



# MALARIA SURVEILLANCE BULLETIN

DIVISION OF NATIONAL MALARIA PROGRAMME

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## Message from the Program Manager

The 34<sup>TH</sup> issue of the malaria surveillance bulletin focuses on performance of malaria indicators during the first quarter of the financial year 2020/2021.

Epidemiological and entomological surveillance is key in monitoring trends of malaria incidence cases, and vector densities to inform subsequent targeting implementation, application of malaria interventions. The malaria surveillance system relies on the existing national DHIS2 platform in which all health facilities within the counties are expected to report.

The malaria data collected routinely is reported on weekly and monthly basis. This routine data is analyzed to draw trends in the malaria surveillance indicators monitored routinely and the results presented depict the current situation. The goal of the national malaria strategy is to reduce malaria incidence and deaths by 75% of the 2016 levels.

The Counties are encouraged to analyze their malaria data and develop similar malaria/health surveillance bulletins so as to use data to make decisions on planning/ better target deployment of the and implementation of targeted interventions, as we strive to achieve the goal of the Kenya Malaria strategy (2019 – 2023).



## Malaria Indicators performance

### Key statistics (the last 12 months and this Quarter)

	Malaria/ 1000 Pop	Malaria Deaths/100,000 Pop	TPR
Fiscal yr (Oct-Sep)	83	2.1 (Year 2019)	33.1%
This Quarter	19.9		34.8%

### Health Facility Surveillance Data

The DNMP has resolved to use OPD summaries to track malaria surveillance indicators data because of the gaps identified in the weekly IDSR surveillance reporting system previously used. The monthly OPD summary (MOH 705) has more comprehensive data from all service delivery points hence most reliable to monitor disease burden. Therefore, malaria incidence rates may not be comparable with previous bulletin publications. In this publication, we look at historical trends as well as provide annual surveillance statistics. We will continue to monitor performance of all the indicators with the baseline being 2016 as indicated in the Kenya Malaria Strategy 2019 - 2023.

The delivery of malaria services is anchored on availability of malaria commodities and health workers' adherence to treatment guidelines.

### Inpatient Indicators

#### 1. Malaria Admission as a proportion of All-cause Admission

Malaria inpatient data is reported by a proportion of admitting facilities and visualized in the Tracker platform of KHIS and are reported using discharge summaries as per the ICD-10/11 classification. According to data from KHIS Tracker, the Malaria accounted for 3%, 6% and 4% of all admissions in 2018, 2019 and 2020 respectively. Admissions have tended to increase in the peak malaria transmission period of **June-to-August**. In 2020, there were fewer admissions compared to 2019. This tracker is currently being implemented and with enhanced implementation we expect more facilities to report. To enhance surveillance, we will continue to monitor malaria inpatient indicators using the available data as we build

on

improving

the

platform.

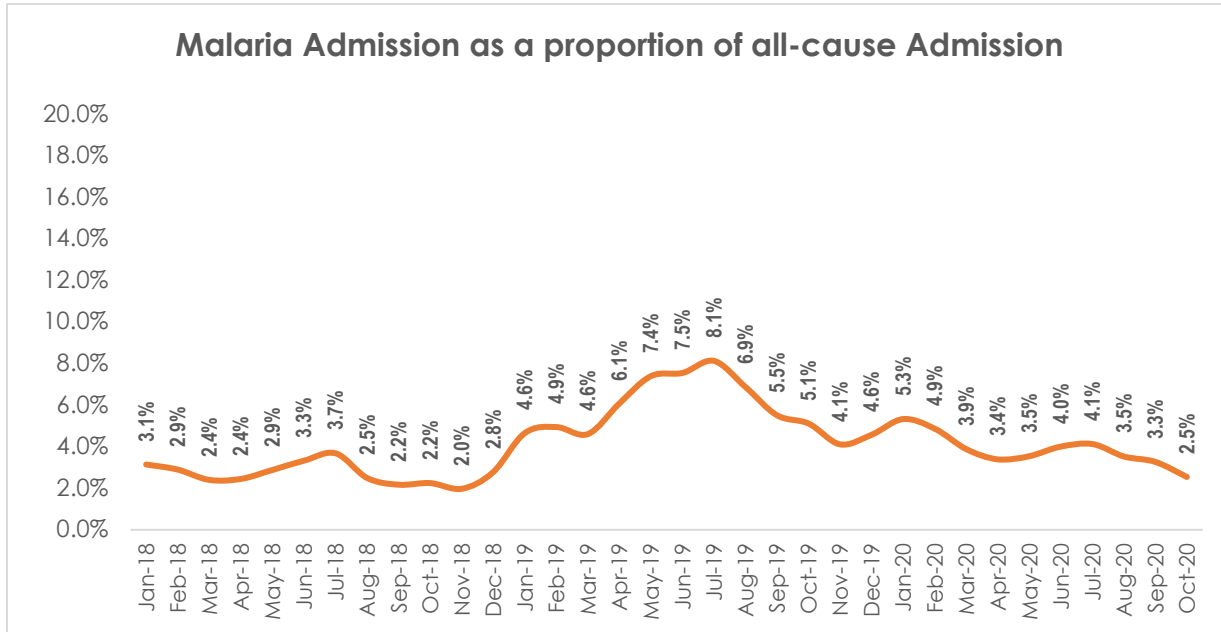


Figure 1a: Proportion of all hospital admissions treated for malaria, January 2018 to October 2020

## 2. Deaths due to Malaria

This is an extract of deaths due to malaria reported in KHIS tracker instance by admitting health facilities. In 2018, a total of 1,190 deaths due to malaria were reported and in 2019 the number of deaths due to malaria reduced to 1,043. This year by September 2020 we had recorded 814 deaths due to malaria reported by admitting health facilities in the country.

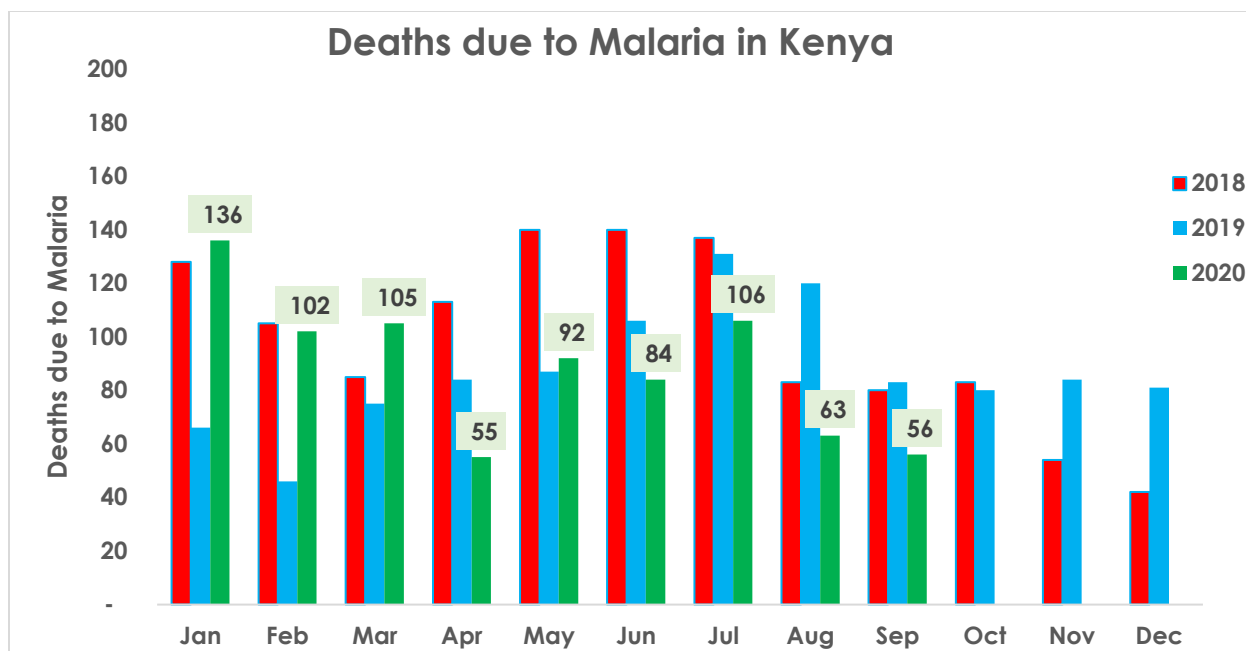


Figure 1b: Proportion of Deaths due to Malaria

## Outpatient Attendance

### 1. Proportion of OPD cases due to suspected malaria

Availability of malaria diagnosis and treatment commodities is key in determining performance of surveillance indicators. In endemic and epidemic prone areas, there is a need to ensure high availability of malaria diagnosis and treatment services. In the absence of either, then we miss the opportunity to effectively manage the suspected cases that present to the health facility/health provider. The suspected malaria cases will be tracked using the revised HIS tools that have recently been disseminated to the counties. This will help track the performance of this indicator in future.

### 2. Number of Malaria RDT kits used to test clients in Health Facilities

Availability of mRDTs especially in high burden areas is paramount in ensuring the T3 policy is adhered to especially in health facilities ‘without microscopy services’ (which are the majority) as well as community health units implementing malaria case management. All suspected cases presenting to a health provider should be tested before treatment and as such it appears not all cases may have been managed especially in periods where inadequate testing was implemented using RDTs. The dips reported in June to October 2017 corresponds to the health workers’ industrial action in Kenya. Dips were reported in October 2018, October 2019 to January 2020 mainly corresponding to periods with reported inadequate / stock-outs of malaria RDTs in most health facilities. The emergence of COVID-19 pandemic in Kenya in March 2020 resulted in reduced hospital attendance and/or delays in procurement of malaria commodities (ACTs and RDTs)

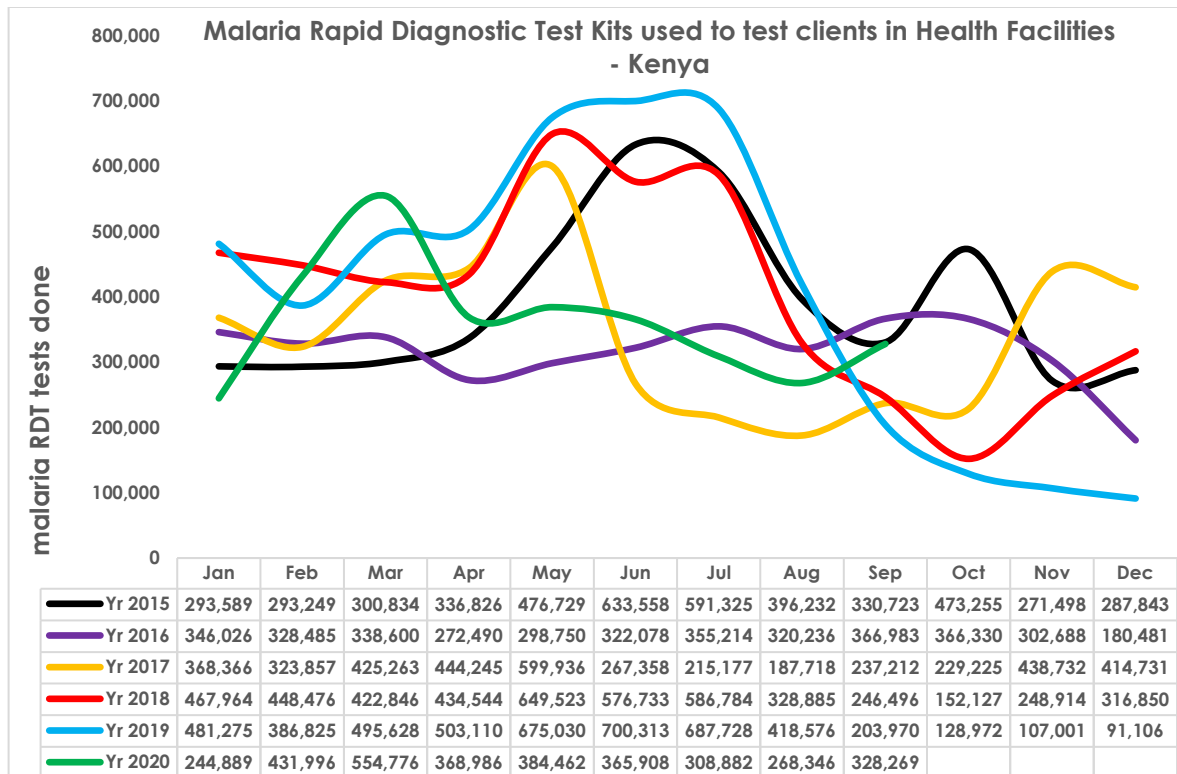


Figure 2a: Number of mRDTs dispensed while diagnosed in health facilities - Kenya

