


UNIT - IV

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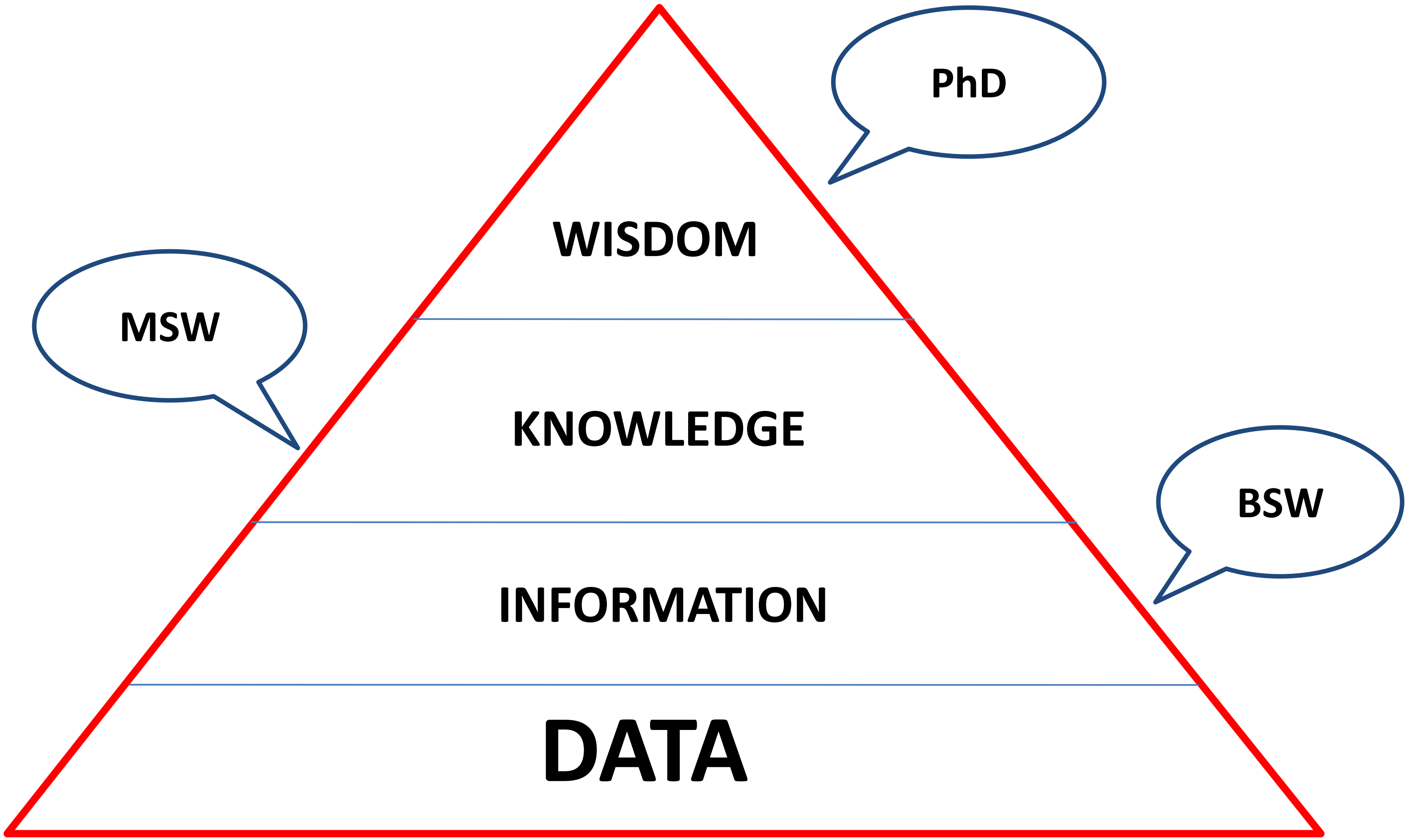
WHAT IS RE-search?


PhD
WISDOM
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KNOWLEDGE
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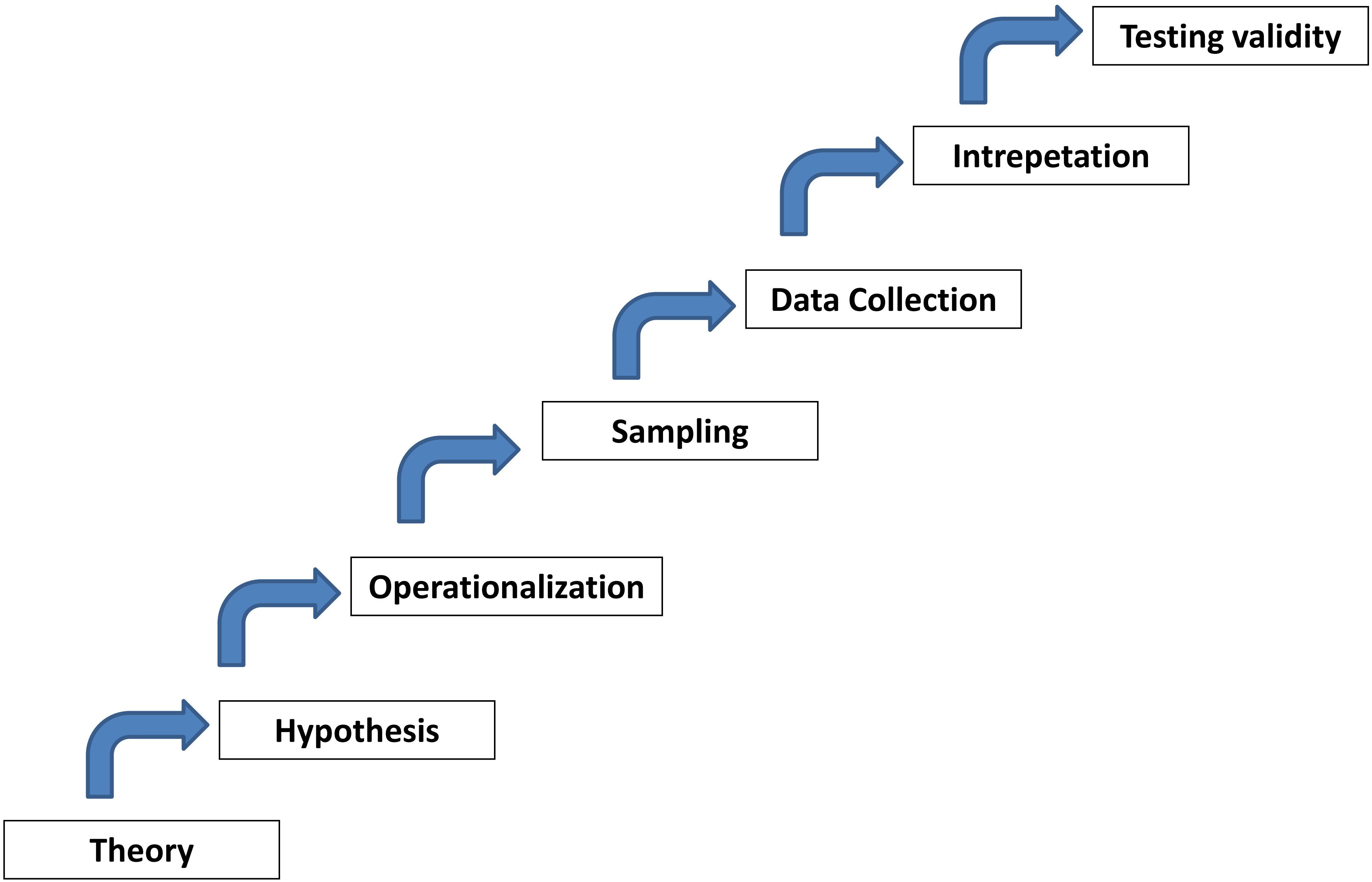
INFORMATION
DATA

