Malaria Surveillance Bulletin

MALARIA CONTROL UNIT ▪ NAIROBI, KENYA ▪ ISSUE 6 ▪ SEPTEMBER 2013

The **MALARIA SURVEILLANCE BULLETIN** is produced by the Malaria Control Unit and is a quarterly production.

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MEASURE Evaluation-PIMA in Kenya is funded by USAID through associate award 623-12-000002 and implemented by the Carolina Population Center at the University of North Carolina at Chapel Hill, with Futures Group, ICF International, Management Sciences for Health, and Tulane University. The views expressed in this publication do not necessarily reflect the views of USAID or the United States government.

Message from the Program Manager

Welcome to the 6th issue of the Malaria Control Program's Surveillance Bulletin. In this issue we focus on the first quarter of 2013/2014 covering July to September 2013. We present the performance under the key malaria indicators using six (6) core surveillance graphs. This issue also features insecticide resistance (IR) maps for 2011 & 2012 that informed decision to change the insecticide used for IRS in the country from pyrethroids to carbamates.

In the last quarter, the Malaria Control Program finalized the round 10 phase 2 proposal for the Global Fund for AIDS, Tuberculosis and Malaria Round. A mini program review was carried out to inform the preparation of the proposal.

Other key milestones for the quarter included the finalization of the Malaria Surveillance Curriculum package. The curriculum has since been approved by the director, Ministry of Public Health and Sanitation. The curriculum will used in the training of health workers to equip them with knowledge, and skills to effectively carry out malaria surveillance. It is expected that the curriculum will contribute towards strengthening the capacity of health care workers to undertake malaria surveillance activities and to routinely monitor key malaria indicators at all levels of health service delivery.

In addition, the 6th cycle of Quality of Care Survey (QOC 6) was finalized during the quarter under review. The findings from the survey showed significant improvements in the uptake of the test and treat policy for malaria Accordingly, febrile patient tested and treated in accordance with national guidelines improved from 16% in 2010 to 50% in June 2013.

Lastly, the Malaria Control Program took part in two events first, the 1st M&E best practice conference held at Panari Sky from 2nd to 4th October 2013 and second, the annual Nairobi International Trade Fair from 30th September to 6th October at Jamhuri Grounds, Nairobi.

Photo courtesy of Arne Hoel, World Bank

Practice View

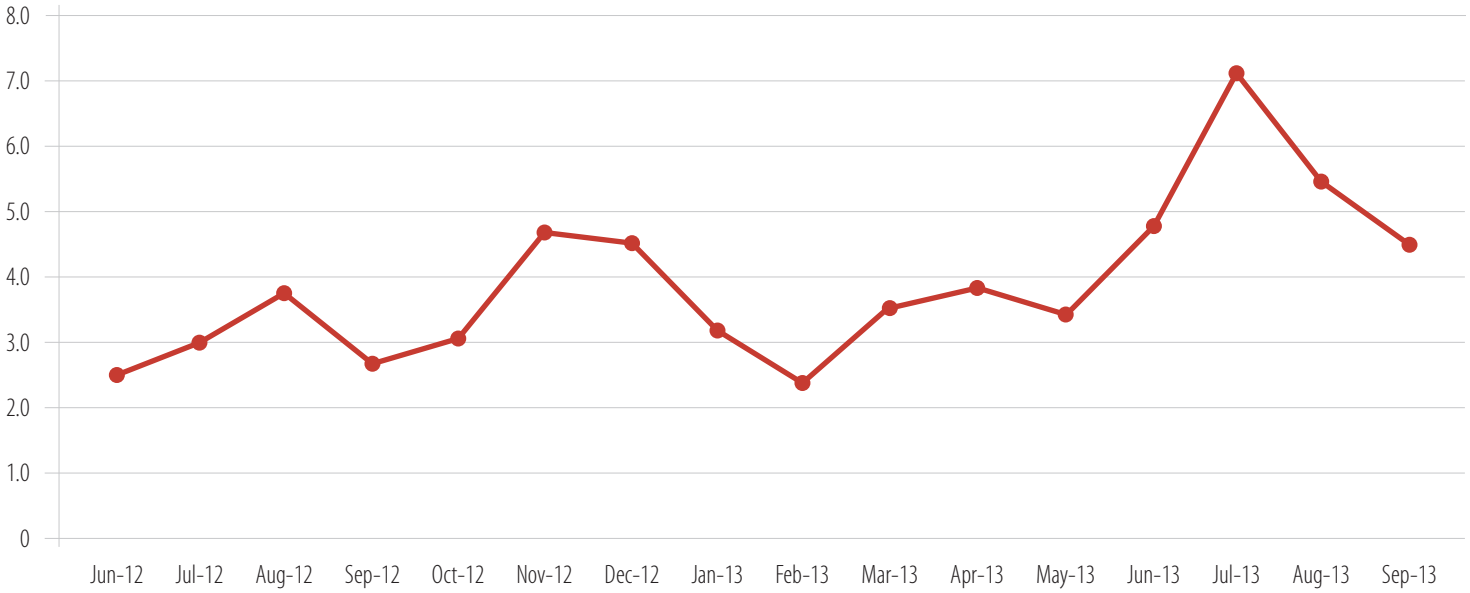
The 9 malaria core surveillance graphs are aimed at helping monitor the malaria situation in the country based on the recommendation by the WHO. The graphs shows performance in the nine core areas which include; the outpatient malaria total positivity rate(TPR) among children under five years, total inpatient malaria cases, the total inpatient malaria deaths in children under five years of age, the outpatient confirmed malaria cases and percentage of suspected malaria cases tested with positive based test, outpatient all-cause cases and suspected malaria cases among across ages, the percentage coverage of patients treated with ACTs, the number of ANC clients receiving ITN and IPT2, the percentage of health facilities without stock outs, and those with stock outs of ACTs, RDT and LLIN and the completeness of reporting and lastly, the percentage of health facilities and districts that report

In this issue, we present six out of the possible 9 graphs. The six are covering surveillance (3 graphs), logistical aspects (two graphs) and reporting rates for each data source. Overall, these graphs are aimed at demonstrating the situation with regard to health facility diagnostic capability and malaria case management in Kenya. These graphs are generated from the routine data sources that include the HMIS, DDSR weekly data reports and the LMIS.

OUTPATIENT CONFIRMED MALARIA CASES

During the quarter under review, the aggregated number of outpatient confirmed malaria cases sharply dropped from 7.0 to 4.5 cases per 1000 of the population in the country. However, the number of cases as at September (4.5) was still higher than the upsurge witnessed in April to June (3.5 cases per 1000 population) that was associated with peak malaria transmission after the long rains. Figure 1a shows the number of outpatient suspected malaria cases that are confirmed to have malaria parasite by microscopy or RDT per 1000 people resident in Kenya. Ideally, a rate of less than 1 case per 1000 people indicates readiness for elimination phase.

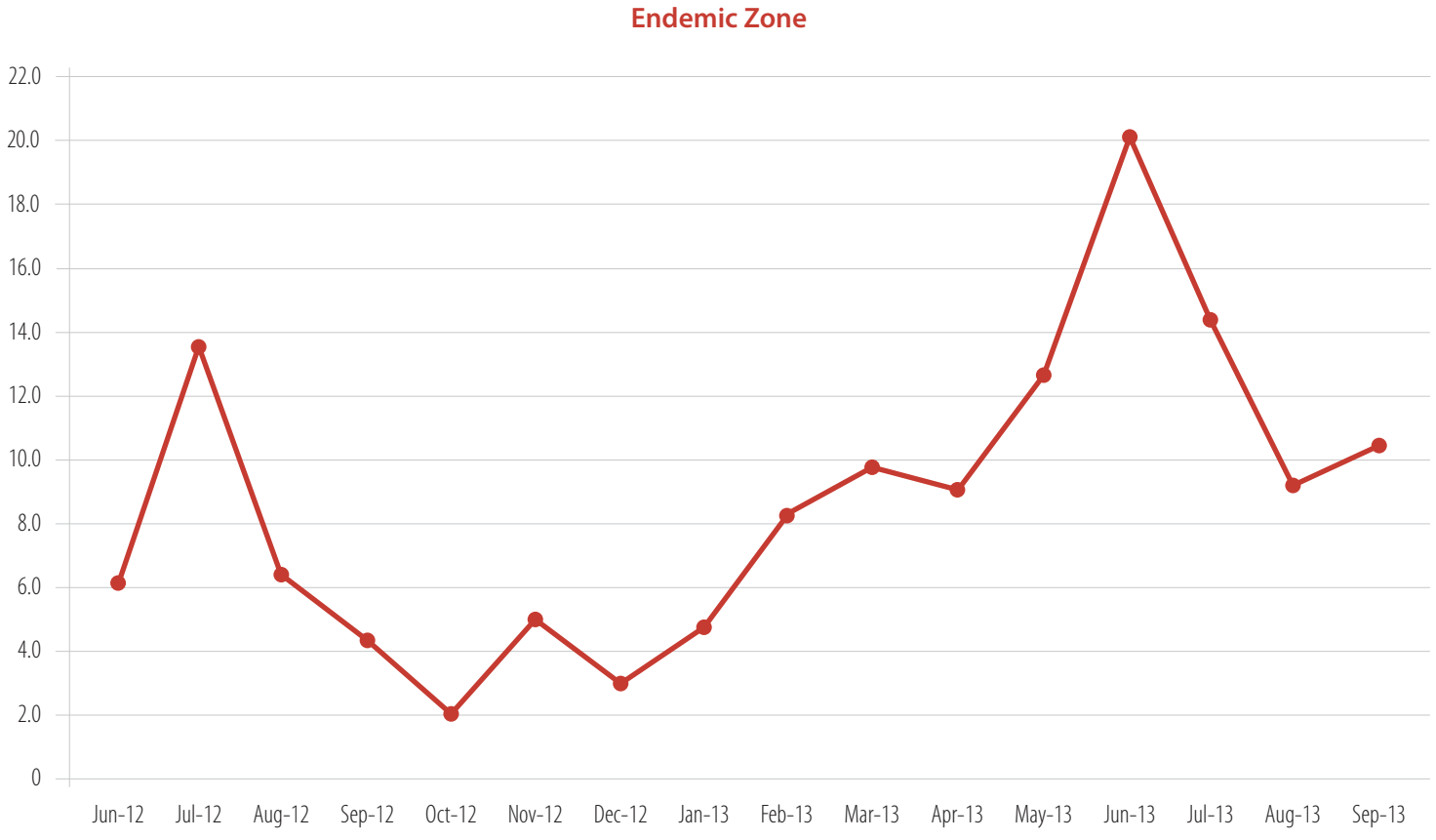
Figure 1a: Number of Outpatient Confirmed Malaria Cases per 1,000 of Population



Sources: DDSR, HMIS, Census 2009

When disaggregated by epidemiology zones data showed a 50% decrease in the number of confirmed malaria cases in both the endemic regions (lake endemic plus coastal endemic) (from about 20 to 10 confirmed cases per 1000 persons) and the highland epidemic prone areas. On the other hand, the number of confirmed malaria cases remained relatively stable in the seasonal & low transmission areas. Figure 1b shows the disaggregated number of outpatient suspected malaria cases that were confirmed to have malaria parasite by microscopy or RDT per 1000 people resident in Kenya, as per the four malaria epidemiological zones. Ideally, a rate of less than 1 case per 1000 people indicates readiness for elimination phase.

