

3RD QUARTER 2019 QUALITY OF SERVICE SURVEY RESULTS

In 3rd quarter of 2019, Pakistan Telecommunication Authority (PTA) has conducted Quality of Service (QoS) surveys jointly with Cellular Mobile Operators (CMOs) in four (04) cities of Punjab, Khyber Pakhtunkhwa and Gilgit Baltistan. The names of these cities are:

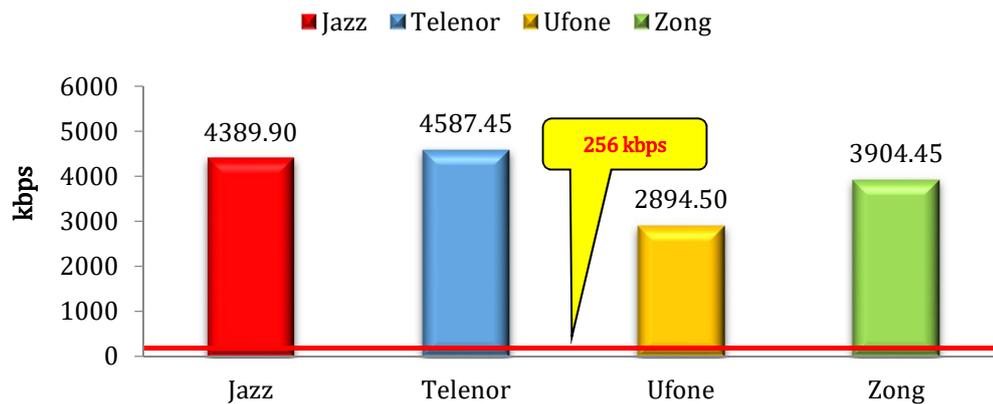
S/No	City	S/No	City
1	Gilgit	3	Kohat
2	Skardu	4	Khanewal

DATA – KEY PERFORMANCE INDICATORS

Data KPIs. The performance of data services of CMOs has been checked by measuring User Data Throughput and Signal Strength Key Performance Indicators (KPIs).

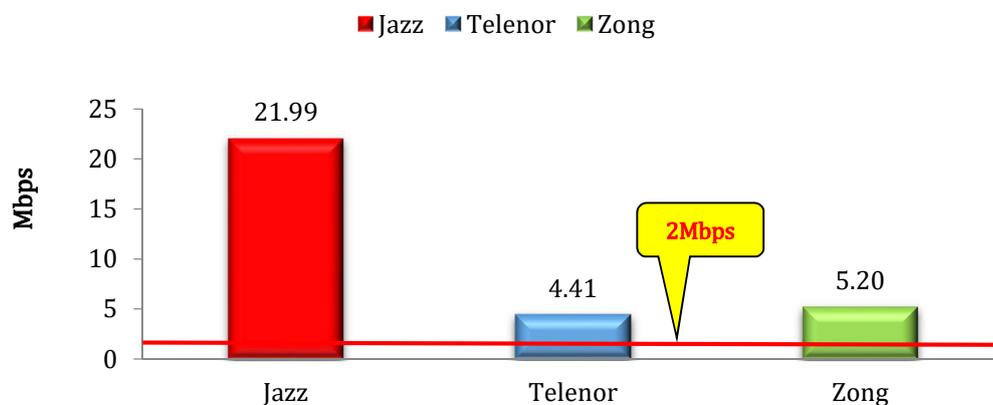
User Data Throughput *This KPI defines user data rate (Internet speed) to be provided by Next Generation Mobile Services (NGMS) operators to mobile users across the coverage areas. The data throughput results of all NGMS licensees are as under:*

User Data Throughput (3G) (Threshold: > 256 kbps)



User data "throughput" of 3G services found higher than the benchmark value of 256Kbps

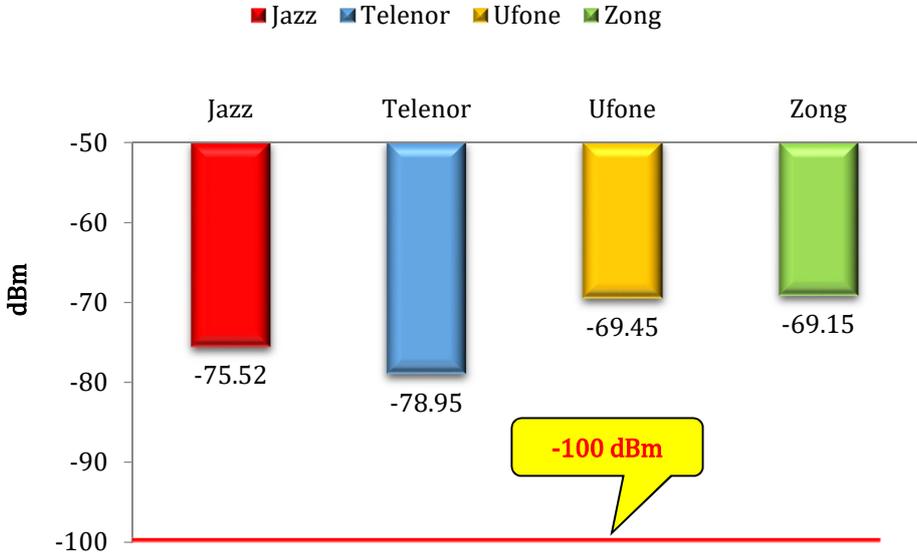
User Data Throughput (4G) (Threshold: > 2Mbps)



User data "throughput" of 4G services found higher than the benchmark value of 2Mbps

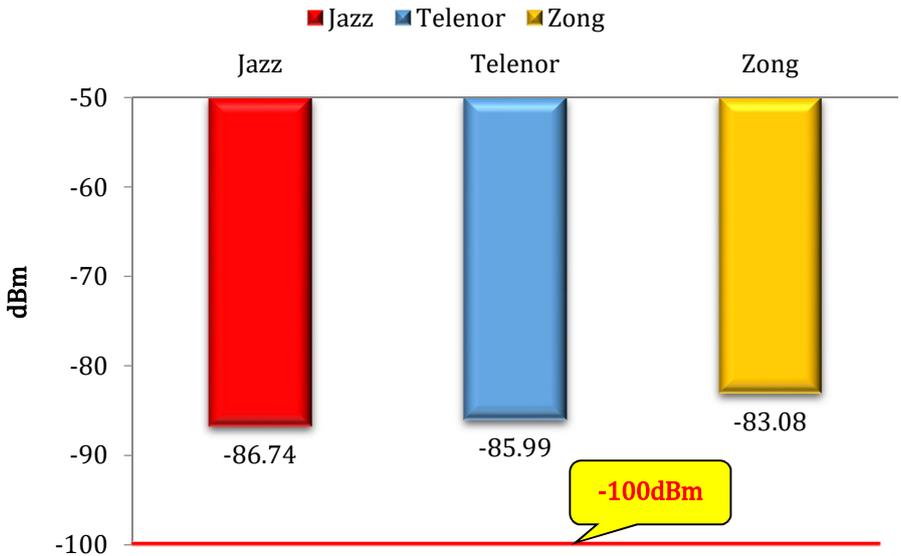
SIGNAL STRENGTH. This KPI defines Received Signal Code Power (RSCP) for 3G and Reference Signal Receive Power (RSRP) for 4G and denotes the power measured by a receiver on a particular physical communication channel. It is used as an indication of signal strength, as a handover criterion, in downlink power control, and to calculate path loss". The Signal Strength for NGMS licensees are as under:

Signal Strength (RSCP) - 3G (Threshold: $\geq -100\text{dBm}$)



Signal Strength (RSCP) of 3G network has been observed greater than -100dBm threshold value

Signal Strength (RSRP) - 4G (Threshold: $\geq -100\text{dBm}$)

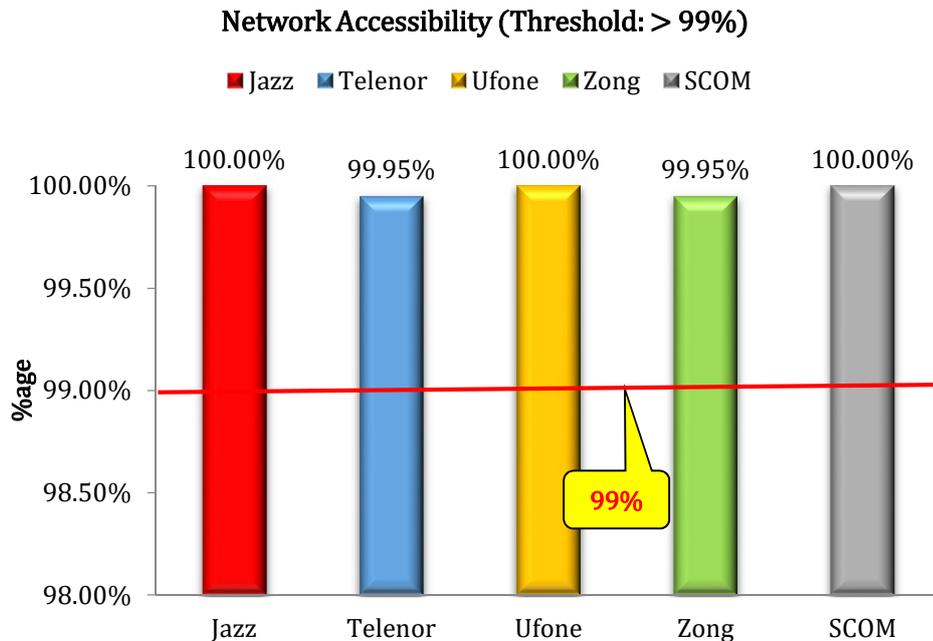


Signal Strength (RSRP) of 4G network has been observed greater than -100dBm threshold value

