Kontrak Perkuliahan
STATISTIK KESEHATAN

TA 2023/2024 Genap

STIKES NOTOKUSUMO YOGYAKARTA

SISTEM PERKULIAHAN

01

TIM PENGAMPU

1.apt. Trifonia Rosa K, M.Biotech (Koordinator)
2.Verawati Fajrin, M.Ec.Dev

02

JUMLAH PPERTEMUAN

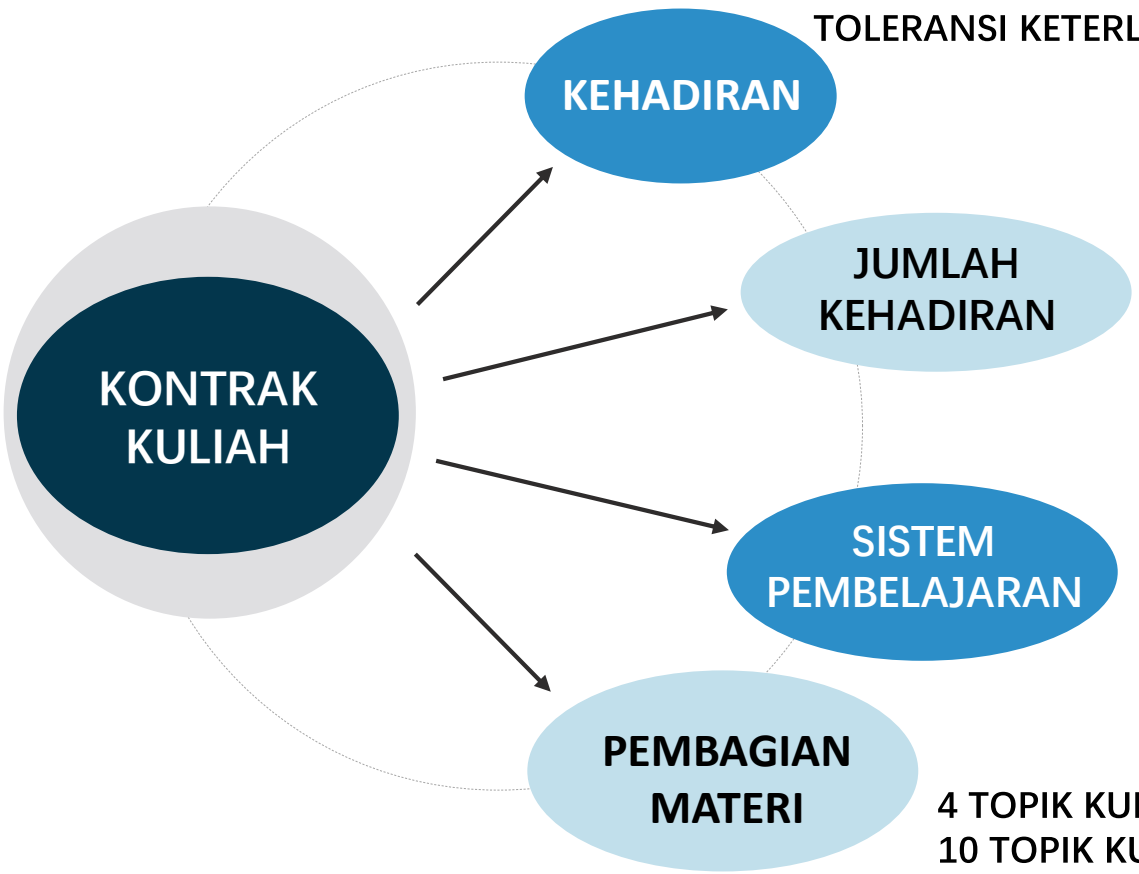
14 PERTEMUAN TEORI
UJIAN TENGAH SEMESTER
UJIAN AKHIR SEMESTER

03

JADWAL PERKULIAHAN

Kelas A : Jumat , 10.00 – 11.40 WIB
Kelas B : Senin, 08.00 – 09.40 WIB

SISTEM PERKULIAHAN



HADIR TEPAT WAKTU, SESUAI JADWAL
TOLERANSI KETERLAMBATAN 15 MENIT

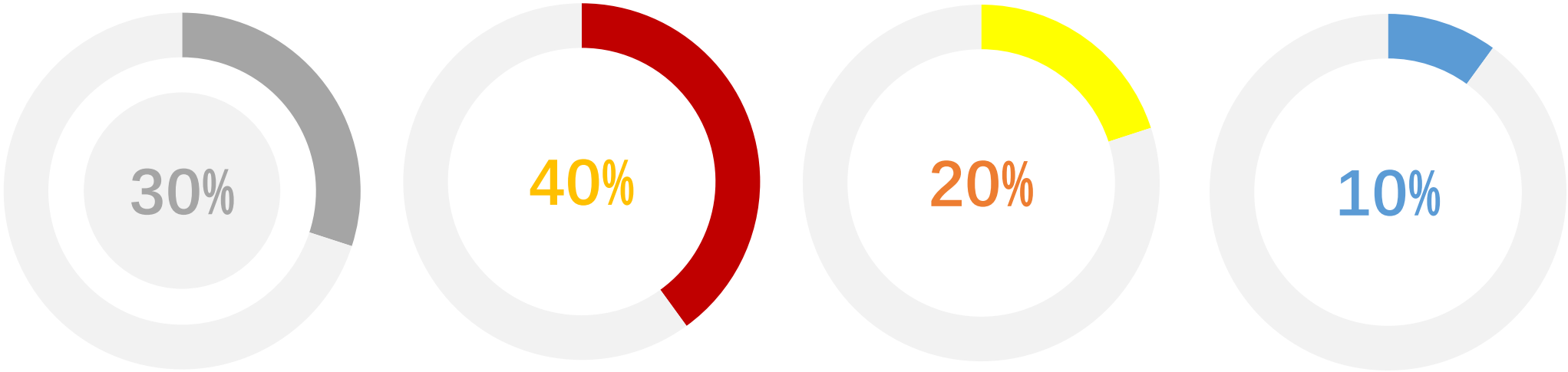
JUMLAH KEHADIRAN MINIMAL 75%

1. DAPAT MENGIKUTI DAN MENDAPAT NILAI UAS
2. BERHAK REMIDIAL (JIKA DIBUKA)
3. TIDAK HADIR :
   SAKIT (DENGAN SURAT KETERANGAN DOKTER)
   IZIN : TUGAS KAMPUS
   KEDUKAAN

SELAMA KULIAH, MEDIA PEMBELAJARAN YANG DIGUNAKAN AKAN MENYESUAIKAN

4 TOPIK KULIAH : IBU ROSA (SEBELUM UTS)
10 TOPIK KULIAH : IBU VERA (SEBELUM DAN SETELAH UTS)

BOBOT PENILAIAN



UJIAN TENGAH SEMESTER

UJIAN AKHIR SEMESTER

TUGAS / DISKUSI

SIKAP

NILAI ABSOLUT	HURUF	ANGKA MUTU
79 – 100	A	4,00
68 – 78	B	3,00
58 - 67	C	2,00
41 - 57	D	1,00
0 - 40	E	0,00

MATERI KULIAH

MATERI UTS

- konsep dasar statistik dalam penelitian
- teknik pengambilan sampel
- penyajian data dalam statistik
- analisis validitas dan reliabilitas untuk kuisioner
- pengujian normalitas
- statistik deskriptif
- Statistik inferensial

MATERI UAS

- Statistik inferensial : korelasi
- Statistik inferensial : uji beda non parametrik
- Statistik inferensial : uji beda parametrik

REFERENSI

1. Sujarweni, V.W., 2015. Statistik Untuk Kesehatan, Gava Media, Yogyakarta.
2. Sabri, L. dan Hastono, S. P., 2007, Statistik Kesehatan, PT. Raja Grafindo Persada, Jakata.
3. Kuzma, J.W., 1984, Basic Statistical for Health Sciences, Mayfield Publishing Company, California
4. Moore, D.S., 2000, The Best Practice of Statistics, W.H. Freeman and Company, New York.
5. Salkind, N.J., 2000, Statistics for People Who Hate Statistics, Sage Publication, USA.

STATISTIK KESEHATAN

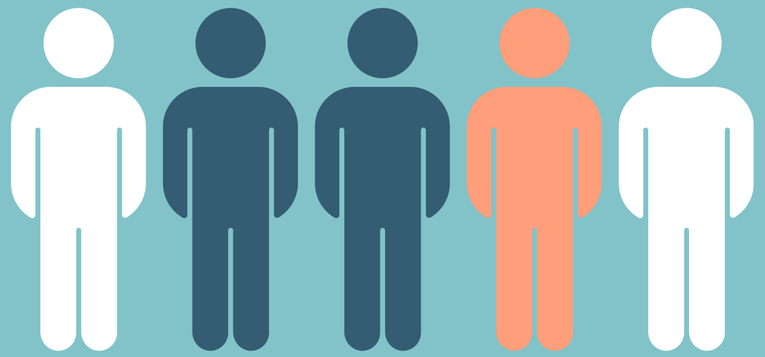
apt. Trifonia Rosa K., M.Biotech

PERTEMUAN 1

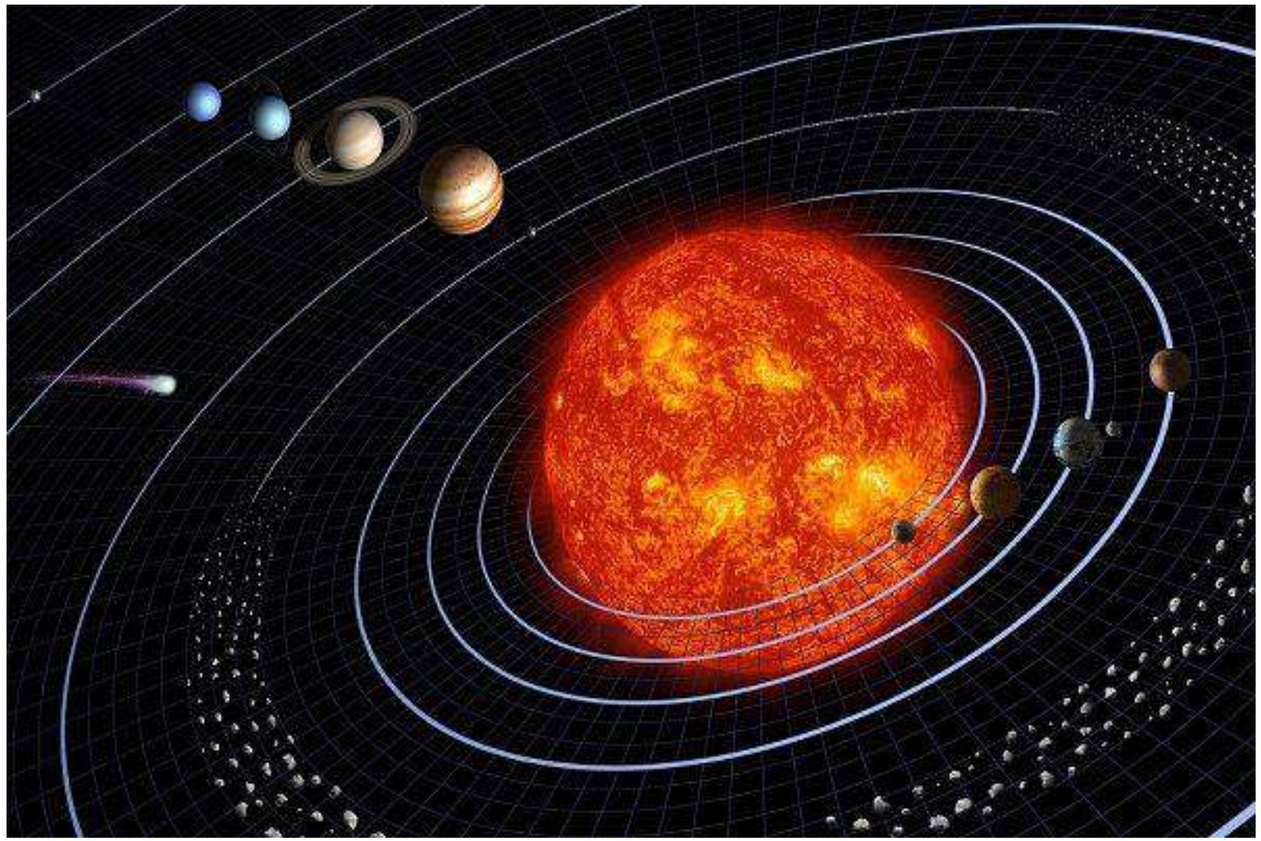
STIKES NOTOKUSUMO YOGYAKARTA

TOPIK BAHASAN

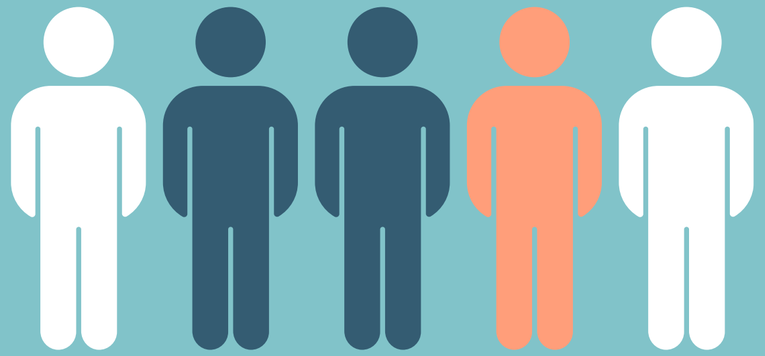
1. Konsep dasar statistik dalam penelitian
2. Peran statitstik dalam penelitian
3. Peran statistik untuk menganalisis data

