Republic of Kenya

KENYA METEOROLOGICAL DEPARTMENT

Republic of Kenya

MINISTRY OF HEALTH

MALARIA EPIDEMIC EARLY WARNING PREDICTION SYSTEM FOR WESTERN KENYA HIGHLAND FOR OCTOBER 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 in the months of October, 2024 and November, 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 October, 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
2024	08	28.2	26.1	2.1	262.6	5	9	95.5
2024	09	28.6	26.9	1.7	155.7	1	4	45.5

The observed climate data for September, 2024 indicates a slight increase in maximum temperature from 28.2°C in August, 2024 to 28.6°C in September, 2024. This observation in September, 2024 was positive (1.7 above the mean of the month). Rainfall decreased from

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

262.6mm in August, 2024 to 155.7mm in September, 2024. The additive model percentage risk in September, 2024 was **45.5%.**

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

Table 2 below shows the malaria epidemic early prediction system for Kisii for October, 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
2024	08	25.9	24.9	15.5	14.7	1.0	0.8	1.8	2	125.5	0	0
2024	09	27.0	26.0	16.2	15.1	1.0	1.1	2.0	3	189.4	0	0

The observed climate data for Kisii for September, 2024 indicates an increase in maximum temperature from 25.9°C in August, 2024 to 27.0°C in September, 2024.. This observation in September, 2024 was positive (1.0 above the mean of the month). Rainfall increased from 125.5mm in August, 2024 to 189.4 mm in September, 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 October, 2024 and November, 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 October, 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**
2024	08	24.0	23.1	0.9	11.7	10.8	0.9	1.9	246.9	2	1	**25**
2024	09	24.8	23.3	1.5	11.2	11.1	0.1	1.6	179.8	2	0	**0.0**

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

The maximum temperature in Nandi indicates an increase from 24.0°C in August, 2024 to 24.8°C in September, 2024. This observation in September, 2024 for Nandi was positive (1.5°C above the mean of the month). Rainfall decreased from 246.9mm in August, 2024 to 179.8mm in September, 2024. The additive model percentage risk in September, 2024 was **NIL.**

Hence, there is low of malaria epidemic in Nandi in the month of October, 2024 and November, 2024. (See Figure 3)

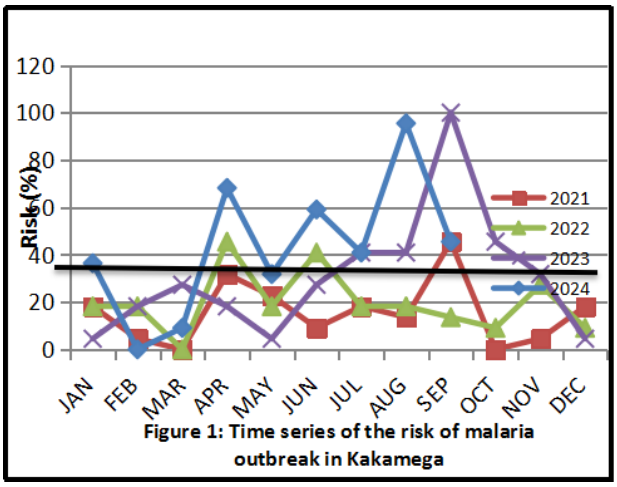

Figure 1: Time series of the risk of malaria outbreak in Kakamega

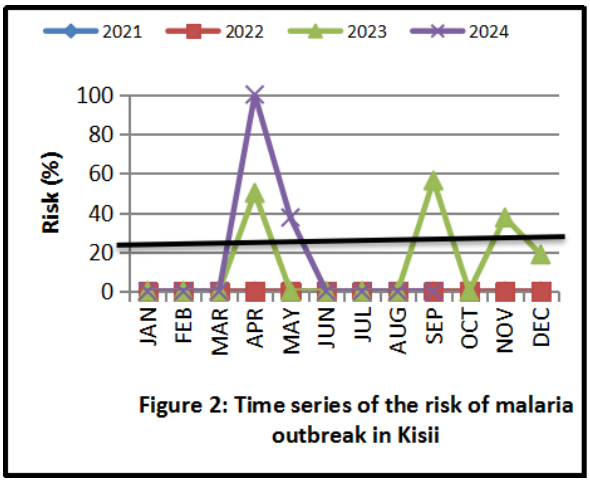

Figure 2: Time series of the risk of malaria outbreak in Kisii

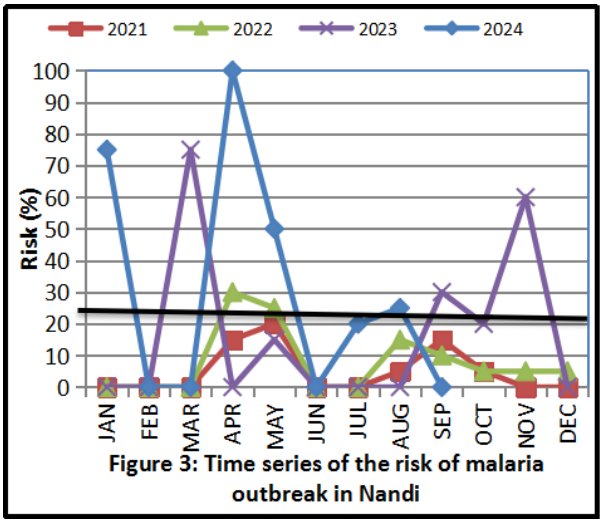

Figure 3: Time series of the risk of malaria outbreak in Nandi

Dr Gikungu

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