

Method of Sampling	Random / Non Random	Methodology	Advantages	Disadvantages	Example
Simple Random Sampling	Random	<p>From a population of size N, we number all the elements of the population from 1 to N, and make a random selection of n of these numbers.</p> <p>To get a random selection, we can either use a table of random numbers or by generating random numbers on a computer or a calculator.</p>	<ul style="list-style-type: none"> analysis of data is relatively easy compared to other sampling methods free from bias, i.e. every element in the population have an equal and independent chance of being selected 	<ul style="list-style-type: none"> requires a sampling frame, i.e. a list of all the members of the population. If the population is large, this is not a simple task and it may not be available if a sampling unit is not available, it cannot be replaced time consuming for very large populations to “locate” the sampling units that have been randomly selected. It may be costly. by chance we could obtain a non-representative sample. (eg if measuring heights, we could end up by chance with a sample where ALL units are either very short or very tall) 	<p>Select a sample of 40 staff from a company with 200 staff.</p> <p>Assign every staff in the company a number, from 1 to 200, by arranging their names in alphabetical order.</p> <p>Use a computer to generate 40 random numbers.</p> <p>The 40 staff with the corresponding numbers would be the ones chosen to be in the sample.</p>
Systematic Sampling	Random	<p>Arrange all units of a population in some order.</p> <p>To pick the first member, we do a random selection of it from the first k members, where $k \approx \frac{N}{n}$. (N is the population size and n is the sample size.)</p> <p>Then every k^{th} member commencing from the first member chosen is selected for inclusion in the sample.</p>	<ul style="list-style-type: none"> easier to conduct as compared with stratified sampling more evenly spread over the population compared to simple random and quota sampling 	<ul style="list-style-type: none"> requires a sampling frame, i.e. a list of all the members of the population. If the population is large, this is not a simple task and it may not be available biased when the members of the population have a periodic or cyclic pattern (eg, if data on the number of commuters who board the North-South line from Toa Payoh MRT station is required and the sample consists of all data collected every 7th day of the week, i.e. every Sunday, then the sample is biased) if a sampling unit is not available, it cannot be replaced 	<p>Assign every staff in the company a number, from 1 to 200, by arranging their names in alphabetical order.</p> <p>As $k = \frac{200}{40} = 5$, randomly select one staff from the first 5.</p> <p>If the 2nd staff is chosen, then every 5th staff from the 2nd staff on the list will be included in the sample. i.e. the 2nd, 7th, 12th, 17th, ..., 197th staff will be included in the sample.</p>
Stratified Sampling	Random	<p>The population is divided into mutually exclusive subgroups called strata.</p> <p>Random samples (using simple random sampling or systematic sampling) are then drawn separately from each stratum, with sample size proportional to the relative size of the stratum.</p>	<ul style="list-style-type: none"> likely to give good representative sample of the population each of the stratum can be treated separately, and so the sampling is convenient and more accurate 	<ul style="list-style-type: none"> requires an extensive sampling frame; more information about the members is required. may be more difficult to conduct as compared with simple random sampling; increased cost due to the extra time and manpower necessary for the organization and implementation of the sample strata may not be clearly defined if a sampling unit is not available, it cannot be replaced 	<p>Assume that the proportion of 200 staff in different age groups is as follows: 38% under 40, 40% between 40 and 60, 22% over 60.</p> <p>To obtain a sample of 40 staff, we draw <u>random samples from the age groups with sample size proportional to the relative size of each age group</u> as follows: 15 (38% of 40) under 40, 16 (40% of 40) between 40 and 60, 9 (22% of 40) over 60.</p>
Quota Sampling	Non-random	<p>Similar to stratified sampling except that units in each stratum are chosen in a non-random way.</p> <p>Also, when the sampling frame is not available, the sample size need not be proportional to the relative size of each stratum, since we do not have the information on the proportion of each stratum.</p>	<ul style="list-style-type: none"> does not require a sampling frame no non-response lower cost and convenient compared to other sampling methods information can be collected quickly 	<ul style="list-style-type: none"> tends to be biased as the researcher may simply select members who are easier to survey/interview/collect data from may not get a representative sample of the population as the researcher may over select from a certain group/type of people/item, resulting in certain segments of the population being over-represented 	<p>Similar as the example for stratified sampling except that when obtaining a sample of 40 staff,</p> <p>non-random samples are drawn from each age group.</p>