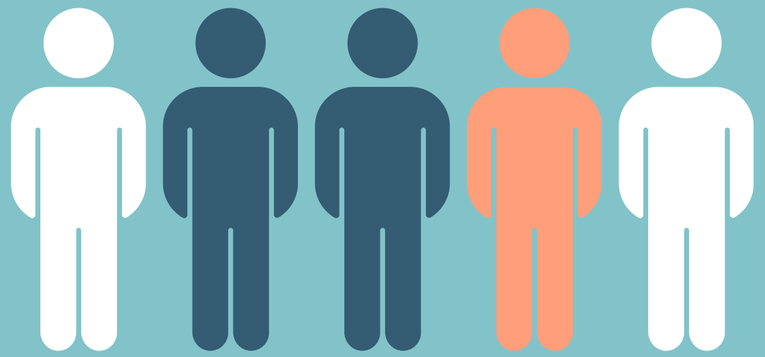


PENELITIAN

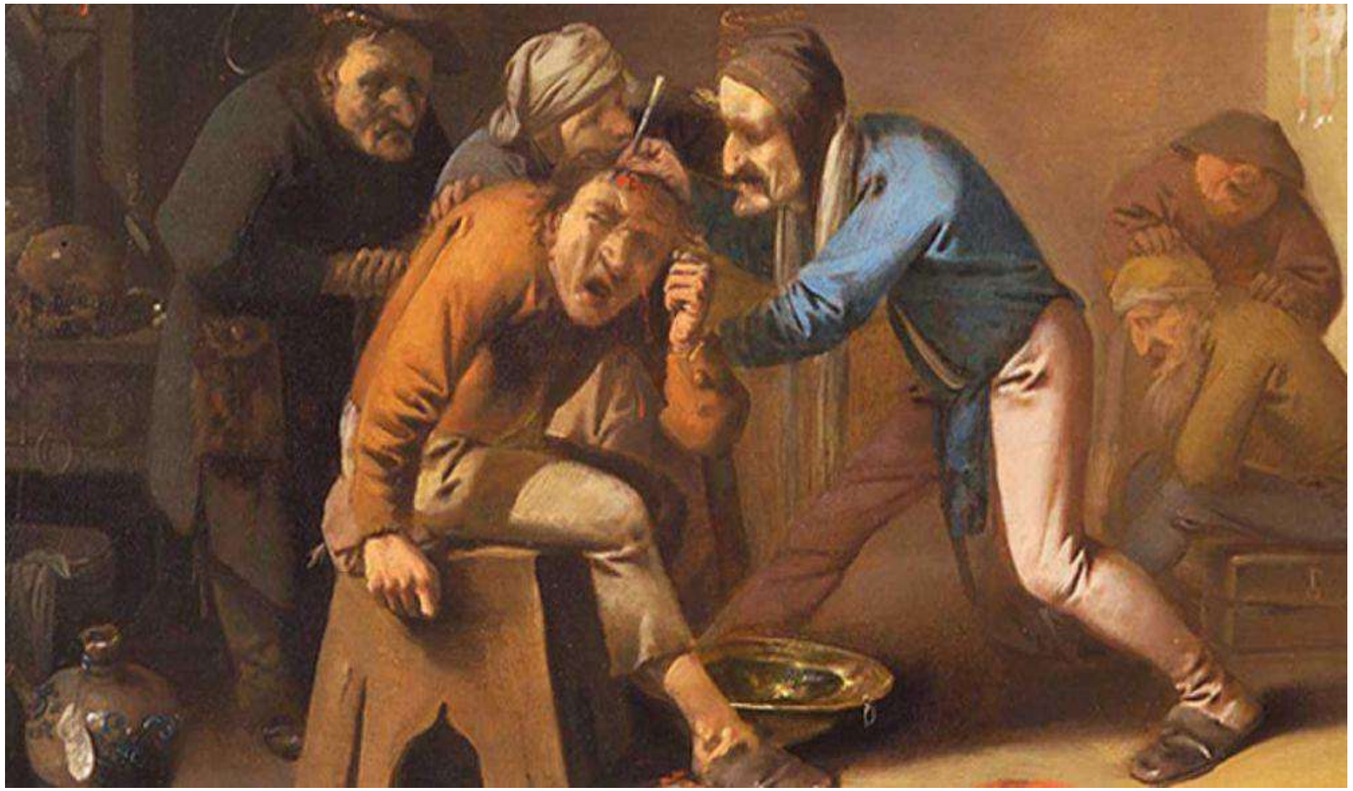


Teori geosentris yang akhirnya dikoreksi oleh teori heliosentris



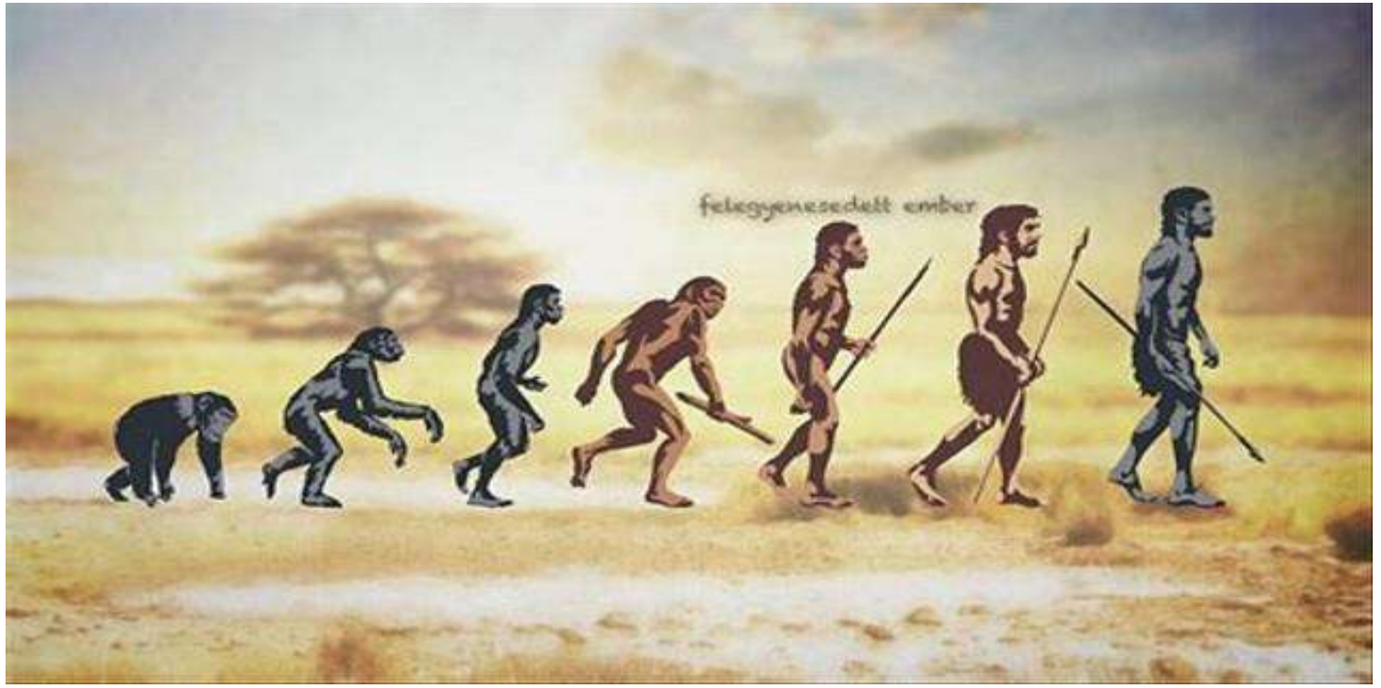


PENELITIAN

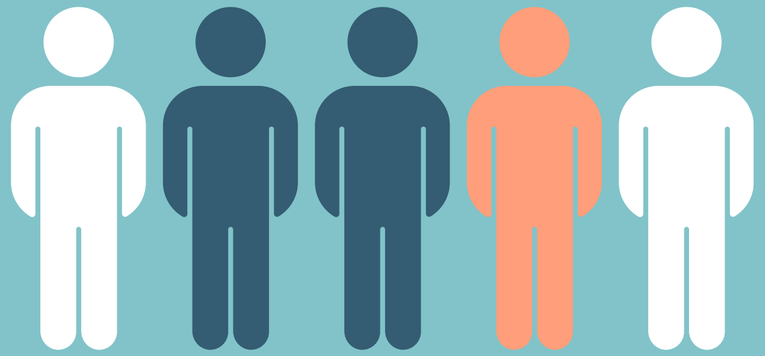


Sempat dilakukan dalam dunia medis, lobotomi akhirnya digantikan dengan obat-obatan yang lebih manusiawi.

PENELITIAN



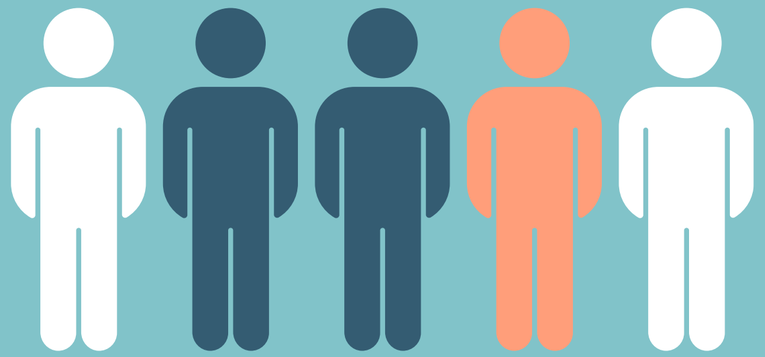
Teori evolusi Charles **Darwin** membahas mengenai perubahan makhluk hidup secara bertahap karena adanya faktor seleksi alam, adaptasi, atau variasi genetika

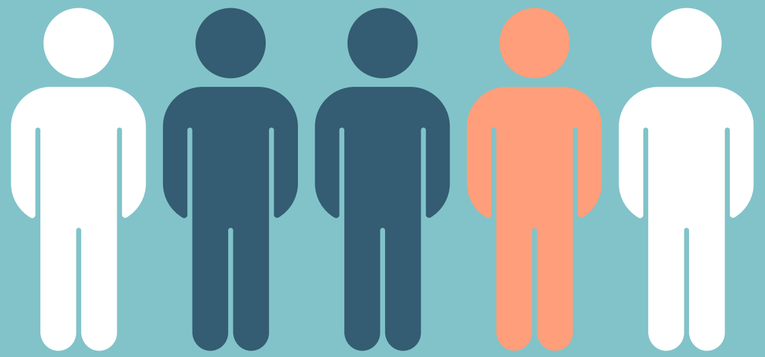


PENELITIAN

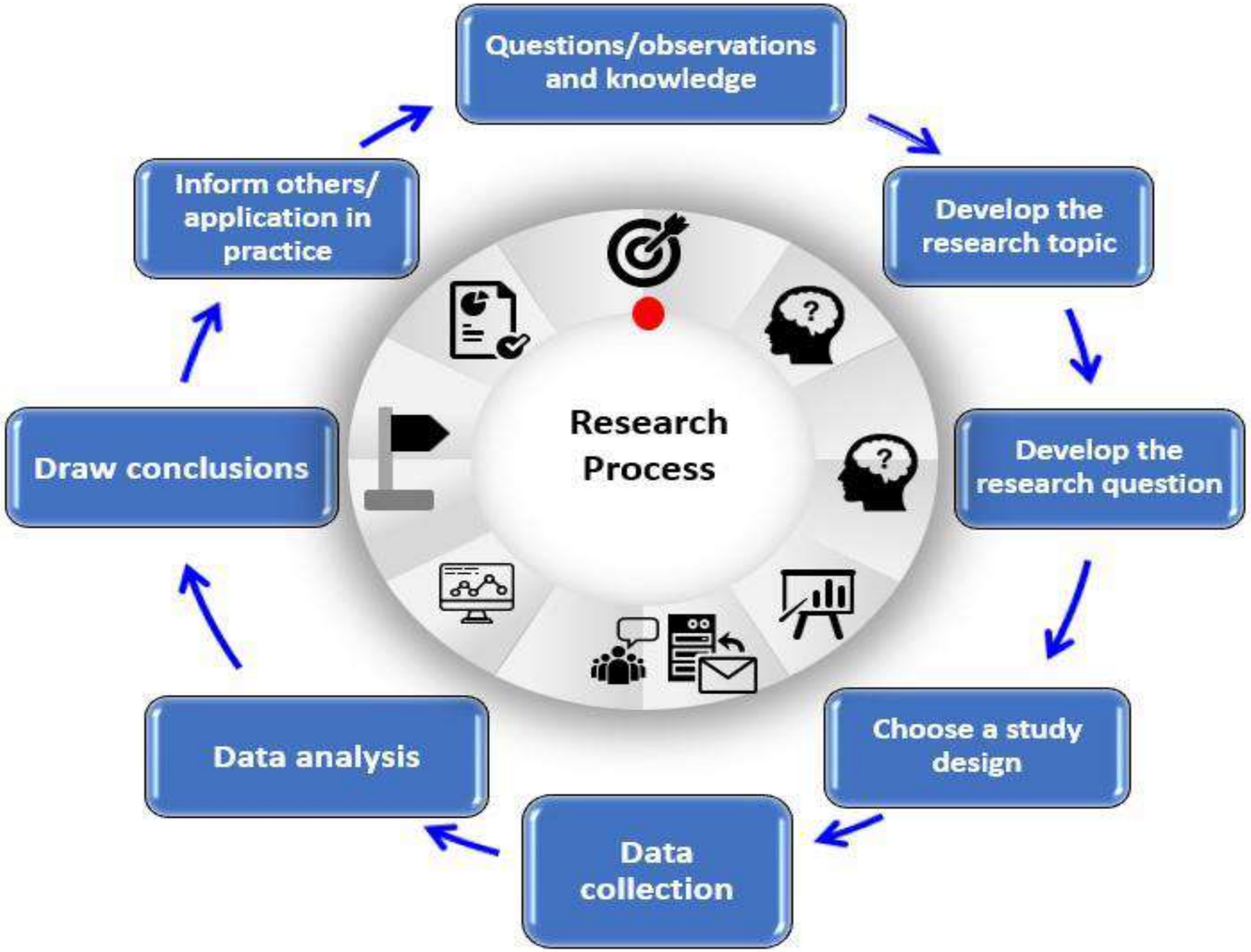
"CARA ILMIAH UNTUK MENDAPATKAN DATA DALAM RANGKA MENCAPAI TUJUAN DAN KEGUNAAN TERTENTU"

