

# CENSUS AND SAMPLE INVESTIGATION

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## Types of Sampling

## 2. Systematic Random Sampling

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- **Systematic Random Sampling:** The items or individuals of the population are arranged in some order. A random starting point is selected and then every  $k$ th member of the population is selected for the sample.

- **EXAMPLE**

A population consists of 845 employees of Tata Industries. A sample of 52 employees is to be selected from that population.

First,  $k$  is calculated as the population size divided by the sample size. 
$$K = \frac{\text{Population Size } (N)}{\text{Sample size } (n)}$$

For *Tata Industries*, we would select every 16th (845/52) employee list. If  $k$  is not a whole number, then round down. Random sampling is used in the selection of the first name. Then, select every 16<sup>th</sup> name on the list thereafter.

## 2. Systematic Random Sampling

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### ❖ Merits:

- Simple and convenient to adopt.
- Less time and work involved.
- Generally satisfactory result.
- Reliable results if population is sufficiently large.

### ❖ Limitations:

- Less representative if population has hidden periodicities.
- Possibility of getting more of certain type of elements selected if population is ordered in a systematic way with respect to characteristics.

## 3. Stratified Random Sampling

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- ❖ **Stratified Random Sampling:** A population is first divided into homogeneous groups, called strata, and a sample is selected from each stratum.
- **Useful** when a population can be clearly divided in groups based on some characteristics.

## 3. Stratified Random Sampling

- Suppose we want to study the advertising expenditures for the 352 largest companies in the India to determine whether firms with high returns on equity (a measure of profitability) spent more of each sales dollar on advertising than firms with a low return or deficit.
- To make sure that the sample is a fair representation of the 352 companies, the companies are grouped on percent return on equity and a sample proportional to the relative size of the group is randomly selected.

Stratum	Profitability (return on equity)	Number of Firms	Relative Frequency	Number Sampled
1	30 percent and over	8	0.02	1*
2	20 up to 30 percent	35	0.10	5*
3	10 up to 20 percent	189	0.54	27
4	0 up to 10 percent	115	0.33	16
5	Deficit	5	0.01	1
Total		352	1.00	50

## 3. Stratified Random Sampling

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- **Merits:**

- More Representative
- Greater Accuracy if each item of stratum is uniform.
- Administrative Convenience
- Stratified sample may be more geographically concentrated. Thus it is more economic in time and money.
- Division into Strata Possible

## 3. Stratified Random Sampling

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- **Limitations:**

- Difficult task to divide the universe into uniform strata. This may require considerable time, money manpower and experience.
- Sometimes, the supplementary information to set up strata may not be available.
- This method of sampling is not suitable in case of overlapping of the universe