LINEAR MODEL FOR RESEARCH PROCESS

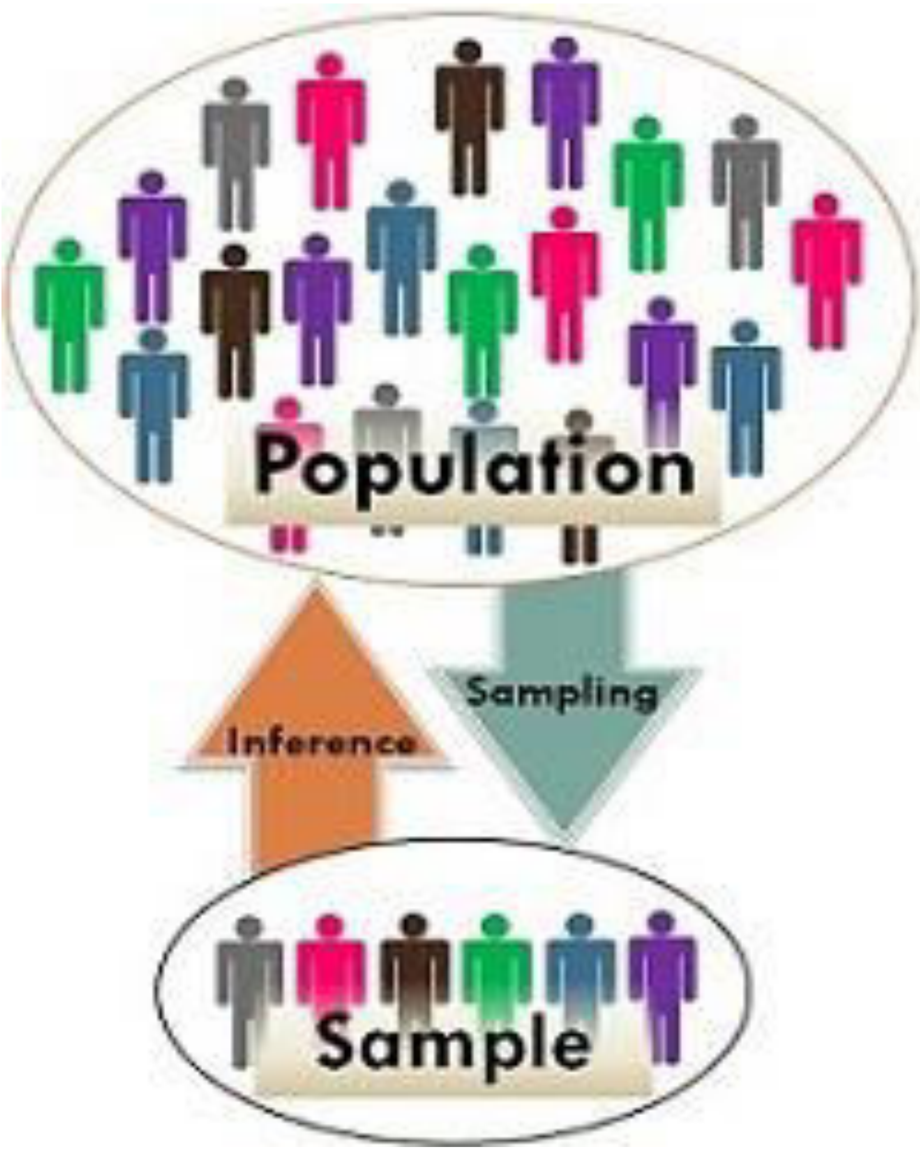


UNIVERSE

- The first step in developing any sample design is to clearly define the set of objects, technically called the Universe.
- The Universe can be **finite or infinite**.
  - ***Finite :*** the number of items is certain
  - ***Infinite:*** the number of items is uncertain

Thus, universe is a particular group of individuals or elements who are the focus of the research

Difference Between Population and Sample



- Whenever we hear the term 'population,' the first thing that strikes our mind is a **large group of people**.
- In the same way, in statistics **population** denotes a large group consisting of elements having **at least one common feature.**
- The term is often contrasted with the **sample**, which is nothing but a part of the population that is **so selected to represent the entire group**.

Important Statistical Terms

Population:

a set which includes all

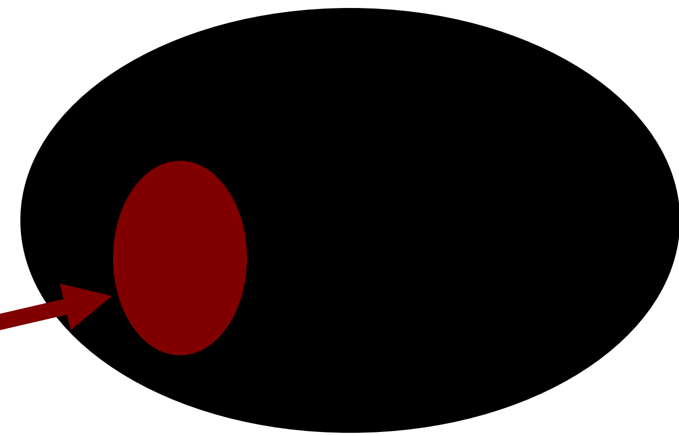
measurements of interest

to the researcher

(The collection of ***all*** responses,

measurements, or counts that are

of interest)



Sample:

A subset of the population

Components of Population

Target Population

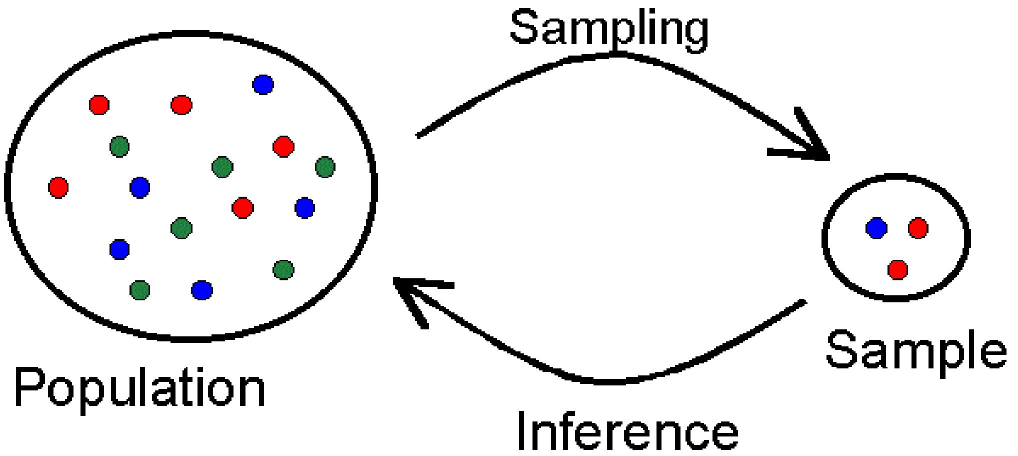
- An entire set of individuals or elements who meet the sampling criteria

Accessible Population

- The portion of the target population to which the researcher has reasonable access

Sample

- By the term sample, we mean a **part of population** chosen at random for participation in the study.
- In other words, the respondents **selected out of population constitutes a 'sample'**, and the process of selecting respondents is known as 'sampling.'
- The units under study are called sampling units, and the number of units in a sample is called sample size.