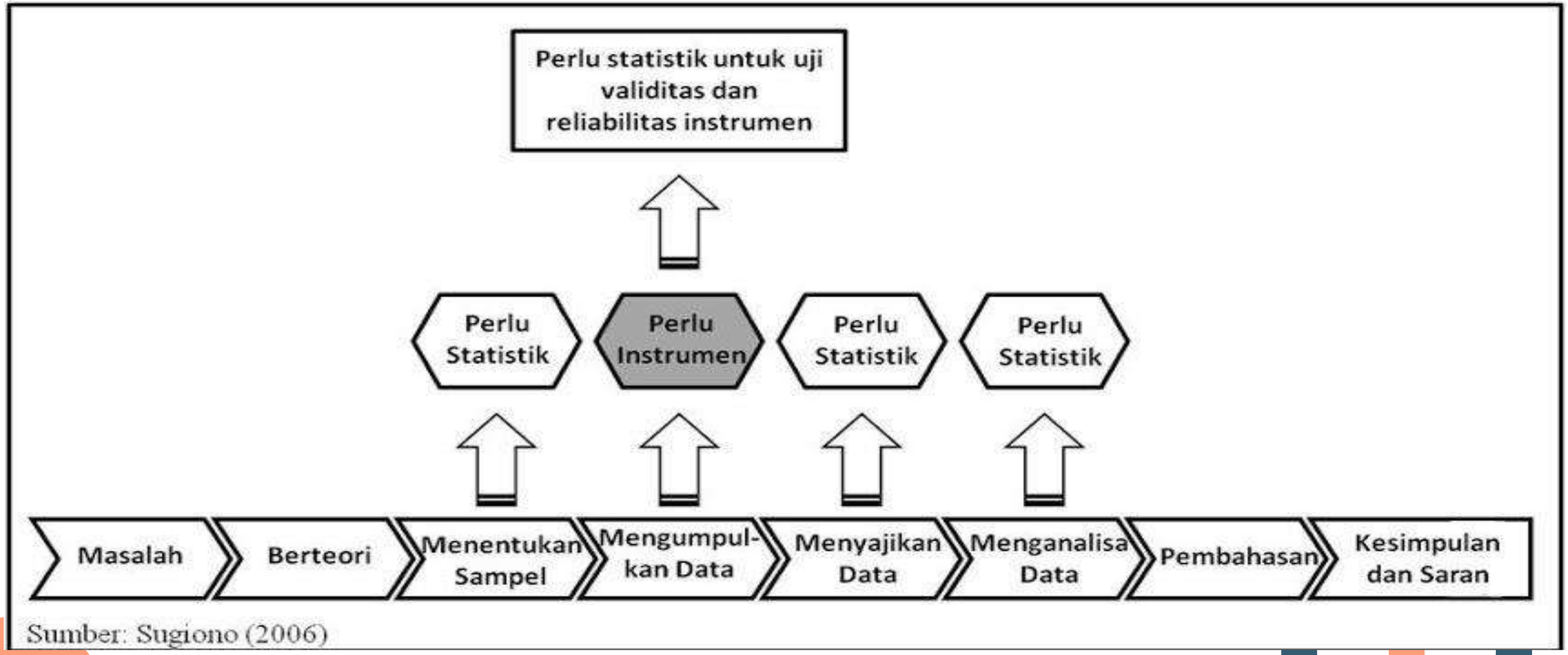
"METODE YANG DIGUNAKAN SEBAGAI ALAT UNTUK MENEMUKAN KEBENARAN DAN TIMBUL KARENA ADANYA SUATU PEMIKIRAN KRITIS"



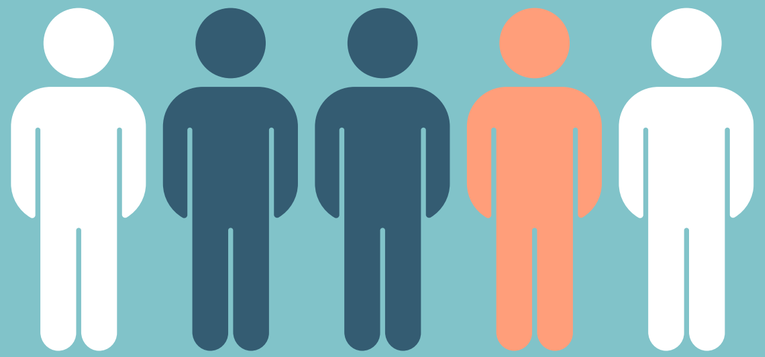


PENELITIAN


Questions/observations and knowledge
Develop the research topic
Develop the research question
Choose a study design
Data collection
Data analysis
Draw conclusions
Inform others/ application in practice
Research Process



Sumber: Sugiono (2006)



STATISTICS

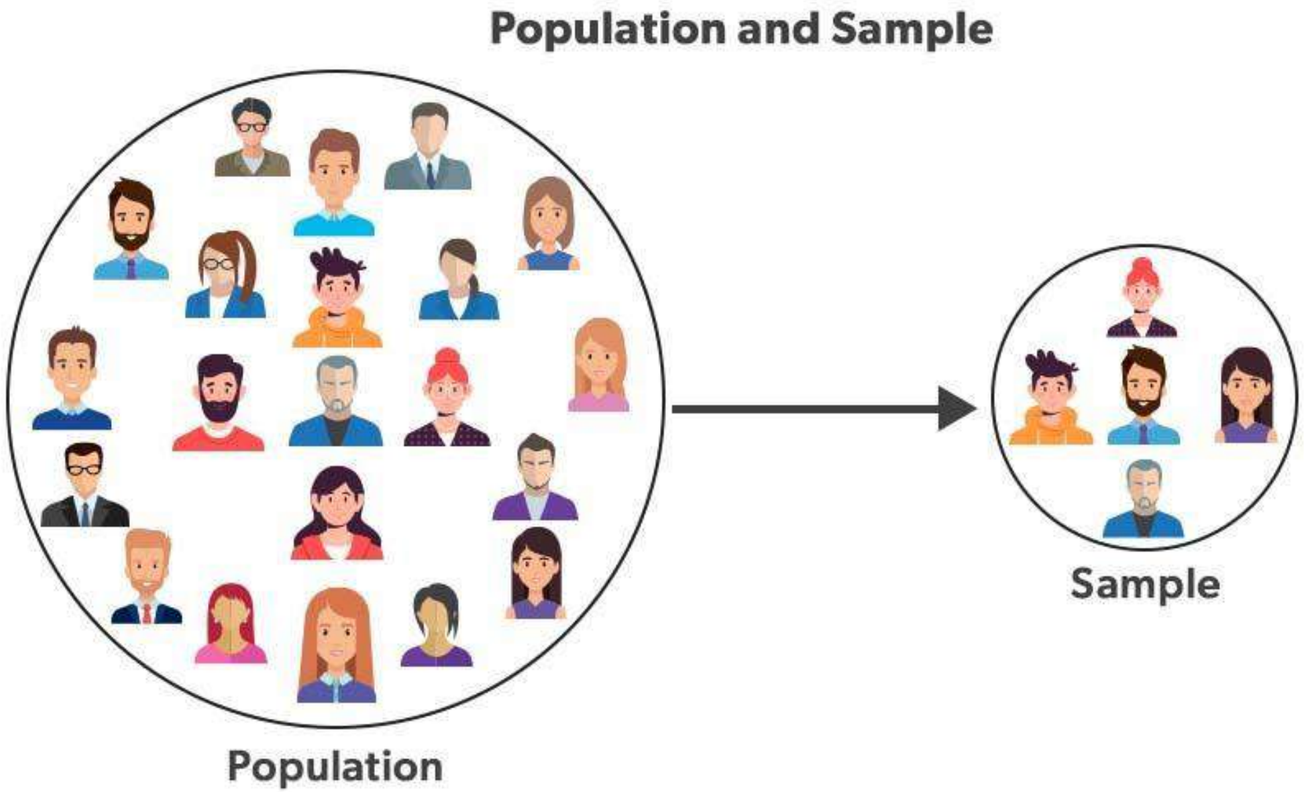
"a branch of mathematics dealing with the collection, analysis, interpretation, and presentation of masses of numerical ***data****"*

https://www.merriam-webster.com/dictionary/statistics

Peran statistik dalam penelitian

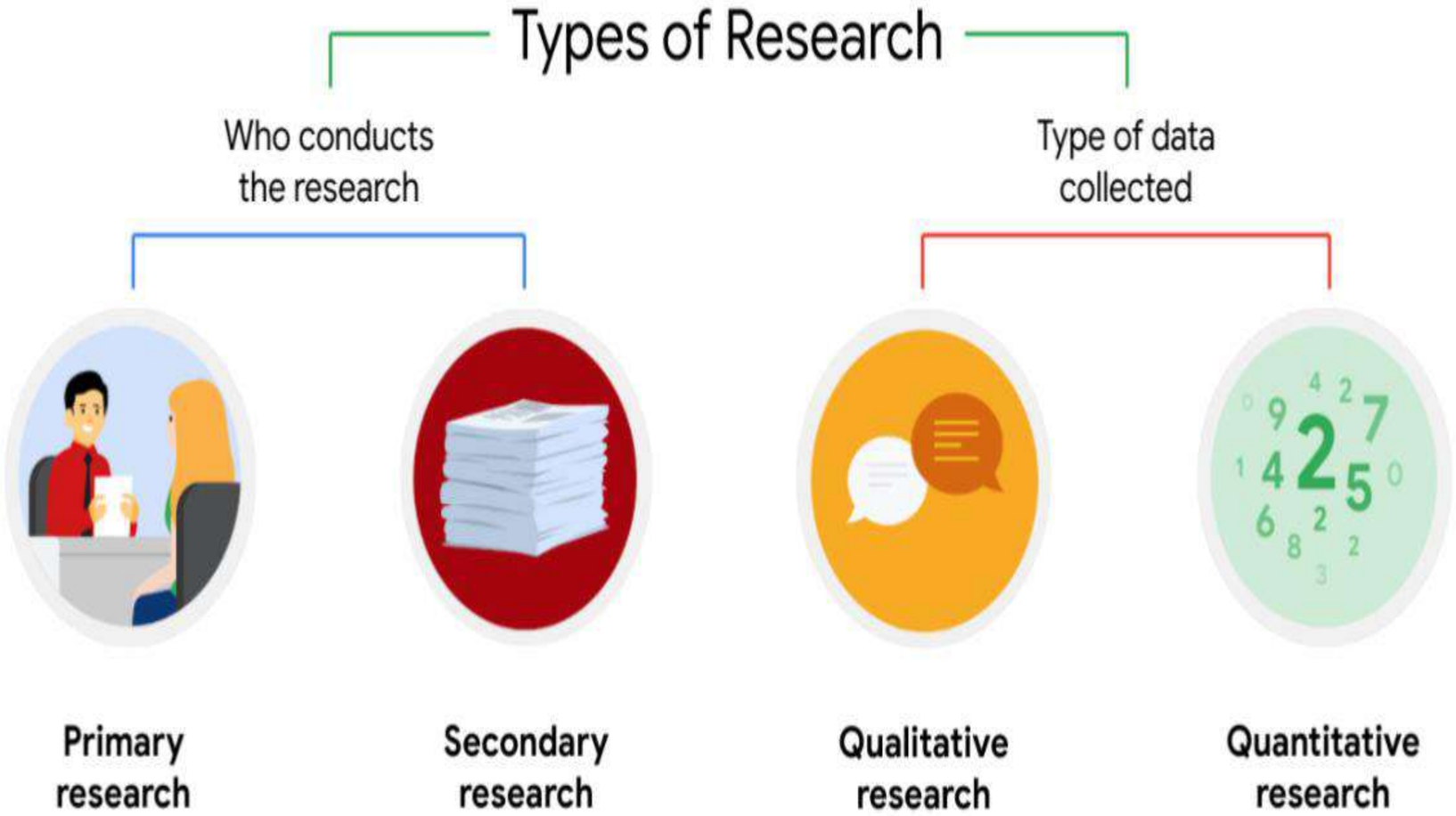
- Alat untuk menghitung besarnya sampel
- Alat untuk menguji validitas dan reliabilitas instrumen
- Teknik untuk menyajikan data sehingga data lebih komunikatif
- Alat untuk analisis : menguji hipotesis, korelasi, regresi, perbedaan

Menentukan sampel

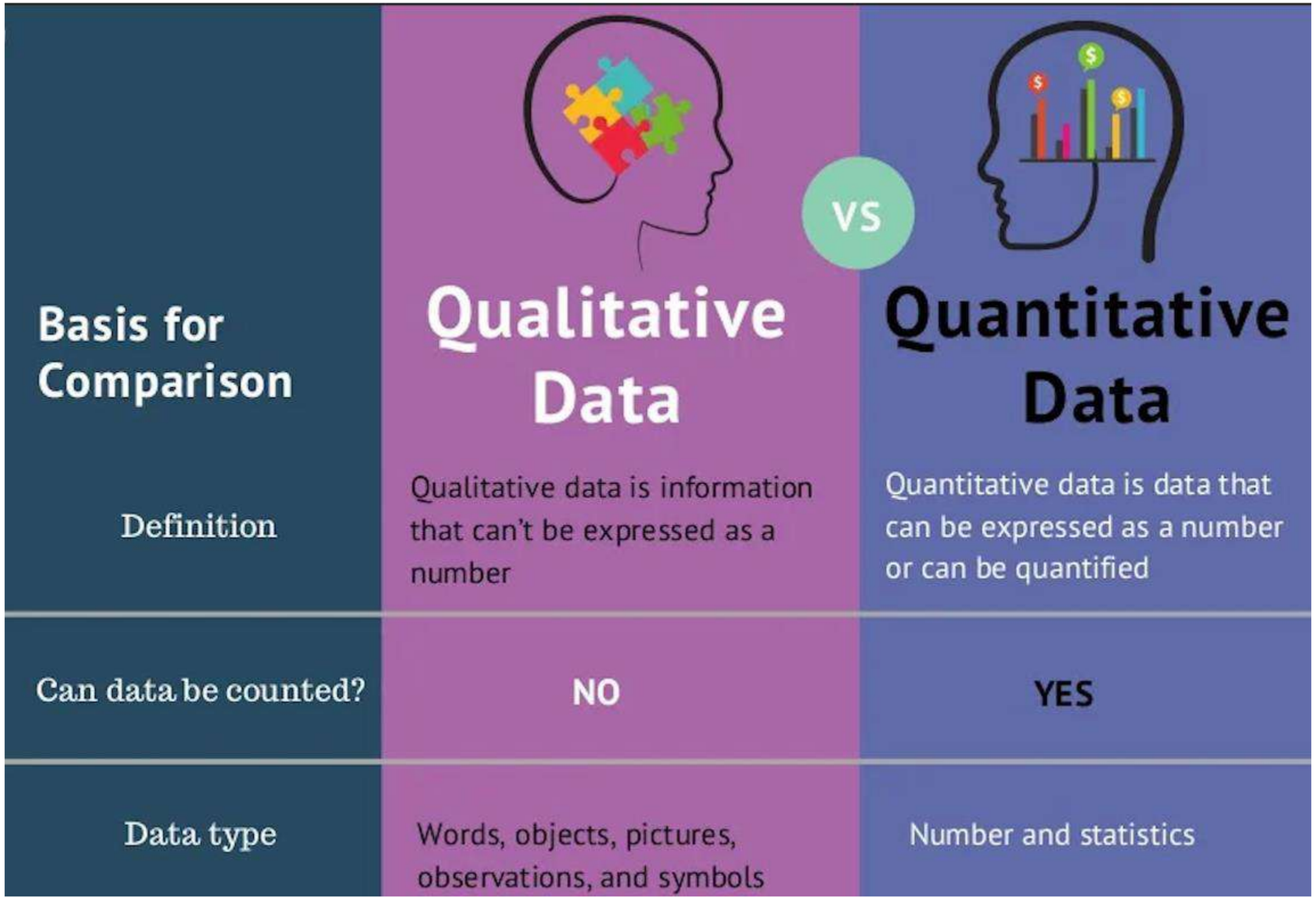


- Populasi adalah keseluruhan jumlah subyek atau obyek penelitian
- Sampel adalah bagian dari sejumlah karakteristik yang dimiliki oleh populasi

