

COMMUNICATIONS COMMISSION OF KENYA

(CCK)

CELLULAR MOBILE QUALITY OF SERVICE PERFORMANCE ASSESSMENT REPORT FOR THE PERIOD 2010-2011

1. Introduction

As provided for under Section 23 of the Kenya Information and Communications Act, Cap 411A, the Communications Commission of Kenya is mandated to ensure provision of good quality services by licensed telecommunications network operators and service providers. This is further elaborated in the respective licenses under the quality of service condition.

Towards this end cellular mobile QoS is assessed based on 8 Key Performance Indicators (KPIs) as indicated in **Table 1** below: The KPIs were adopted in 2008/09 through a consultative process.

Table 1: QoS Performance Assessment KPIs

No.	KPI	TARGETS	
		Immediate (From 2009)	After 3 years (i.e. from 2012)
1.	Completed Calls	90%	95%
2.	Call Set Up Success Rate (CSSR)	90%	95%
3.	Call Drop Rate	2%	2%
4.	Call Block Rate	10%	5%
5.	Speech Quality	MOS for 95% of samples > 2.7	95% of samples >3.1
6.	Call Set Up Time	13.5 seconds	13.5 seconds
7.	Handover Success Rate	85%	90%
8.	Rx Lev	Outdoor = - 102 dBm	Outdoor = - 102 dBm
		Indoor = -95 dBm	Indoor = -95 dBm
		In car = - 100 dBm	In car = - 100 dBm

Note: An Operator is expected to meet the targets of at least 80% (i.e.7 out of 8) of the above KPIs.

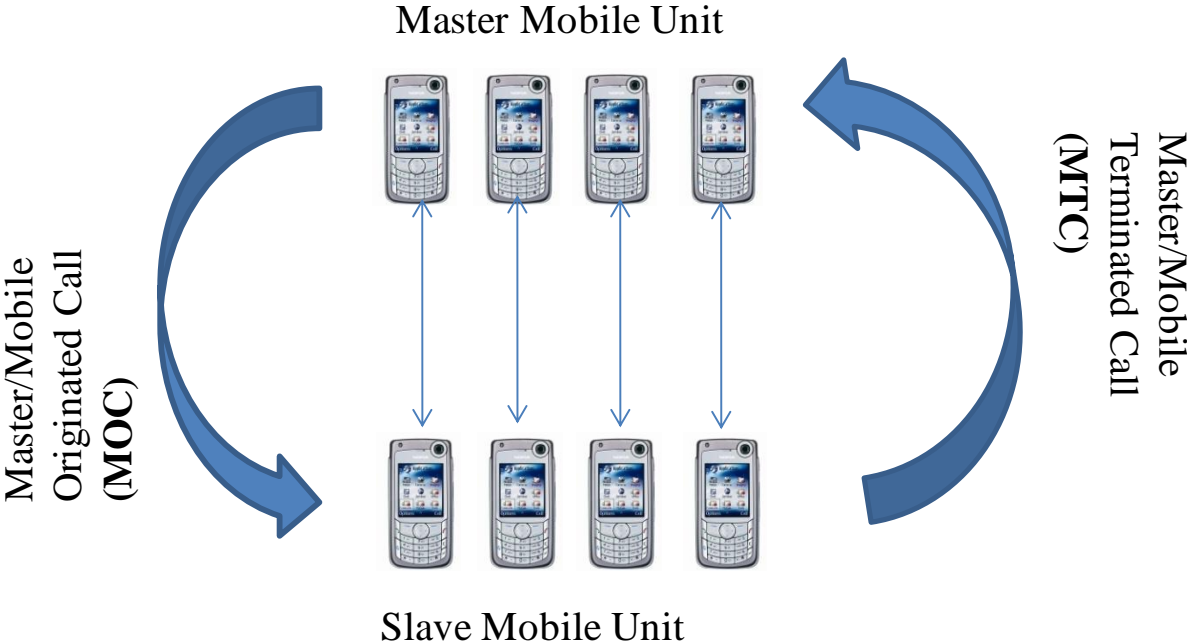
Based on the above mentioned KPIs the Commission continues to carry out independent quality of service measurement throughout the country to confirm operators' compliance with this requirement and in accordance with section 8 of the Kenya Information And Communications (compliance Monitoring, Inspections And Enforcement) Regulations, 2010.

2. Quality Of Service Measurement Approach

In the period 2010/11 quality of services measurements were carried out throughout the country with the results being presented in terms of 7 regions namely; Coast, Eastern, Rift Valley, Central, North Eastern, Nairobi, Western & Nyanza.

The measurements were carried out in a Mobile to Mobile configuration, see figure 1 below, where calls are alternately generated from Master/Mobile Originated Calls-MOC and Master/Mobile Terminated Calls-MTC. This was to enable the Commission to determine quality of service based on the call configuration commonly used by a majority of the public.

Figure 1: Quality of Service Measurement Configuration



3. Performance Assessment Results

The results of the performance assessment are presented as follows:

- a) Overall performance Assessment Results
- b) Regional Performance Assessment Results
- c) Performance Assessment on Specific Quality of Service Parameters
- d) Comparative Performance Assessment on Specific Parameters per Region

3.1.Overall Performance Assessment Results

The overall performance assessment of the mobile operators during the 2010-2011 period was as presented in **Table 1**.

Table 1: Overall %age Compliance Level

LICENSEE	Target Number of QoS parameters for Compliance	%age QoS parameters' Compliance Required	No. of QoS Parameters for which targets are Met	Actual %age QoS Parameters' Performance by each operator
Safaricom Ltd	8	80%	6	75%
Airtel Kenya Ltd	8	80%	6	75%
Telkom Kenya Ltd	8	80%	4	50%
Essar Telecom (K) Ltd	8	80%	6	75%

Please note that of the eight (8) quality of service parameters an operator is expected to meet or exceed the threshold of at least seven (7).

From the above results, no mobile operator met the quality of service targets during the period 2010-2011. Please note that Operators that persist in contravention of their license conditions shall, in accordance with Section 83A of the Kenya Information and Communications Act, Cap 411A, be liable to penalties of Five Hundred Thousand Shillings

The detailed analysis of the operators' individual performance on the specific quality of service parameters in different regions of the country are presented in the following tables and graphs;

3.2.Regional Performance Assessment Results

Figure 2: Essar's Regional Compliance Level

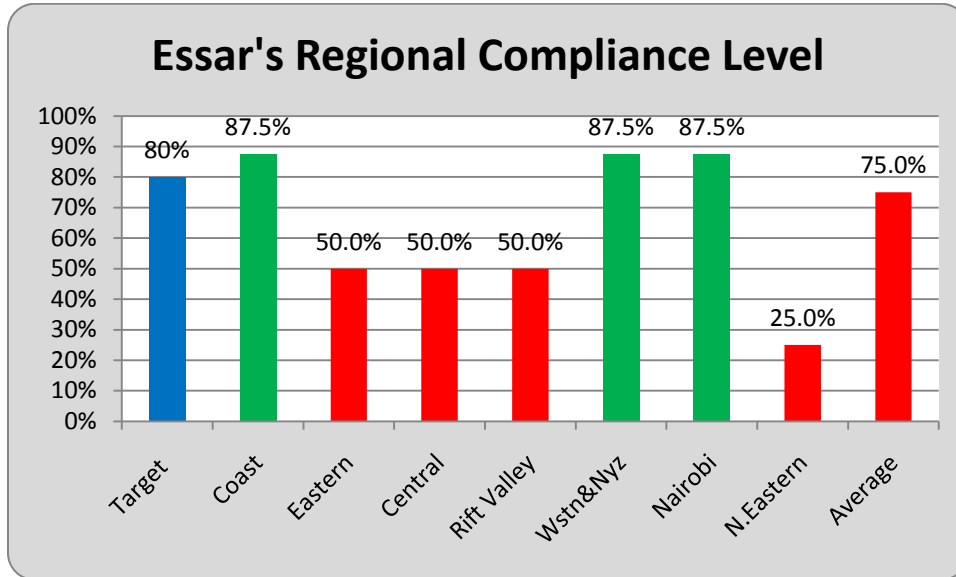


Figure 3: Telkom's Regional Compliance Level

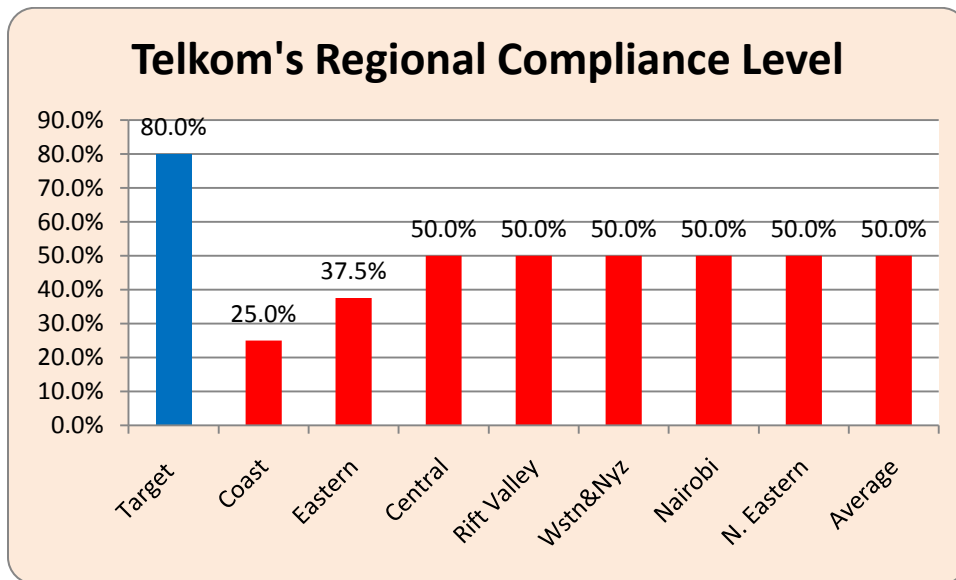


Figure 4: Airtel's Regional Compliance Level

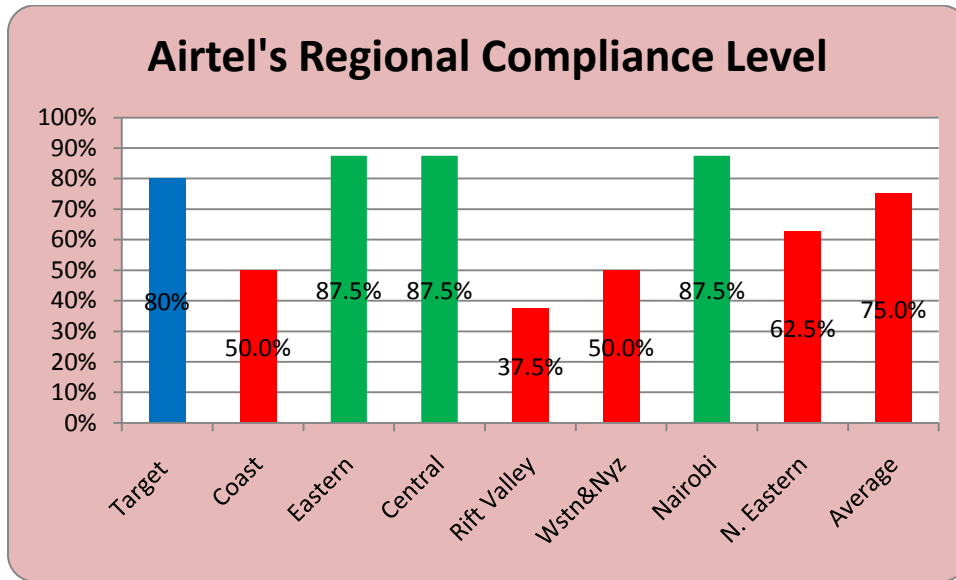
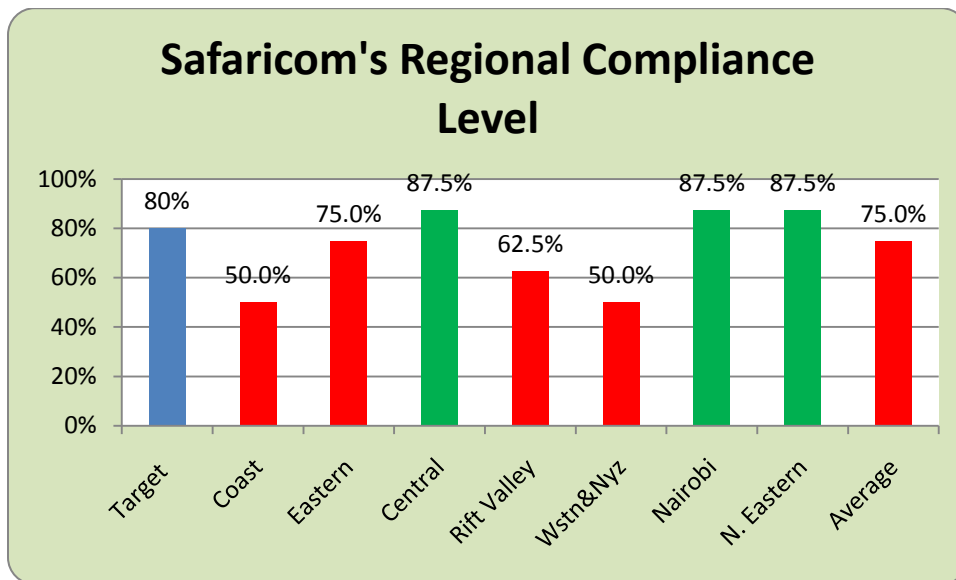


Figure 5: Safaricom's Regional Compliance Level



3.3. Performance Assessment on Specific Quality of Service Parameters

Table 2: Essar's Overall Performance Assessment Results

No.	QoS Parameter	Targets (%)	Essar's Performance	Essar's Compliance Status
1.	Completed Calls	90%	89.92%	Not Compliant
2.	Call Set up Success Rate	90%	90.14%	Compliant
3.	Dropped Calls	2%	1.30%	Compliant
4.	Blocked Calls	10%	9.87%	Compliant
5.	Speech Quality (MOS, PESQ Values)	95% of samples >2.7	71.64%	Not Compliant
6.	Handover Success Rate	85%	94.14%	Compliant
7.	Call Set Up Time	<13.5 Secs	9.15	Compliant
8.	RxLev	Outdoor -102 dBm	-84.04	Compliant

Table 3: Telkom's Overall Performance Assessment Results

No.	QoS Parameter	Targets (%)	Telkom's Performance	Telkom's Compliance Status
9.	Completed Calls	90%	38.50%	Not Compliant
10.	Call Set up Success Rate	90%	41.36%	Not Compliant
11.	Dropped Calls	2%	1.91%	Compliant
12.	Blocked Calls	10%	58.75%	Not Compliant
13.	Speech Quality (MOS, PESQ Values)	95% of samples >2.7	85.45%	Not Compliant
14.	Handover Success Rate	85%	94.17%	Compliant
15.	Call Set Up Time	<13.5 Secs	9.33	Compliant
16.	RxLev	Outdoor -102 dBm	-84.86	Compliant