VOICE – KEY PERFORMANCE INDICATORS

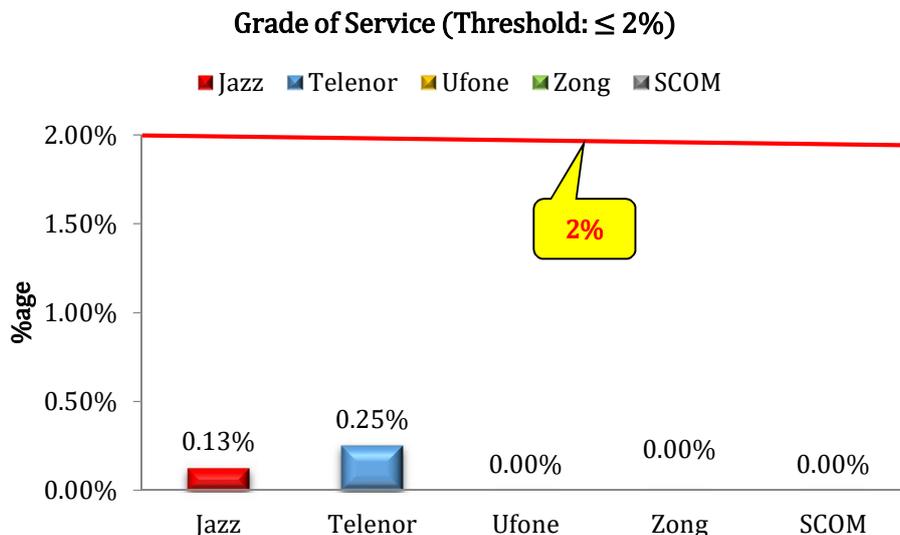
Voice KPIs. The performance of voice services of CMOs has been checked by measuring Network Down Time/Network Accessibility, Grade of Service, Service Accessibility, Call Connection Time, Call Completion Ratio, End-to-End Speech Quality and Session Abnormal Release Rate Key Performance Indicators (KPIs).

Network Accessibility. *“The probability that mobile services are available to an end customer by display of the network indicator on the mobile equipment”.*



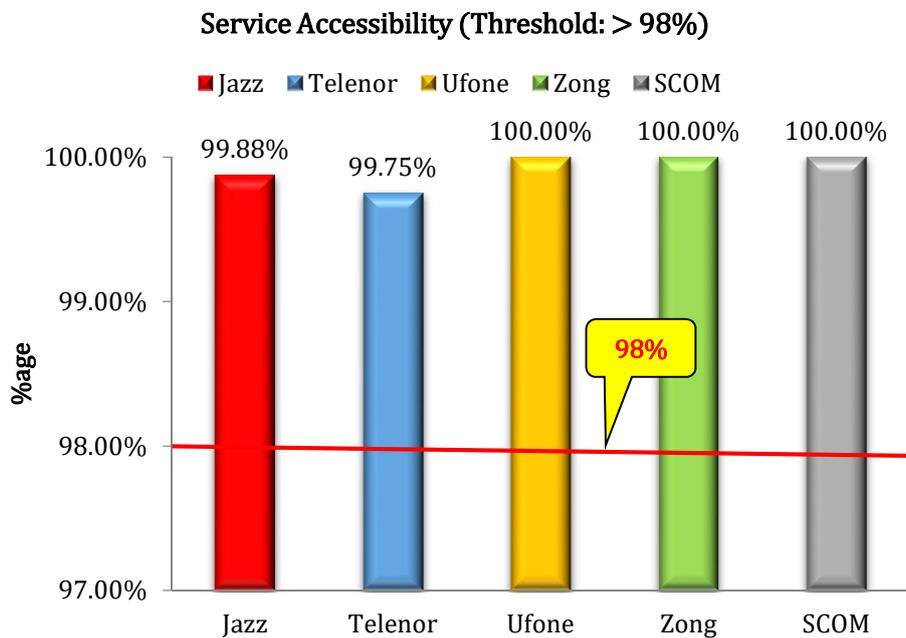
Network Accessibility is converse of Network Down Time and its value found greater than threshold value of 99% of all the mobile operators

Grade of Service (GOS). *“Grade of Service is probability that the end customer cannot access the mobile services when requested if it is offered by display of the network indicator on the mobile phone. In simple words, Grade of Service is Network Blocking”.*



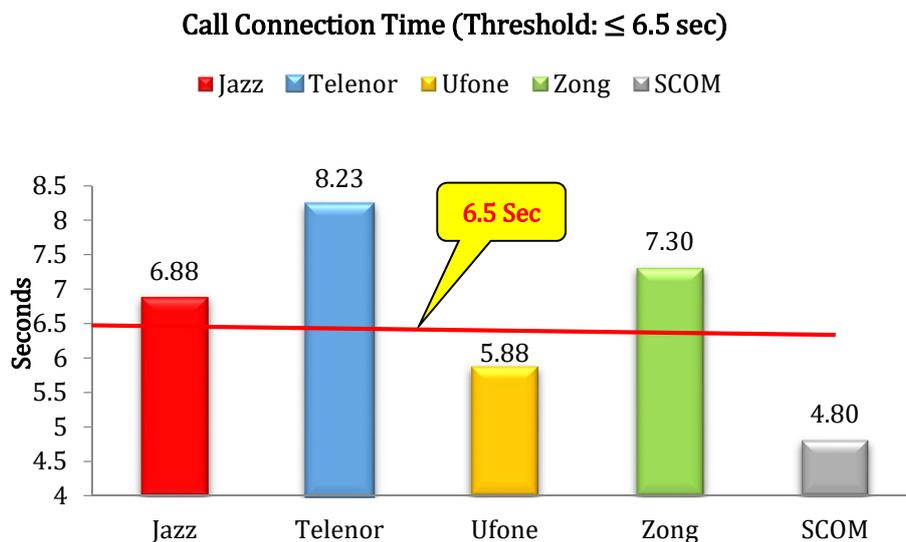
All mobile operators are meeting the threshold value of Grade of Service

Service Accessibility. “Service Accessibility is the probability that the user can access the desired service. A given network accessibility is a precondition for this phase”.



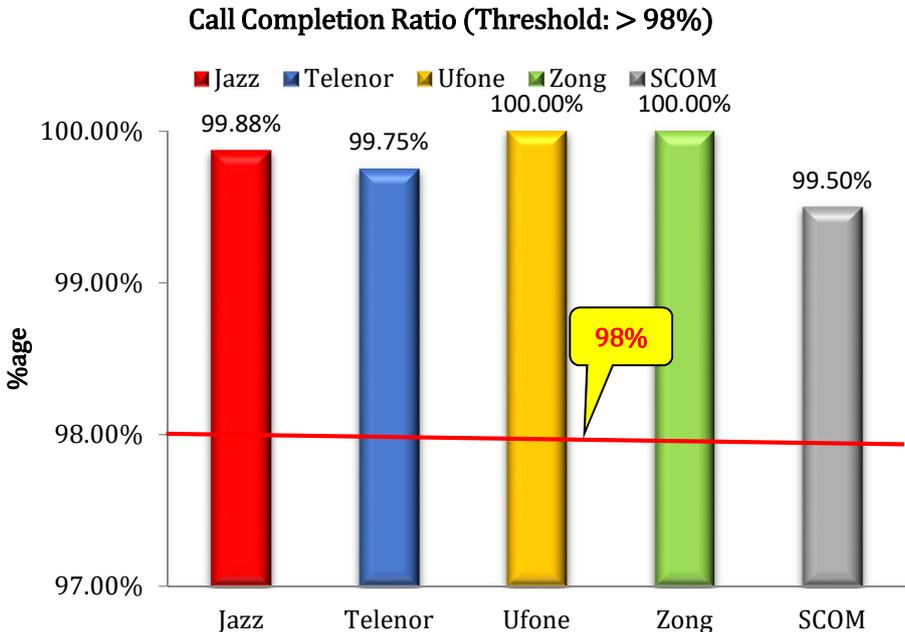
All mobile operators are meeting the criteria of Service Accessibility

Call Connection Time. “Call Connection Time is the time between sending of complete call initiation information by the caller and in return receipt of call setup notification. In simple words, it is time between dialing a number and hearing ring-back tone”.