Terminology related to Sample

1. **Sample:** The selected part of the population is known as a sample.
2. **Sample Size:** The number of people in the selected sample is known as sample size.
3. **Sampling Frame:** Sampling frame means the list of individual or people included in the same. It reflects who will be included in the sample. For making a sampling frame, the researcher has to make a list of names and details of all the items of the sample.
4. **Sampling Technique:** It refers to the technique or procedure used to select the members of the sample. There are various types of sampling techniques.

Types of sampling

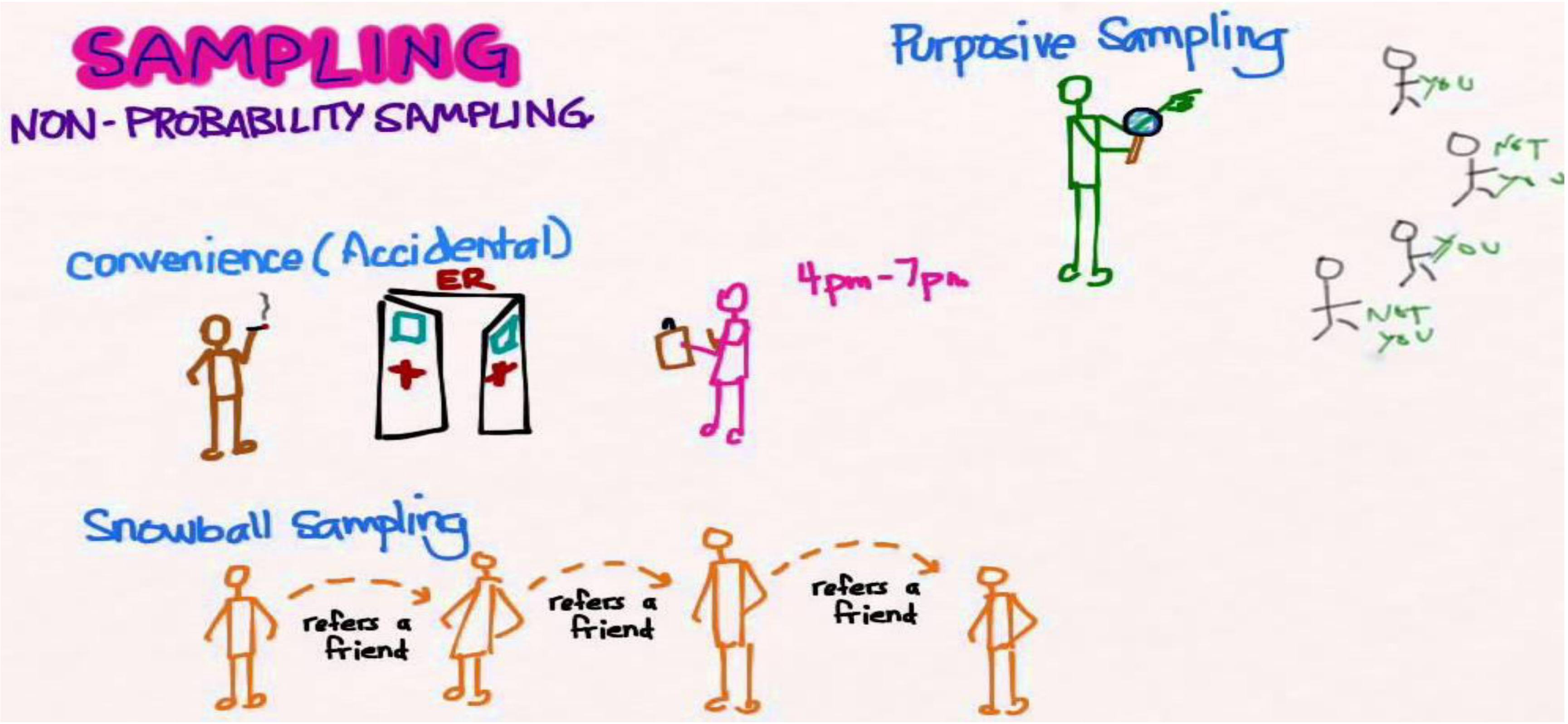
- **Non-Probability samples**

- **Probability samples**

Non-Probability samples

Non – Probability sampling is also known by different names such as **deliberate sampling, purposive sampling and judgement sampling**.

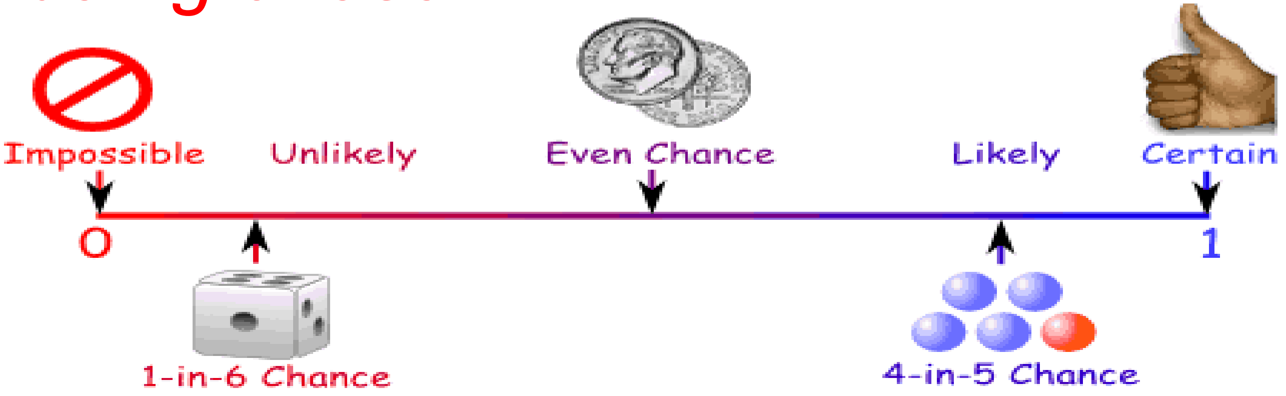
Non Probability samples



- **Convenience samples** (ease of access) - sample is selected from elements of a population that are easily accessible
- **Snowball sampling** (friend of friend….etc.)
- **Purposive sampling** (judgemental) - You chose who you think should be in the study
- **Quota sample** - **sample** has the same proportions of individuals as the entire population with respect to known characteristics, traits or focused phenomenon.