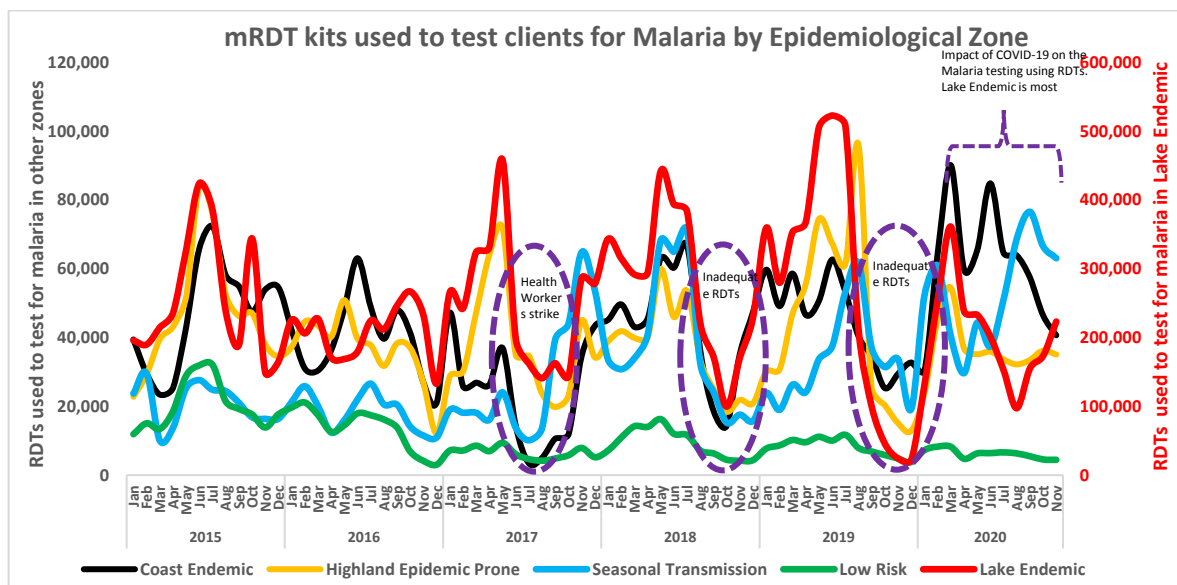
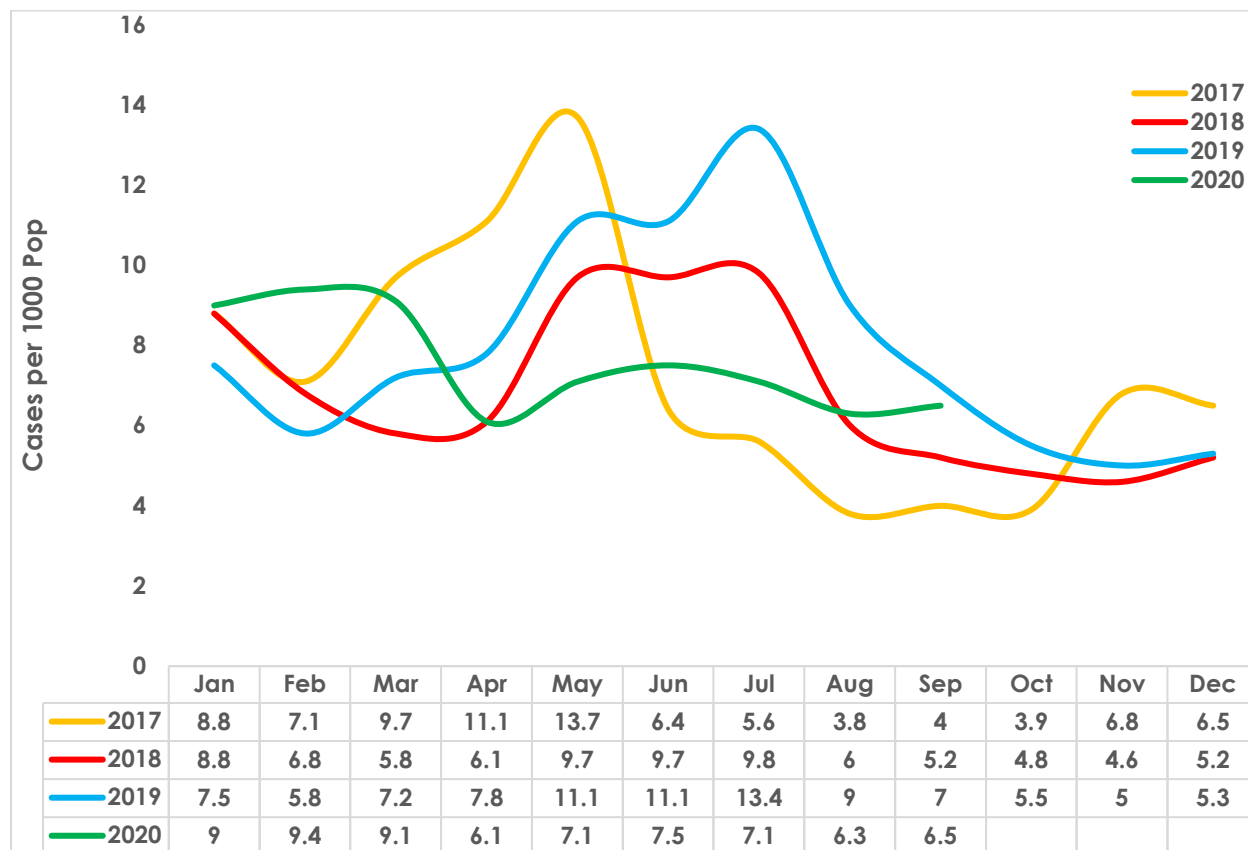


Figure 2b: Number of mRDTs dispensed while diagnosed in health facilities – Epidemiological zones

### 3. Trend in Incidence of Malaria

Malaria Incidence is the number of confirmed malaria cases identified by the surveillance system expressed as a proportion of the resident population (per 1,000 population).

Malaria is seasonal with the high transmission season being June to August of every year. In 2020, the monthly rates reduced from 9 cases per 1,000 population to less than 7 cases per 1000 population due to the impact of COVID-19 pandemic affecting health seeking behavior and/or malaria diagnosis.



Source: DHIS

Figure 3a: Confirmed Malaria cases per 1,000 population - Kenya

### **Confirmed Malaria Cases per 1,000 population by Epidemiological zones**

Due to COVID-19 pandemic, there were disruptions in provision of essential services, malaria included. This could have led to the reduced numbers of confirmed malaria cases in the epidemiological zones in Kenya.

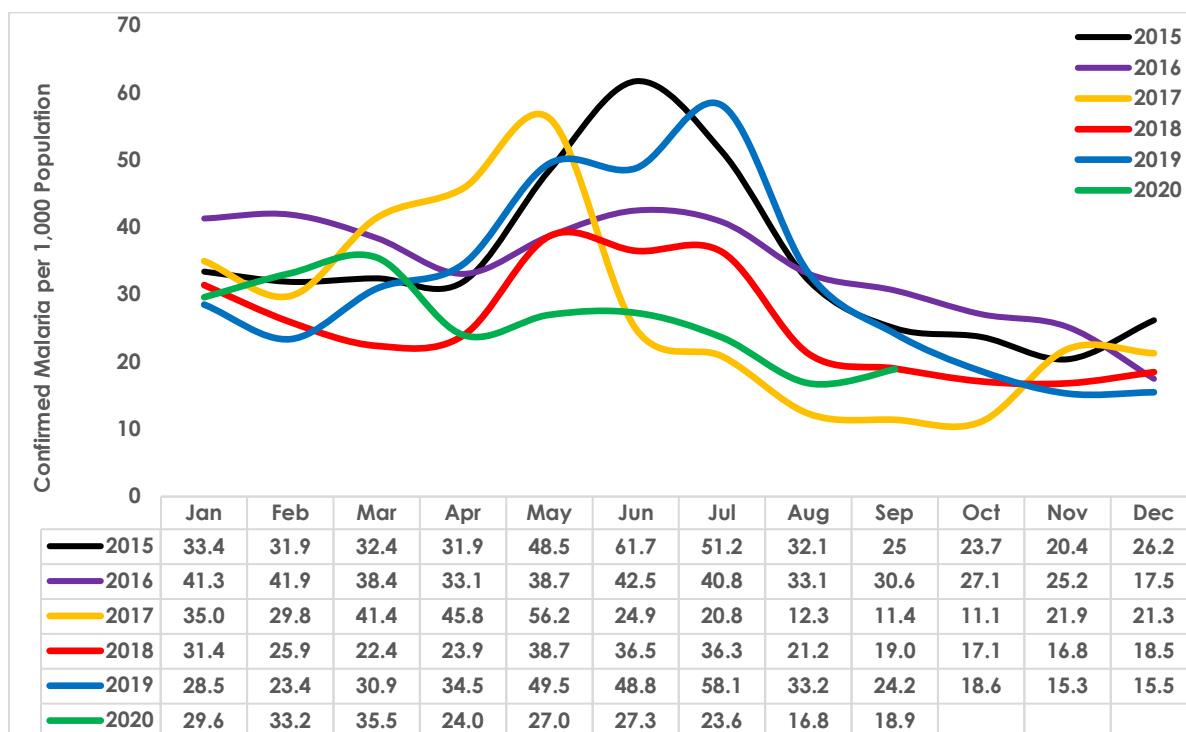
Table 2: Trend in monthly and annual malaria incidence by epidemiological zones, 2015 to 2020