Table 4: Airtel's Overall Performance Assessment Results

No.	QoS Parameter	Targets (%)	Airtel's Performance	Airtel's Compliance Status
17.	Completed Calls	90%	89.78%	Not Compliant
18.	Call Set up Success Rate	90%	90.02%	Compliant
19.	Dropped Calls	2%	1.79%	Compliant
20.	Blocked Calls	10%	9.97%	Compliant
21.	Speech Quality (MOS, PESQ Values)	95% of samples >2.7	87.47%	Not Compliant
22.	Handover Success Rate	85%	97.57%	Compliant
23.	Call Set Up Time	<13.5 Secs	9.69	Compliant
24.	RxLev	Outdoor -102 dBm	-87.43	Compliant

Table 5: Safaricom's Overall Performance Assessment Results

No.	QoS Parameter	Targets (%)	Safaricom's Performance	Safaricom's Compliance Status
25.	Completed Calls	90%	89.00%	Not Compliant
26.	Call Set up Success Rate	90%	91.67%	Compliant
27.	Dropped Calls	2%	1.34%	Compliant
28.	Blocked Calls	10%	8.39%	Compliant
29.	Speech Quality (MOS, PESQ Values)	95% of samples >2.7	82.21%	Not Compliant
30.	Handover Success Rate	85%	99.28%	Compliant
31.	Call Set Up Time	<13.5 Secs	8.70	Compliant
32.	RxLev	Outdoor -102 dBm	-87.11	Compliant

3.4.Regional Comparative Performance Assessment on Specific Parameters

3.4.1. COAST REGION

Figure 6:Completed Calls

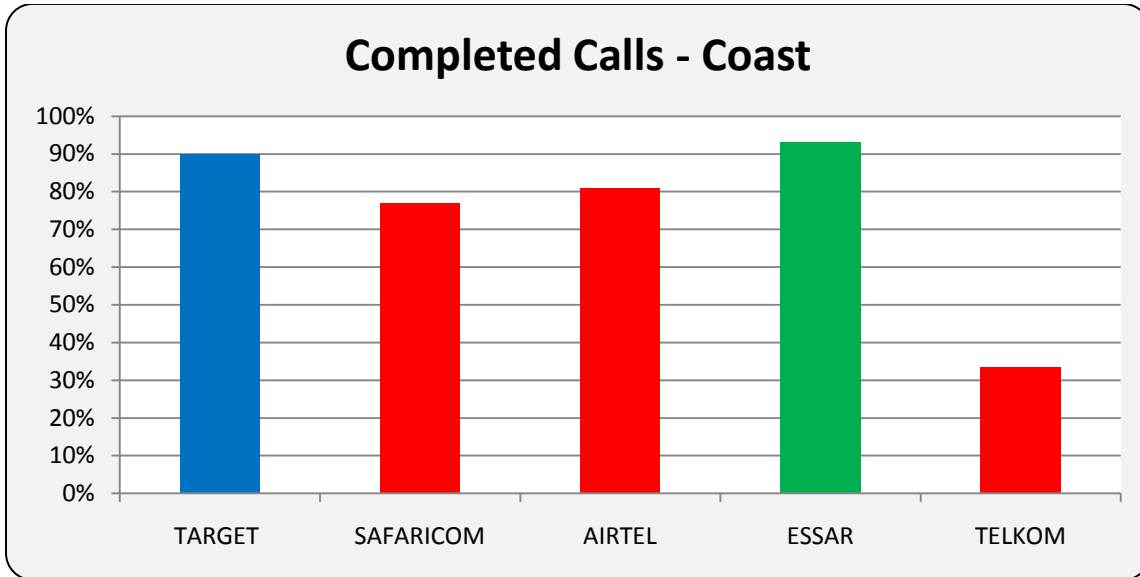


Figure 7:Call Set Up Success Rate

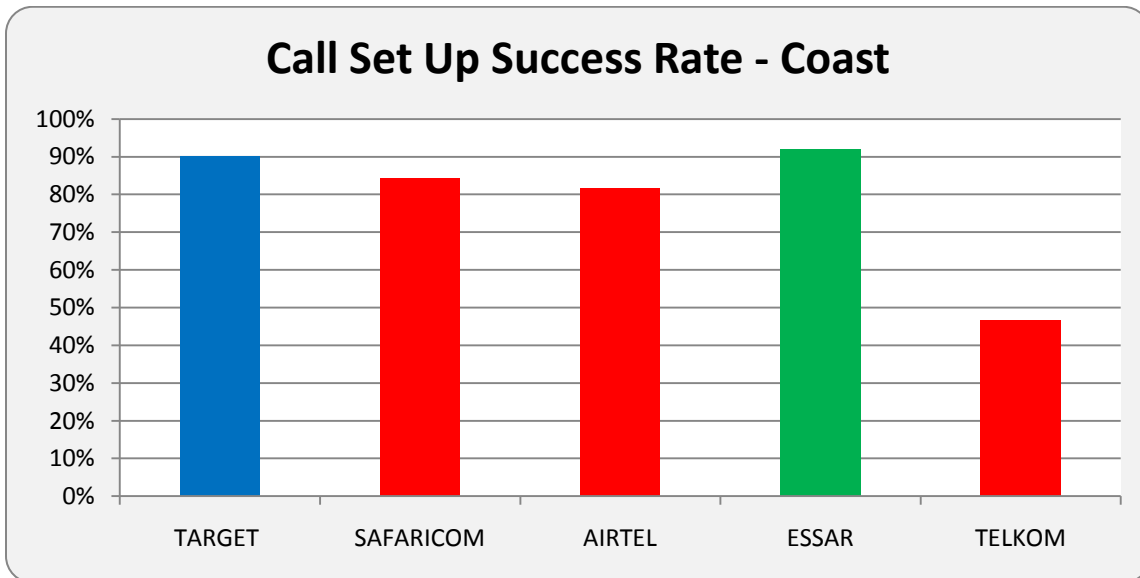


Figure 8: Call Drop Rate

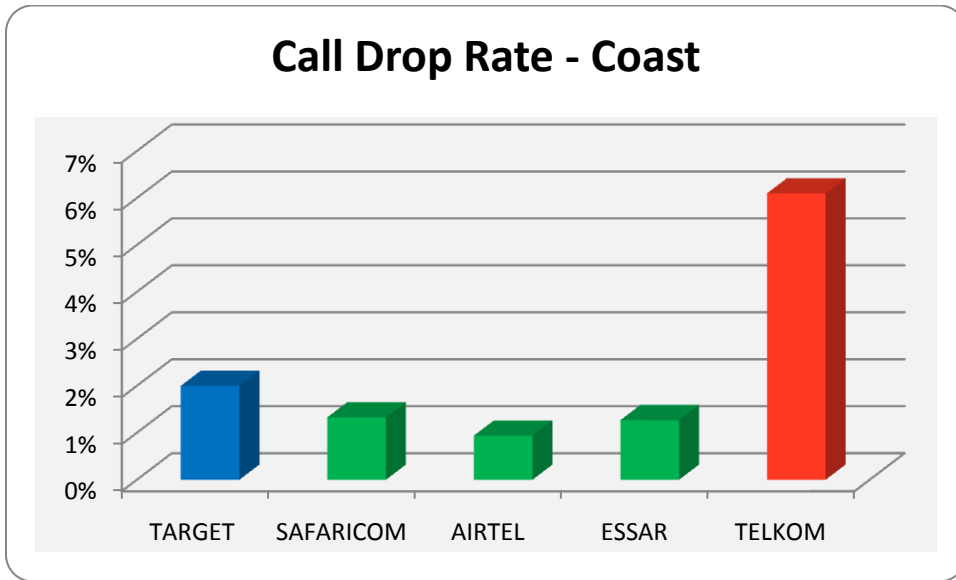


Figure 9: Call Block Rate

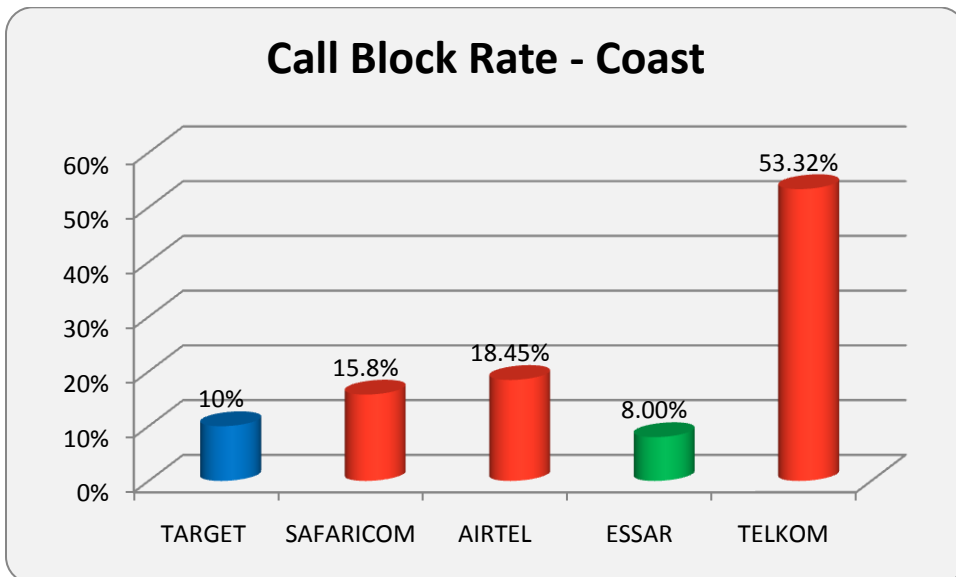


Figure 10: Hand Over Success Rate

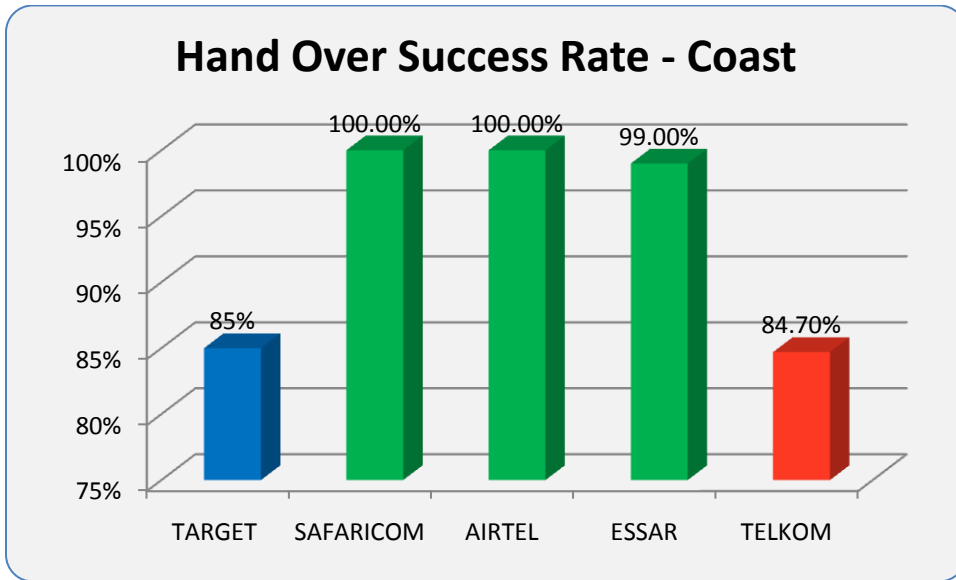


Figure 11: Speech Quality

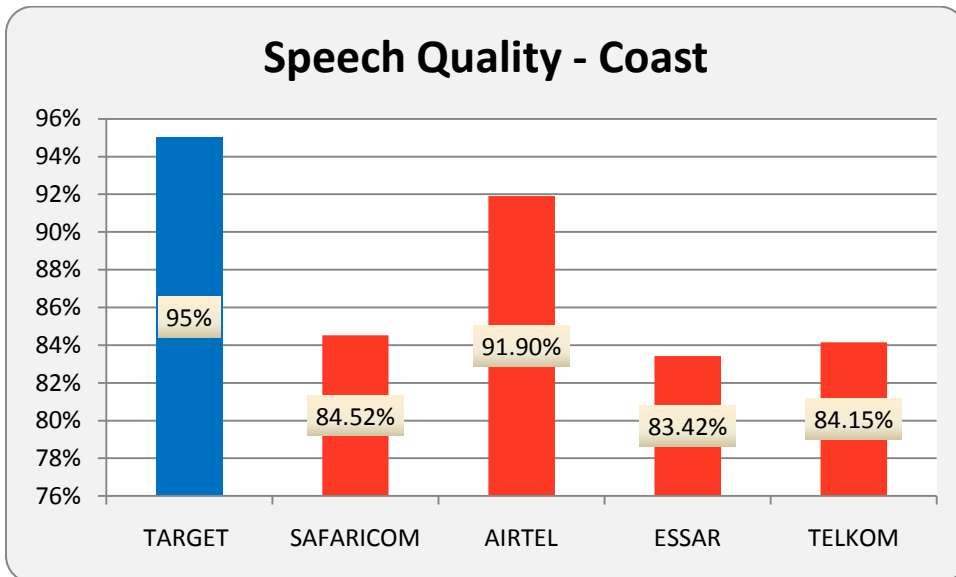


Figure 12: Call Set Up Time

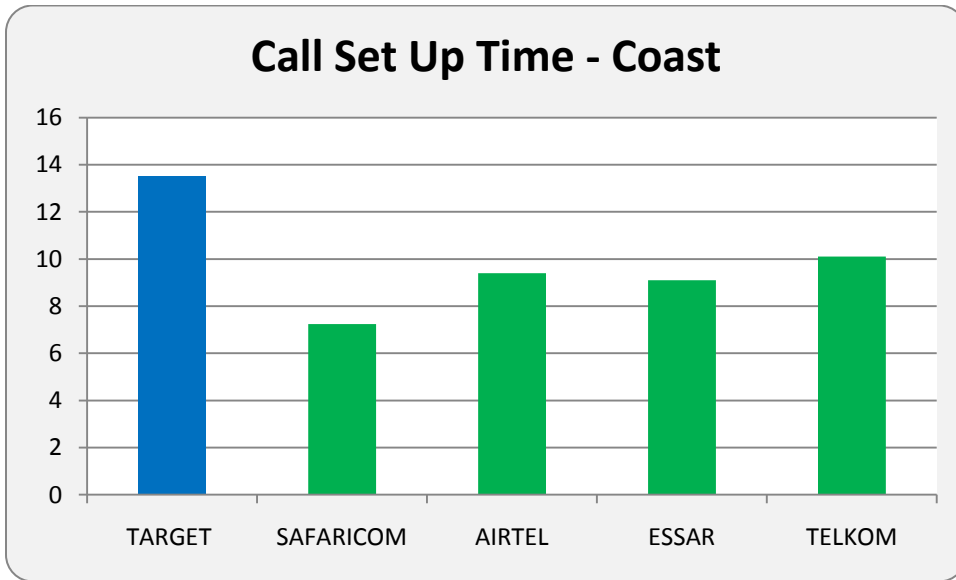
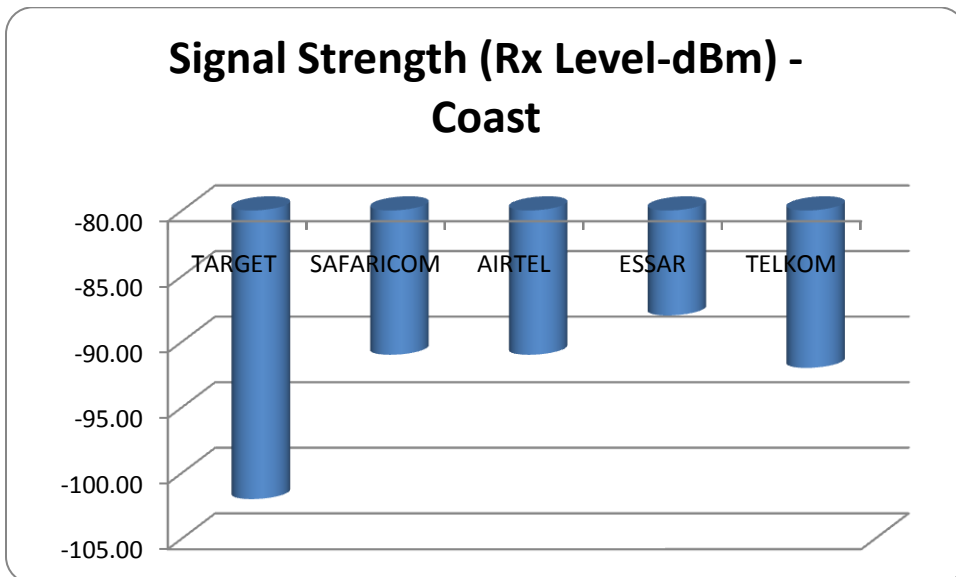


