

Research Methods (Population and Sample)

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Research

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Populasi ?

Sampel?

Data?



Structure of Writing Scientific / Research

PROPOSAL

- ▶ TITLE
- ▶ TABLE OF CONTENTS
- ▶ CHAPTER 1
- ▶ CHAPTER 2
- ▶ CHAPTER 3
- ▶ CHAPTER 4
- ▶ REFERENCES
- ▶ ATTACHMENT

RESULT

- ▶ TITLE
- ▶ TABLE OF CONTENTS
- ▶ CHAPTER 1
- ▶ CHAPTER 2
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- ▶ CHAPTER 4
- ▶ CHAPTER 5
- ▶ CHAPTER 6
- ▶ REFERENCES
- ▶ ATTACHMENT

Determine The Title

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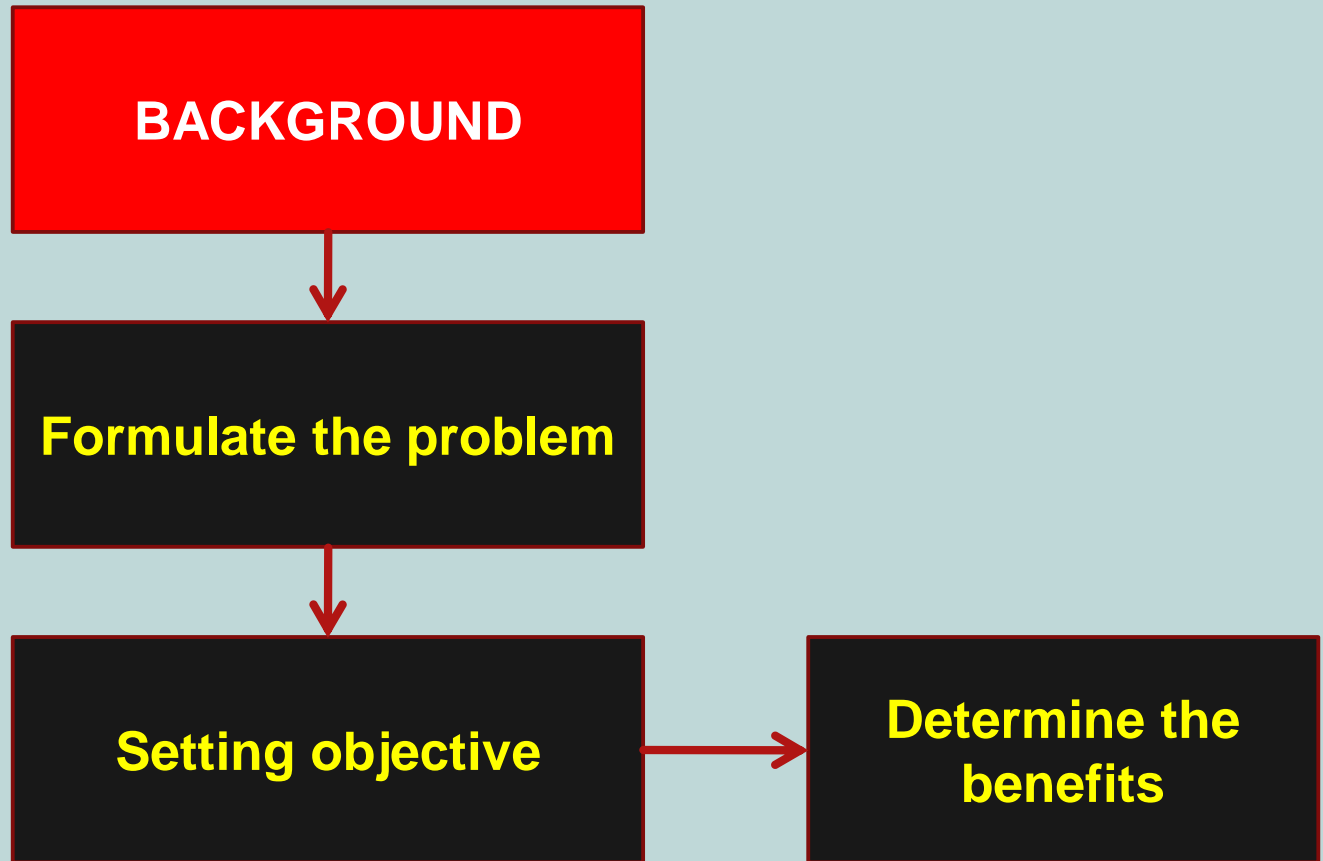
BACKGROUND