Figure 1b: Outpatient Confirmed Malaria Cases per 1,000 of Population by Epidemiology Zones



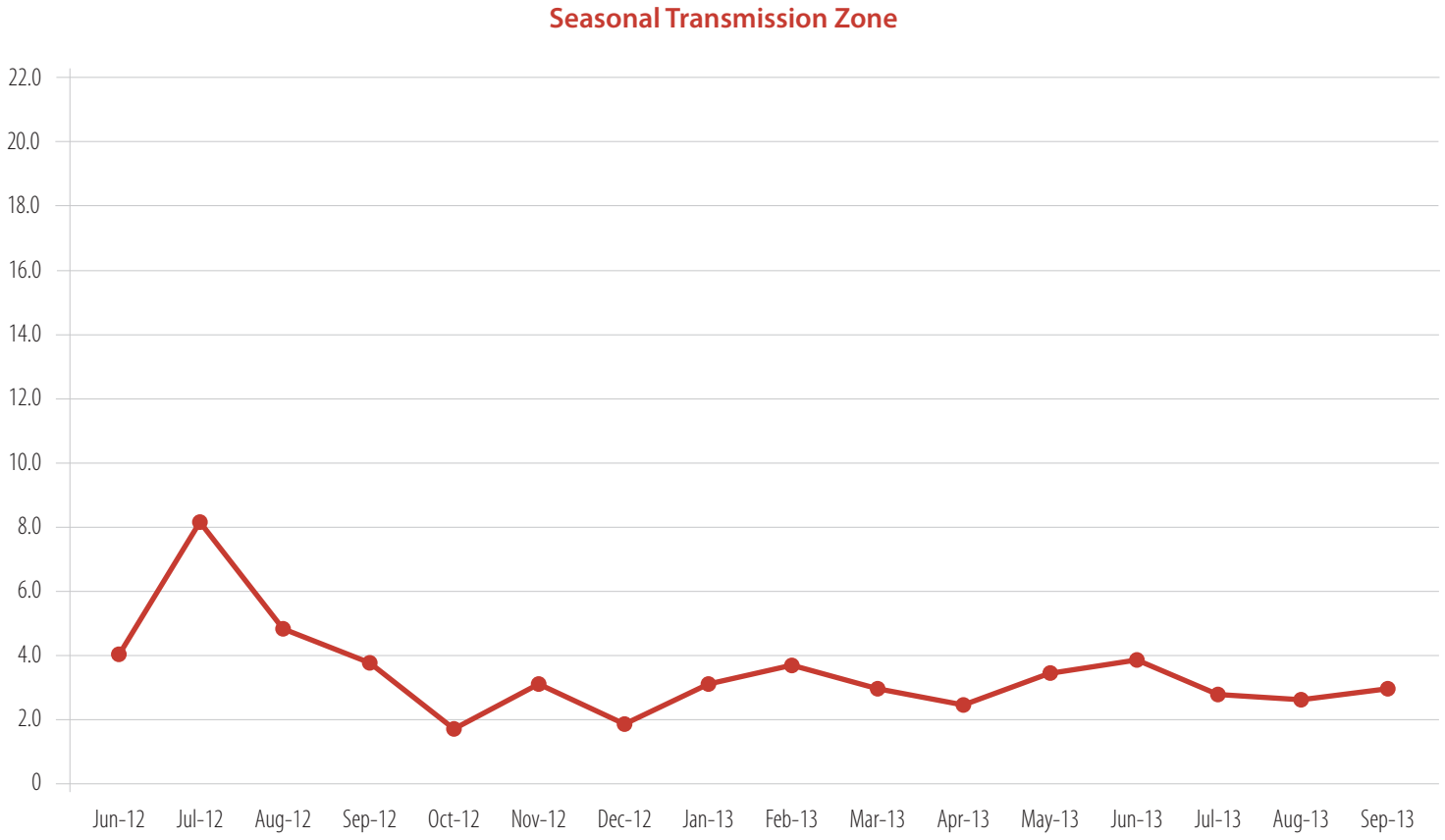
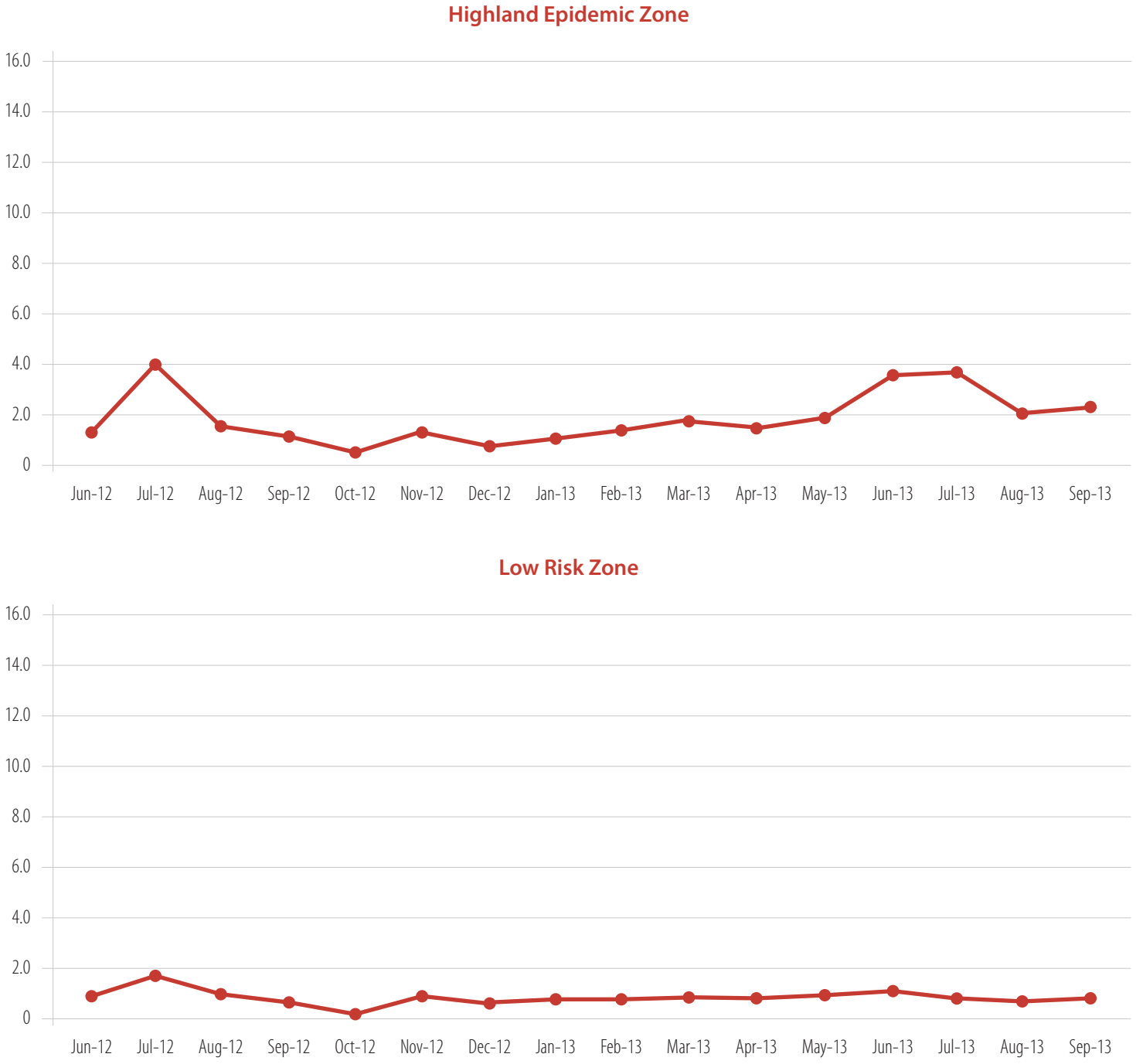


Figure 1b: Outpatient Confirmed Malaria Cases per 1,000 of Population by Epidemiology Zones *(continued)*



OUTPATIENT TEST POSITIVITY RATES AMONG THE UNDER5 YEARS AND ALL AGES

The aggregated outpatient test positivity rate (TPR) for both under fives and all age groups was observed to have dropped in the country from around 35% to 30% during the last quarter.

When compared with the pattern observed for the number of confirmed malaria cases, the TPR for both the < 5 years and all age groups slightly decreased in the malaria endemic (from ~50% to ~40%) and in the highland epidemic prone regions (~25% to ~20%), but remained stable in the seasonal and low malaria transmission areas.

Figure 2a and 2b demonstrate the trends with regard to the percentage of the malaria cases that tested positive against the total number of cases tested for parasites. Figure 2a presents the overall outpatient test positivity rates for the under-fives and all ages while figure 2b shows the outpatient test positivity rates for the under fives and all ages by malaria epidemiological zones. The graphs are based on data from the weekly reports by the division of diseases surveillance and response (DDSR).