Figure 13: Signal Strength



3.4.2. EASTERN REGION

Figure 14: Completed Calls

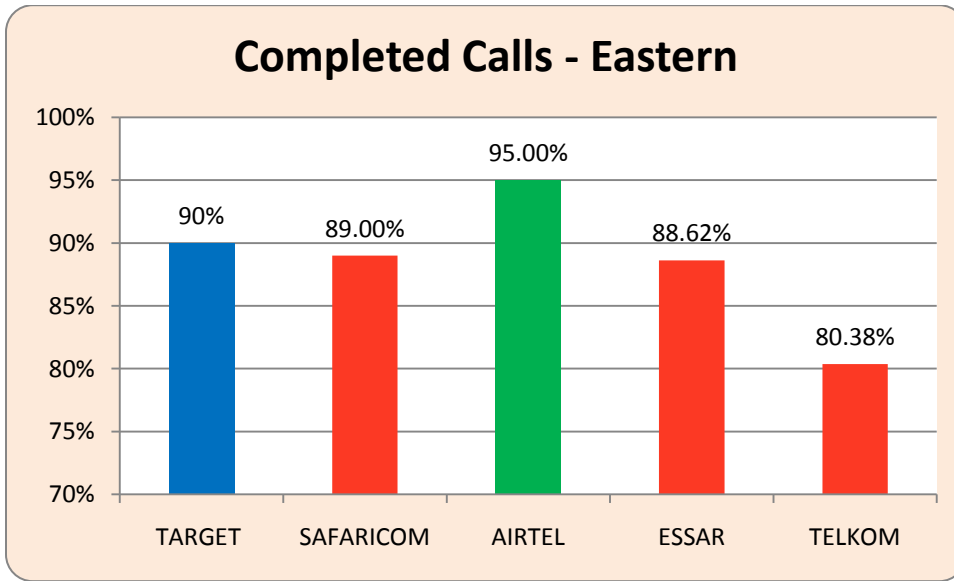


Figure 15: Call Set Up Success Rate

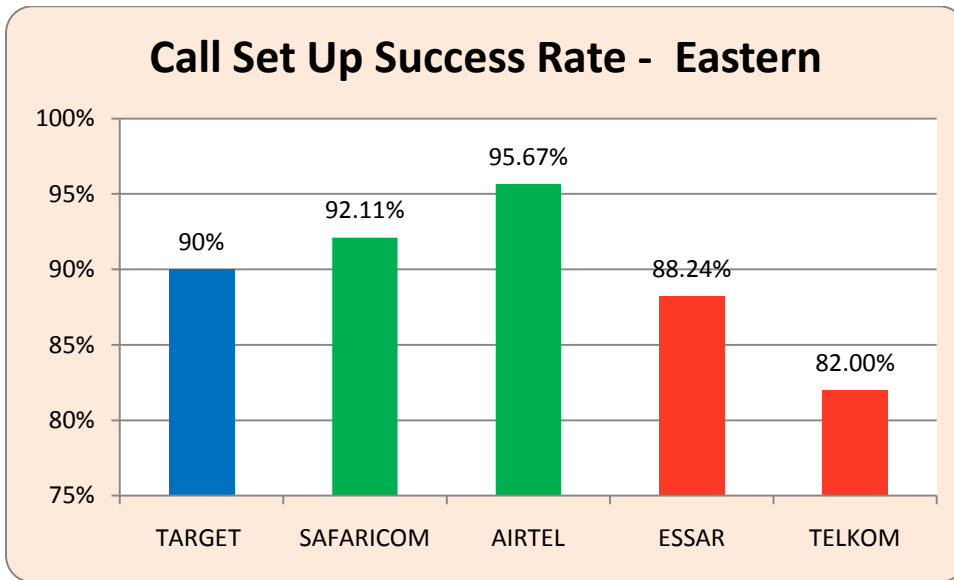


Figure 16: Call Drop Rate

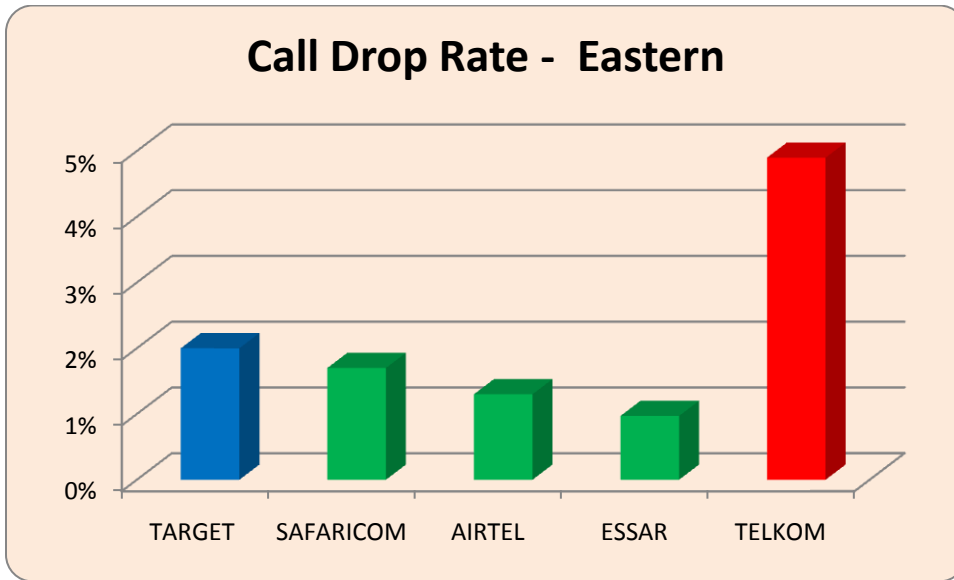


Figure 17: Call Block Rate

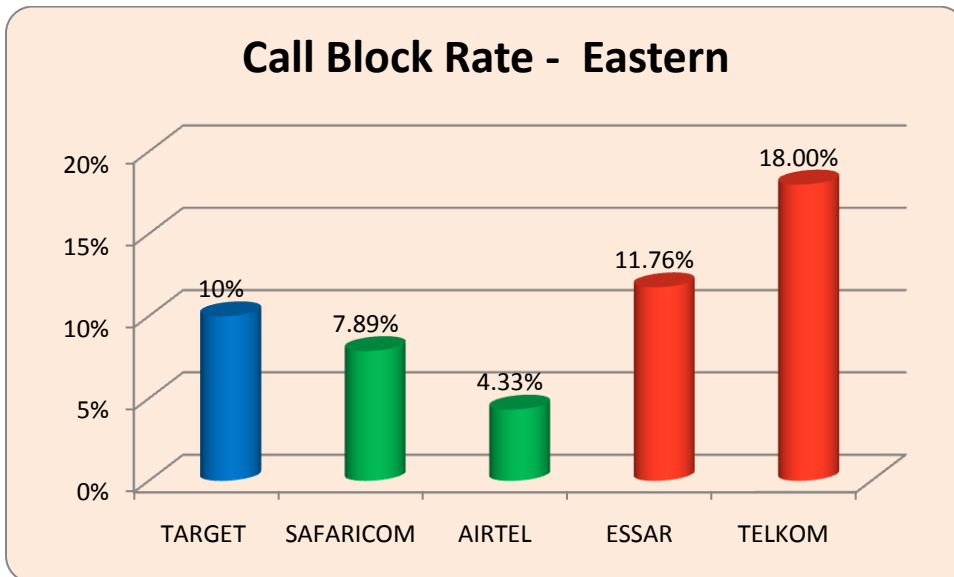


Figure 18: Hand Over Success Rate

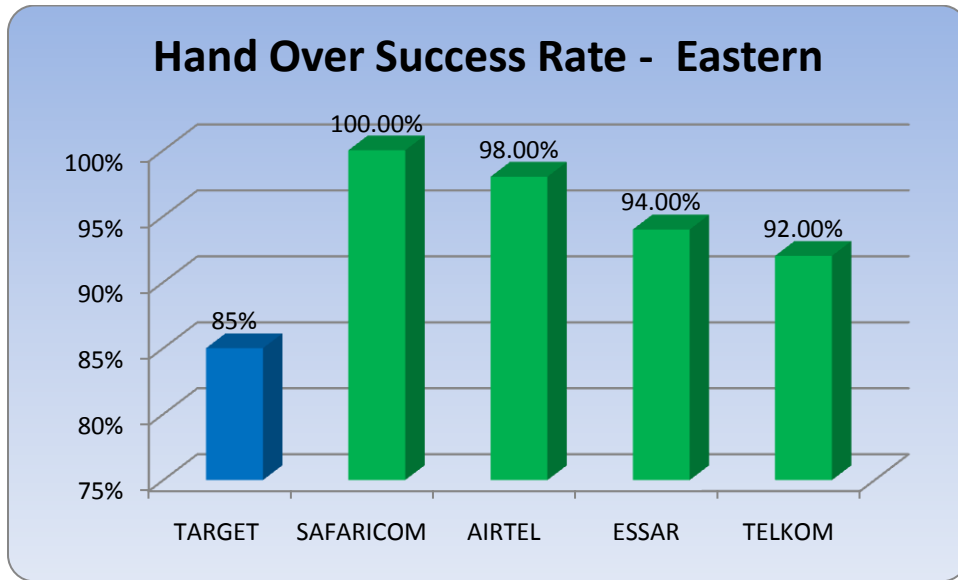


Figure 19: Speech Quality

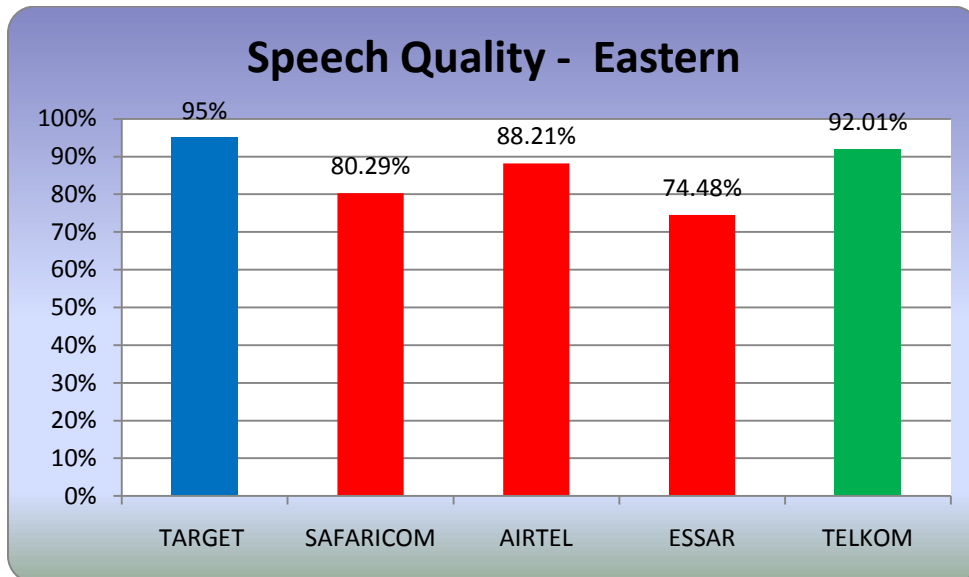


Figure 20: Call Set Up Time

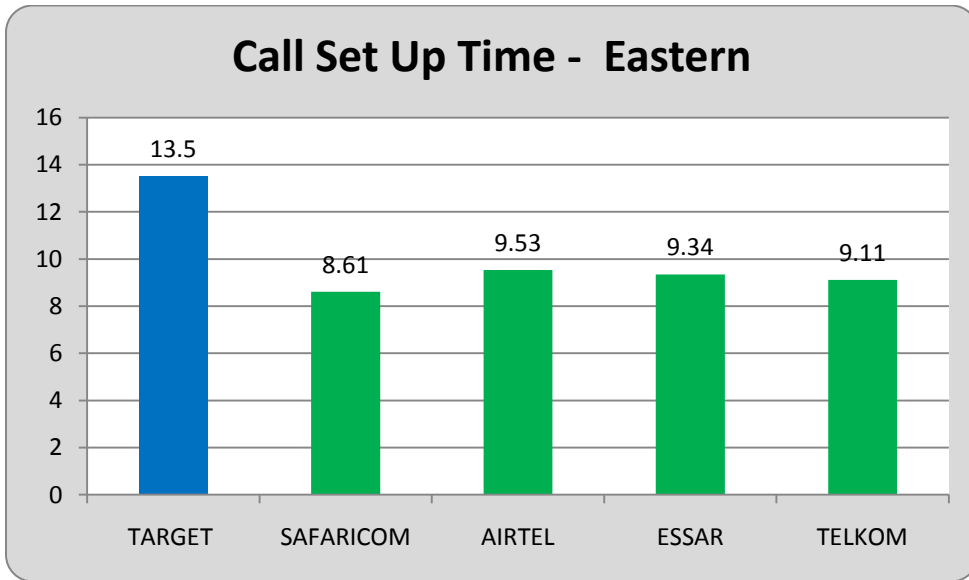
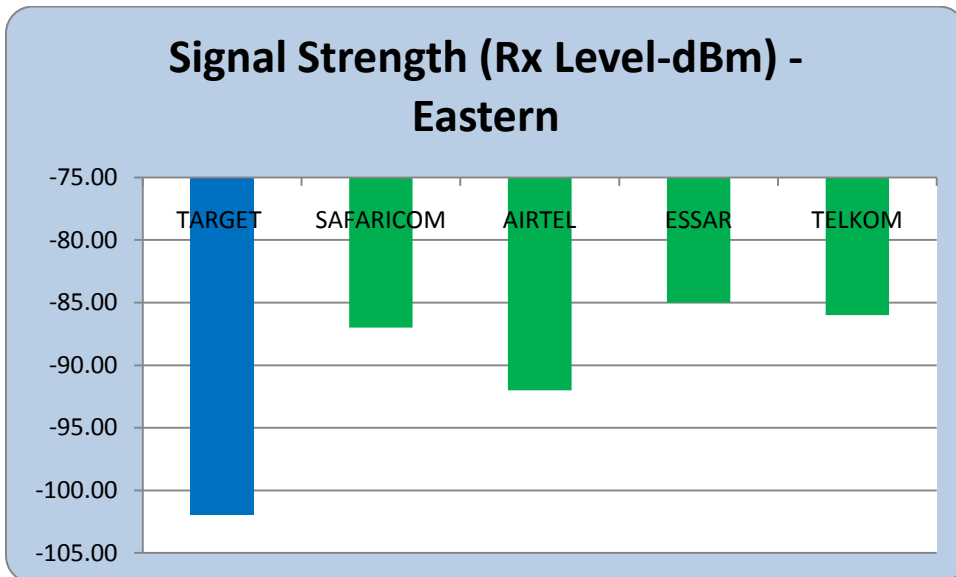


