

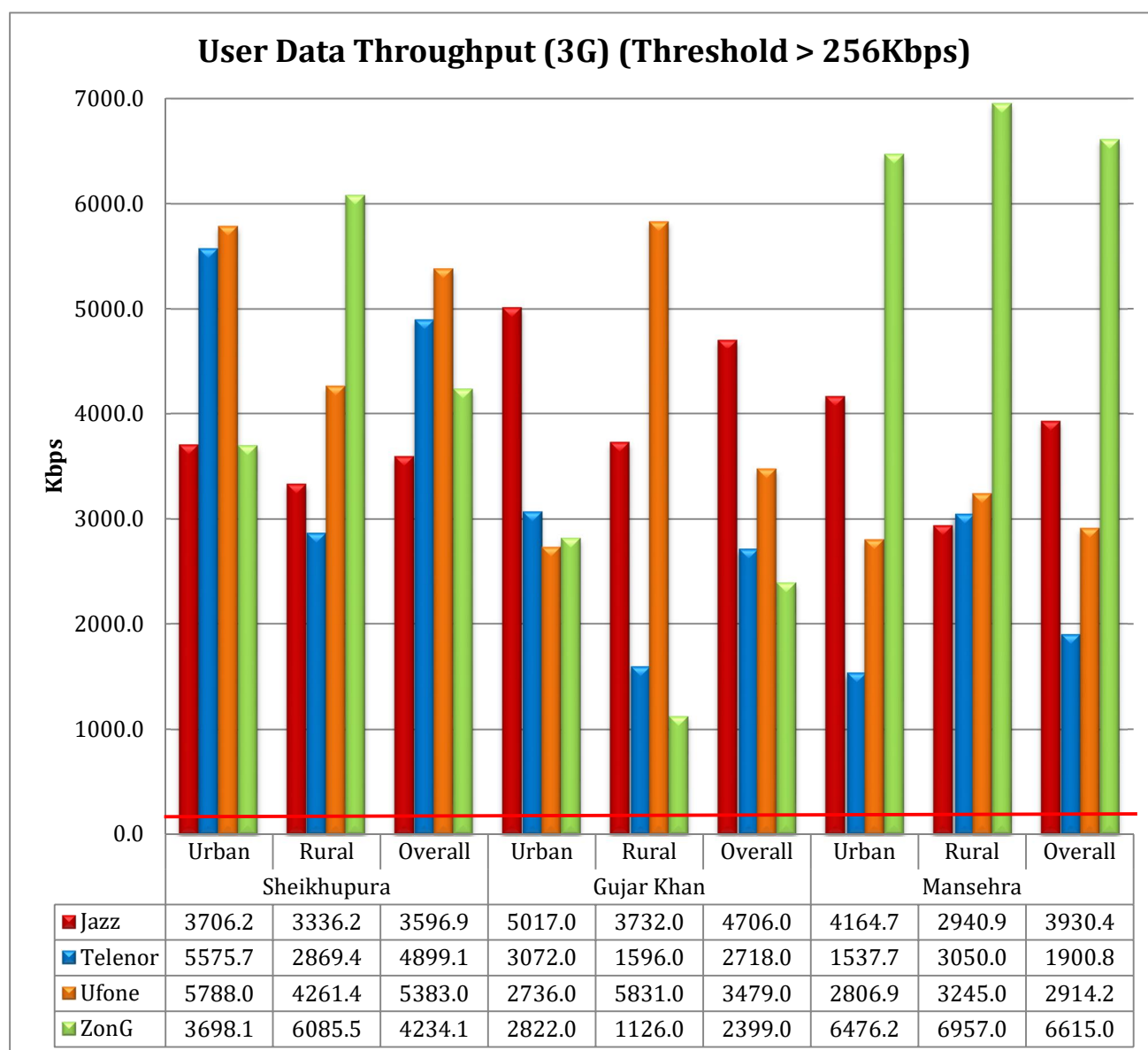
JOINT QUALITY OF SERVICE SURVEY REPORT – 1ST QUARTER 2020

Pakistan Telecommunication Authority (PTA) has carried out joint quarterly Quality of Service (QoS) survey with Cellular Mobile Operators (CMOs) from January to March 2020 in three (3) different cities i.e. Sheikhupura and Gujar Khan of Punjab and Mansehra of Khyber Pakhtunkhwa.