Probability Samples

Probability sampling is based on the fact that every member of a population has a known and equal chance of being selected. *For example, if you had a population of 100 people, each person would have odds of 1 out of 100 of being chosen.*

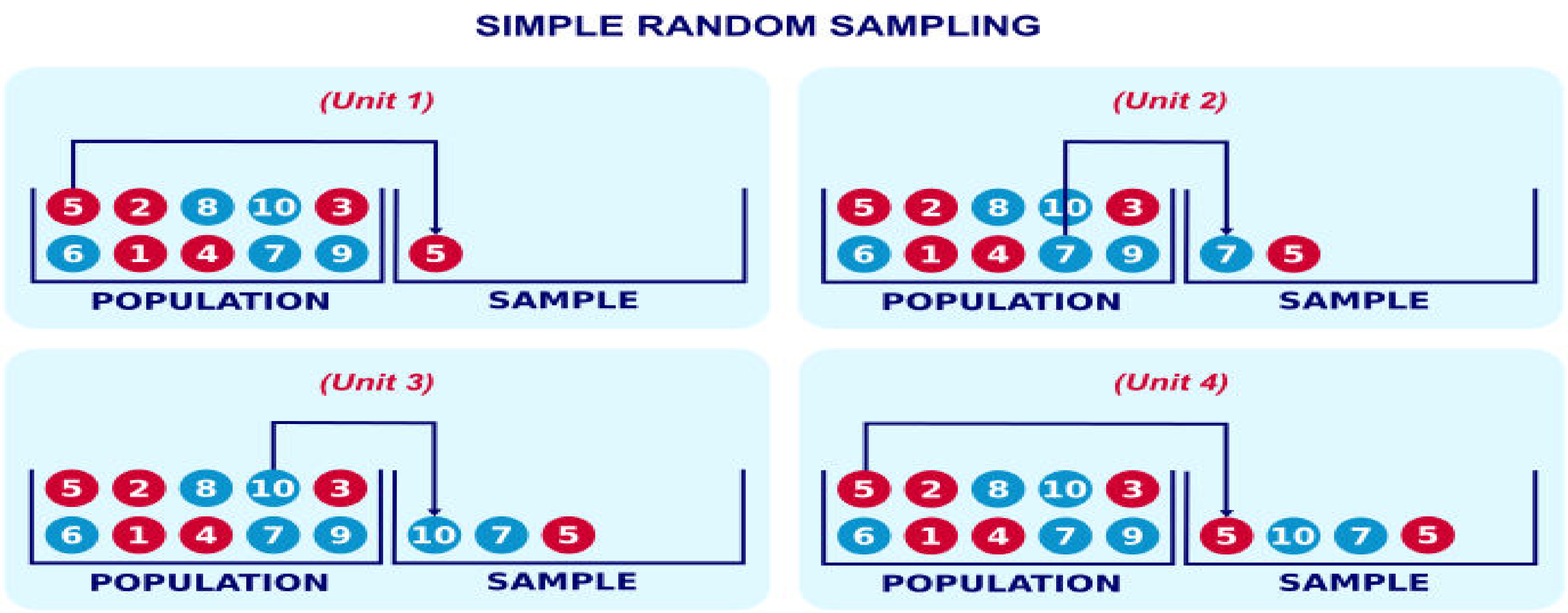


Methods used in probability samples

- Simple Random Sampling
- Systematic Sampling
- Stratified Sampling
- Multi-stage Sampling
- Cluster Sampling
- Area Sampling

Simple Random Sampling

- Randomly choosing the sample
- Can use a table of random numbers
- Can draw names out of a hat



Simple Random Sampling

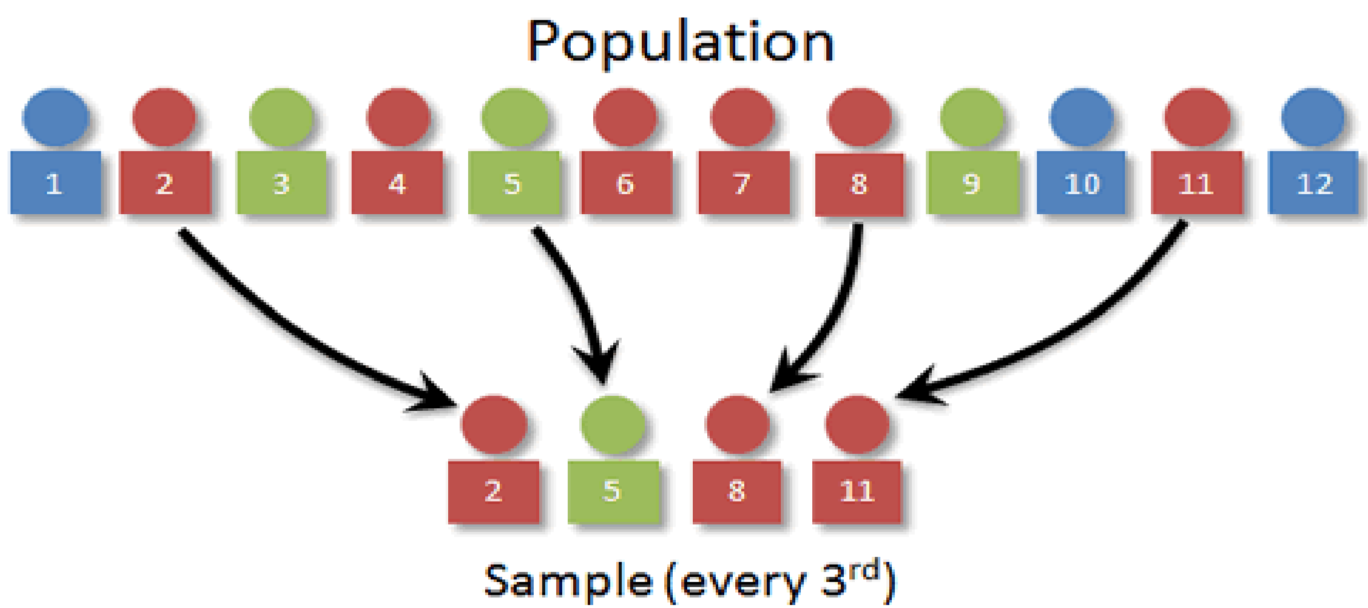
1	Albert D.
2	Richard D.
3	Belle H.
4	Raymond L.
5	Stéphane B.
6	Albert T.
7	Jean William V.
8	André D.
9	Jeremy W.
10	Anthony Q.
11	James B.
12	Denis G.
13	Amanda L.
14	Jennifer L.
15	Philippe K.
16	Eve F
17	Priscilla O.
18	Robert D
19	Brian F.
20	Hellène H.
21	Isabelle R.
22	Jean T.
23	Samanta D.
24	Berthe L.
25	Monique Q.
26	Régine D.
27	Lucille L.
28	Jérémy W.
29	Gilles D.
30	Renaud S.
31	Pierre K.
32	Etienne M.
33	Marie M.
34	Gaétan Z.
35	Fidèle D.
36	Maria P.
37	Anne Marie G.
38	Michel K.
39	Gaston C.
40	Alain M.
41	Olivier P.
42	Geneviève M.
43	Berthe D.
44	Jean Pierre P.
45	Jacques B.
46	François P.
47	Dominique M.
48	Antoine C.

Table of random numbers

6	8	4	2	5	7	9	5	4	1	2	5	6	3	2	1	4	0
5	8	2	0	3	2	1	5	4	7	8	5	9	6	2	0	2	4
3	6	2	3	3	3	2	5	4	7	8	9	1	2	0	3	2	5
9	8	5	2	6	3	0	1	7	4	2	4	5	0	3	6	8	6

Systematic Sampling

- Selecting every *k*th individual on the list, starting randomly
- Researcher must know number of elements in the population and the sample size desired