Formulate the problem

Setting objective

Determine the benefits


**Chapter
1**





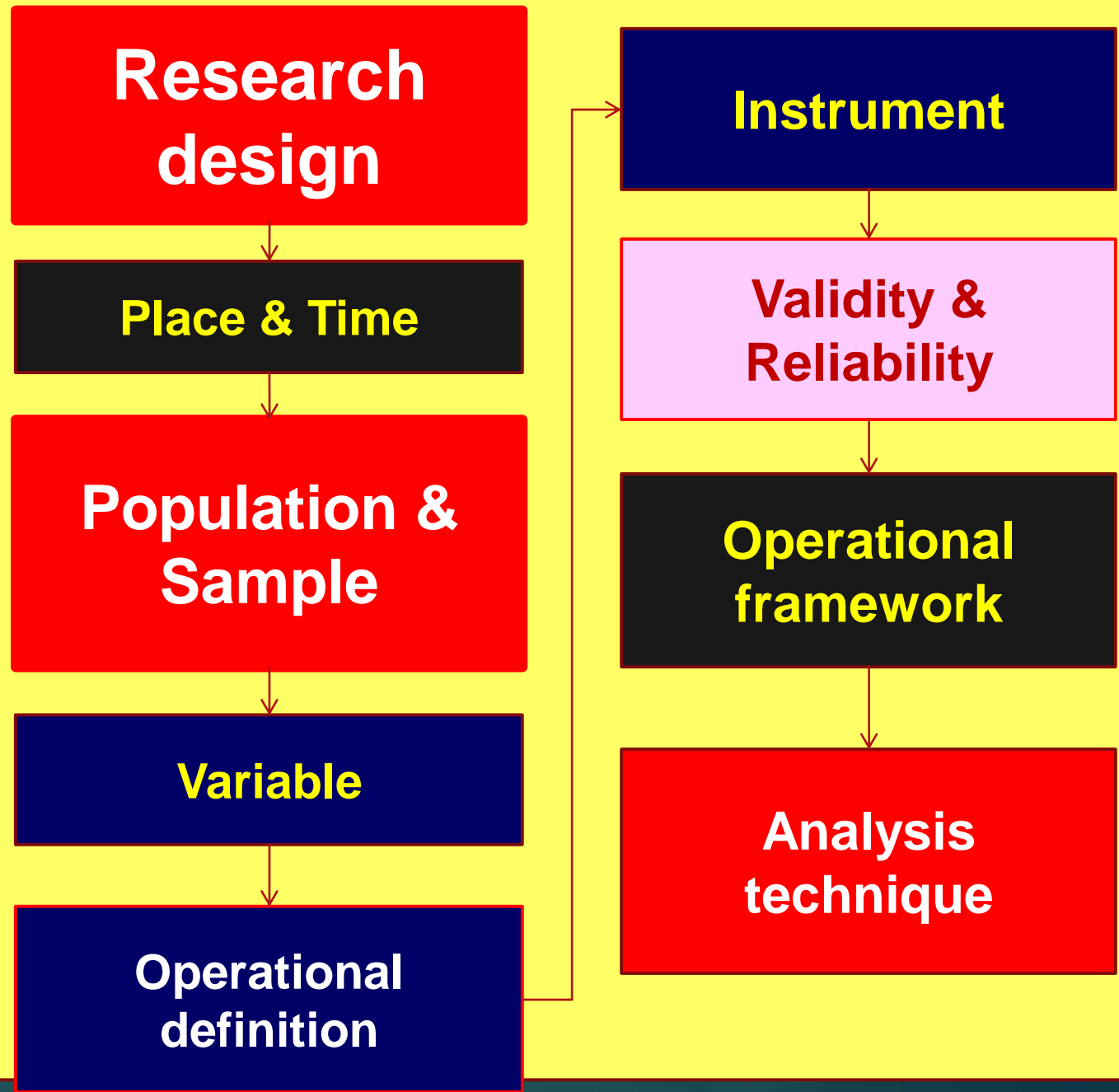
**Chapter
2**

**Literature review /
theoretical foundation**



**Chapter
3**

Conceptual framework



Chapter 5

Research result

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Chapter 6

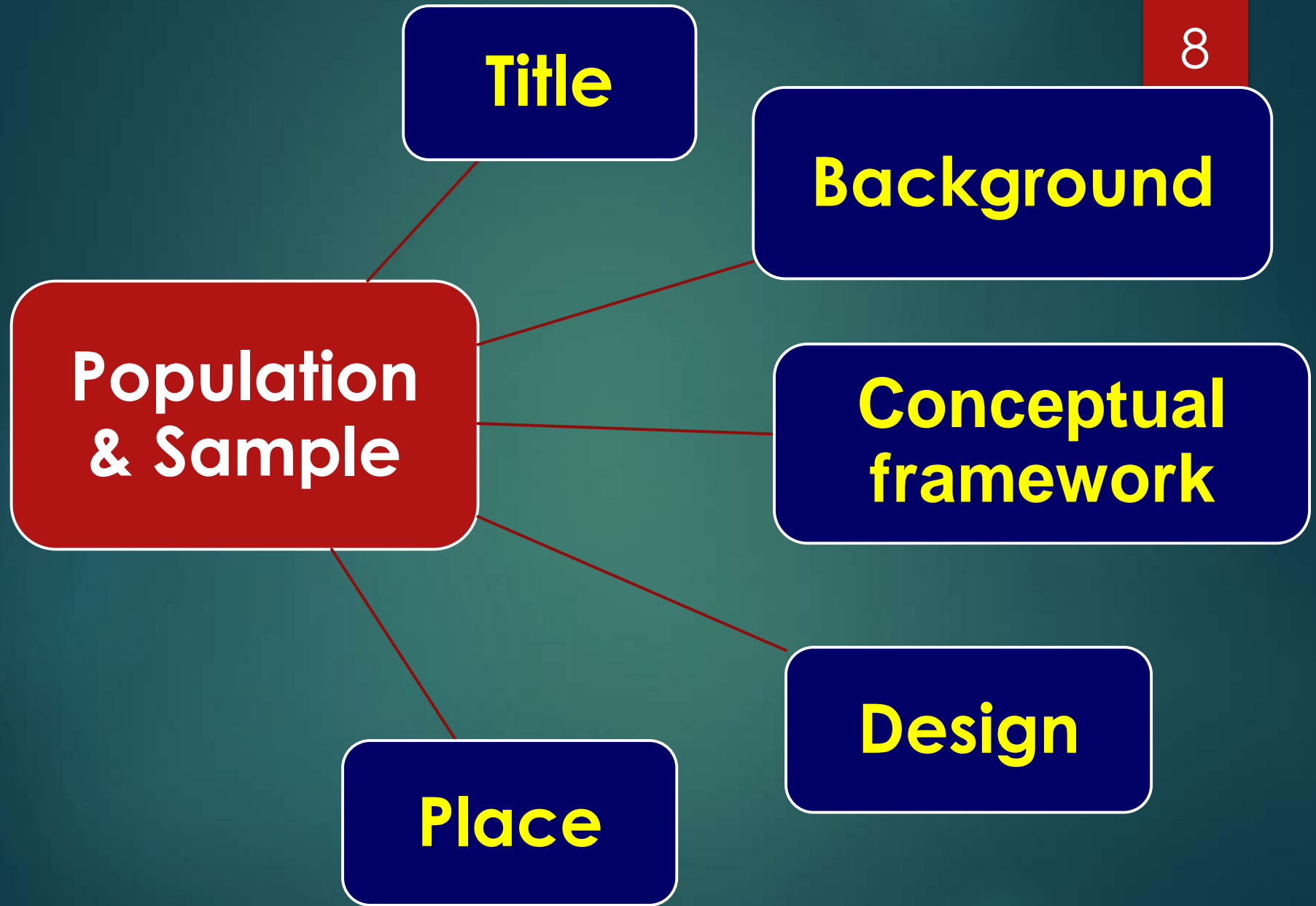
Discussion

Chapter 7

**Conclusions &
Suggestions**

References

Attachment



Title

Background

**Conceptual
framework**

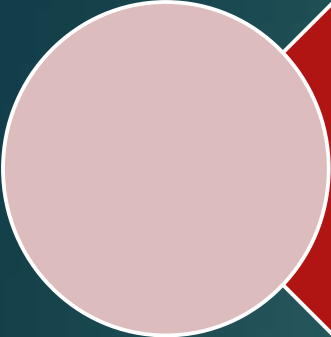
Design

Place

**Population
& Sample**

Population

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A group of people or objects, that have similarities in one thing or several things and that form the main problem in a study