Figure 21: Signal Strength



3.4.3. CENTRAL REGION

Figure 22: Completed Calls

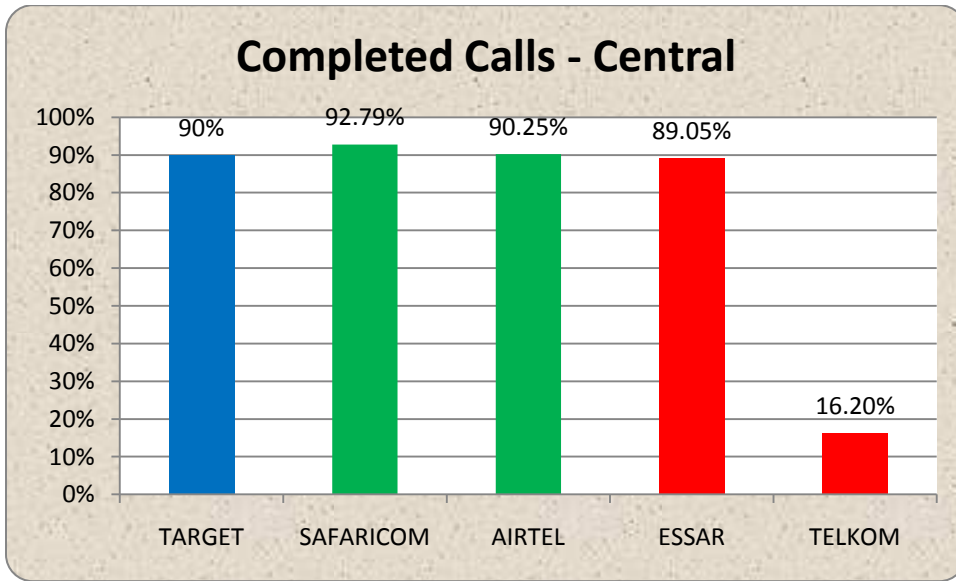


Figure 23: Call Set Up Success Rate

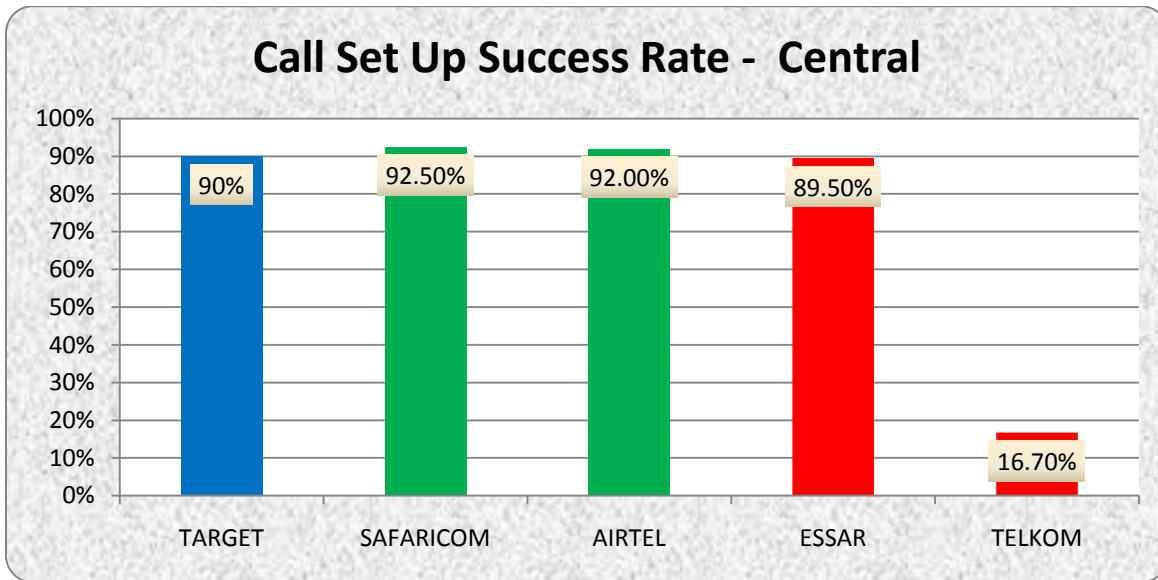


Figure 24: Call Drop Rate

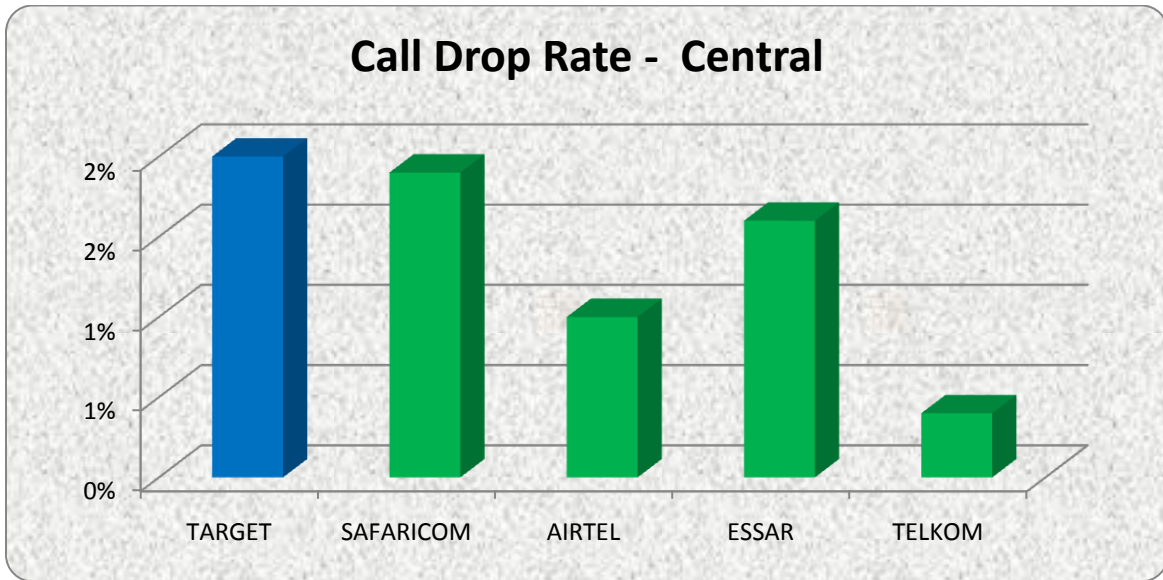


Figure 25: Call Block Rate

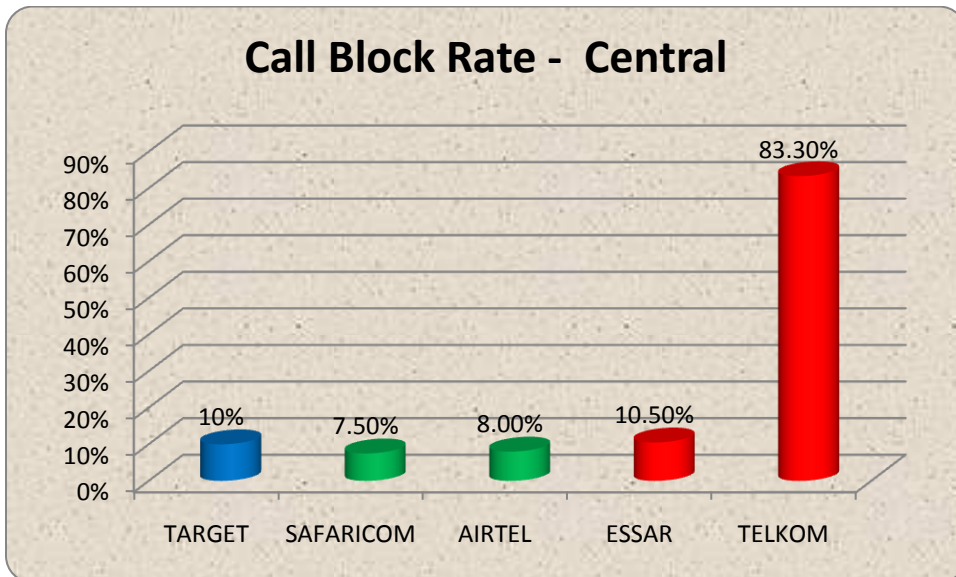


Figure 26: Hand Over Success Rate

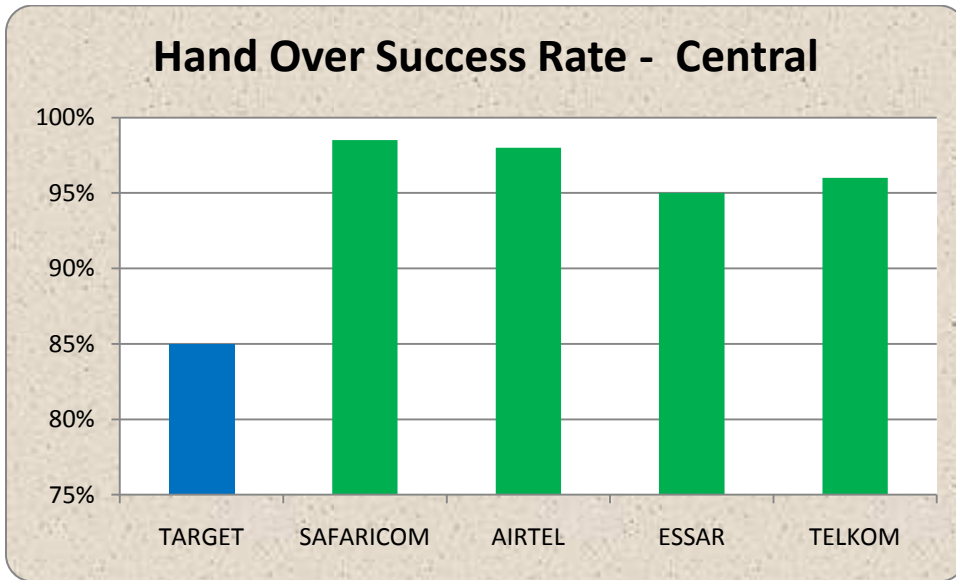


Figure 27: Speech Quality

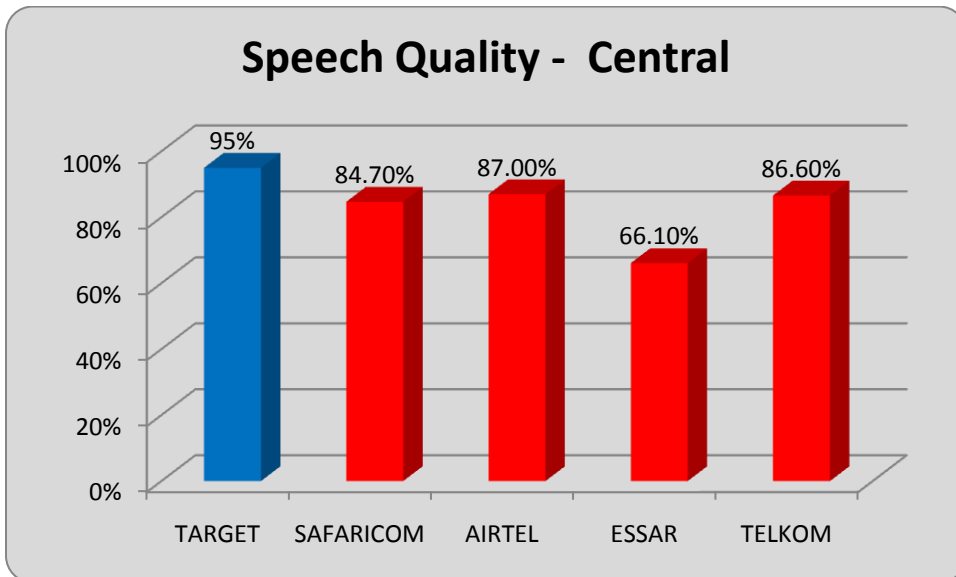


Figure 28: Call Set Up Time

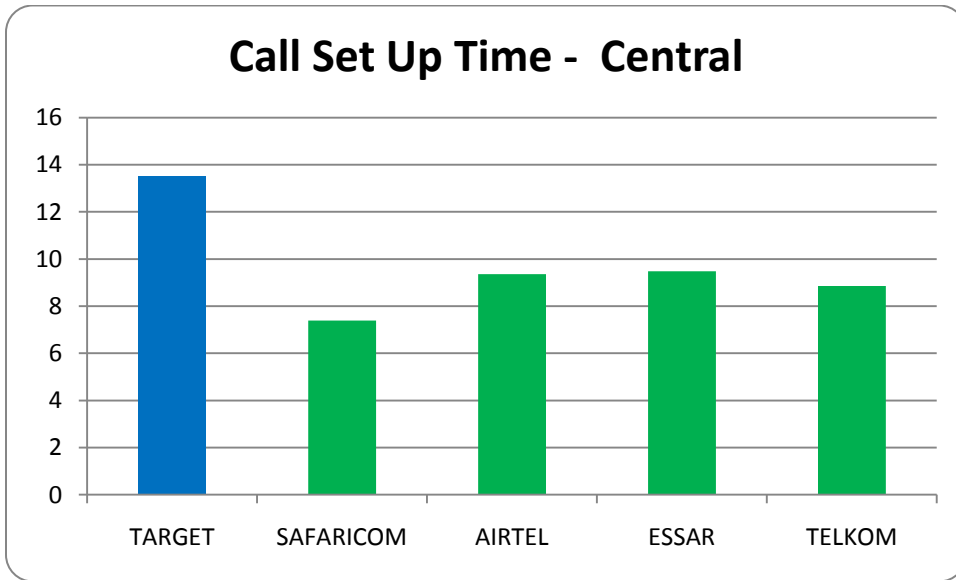
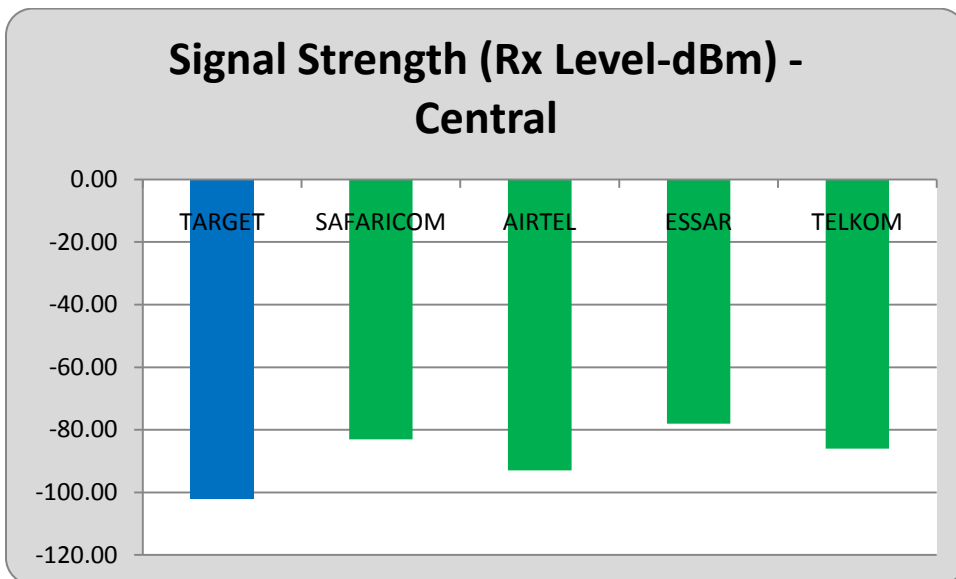