Figure 2a: Outpatient TPR for < 5 Years and All Ages in the Country

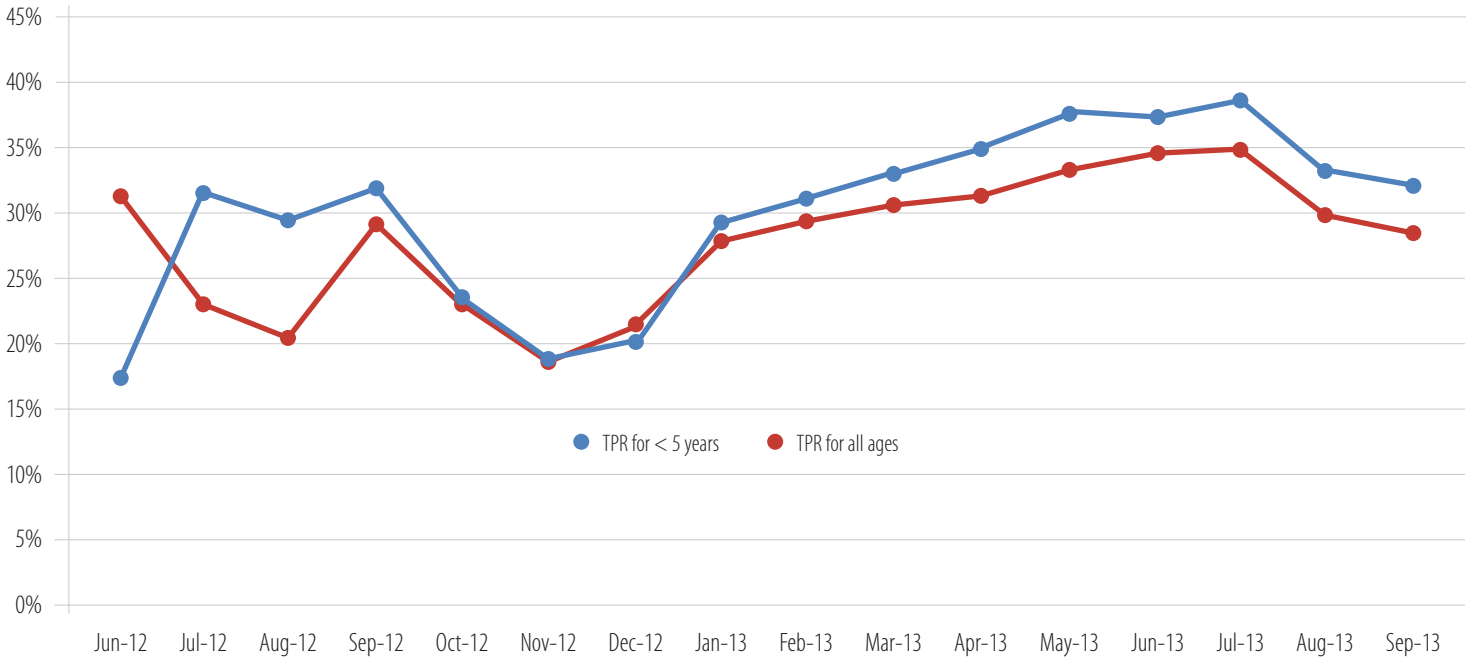
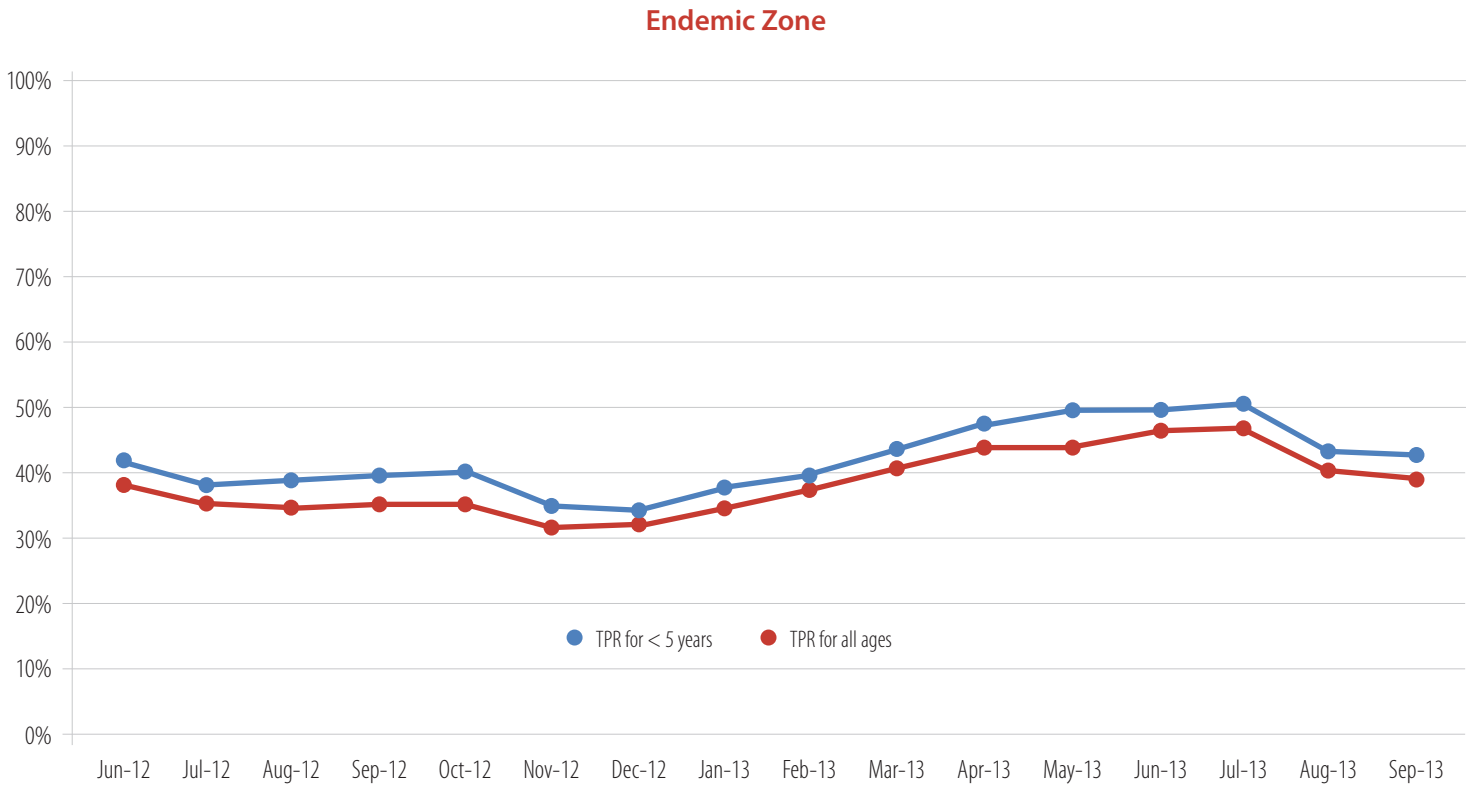


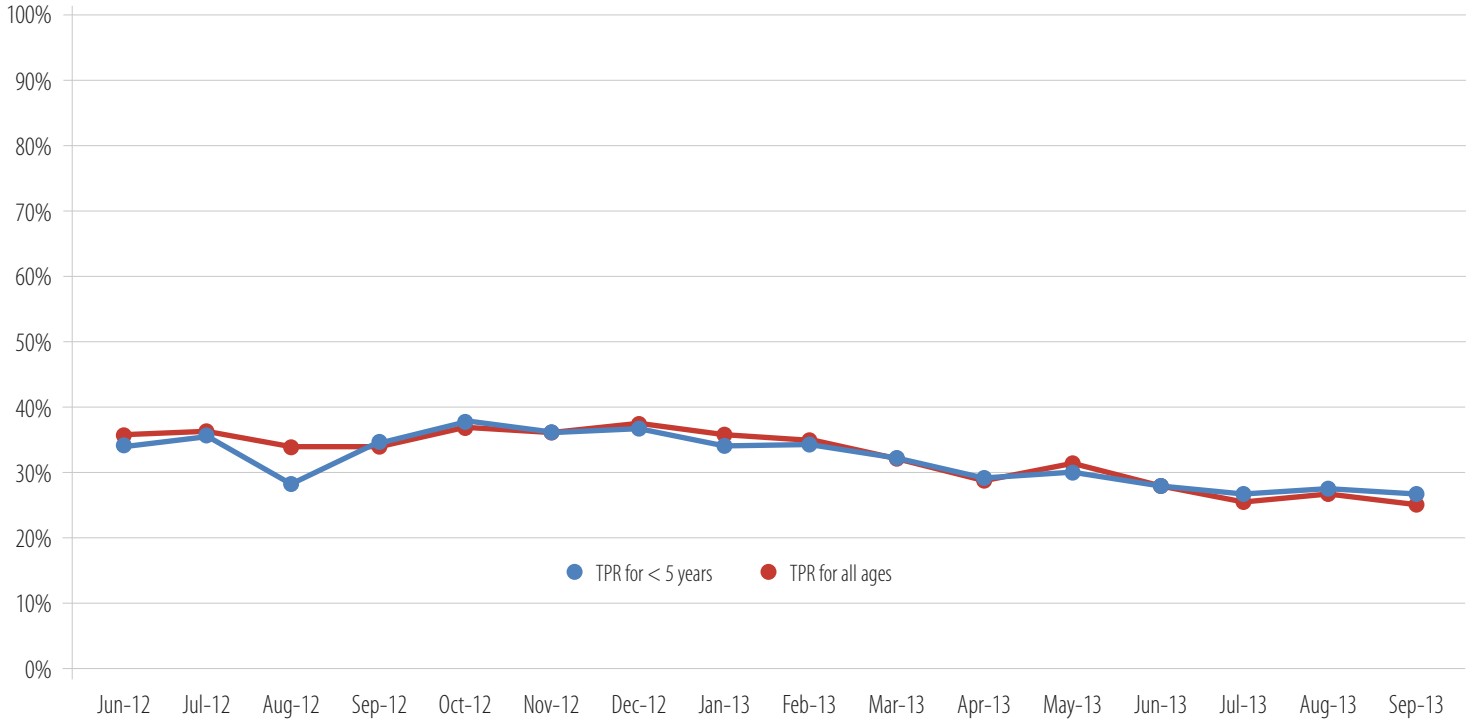
Figure 2b: Outpatient TPR for < 5 Years and All Ages by Malaria Epidemiology Zones