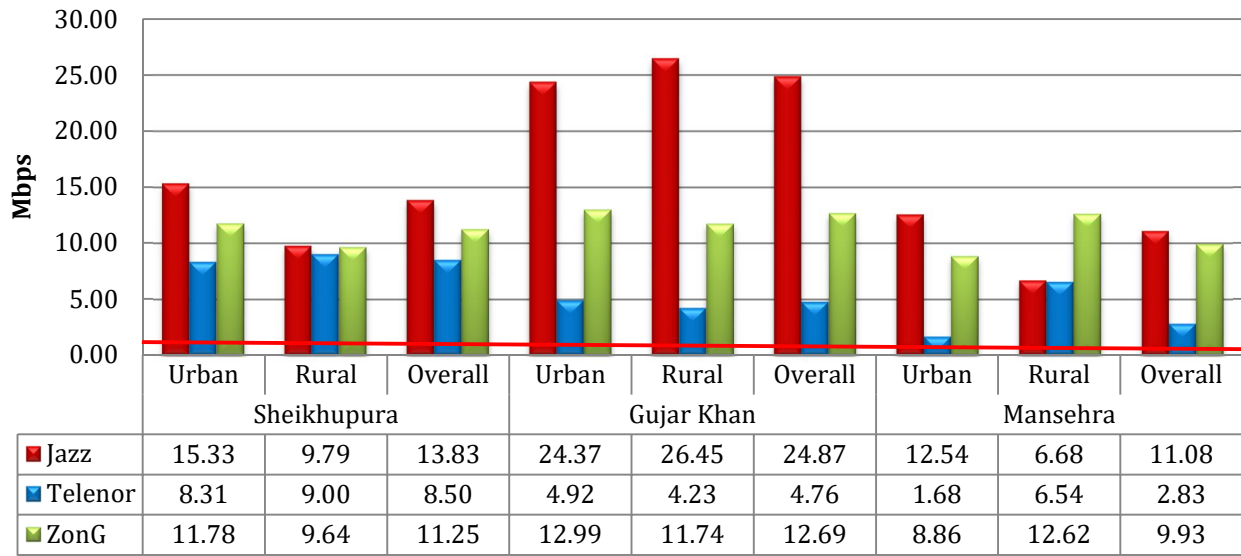
DATA – KEY PERFORMANCE INDICATORS

Data KPIs. The performance of data services of CMOs has been checked by measuring User Data Throughput and Signal Strength (i.e. Received Signal Code Power (RSCP) for 3G and Reference Signal Receive Power (RSRP) for 4G).

User Data Throughput *This KPI defines user data rate (Internet speed) to be provided by CMOs to mobile users across the coverage areas. The data throughput results of all CMOs are:*



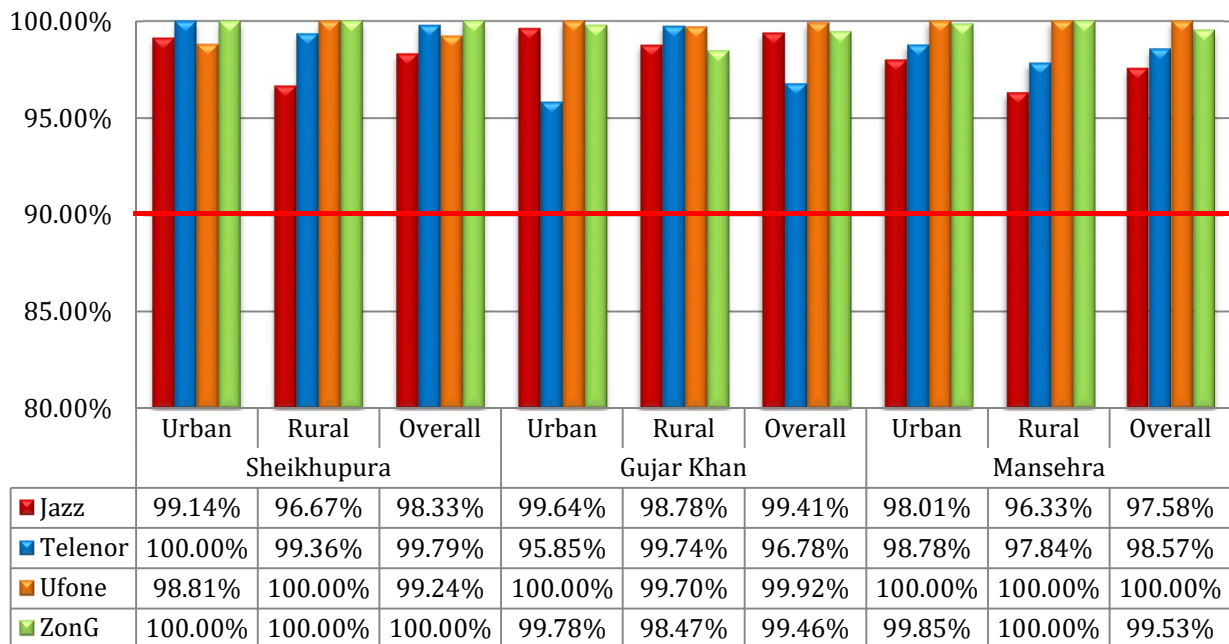
User Data Throughput (4G) (Threshold > 2Mbps)