A collection of individuals has the same / relative characteristics that are in a particular area and at a certain time as well



Overall research object

Sample

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The elements taken from the population → able to represent the population → research objects



Part of the population that can represent the entire population



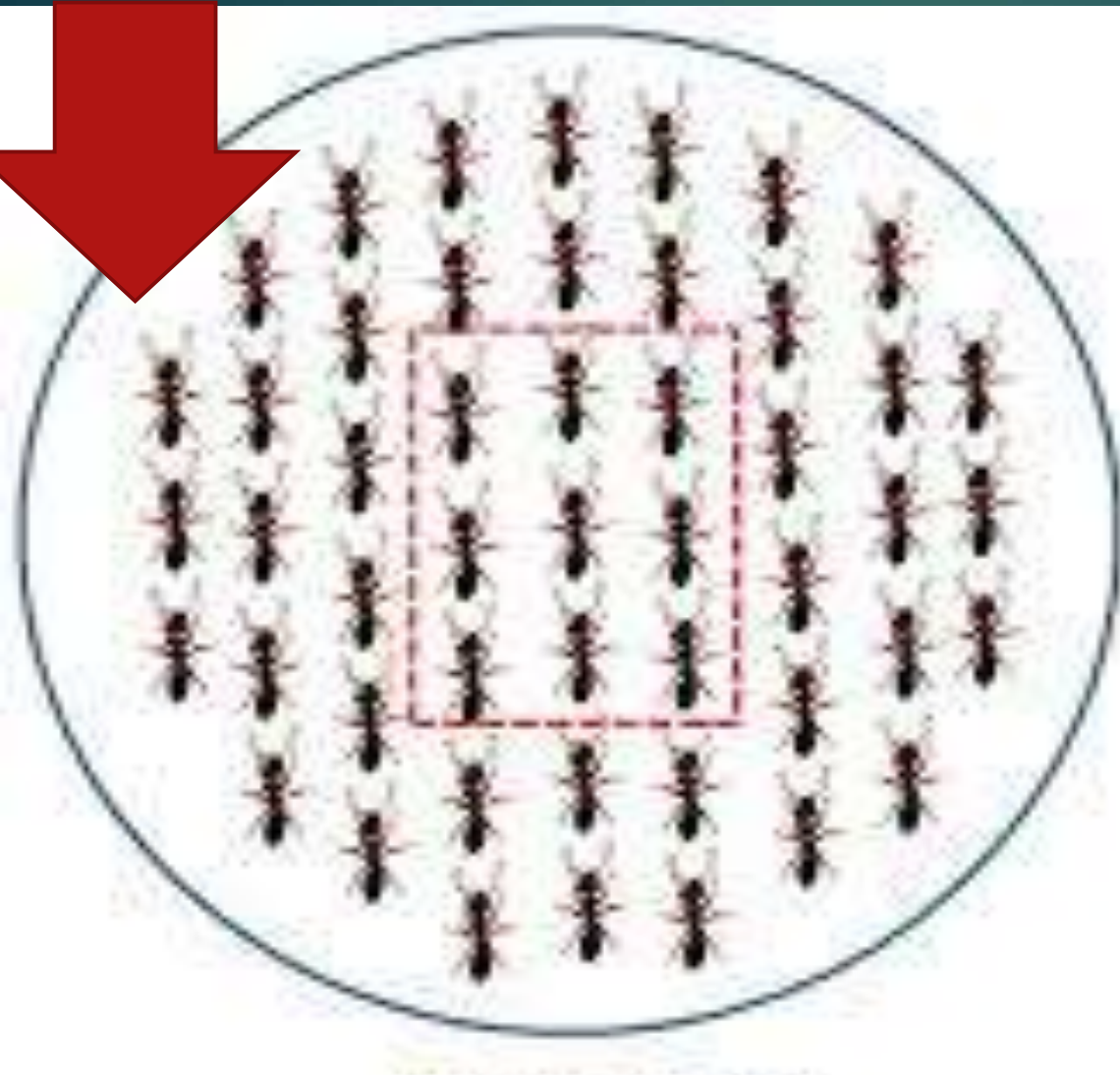
Has the same or relatively similar characteristics to the characteristics of the population

Why Need Sampling?

