

▼ **Table 4-5** Advantages and disadvantages of various sampling methods

Sampling Method	Description	Advantages	Disadvantages
Probability Sampling Methods			
Simple random sample	A sample that is drawn random sample in such a way that every member of a population has an equal chance of being included. A random number table or a random number generator is typically used to actually pull the sample.	<ul style="list-style-type: none"> • Requires minimum knowledge of the population in advance • Free of possible classification errors • Easy to analyze the data and compute errors • Fairly inexpensive 	<ul style="list-style-type: none"> • Does not take advantage of the knowledge the researcher might have about the population • There could be over- or underrepresentation of subgroups within the population • Typically produces larger sampling errors for the same sample than a stratified sample
Stratified random sample	The population is divided into relevant strata before random sampling is applied to each stratum.	<ul style="list-style-type: none"> • Helps to reduce the chances of over-/underrepresenting subgroups within the population • Allows you to segment the data into “buckets” during the analysis phase • Create more efficient samples • Reduces sampling error 	<ul style="list-style-type: none"> • Requires knowledge of the presence of various characteristics within the population • Sampling costs can increase if knowledge of the population is shallow • If the strata are not highly homogeneous then sampling error goes up and efficiency goes down
Proportional stratified random sample	The proportion (or percentage) of a particular stratum is determined in the population and then applied to the random sample.	<ul style="list-style-type: none"> • Adds even more precision than the stratified random sample • Increases sample representativeness • Creates very efficient samples • Reduces sampling error 	<ul style="list-style-type: none"> • Requires more human and financial resources than other methods • Requires even more information about the population than stratified random methods

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Sampling Method	Description	Advantages	Disadvantages
Systematic sample	Select every k^{th} observation from the population after a random starting point has been selected.	<ul style="list-style-type: none"> • Very easy to conduct • Has “intuitive” appeal • Inexpensive to conduct 	<ul style="list-style-type: none"> • Can produce bias due to periodic ordering of observation, which produces exclusion of segments of the population • Increased probability of sampling bias
Cluster sample	Clusters or “bunches” of the population are identified, and then random sampling is applied to each cluster.	<ul style="list-style-type: none"> • Can be low cost, especially if geographic clusters are used • If properly done, each cluster is a small model of the population • High level of practicality 	<ul style="list-style-type: none"> • Clusters need to be as heterogeneous as possible • Typically has lower statistical efficiency • Large samples are often needed to ensure precision
Nonprobability Sampling Methods			
Convenience sample	Observations are selected based on availability and convenience. Also known as “accidental” samples.	<ul style="list-style-type: none"> • Ease of obtaining a sample • Relatively low cost 	<ul style="list-style-type: none"> • Extremely low generalizability • No way to determine sampling bias or sampling error
Quota sample	A population is divided into relevant strata. The desired proportion of samples to be obtained from each stratum is determined, and then a fixed quota within each stratum is set.	<ul style="list-style-type: none"> • Stratification effect is achieved if the strata are appropriately structured • In theory, the quota sample should be reasonably representative of the population • Human and financial costs can be kept to a minimum if the strata from which the quotas are to be drawn are grouped close together (reduced the amount of travel the data collectors have to perform in order to gather the data) 	<ul style="list-style-type: none"> • The people assigned to collect the quotas need to be scrupulous, free from selection bias, and follow the prescribed sampling design (otherwise this method becomes a convenience sample) • It is difficult to guarantee that the quotas were filled accurately • In-depth knowledge of the population is required • Nonrandom selection of the quotas can also introduce bias

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Sampling Method	Description	Advantages	Disadvantages
Judgment sample	Subgroups are drawn from a process over time based on expert knowledge. The subgroup samples can be drawn either by random or nonrandom procedures.	<ul style="list-style-type: none"> • Samples in a subgroup can be small “(3–5) since many subgroups will be selected • Data collection costs can be reduced • Provides a dynamic picture of the data and serves as the basis for process improvement • Minimum stratification effect is achieved 	<ul style="list-style-type: none"> • Sampling bias and sampling error cannot be calculated • Expert knowledge of the process or population is required • Generalization of the judgment sample to larger populations cannot be done • Personal bias enters into the selection of the sample

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