<i>Epidemiological Zones</i>	Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Malaria Incidence	Projected Incidence 2020
<i>Lake Endemic</i>	2015	33.4	31.9	32.4	31.9	48.5	61.7	51.2	32.1	25	23.7	20.4	26.2	418.4	
	2016	41.3	41.9	38.4	33.1	38.7	42.5	40.8	33.1	30.6	27.1	25.2	17.5	410.2	
	2017	35.0	29.8	41.4	45.8	56.2	24.9	20.8	12.3	11.4	11.1	21.9	21.3	331.9	
	2018	31.4	25.9	22.4	23.9	38.7	36.5	36.3	21.2	19.0	17.1	16.8	18.5	307.7	
	2019	28.5	23.4	30.9	34.5	49.5	48.8	58.1	33.2	24.2	18.6	15.3	15.5	380.5	
	2020	29.6	33.2	35.5	24.0	27.0	27.3	23.6	16.8	18.9				235.9	
<i>Coast Endemic</i>	2015	21.6	12.2	8.4	6.7	9.9	17.7	18.2	15.2	14.9	11.8	9.6	14.7	160.9	
	2016	15	9.6	7	4.5	9.7	12	10.5	8.6	7.6	6.7	5.1	5.8	102.1	
	2017	9.3	4.4	3.9	3.3	7.2	4.4	4.9	3.5	3.2	3.1	7.6	10.4	65.2	
	2018	17.1	8.8	5.7	6.8	10.5	11.4	11.9	9.9	7.9	7.3	9	12.7	119.0	
	2019	13.8	7.1	5.8	3.7	4.4	6.9	8.1	6.3	6.9	5.5	7.4	10.4	86.3	
	2020	15	14.1	13.1	8.4	11.6	15.2	14.2	13.7	11.8				117.1	
<i>Highland Epidemic</i>	2015	6.2	6.3	7.3	7.3	10.1	12.9	11.9	7.2	5.7	5.2	4.2	5	89.3	
	2016	5.8	6	6.1	5.2	6.8	7.1	7.2	5.7	5.1	4.9	3.8	2.6	66.3	
	2017	4.3	3.7	6	9.6	10.6	4.9	4.4	3.1	2.6	2.9	3.3	3.1	58.5	
	2018	4.1	3.7	3.6	3.2	4.3	4.5	4.4	2.7	2.6	3	2.2	2.1	40.4	
	2019	2.8	2.6	3.2	3.8	5.9	5.3	5.9	4.3	3.8	3.6	2.8	2.7	46.7	
	2020	4.1	4.8	4	2.8	2.8	3.1	2.9	2.9	2.5				29.9	
<i>Seasonal Transmission</i>	2015	4.5	3.9	3.5	2.8	4.3	5.4	5.2	3.8	3	2.7	2.6	3.7	45.4	
	2016	8.3	5.5	3.6	2.3	4.4	5.4	6.3	5.8	5	2.6	1.9	1.6	52.7	
	2017	2.4	2	2.1	1.5	2.1	1.9	1.8	2.4	5	4.3	7.4	5.2	38.1	
	2018	3.1	2.3	2.1	2	3.9	5.5	6.2	3.6	2.5	1.8	1.4	1.3	35.7	
	2019	1.9	1.4	1.7	1.4	2	2.2	4.3	7.5	5.9	4.1	4.9	4.5	41.8	
	2020	6.4	5.5	3.4	2.4	3.2	3.2	4.8	7.5	7.6				44.0	
<i>Low Risk</i>	2015	1.5	1.3	1.5	1.3	1.4	1.3	1.3	0.97	0.99	0.87	0.69	0.77	13.9	
	2016	1.4	1.1	1	0.86	0.93	0.84	0.84	0.8	0.75	0.57	0.55	0.55	10.2	
	2017	0.94	0.56	0.69	0.71	0.9	0.59	0.53	0.5	0.69	0.45	0.5	0.51	7.6	
	2018	0.87	0.49	0.5	0.47	0.6	0.55	0.48	0.46	0.45	0.4	0.39	0.37	6.0	

Epidemiological Zones	Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Malaria Incidence	Projected Incidence 2020
	2019	0.64	0.45	0.51	0.43	0.61	0.53	0.7	0.54	0.51	0.48	0.36	0.59	6.4	
	2020	0.85	0.51	0.4	0.19	0.18	0.19	0.23	0.32	0.25				3.1	4.2
National	2015	10.5	9.4	9.3	8.9	13.1	17	14.8	9.7	7.9	7.2	6.1	8	121.9	
	2016	12.3	11.4	10.1	8.4	10.6	11.8	11.5	9.5	8.7	7.4	6.5	4.8	113.0	
	2017	8.8	7.1	9.7	11.1	13.7	6.4	5.6	3.8	4	3.9	6.8	6.5	87.4	
	2018	8.8	6.8	5.8	6.1	9.7	9.7	9.8	6	5.2	4.8	4.6	5.2	82.5	
	2019	7.5	5.8	7.2	7.8	11.1	11.1	13.4	9	7	5.5	5	5.3	95.7	
	2020	9	9.4	9.1	6.1	7.1	7.5	7.1	6.3	6.5				68.1	87.6

### Lake Endemic:

The number of confirmed cases of malaria per month per 1000 population in this zone reduced from 27 to 18 during the reporting period. The reduction may be due to insufficient diagnostics (mRDTs) during the reporting period.



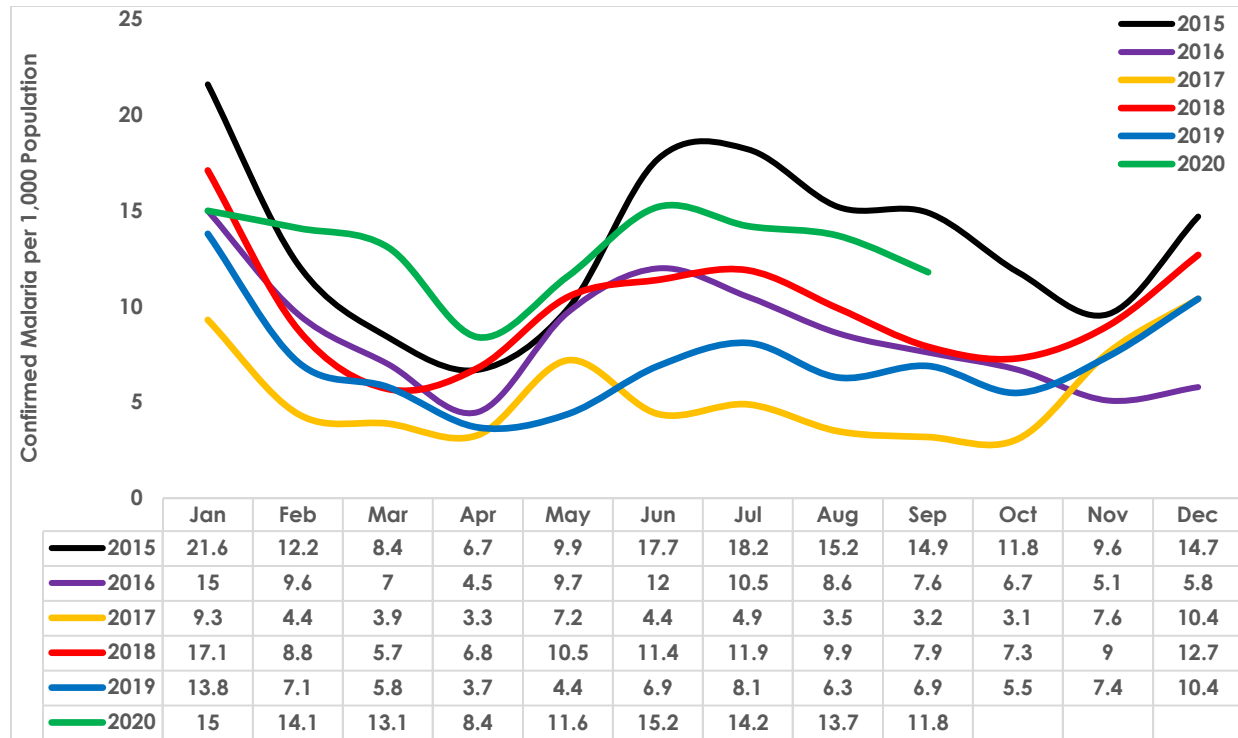
Source: DHIS

Figure 3b: monthly Confirmed malaria cases per 1,000 Population – Lake Endemic, 2015 to 2020



**Coast Endemic:**

This zone has two malaria transmission zones. The malaria cases in this zone remained relatively high at between 12 and 15 cases per month per 1,000 persons. This is the highest levels witnessed in this zone in the last four years.

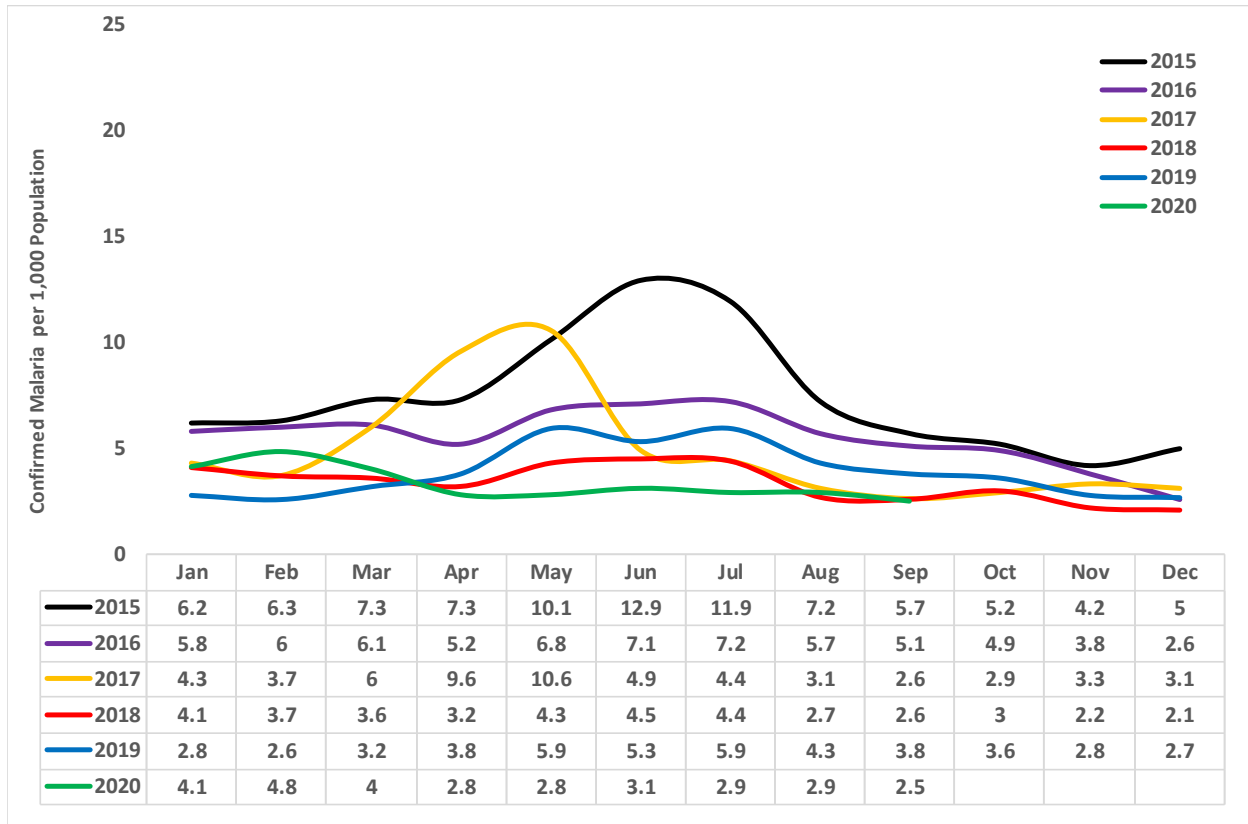


Source: DHIS

Figure 3c: monthly Confirmed malaria cases per 1,000 Population – Coast Endemic, 2015 to 2020

## Highland Epidemic

The rate in the highland epidemic zone remained low at 2.5 cases per 1,000 population.