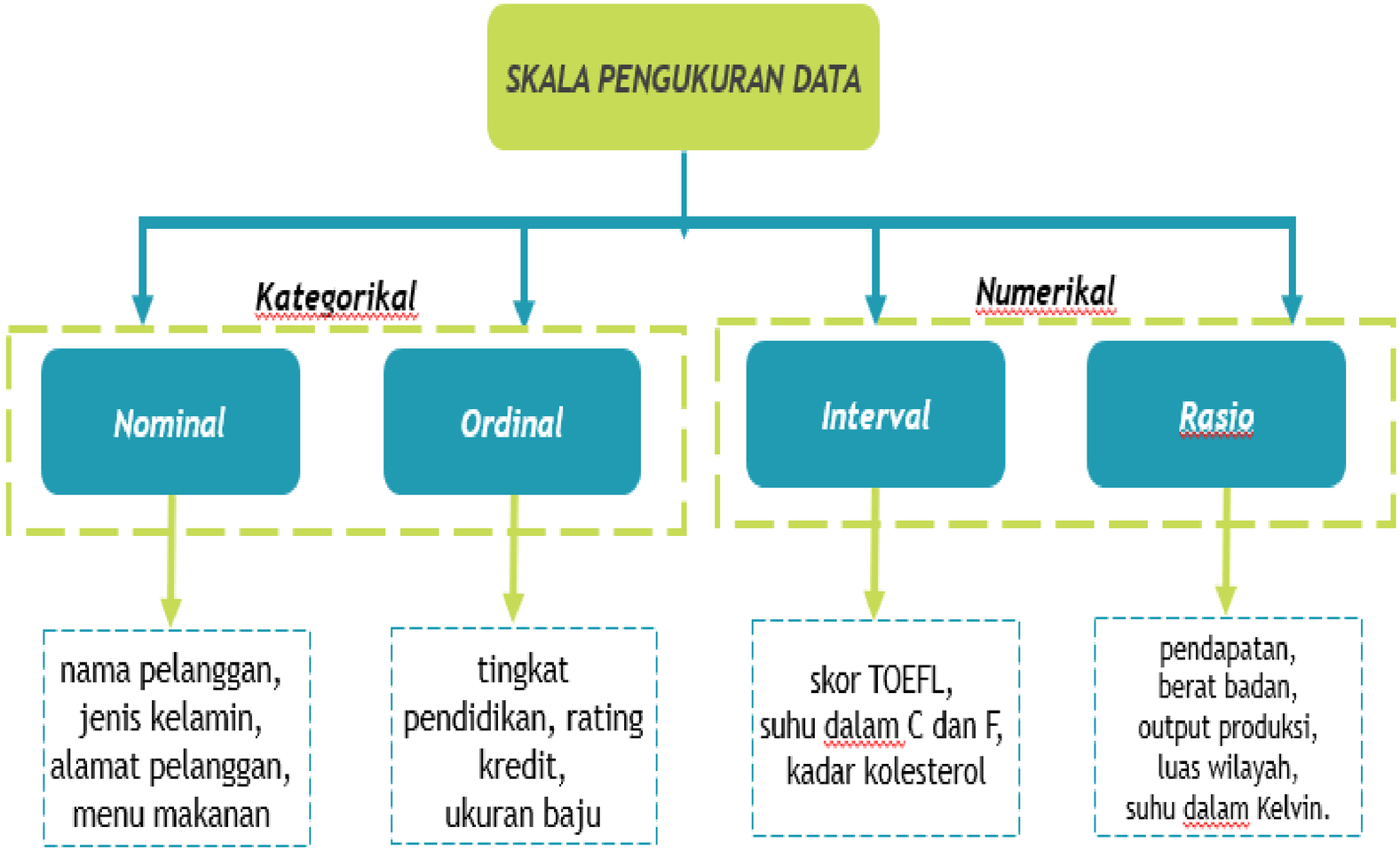
DATA DALAM PENELITIAN



DATA DALAM PENELITIAN



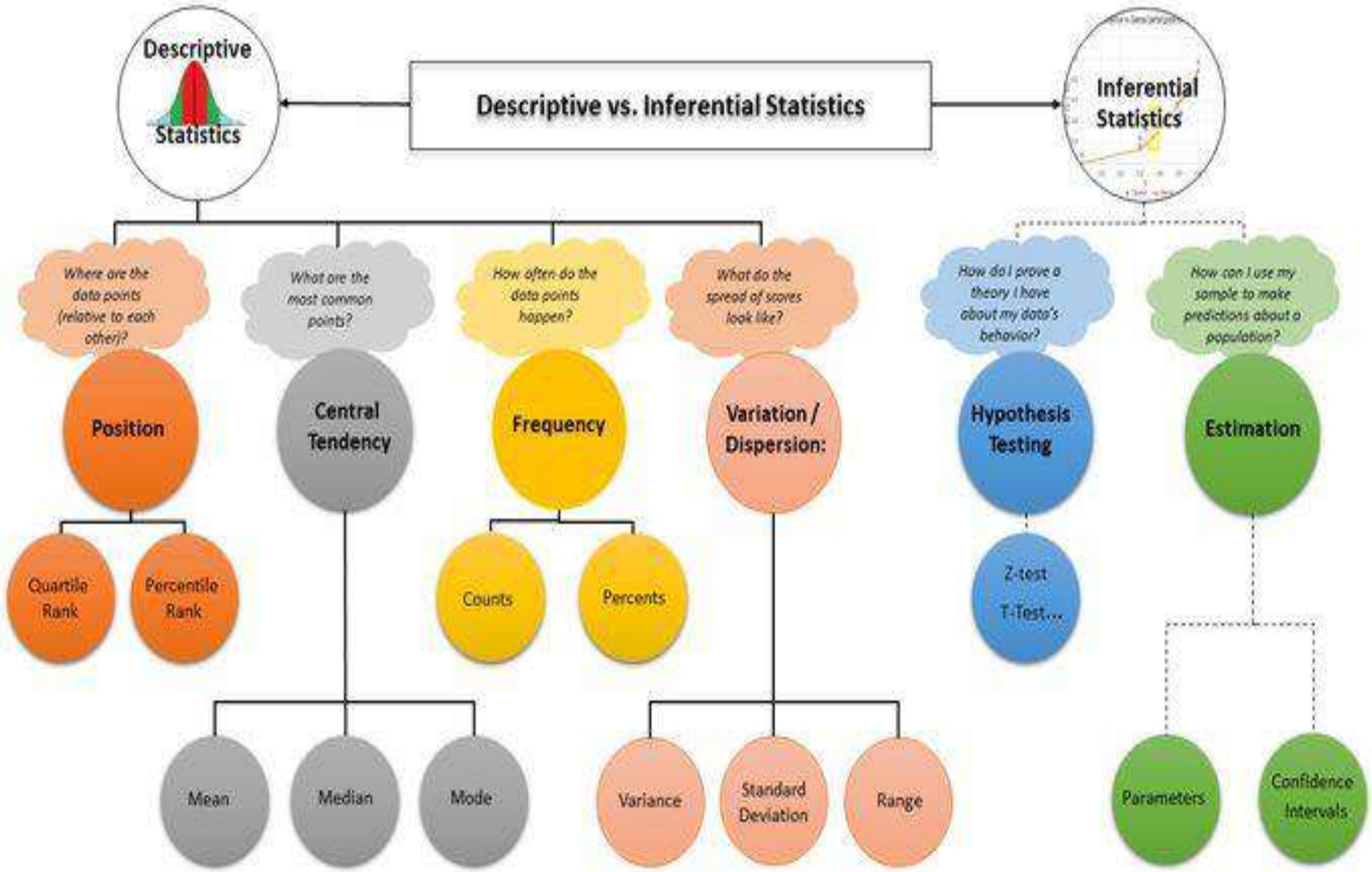
DATA DALAM STATISTIK



ANALISIS DATA

Inferential Statistics	Descriptive Statistics
Using sample data to make an inference or draw a conclusion of the population	Organizing and summarizing data using numbers and graphs
The objective is to draw conclusion of the population data	Describe the characteristics of the sample or population
Drawing conclusions, performing estimations and making predictions	Collection, organizing, summarizing, presenting the data
Form of results- probability score	Charts, Graphs and Tables
Tools- Hypothesis test, ANOVA	Measure of tendency, Measure of dispersion
Use when the population data set is large	Data set is small

ANALISIS DATA



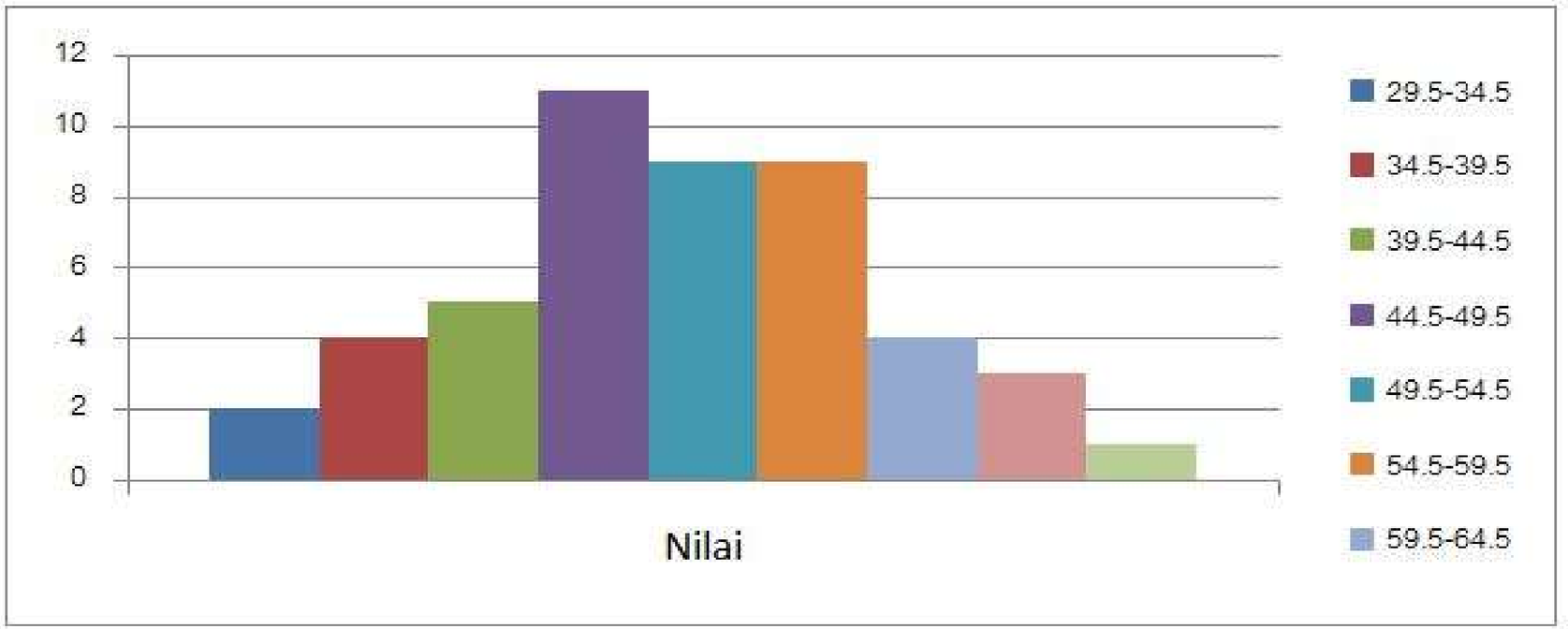
PENYAJIAN DATA

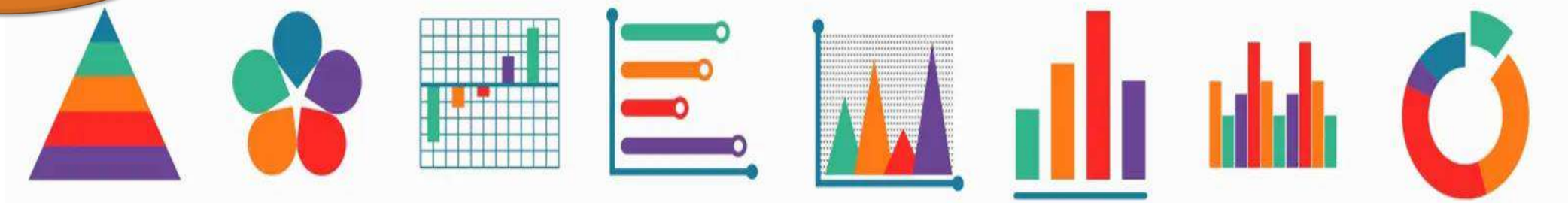
Lampiran 2:

