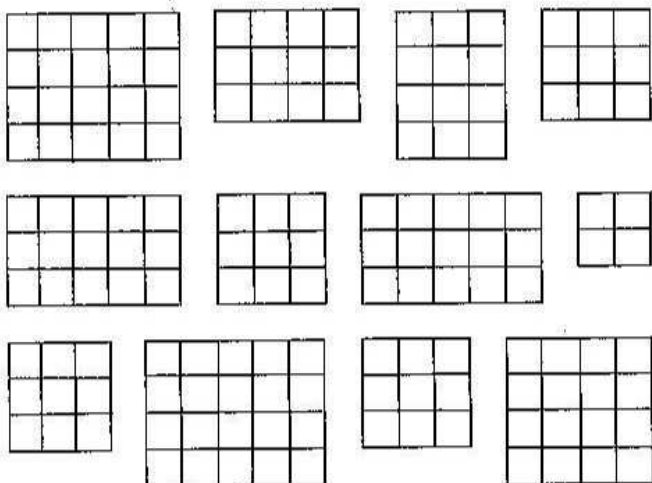


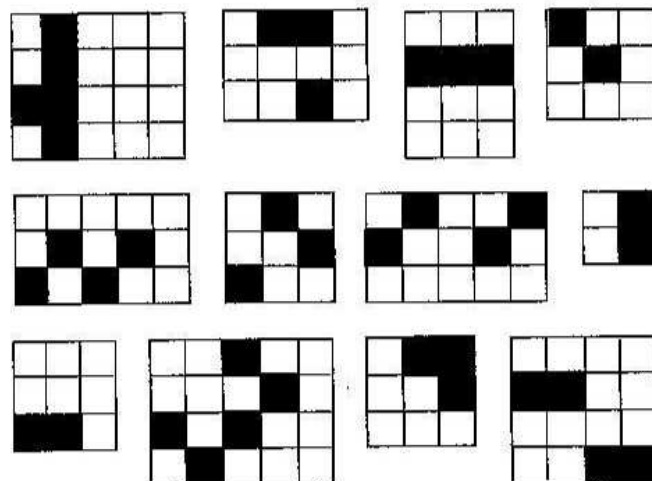
## Stratified Sampling

Each element of the population is in exactly one stratum.

Population of  $H$  strata; stratum  $h$  has  $n_h$  elements:



Take an SRS from *every* stratum:



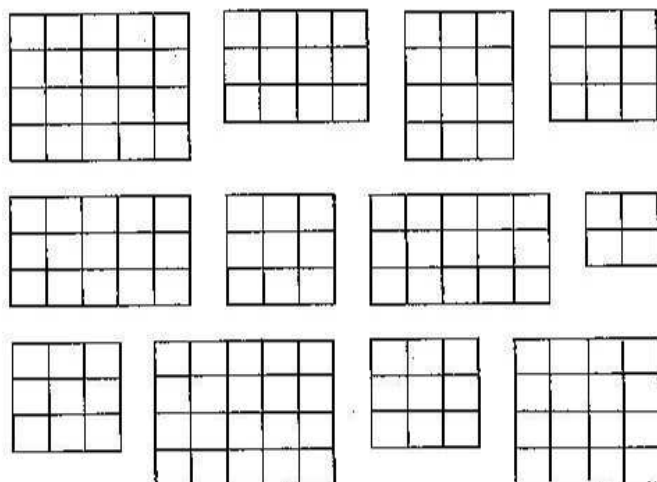
Variance of the estimate of  $\bar{y}_U$  depends on the variability of values *within* strata.

For greatest precision, individual elements within each stratum should have similar values, but stratum means should differ from each other as much as possible.

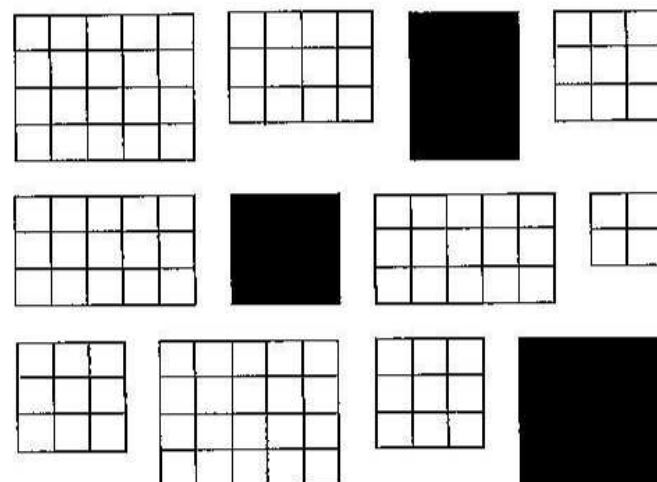
## Cluster Sampling

Each element of the population is in exactly one cluster.

One-stage cluster sampling; population of  $N$  clusters:



Take an SRS of clusters; observe all elements within the clusters in the sample:



The cluster is the sampling unit; the more clusters we sample, the smaller the variance. The variance of the estimate of  $\bar{y}_U$  depends primarily on the variability *between* cluster means.

For greatest precision, individual elements within each cluster should be heterogeneous, and cluster means should be similar to one another.