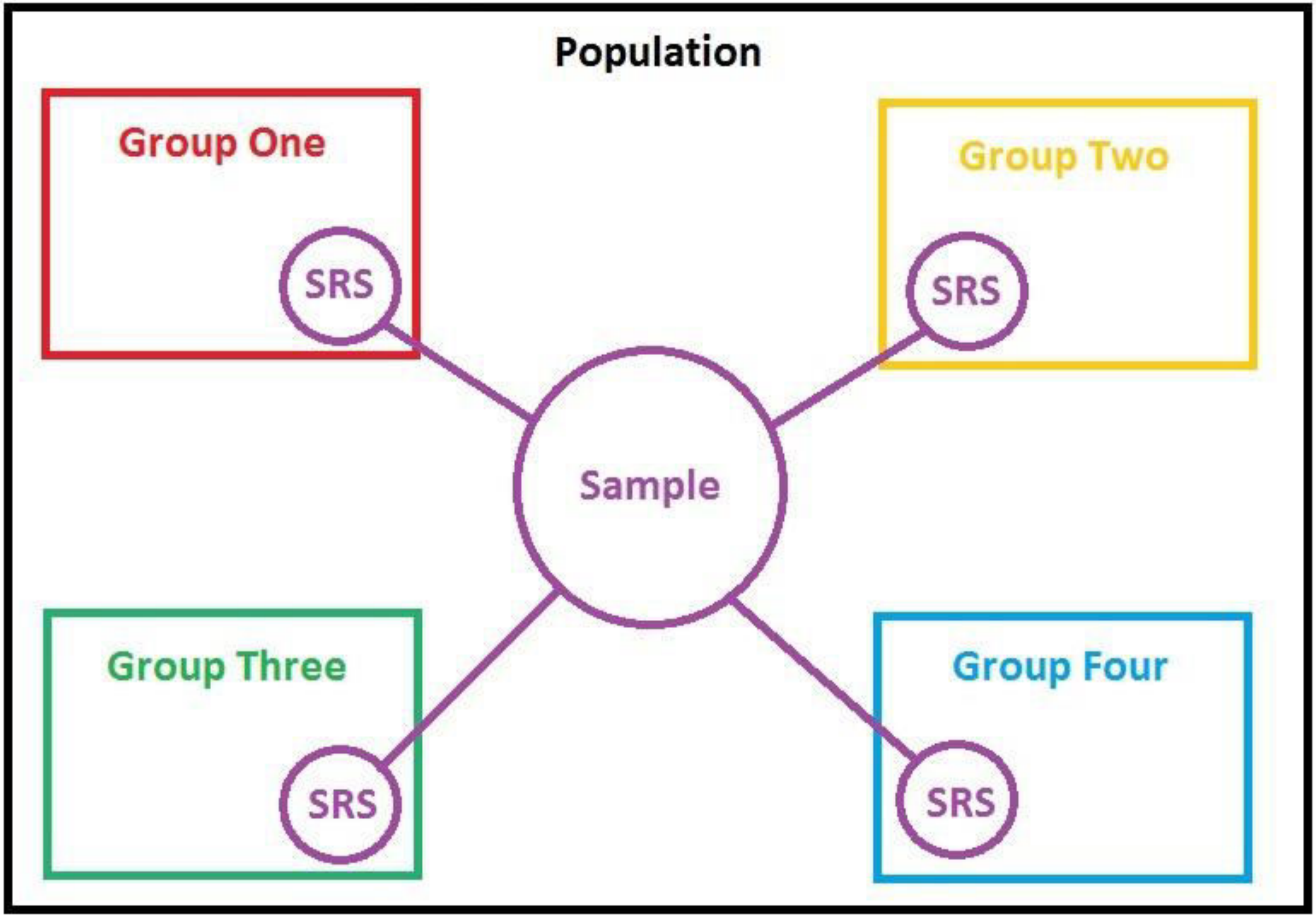
Systematic sampling

1	Albert D.	25	Monique Q.
2	Richard D.	26	Régine D.
3	Belle H.	27	Lucille L.
4	Raymond L.	28	Jérémy W.
5	Stéphane B.	29	Gilles D.
6	Albert T.	30	Renaud S.
7	Jean William V.	31	Pierre K.
8	André D.	32	Etienne M.
9	Jeremy W.	33	Marie M.
10	Anthony Q.	34	Gaétan Z.
11	James B.	35	Fidèle D.
12	Denis G.	36	Maria P.
13	Amanda L.	37	Anne-Marie G.
14	Jennifer L.	38	Michel K.
15	Philippe K.	39	Gaston C.
16	Eve F.	40	Alain M.
17	Priscilla O.	41	Olivier P.
18	Robert D.	42	Geneviève M.
19	Brian F.	43	Berthe D.
20	Hellène H.	44	Jean Pierre P.
21	Isabelle R.	45	Jacques B.
22	Jean T.	46	François P.
23	Samanta D.	47	Dominique M.
24	Berthe L.	48	Antoine C.

Stratified Random Sampling

- If a population from which a sample is to be drawn does not constitute a homogeneous group, this technique is applied.
- The population is divided into several sub-populations.
- Needs a large population with which to start
- Variables often stratified
  - Age, gender, socioeconomic status
  - Types of nurses, sites of care