Figure 29: Signal Strength



3.4.4. RIFT VALLEY REGION

Figure 30: Completed Calls

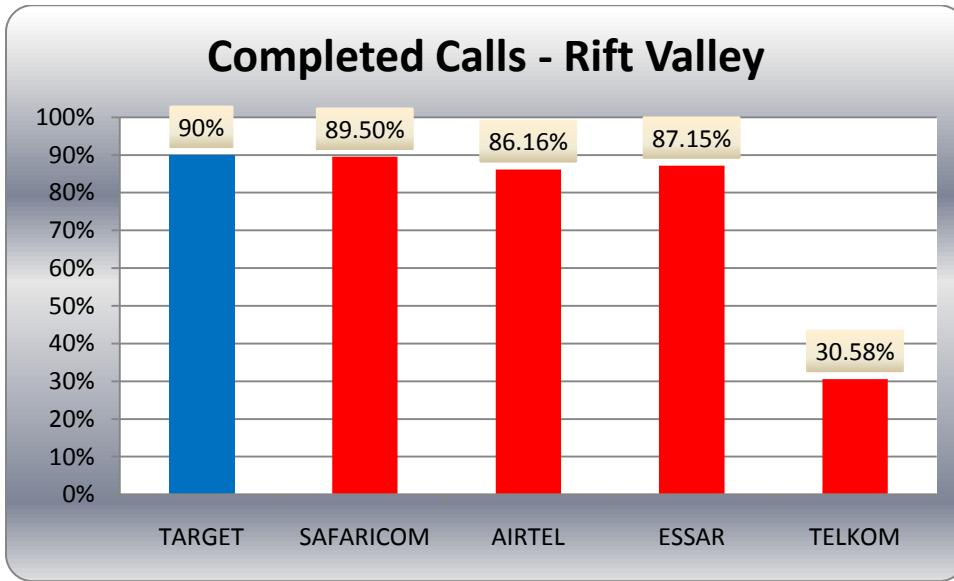


Figure 31: Call Set Up Success Rate

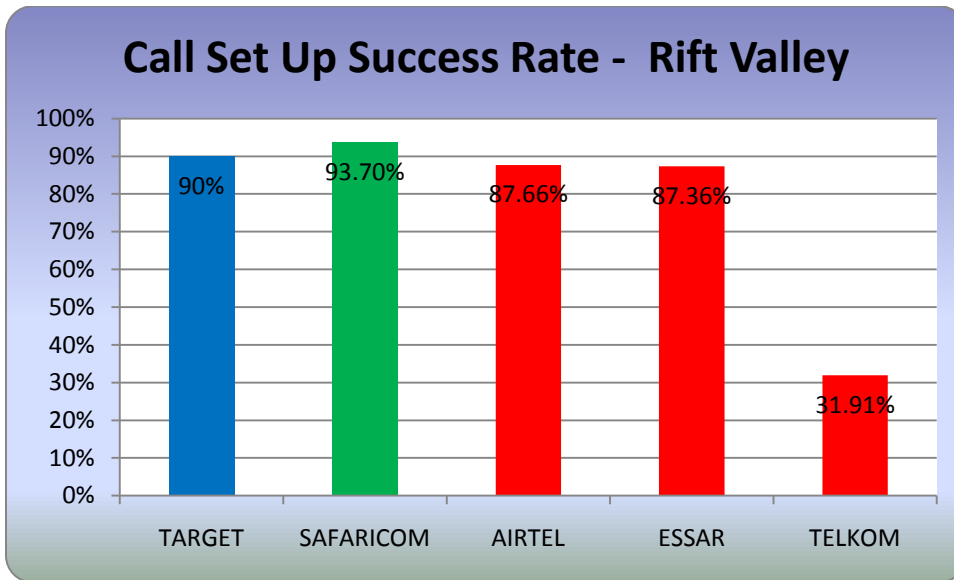


Figure 32: Call Drop Rate

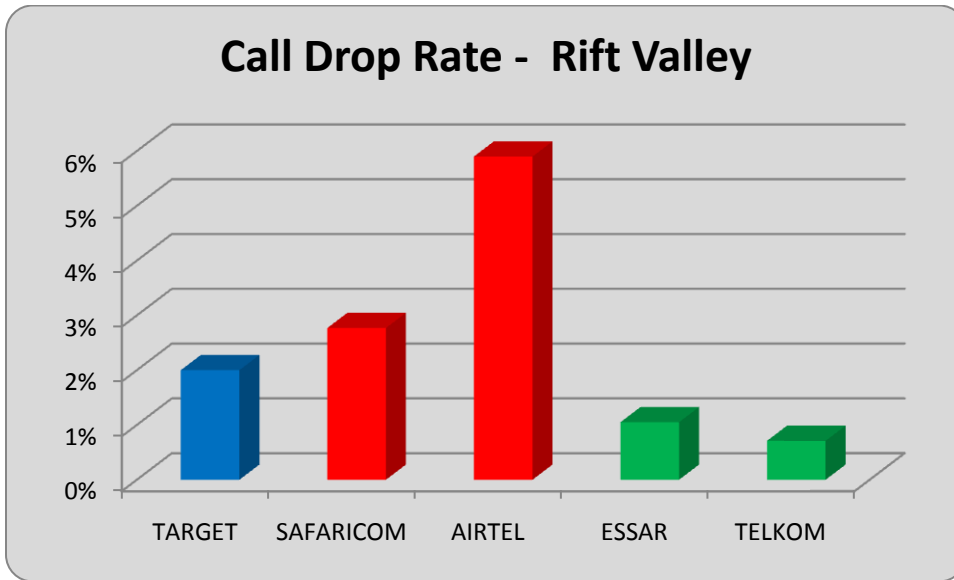


Figure 33: Call Block Rate

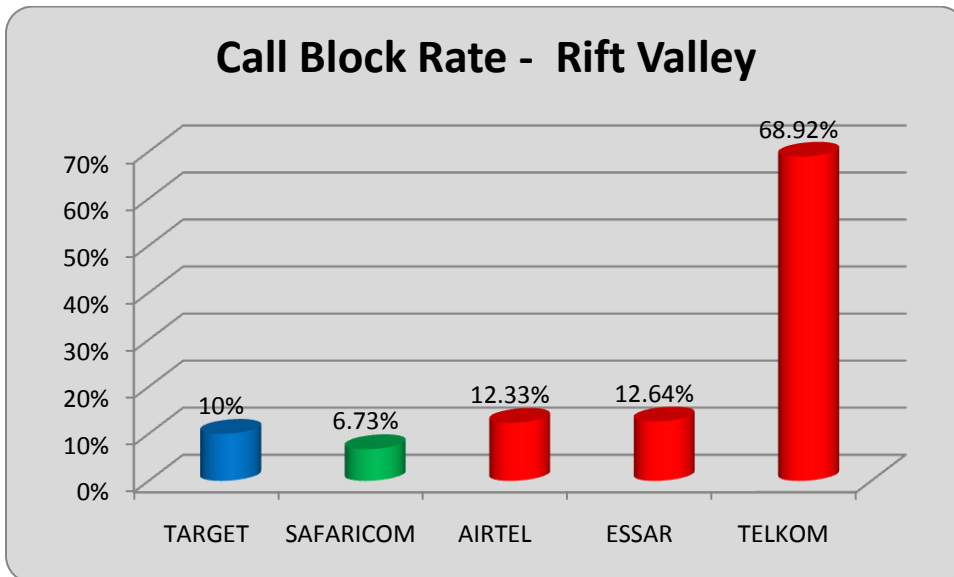


Figure 34: Speech Quality

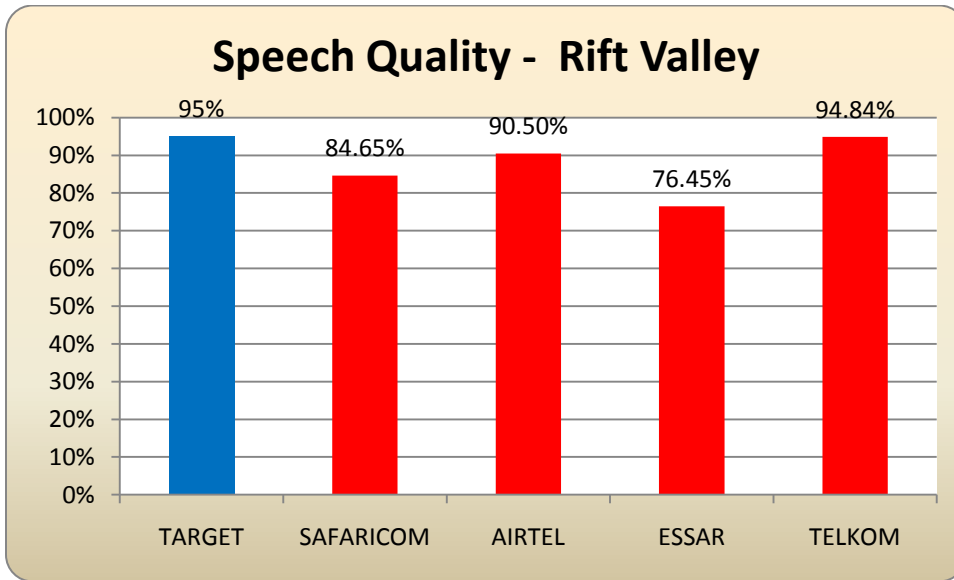


Figure 35: Hand Over Success Rate

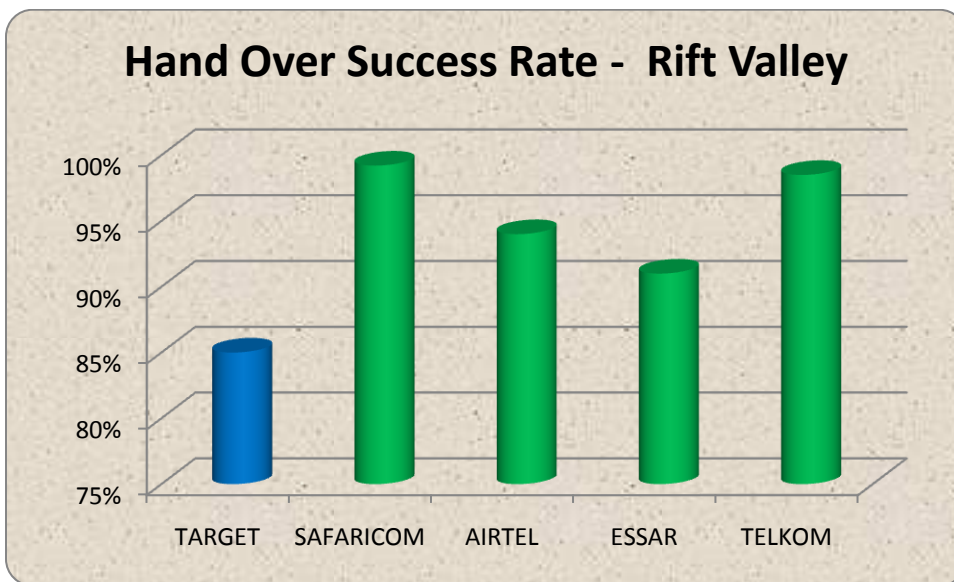


Figure 36: Call Set Up Time

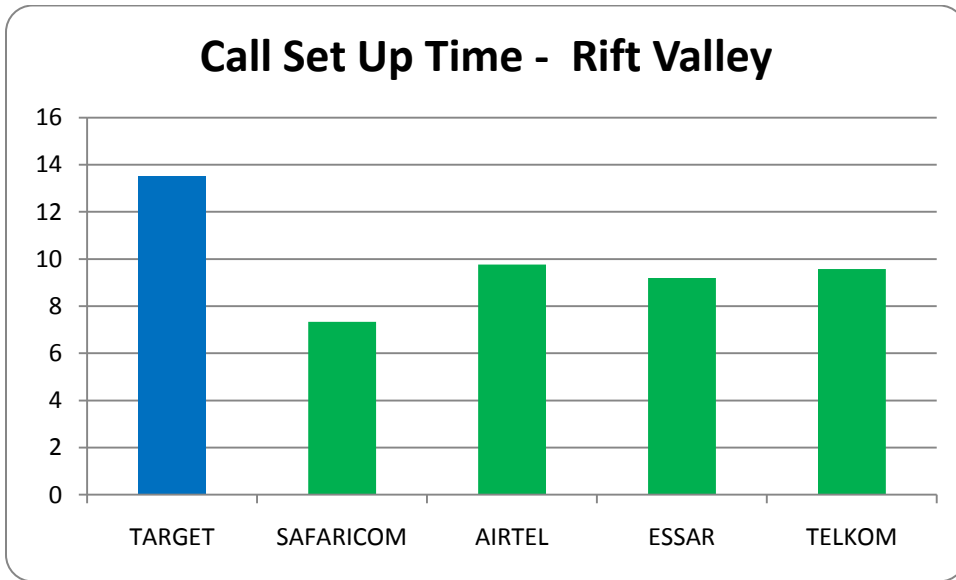
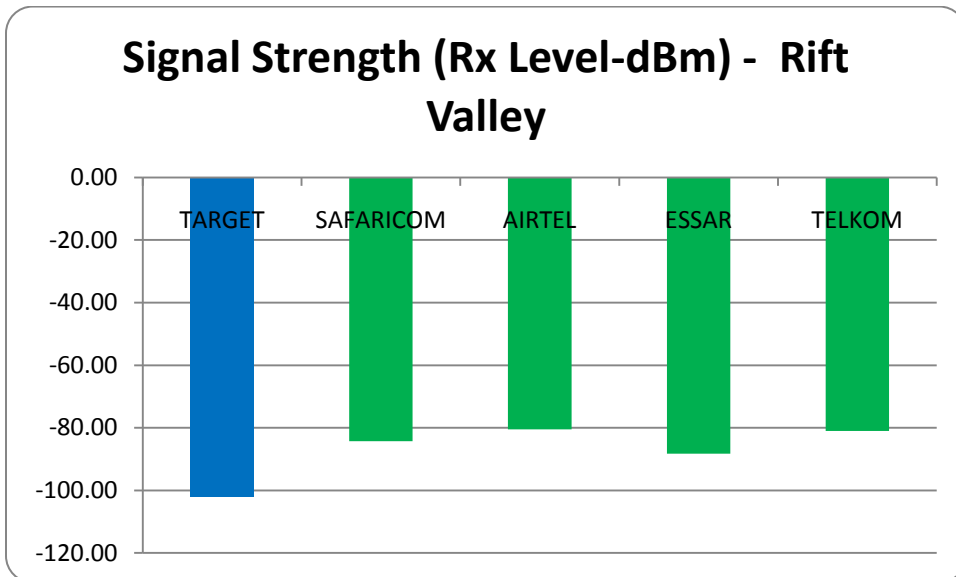