DATA MENTAH SKOR KUESIONER VARIABEL KUALITAS PELAYANAN

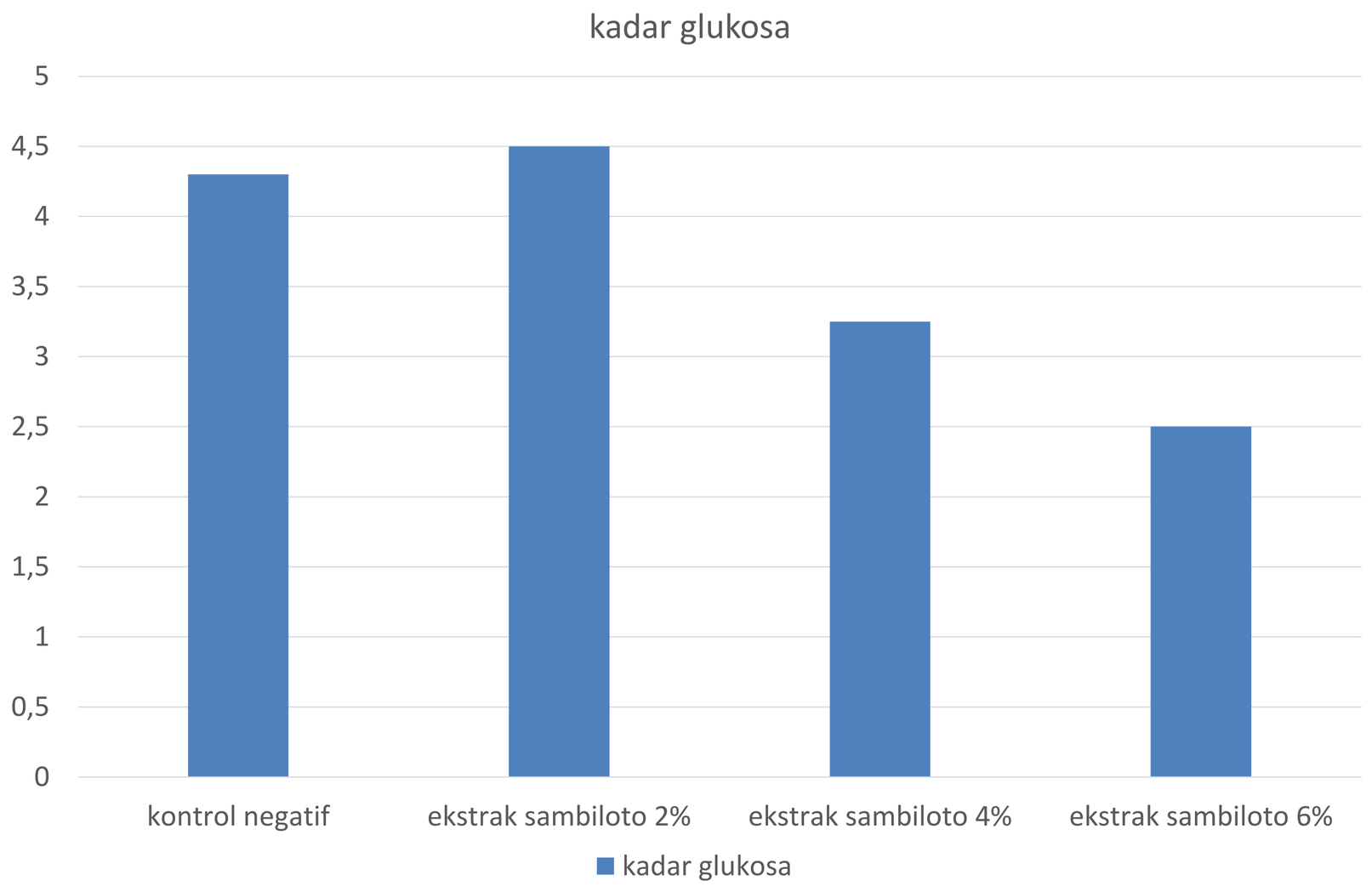
Resp.	Usia	lama kerja	P/L	Kualitas Pelayanan (X1)														
				Q_1	Q_2	Q_3	Q_4	Q_5	Q_6	Q_7	Q_8	Q_9	Q_{10}	Q_{11}	Q_{12}	Q_{13}	Q_{14}	Q_{15}	$X_{1.(Total)}$
1	42	14	L	3	3	3	3	4	3	4	4	4	4	3	4	4	4	4	**54**
2	37	15	L	3	3	3	3	4	4	3	3	3	3	3	4	4	4	4	**51**
3	52	27	L	3	4	4	4	4	4	3	3	3	3	3	3	3	3	3	**50**
4	47	27	L	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	**60**
5	49	19	L	4	4	4	4	4	4	3	3	3	3	3	4	3	4	3	**53**
6	34	4	L	4	4	4	4	4	4	4	3	3	4	3	4	3	3	4	**55**
7	19	1	P	3	3	4	4	3	3	4	3	2	4	4	4	3	3	3	**50**
8	51	29	P	4	4	4	4	4	4	4	4	3	4	4	4	4	4	4	**59**
9	56	29	L	4	4	4	4	4	4	3	4	3	4	3	4	4	4	4	**57**
10	42	24	L	4	4	4	4	4	4	4	4	4	3	3	3	3	3	3	**54**
11	49	27	P	4	4	4	4	4	4	3	3	3	3	3	4	4	4	3	**54**
12	47	27	P	4	4	4	4	4	4	3	3	3	3	3	3	2	3	3	**50**
13	53	30	L	4	4	4	4	4	4	4	3	3	4	3	4	4	3	3	**55**
14	55	34	L	4	4	4	4	4	4	3	3	4	4	3	4	3	3	4	**55**
15	37	17	L	4	4	4	4	4	4	4	4	4	3	3	4	4	3	3	**56**
16	48	20	L	4	4	4	4	4	4	3	3	3	3	3	4	4	3	3	**53**
17	32	3	P	4	4	4	4	4	4	3	3	3	3	3	3	3	3	3	**51**
18	42	19	P	3	3	3	4	3	3	3	3	3	3	3	3	4	4	4	**49**
19	39	19	P	4	4	4	4	4	4	3	3	3	3	4	4	4	3	3	**54**
20	47	25	L	3	3	4	3	3	4	2	3	4	4	4	2	4	3	4	**50**

PENYAJIAN DATA





PENYAJIAN DATA



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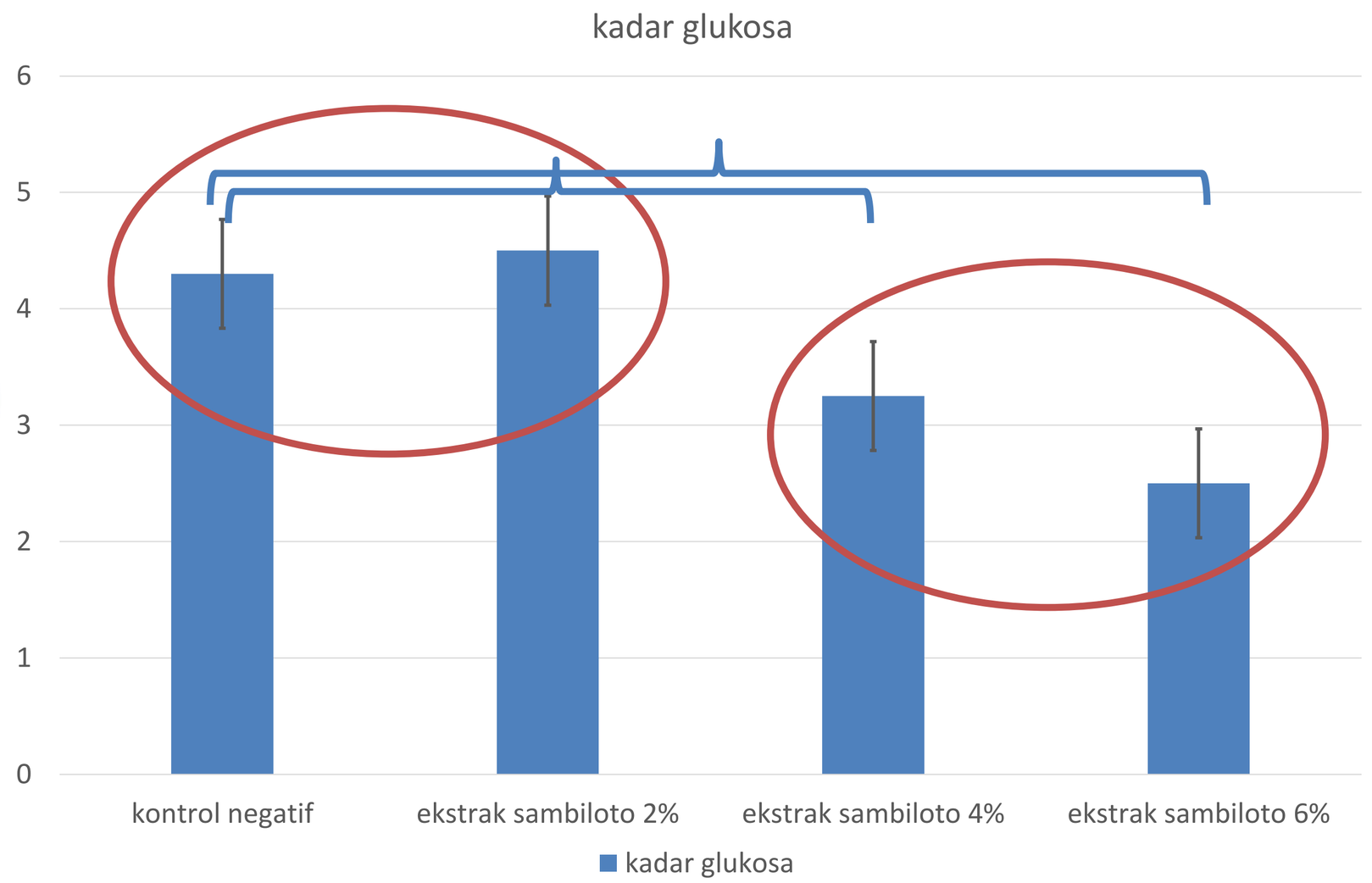
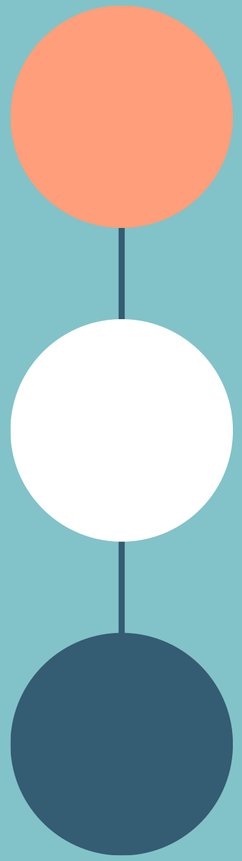


Peran statistik dalam penelitian

Peran statistik dalam penelitian

REFERENSI

1. “Statistics.” Merriam-Webster.com Dictionary, Merriam-Webster, https://www.merriam-webster.com/dictionary/statistics. Accessed 18 Feb. 2024.



THANK YOU!

STIKES NOTOKUSUMO YOGYAKARTA

STATISTIKA KESEHATAN

Pertemuan 2

apt. Trifonia RK., M.Biotech

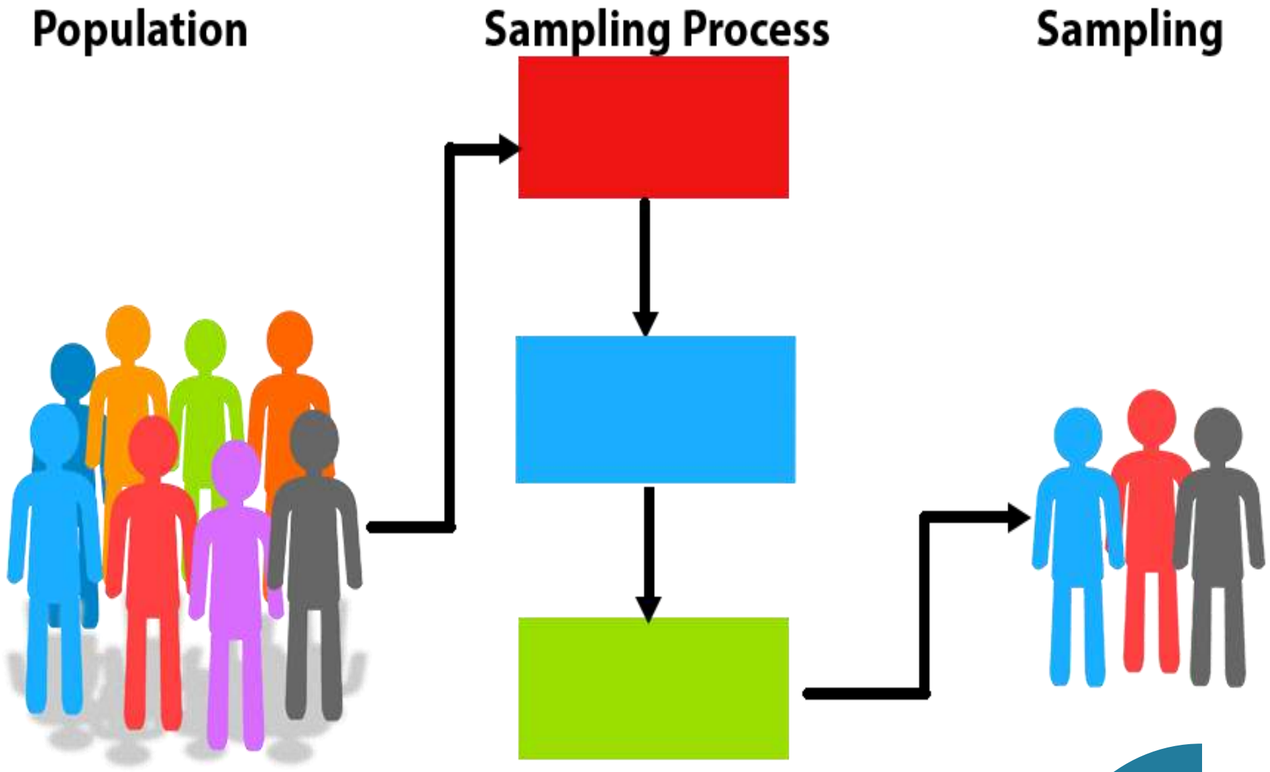
TOPIK BAHASAN

- Populasi dan Sampel
- Teknik Pengambilan Sampel
- Desain Penelitian

PENDAHULUAN

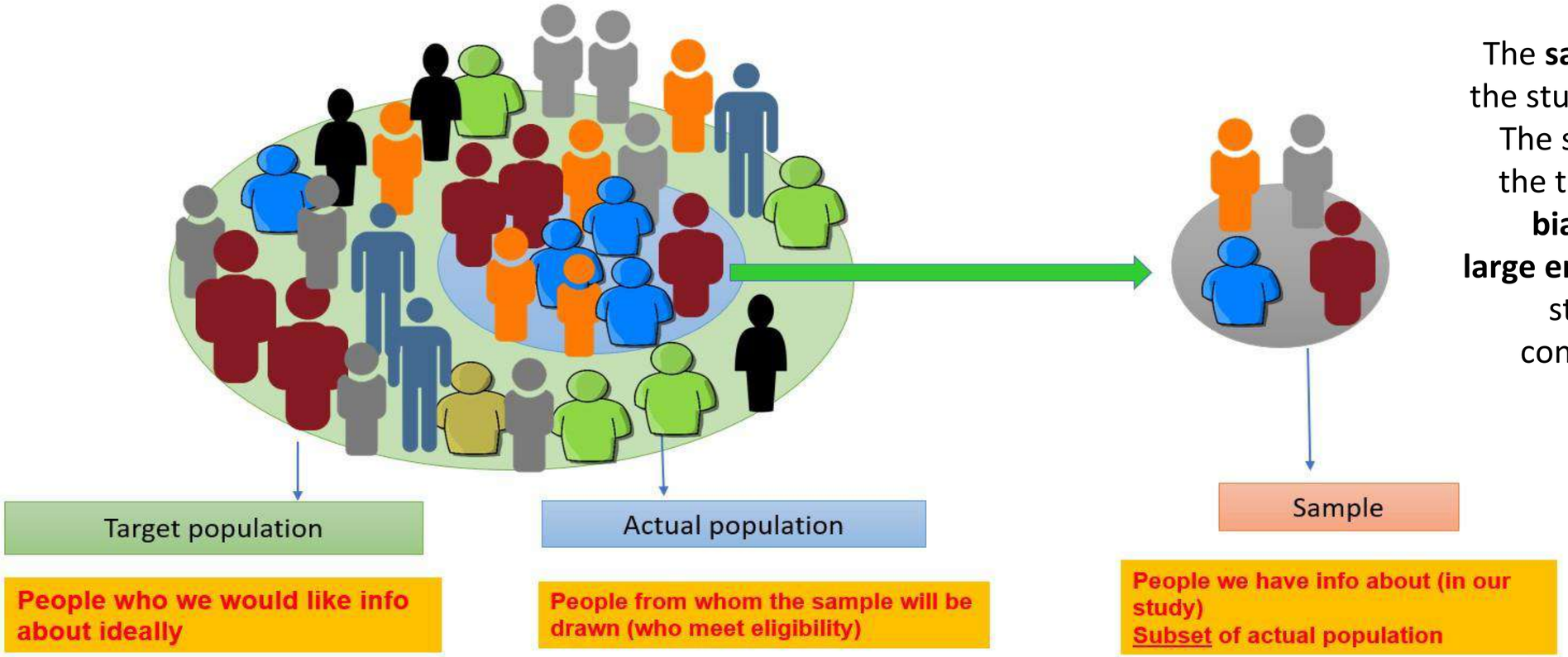
Pengertian teknik pengambilan sampel menurut Margono (2004) adalah:

