Statistical Analysis

- **N:** Number of results received or number of results used to generate mean for comparison.
- **Assigned Value (Robust Mean):** The estimate of the population means using a robust algorithm. Refer Algorithm A, Annex C of ISO 13528 standard for more information.
- **Standard Deviation:** The estimate of the population standard deviation using a robust algorithm. Refer Algorithm A, Annex C of ISO 13528 standard for more information.
- **Coefficient of Variation (CV):** Coefficient of variation is the relative standard deviation (that is, the standard deviation expressed as a percentage of the mean). The CV is useful because it is independent of concentration.

$$\% \text{ CV} = (\text{Standard Deviation}/\text{Assigned value}) * 100$$

- **Uncertainty (U):** Uncertainty of the assigned value is estimated. It is an indicator in the confidence of the comparator mean (assigned value). Lower values, close to zero, indicate low uncertainty. Higher values indicate grater uncertainty (or reduced confidence) in the comparator results.

$$U\,(x_{pt}) = 1.25 \times \sigma/\sqrt{p}$$

Where: σ = is the robust standard deviation

p = is the participant number or number results

- **Z Score:** Laboratory performance is evaluated as a Z-score and calculated as per below formula given in ISO 13528 standard:

$$Z = \frac{(X_i - X_{pt})}{\sigma_{pt}}$$

Where: X_i = Participant Result

X_{pt} = Assigned Value

σ_{pt}= Standard Deviation

- **Acceptance Criteria of Z score:**

Criteria	Description
$\|Z\| \leq 2.0$	If your Z score lies between ±2.0 Z Score - considered to be Acceptable
$2.0 < \|Z\| < 3.0$	If your Z score lies between ± 2.0 to 2.99 - considered to be Questionable (warning signal)
$\|Z\| \geq 3.0$	If your Z score is ± 3.0 Z score or more then it - considered to be Unacceptable (action signal).

- **RMZ:** Running Mean Z-score. This is the average z-score for the last six for a particular analyte. This is a cycle independent.
- **Percentage Deviation (%):** The mean bias of a laboratory results relative to assigned value, expressed as a percent.

$$\% D = 100 \times (X_i - X_{pt}) / X_{pt}$$

Where: X_i = Participant result

X_{pt}= Assigned value

- **EQAS Score for Evaluated Analyte:** (Number of Analytes with Z-score <3) / (Number of Analytes reported) *100