Figure 37: Signal Strength



3.4.5. WESTERN & NYANZA REGION'S

Figure 38: Completed Calls

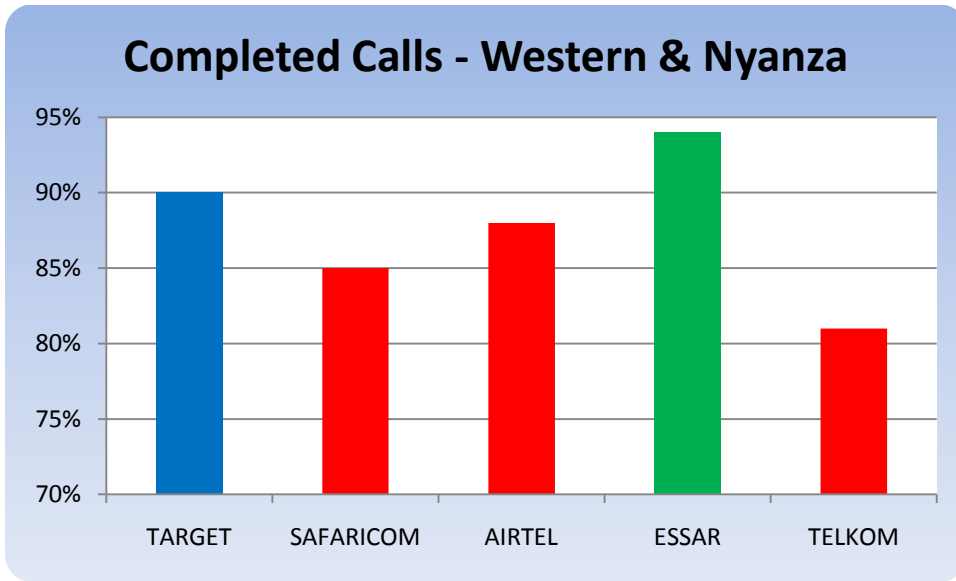


Figure 39: Call Set Up Success Rate

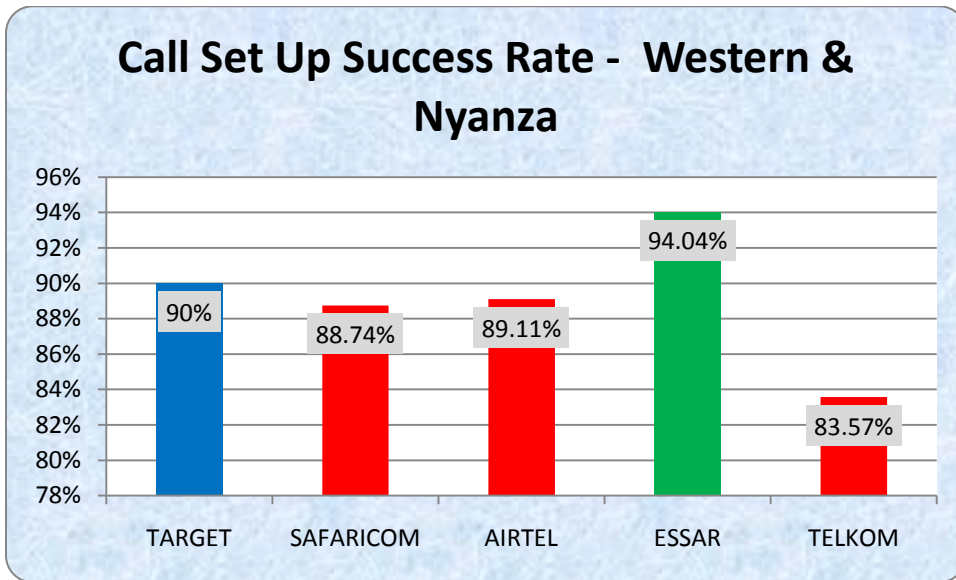


Figure 40: Call Drop Rate

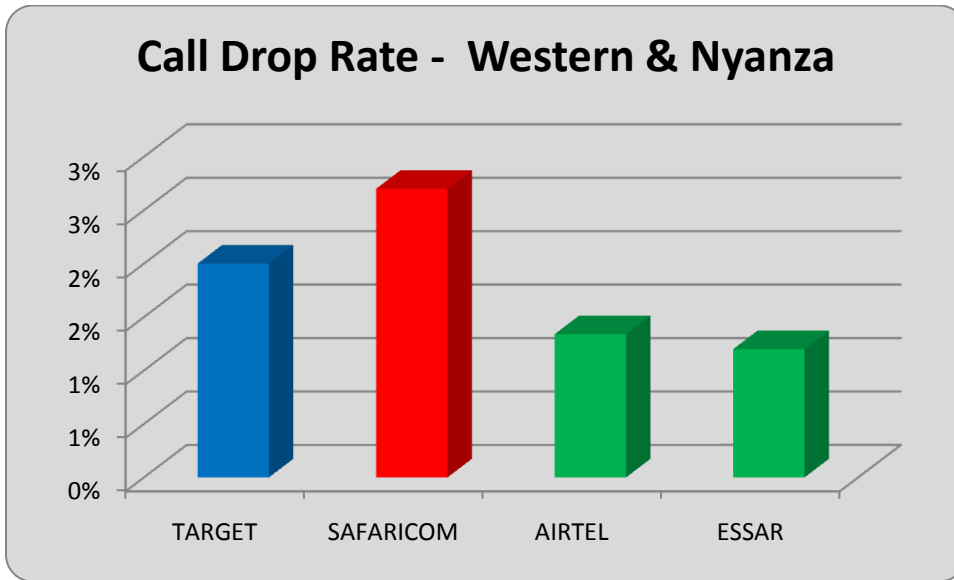


Figure 41: Call Block Rate

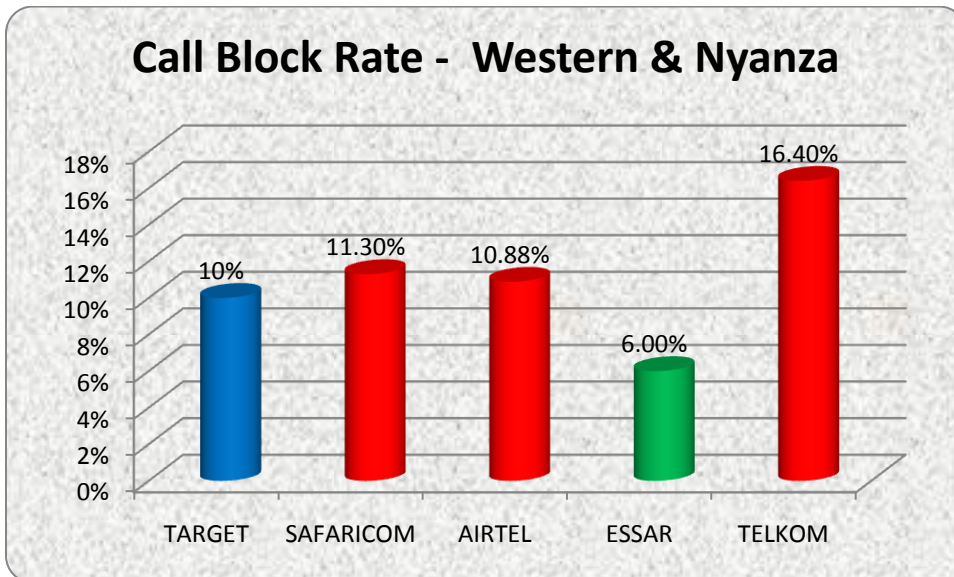


Figure 42: Speech Quality

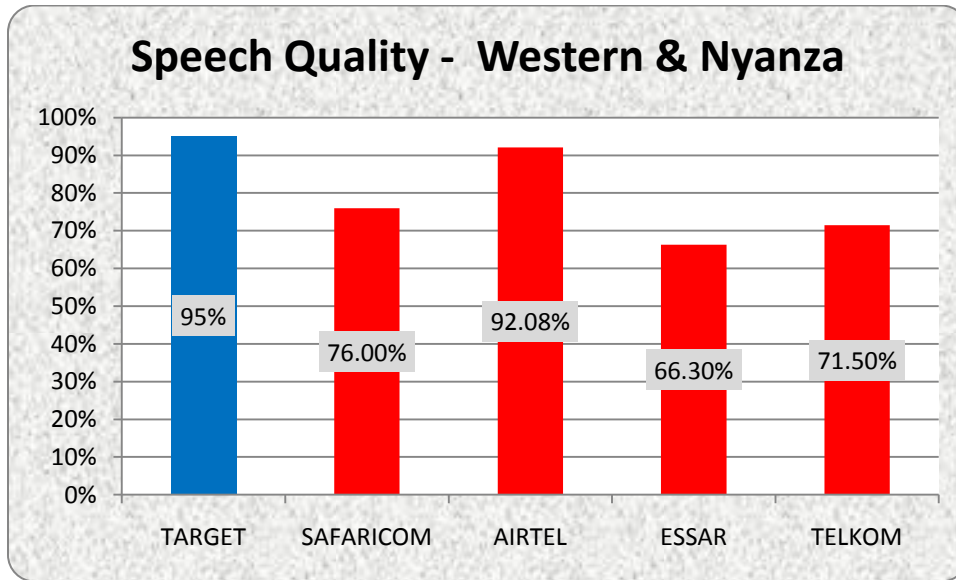


Figure 43: Hand Over Success Rate

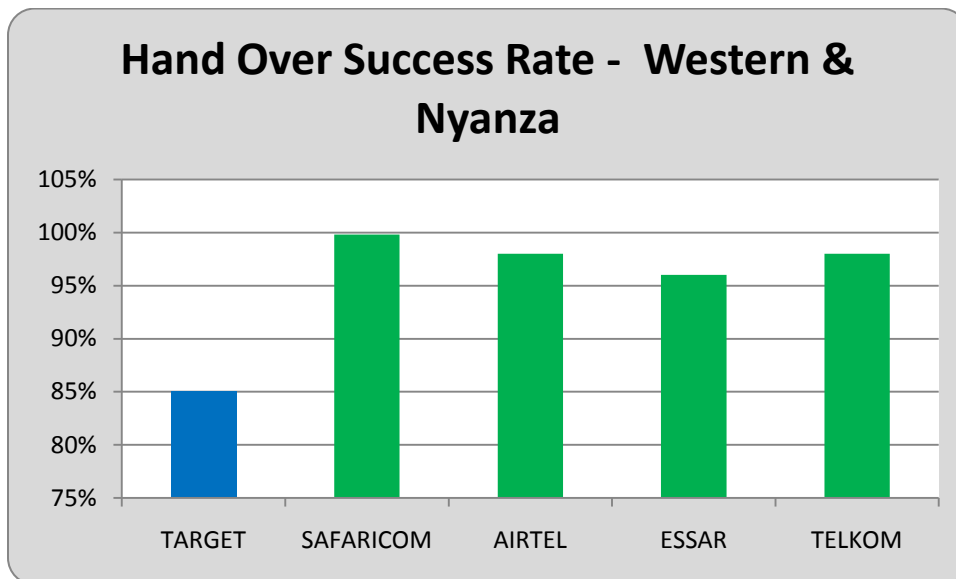


Figure 44: Call Set Up Time

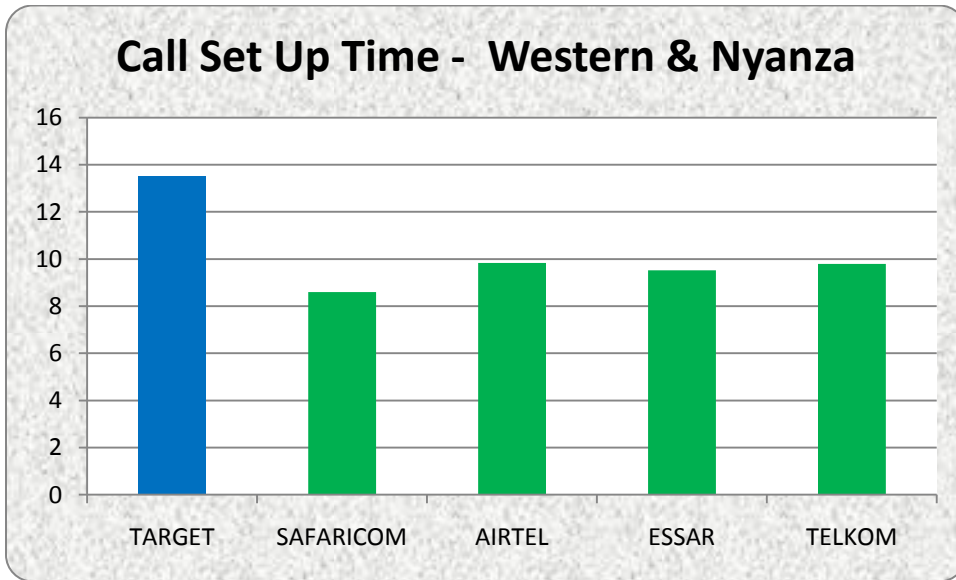
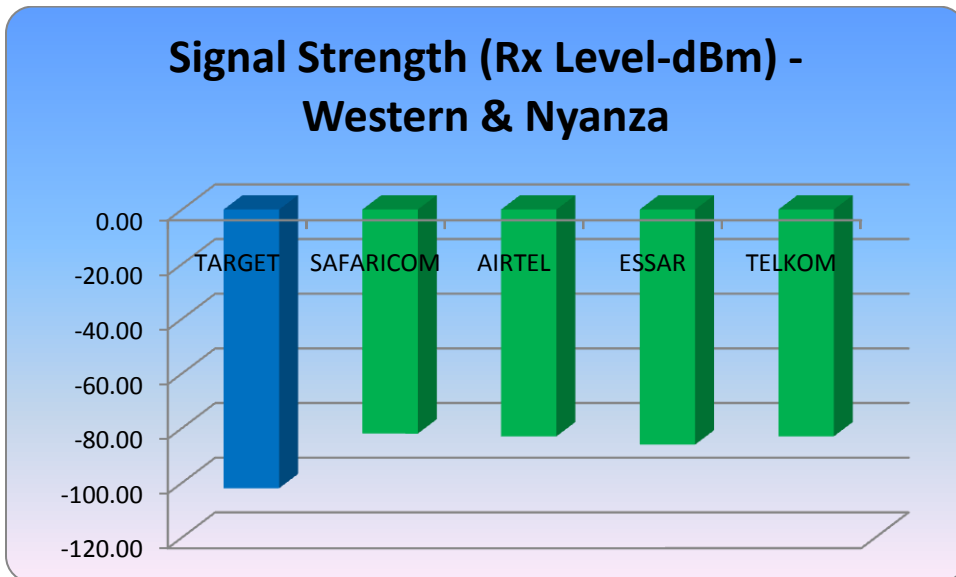