Source: DDSR

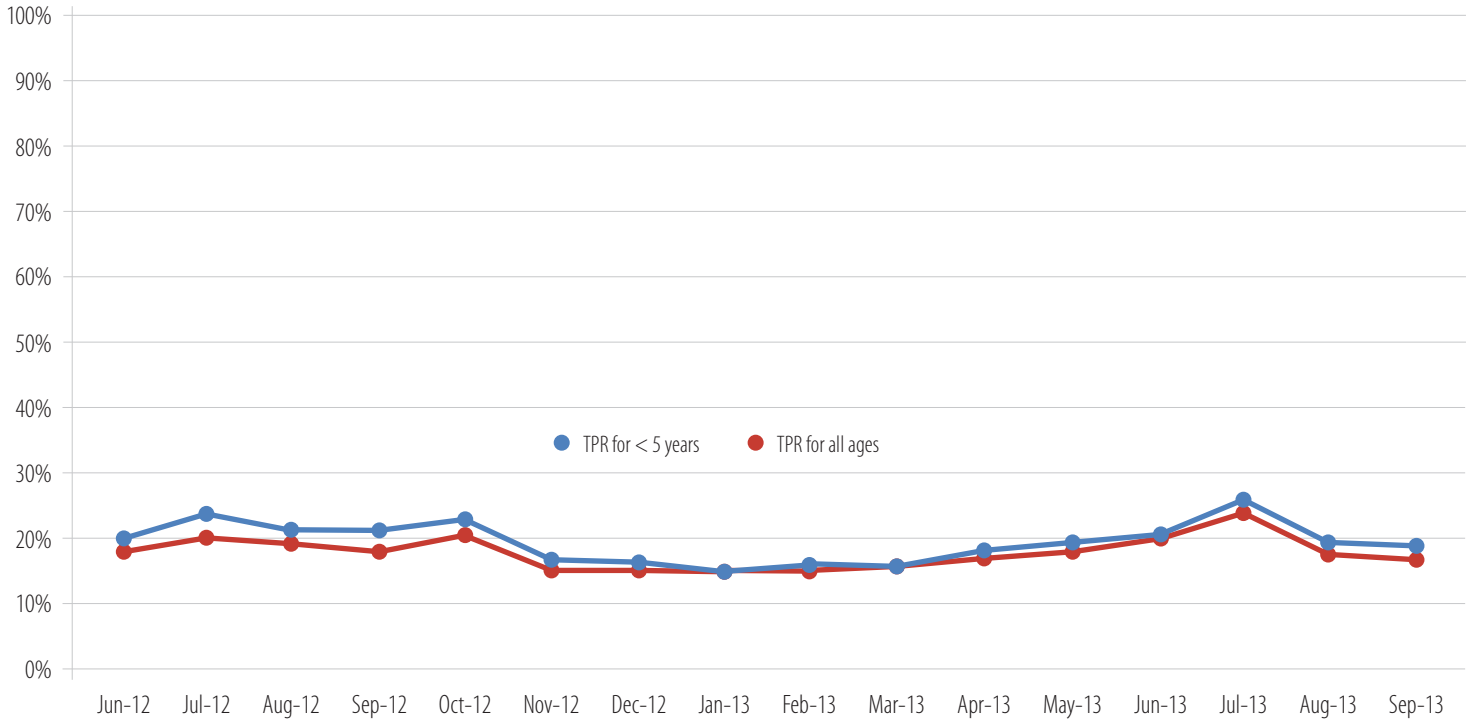
Figure 2b: Outpatient TPR for < 5 Years and All Ages by Malaria Epidemiology Zones *continued*

Seasonal Transmission Zone



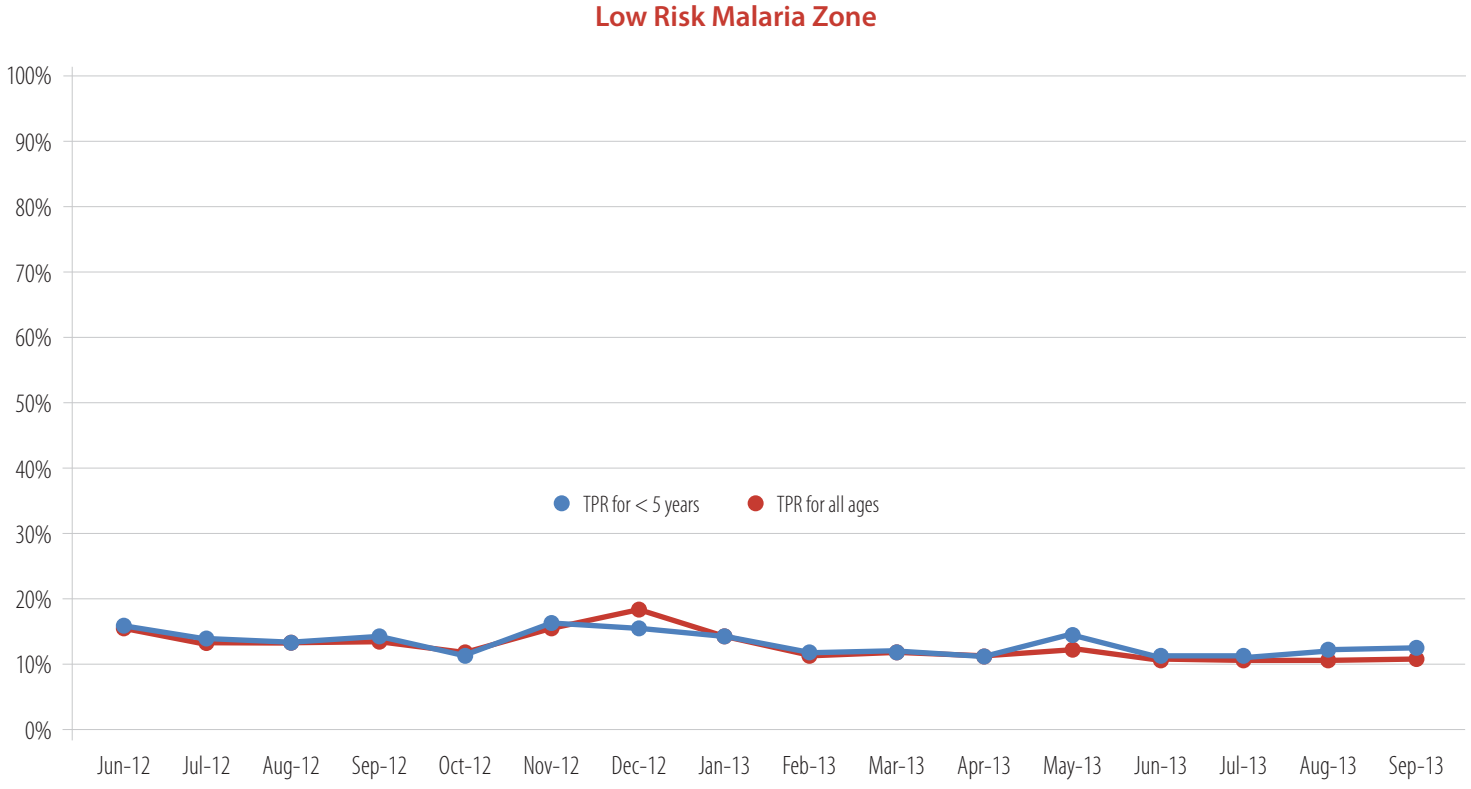
Source: DDSR

Highland Epidemic Zone



Source: DDSR

Figure 2b: Outpatient TPR for < 5 Years and All Ages by Malaria Epidemiology Zones *continued*



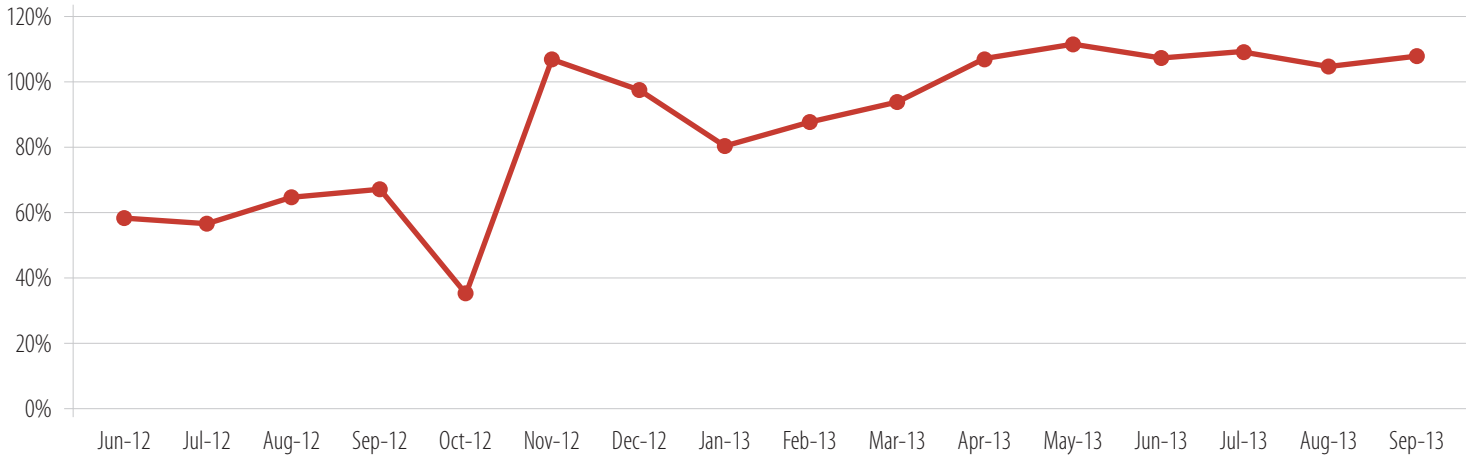
Source: DDSR

SUSPECTED MALARIA CASES TESTED WITH PARASITE-BASED TEST

The diagnostic capability of health facilities in the country is illustrated through the data presented in figure 3, which is expressed as the percentage of suspected malaria cases among the outpatient that underwent a laboratory diagnosis over the reporting period are presented.

The testing rate (percentage of suspected malaria cases tested using a parasite based test) has remained stable, slightly above 100%, in this quarter under review. However, we can't plausibly explain the >100% TR, even though it possible to speculate that double counting of tests done using microscopy and RDTs, and patients who are referred for laboratory with out passing the outpatient clinic could in part explain this observed anomaly (as the numerator is obtained from laboratory register while the denominator is from OPD register).

