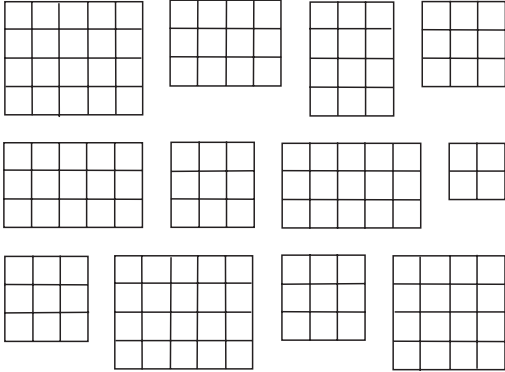
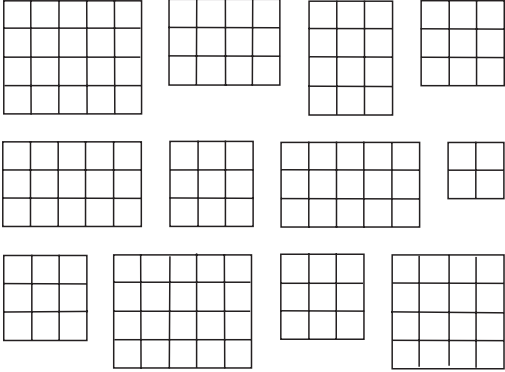
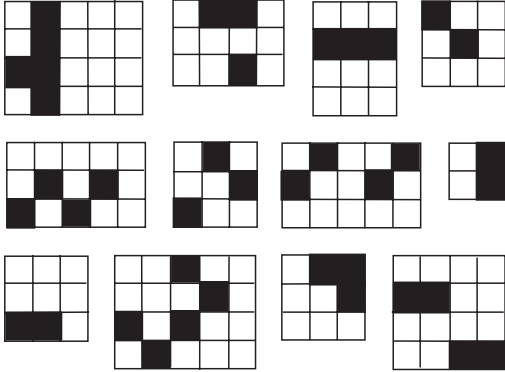
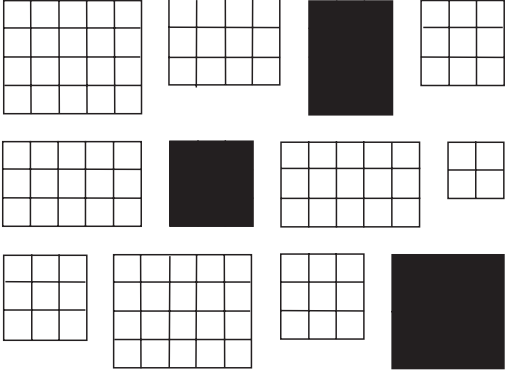


**FIGURE 5.1**  
Similarities and differences between stratified sampling and one-stage cluster sampling

Stratified Sampling	Cluster Sampling
Each element of the population is in exactly one stratum.	Each element of the population is in exactly one cluster.
Population of $H$ strata; stratum $h$ has $n_h$ elements:	One-stage cluster sampling; population of $N$ clusters:
	
Take an SRS from <i>every</i> stratum:	Take an SRS of clusters; observe all elements within the clusters in the sample:
	
Variance of the estimate of $\bar{y}_U$ depends on the variability of values <i>within</i> strata.	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 <i>between</i> cluster means.
For greatest precision, individual elements within each stratum should have similar values, but stratum means should differ from each other as much as possible.	For greatest precision, individual elements within each cluster should be heterogeneous, and cluster means should be similar to one another.

we partially repeat the same information instead of obtaining new information, and that gives us less precision for estimates of population quantities. Cluster sampling is used in practice because it is usually much cheaper and more convenient to sample in clusters than randomly in the population. Most large household surveys carried out by the U.S. government, or by commercial or academic institutions, use cluster sampling because of the cost savings.