Figure 45: Signal Strength



3.4.6. NAIROBI REGION

Figure 46: Completed Calls

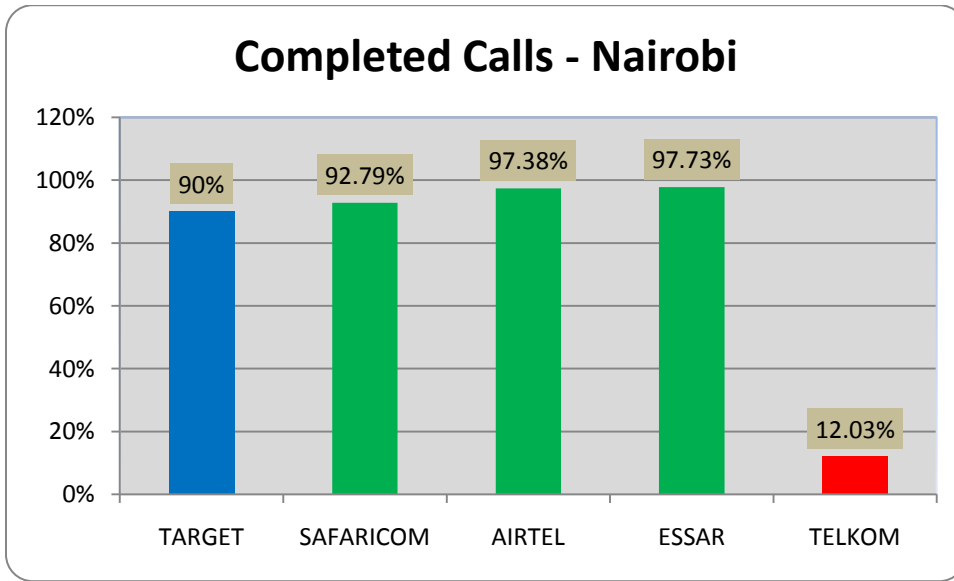


Figure 47: Call Set Up Success Rate

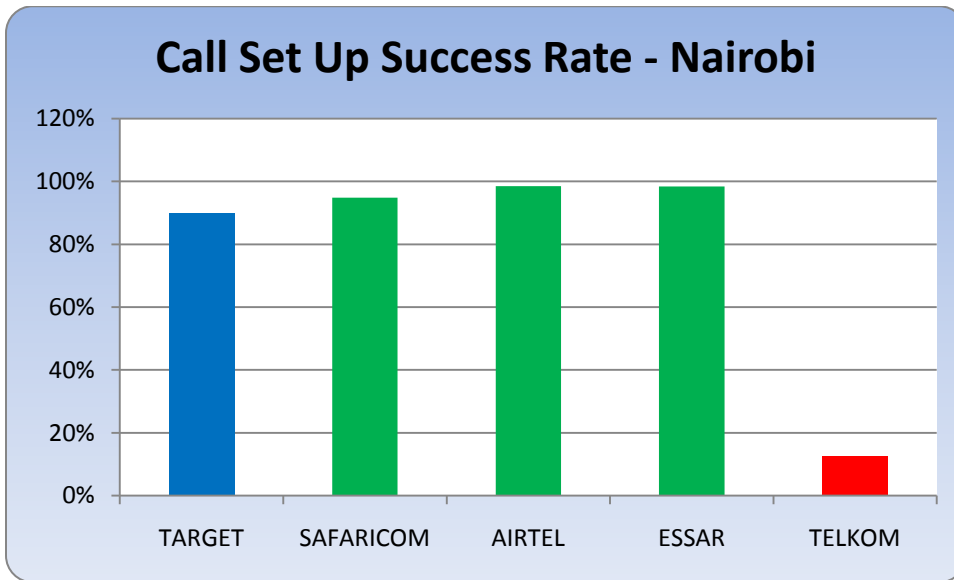


Figure 48: Call Drop Rate

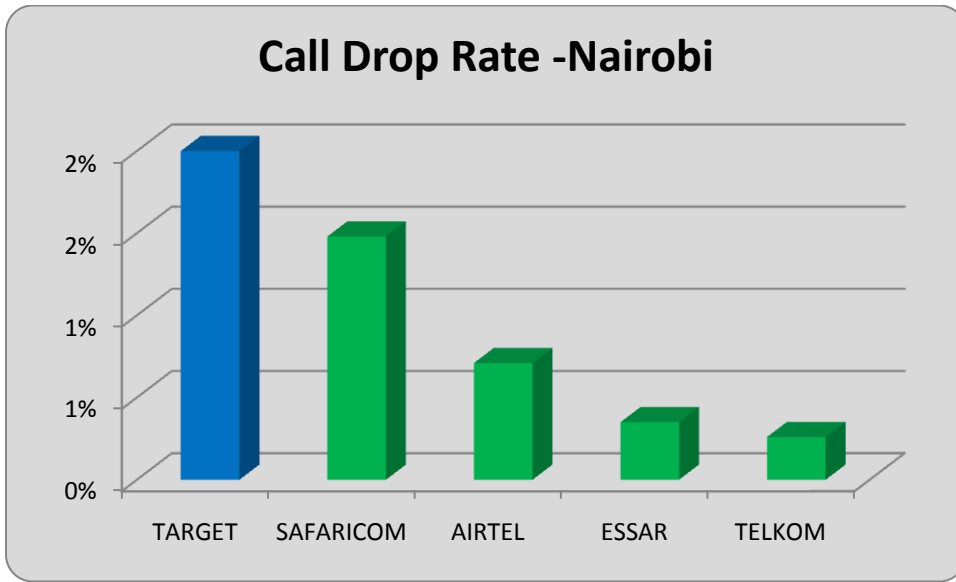


Figure 49: Call Block Rate

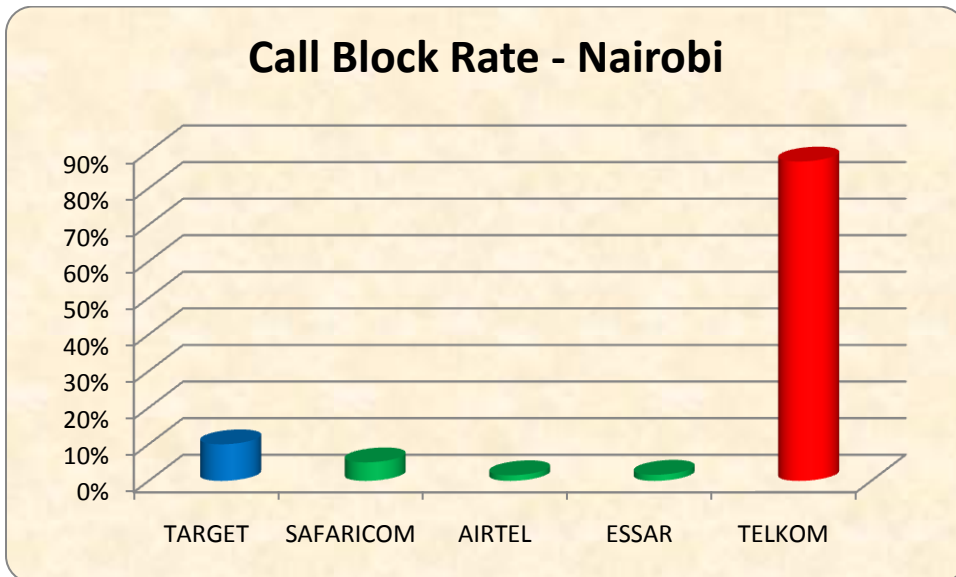


Figure 50: Hand Over Success Rate

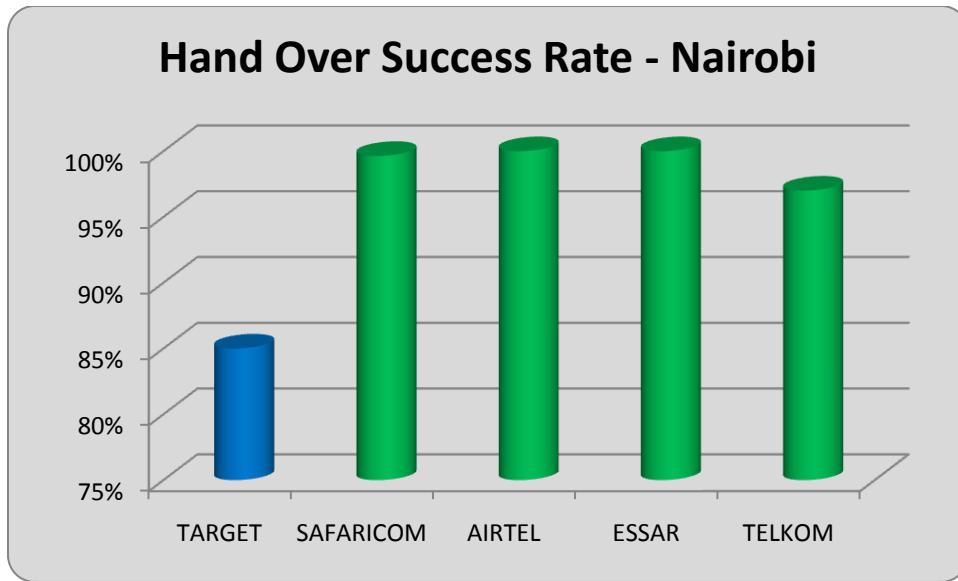


Figure 51: Speech Quality

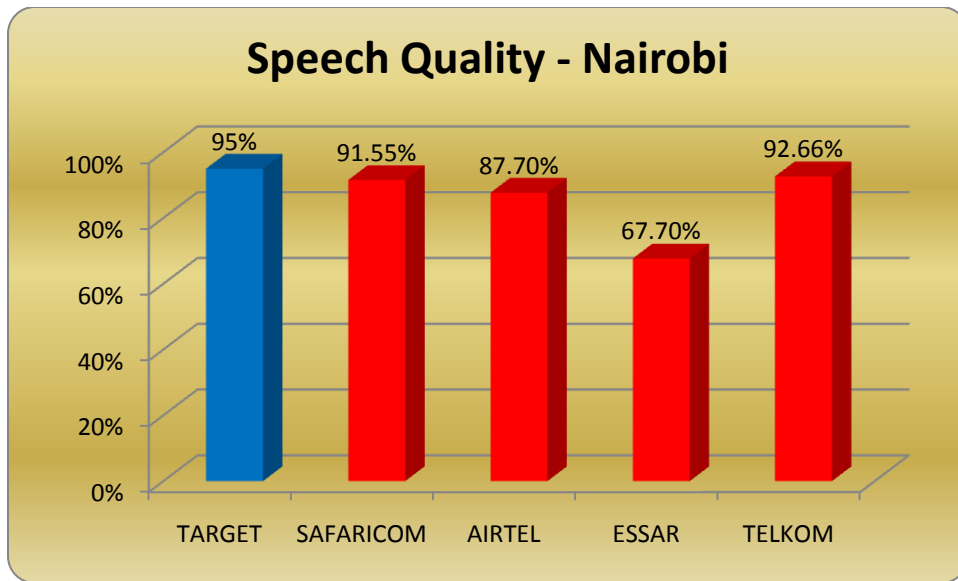


Figure 52: Call Set Up Time

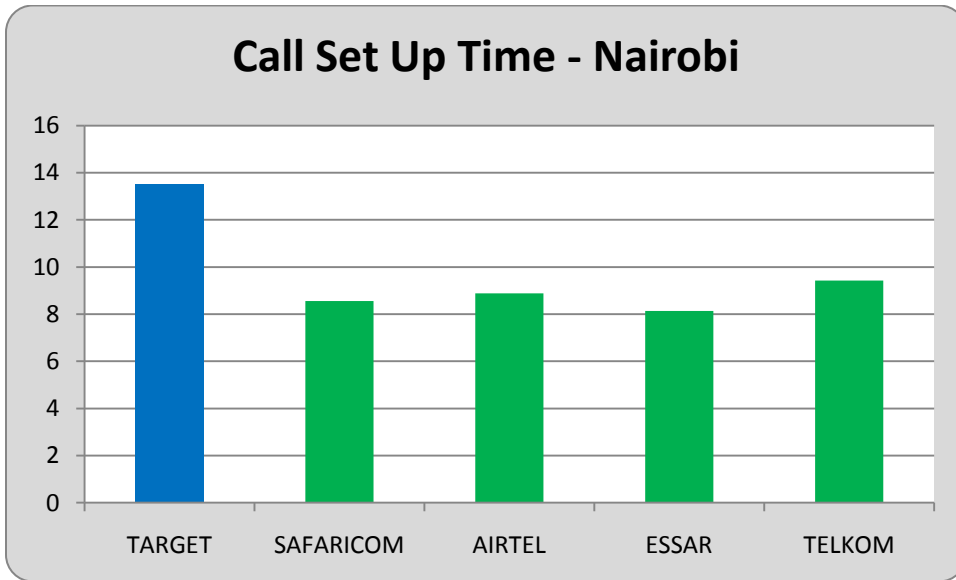
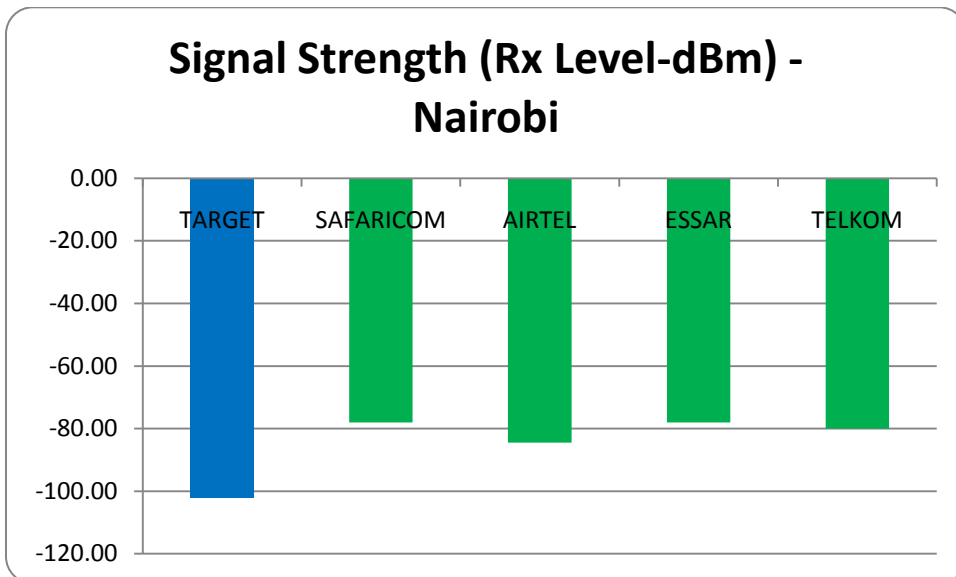