Figure 3: Percentage of Suspected Malaria Cases Tested with Parasite-Based Test



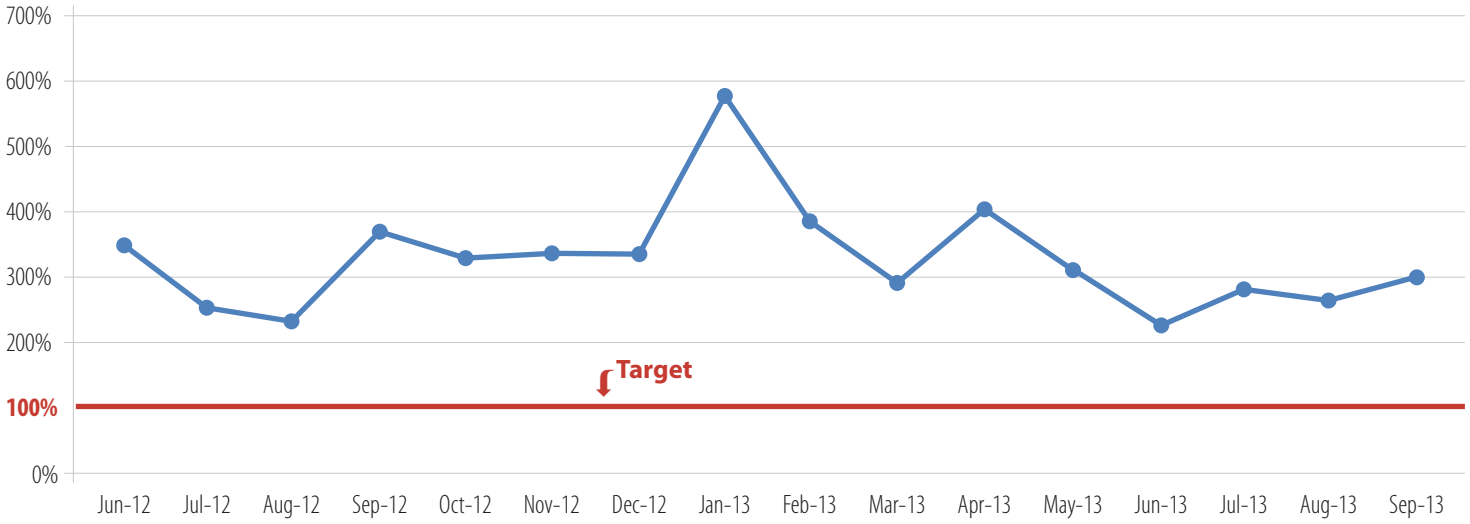
Source: DDSR

COVERAGE FOR OUTPATIENTS TREATED WITH ARTEMISININ-BASED COMBINATION THERAPY

Kenya has adopted the T3 policy (test, treat and track) that makes mandatory, the testing of all patients suspected of malaria, using a parasitic laboratory test before treatment. The capacity of health facilities to adhere to this policy has in the past been hampered by low coverage of the rapid diagnostic test kits (RDTs) or microscopy.

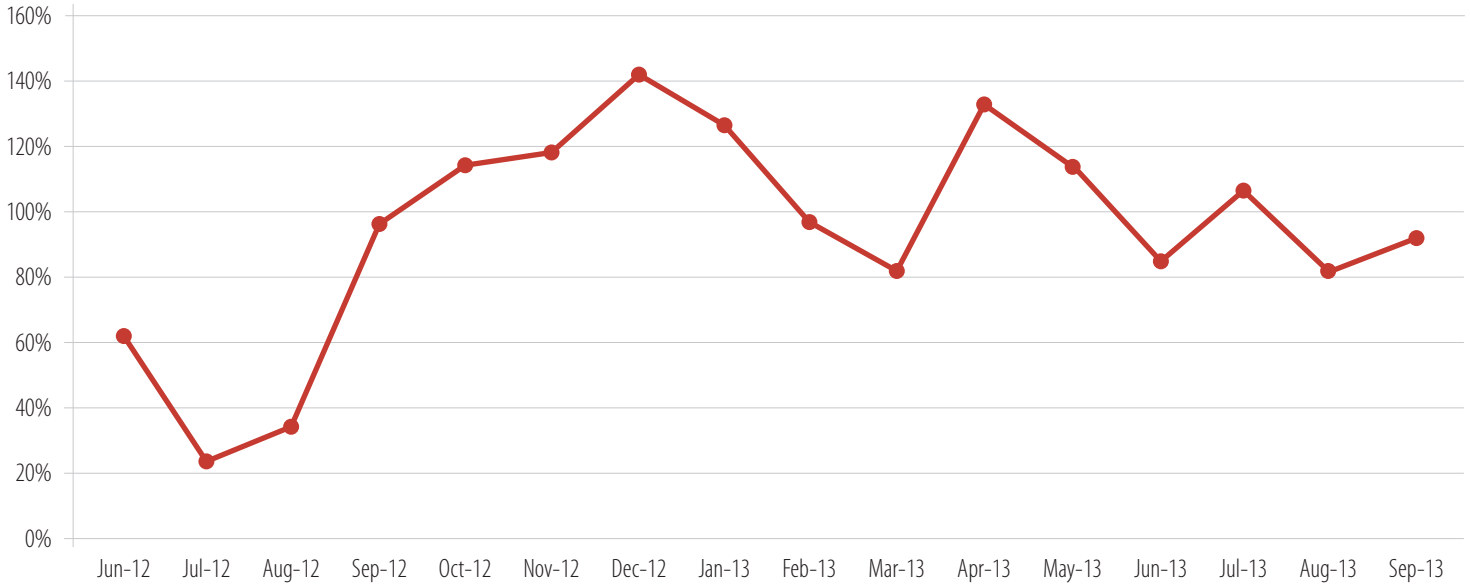
Over the last quarter, an increase of over-treatment from about 250% to 300% was observed in the country. This shows that the 3T policy is not being adhered to and more emphasis on compliance with the national treatment guideline by the health workers needs to be continued. Figure 4a demonstrates the percentage of outpatient cases that were treated using AL over the reporting period, while Figure 4b shows the percentage of outpatient suspected malaria cases who received AL treatment.

Figure 4a: Percentage of Coverage with Outpatient Cases Treated with ACTs



Sources: DDSR/LMIS/DHIS

Figure 4b: Percentage Coverage of Outpatient Suspected Malaria Cases Treated with ACTs



Source: DDSR/LMIS/DHIS

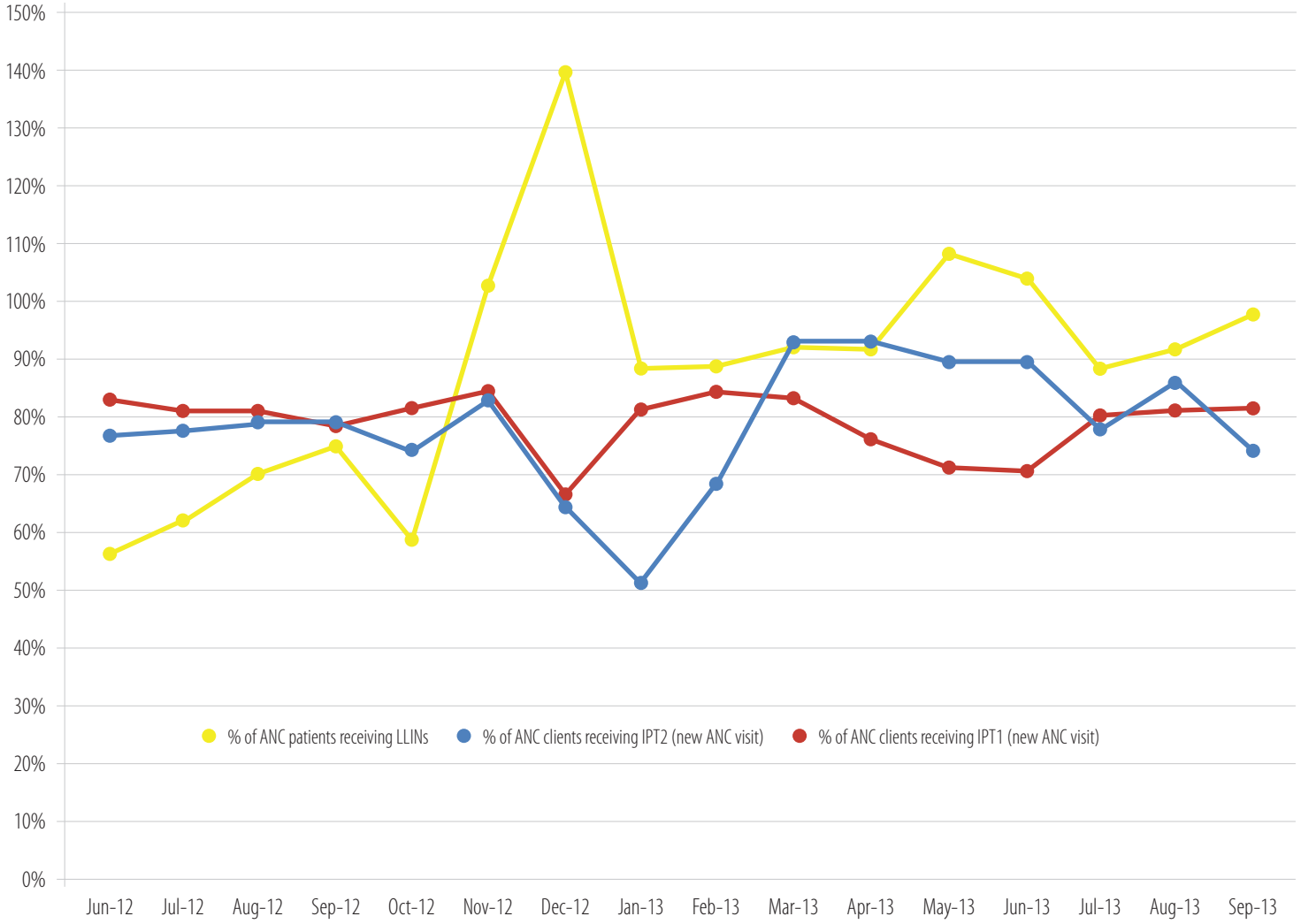
PERCENTAGE COVERAGE OF ANC MOTHER RECEIVING LLINS AND IPTP1 & IPTP2 AT ANC

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 with at least two doses of intermittent preventive treatment for expectant (IPT2), Provision of Long Lasting Insecticide Nets(LLINs) and the provision of prompt diagnosis and treatment of fever.

