What is non-probability sampling methods?

Non-probability sampling is used when the population parameters are either unknown or not possible to individually identify.

❖ Convenience sampling

Is primarily determined by convenience to the researcher. This can include factors like: Ease of access ,Geographical proximity.

Example:

You are investigating the association between daily weather and daily shopping patterns. To collect insight into people's shopping patterns, you decide to stand outside a major shopping mall in your area for a week, stopping people as they exit and asking them if they are willing to answer a few questions about their purchases.

❖ Quota sampling

In quota sampling, you select a predetermined number or proportion of units, called a quota. Your quota should comprise subgroups with specific characteristics (e.g.,

individuals, cases, or organizations) and should be selected in a non-random manner.

You work for a market research company. You are seeking to interview 20 homeowners and 20 tenants between the ages of 45 and 60 living in a certain suburb.You stand at a convenient location, such as a busy shopping street, and randomly select people to talk to who appear to satisfy the age criterion. Once you stop them, you must first determine whether they do indeed fit the criteria of belonging to the predetermined age range and owning or renting a property in the suburb.Sampling continues until quotas for various subgroups have been selected. If contacted individuals are unwilling to participate or do not meet one of the conditions (e.g., they are over 60 or they do not live in the suburb), they are simply replaced by those who do. This approach really helps to mitigate nonresponse bias.

❖ Snowball sampling

To conduct a snowball sample, you start by finding one person who is willing to participate in your research. You then ask them to introduce you to others.

Example:

You are studying homeless people living in your city. You start by attending a housing advocacy meeting, striking up a conversation with a homeless woman. You explain the purpose

of your research and she agrees to participate. She invites you to a parking lot serving as temporary housing and offers to introduce you around.In this way, the process of snowball sampling begins. You started by attending the meeting, where you met someone who could then put you in touch with others in the group.When studying vulnerable populations, be sure to follow ethical considerations and guidelines.

❖ Purposive (judgmental) sampling

Purposive sampling is a blanket term for several sampling techniques that choose participants deliberately due to qualities they possess. It is also called judgmental sampling, because it relies on the judgment of the researcher to select the units (e.g., people, cases, or organizations studied).Purposive sampling is common in qualitative and mixed methods research designs, especially when considering specific issues with unique cases.

Types of Data Distributions and Density Functions

Types of Data Distributions:

❖ Uniform Distribution

A uniform distribution represents a scenario where all values in a dataset are equally likely to occur within a specified range. It is often visualized as a flat, horizontal line on a graph, indicating constant probability.

❖ Normal Distribution (Gaussian)

The normal distribution, often called the bell curve, is one of the most ubiquitous distributions in nature. It is characterized by its symmetrical, bell-shaped curve, with data clustering around the mean. Many real-world phenomena, from heights to exam scores, approximate a normal distribution.

❖ Exponential Distribution

The exponential distribution models the time between events in a Poisson process, where events occur independently at a

constant rate. It exhibits a rapid initial decline and then tapers off gradually.

❖ Poisson Distribution

The Poisson distribution describes the number of events occurring in a fixed interval when events happen independently at a known average rate. It is often used in scenarios like counting the number of phone calls at a call center within a given time frame.

❖ Binomial Distribution

The binomial distribution models the number of successes in a fixed number of independent trials, each with two possible outcomes (success or failure). It plays a central role in statistics, especially in hypothesis testing and probability calculations.

Types of Density Functions:

❖ Continuous Density Functions

These functions describe probability distributions for continuous random variables. The most famous among them is the probability density function (PDF) of the normal distribution,

characterized by its smooth, bell-shaped curve. Other examples include the exponential and beta distributions.

❖ Discrete Density Functions

These functions apply to discrete random variables, which can only take specific values. The PDF of a discrete distribution assigns probabilities to individual values, often depicted as bars in a histogram. The Poisson and binomial distributions are prime examples.