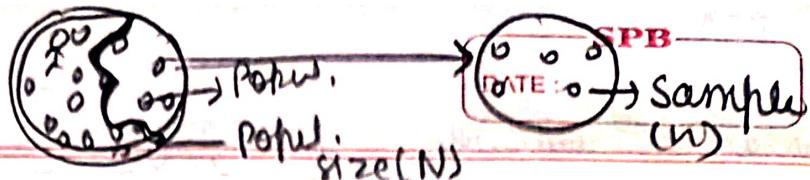


Sampling



SPB

- All items, elements or observation of interest having similar properties known as population

- aggregate of all units under consideration.
- no. of unit belonging to a population is population size (N)

4 types of population.

1. finite → countable unit

Ex:- Population of student enrolled in CA course.

2. Infinite → uncountable unit

Ex:- population of stars.

3.) existent population → population consisting of a real objects.

No. of fin. student

4.) imaginary population → population that exists

Just hypothetically like population of head when coin is tossed.

student of all courses.

* Census → study of every elements of population.

sample → part of a population with a view

to represent the all population.

↳ consists of (n) units.

↳ sample size.

↳ The Unit forming the sample → sampling unit.

↳ A detailed and complete list of all sampling units - sampling frame

Parameter

DATE: SPB

- statistical measures (mean, median). It is the statistical measures computed from population.
- characteristic of population
- based on all unit of the population.

Sample help in Estimation of population.

population

Sample

$\mu \leftarrow \text{Mean} \rightarrow \bar{x}$

$\sigma^2 \leftarrow \text{Variance} \rightarrow S^2$

$\sigma \leftarrow \text{Standard deviation} \rightarrow S$

$N \leftarrow \text{size} \rightarrow n$

$p. \leftarrow \text{proportion} \rightarrow \hat{p}$

Sampling is technique of selecting population to make statistical inferences from them and estimate characteristic of the whole universe.

law of statistical regularity

1, sample of fairly large size is drawn from the population under discussion at random then an average the sample would possess the characteristics of population

Principle of Inertia: It states that a ~~small~~ sample size increases, the result are likely to be more reliable, accurate, provided other factor are kept constant.

Principle of Optimisation:

The Principle stresses the need of obtaining optimum result in term of efficiency and cost of sampling design with the sources available at our disposal.



Principle of validity

→ A Sampling design is termed as valid if it enables us to obtain valid tests and estimates about the population parameter.

comparison b/w sample survey and complete census enumeration.

i) when complete info. is collected from all the units belonging to a population, called census.

Speed

cost

Reliability

Accuracy

census is

free from
Sampling error

Sampling →

has sampling
error

Error in Sample Survey
biases in error

Value of
population
parameter
sample.

Types of Error

sampling error

non sampling error

- only a part of population is investigated in sampling.

Error due to recording observation.

Error happen in both census & sample.

Types of Sampling

- Probability Sampling : always a fixed, pre assigned prob. for each member of the population to be a part of the sample taken from that population

- random Sampling → sample ma anna ka equal chances hona independent of each other.

↓
It is effective when :- population is not very large.

- sample size is not very small.
- the population under consideration is not heterogenous.

- stratified sampling :- too much heterogenous.
↳ help in reduction of variability.

* Proportional allocation

↳ Bowley's allocation,
not much variation b/w the strata variances.

↳ sample size is proportional to the population size

$$n \propto N$$

* Neyman's allocation,

↳ sample size directly varies with population size and population standard deviation

$$n \propto NS$$

Multistage Sampling

- ↳ very flexible
- ↳ quite large coverage, population.
- ↳ cost-effective
- ↳ less accurate

* cities → villages → area
 I stage II stage III stage.

Non Probability sampling.

- ↳ aka purposive

or Judgemental sampling

- picking people as per purpose
- Apna man marzi sa sample banana.

Mixed sampling.

- systematic sampling → where the units constituting the sample are selected at regular interval after selecting the very first unit at random i.e. equal probability.

linear.

circular.

$$N = nk$$

$$N = nk + p.$$

Sampling fluctuation.

Variation is values of statistics.

mean Standard error (E)

- ↳ standard deviation of the statistic

Sampling Distribution → probability distribution of given statistic

SE can be regarded as a measure of precision achieved by sampling.

SE is inversely proportional to the square root of sample size.

Sampling with replacement

- Total no. of sample. $\frac{N^n}{\text{pop. size}}$ \rightarrow sample size.

Sampling without replacement

- Total no. of sample ${}^N C_n$.