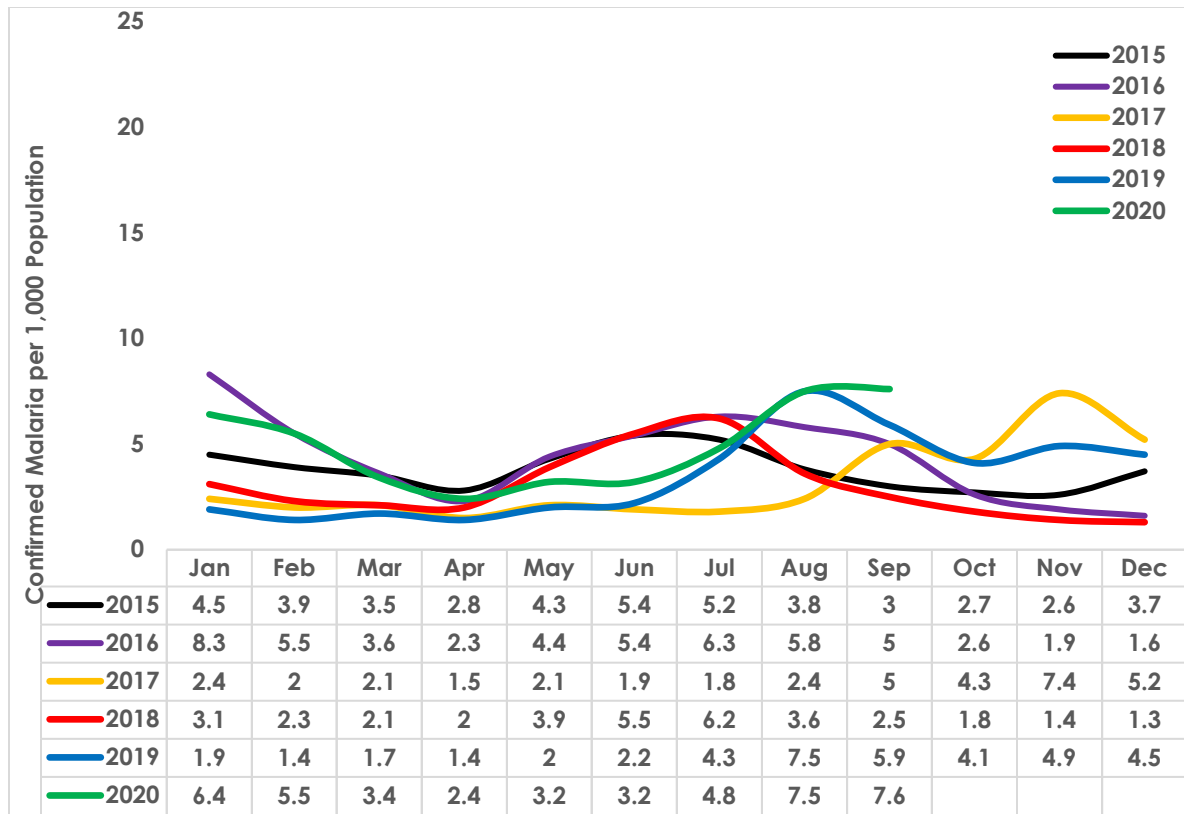


Source: DHIS

Figure 3d: Confirmed malaria cases per 1,000 Population – Highland Epidemic Prone, 2015 to 2020

### Seasonal Transmission Zone

In the seasonal transmission zone, there was an increase in the confirmed cases from 4.8 to 7.6 cases per 1,000 population

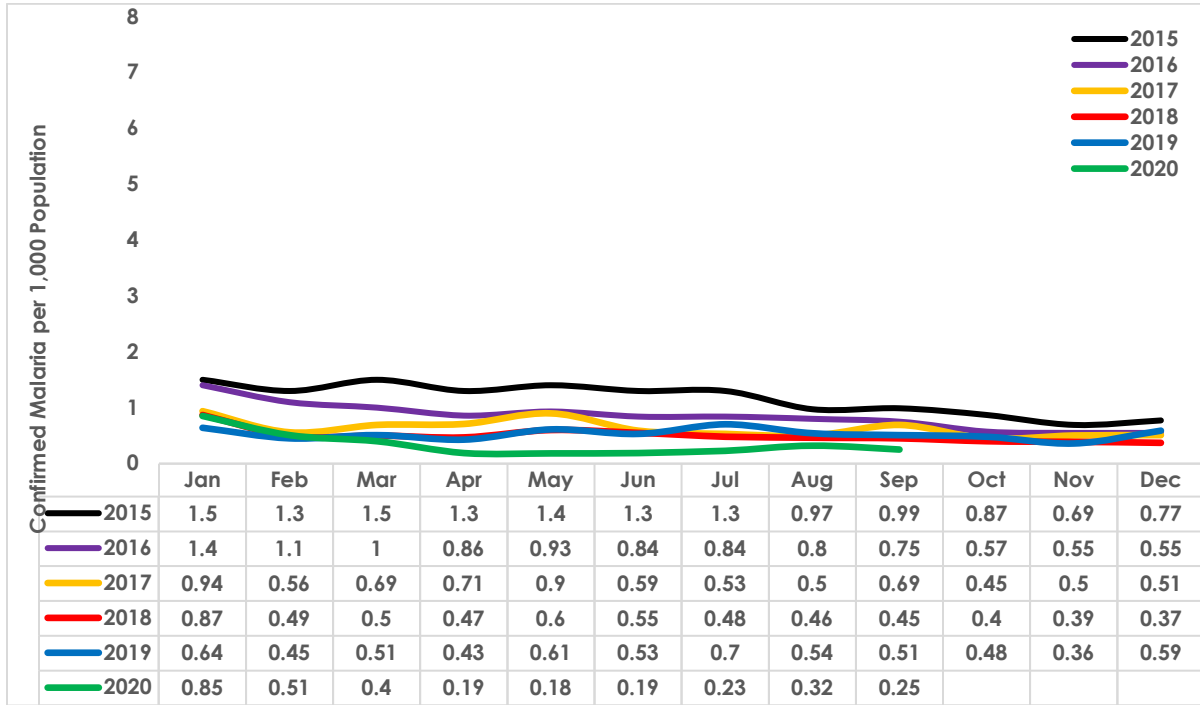


Source: DHIS

Figure 3e: Confirmed malaria cases per 1,000 Population – Seasonal Transmission, 2015 to 2020

### Low Risk Transmission zone

This zone has counties earmarked for malaria elimination and therefore enhanced surveillance is a priority. Few malaria cases reported in the better part of this year. The COVID mitigation measures barring population movement may have resulted in the few cases reported. This is an indication that this zone has very few cases.



Source: DHIS

Figure 3f: Confirmed malaria cases per 1,000 Population – Low Risk, 2015 to 2020

#### 4. Suspected malaria cases tested with parasite-based test

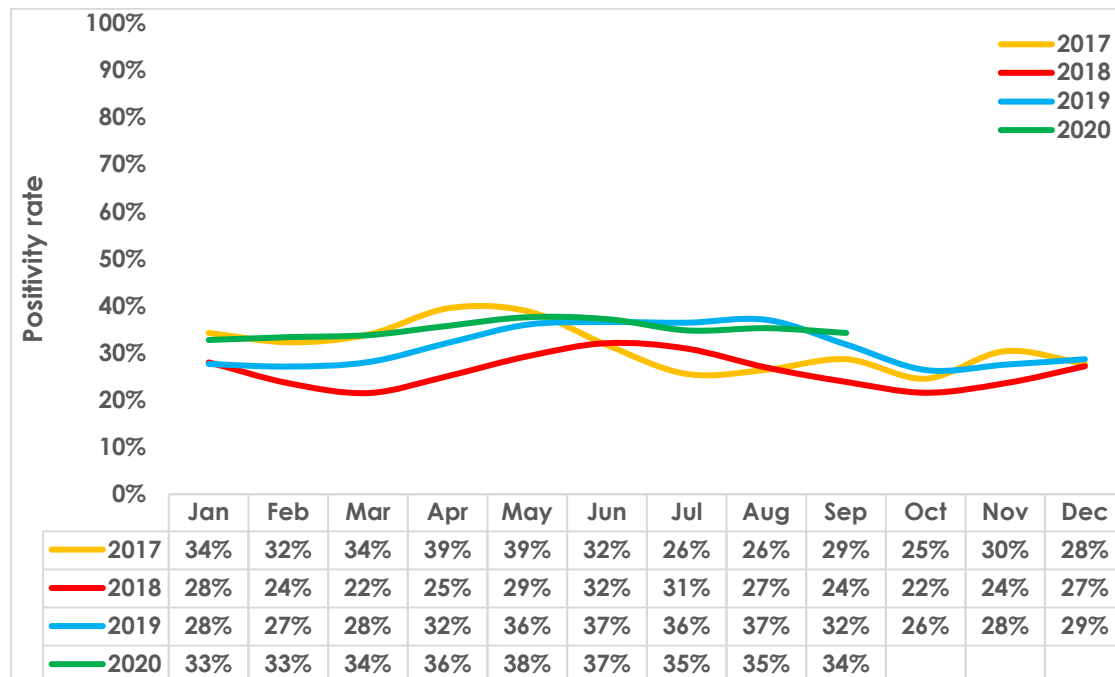
The national guidelines on prevention, diagnosis and treatment of malaria indicate that all suspected malaria cases should be subjected to a confirmatory test before treatment. The revised HIS tools have recently been distributed to health facilities. The program is keen on embarking in sensitization workshops to ensure standardization in reporting on all indicators including this indicator. Proper tracking of suspected malaria cases across all health facilities in the country will necessitate a working surveillance system as well as determine efficient quantification of diagnostic services by health facilities. The low stock levels of RDTs in-country has resulted in reduction in adherence to the guidelines.

In future bulletins, we will monitor the performance of this indicator immediately facilities commence reporting through the revised reporting tools

#### 5. Outpatient Test Positivity Rates among the under 5 years and all ages

Figure 3 presents the overall outpatient test positivity rates for all ages in Kenya in this current year and the previous years. This graph shows the trends with regard to the percentage of the malaria cases that tested positive against the total number of cases tested for parasites.

The national malaria test positivity rate for malaria is varied every year depending on deployment of interventions and climatic factors. During the reporting period, fewer malaria cases were reported with the positivity rate reducing from 38% in the previous quarter to 35% by September 2020.



Source: DHIS

Figure 5a: Outpatient Malaria TPR for all ages in Kenya

## Outpatient TPR for all ages by Epidemiological Zones

### Lake Endemic

The lake endemic zone has the highest malaria burden in the country accounting for more than two-thirds of the malaria cases reported nationally this financial year. In this zone four to five of every ten persons tested for malaria turn positive. The average test positivity rate for the period was 46%.