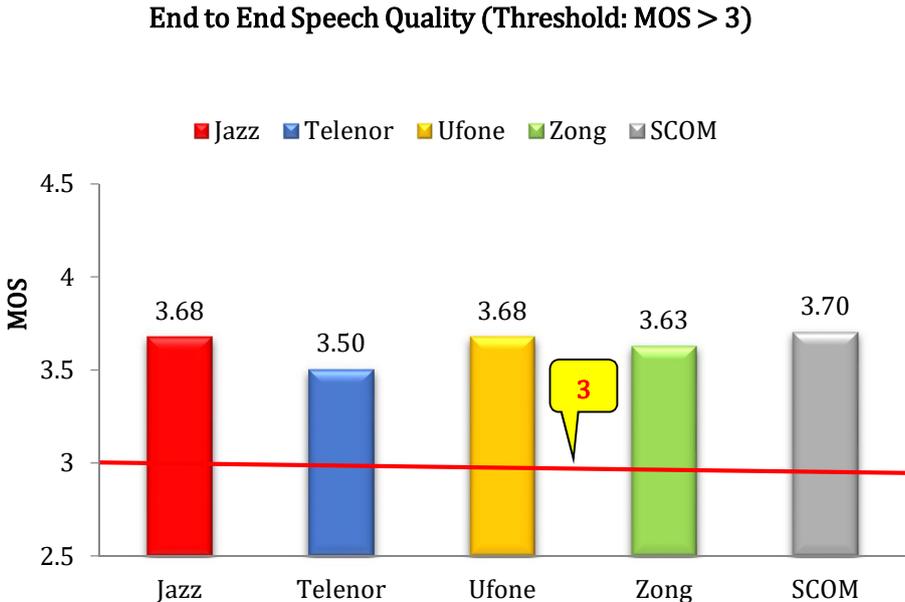
Only Ufone and SCOM are following the benchmark of Call Connection Time of 6.5 seconds

Call Completion Ratio. “Call Completion Ratio is the probability that a service, once obtained, will continue to be provided under given conditions for a given time duration or until deliberately terminated by either caller (A-party) or receiver (B-party). In simple words, this KPI provides information about Call Drops”.



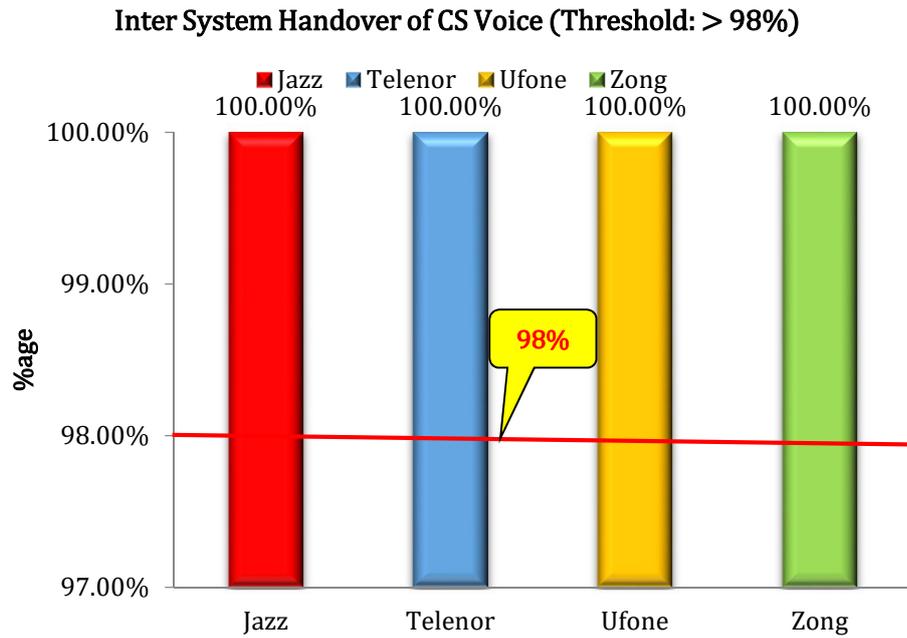
All mobile operators are meeting Call Completion Ratio threshold value of 98%

End-to-End Speech Quality. End-to-End Speech Quality is the degree of speech quality that a listener perceives at the terminal/mobile with a talker at the other end. In simple words, it provides information about clarity of voice.



Mean Opinion Score (MOS) of all mobile operators found above the threshold value of 3

Inter System Handover (ISHO) For Circuit Switched Voice. *“Inter System Handover is the measurement of successfulness of Handover in 3G/2G for Circuit Switched Voice.”*

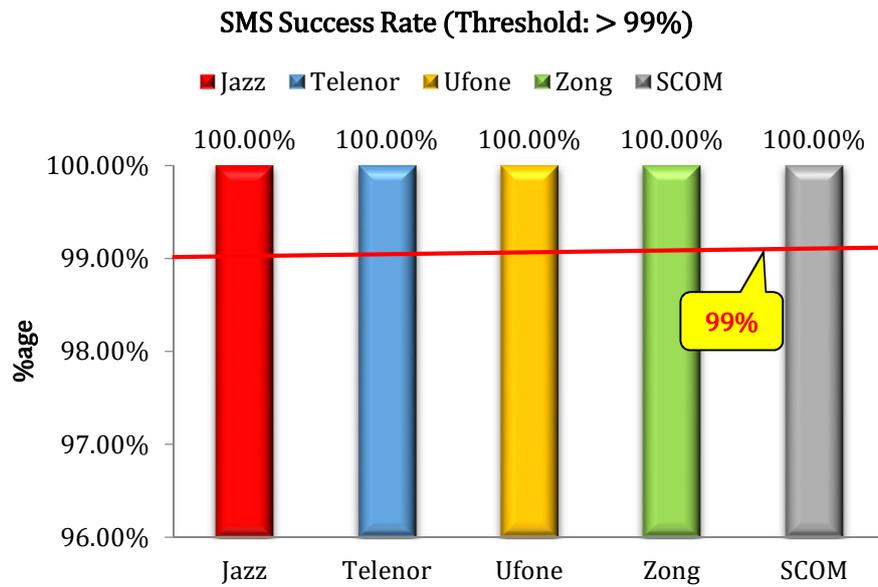


Inter System Handover of CS Voice of all the mobile operators is above the threshold value of 98%

SMS – KEY PERFORMANCE INDICATORS

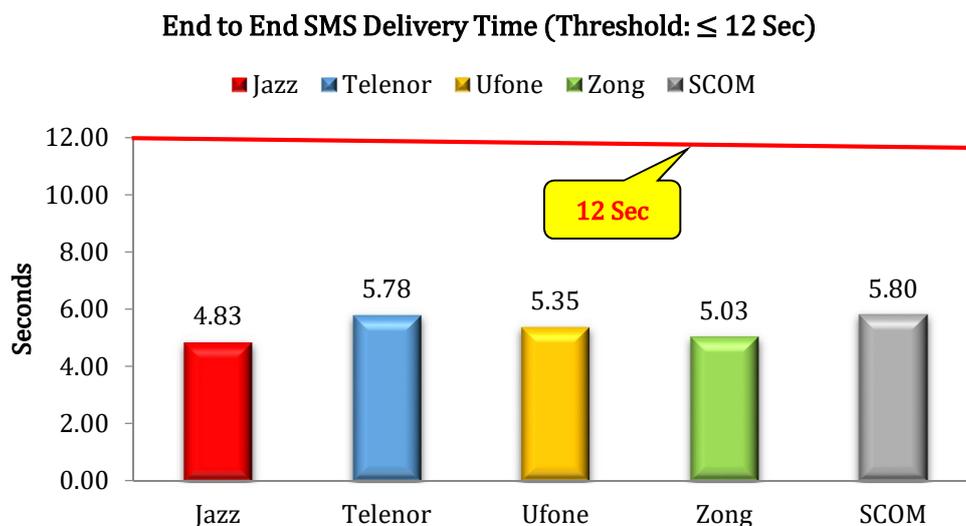
SMS KPIs. The performance of SMS services of CMOs has been checked by measuring SMS Success Rate and End-to-End SMS Delivery Time Key Performance Indicators (KPIs).