“Teknik sampling adalah cara untuk menentukan sampel yang jumlahnya sesuai dengan ukuran sampel yang akan dijadikan sumber data sebenarnya, dengan memperhatikan sifat-sifat dan penyebaran populasi agar diperoleh sampel yang representative”



Population and Sample

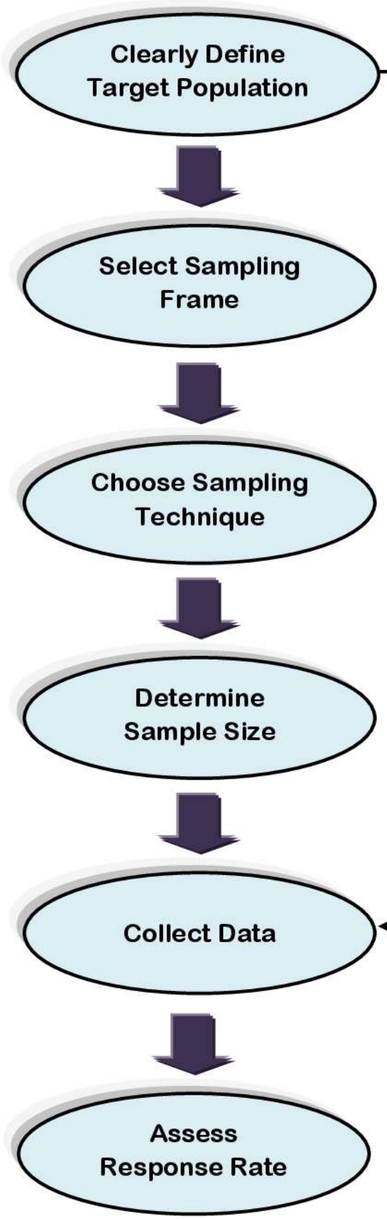
The **target population** includes the people the researcher **is interested** in conducting the research and generalizing the findings on. For example, if certain researchers are interested in vaccine-preventable diseases in children five years and younger in Indonesia. The target population → all children aged 0–5 years residing in Indonesia.



The **sample** is the **people chosen** for the study from the actual population. The sample must **accurately reflect** the target population, **be free from bias** in terms of selection, and be **large enough** to **validate or reject** the study hypothesis with statistical confidence and **minimise random error.**

The **actual population** is a **subset** of the target population from which the sample is drawn, e.g. children aged 0–5 years living in the capital cities in Indonesia.

SAMPLING PROCESS



Define who can **provide you with the information** your are interested in

A sampling frame is a list of the actual cases from which sample will be drawn. The sampling frame must **be representative** of the population

Choosing **specific type of sampling** technique. Sampling can be used to make **inference about a population or to make generalization** in relation to existing theory.

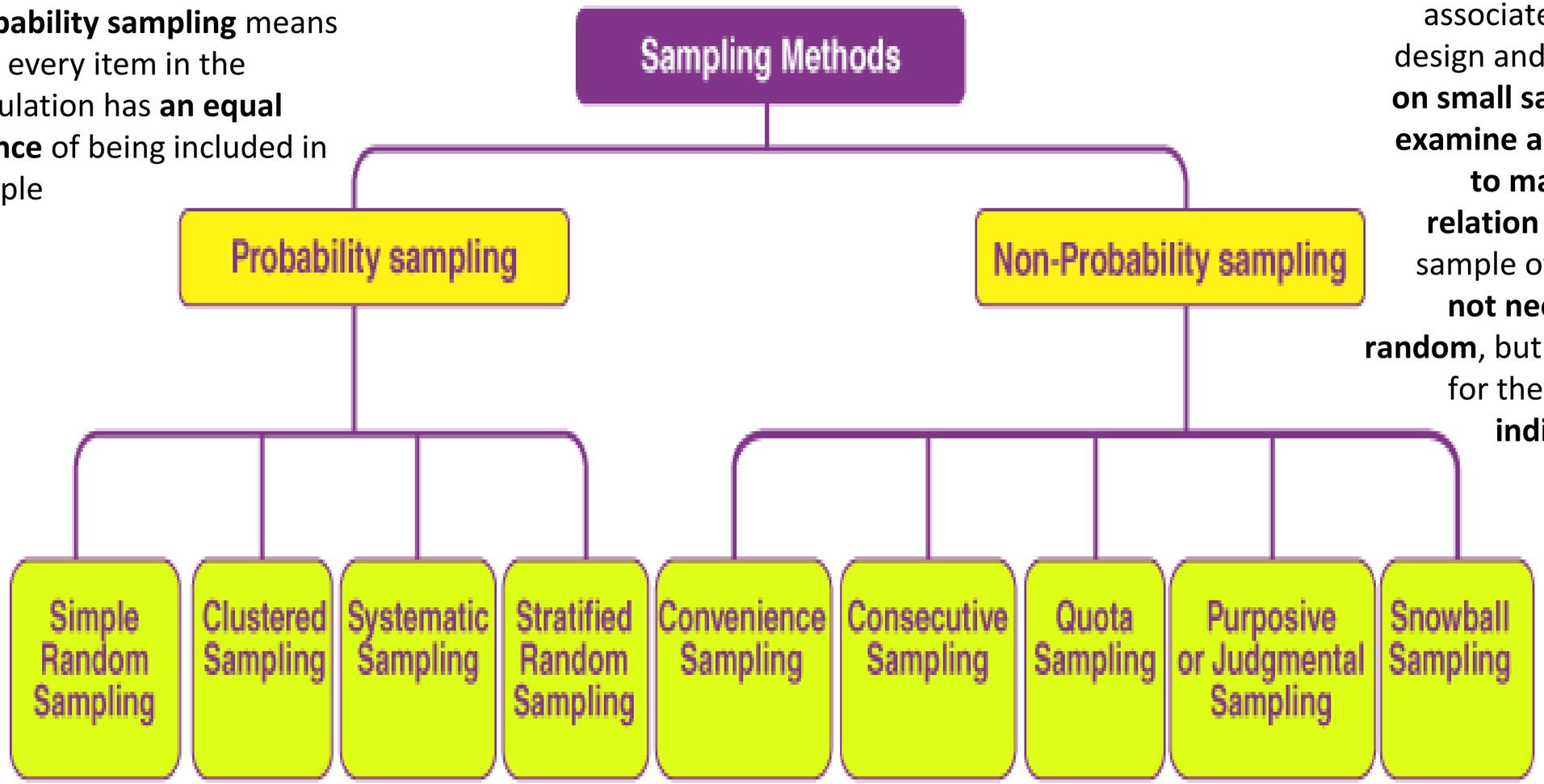
Decide **how many** element you want to include in your sample (the aims of the researcher and the kinds of statistical).
Large sampel = reduce sampling error or biased

Once target population, sampling frame, sampling technique and sample size have been established, the next step **is to collect data**.

Response rate is the **number of cases agreeing** to take part in the study.

SAMPLING TECHNIQUES

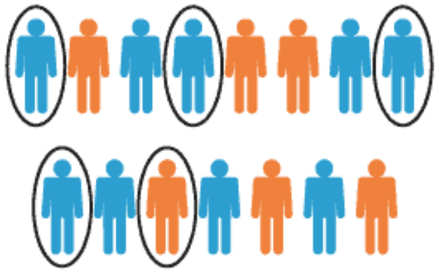
Probability sampling means that every item in the population has **an equal chance** of being included in sample



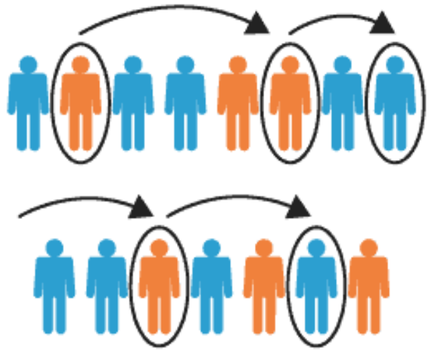
Non probability sampling is often associated with case study research design and qualitative research, **focus on small samples** and are intended **to examine a real life phenomenon**, **not to make statistical inferences in relation to the wider population**. A sample of participants or cases **does not need to be representative**, **or random**, but **a clear rationale** is needed for the **inclusion of some cases or individuals** rather than others.

SAMPLING TECHNIQUES

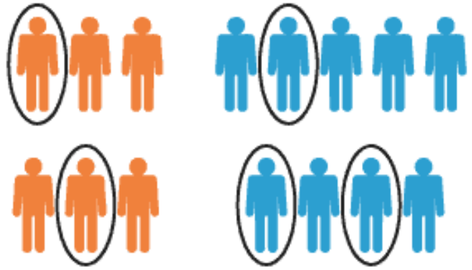
Simple random sample



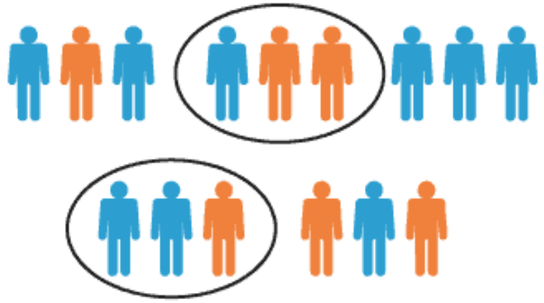
Systematic sample



Stratified sample



Cluster sample



Simple Random Sampling

Every member of the population has an equal chance of being selected.

Convenience Sample

It includes the individuals who are most accessible to the researcher.

Systematic Sampling

Individuals of the population are chosen at regular intervals. It is easier to conduct than simple random method.

Voluntary Response

Here people volunteer themselves, instead of researchers choosing individuals.

Stratified Sampling

When the population shows mixed character then this method is us The population divides into subgroups.

Purposive Sampling

Researchers use judgements to select a sample that is most useful for research.

Cluster Sampling

Instead of sampling individuals from subgroups, the subgroups are randomly selected.

Snowball Sampling

In this sampling, the number of people who have access to "snowballs" as you come in contact with more people.

SAMPLING TECHNIQUES

Simple Random Sampling

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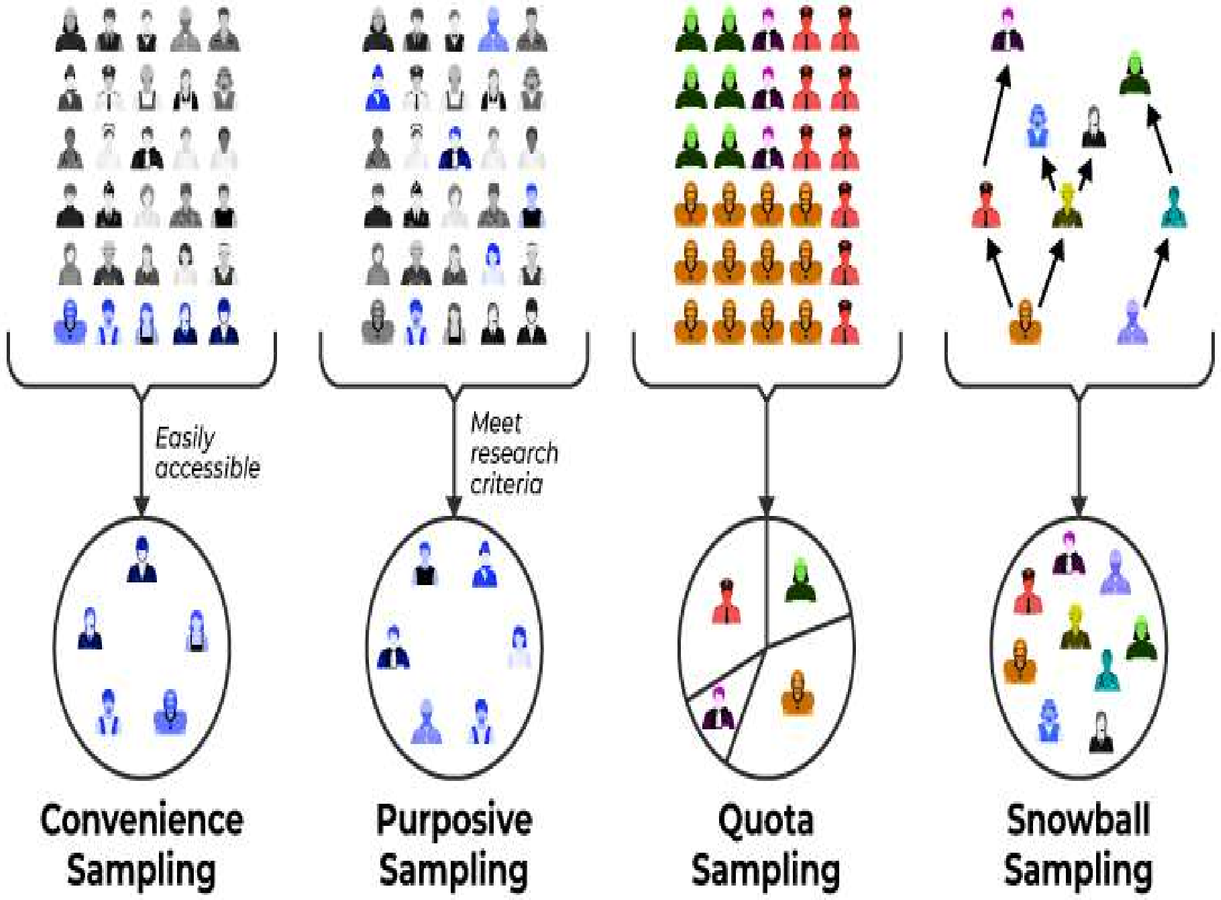
Snowball Sampling

In this sampling, the number of people who have access to "snowballs" as you come in contact with more people.