In the last quarter, the percentage of ANC mothers in the endemic regions who received IPTp1 and IPTp2 remained at 80%. Ideally, ANC mothers receiving IPTp1are expected to be higher than those receiving IPTp2. The discrepancy observed could be attributed in part reporting of IPT2 plus as IPTp 2 at the same time by heath workers.

The percentage of ANC mothers who received LLINs increased slightly from 90% in April to about 100% in September 2013.

Figure 5: Percentage Coverage of Antenatal Care Clients Receiving Insecticide Treated Nets and at Least Two Doses of Intermittent Preventive Treatment (IPT2)



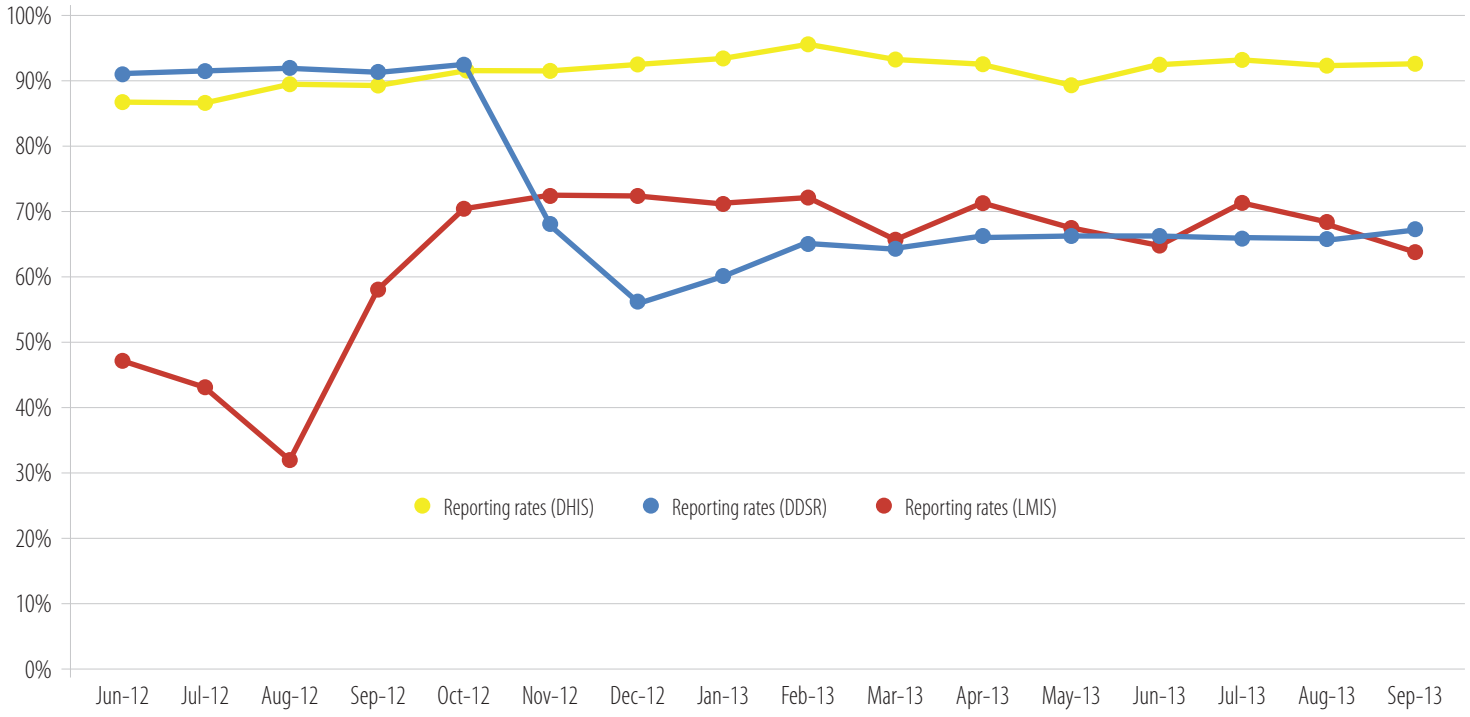
Source: DHIS/DDSR/LMIS

REPORTING RATES BY DATA SOURCES

The Division of Malaria Control (DOMC) derives surveillance monitoring and evaluation (SM&E) data from various routine data reporting systems that includes the Division of Health Information Systems (DHIS), Division of Disease Surveillance and Response (DDSR), the Logistics Management Information System, and Laboratory Information Management System (LIMS). The reporting rates presented in graph 6 are for DHIS, IDSR and LMIS and is derived from the number of health facilities send in monthly reports against the number of health facilities expected to report each month. Data from DDSR is an average of the weekly data that was reported during the reporting months.

The reporting rates remained steady over the last quarter at 90% for DHIS, at round 65% for LMIS and e-IDSR. The low rates for e-IDSR as compared to 2012, is due to the migration to the electronic systems and is expected to improve as the system stabilizes.

Figure 6: Reporting Rates



Source: DHIS/DDSR/LMIS

From Counties

Table 1 presents an overview of performance per county in terms of data collection and reporting for selected malaria indicators over the reporting period.

Table 1: County Performance in Data Collection and Reporting for Selected Malaria Indicators

Province	County	No. suspected malaria cases	No. suspected malaria cases tested	No. out-patient confirmed malaria cases	No. out-patients treated for malaria	% of outpatient suspected malaria cases tested	No. LLINs distributed to pregnant women	No. LLINs distributed to under 5 years
Western	Bungoma*	85,310	97,652	41,152	131,531	114	9,956	11,607
	Busia	99,399	95,579	46,562	96,935	96	6,189	3,774
	Kakamega	172,019	161,787	72,933	174,260	94	13,909	15,073
	Vihiga	57,330	56,955	29,203	72,077	99	3,945	4,688
Nyanza	Homa Bay	129,722	96,703	42,914	189,923	75	7,246	8,823
	Kisii	79,723	78,839	11,117	40,725	99	7,478	4,839
	Kisumu	78,989	74,465	30,441	84,967	94	10,259	6,476
	Migori	118,534	75,633	35,350	77,456	64	8,614	8,904
	Nyamira	28,523	20,840	978	14,911	73	3,106	4,926
	Siaya	181,461	161,206	84,508	155,043	89	7,738	10,086
Rift Valley	Baringo	20,534	10,731	2,358	33,609	52	3,354	4,175
	Bomet	27,515	19,628	567	19,964	71	4,156	3,803
	Elgeyo/Marakwet	13,900	11,206	2,132	5,788	81	2,593	2,573
	Kajiado*	7,349	14,260	1,179	2,058	194	7,162	4,103
	Kericho	36,936	21,729	2,017	32,975	59	5,937	6,824
	Laikipia*	5,484	8,537	1,923	7,321	156	15	0
	Nakuru*	45,930	57,421	12,958	22,266	125	199	360
	Nandi	42,948	26,725	7,484	55,577	62	4,740	3,095
	Narok*	20,593	24,508	4,443	12,519	119	5,596	6,310
	Samburu*	1,627	4,543	1,038	2,703	279	17	136
	Trans Nzoia	49,953	50,473	11,735	20,177	101	5,413	7,240
	Turkana	46,381	35,260	19,412	12,600	76	445	0
	Uasin Gishu*	19,189	35,213	7,277	35,122	184	5,939	6,655
	West Pokot	43,973	46,230	17,098	24,051	105	3,035	4,681
Coast	Kilifi*	16,104	37,760	8,382	25,403	234	10,116	8,211
	Kwale	27,959	45,701	15,816	51,223	163	4,824	2,360
	Lamu*	1,268	7,802	653	559	615	1,102	0
	Mombasa*	15,060	44,248	7,818	4,951	294	5,173	1,540
	TaitaTaveta*	6,244	20,257	1,634	4,360	324	1,344	490
	Tana River*	5,045	7,775	1,052	1,691	154	1,300	994
Eastern	Embu*	28,299	51,868	9,673	21,694	183	3,000	2,885
	Isiolo*	2,268	2,895	472	7,079	128	1,542	282
	Kitui	32,394	31,536	7,380	52,644	97	7,238	9,511
	Machakos*	15,876	39,053	2,060	13,262	246	6,444	10,281
	Makueni*	28,372	35,605	2,742	32,732	125	4,568	5,524
	Marsabit	2,570	2,511	137	620	98	114	0
	Meru*	93,573	104,279	29,624	49,863	111	7,056	6,957
	Tharaka-Nithi	32,054	26,324	6,251	25,782	82	2,569	4,712

Province	County	No. suspected malaria cases	No. suspected malaria cases tested	No. out-patient confirmed malaria cases	No. out-patients treated for malaria	% of outpatient suspected malaria cases tested	No. LLINs distributed to pregnant women	No. LLINs distributed to under 5 years
North Eastern	Garissa*	1,153	13,324	798	8,580	1,156	251	0
	Mandera	3,077	3,128	485	493	102	0	5
	Wajir*	1,001	1,455	513	4,208	145	30	0
Central	Kiambu*	18,924	40,830	1,642	4,652	216	5,628	4,306
	Kirinyaga*	2,014	12,766	123	3,467	634	2,635	29
	Murang'a*	122	7,728	139	3,623	6,334	3,902	3,964
	Nyandarua*	2,234	4,842	271	2,921	217	46	0
	Nyeri*	297	3,146	47	328	1,059	59	9
Nairobi	Nairobi*	15,990	60,093	6,261	10,323	376	189	382