Figure 53: Signal Strength



3.4.7. NORTH EASTERN REGION

Figure 54: Completed Calls

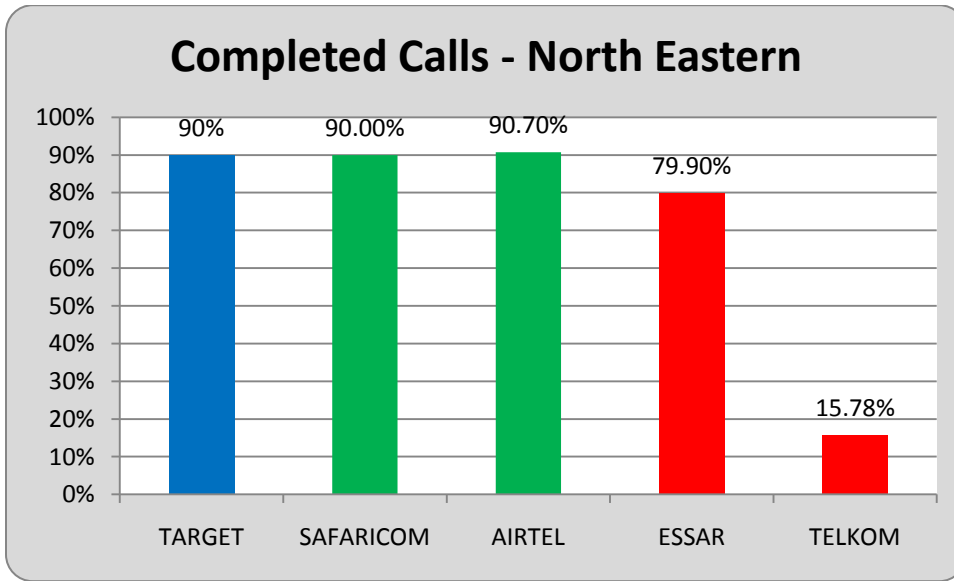


Figure 55: Call Set Up Success Rate

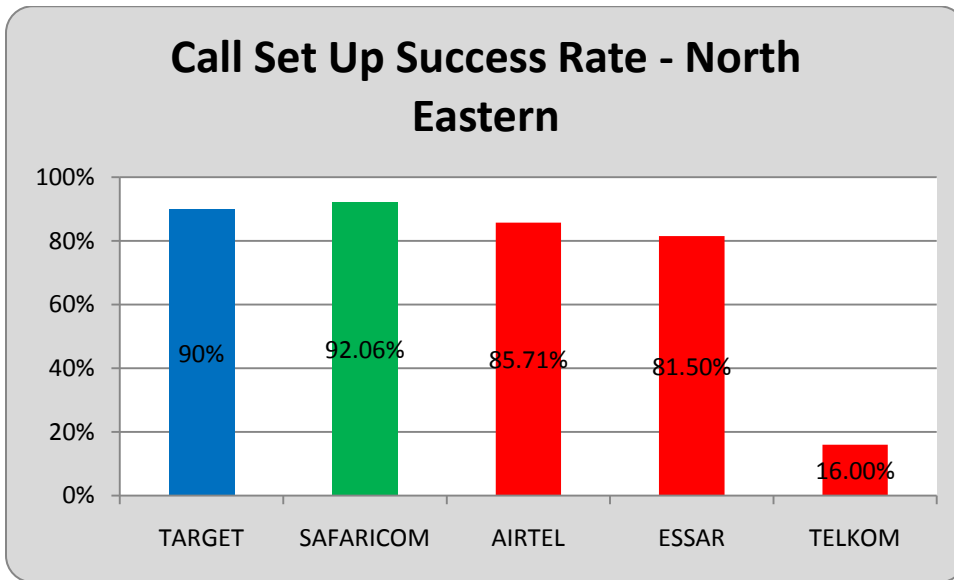


Figure 56: Call Drop Rate

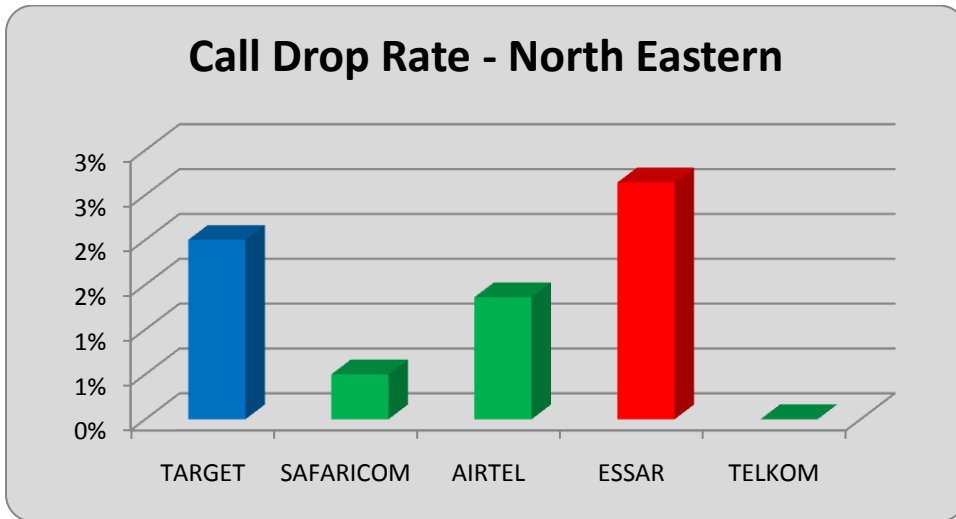


Figure 57: Call Block Rate

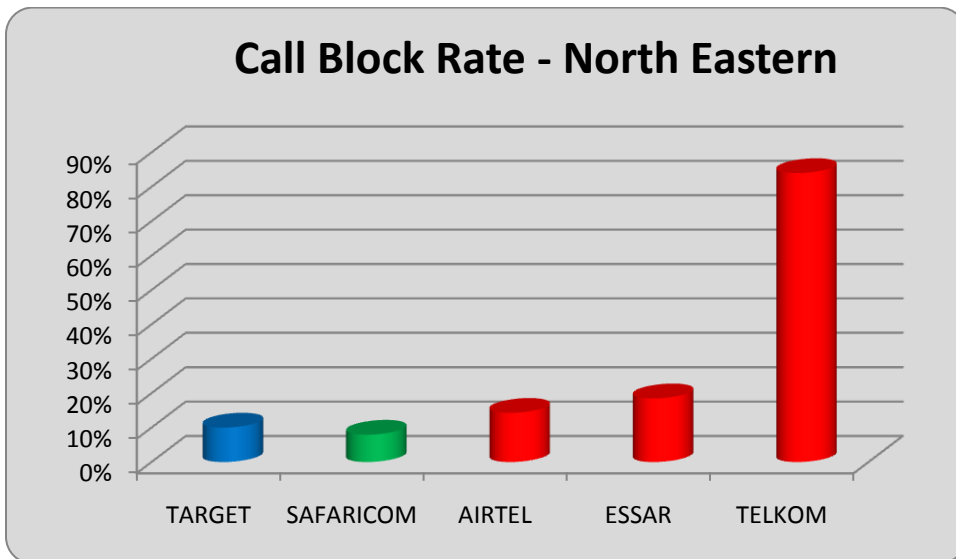


Figure 58: Hand Over Success Rate

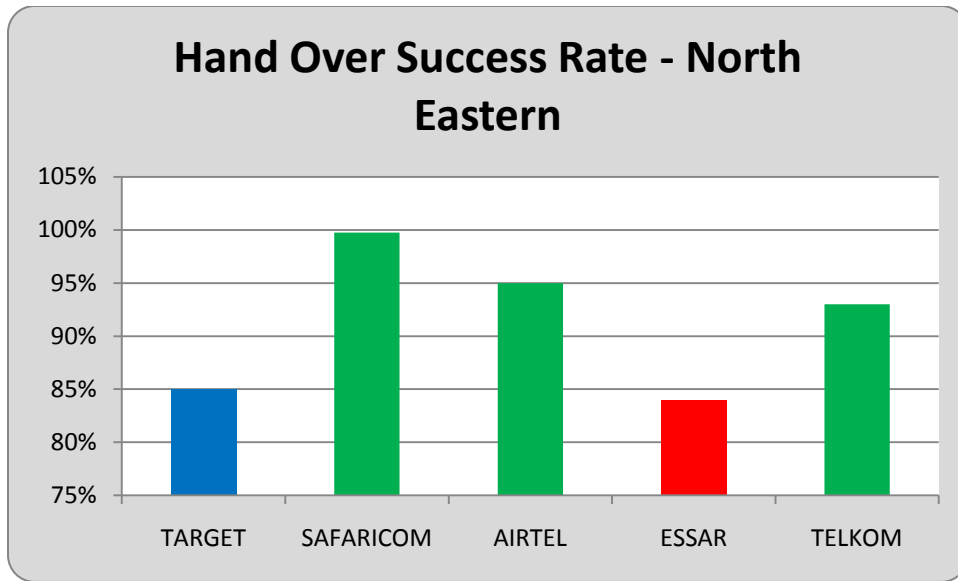


Figure 59: Speech Quality

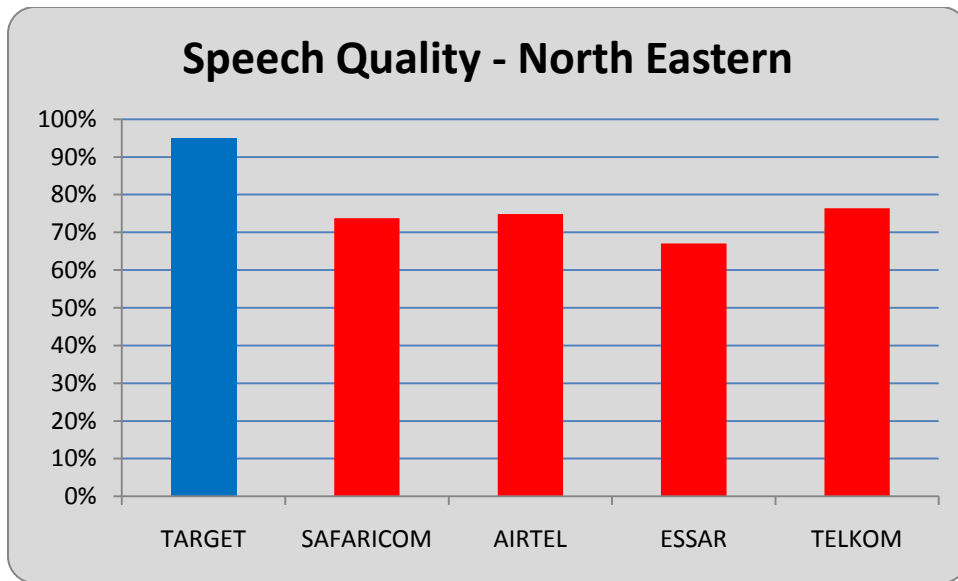


Figure 60: Call Set Up Time

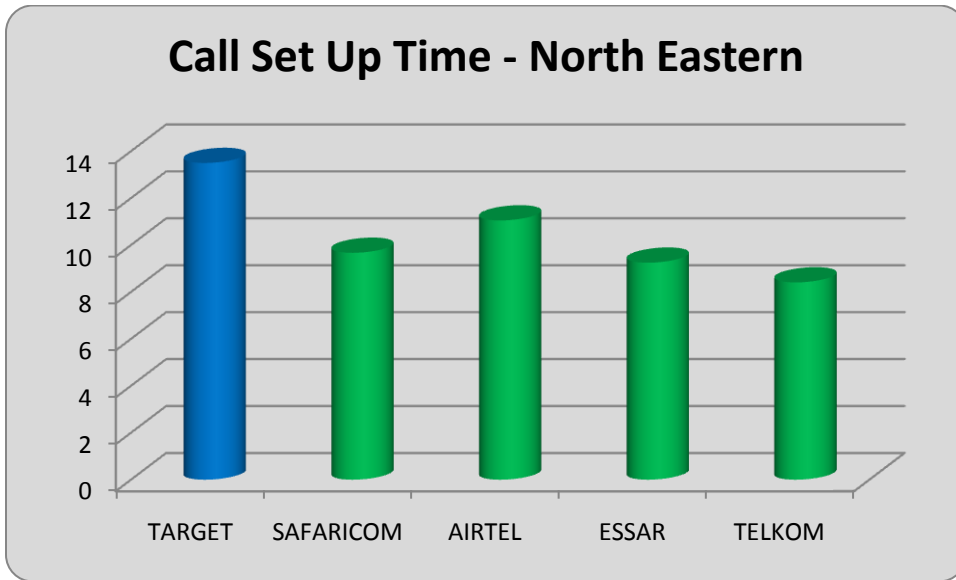


Figure 61: Signal Strength