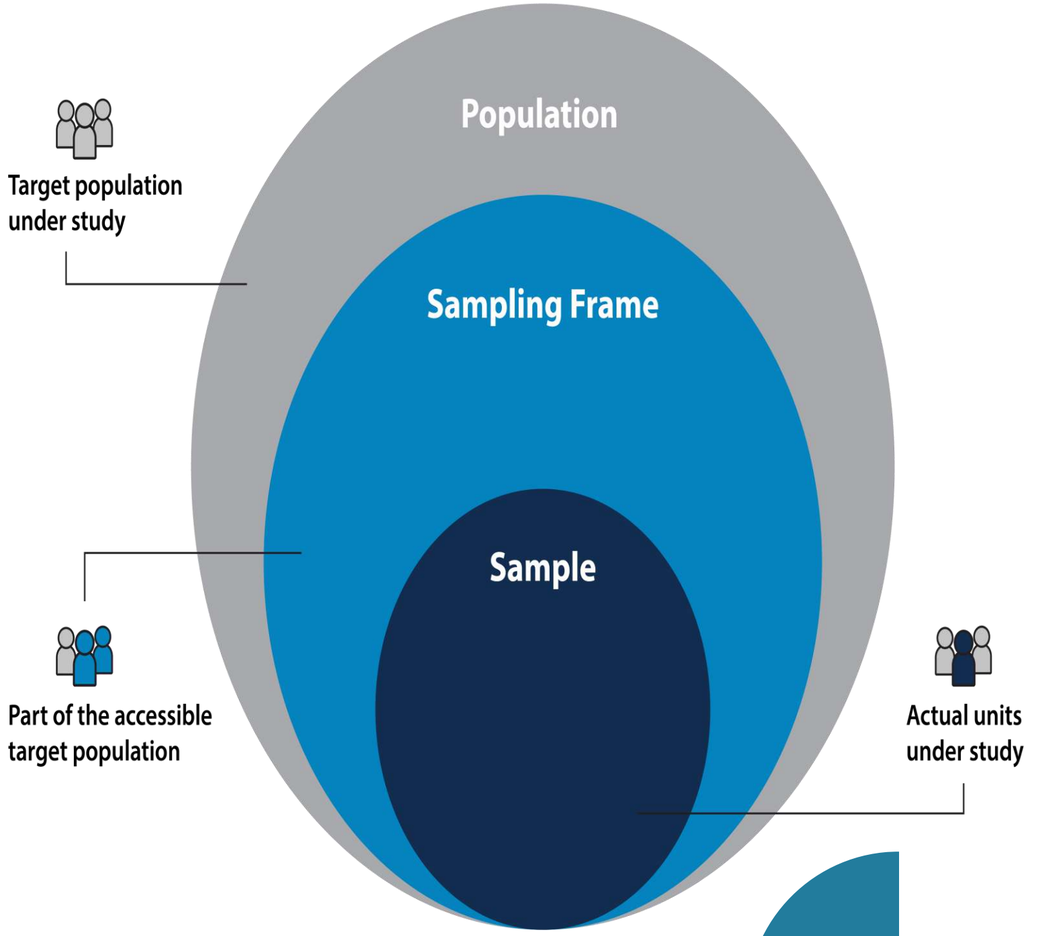


SAMPLING TECHNIQUES

TABLE 1: STRENGTHS AND WEAKNESSES OF SAMPLING TECHNIQUES

SOURCE: (MALHOTRA AND BIRKS, 2006)

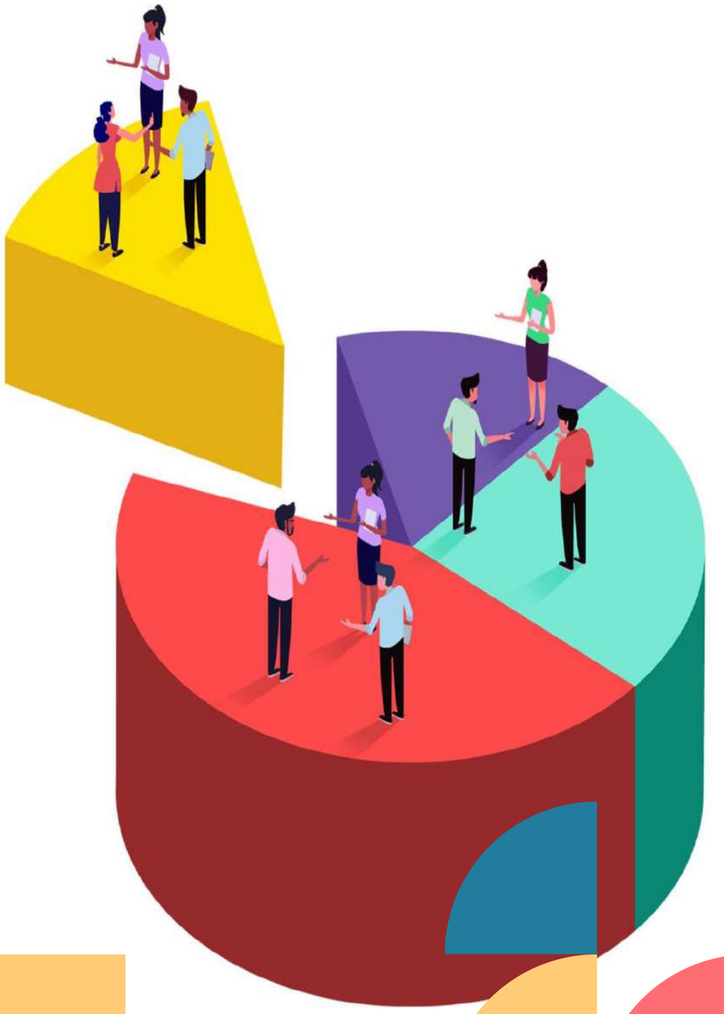
Technique	Strengths	Weaknesses
Convenience sampling	Least expensive, least time-consuming, most convenient	Selection bias, sample not representative, not recommended by descriptive or casual research
Judgment sampling	Low-cost, convenient, not time-consuming, ideal for exploratory research design	Does not allow generalization, subjective
Quota sampling	Sample can be controlled for certain characteristics	Selection bias, no assurance
Snowball sampling	Can estimate rare characteristics	Time-consuming
Simple random sampling	Easily understood, results projectable	Difficult to construct sampling frame, expensive, lower precision, no assurance of representativeness
Systematic sampling	Can increase representativeness, easier to implement than simple random sampling, sampling frame not always necessary	Can decrease representativeness
Stratified sampling	Includes all important sub-population, precision	Difficult to select relevant stratification variables, not feasible to stratify on many variables, expensive
Cluster sampling	Easy to implement, cost-effective	Imprecise, difficult to compute an interpret results



SAMPLING TECHNIQUES

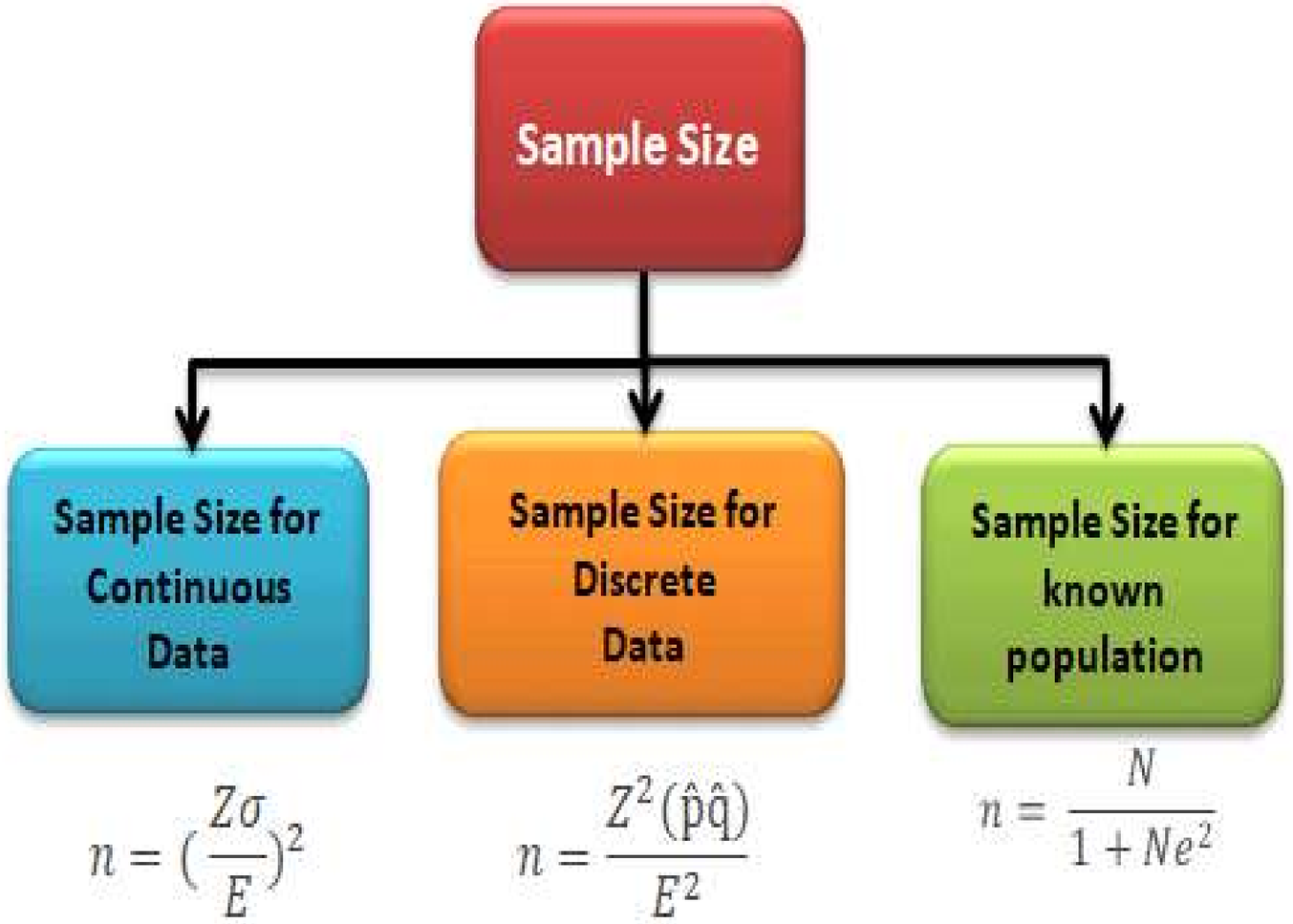
Table 7.1 Examples, Advantages, and Limitations of the Four Sampling Techniques

Sampling Technique	Example	Advantages	Limitations
Simple random sampling	The names of all 1,000 children are placed into a computer database. The computer is then instructed to randomly select 100 names. These children and their parents are then contacted.	Representative of the population	May be difficult to obtain the list May be more expensive
Stratified random sampling	The names of all 1,000 children are placed into a computer database and organized by grade (sixth, seventh, eighth). The computer is then instructed to randomly select 35 names from each of the three grades. These children and their parents are then contacted.	Representative of the population	May be difficult to obtain the list May be more expensive
Convenience sampling	The researcher knows one of the middle-school teachers, and the teacher volunteers her 35 students for the study. These children and their parents are then contacted.	Simple Easy Convenient No complete member list needed	May not be representative of the population
Quota sampling	Using the middle-school directory, the researcher selects the first 20 sixth-grade boys, the first 20 sixth-grade girls, the first 20 seventh-grade boys, the first 20 seventh-grade girls, the first 20 eighth-grade boys, and the first 20 eighth-grade girls. These children and their parents are then contacted.	Simple Easy Convenient No complete member list needed	May not be representative of the population



SAMPLE SIZE

- **Sample size (SS)** is a research term used for **defining the number of individuals** included in a research study to represent a population
- The size of the sample depends on various considerations, including population variability, statistical issues, economic factors, availability of participants, and the importance of the problem.
- If the SS is 30 or more, it is known as a large sample
  - For large samples, the sampling distribution of statistics is normal (**Z distribution**)
  - For small SS (<30), the sampling distribution is t, F, and chi square distribution



SAMPLE SIZE

Margin of Error (E)
The margin of error is a statistic expressing the **amount of random sampling error** in the results of an experiment. It determines how much higher or lower the population means you are willing to let your sample mean fall. Often margin error is expressed in terms of percentage.

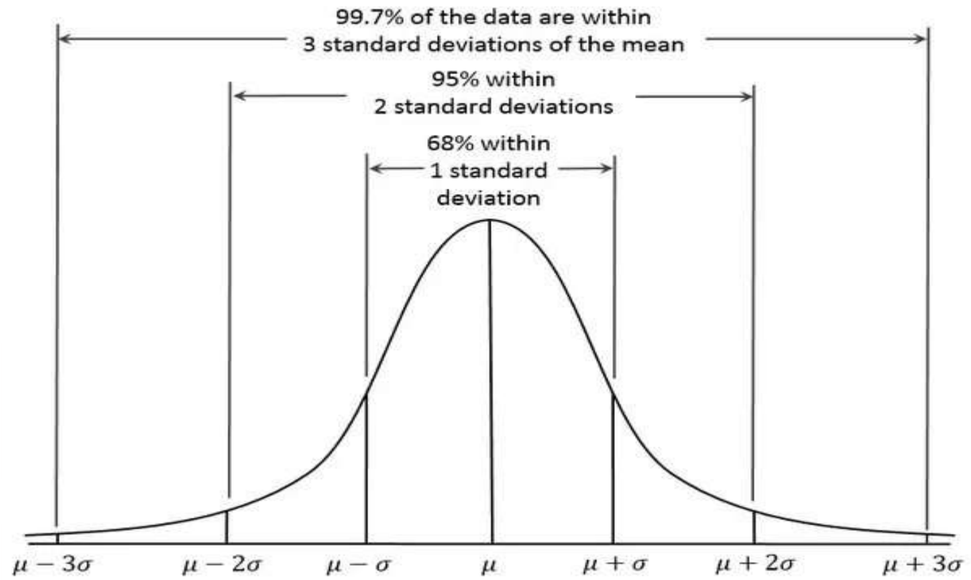
Confidence Level
The Confidence level is the estimated probability that a population estimate lies within a given margin of error. In other words, it tells how confident you want to be that the actual mean falls within your confidence level. The most commonly used confidence levels are 90%, 95%, and 99%.
→ Alpha levels are related to confidence levels: to find **alpha**, just subtract the confidence interval from 100%. for example, the alpha level for a 90% confidence level is 100% - 90% = 10%.

Degree of variability
The degree of variability is the extent to which the sample measures differ from the measure of the population. The greater the variance, the larger the sample size.

