Summary

- Standard error is a Standard deviation of all possible values of statistic in repeated samples of a fixed size from a given population.
- Standard error depends on i) Sample size ii) Nature of the statistic eg: Mean, Variance,...iii) The mathematical form of the sampling distribution iv) The values of some of the parameters used in the sampling distribution.
- Standard Error of the estimated population mean is $\sqrt{\frac{\sum_{h=1}^{k} W_h^2 \sigma_h^2}{n_h}}$ and its estimate is $\sqrt{\frac{\sum_{h=1}^{k} W_h^2 s_h^2}{n_h}}$
- Standard Error of the estimated population total under Stratified SRSWR is $\sqrt{\sum_{h=1}^{k} N_h^2 \sigma_h^2 / n_h}$ and its estimate is $\sqrt{\frac{\sum N_h^2 s_h^2}{n_h}}$
- Standard Error of the unbiased estimator of the population mean under Stratified sampling using SRSWOR is $\sqrt{\sum W_h^2 (\frac{N_h - n_h}{N_h}) \frac{S_h^2}{n_h}}$ and its estimate is $\sqrt{\sum N_h (N_h - n_h) \frac{s_h^2}{n_h}}$

- Standard Error of the estimated population total under Stratified SRSWOR $\sqrt{\sum_{h=1}^{k} N_h (N_h - n_h) \frac{S_h^2}{n_h}}$ and its estimate is

$$\sqrt{\sum_{h=1}^{k} \frac{N_h^2 s_h^2}{n_h} - \sum_{h=1}^{k} N_h s_h^2}$$