Republic of Kenya   **Republic of Kenya**

KENYA METEOROLOGICAL DEPARTMENT

MINISTRY OF HEALTH

MALARIA EPIDEMIC EARLY WARNING PREDICTION SYSTEM FOR WESTERN   KENYA HIGHLAND FOR AUGUST 2022

1.   **Summary**

The model outputs for the malaria epidemic early prediction system for the western highlands of Kenya indicate **no** risk of malaria outbreak in all three areas in the months of August and September 2022.

The weather observations indicate generally a decrease in total monthly Rainfall 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 August 2022.

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
2021	12	29.5	27.5	2.0	54.4	0	4	18.2
2022	01	29.2	28.3	0.9	70.6	0	1	18.2
2022	02	28.6	29.2	-0.6	103.5	0	0	4.5
2022	03	30.4	29.1	1.3	62.8	0	4	0.0
2022	04	28.7	27.3	1.4	282.7	6	4	45.5
2022	05	27.8	26.4	1.4	138.4	0	4	18.2
2022	06	27.4	25.8	1.6	254.7	5	4	40.9
2022	07	27.2	25.6	1.6	96.8	0	4	18.2

The observed climate data for July 2022 indicates a slight decrease in maximum temperature from 27.4°C in June 2022 to 27.2°C in July 2022. However, the maximum temperature anomaly in July 2022 was positive (1.6 above the mean of the month). Rainfall decreased from 254.7mm in June 2022 to 96.8mm in June 2022. The additive model percentage risk in July 2022 was **18.2%.**

 Consequently, there is low risk of the Malaria Epidemic outbreak in Kakamega in the month of August and September 2022. (See Figure 1)

Table 2 below shows the malaria epidemic early prediction system for Kisii for August 2022.

Table 2: MALARIA EPIDEMIC EARLY PREDICTION SYSTEM: KISII

Yr	Mon	Tmax (°C)	Mean Tmax (°C)	Tmin (°C)	Mean Tmin (°C)	Tmax Dev./ anom	Tmin Dev. /anom	Total Temp Dev./ anom	Temp Dev./ anom Code	R/fall (mm)	R/fall Code	Model Output
2021	12	25.9	25.4	16.1	15.4	0.5	0.7	1.2	2	65.4	0	0
2022	01	26.4	26.1	15.9	15.7	0.3	0.2	0.5	0	96.4	0	0
2022	02	26.5	27.0	15.9	16.1	-0.5	-0.2	-0.7	0	159.3	0	0
2022	03	27.2	27.0	15.6	15.9	0.2	-0.3	-0.1	0	101.6	0	0
2022	04	26.4	25.5	16.0	15.8	0.9	0.2	1.1	2	291.5	2	0
2022	05	25.6	25.1	15.8	15.6	0.5	0.2	0.7	0	187.4	0	0
2022	06	25.2	24.6	14.8	15.0	0.6	-0.2	0.5	0	113.1	0	0
2022	07	25.9	24.5	14.7	14.5	1.4	0.2	1.6	2	98.9	0	0

The observed climate data for Kisii for July 2022 indicates an increase in maximum temperature from 25.2°C in June 2022 to 25.9°C in July 2022. This observation in July 2022 was positive (1.4°C above the mean of the month). Rainfall decreased from 113.1mm in June 2022 to 98.9mm in July 2022. The Model output risk is Nil.

Hence there is no risk of malaria epidemic in Kisii in the month of August and September 2022. (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 2022.