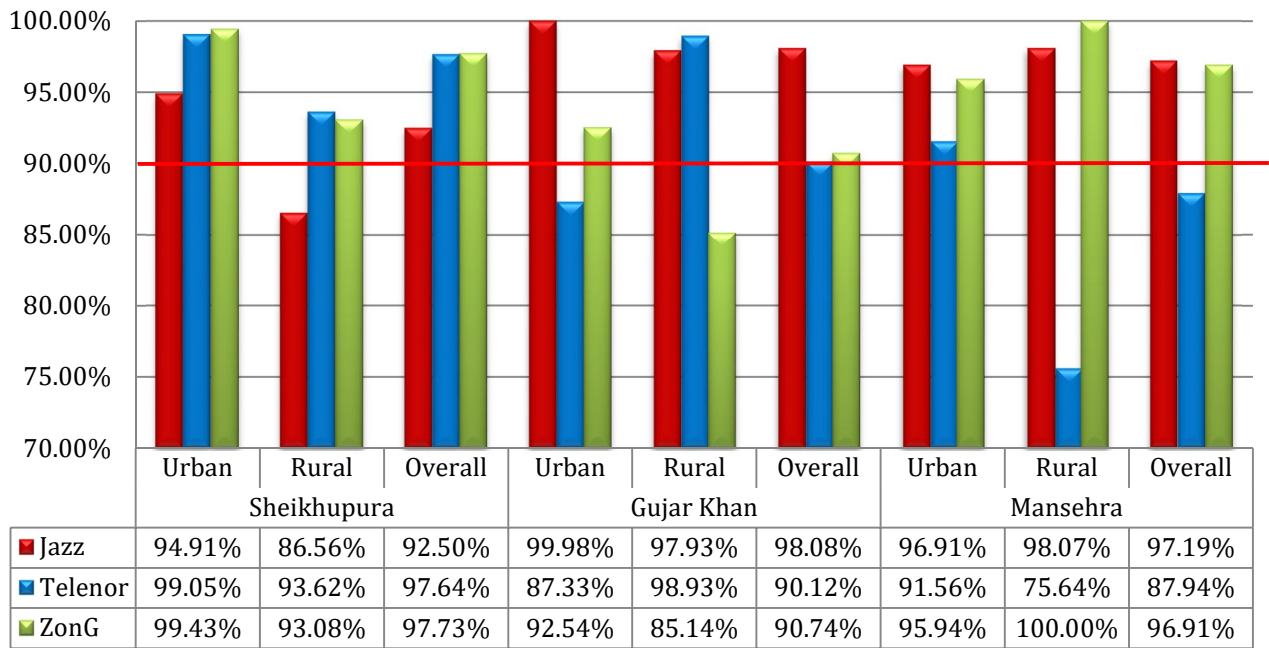
- Telenor has not achieved the threshold of 2Mbps User Data Throughput for 4G services in Urban Areas at Mansehra.

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 CMOs are:

Signal Strength (RSCP) 3G (Threshold: Min -100 dBm with 90% Confidence)



