2024	07	29.1	25.6	3.5	82.3	0	16	40.9

The observed climate data for July 2024 indicates an increase in maximum temperature from 28.1°C in June 2024 to 29.1°C in July 2024. This observation in July 2024 was positive (3.5 above the mean of the month). Rainfall decreased from 247.4mm in June 2024 to 82.3mm in July 2024. The additive model percentage risk in July 2024 was **40.9%.**

Box 1:
For Kakamega, the epidemic threshold level is 30%.

Consequently, there is high risk of Malaria Epidemic in Kakamega in the month of August 2024 and September 2024(See Figure 1)

Table 2 below shows the malaria epidemic early prediction system for Kisii for August 2024.

Table 2: MALARIA EPIDEMIC EARLY PREDICTION SYSTEM: KISII

Yr	Mon	Tmax (^{0}C)	Mean Tmax (^{0}C)	Tmin (^{0}C)	Mean Tmin (^{0}C)	Tmax Dev./ anom	Tmin Dev. /anom	Total Temp Dev./ Anom	Temp Dev./ anom Code	R/fall (mm)	R/fall Code	Model Output
2024	01	26.2	26.1	16.4	15.7	0.1	0.7	0.8	0	121.3	0	0
2024	02	29.7	27.0	16.6	16.1	2.7	0.5	3.2	4	194.0	0	0
2024	03	28.8	27.0	16.1	15.9	1.8	0.2	2.0	3	185.7	0	0
2024	04	25.5	25.5	16.7	15.8	0.0	0.9	0.9	0	379.5	4	100
2024	05	26.1	25.1	16.9	15.6	1.0	1.3	2.3	3	300.6	2	37.5
2024	06	26.1	24.6	16.0	15.0	1.5	1.0	2.6	3	93.8	0	0
2024	07	26.1	24.5	16.1	14.5	1.6	1.6	3.2	4	92.5	0	0

The observed climate data for Kisii for July 2024 indicates no change in maximum temperature. This observation in July 2024 was positive (1.6 above the mean of the month). Rainfall decreased from 93.8mm in June 2024 to 92.5 mm in July 2024. The Model output risk is **NIL.**

Box 2:
For Kisii, the epidemic threshold level is 20%.

Hence, there is no risk of malaria epidemic in Kisii in the month of August 2024 and September 2024. (See Figure 2).

2.2 Malaria epidemic early prediction system for Nandi

Table 3 below shows the malaria epidemic early prediction system for Nandi for August 2024.

Table 3: NANDI MALARIA EPIDEMIC EARLY PREDICTION SYSTEM

Yr	Mon	Tmax (^{0}C)	Mean Tmax (^{0}C)	Tmax Dev.	Tmin	Mean Tmin	Tmin Dev. /anom	Total Temp Dev. /Anom.	R/fall (mm)	Temp Dev. Filters	R/fall Filters	Multiplicative Model
2024	01	24.4	23.3	1.1	13.3	10.9	2.4	3.5	303.8	4	3	**75**
2024	02	26.4	23.2	3.2	12.5	11.7	0.8	4.0	123.8	5	0	**0.0**
2024	03	27.7	23.0	4.7	12.1	11.5	0.6	5.3	150.3	5	0	**0.0**
2024	04	24.4	22.8	1.8	16.8	11.2	5.6	7.2	366.3	5	4	**100**
2024	05	24.8	22.7	2.1	12.1	10.7	1.4	3.5	273.0	4	2	**50**
2024	06	24.3	22.7	1.6	16.8	10.9	5.9	7.5	136.5	5	0	**0.0**
2024	07	24.8	22.8	2.0	12.1	10.6	1.5	3.5	203.3	4	1	**20**

The maximum temperature in Nandi indicates a slight increase from 24.3°C in June 2024 to 24.8°C in July 2024. This observation in July 2024 for Nandi was positive (2.0°C above the mean of the month). Rainfall increased from 136.5mm in June 2024 to 203.3mm in July 2024. The additive model percentage risk in July 2024 was **20%.**

Box 3:
For Nandi, epidemic threshold level is 20%.

Hence, there is high risk of malaria epidemic in Nandi in the month of August 2024 and September 2024. (See Figure 3)

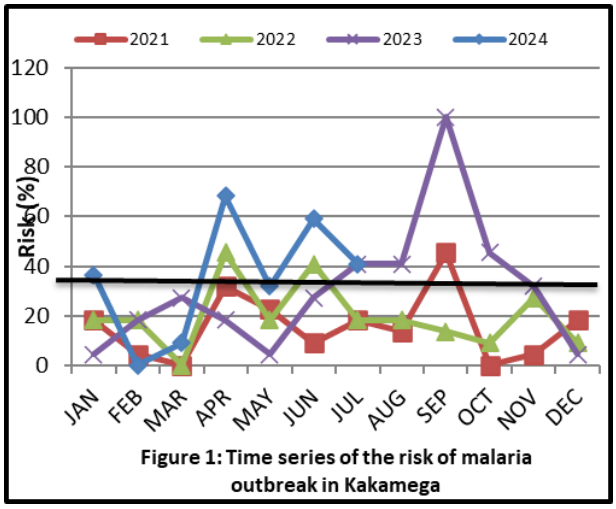

Figure 1: Time series of the risk of malaria outbreak in Kakamega

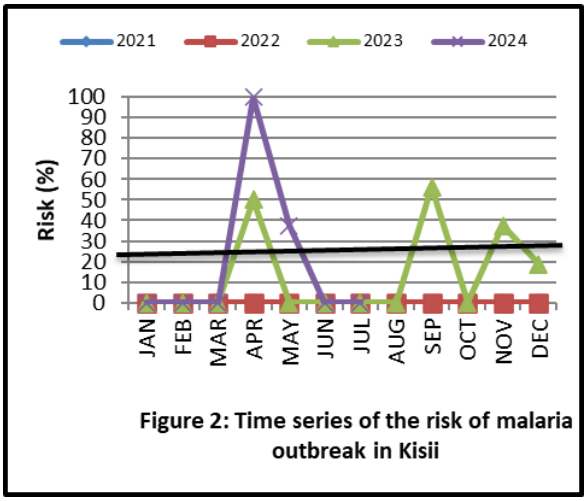

Figure 2: Time series of the risk of malaria outbreak in Kisii

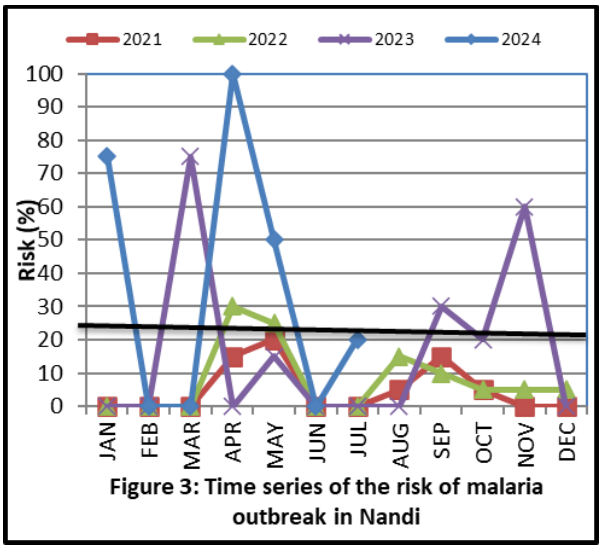

Figure 3: Time series of the risk of malaria outbreak in Nandi

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