** Counties which had more cases tested than the suspected malaria cases*

Table 2: Malaria Treatment by County

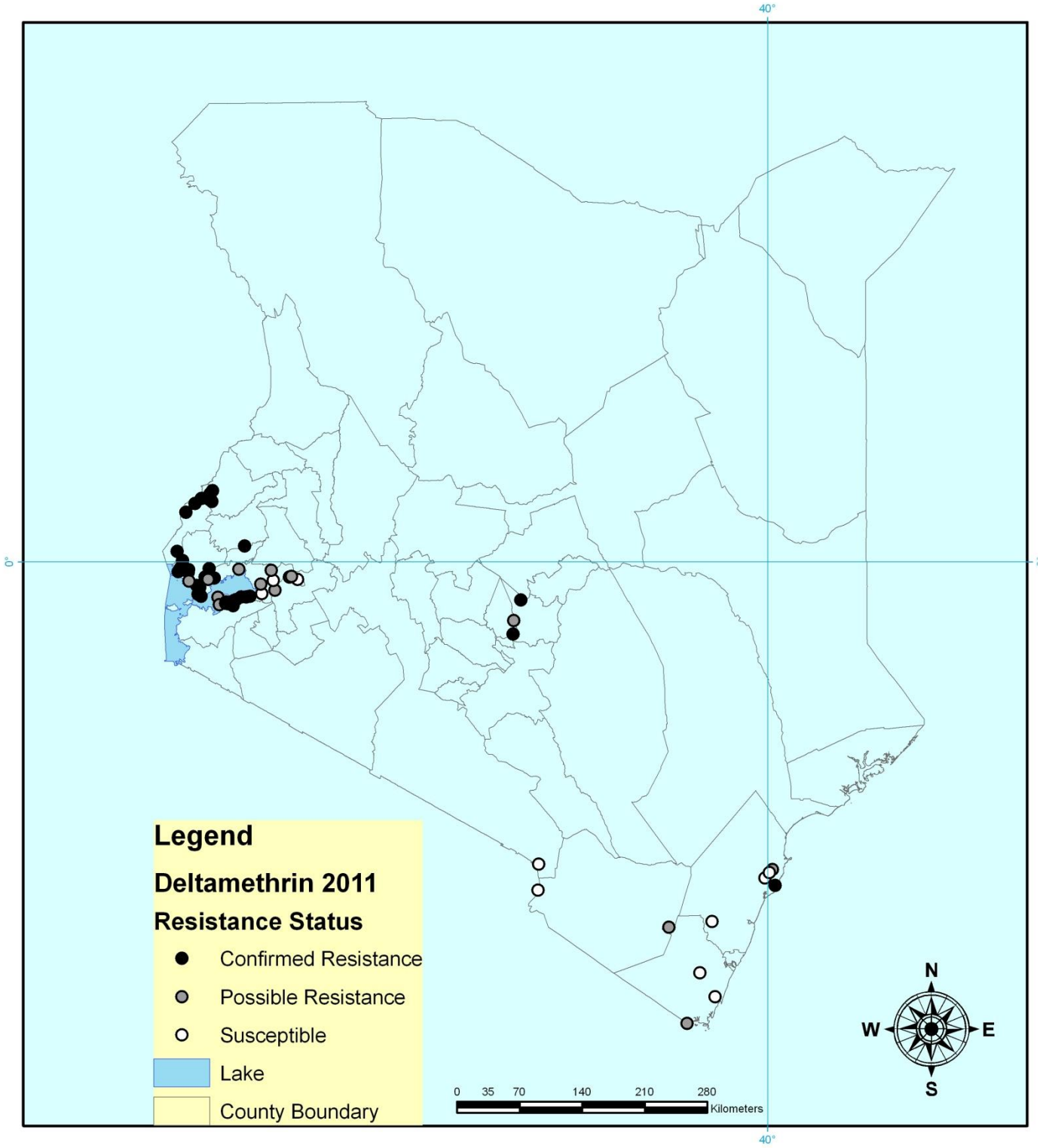
Province	County	No. oupatient suspected malaria cases	No. oupatient confirmed malaria cases	Aggregated Patients on AL	% of outpatient suspected malaria cases treated with ACT	% of outpatient confirmed malaria cases treated with ACT
Western	Bungoma	85,310	41,152	131,531	154	320
	Busia	99,399	46,562	96,935	98	208
	Kakamega	172,019	72,933	174,260	101	239
	Vihiga	57,330	29,203	72,077	126	247
Nyanza	Homa Bay	129,722	42,914	189,923	146	443
	Kisii	79,723	11,117	40,725	51	366
	Kisumu	78,989	30,441	84,967	108	279
	Migori	118,534	35,350	77,456	65	219
	Nyamira	28,523	978	14,911	52	1,525
	Siaya	181,461	84,508	155,043	85	183
Rift Valley	Baringo	20,534	2,358	33,609	164	1,425
	Bomet	27,515	567	19,964	73	3,521
	Elgeyo/Marakwet	13,900	2,132	5,788	42	271
	Kajiado	7,349	1,179	2,058	28	175
	Kericho	36,936	2,017	32,975	89	1,635
	Laikipia	5,484	1,923	7,321	133	381
	Nakuru	45,930	12,958	22,266	48	172
	Nandi	42,948	7,484	55,577	129	743
	Narok	20,593	4,443	12,519	61	282
	Samburu	1,627	1,038	2,703	166	260
	Trans Nzoia	49,953	11,735	20,177	40	172
	Turkana	46,381	19,412	12,600	27	65
	UasinGishu	19,189	7,277	35,122	183	483
	West Pokot	43,973	11,097	24,051	55	217
Coast	Kilifi	16,104	8,382	25,403	158	303
	Kwale	27,959	15,816	51,223	183	324
	Lamu	1,268	653	559	44	86
	Mombasa	15,060	7,818	4,951	33	63
	TaitaTaveta	6,244	1,634	4,360	70	267
	Tana River	5,045	1,052	1,691	34	161

Province	County	No. oupatient suspected malaria cases	No. oupatient confirmed malaria cases	Aggregated Patients on AL	% of outpatient suspected malaria cases treated with ACT	% of outpatient confirmed malaria cases treated with ACT
Eastern	Embu	28,299	9,673	21,694	77	224
	Isiolo	2,268	472	7,079	312	1,500
	Kitui	32,394	7,380	52,644	163	713
	Machakos	15,876	2,060	13,262	84	644
	Makueni	28,372	2,742	32,732	115	1,194
	Marsabit	2,570	137	620	24	453
	Meru	93,573	29,624	49,863	53	168
	Tharaka-Nithi	32,054	6,251	25,782	80	412
North Eastern	Garissa	1,153	798	8,580	744	1,075
	Mandera	3,077	485	493	16	102
	Wajir	1,001	513	4,208	420	820
Central	Kiambu	18,924	1,123	4,652	25	414
	Kirinyaga	2,014	123	3,467	172	2,819
	Murang'a	122	139	3,623	2,970	2,606
	Nyandarua	2,234	271	2,921	131	1,078
	Nyeri	297	47	328	110	698
Nairobi	Nairobi	15,990	6,261	10,323	65	165

Table 3: Reported Malaria Cases by Epidemiological zones

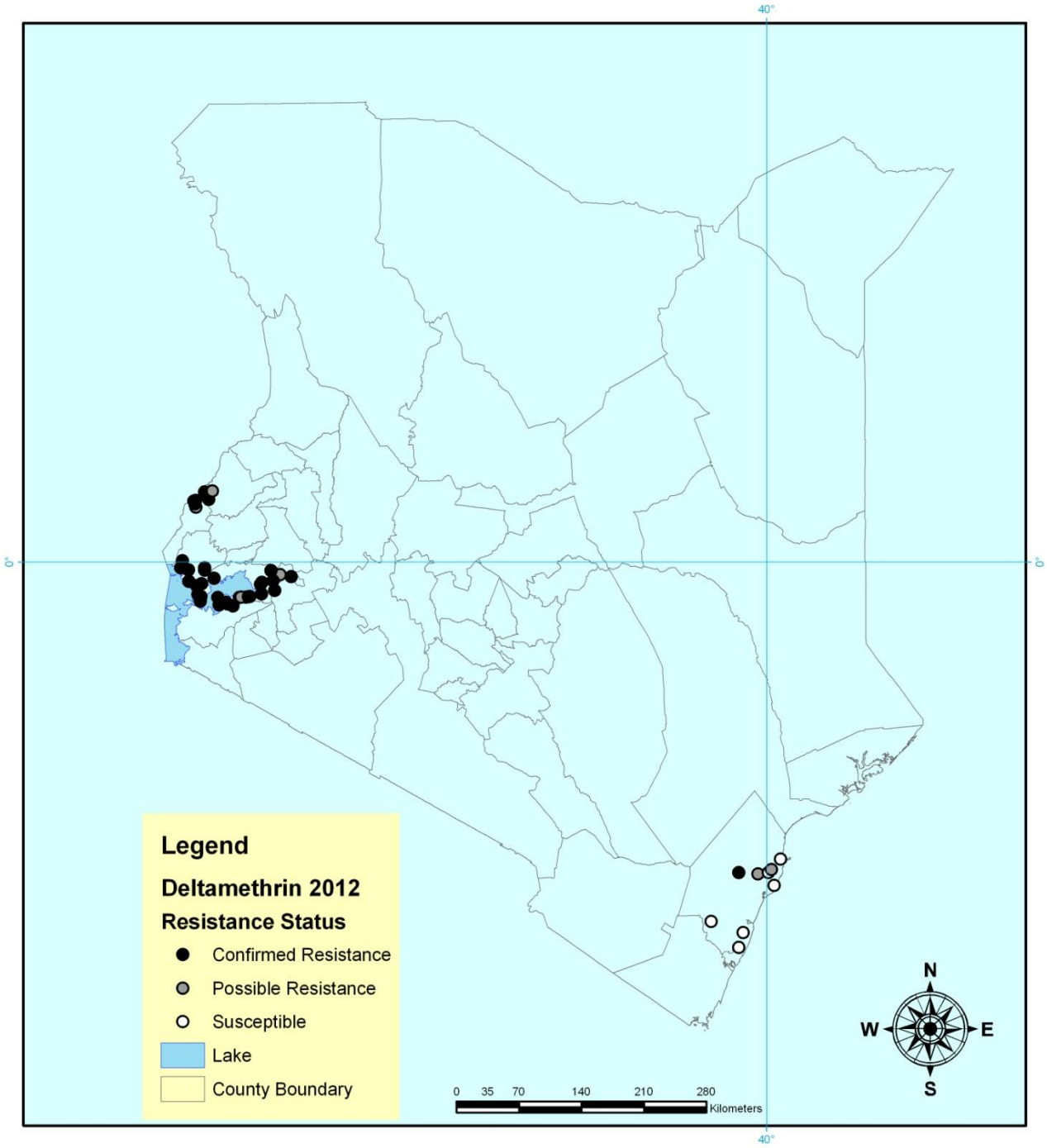
Zones	Quarter	No. cases < 5	No. tested <5	Positive <5	TPR for < 5 years	Total no. of cases	Total no. tested	Total no. positive	TPR for all ages
Endemic	Qtr1 12/13	1,868,047	263,741	102,626	39	4,496,209	688,235	244,302	35
	Qtr2 12/13	930,194	135,215	48,687	36	2,257,935	353,189	115,011	33
	Qtr3 12/13	359,525	263,615	108,137	41	864,273	684,359	261,907	38
	Qtr4 12/13	418,903	398,240	195,762	49	1,046,465	1,066,682	481,872	45
	Qtr1 13/14	353,270	335,044	154,586	46	953,801	943,034	400,802	43
Seasonal Transmission	Qtr1 12/13	702,983	129,078	41,543	32	2,001,600	409,759	143,458	35
	Qtr2 12/13	314,785	54,622	20,019	37	948,586	173,913	64,153	37
	Qtr3 12/13	105,172	91,025	30,584	34	310,157	279,425	96,160	34
	Qtr4 12/13	99,933	97,497	28,267	29	316,277	331,412	97,701	29
	Qtr1 13/14	88,138	89,936	24,445	27	293,938	322,387	83,002	26
Highland Epidemic	Qtr1 12/13	660,838	74,342	17,191	23	1,733,736	230,038	46,394	20
	Qtr2 12/13	330,042	43,029	7,521	17	916,443	131,343	21,333	16
	Qtr3 12/13	116,337	78,878	12,518	16	318,888	227,403	35,557	16
	Qtr4 12/13	119,711	100,120	19,756	20	336,438	298,100	56,377	19
	Qtr1 13/14	116,062	104,913	22,825	22	354,838	328,861	65,341	20
Low Risk Malaria Areas	Qtr1 12/13	373,085	84,126	11,436	14	1,046,924	266,615	35,053	13
	Qtr2 12/13	157,719	43,754	6,483	15	467,826	137,234	21,104	15
	Qtr3 12/13	56,751	85,312	10,443	12	163,889	255,251	30,428	12
	Qtr4 12/13	58,665	104,138	12,548	12	168,917	319,684	35,022	11
	Qtr1 13/14	46,707	82,107	9,641	12	135,423	270,098	28,167	10