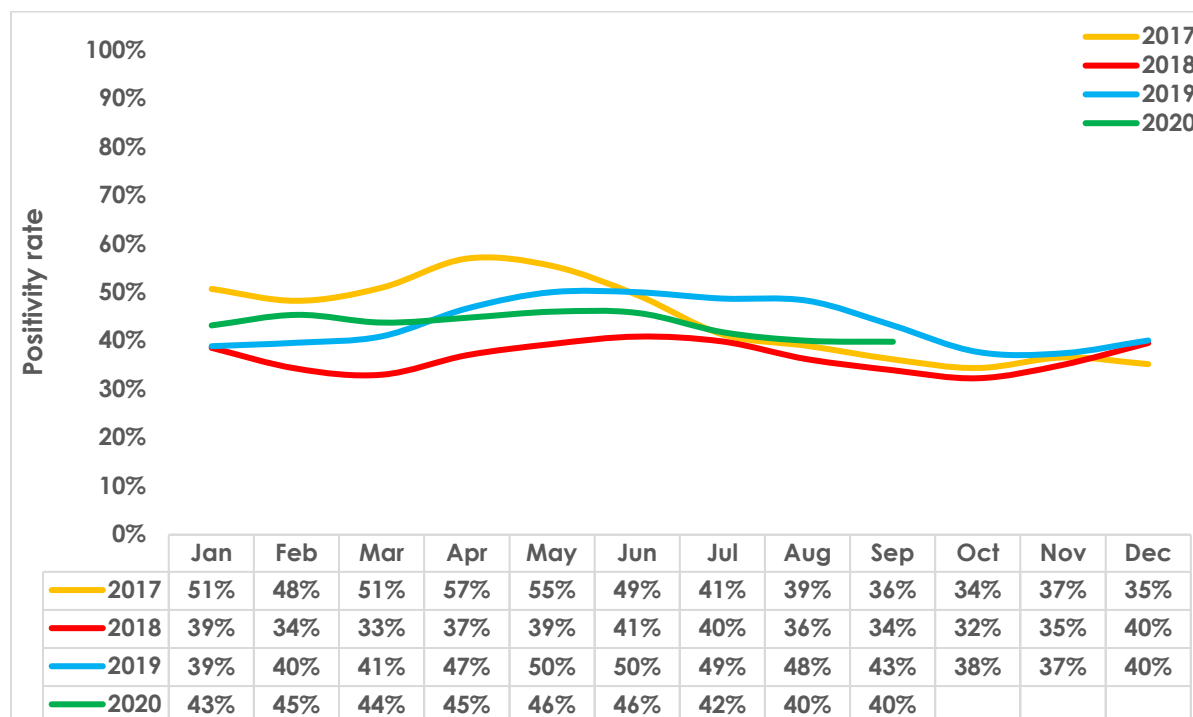
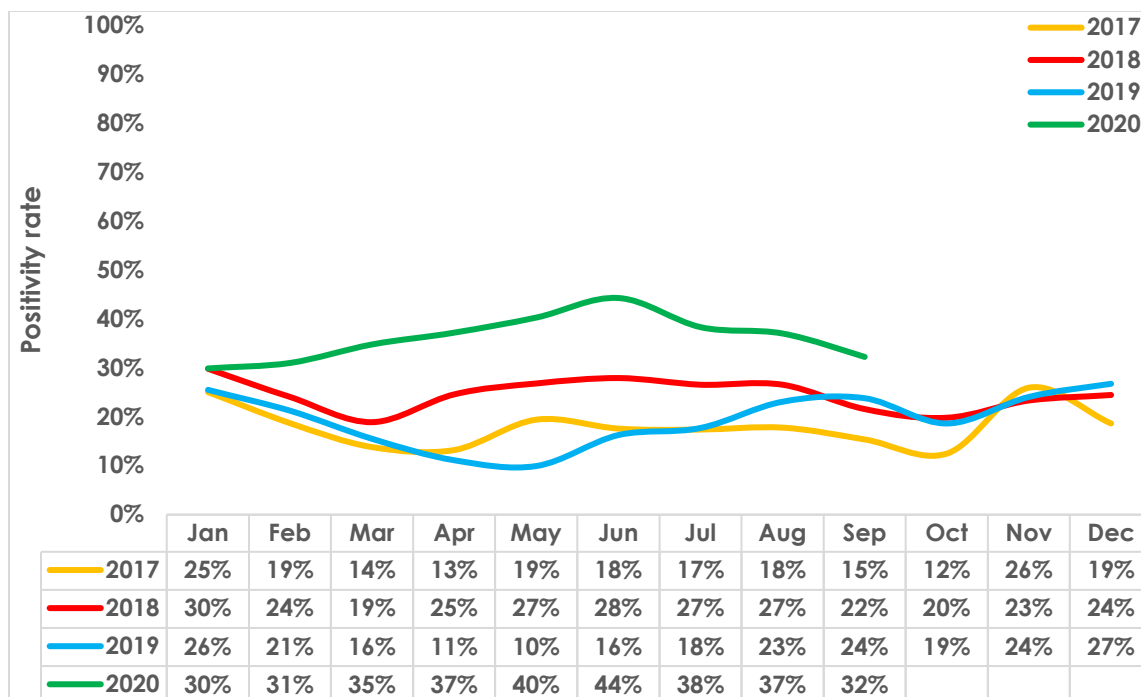


Figure 5b (i): Outpatient TPR for all ages by Epidemiological Zones - Lake Endemic

### Coast Endemic

The positivity rate this year is much higher compared to the levels reported in the last three years. Kwale and Kilifi counties contribute the highest malaria positivity rates in this region with the region accounting for an average of forty percent (40%). More interventions need to be deployed to this region to ensure malaria burden reduction and avoid resurgence in this region as has been recorded this year.



**Figure 5b (ii): Outpatient TPR for all ages by Epidemiological Zones - Coast Endemic**

### Seasonal Transmission

The seasonal malaria transmission zone has an erratic transmission pattern with cases reported following heavy rainfall and flooding. Counties in this zone are expected to identify sub-counties' sentinel facilities and monitor weekly thresholds in order to detect and respond to probable upsurges and avert epidemics and probable malaria mortalities. Counties in the northern Kenya (Baringo, Turkana Samburu and Marsabit) experienced elevated rainfall between March and July and therefore pockets of vector breeding sites may be available.

During the reporting period, this zone recorded an increase in malaria positivity rate from 31% in July to 42% in August and September.

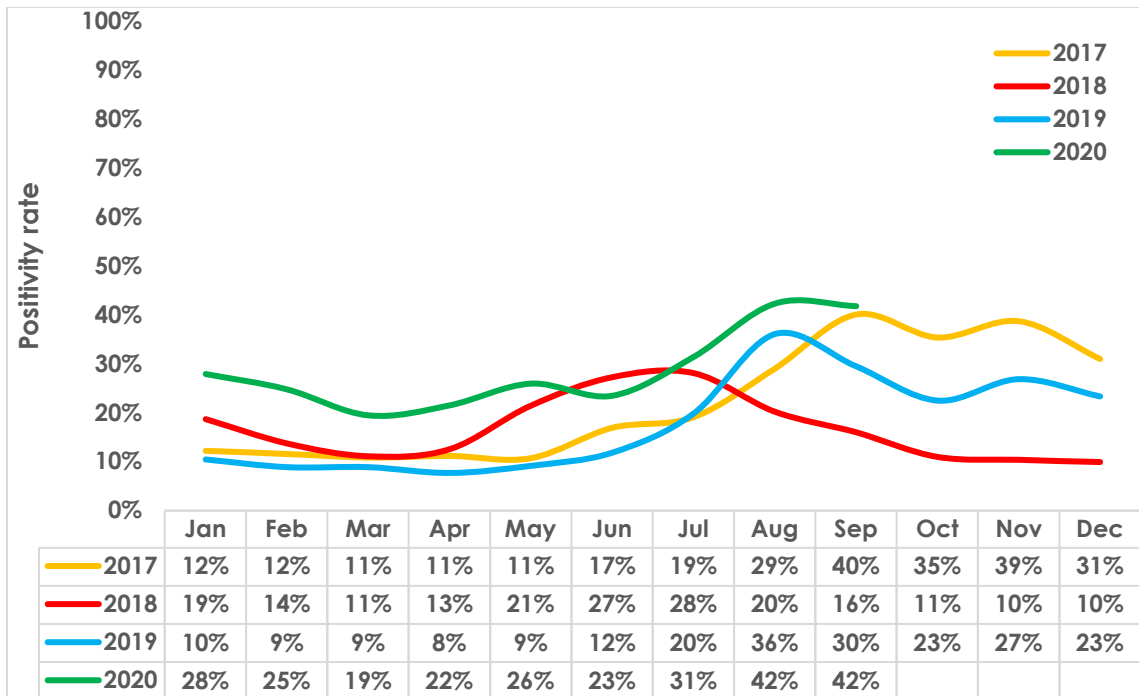


Figure 5b (iii): Outpatient TPR for all ages by Epidemiological Zones - Seasonal Transmission



### Highland Epidemic Prone

The positivity rate in this zone remained fairly low at 14% to 15% during the reporting period.

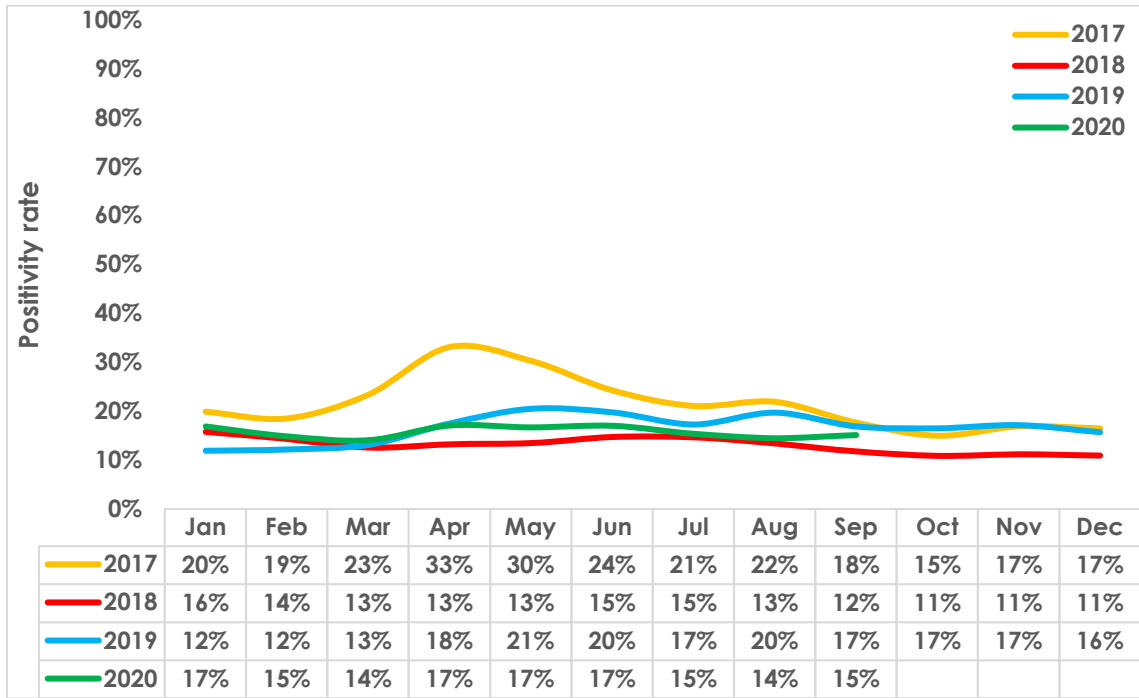


Figure 5b (iv): Outpatient TPR for all ages by Epidemiological Zones - Highland Epidemic Prone

### Low Risk

The positivity Rate in this zone remained low at 4%. The program is set to embark on setting up structures for intensified surveillance geared towards attaining subnational elimination of malaria for some of the counties in this zone.