- Large population, it is not possible to study all elements -→ physical and mental fatigue → many errors
- Research on samples can be more reliable
- Population is often constrained:
 - Cost
 - Time
 - Power

Population \approx Sample

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Important Things about Samples

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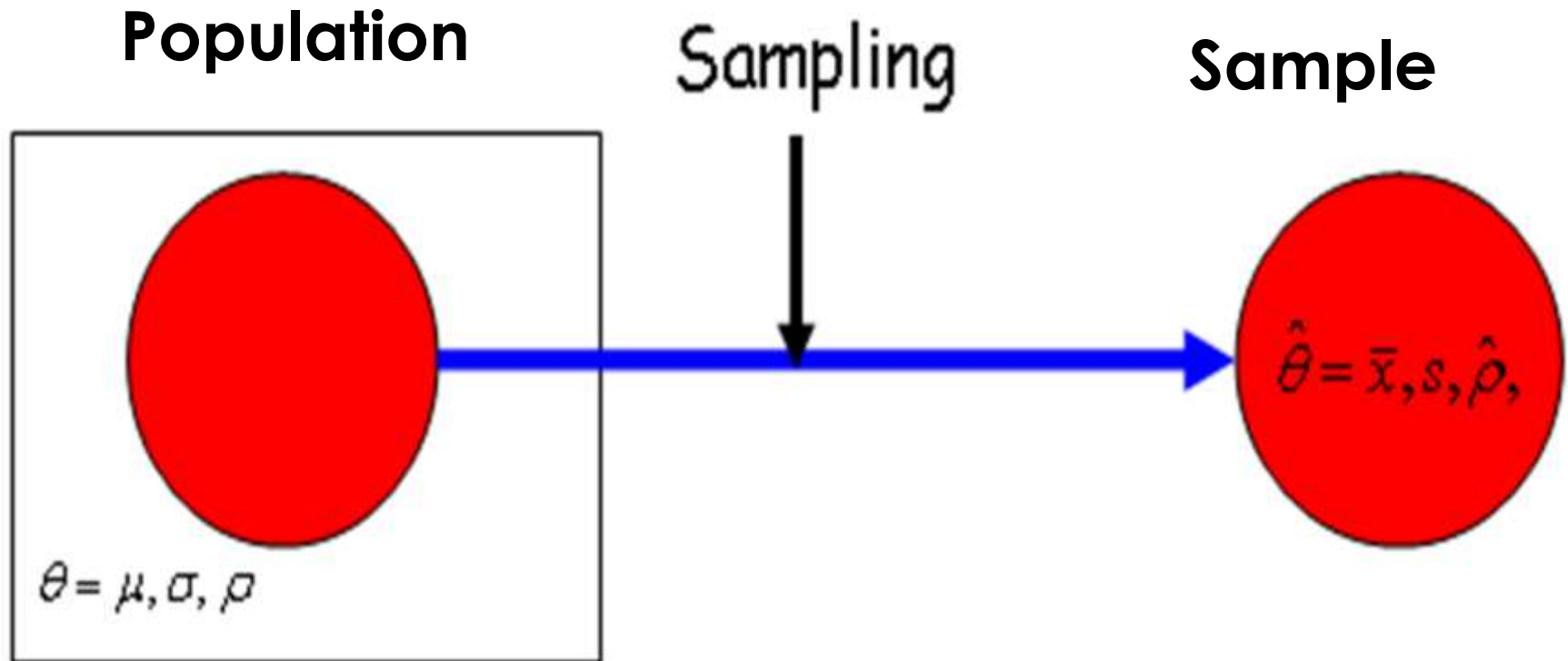
▶ Sample size