Figure 7a: Insecticide Resistance Maps in Kenya—Deltamethrin 2011



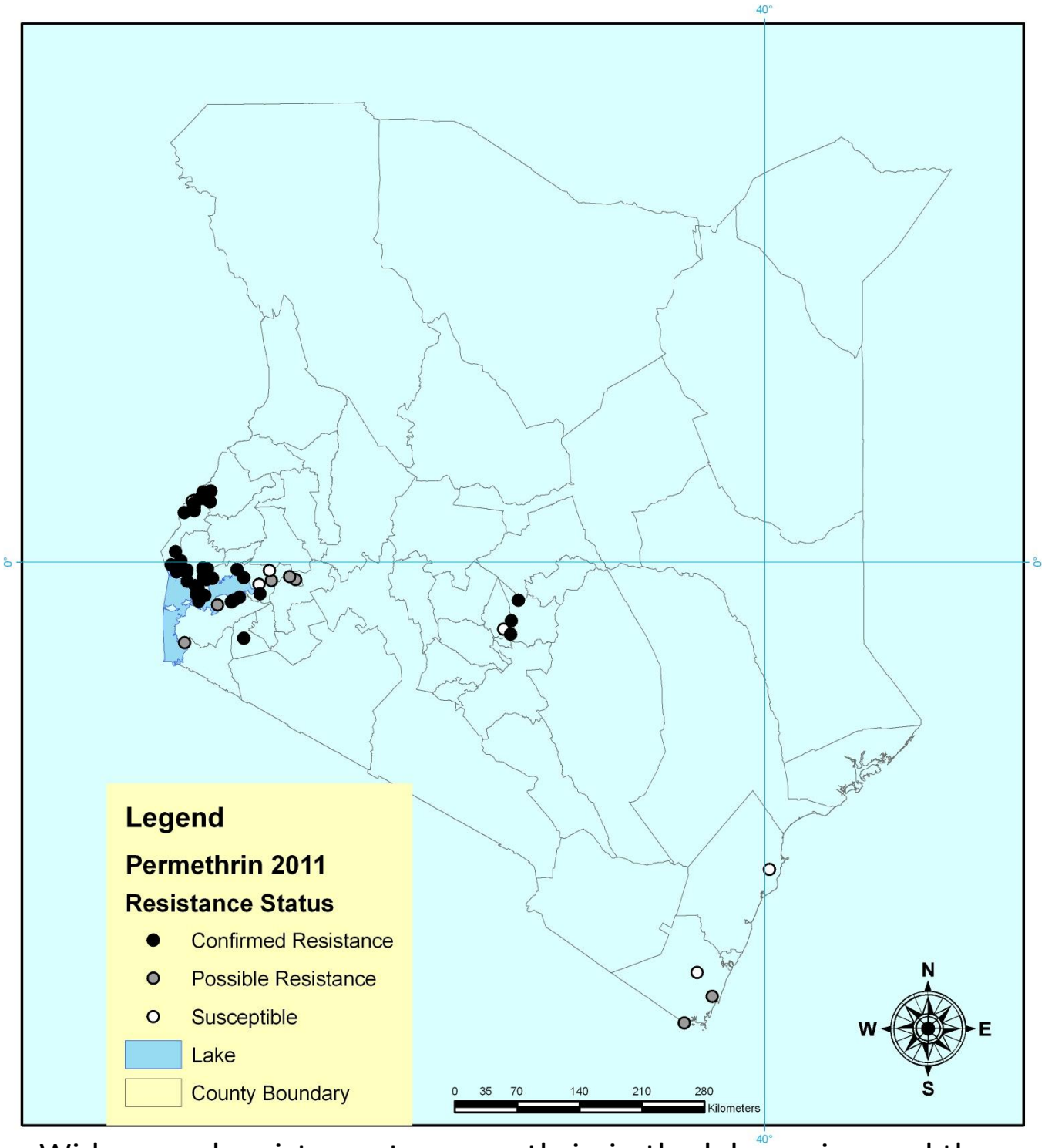
Resistance to deltamethrin is widespread around the lake region and the central region. Mosquitoes along the coastal areas are mostly susceptible to deltamethrin.

Figure 7b: Insecticide Resistance Maps in Kenya—Deltamethrin 2012



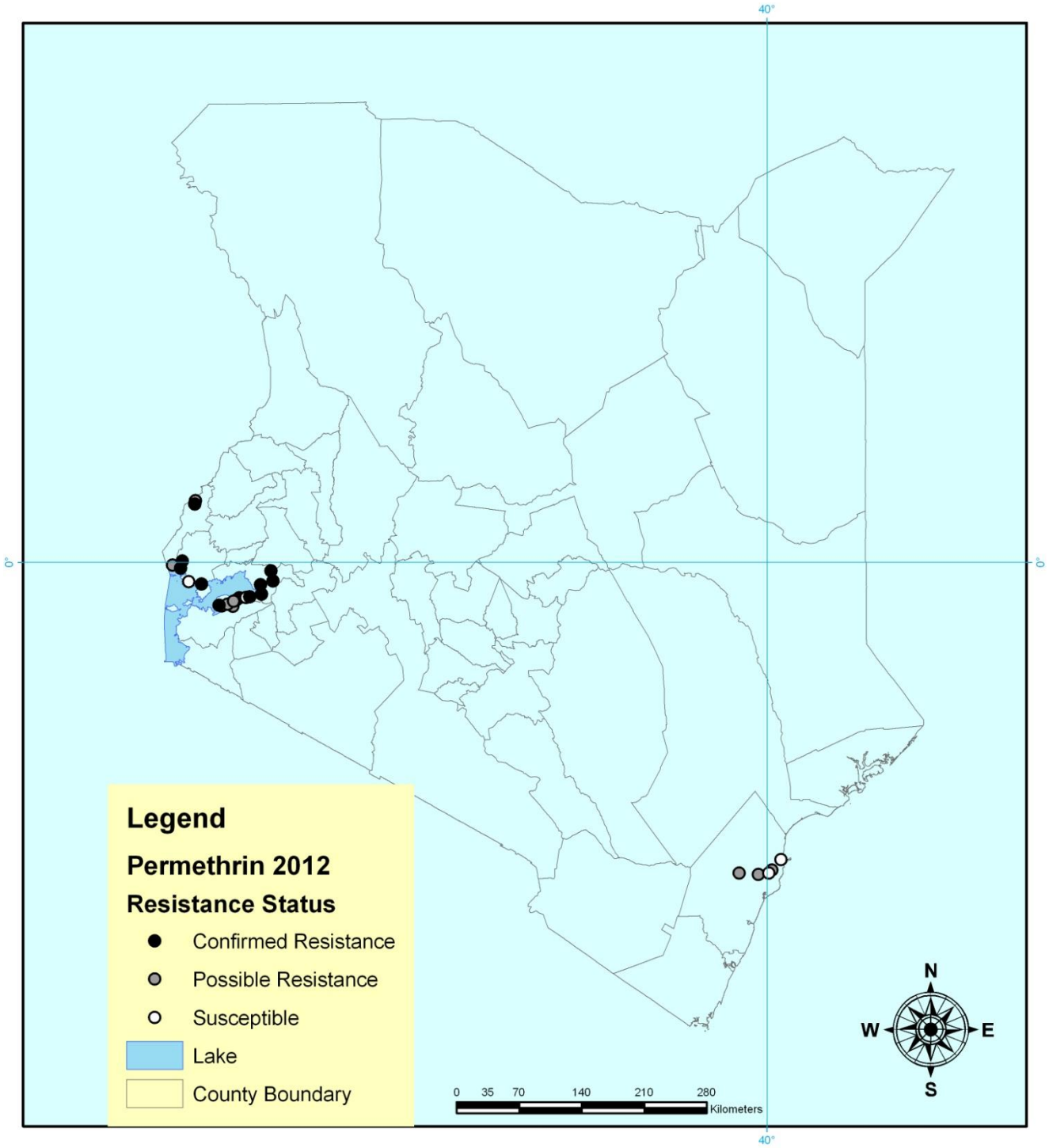
The situation for deltamethrin in 2012 depicts a worsening picture wherein most of the sites with suspected resistance around the lake region are now confirmed.

Figure 8a: Insecticide Resistance Maps in Kenya—Permethrin 2011



Widespread resistance to permethrin in the lake region and the central region in 2011. Mosquitoes along the coastal areas are mostly susceptible to permethrin.

Figure 8b: Insecticide Resistance Maps in Kenya—Permethrin 2012



Permethrin resistance sites increased in 2012 in the lake region.