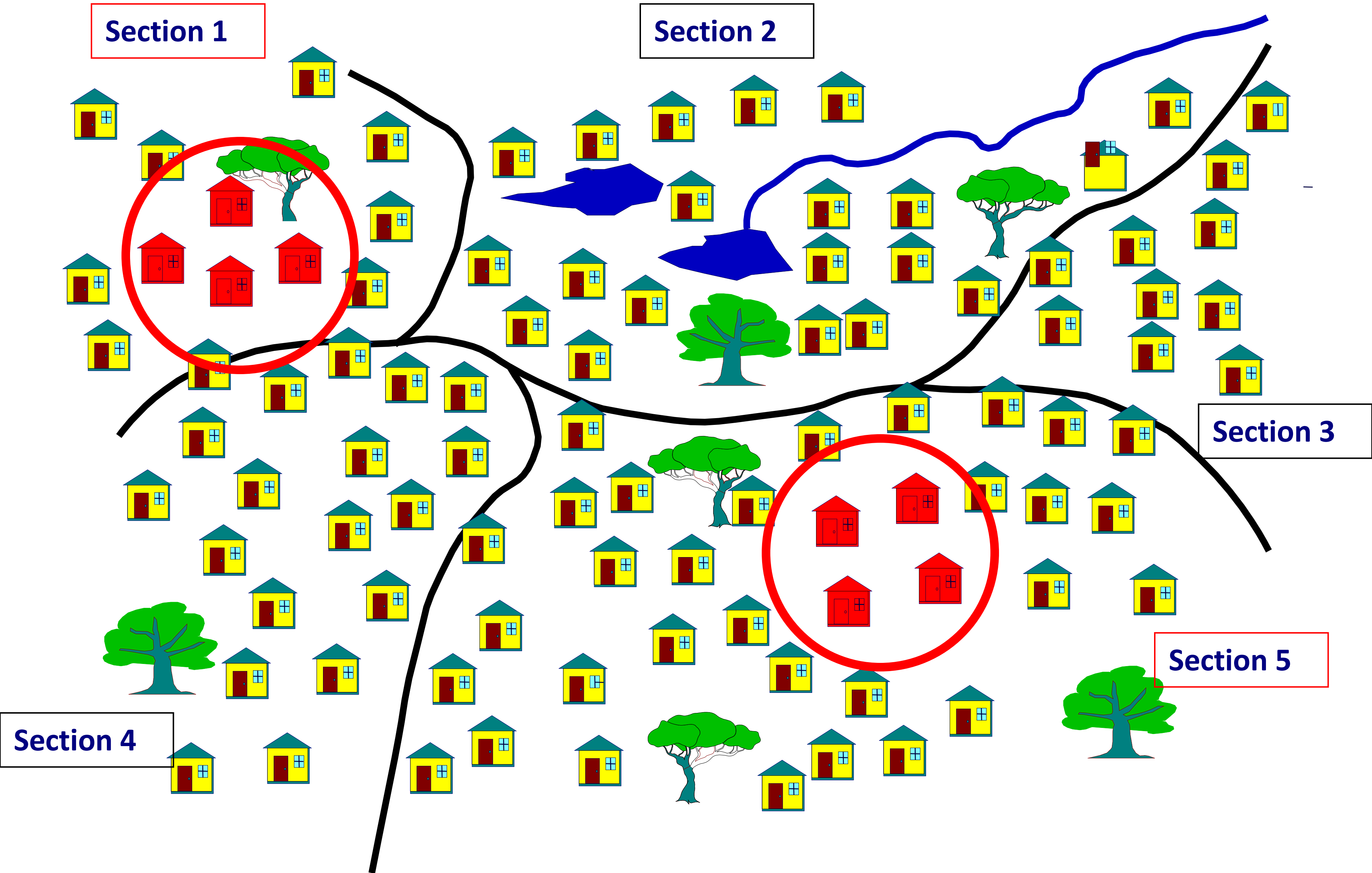
Stratified Random Sampling



Cluster Sampling

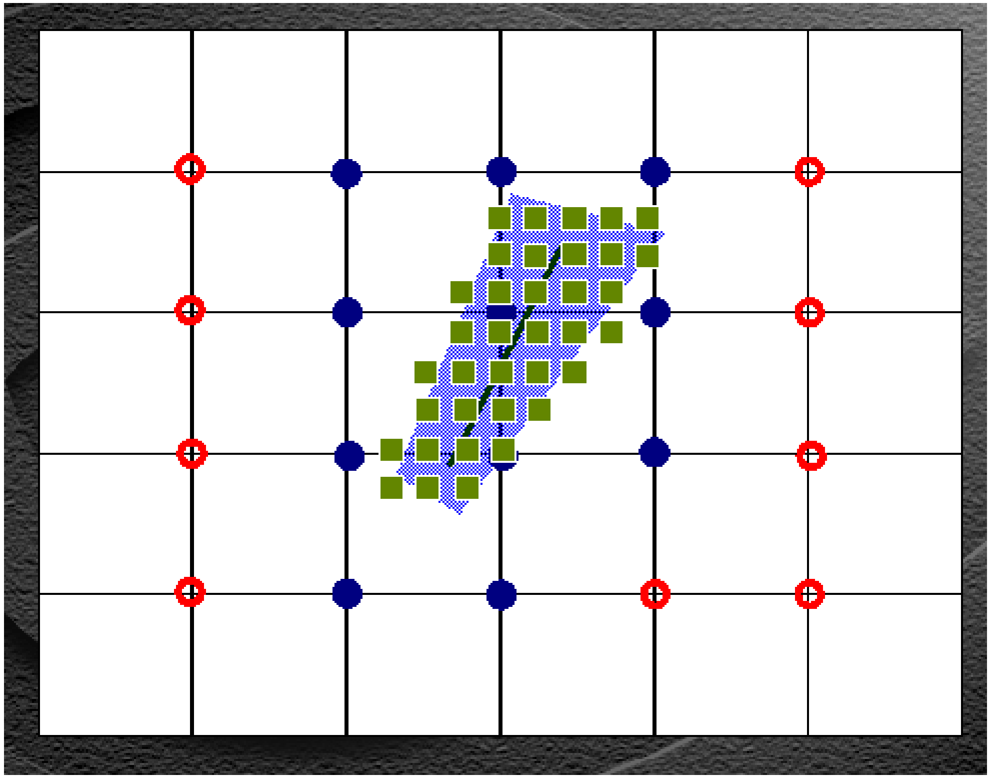
- All areas with the elements of the identified population are linked.
- A randomized sample of these areas is then chosen.
- Used to get a geographically diverse sample
- Also used when developing a sampling frame is difficult because of a lack of knowledge of the variables

Cluster sampling



Area Sampling

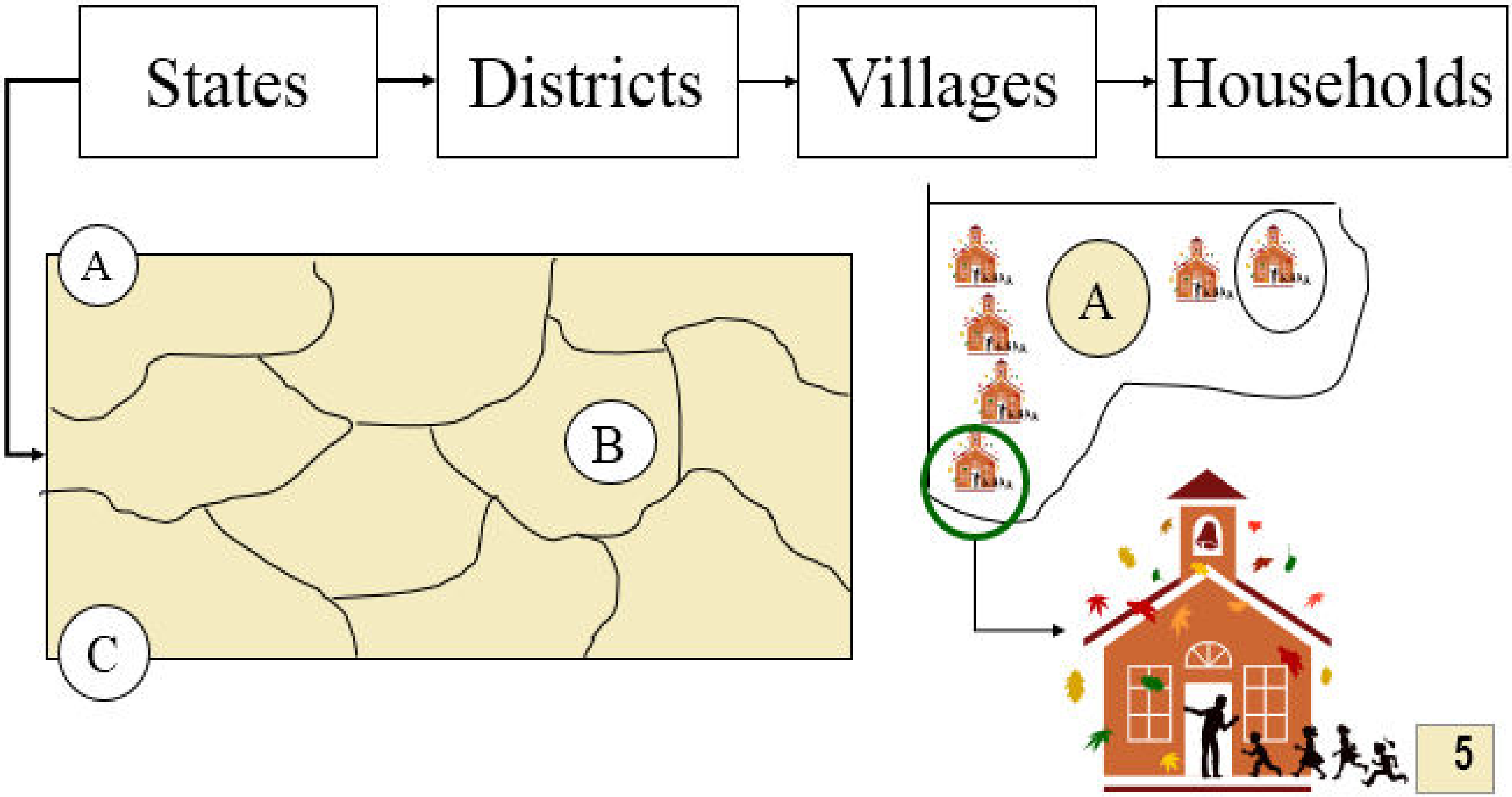
- If clusters happen to be some geographic subdivisions, in that case cluster sampling is better known as area sampling.