▶ Sampling technique



▶ Ideal

▶ Representative



Roscoe (1975)

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- ▶ Recommended that the sample size be between 30 to 500 elements
- ▶ If the sample into subsamples (male / female, SD / SLTP / SMU), the minimum number of subsamples must be 30
- ▶ In multivariate studies → the sample size must be several times larger (10 times) than the number of variables to be analyzed..
- ▶ Experimental research, with strict control, the sample size can be between 10 to 20 elements

The minimum acceptable sample size is based on the research design used, which is:

- ▶ **Descriptive method, minimum 10% population,**
- ▶ **for a relatively small population min 20%**
- ▶ **Descriptive-correlational method, a minimum of 30 subjects**
- ▶ **The ex post facto method, a minimum of 15 subjects per group**
- ▶ **The experimental method, a minimum of 15 subjects per group**

$$n = \frac{N}{1 + Ne^2}$$

n = sample size

N = population size

e = percent of leeway for inaccuracy due to sampling errors that can still be tolerated or desired (1%-20%)

$$n = \frac{N}{N \cdot d^2 + 1}$$

n = sample size,

N = population size

d² = unwanted precision in research (5%, 10%, 15%, 20%)

Krejcie dan Morgan (1970)

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Population (N)	Sample(n)	Population (N)	Sample(n)	Population (N)	Sample(n)
10	10	220	140	1200	291
15	14	230	144	1300	297
20	19	240	148	1400	302
25	24	250	152	1500	306
30	28	260	155	1600	310
35	32	270	159	1700	313
40	36	280	162	1800	317
45	40	290	165	1900	320
50	44	300	169	2000	322
55	48	320	175	2200	327
60	52	340	181	2400	331
65	56	360	186	2600	335
70	59	380	191	2800	338
75	63	400	196	3000	341

Population (N)	Sample(n)	Population (N)	Sample(n)	Population (N)	Sample(n)
90	73	460	210	4500	354
95	76	480	214	5000	357
100	80	500	217	6000	361
110	86	550	226	7000	364
120	92	600	234	8000	367
130	97	650	242	9000	368
140	103	700	248	10000	370
150	108	750	254	15000	375
160	113	800	260	20000	377
170	118	850	265	30000	379
180	123	900	269	40000	380
190	127	950	274	50000	381
200	132	1000	278	75000	382
210	136	1100	285	1000000	384

$$S = \frac{\lambda^2 \cdot N \cdot P \cdot Q}{d^2 (N - 1) + \lambda^2 \cdot P \cdot Q}$$

Note : λ^2 with $dk = 1$, error rate : 1%, 5%, 10%

$P = Q = 0,5$

$d = 0,05$

$S =$ sample size

Steel & Torrie

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$$(\bar{x}_1 - \bar{x}_2) \pm t_{\alpha/2} \sqrt{s_1^2 / (n_1) + (s_2^2) / (n_2)}$$



Small sample

$$(\bar{x}_1 - \bar{x}_2) \pm z_{\alpha/2} \sqrt{s_1^2 / (n_1) + (s_2^2) / (n_2)}$$



Big sample

Note:

- \bar{x}_1, \bar{x}_2 : percentage the sample mean groups 1 and 2
- s_1, s_2 : standard deviation of sample groups 1 and 2
- $Z_{\alpha/2}$ and $t_{\alpha/2}$: represent the values of z and t distributions with free degrees $n_1 + n_2 - 2$
- n_1 is the number of samples 1, n_2 is the number of samples 2

WIBISONO

(population number is unknown)

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$$n = \left[\frac{Z_{\alpha/2} \cdot \sigma}{e} \right]^2$$

Note :

n = sample size

Z_{α} = value table Z = 0.05

σ = Standard deviation of population

e = error rate (5%, 10%, 15%, 20%)

SUGIYONO

(stratified sample)

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$$n_i = \frac{N_i}{N} \cdot n$$