**Signal Strength (RSRP) 4G
(Threshold: Min -100 dBm with 90% Confidence)**

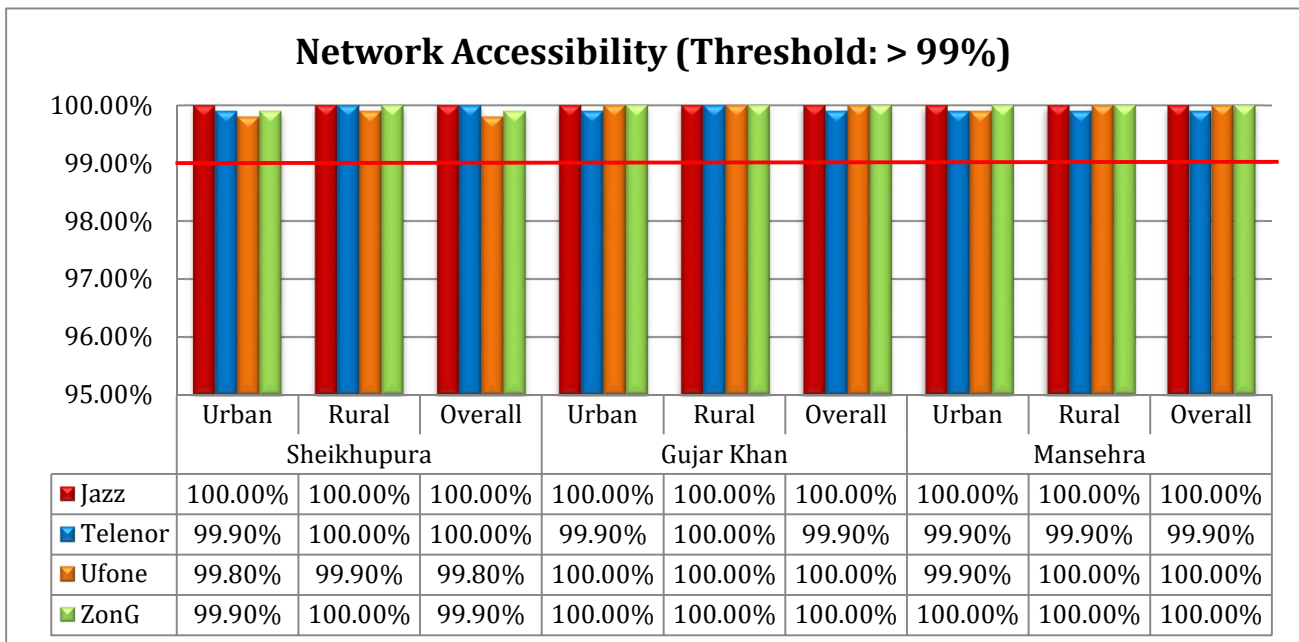


- *Telenor has not met the confidence level of 90% of signal strength (i.e. -100dBm of RSRP of 4G) in Urban Areas of Gujar Khan, Rural and Overall Areas of Mansehra.*
- *ZonG has not met the confidence level of 90% of signal strength (i.e. -100dBm of RSRP of 4G) in Rural Areas of Gujar Khan.*
- *Jazz has not met the confidence level of 90% of signal strength (i.e. -100dBm of RSRP of 4G) in Rural Areas of Sheikhupura.*