SMS Success Rate. *SMS Success Rate is the probability that the short message is delivered successfully, end-to-end when requested and display of the relevant information on the mobile phone. It provides information about successful delivery of SMS.*



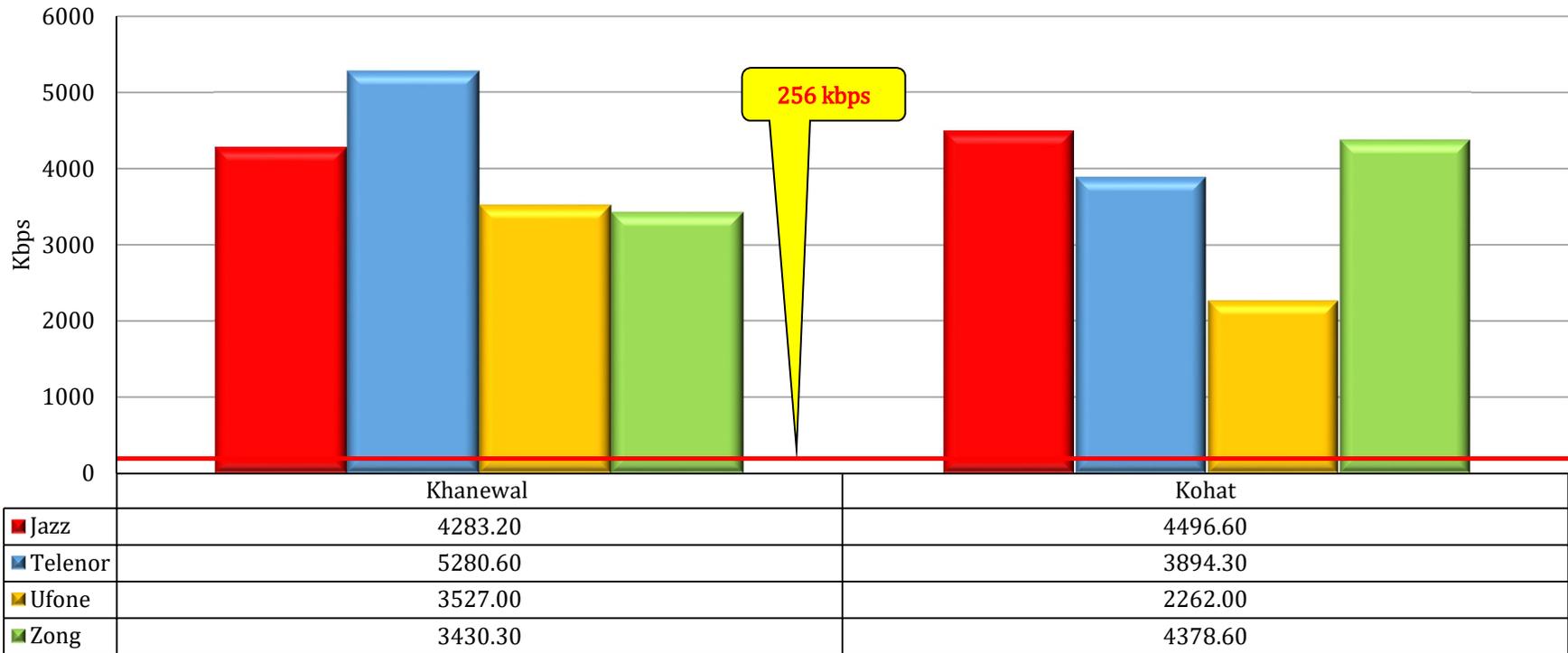
SMS Success Rate for all CMOs is above the threshold value of 99%

End-to-End SMS Delivery Time. *End-to-End SMS Delivery Time is the time between sending a short message to a short message center and receiving the very same short message at intended mobile phone (receiver). It provides average time taken for delivery of short message from sender to recipient.*

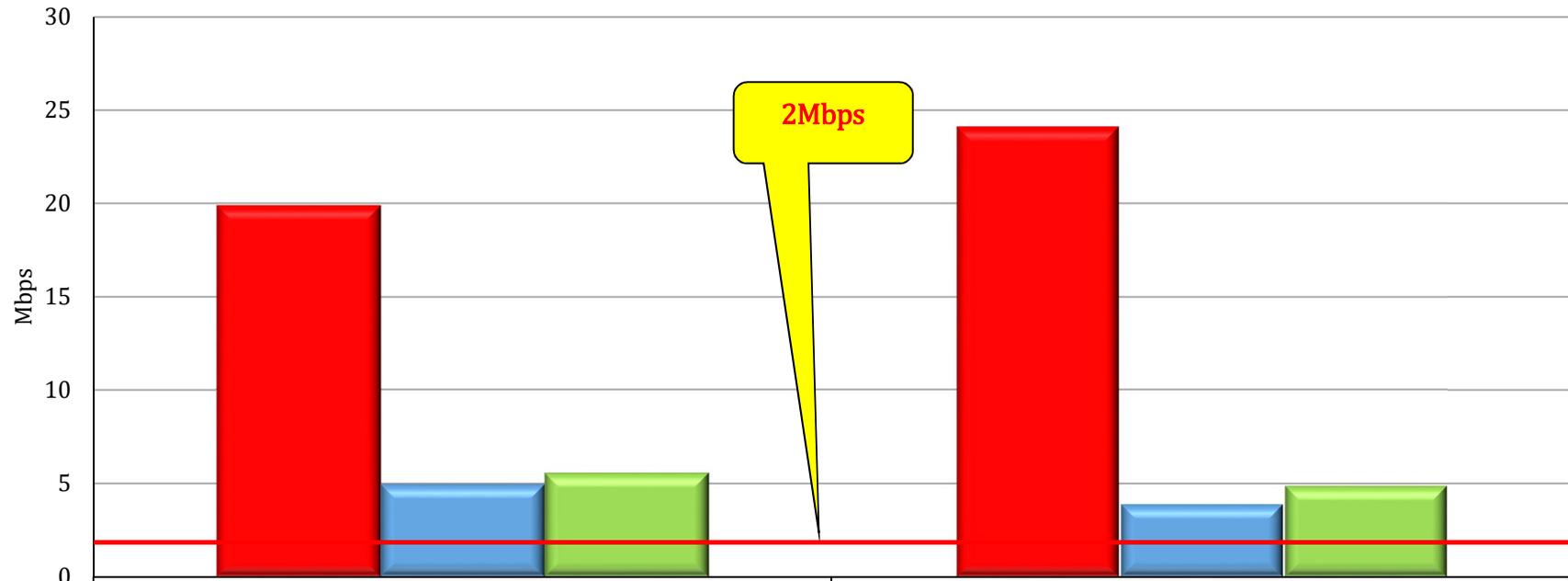


All CMOs are meeting the threshold for End-to-End SMS Delivery Time of 12 Seconds

User Data Throughput (Threshold: > 256 kbps)

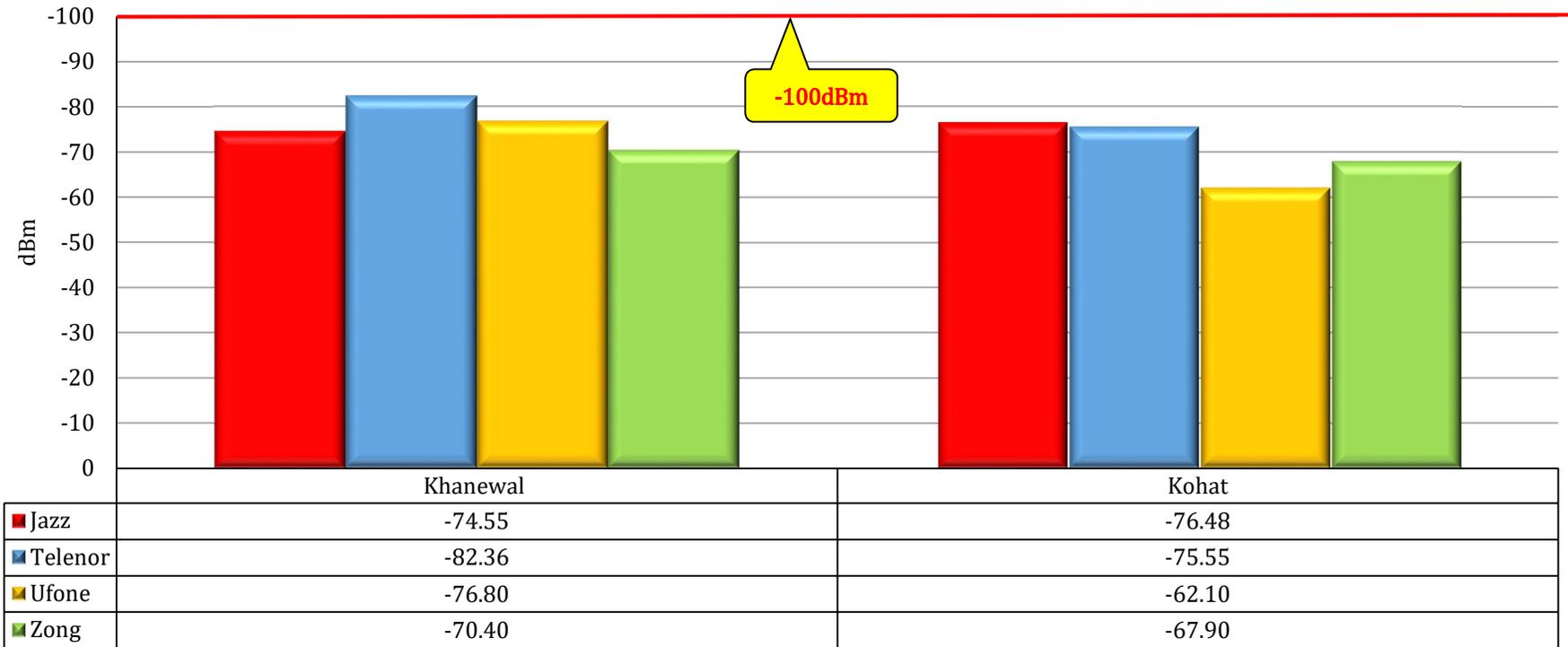


User Data Throughput (Threshold: > 2Mbps)