N_i = Total population according to the stratum

N = Total population

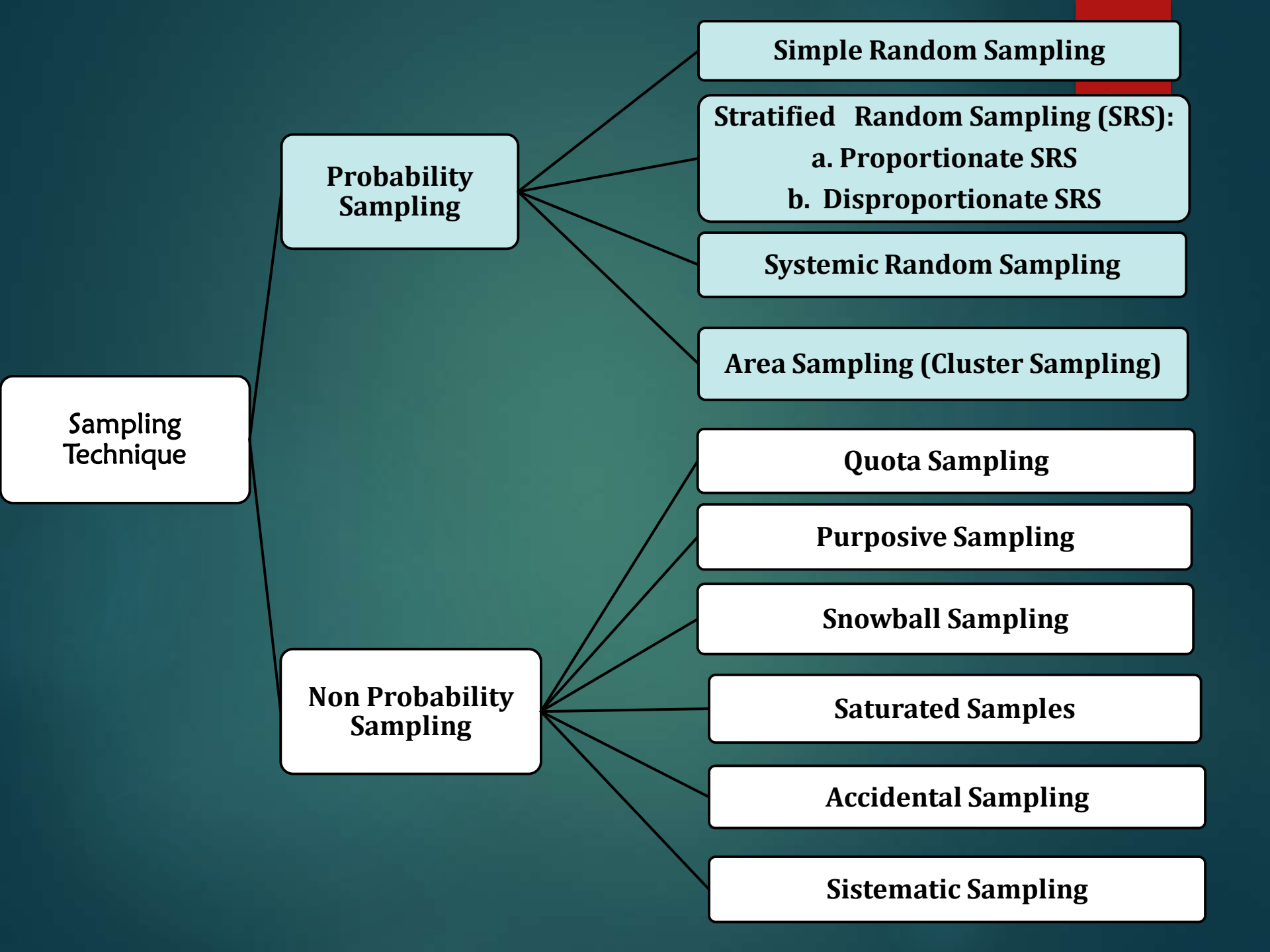
n_i = Number of samples according to strata

n = Total sample size

Sampling Technique

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- ▶ **Probability Sampling (Random Sampling)**
- ▶ **Non Probability Sampling (Non Random Sampling)**



Difference between Stratified Sampling and Cluster Sampling

- **Stratified Sampling** → Homogeneous sub population
- **Cluster Sampling** → Heterogeneous sub-population

- Title
- Purpose
- Background
- Conceptual framework



- Research Methods
(Population -
Samples)



- Result

Thank you