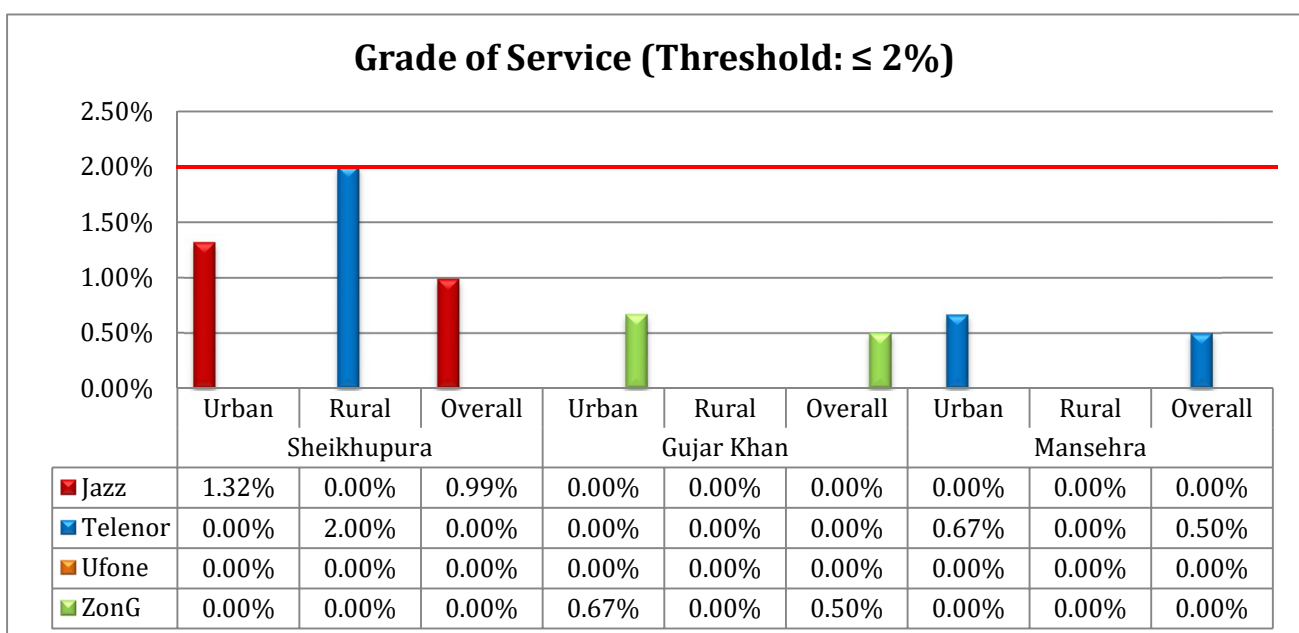
VOICE – KEY PERFORMANCE INDICATORS

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”.*

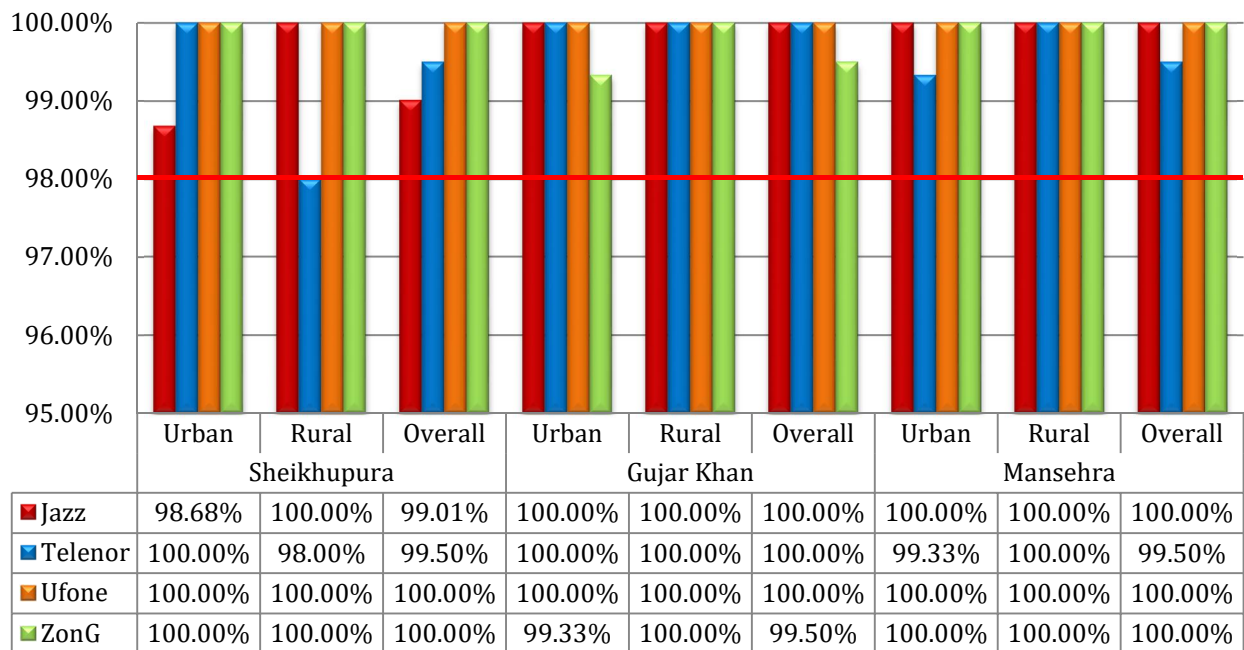


Grade of Service (GOS). *“Grade of Service is probability that the end customer cannot access the mobile services when requested if it is offered by display of the network indicator on the mobile phone. In simple words, Grade of Service is Network Blocking”.*



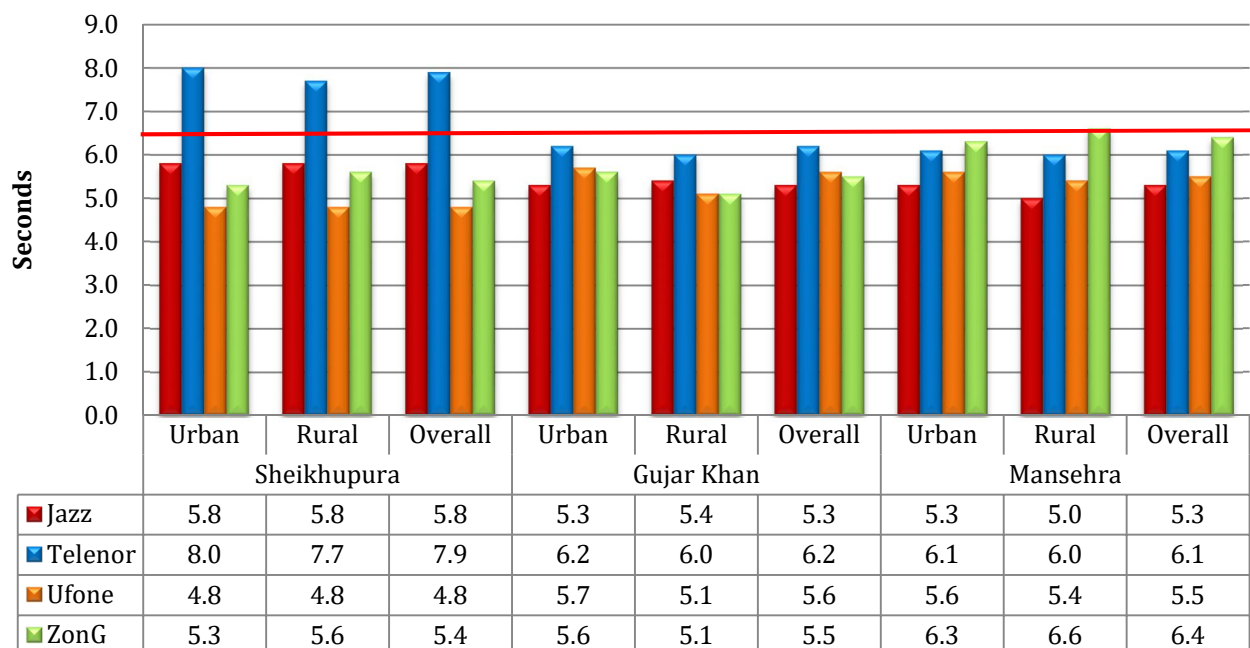
Service Accessibility. “Service Accessibility is the probability that the user can access the desired service. A given network accessibility is a precondition for this phase”.

Service Accessibility (Threshold: > 98%)



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”.