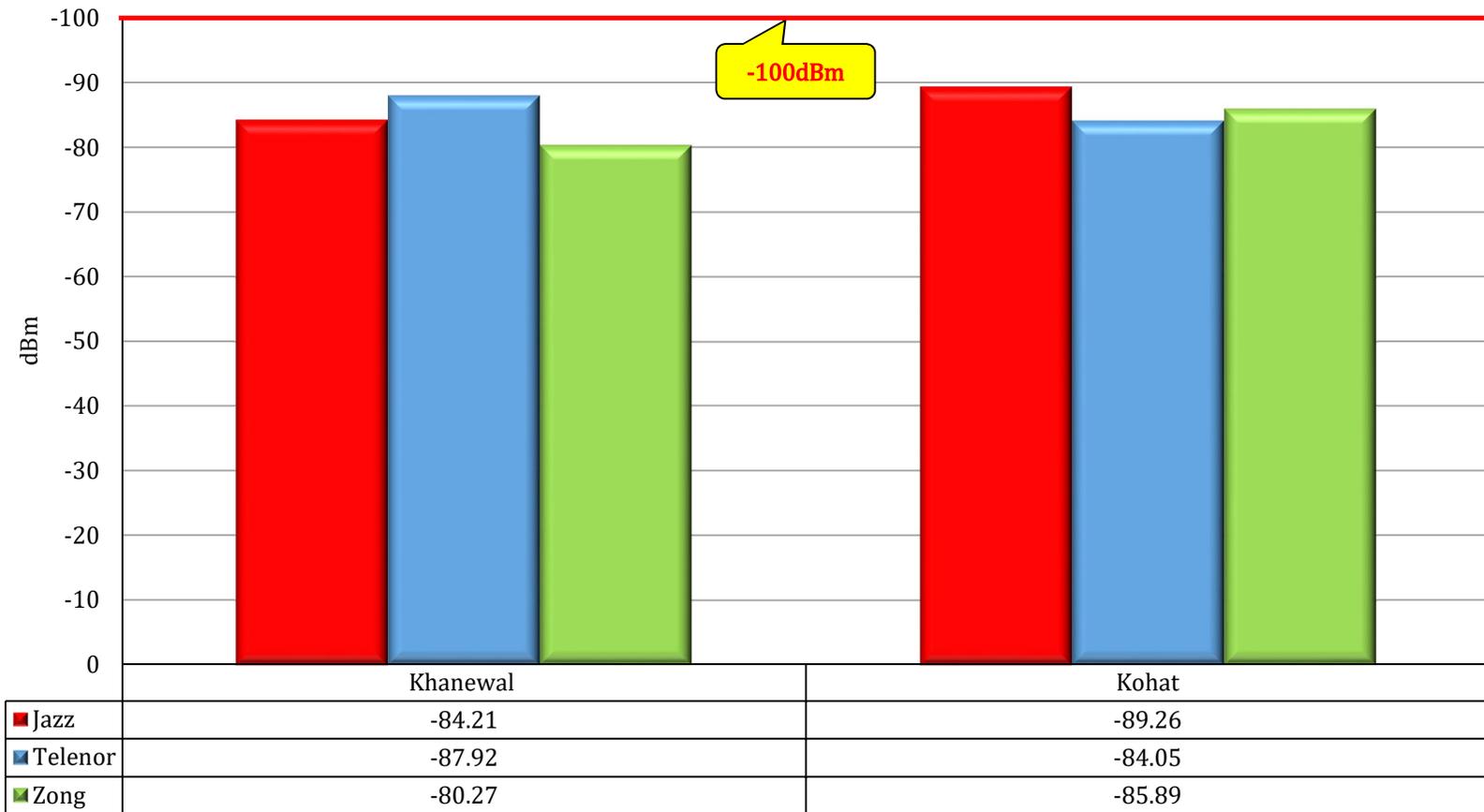


	Khanewal	Kohat
■ Jazz	19.88	24.10
■ Telenor	4.95	3.87
■ Zong	5.55	4.86

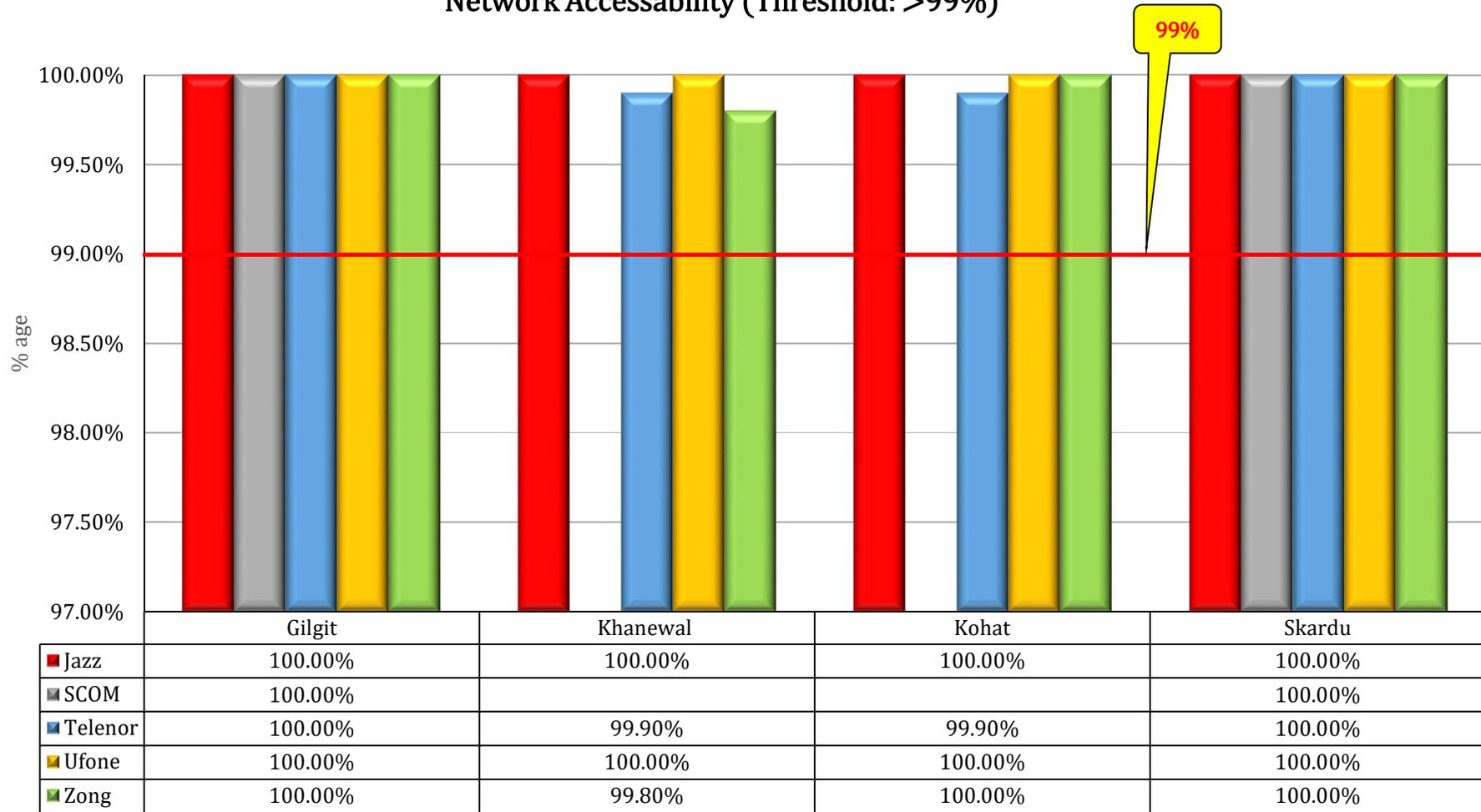
Signal Strength RSCP- 3G (Threshold: $\geq -100\text{dBm}$)