Multi Stage Sampling

- Multistage sampling can be a complex form of cluster sampling because it is a type of sampling which involves dividing the population into groups (or clusters).
- Then, one or more clusters are chosen at random and everyone within the chosen cluster is sampled.
- Using all the sample elements in all the selected clusters may be prohibitively expensive or unnecessary.
- Under these circumstances, multistage cluster sampling becomes useful. Instead of using all the elements contained in the selected clusters, the researcher randomly selects elements from each cluster.
  - Constructing the clusters is the first stage.
  - Deciding what elements within the cluster to use is the second stage.
  - The technique is used frequently when a complete list of all members of the population does not exist and is inappropriate.

Multi Stage Sampling




Data
Collection

Principles of Data Collection

- Understanding and knowing what types of data required
- Collect only relevant data
- Determine methods of data collection
    * Survey/questionnaire
    * Observation, participatory
    * Standard instruments
    * Content analysis, etc
- Where, who, how, and when to collect
    * Research design
    * Sampling procedure
    * Prepare field work schedule/data plan
    * Conduct preliminary investigation
- Assess situation and prepare further strategies

Data Collection Techniques

Observations,

Tests,

Surveys,

Document analysis

Experiments

Instrumentation

- A process of selecting and developing research tool for the purpose of data collection
- Examples of instrument:

  * Questionnaire

  * Interview checklist

  * Observational form

  * Attitude/view scale

  * Content analysis form

  * Researcher-designed achievement test

  * Field Tools and equipments
- Depends on method of study

Important aspects of instrumentation

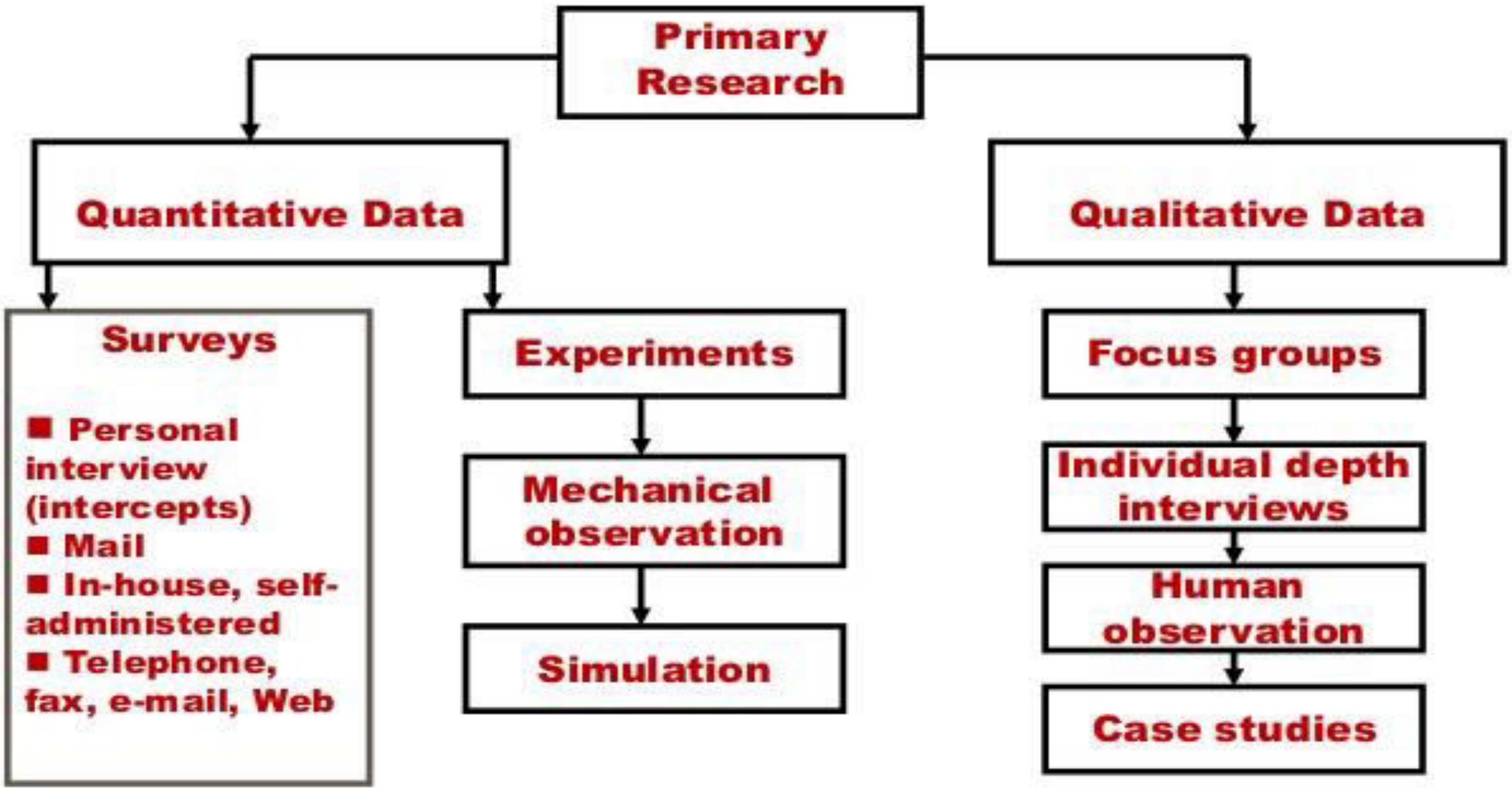
- Reliability: can it produce consistent results?
- Validity: can it fulfill the required function?
- Feasibility: can it fulfill the need of the researcher→ Reliable? Valid?
- Calibration needed

Questionnaire

- Crystallise research issue and objectives
- List specific questions, the issue & objectives
- Identify & list key words and their relationships
- Identify cause-and-effect explanation by relating all the keywords
- Identify how to operationalise the issue
  - * define concepts
  - * identify variables
  - * variable measurement
- Construct questionnaire table
  - * Related questions that address issue & objectives