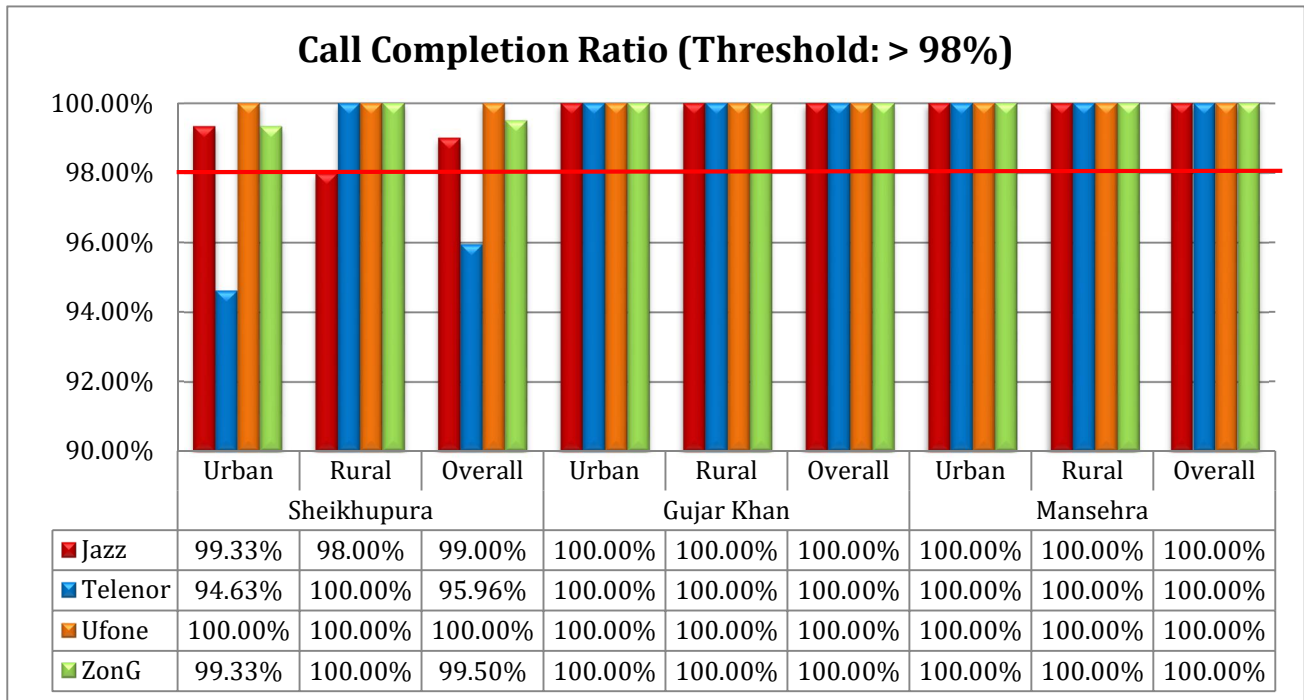
Call Connection Time (Threshold: ≤ 6.5 sec)



- **Telenor has not met the threshold value of 6.5 Seconds of Call Connection Time in Urban, Rural and Overall Areas of Sheikhupura.**

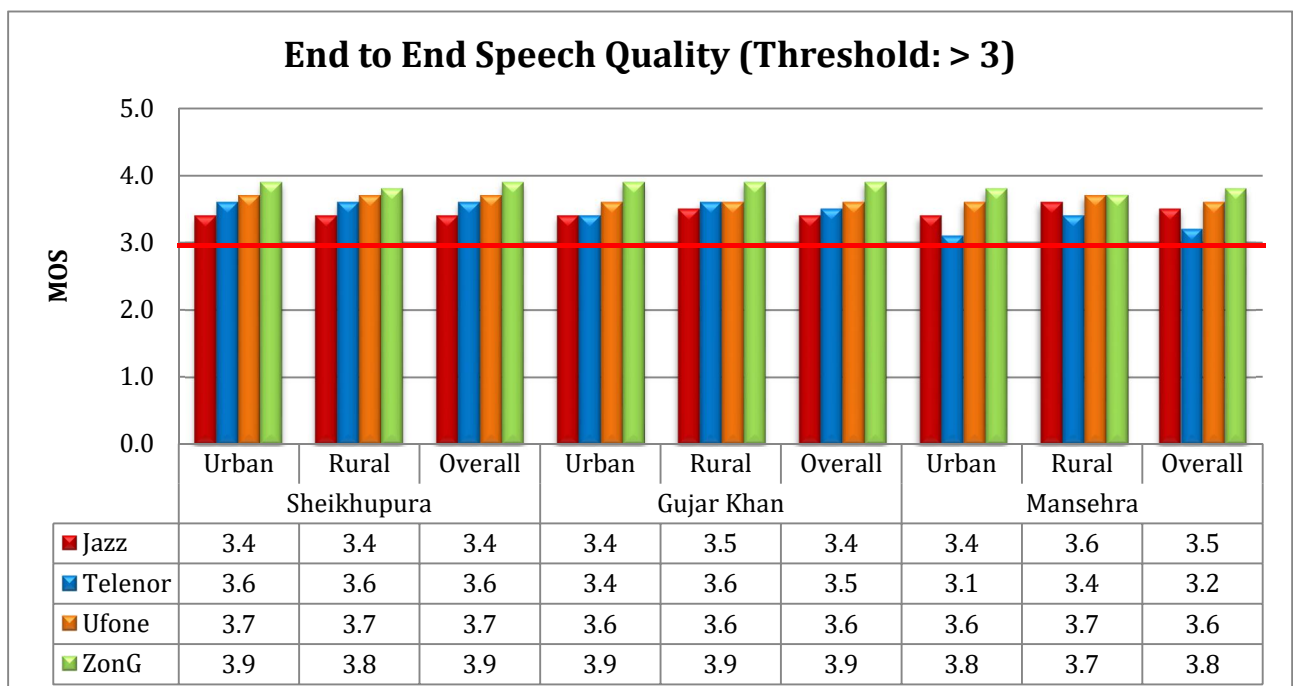
- ZonG has not met the threshold value of 6.5 Seconds of Call Connection Time in Rural Areas of Mansehra.