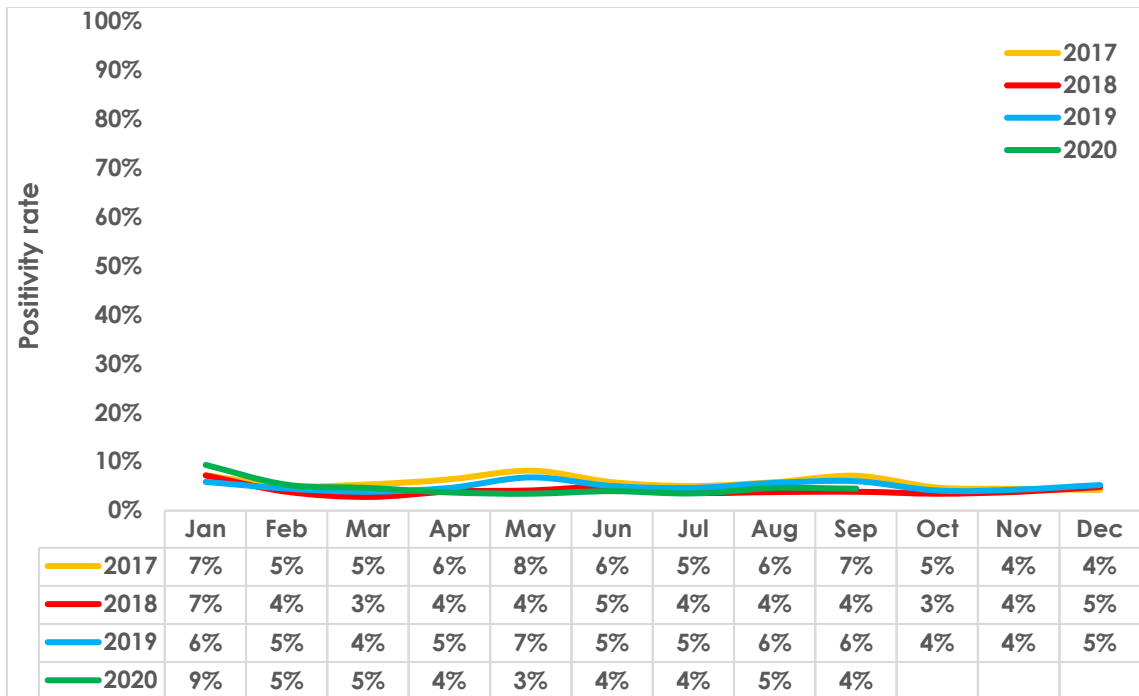
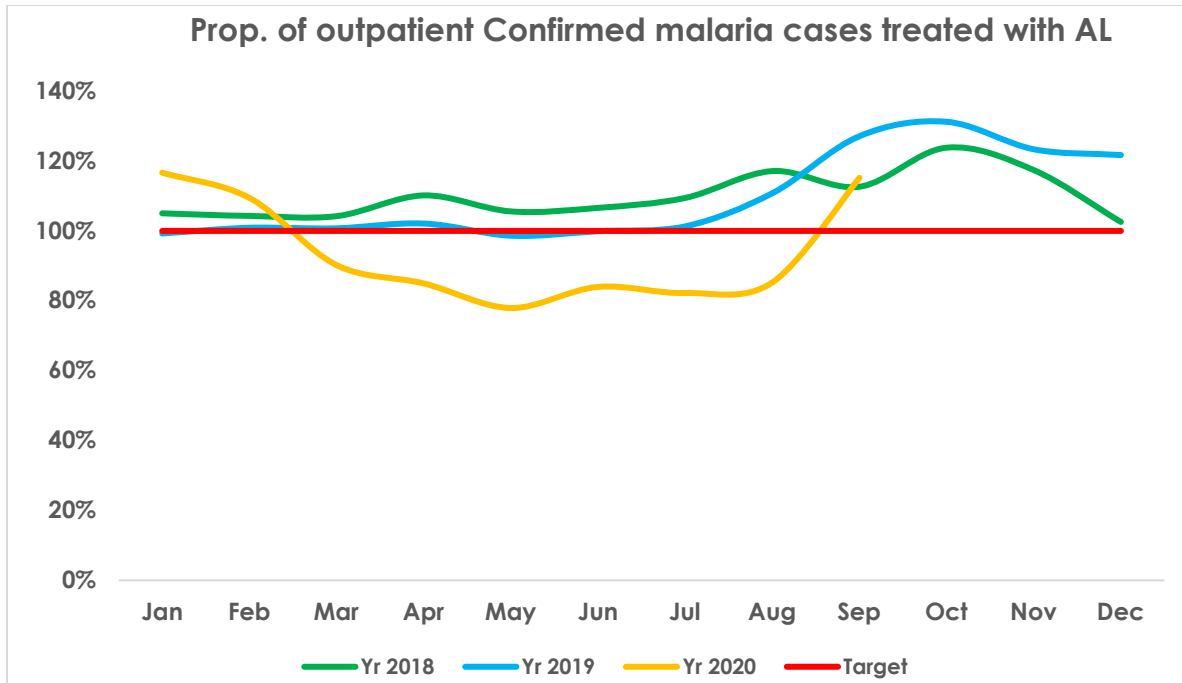


Figure 5b (v): Outpatient TPR for all ages by Epidemiological Zones – Low Risk

## 6. Coverage for Outpatients Treated with Artemisinin-Based Combination Therapy

Kenya has adopted the policy of testing suspected cases of malaria before treatment. The first line anti-malarial for uncomplicated malaria-AL, should only be administered to outpatients who are tested positive for malaria parasites using a parasitological test by either RDT or microscopy.

The proportion of cases treated for malaria compared with the confirmed malaria cases recorded in outpatient was optimal. However, the inadequate RDTs reported to have been dispensed may imply that we may have missed out on more malaria cases since the numbers tested were fewer than reported in previous years. At the same time, it's possible we did not treat every case since there were insufficient antimalarials at the central level. There is need to ensure the pipeline is secured with sufficient commodities to avert stock-outs and/or expiries and thus opportunities to manage malaria cases within our health facilities are not missed.



Source: DHIS

**Figure 6: Proportion of Outpatient confirmed malaria cases treated with AL**

### 7. Proportion of ANC clients issued with LLINs and CWC clients issued with LLINs

The prevention of malaria in pregnancy involves combination strategies that together are aimed at reducing maternal and perinatal morbidity and mortality occasioned by malaria. The strategies comprise the antenatal care (ANC) package that comprises at least two doses of intermittent preventive treatment for expectant mothers (IPT2) and provision of Long-Lasting Insecticide Nets (LLINs) in Endemic areas.

The number of LLINs issued to pregnant women at ANC and CWC reduced to less than 40% in the coast endemic zone and less than 20% in the epidemic prone zone. This was occasioned by stock-outs of LLINs recorded in most health facilities in the country. The replenishment of the LLINs focused on the Lake endemic zone yielding more than 100% since mothers and children who missed the LLINs in previous clinic visits were served together. There is need to fast track the delivery of LLINs to ensure the pregnant women and children under one year attending ANC clinics are issued with the malaria preventive intervention in LLINs.

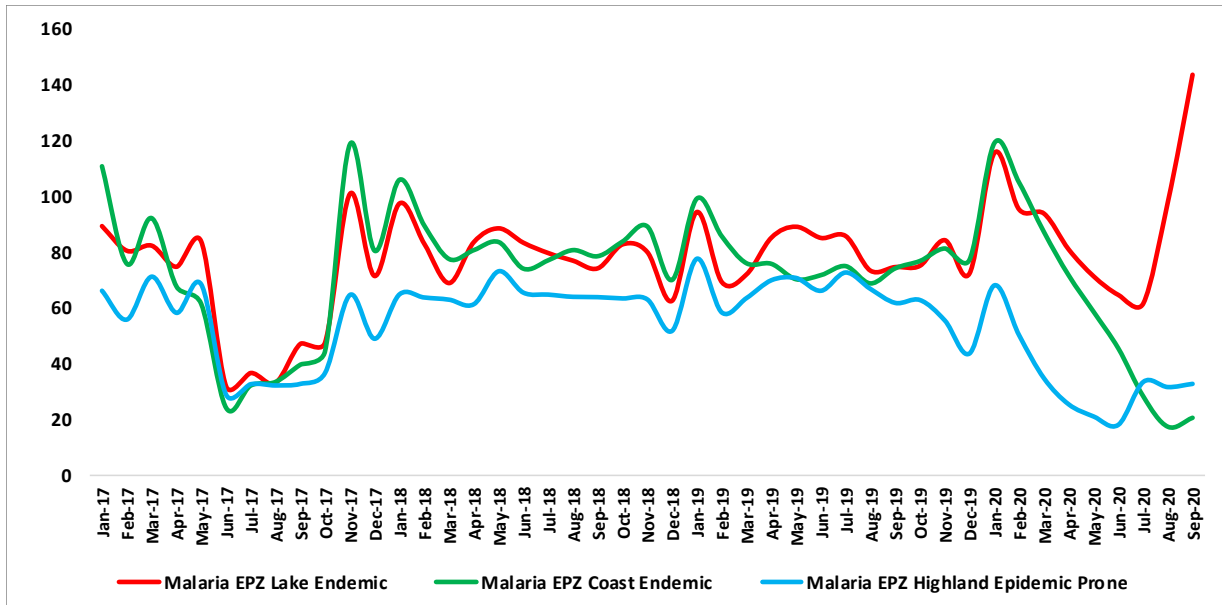
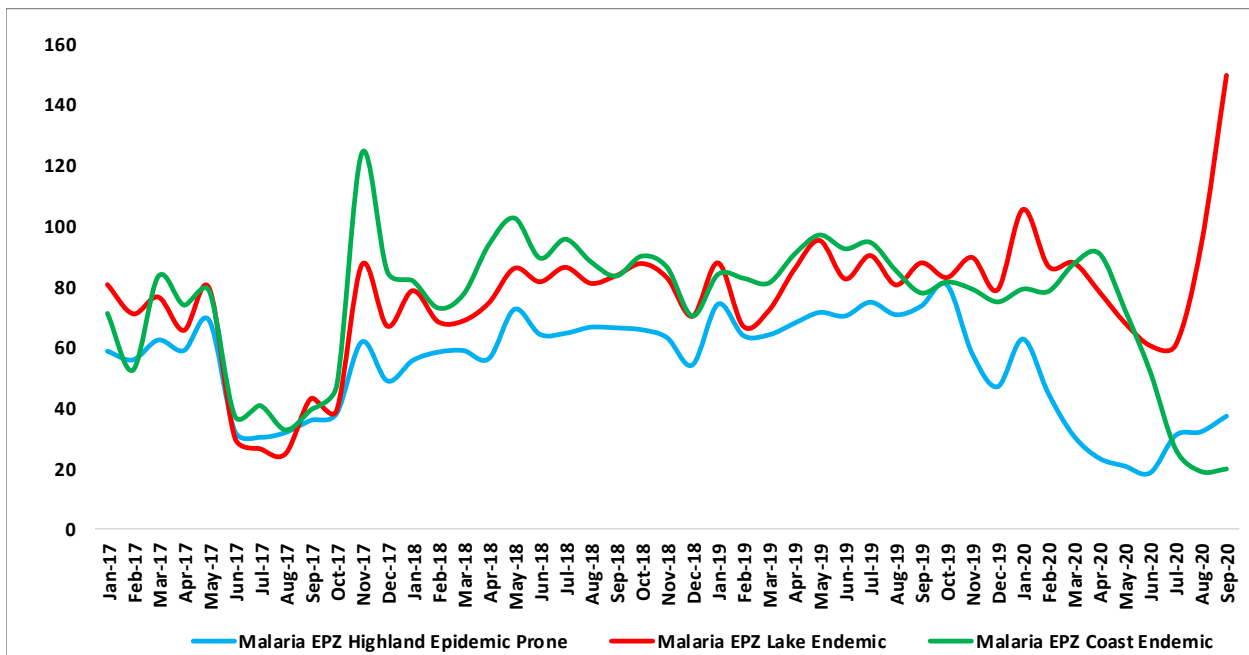
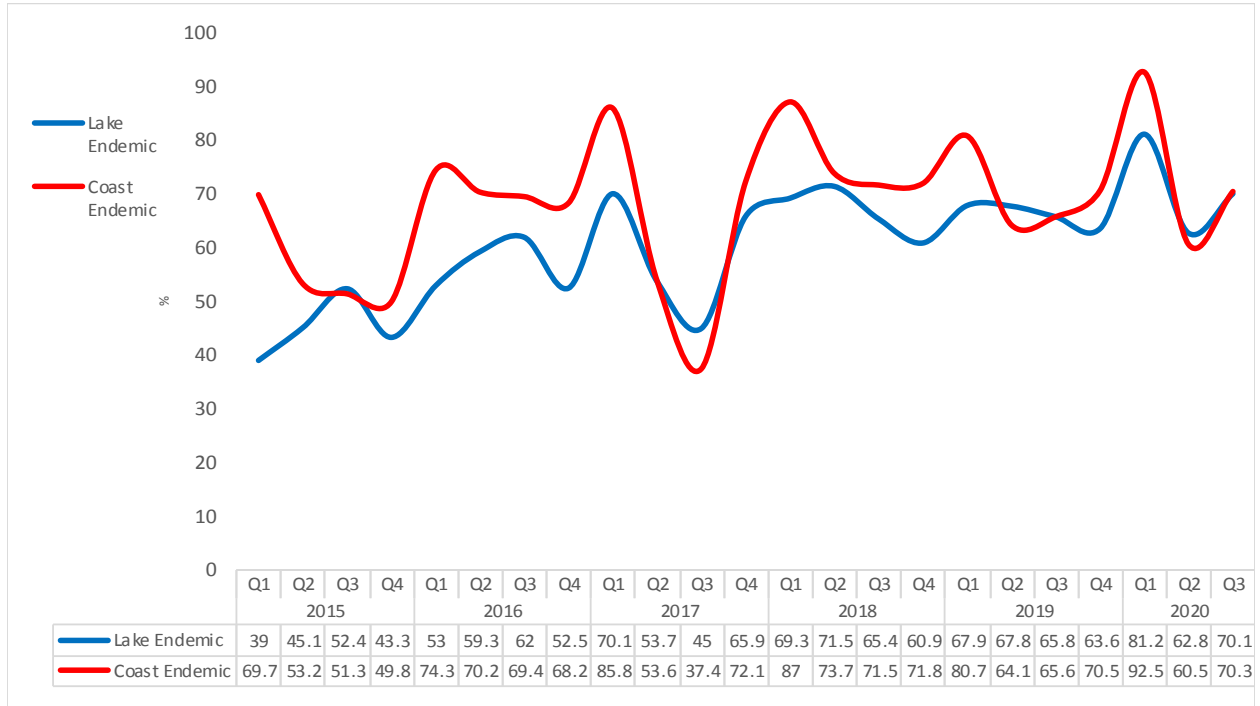