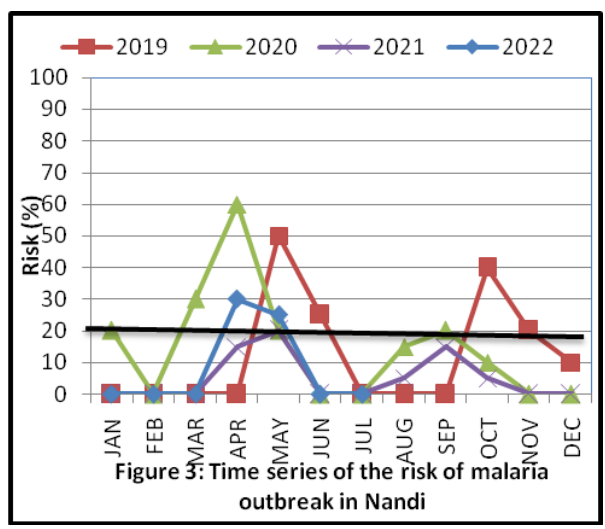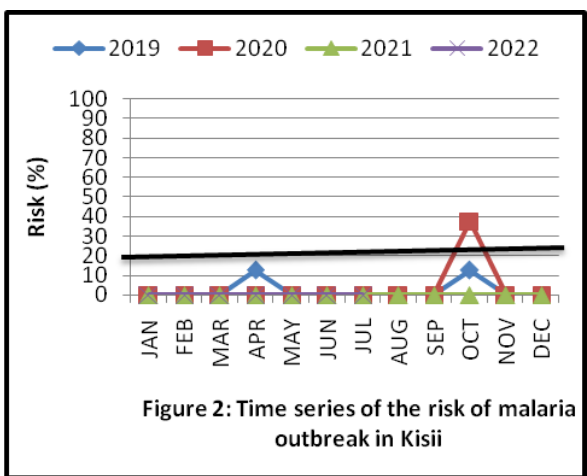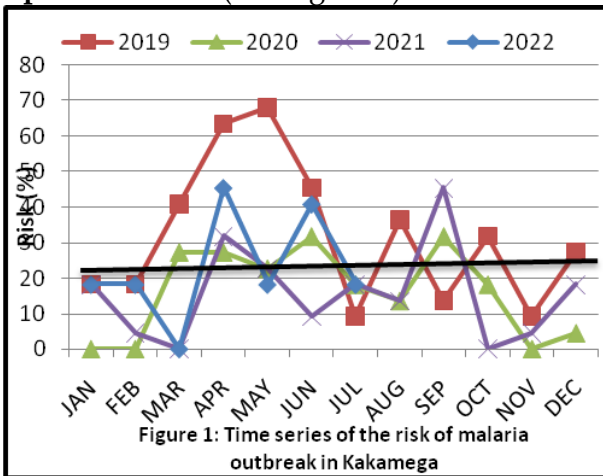### Table 3: NANDI MALARIA EPIDEMIC EARLY PREDICTION SYSTEM

Yr	Mon	Tmax (°C)	Mean Tmax (°C)	Tmax Dev.	Tmin	Mean Tmin	Tmin Dev. /anom	Total Temp Dev. /Anom.	R/fall (mm)	Temp Dev. Filters	R/fall Filters	Multiplicative Model

2021	12	25.3	23.7	1.6	11.4	10.8	0.6	2.2	57.6	3	0	0.0
2022	01	25.4	23.3	2.1	11.1	10.9	0.2	2.3	68.6	3	0	0.0
2022	02	25.5	23.2	2.3	11.8	11.7	0.1	2.4	75.6	3	0	0.0
2022	03	27.3	23.0	4.3	12.2	11.5	0.7	5.0	58	5	0	0.0
2022	04	27.5	22.8	4.7	11.8	11.2	0.6	5.3	256.6	5	2	30
2022	05	24.7	22.7	2.0	12.6	10.7	1.9	3.9	200.9	4	1	25
2022	06	23.5	22.7	0.8	10.5	10.9	-0.4	0.4	101.8	1	0	0.0
2022	07	23.4	22.8	0.6	11.5	10.6	0.9	1.5	61.5	2	0	0.0

The maximum temperature in Nandi slightly decreased from 23.5°C in June 2022 to 23.4°C in July 2022. This observation in July 2022 for Nandi was positive (0.6°C above the mean of the month).

Rainfall decreased from 101.8mm in June 2022 to 61.5mm in July, 2022. The July 2022 multiplicative model percentage risk for malaria was Nil.

Hence, there is no risk of malaria epidemic in Nandi in the month of August and September 2022. (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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