Republic of Kenya

KENYA METEOROLOGICAL DEPARTMENT

Republic of Kenya

MINISTRY OF HEALTH

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

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1. Summary

The model outputs for the malaria epidemic early prediction system for the western highlands of Kenya indicate very high risk of Malaria in all the three areas in the months of May 2024 and June 2024

The weather observations indicate generally a decrease in maximum temperatures and an increase in total rainfall amounts in all the three areas.

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 May 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

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

The observed climate data for April 2024 indicates a decrease in maximum temperature from 31.3°C in March 2024 to 28.2°C in April 2024. This observation in April 2024 was positive (0.9 above the mean of the month). Rainfall increased from 156.7mm in March 2024 to 329.6mm in April 2024. The additive model percentage risk in April 2024 was **68.2%.**

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

Table 2 below shows the malaria epidemic early prediction system for Kisii for May 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

The observed climate data for Kisii for April 2024 indicates a decrease in maximum temperature from 28.8°C in March 2024 to 25.5°C in April 2024. This observation in April 2024 was equal to the mean of the month. Rainfall increased from 185.7mm in March 2024 to 379.5 mm in April 2024. The Model output risk is **100%.**

Hence, there is very high risk of malaria epidemic in Kisii in the month of May 2024 and June 2024. (See Figure 2).

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

2.2 Malaria epidemic early prediction system for Nandi

Table 3 below shows the malaria epidemic early prediction system for Nandi for May 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**

The maximum temperature in Nandi indicates a decrease from 27.7°C in March 2024 to 24.4°C in April 2024. This observation in April 2024 for Nandi was positive (1.8°C above the mean of the month). Rainfall increased from 150.3mm in March 2024 to 366.3mm in April 2024. The additive model percentage risk in April 2024 was **100%.**

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

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

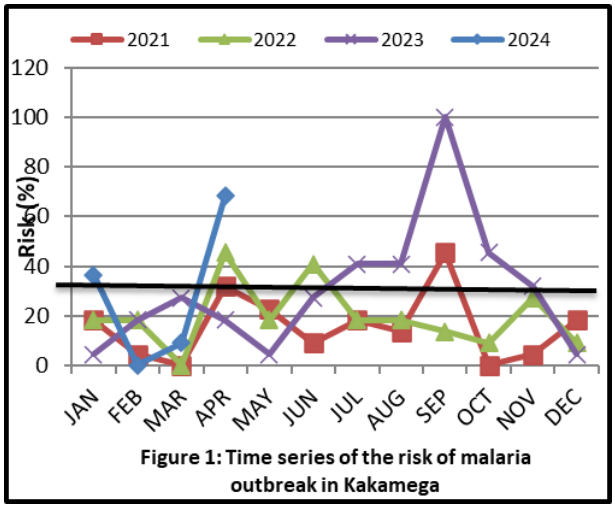

Figure 1: Time series of the risk of malaria outbreak in Kakamega

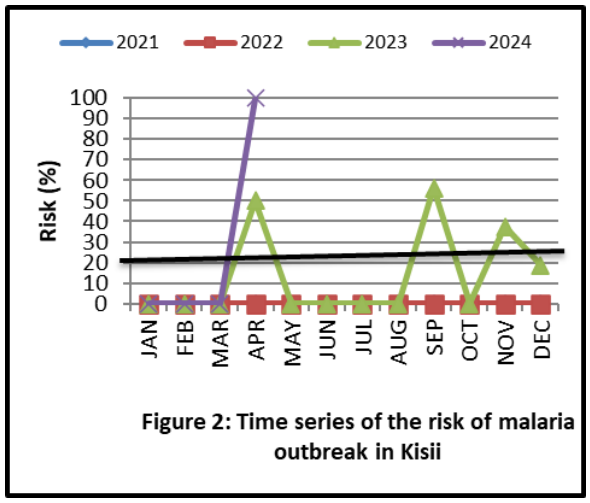

Figure 2: Time series of the risk of malaria outbreak in Kisii

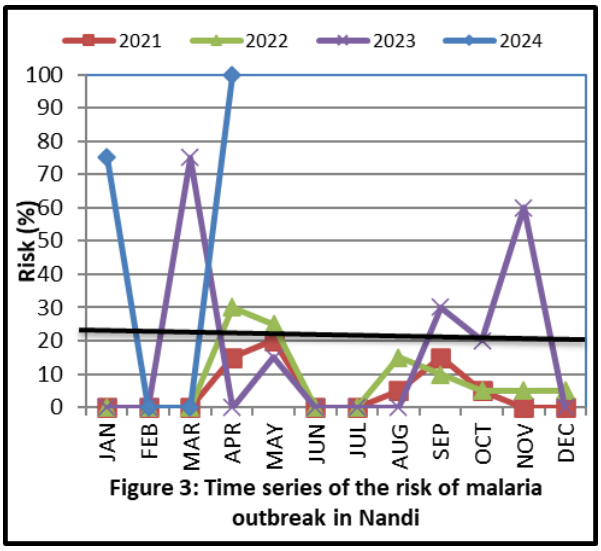

Figure 3: Time series of the risk of malaria outbreak in Nandi

Dr Gikungu

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