Figure 7a: Percentage of Antenatal Care Receiving Insecticide Treated Nets (LLINs) in Endemic and Epidemic prone areas



Source: DHIS

**Figure 7b: Percentage of Child Welfare Clinic clients Receiving Insecticide Treated Nets (LLINs) in Endemic and Epidemic prone areas**



**Figure 8: Percentage of Antenatal Care Clinics Clients Receiving Intermittent Presumptive Treatment in Pregnancy (IPTp 1) in Malaria Endemic Counties**



**Figure 9: Percentage of Antenatal Care Clinic Clients Receiving Intermittent Presumptive Treatment in Pregnancy (IPTp 2) in Malaria Endemic Counties**

## From the Counties

The Division of National Malaria Program (DNMP) derives surveillance monitoring and evaluation (SM&E) data from various routine data reporting forms all constituted within the Kenya Health Information Software (KHIS). The reporting performance presented in the tables captured here.

**Table 3a: Reporting Rates by County**

Table 1a indicates the counties monthly reporting rates and timeliness for malaria datasets.

County	% Reporting rate				% Reporting rate on time			
	MOH 705 A Outpatient summary < 5 years Reporting rate	MOH 505 IDSR Weekly Epidemic Monitoring Form Reporting rate	MOH 706 Laboratory Summary Report Reporting rate	MOH 743 Malaria Commodities Form Reporting rate	MOH 705 A Outpatient summary < 5 years Reporting rate on time	MOH 505 IDSR Weekly Epidemic Monitoring Form Reporting rate on time	MOH 706 Laboratory Summary Report Reporting rate on time	MOH 743 Malaria Commodities Form Reporting rate on time
Baringo	99.7	53.7	80.6	97	96.1	51.5	94.1	79.1
Bomet	94.6	91.6	94.2	83.7	94.4	90.8	83.4	92.6
Bungoma	99.1	92.3	99.6	100.2	98.8	91.9	99.8	98.8
Busia	93.2	97.1	101.2	100.7	93.2	86.4	100.3	101.2
Elgeyo Marakwet	94.1	97.6	88.2	89.8	94.1	97.3	84.4	88.2
Embu	100.2	86	93.5	100	100.2	83.8	100	85.8
Garissa	94.1	89.8	91.7	97.1	94.1	83.7	94.2	91.7
Homa Bay	96.5	67.7	90	98.4	95.4	66.6	92.3	77.4
Isiolo	75.2	74.4	67.9	86.5	71.4	70.3	56	48.1
Kajiado	83.2	90.9	86.6	96.8	82.6	90.1	94.2	74.1
Kakamega	92.9	99.7	99.4	98.5	92.5	99.7	97.7	99.4
Kericho	85.7	91.2	91.7	98.2	85	89.7	96.8	90.6
Kiambu	97.2	47.8	92.7	86.5	94.9	47.2	60.9	90.2
Kilifi	92.2	77.4	91	96.8	92.1	72.5	91	90.4
Kirinyaga	84.1	76.6	88.4	99	83.2	76.5	96.9	82.8
Kisii	90	95.3	93.9	93.9	88.9	95	93.3	91.7
Kisumu	94.2	71.1	100.3	100.2	93.8	70.6	98.9	100.3
Kitui	94.7	92.5	88.5	91.6	86.1	92.5	80.9	78.8
Kwale	94.9	65.4	97.2	99.2	90.6	65.3	96	92
Laikipia	97	54.3	92.4	90.3	96.5	54.3	89.5	80.3
Lamu	92.9	93.3	88.9	80	91.7	93.3	78.1	81.5
Machakos	89.9	79.4	93.9	95.8	87	77.4	94.2	87.5
Makueni	93.1	100	100	98.2	93.1	100	98.2	100
Mandera	79.4	58.5	67.5	53.2	76.9	58.5	50.2	64.3
Marsabit	81	53.8	41.5	93.7	79.7	52.2	92.9	39.3
Meru	84.9	94.9	92.6	92.7	84.3	94.9	90.8	91.6
Migori	94.2	97.6	99.7	99.3	94.1	96.8	96.6	99
Mombasa	92.1	64.7	100	98.5	91.5	54.6	97.8	98.1
Muranga	79.7	64.6	98	88	79.1	60.3	85.1	96.6
Nairobi	71.2	39.6	63.5	100	65.9	29.4	92.6	56.6
Nakuru	88.4	86.9	99.6	92.1	88.3	85.4	91.1	99.6

County	% Reporting rate				% Reporting rate on time			
	MOH 705 A Outpatient summary < 5 years Reporting rate	MOH 505 IDSR Weekly Epidemic Monitoring Form Reporting rate	MOH 706 Laboratory Summary Report Reporting rate	MOH 743 Malaria Commodities Form Reporting rate	MOH 705 A Outpatient summary < 5 years Reporting rate on time	MOH 505 IDSR Weekly Epidemic Monitoring Form Reporting rate on time	MOH 706 Laboratory Summary Report Reporting rate on time	MOH 743 Malaria Commodities Form Reporting rate on time
Nandi	95.4	84.6	100.6	98.8	93.7	79.2	98.6	100.3
Narok	95.9	69.3	71.7	90.3	95.1	69.3	85	62.9
Nyamira	97.6	74.4	96	92.9	97.6	74.4	92.9	95.6
Nyandarua	79.6	76.4	96.2	98.4	79.6	76	98	78
Nyeri	95.5	81.6	104.4	99.7	94.9	81.1	93	103.6
Samburu	90.5	47.4	62.7	89.9	88.1	47.4	88.6	60
Siaya	99.3	87.4	96.6	100	98.9	87.1	99.2	94.8
Taita Taveta	91.7	81.4	94.1	89.6	90.7	79.3	89.1	89.8
Tana River	94.1	48.2	48.6	97.6	88.2	28.9	76.2	40.5
Tharaka Nithi	98.1	97	99.7	89.3	97.6	96.7	87.7	99.3
Trans Nzoia	97.7	88.2	90.3	90.6	97.2	85.9	85	88.9
Turkana	93.4	94.2	90.7	96.8	90.3	91.2	93.4	81.4
Uasin Gishu	94.9	90.9	86.5	98.6	94.6	90.4	96.7	86.2
Vihiga	94.3	95.8	100.5	100	93.2	95	99.5	100
Wajir	91.9	87	84.4	90.4	90	86.7	86.7	84.4
West Pokot	98.4	91	99.3	94.8	98.2	90.6	94	99.3
<b>KENYA</b>	<b>90.8</b>	<b>79.2</b>	<b>90.9</b>	<b>94.7</b>	<b>89.2</b>	<b>77</b>	<b>87.4</b>	<b>91.2</b>

Source: DHIS

### Confirmed Malaria Cases per 1,000 persons per Year.

Siaya, Busia and Kakamega counties have the highest malaria incidence in the country. Kisumu, Kwale and Turkana counties have also reported high malaria incidence. This implies that malaria burden is not confined in one zone and therefore there is need to enhance malaria interventions to these zones.

Table 3b: Confirmed Malaria Cases per 1,000 Population per Year

		Confirmed Malaria cases Per 1000 Population Per Year 2012 - 2020								
	County \ Period	Yr 2012	Yr 2013	Yr 2014	Yr 2015	Yr 2016	Yr 2017	Yr 2018	Yr 2019	Projected 2020
1	Siaya	209.5	416.9	498.4	533.6	586.1	449	517.8	615.3	570.0
2	Busia	184.3	362.1	530.3	464.8	418.3	381.4	481.2	575.8	421.2
3	Turkana	79.6	97.5	129.8	94.4	193.1	175	152.7	193.2	392.2
4	Kakamega	90.9	193.3	263.2	483.7	353.6	406.5	294.6	447.6	305.7
5	Kisumu	117.7	255	293.6	330.8	413.8	289.6	309.2	309.1	297.3
6	Kwale	83.6	104	177.5	344.2	218.9	126.5	283.2	161.6	266.2
7	Migori	103.4	257.9	408.4	386	428.8	234.6	217.4	249.7	240.7



Confirmed Malaria cases Per 1000 Population Per Year 2012 - 2020										
	<i>County \ Period</i>	<i>Yr 2012</i>	<i>Yr 2013</i>	<i>Yr 2014</i>	<i>Yr 2015</i>	<i>Yr 2016</i>	<i>Yr 2017</i>	<i>Yr 2018</i>	<i>Yr 2019</i>	<i>Projected 2020</i>
8	Vihiga	121.6	262.3	257.2	357.2	331.3	299.8	208	323.3	<b>238.3</b>
9	Kilifi	71.5	88.1	112.4	171.4	97.7	55.3	102	101	<b>198.0</b>
10	Bungoma	114	169.2	253.9	300.3	219.4	210.1	189.2	318.4	<b>177.5</b>
11	West Pokot	20.9	74.9	152	168.9	167.9	91.3	69.1	115.1	<b>149.0</b>
12	Homa Bay	102.8	279.9	346.6	371.9	476	327.9	197.3	99.6	<b>105.7</b>
13	Baringo	31.6	44.1	42.1	46.8	48.4	46.7	58.2	53.9	<b>91.7</b>
14	Trans Nzoia	97.5	127.3	115.9	125.5	93.8	95.6	77	95.5	<b>76.6</b>
15	Elgeyo Marakwet	20.8	32	16.2	51	64	26.5	27.2	36.9	<b>63.8</b>
16	Nandi	33.3	52	67.2	101	76.3	58.4	62.5	67.2	<b>47.7</b>
17	Samburu	33.5	45.3	38.3	37.2	35.1	21.1	52.3	51	<b>35.1</b>
18	Kisii	42.3	55.7	105.8	116.7	88.2	59.6	45.5	35.9	<b>34.7</b>
19	Kericho	38.8	51.9	34.4	44.7	33.4	28.3	27.8	24.9	<b>33.8</b>
20	Mombasa	98.3	85.3	68.1	72.5	59.1	49.1	52.8	36.6	<b>29.8</b>
21	Nyamira	17.3	17.5	41.6	54	52.8	39	22.4	23.5	<b>28.3</b>
22	Tana River	60.2	49.6	43.5	76.4	45.4	28.4	33.8	16.4	<b>23.9</b>
23	Isiolo	103.7	96	78.2	57.6	75.3	24.3	41.2	39.2	<b>23.7</b>
24	Uasin Gishu	50.5	55.7	75.3	76.4	45.5	45.6	27.5	26.6	<b>15.3</b>
25	Narok	15	21	26.4	26.6	20.1	12.3	10.4	14.2	<b>14.2</b>
26	Marsabit	16.6	13.9	16	16.2	14.5	21.4	11	5.4	<b>11.8</b>
27	Tharaka Nithi	203.7	178.5	138.1	87.3	59	23.4	19.2	12	<b>10.3</b>
28	Nairobi	40.5	33.5	16.2	12.5	12.5	11.3	9.1	10.8	<b>7.9</b>
29	Nakuru	59.8	49.9	43	30.5	23.3	16.8	12.4	12.9	<b>7.2</b>
30	Kajiado	33.9	33.6	32	20	15.9	13.6	11.2	8.7	<b>6.1</b>
31	Garissa	26.5	18.5	20.4	19.5	13.8	11.1	12.4	5.1	<b>6.0</b>
32	Taita Taveta	56.3	30.4	32.3	18.6	9.1	6.7	9	7.3	<b>5.2</b>
33	Kitui	83.1	81.7	58.3	33.2	21	5.4	5.4	2.7	<b>5.0</b>
34	Meru	176.2	93	133.7	47.8	26.9	12.7	9	6	<b>4.0</b>
35	Lamu	20.2	19.8	21.2	3.9	4.2	10	8	4.6	<b>3.2</b>
36	Embu	229.6	173	70.5	43.2	21.1	6.1	6.6	2.8	<b>2.4</b>
37	Bomet	7.7	9	6.7	8.5	7.7	3.5	2.3	2.3	<b>2.3</b>
38	Kiambu	22.4	12.6	7.9	5.2	3.7	3.6	2.9	3.9	<b>1.9</b>
39	Laikipia	57	35	23.3	19.2	7.2	6	4.4	1.9	<b>1.6</b>
40	Machakos	28	15.4	10.1	4.9	3.5	3.2	2.7	2.8	<b>1.5</b>
41	Makueni	72.9	42.2	14	7.4	2.3	1.4	1.9	1.4	<b>1.5</b>
42	Mandera	22.6	3.7	5.6	6	3.9	1.1	2.3	2.1	<b>1.4</b>
43	Wajir	48.6	29.4	15.8	6.7	3.5	1.2	0.72	0.37	<b>0.8</b>
44	Nyeri	4.1	0.68	0.34	0.38	0.73	0.67	0.39	0.52	<b>0.5</b>
45	Kirinyaga	6.4	5.5	2.3	0.45	0.41	0.47	0.35	0.23	<b>0.4</b>

