Notation

$h = \{1, 2, \ldots H\}$

U_h = index set for stratum h

$U_h = \{1, 2, \ldots N_h\}$

N_h = # of OUs in stratum h

- $N = N_1 + N_2 + \cdots + N_H$ (population size)

n_h = # of sampling units from stratum h

S_h = index set for sample in stratum h

- $n = n_1 + n_2 + \cdots n_H$ (sample size)
- Response variable

Y_{hj} = characteristic of interest for OU j in stratum h

population parameters

$$t_h = \sum_{j=1}^{N_h} Y_{hj} = \text{population total in stratum } h$$

$$t = \sum_{h=1}^{H} t_h = \text{population total}$$

$$\bar{Y}_{Uh} = \frac{\sum_{j=1}^{N_h} Y_{hj}}{N_h} = \text{population mean in stratum } h$$

$$\bar{Y}_U = \frac{t}{N} = \frac{\sum_{h=1}^{H} \sum_{j=1}^{N_h} Y_{hj}}{N}$$

population stratum variance

$$S_h^2 = \sum_{j=1}^{N_h} \frac{(Y_{hj} - \bar{Y}_{Uh})^2}{N_h - 1}$$