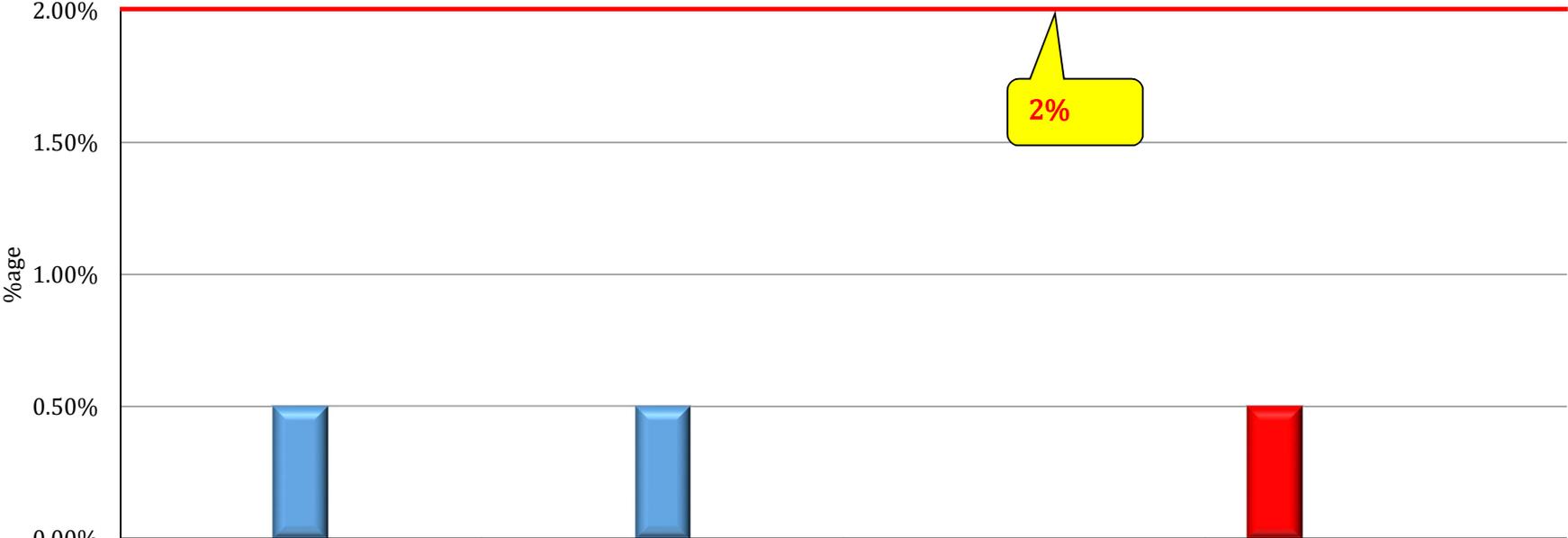
Signal Strength RSRP- 4G (Threshold: $\geq -100\text{dBm}$)



Network Accessibility (Threshold: >99%)

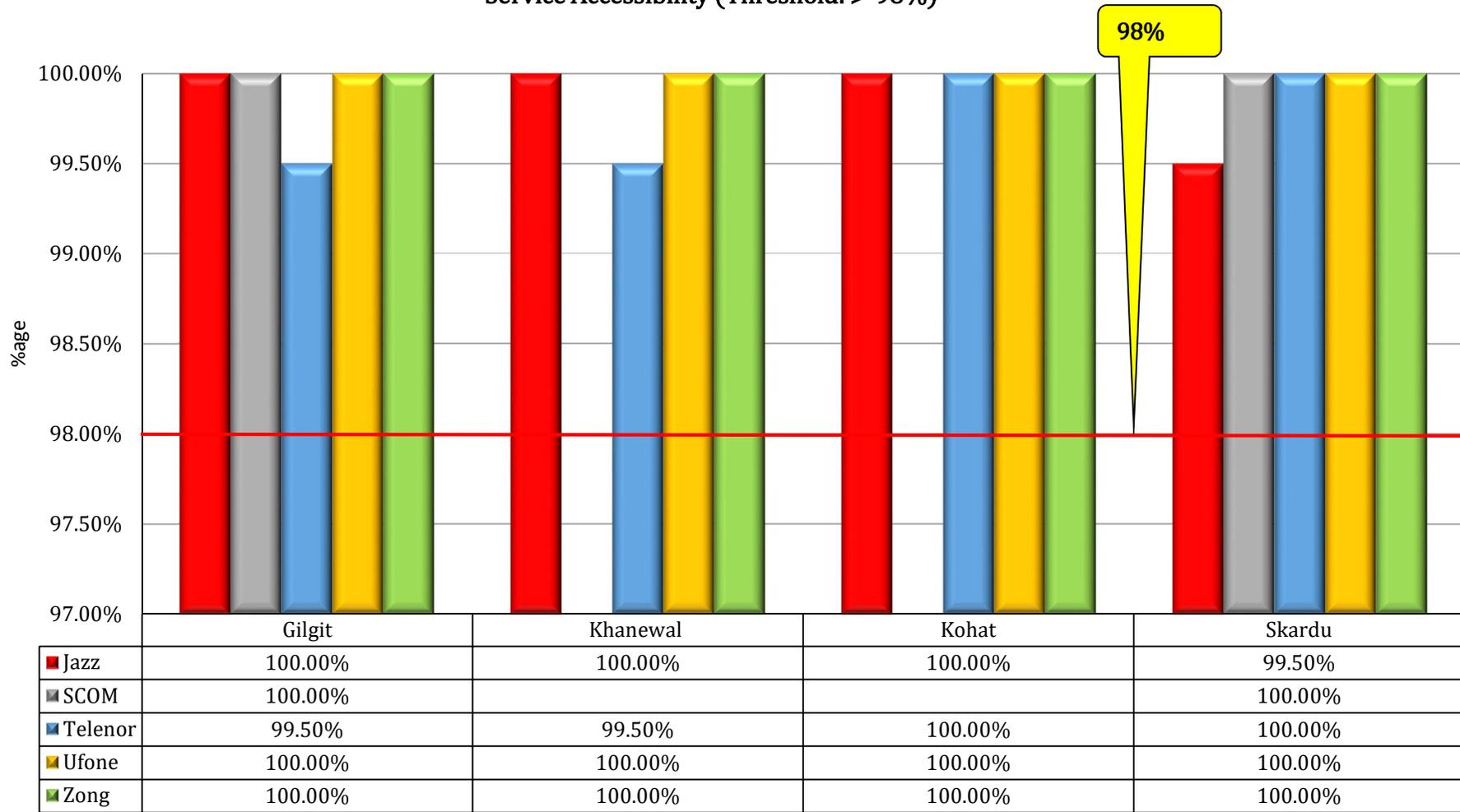


Grade of Service (Threshold: ≤ 2%)