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”.

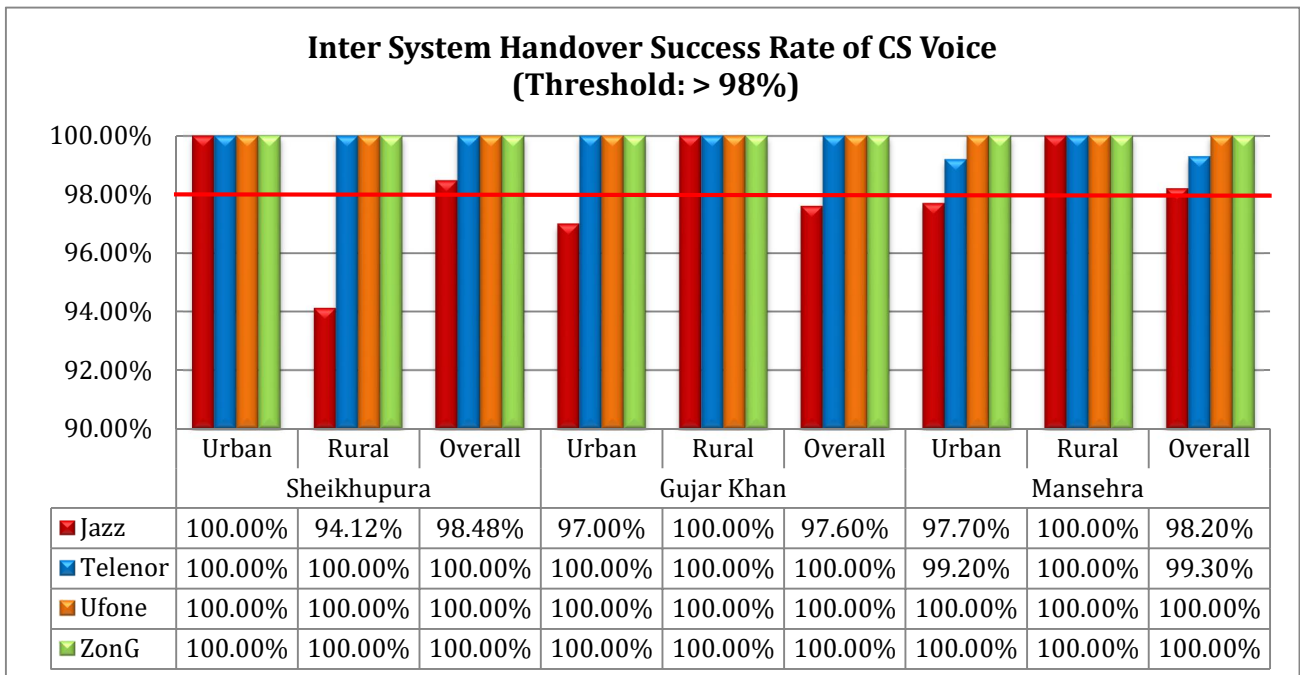


- Call Completion Ratio of 98% has not been met by Telenor in Urban and Overall Areas of Sheikhupura.

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.



