Z-score

The deviation of the value for an individual from the median value of the reference population, divided by the standard Deviation for the reference population

$$Z\text{- Score} = \frac{\text{(Observed value) - (Median reference value)}}{\text{Standard deviation of reference population}}$$

A fixed Z score interval implies a fixed height or weight difference for children of a given age Advantage:- Allows mean and SD calculation for a group of Z score in population based applications

Percentile

It refers to a point on the scale, when series of data is arranged in an ascending order for a measurement. It is an ordinal scale and shows merely the order of rating on the scale.The rank position of an individual on a given reference distribution, stated in terms of what percentage of the group the individual equals or exceeds .

Eg. A child of a given age whose weight falls in the 10^{th} percentile weighs the same or more than 10% of the reference population of children of same age**.**

- Summary statistics not possible
- Towards the extremes of the reference distribution there is little change in percentile values, when there is infact substantial change in weight or height.
- If the distribution of reference values fallows a normal distribution, percentiles and Z scores are related through a mathematical transformation.
- Commonly used -3,-2 and -1 Z scores are respectively the 0.13^{th} , 2.28^{th} and 15.8^{th} percentiles and the 1^{st} ,3^{rd} and 10^{th} percentiles correspond to, respectively, the -2.33,-1.88,and -1.29 Z scores.