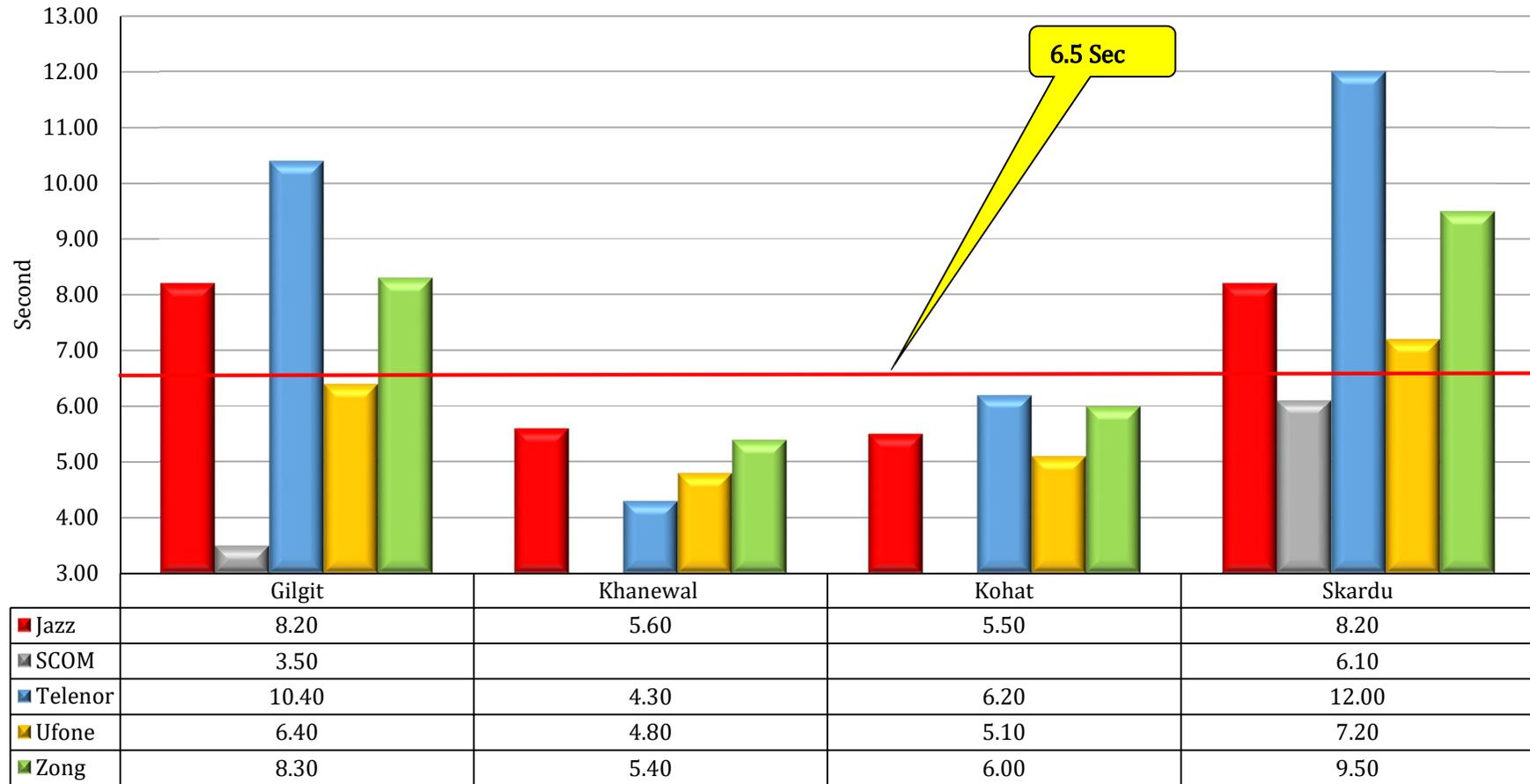


	Gilgit	Khanewal	Kohat	Skardu
Jazz	0.00	0.00	0.00	0.50
SCOM	0.00			0.00
Telenor	0.50	0.50	0.00	0.00
Ufone	0.00	0.00	0.00	0.00
Zong	0.00	0.00	0.00	0.00

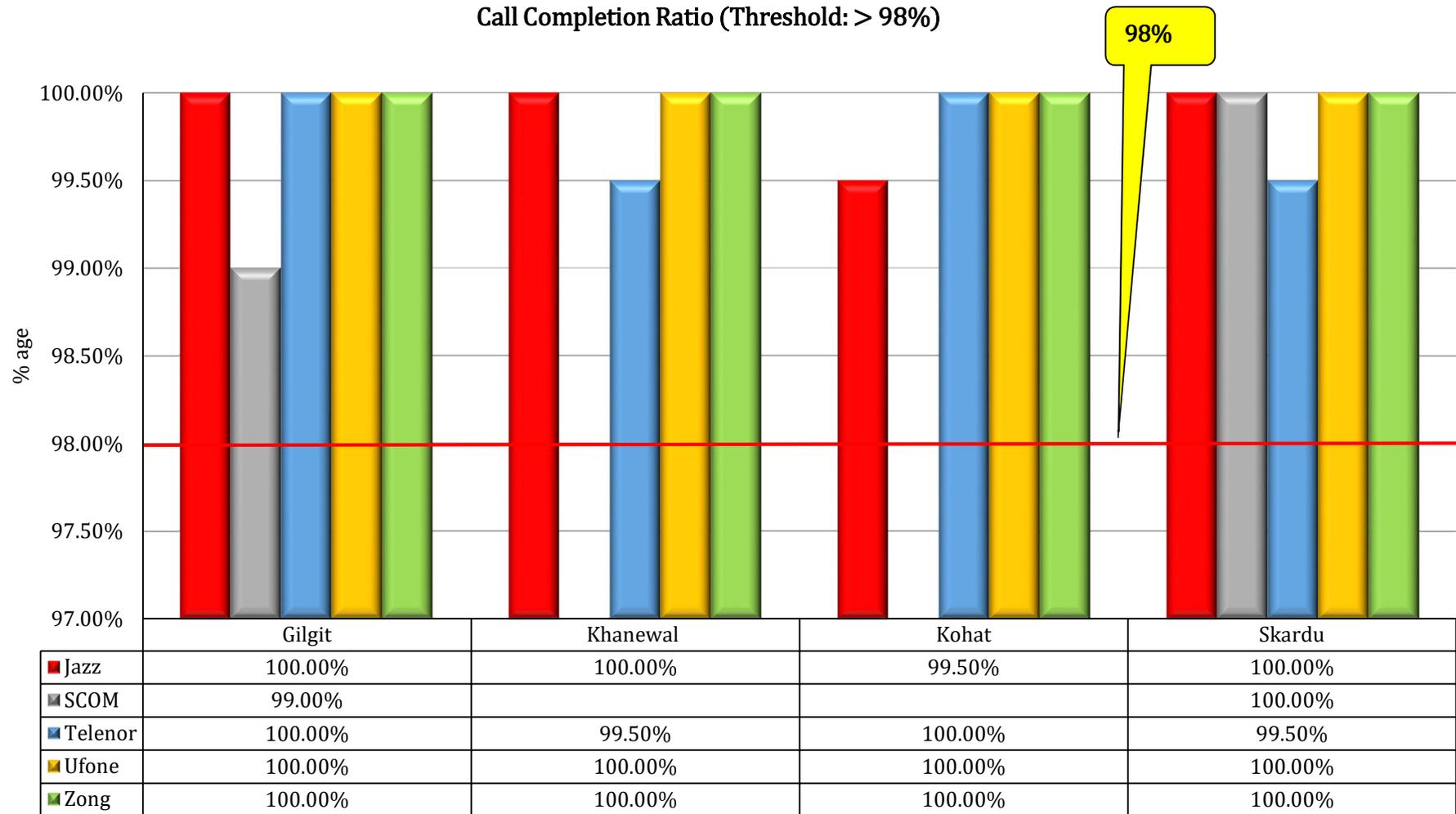
Service Accessibility (Threshold: > 98%)



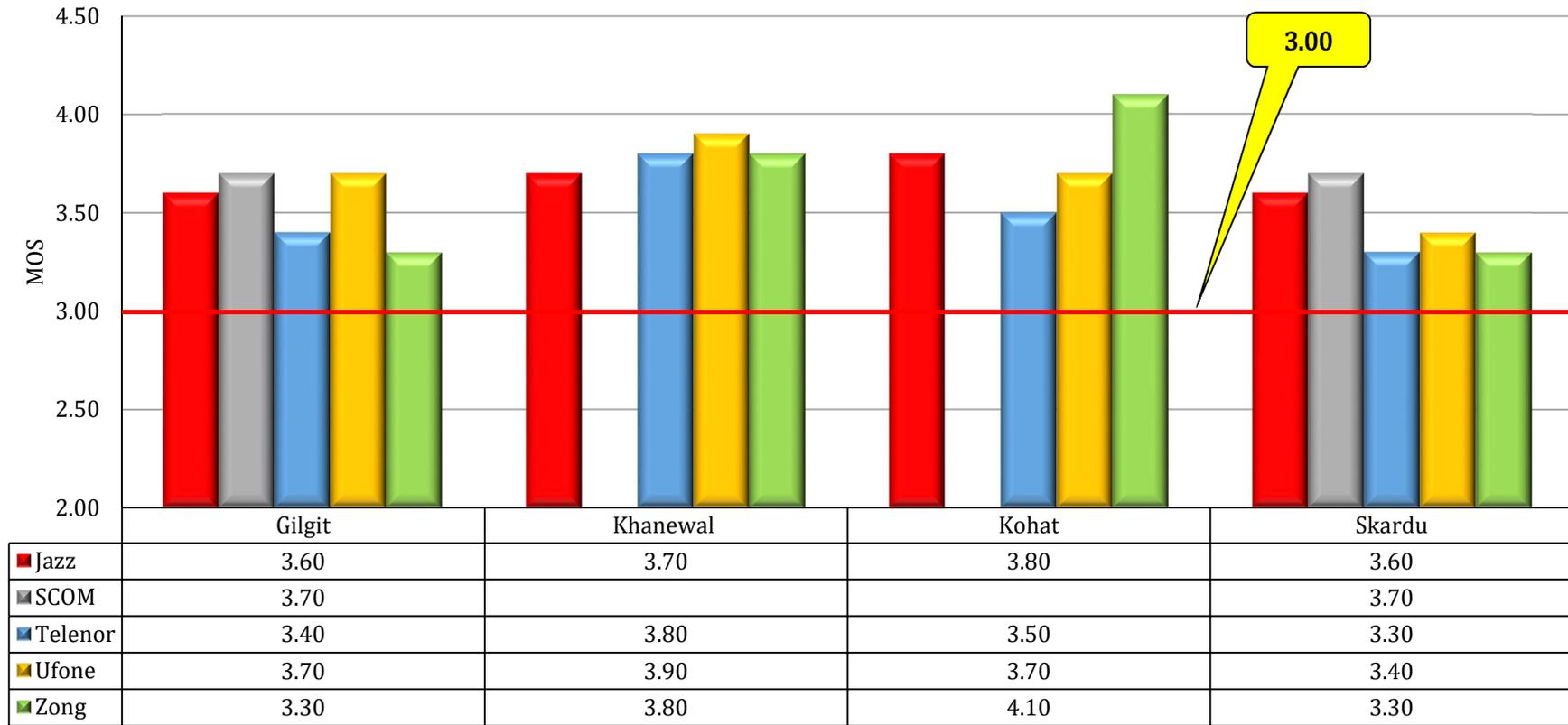
Call Connection Time (Threshold: ≤ 6.5 Sec)