Primary and Secondary Data

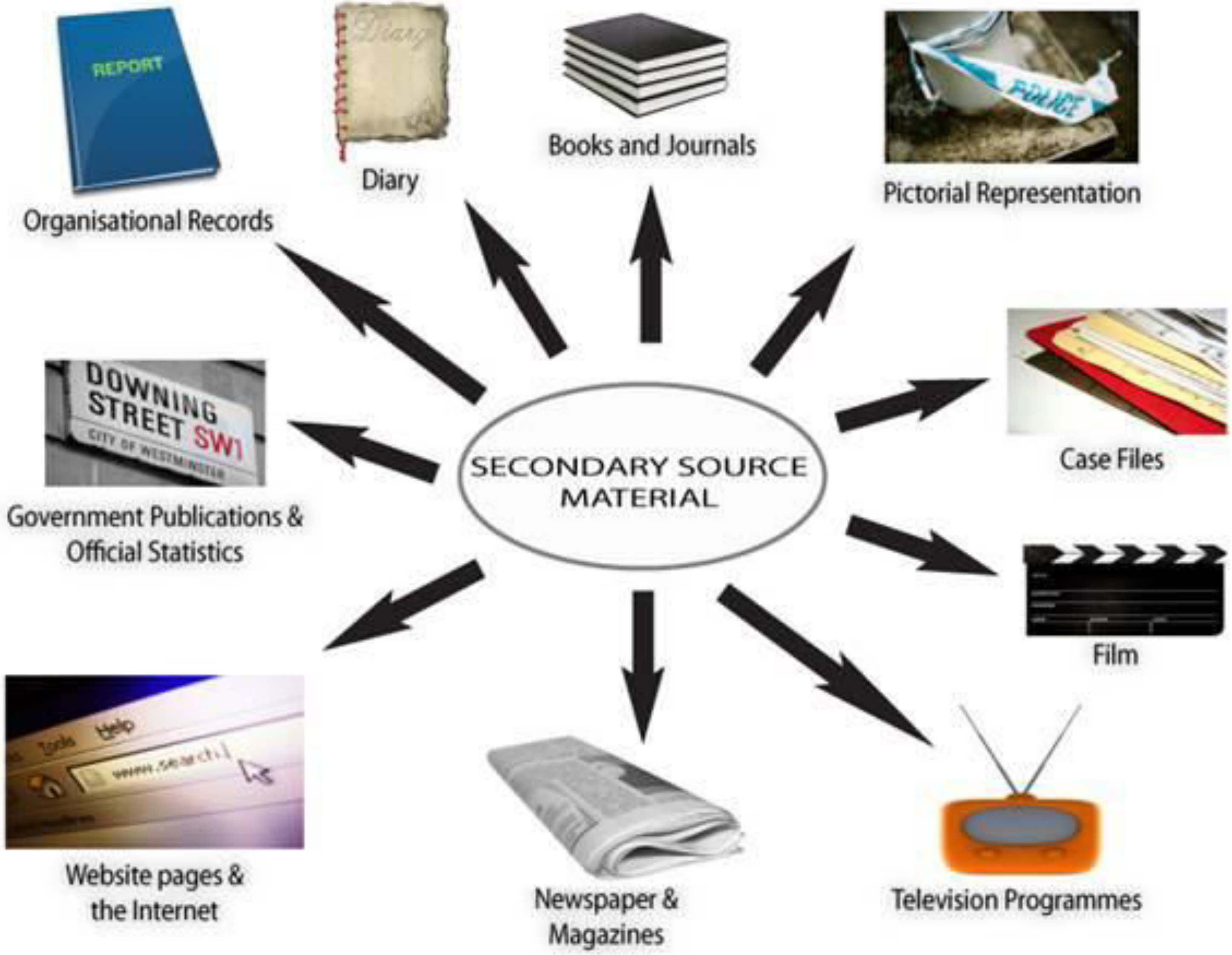
Primary Research Methods & Techniques



Primary Data - Limitations

- **Do you have the time and money for:**
  - Designing your collection instrument?
  - Selecting your population or sample?
  - Pre-testing/piloting the instrument to work out sources of bias?
  - Administration of the instrument?
  - Entry/collation of data?
- **Uniqueness**
  - May not be able to compare to other populations
- **Researcher error**
  - Sample bias
  - Other confounding factors

Secondary Data



Secondary Data – Examples of Sources

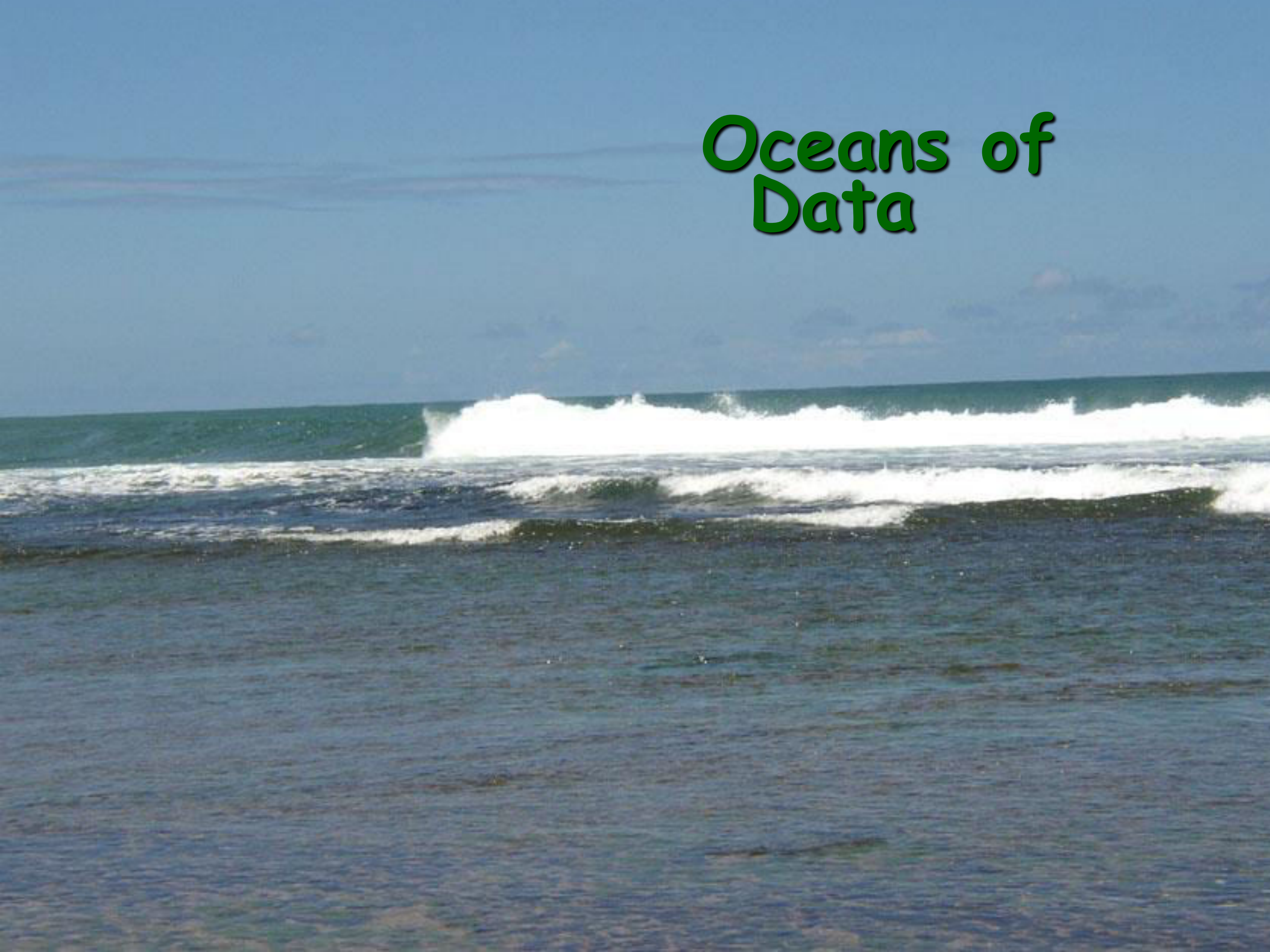
- District health departments
- Vital Statistics – birth, death certificates
- Hospital, clinic, school nurse records
- Private and foundation databases
- Federal and State governments
- Surveillance data from state government programs
- Federal agency statistics
- Dept of Environment

Secondary Data – Advantages

- **It will save you money.**
  - Even if you have to pay for access, often it is cheaper in terms of money than collecting your own data.
- **It will save you time.**
  - Primary data collection is very time consuming.
- **It may be very accurate.**
  - When especially a government agency has collected the data, incredible amounts of time and money went into it. It's probably highly accurate.
- **It has great exploratory value**
  - Exploring research questions and formulating hypothesis to test.

Secondary Data – Limitations

- When was it collected? For how long?
  - May be out of date for what you want to analyze.
  - May not have been collected long enough for detecting trends.


Oceans of
Data


Rivers of
Information


Streams of
Knowledge


Drops of
Wisdom & Understanding


Bye!

THANK YOU