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.”*

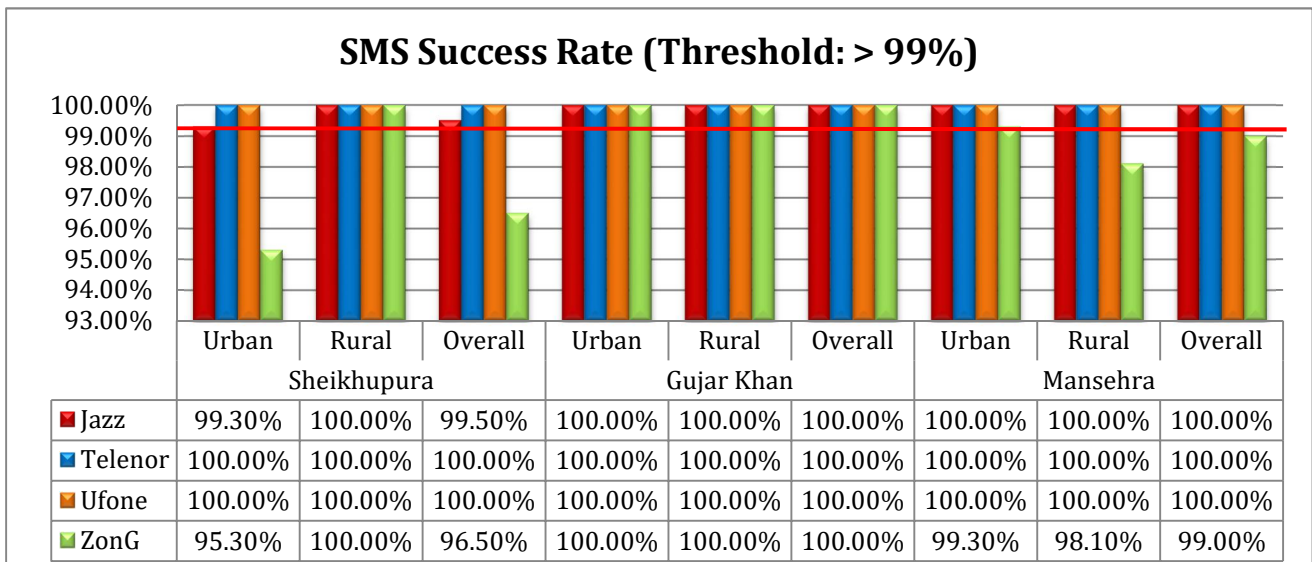


- ***Inter System Handover Success Rate of Circuit Switched (CS) Voice of 98% has not been met by Jazz in Rural Areas of Sheikhupura, Urban and Overall Areas of Gujar Khan and Urban Areas of Mansehra.***

SMS – KEY PERFORMANCE INDICATORS

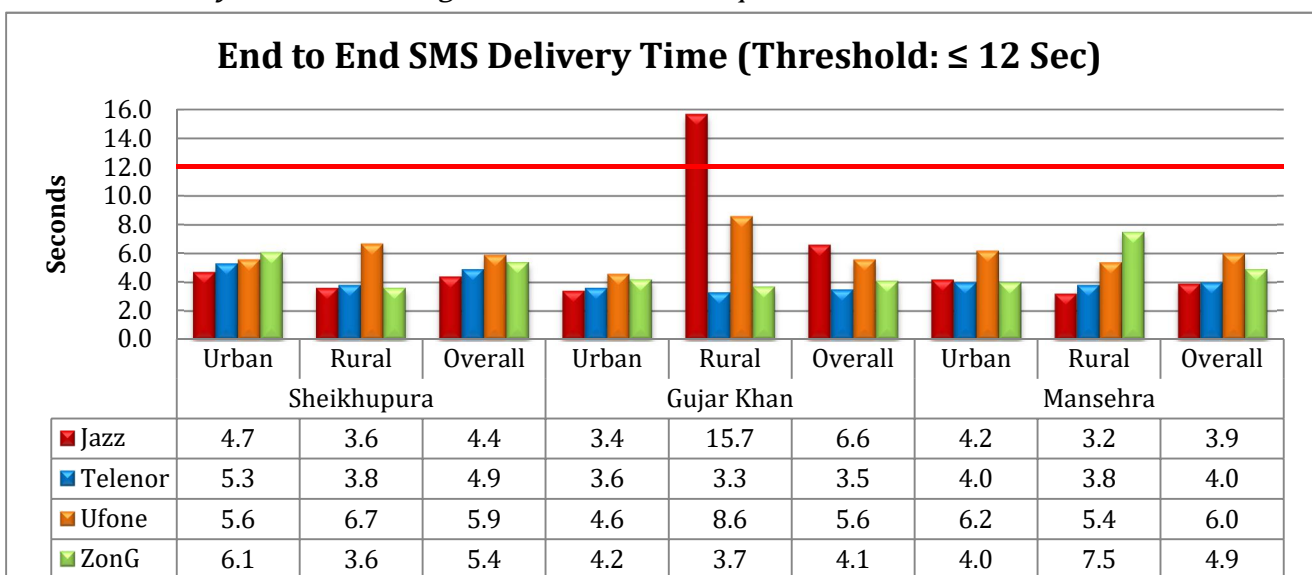
SMS KPIs. The performance of SMS services of CMOs has been checked by measuring SMS Success Rate and End-to-End SMS Delivery Time Key Performance Indicators (KPIs).

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.*



ZonG has not met the SMS Success Rate of 99% in Urban and Overall Areas of Sheikhupura and in Rural Areas of Mansehra.

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.*



Jazz has not met the 12 Seconds Threshold value of End-to-End Delivery Time of SMS in Rural Areas of Gujar Khan