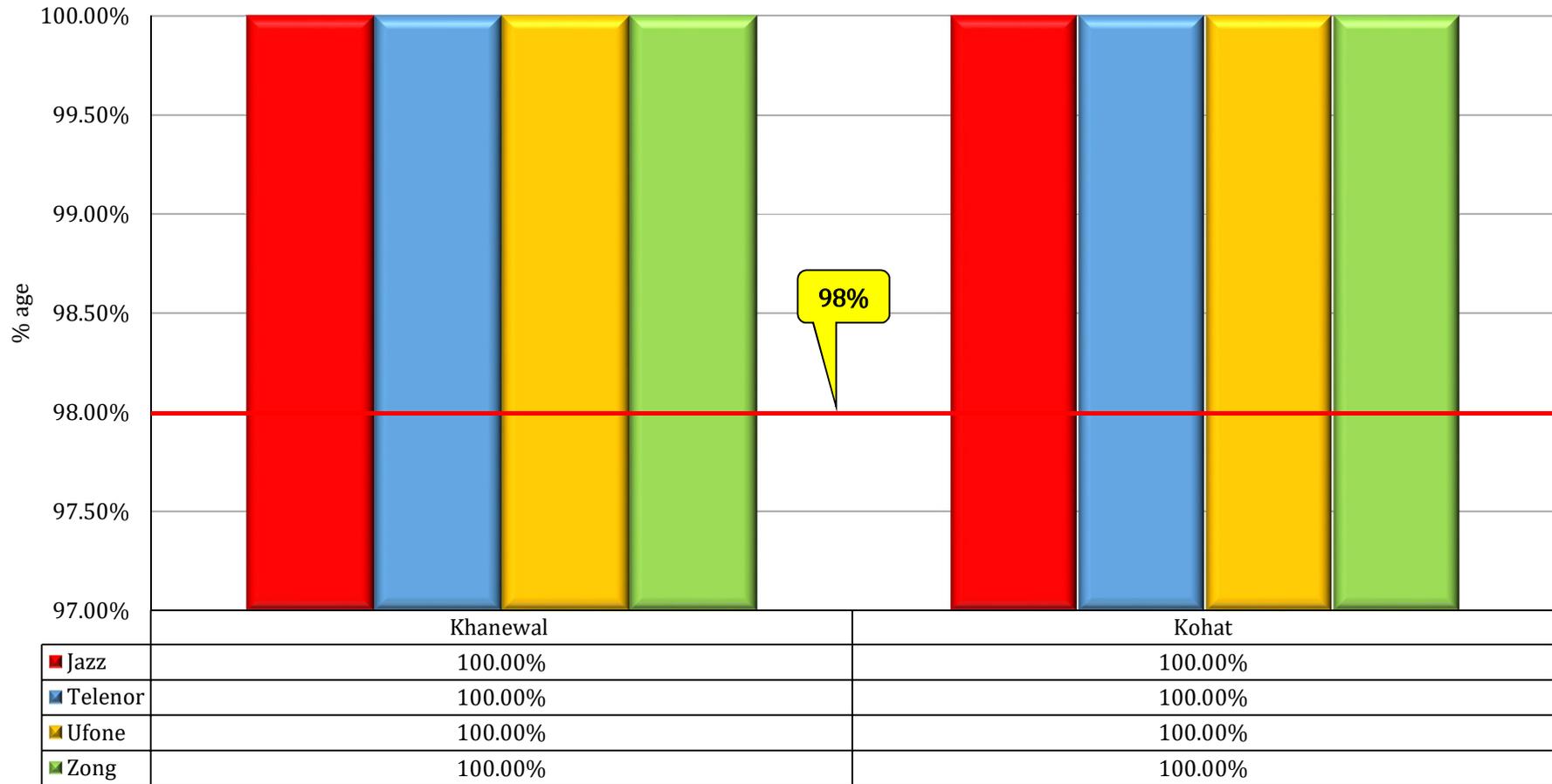
Call Completion Ratio (Threshold: > 98%)



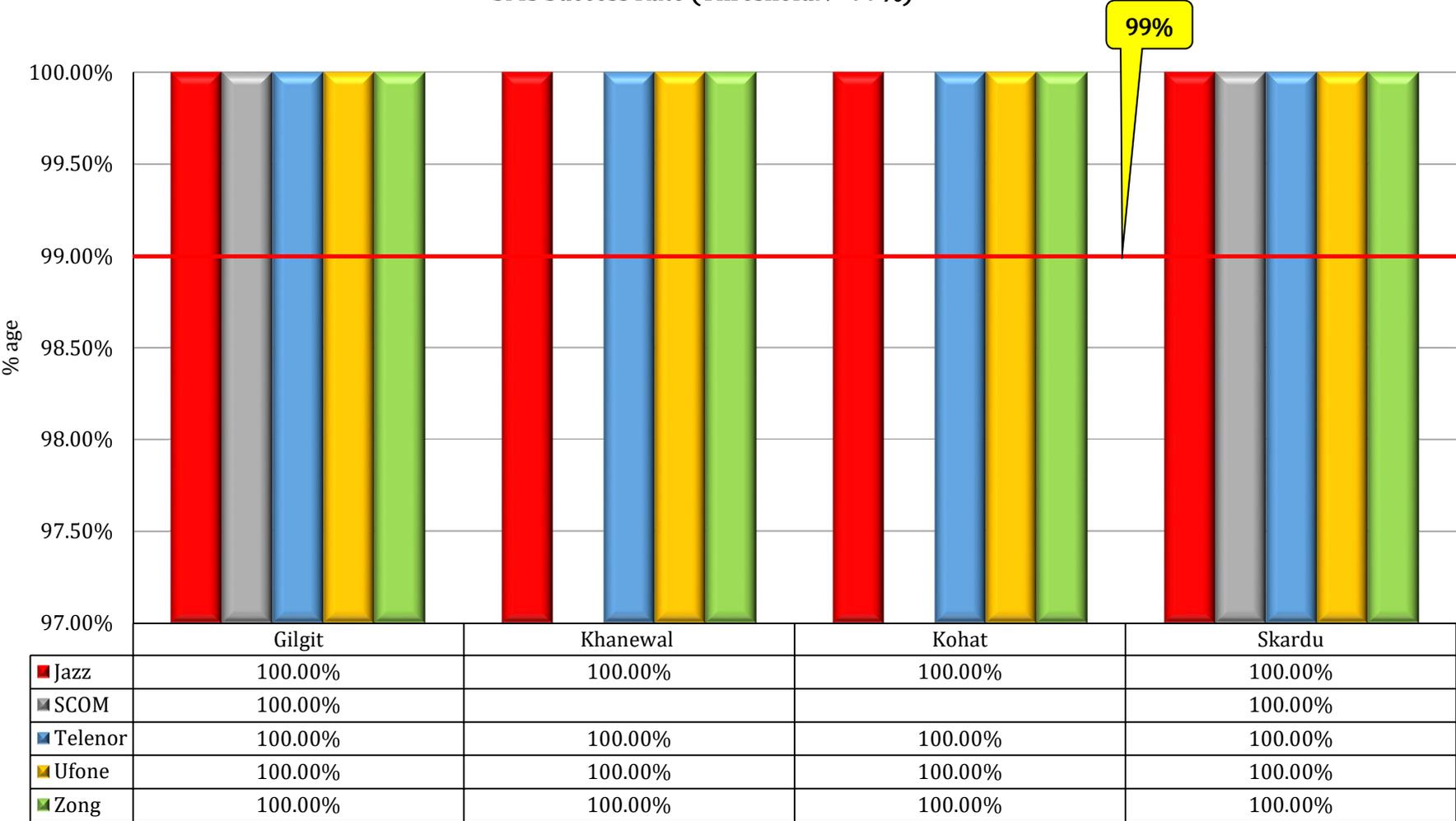
Mean Opinion Score (Threshold: >3)



Inter System Handover of CS Voice (Threshold: > 98%)



SMS Success Rate (Threshold: > 99%)



End to End Delivery Time (Threshold: ≤ 12 Sec)