Confirmed Malaria cases Per 1000 Population Per Year 2012 - 2020										
	County \ Period	Yr 2012	Yr 2013	Yr 2014	Yr 2015	Yr 2016	Yr 2017	Yr 2018	Yr 2019	Projected 2020
46	Nyandarua	42.8	12.7	7.2	4.1	2.1	1.1	0.89	0.85	0.4
47	Muranga	4.5	2.7	0.84	0.5	0.41	0.21	0.36	0.41	0.3
<b>KENYA</b>		<b>70.3</b>	<b>94.7</b>	<b>106.4</b>	<b>122</b>	<b>112.6</b>	<b>87.5</b>	<b>82.4</b>	<b>95.7</b>	<b>87.6</b>

Source: DHIS

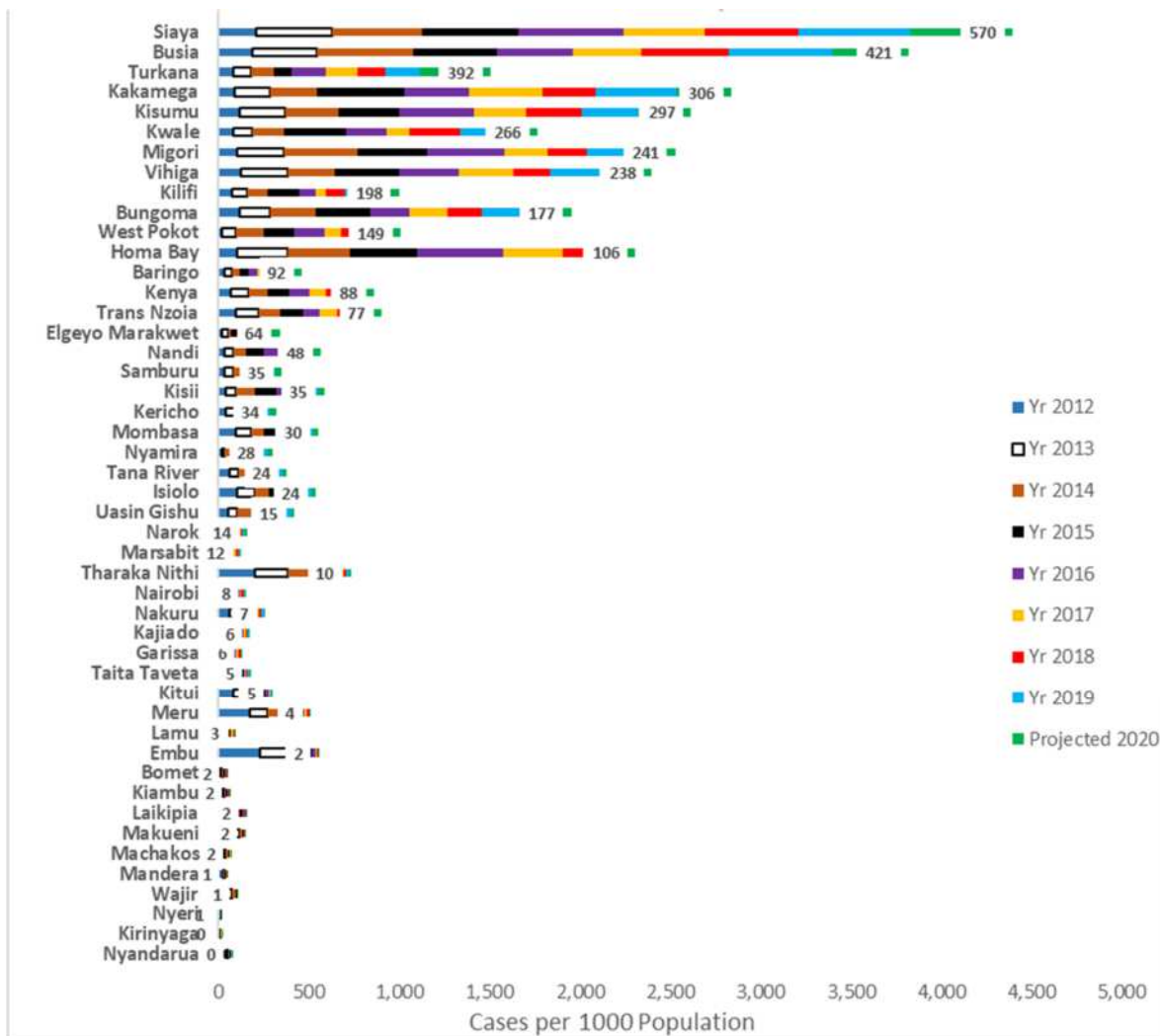


Figure 9: Annual Malaria Incidence 2012 to 2020 (2020 is a projection)

## Malaria Treatment in the Community

The malaria high burden region undertakes management of uncomplicated malaria within the community through community health volunteers (CHVs). Eight counties in the lake endemic region have been implementing this. Data is uploaded in the DHIS by the CHEW on a monthly basis in each CHU aggregates into the summary displayed in Table: 1c

**Table 4: Treatment of malaria in the Community - quantity dispensed**

Month	CHEW artemether-lumefantrine 6s	CHEW artemether-lumefantrine 12s	CHEW artemether-lumefantrine 18s	CHEW artemether-lumefantrine 24s	CHEW malaria RDTs
Jan-19	9,570	19,014	3,013	10,591	65,644
Feb-19	11,095	19,589	2,799	11,035	56,550
Mar-19	11,687	12,985	10,231	13,264	59,462
<b>Quarter 3</b>	<b>32,352</b>	<b>51,589</b>	<b>16,043</b>	<b>34,890</b>	<b>181,656</b>
Apr-19	11,702	34,049	6,104	15,341	76,783
May-19	14,662	30,548	8,195	14,071	68,536
Jun-19	12,080	24,745	7,816	13,246	71,407
<b>Quarter 4</b>	<b>38,444</b>	<b>89,342</b>	<b>22,115</b>	<b>42,658</b>	<b>216,726</b>
Jul-19	8,646	21,705	7,419	13,801	59,802
Aug-19	3,562	12,758	3,075	6,714	33,683
Sep-19	1,013	4,000	1,467	3,608	16,271
<b>Quarter 1</b>	<b>13,221</b>	<b>38,462</b>	<b>11,960</b>	<b>24,123</b>	<b>109,756</b>
Oct-19	997	1,961	902	1,826	8,218
Nov-19	280	921	367	1,599	4,834
Dec-19	106	888	116	668	2,684
<b>Quarter 2</b>	<b>1,383</b>	<b>3,769</b>	<b>1,386</b>	<b>4,093</b>	<b>15,736</b>
Jan-20	1,153	2,150	663	4,259	6,451
Feb-20	6,946	3,692	1,693	2,671	15,766
Mar-20	10,700	3,476	2,309	2,808	20,485
<b>Quarter 3</b>	<b>18,799</b>	<b>9,317</b>	<b>4,665</b>	<b>9,738</b>	<b>42,702</b>
Apr-20	10,406	2,362	1,532	1,992	16,323
May-20	6,412	1,999	926	1,209	11,565
Jun-20	6,686	1,393	915	1,323	10,675
<b>Quarter 4</b>	<b>23,504</b>	<b>5,754</b>	<b>3,374</b>	<b>4,524</b>	<b>38,563</b>
Jul-20	6,327	769	666	1,456	9,474
Aug-20	5,231	757	490	1,318	9,636
Sep-20	6,301	3,313	2,104	6,658	24,206
<b>Quarter 1</b>	<b>17,859</b>	<b>4,839</b>	<b>3,261</b>	<b>9,432</b>	<b>43,316</b>

Source: DHIS

**Table 5a: Fiscal year Malaria incidence and average monthly incidence**

<b>Fiscal Year (Oct-Sep)</b>	<b>Annual Malaria Incidence (FY Oct – Sep)</b>	<b>Average monthly incidence per year</b>
2015/2016	116.9	9.7
2016/2017	90.9	7.6
2017/2018	86.4	7.2
2018/2019	96	8.0
<b>2019/2020</b>	<b>83.2</b>	<b>6.9</b>

Source: DHIS

**Table 5b: Fiscal year monthly average monthly incidence per quarter**

<b>Quarterly Malaria Incidence and monthly average per quarter</b>								
<b>Year</b>	<b>Quarterly Malaria Incidence</b>				<b>Average Malaria monthly Incidence for the Quarter</b>			
	<b>Jan - Mar</b>	<b>Apr - Jun</b>	<b>Jul - Sep</b>	<b>Oct - Dec</b>	<b>Jan - Mar</b>	<b>Apr - Jun</b>	<b>Jul - Sep</b>	<b>Oct - Dec</b>
<b>2015</b>	<b>29.2</b>	<b>39</b>	<b>32.4</b>	<b>21.4</b>	<b>9.7</b>	<b>13.0</b>	<b>10.8</b>	<b>7.1</b>
<b>2016</b>	<b>33.8</b>	<b>30.8</b>	<b>29.7</b>	<b>18.6</b>	<b>11.3</b>	<b>10.3</b>	<b>9.9</b>	<b>6.2</b>
<b>2017</b>	<b>25.6</b>	<b>31.2</b>	<b>13.4</b>	<b>17.2</b>	<b>8.5</b>	<b>10.4</b>	<b>4.5</b>	<b>5.7</b>
<b>2018</b>	<b>21.4</b>	<b>25.4</b>	<b>21</b>	<b>14.6</b>	<b>7.1</b>	<b>8.5</b>	<b>7.0</b>	<b>4.9</b>
<b>2019</b>	<b>20.5</b>	<b>29.9</b>	<b>29.5</b>	<b>15.8</b>	<b>6.8</b>	<b>10.0</b>	<b>9.8</b>	<b>5.3</b>
<b>2020</b>	<b>27.5</b>	<b>20.8</b>	<b>19.8</b>		<b>9.2</b>	<b>6.9</b>	<b>6.6</b>	

Source: DHIS