SAMPLE SIZE

Z distribution

Alpha(α)	Two Sided Test $Z_{1-\alpha/2}$	One Sided Test $Z_{1-\alpha}$
0.01	2.576	2.326
0.05	1.960	1.645
0.10	1.645	1.282
0.20	1.282	0.842



Z	0.00	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09
0.0	0.5000	0.5040	0.5080	0.5120	0.5160	0.5199	0.5239	0.5279	0.5319	0.5359
0.1	0.5398	0.5438	0.5478	0.5517	0.5557	0.5596	0.5636	0.5675	0.5714	0.5753
0.2	0.5793	0.5832	0.5871	0.5910	0.5948	0.5987	0.6026	0.6064	0.6103	0.6141
0.3	0.6179	0.6217	0.6255	0.6293	0.6331	0.6368	0.6406	0.6443	0.6480	0.6517
0.4	0.6554	0.6591	0.6628	0.6664	0.6700	0.6736	0.6772	0.6808	0.6844	0.6879
0.5	0.6915	0.6950	0.6985	0.7019	0.7054	0.7088	0.7123	0.7157	0.7190	0.7224
0.6	0.7257	0.7291	0.7324	0.7357	0.7389	0.7422	0.7454	0.7486	0.7518	0.7549
0.7	0.7580	0.7612	0.7642	0.7673	0.7704	0.7734	0.7764	0.7794	0.7823	0.7852
0.8	0.7881	0.7910	0.7939	0.7967	0.7995	0.8023	0.8051	0.8078	0.8106	0.8133
0.9	0.8159	0.8186	0.8212	0.8238	0.8264	0.8289	0.8315	0.8340	0.8365	0.8389
1.0	0.8413	0.8438	0.8461	0.8485	0.8508	0.8531	0.8554	0.8577	0.8599	0.8621
1.1	0.8643	0.8665	0.8686	0.8708	0.8729	0.8749	0.8770	0.8790	0.8810	0.8830
1.2	0.8849	0.8869	0.8888	0.8907	0.8925	0.8944	0.8962	0.8980	0.8997	0.9015
1.3	0.9032	0.9049	0.9066	0.9082	0.9099	0.9115	0.9131	0.9147	0.9162	0.9177
1.4	0.9192	0.9207	0.9222	0.9236	0.9251	0.9265	0.9279	0.9292	0.9306	0.9319
1.5	0.9332	0.9345	0.9357	0.9370	0.9382	0.9394	0.9406	0.9418	0.9429	0.9441
1.6	0.9452	0.9463	0.9474	0.9484	0.9495	0.9505	0.9515	0.9525	0.9535	0.9545
1.7	0.9554	0.9564	0.9573	0.9582	0.9591	0.9599	0.9608	0.9616	0.9625	0.9633
1.8	0.9641	0.9649	0.9656	0.9664	0.9671	0.9678	0.9686	0.9693	0.9699	0.9706
1.9	0.9713	0.9719	0.9726	0.9732	0.9738	0.9744	0.9750	0.9756	0.9761	0.9767
2.0	0.9772	0.9778	0.9783	0.9788	0.9793	0.9798	0.9803	0.9808	0.9812	0.9817
2.1	0.9821	0.9826	0.9830	.09834	0.9838	0.9842	0.9846	0.9850	0.9854	0.9857
2.2	0.9861	0.9864	0.9868	0.9871	0.9875	0.9878	0.9881	0.9884	0.9887	0.9890
2.3	0.9893	0.9896	0.9898	0.9901	0.9904	0.9906	0.9909	0.9911	0.9913	0.9916
2.4	0.9918	0.9920	0.9922	0.9925	0.9927	0.9929	0.9931	0.9932	0.9934	0.9936
2.5	0.9938	0.9940	0.9941	0.9943	0.9945	0.9946	0.9948	0.9949	0.9951	0.9952
2.6	0.9953	0.9955	0.9956	0.9957	0.9959	0.9960	0.9961	0.9962	0.9963	0.9964
2.7	0.9965	0.9966	0.9967	0.9968	0.9969	0.9970	0.9971	0.9972	0.9973	0.9974
2.8	0.9974	0.9975	0.9976	0.9977	0.9977	0.9978	0.9979	0.9979	0.9980	0.9981
2.9	0.9981	0.9982	0.9982	0.9983	0.9984	0.9984	0.9985	0.9985	0.9986	0.9986
3.0	0.99865	0.99869	0.99874	0.99878	0.99882	0.99886	0.99889	0.99893	0.99897	0.99900
3.1	0.99903	0.99906	0.99910	0.99913	0.99916	0.99918	0.99921	0.99924	0.99926	0.99929
3.2	0.99931	0.99934	0.99936	0.99938	0.99940	0.99942	0.99944	0.99946	0.99948	0.99950
3.3	0.99952	0.99953	0.99955	0.99957	0.99958	0.99960	0.99961	0.99962	0.99964	0.99965
3.4	0.99966	0.99968	0.99969	0.99970	0.99971	0.99972	0.99973	0.99974	0.99975	0.99976
3.5	0.99977	0.99978	0.99978	0.99979	0.99980	0.99981	0.99981	0.99982	0.99983	0.99983
3.6	0.99984	0.99985	0.99985	0.99986	0.99986	0.99987	0.99987	0.99988	0.99988	0.99989
3.7	0.99989	0.99990	0.99990	0.99990	0.99991	0.99991	0.99992	0.99992	0.99992	0.99992
3.8	0.99993	0.99993	0.99993	0.99994	0.99994	0.99994	0.99994	0.99995	0.99995	0.99995
3.9	0.99995	0.99995	0.99996	0.99996	0.99996	0.99996	0.99996	0.99996	0.99997	0.99997
4.0	0.99996832									
4.5	0.99999660									

SAMPLE SIZE

Sample Size for One Sample, Continuous Outcome

$$n = \left(\frac{Z\sigma}{E}\right)^2$$

n is the Sample Size,
Z is the Z score from the desired risk,
sigma is the standard deviation,
E is the mean shift – or error.

Example :
A Peanut Butter Manufacturer wants to estimate the sugar content in a bottle. In fact, the previous batch of 1000 bottles had a standard deviation of 10 grams. Identify the sample size to estimate the mean is within 4 grams of the population mean with a 95% confidence

Ans :
Margin of error→ E = 4gram
Standard deviation → σ = 10gram

Identify the Z score :
1. Subtract the confidence level (95%) from 1 and then divide the result by two
α=(1 – 0,95)/2 =

2. subtract alpha from 1 and then look that is up in the middle of the z table to get the z-score
Zscore = 1 – 0,025
Zscore = ; Z= → *lihat tabel distribusi Z*

Sample size n

$$n = \left(\frac{Z\ x\ \sigma}{E}\right)^2$$

$$n =$$

SAMPLE SIZE

Sample Size for Continuous and Binary Random Variables

An essential property of Bernoulli sampling is that all elements of the population have equal probability of being included in the sample

$$n = \frac{Z^2(\hat{p}\hat{q})}{E^2}$$

n is the Sample Size,
Z is the Z score from the desired risk
p̂ is the size of the proportion accepted
q̂ =1- p̂ (a large proportion were rejected)
E is the mean shift – or error.

Example :
The expectation is that 20% of employees in the Yogyakarta area are using TransJogja. With 90% confidence level, what would be the minimum sample that needs to estimate the population proportion with a maximum permissible difference of 6%?

Ans :
Sample proportion=0.20
Margin of error E =0.06
90% confidence level α = ? → Z =?

α = (1 – 0,9)/2 =

Zscore =1 – 0,05
Zscore = ; Z= → *lihat tabel Z*

Sample size n

$$n = \frac{Z^2(pq)}{E^2}$$

$$n =$$

SAMPLE SIZE

Sample Size for Known populations (Solvin's Formula)

Solvin's formula is used to compute the sample size in a study for a given total population and a margin of error. Slovin's formula works for simple random sampling. Moreover, it computes the number of samples required when the population is too large.

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

n is the Sample Size,
N total population
E is the mean shift – or error.

Example :
Compute the SS for a population of 1200. You need to take a survey about financial problems. While the margin of error is 5%.

Ans :
Population =1200
Margin of error E =5% → 0,05

Sample size n

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

$$n =$$

SAMPLE SIZE

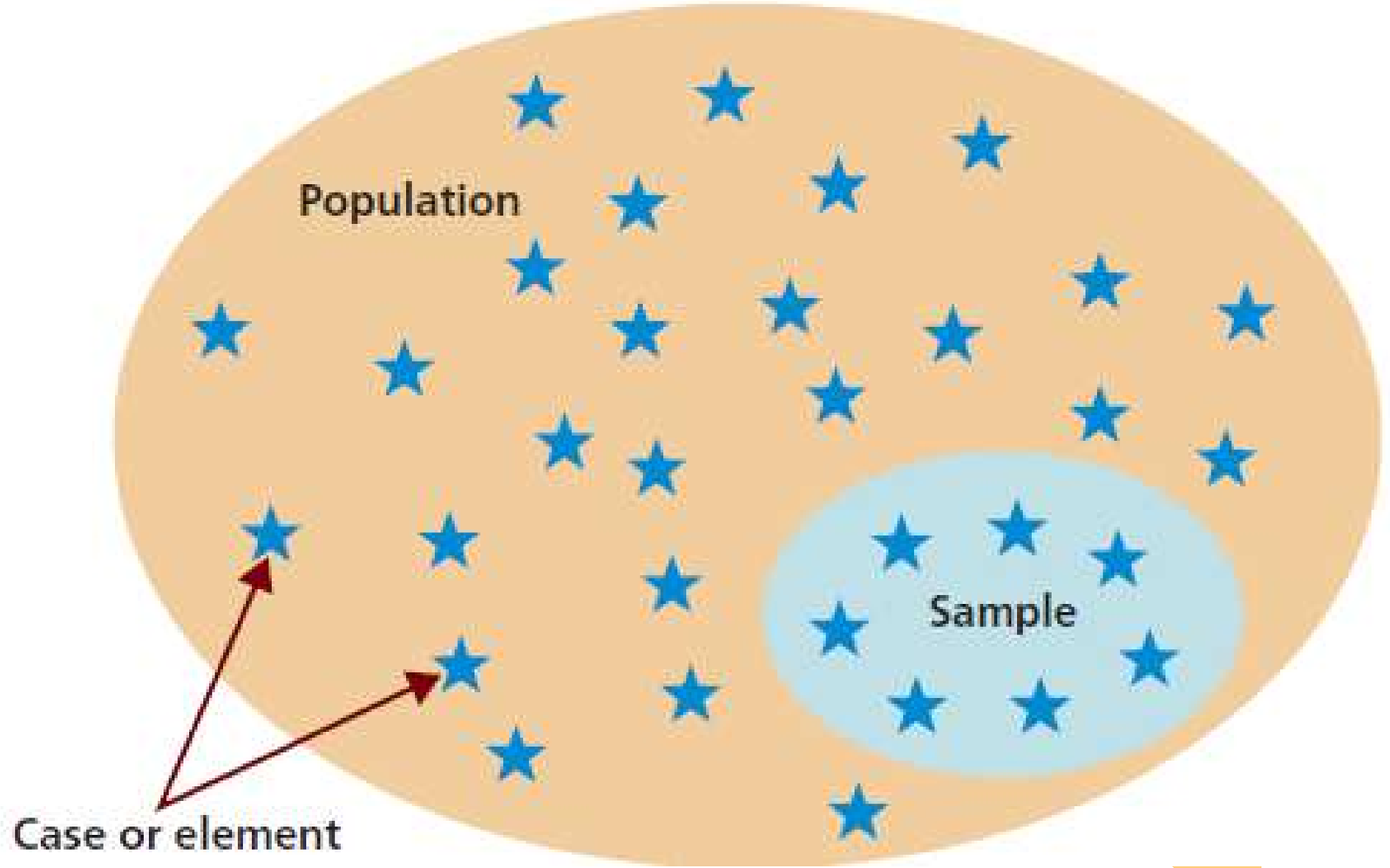
S.No	Scenario	Formula for Sample Size Calculation	Description
1	Sample size for One Sample, Continuous Outcome	$n = (\frac{Z\sigma}{e})^2$	n=is the sample size, Z = Z score from the desired risk, sigma is the standard deviation and e is the margin of error
2	Sample size for proportion (Binomial Data Sample Size)	$n = \frac{z^2pq}{e^2}$	n = sample size z is the standard error associated with the chosen level of confidence p= variability/standard deviation. q=1- p
3	Sample size for Two independent samples proportion (Binomial Data Sample Size)	$n = \{p_1(1-p_1) + p_2(1-p_2)\frac{z^2}{e^2}$	n = sample size z is the standard error associated with the chosen level of confidence p1 and p2 are the proportions of successes in each comparison group
4	Population size is finite and known	$n = \frac{N}{(1+Ne^2)}$	n=sample size N= Population size e= Margin of error
5	Normal distribution: (Single Mean) Two sided	$n = \frac{s^2(Z_{(1-\frac{\alpha}{2})} + Z_{(1-\beta)})^2}{(\mu_0 - \mu_A)^2}$	The quantities $z_{1-\alpha/2}$ and $z_{1-\beta}$ are critical values from the normal distribution.
6	Normal distribution: (Single Mean) One sided	$n = \frac{s^2(Z_{(1-\alpha)} + Z_{(1-\beta)})^2}{(\mu_0 - \mu_A)^2}$	The quantities $z_{1-\alpha}$ and $z_{1-\beta}$ are critical values from the normal distribution.
7	Normal distribution: (Compare means) Two sided	$n = \frac{4{s_p}^2(Z_{(1-\frac{\alpha}{2})} + Z_{(1-\beta)})^2}{(\mu_1 - \mu_2)^2}$	The quantities $z_{1-\alpha/2}$ and $z_{1-\beta}$ are critical values from the normal distribution. Sp – pooled standard deviation
8	Normal distribution: (Compare means) One sided	$n = \frac{4{s_p}^2(Z_{(1-\alpha)} + Z_{(1-\beta)})^2}{(\mu_1 - \mu_2)^2}$	The quantities $z_{1-\alpha}$ and $z_{1-\beta}$ are critical values from the normal distribution. Sp – pooled standard deviation

SAMPLE SIZE

Required Sample Size†

Population Size	Confidence = 95% Margin of Error				Confidence = 99% Margin of Error			
	5.0%	3.5%	2.5%	1.0%	5.0%	3.5%	2.5%	1.0%
10	10	10	10	10	10	10	10	10
20	19	20	20	20	19	20	20	20
30	28	29	29	30	29	29	30	30
50	44	47	48	50	47	48	49	50
75	63	69	72	74	67	71	73	75
100	80	89	94	99	87	93	96	99
150	108	126	137	148	122	135	142	149
200	132	160	177	196	154	174	186	198
250	152	190	215	244	182	211	229	246
300	169	217	251	291	207	246	270	295
400	196	265	318	384	250	309	348	391
500	217	306	377	475	285	365	421	485
600	234	340	432	565	315	416	490	579
700	248	370	481	653	341	462	554	672
800	260	396	526	739	363	503	615	763
1,000	278	440	606	906	399	575	727	943
1,200	291	474	674	1067	427	636	827	1119
1,500	306	515	759	1297	460	712	959	1376
2,000	322	563	869	1655	498	808	1141	1785
2,500	333	597	952	1984	524	879	1288	2173
3,500	346	641	1068	2565	558	977	1510	2890
5,000	357	678	1176	3288	586	1066	1734	3842
7,500	365	710	1275	4211	610	1147	1960	5165
10,000	370	727	1332	4899	622	1193	2098	6239
25,000	378	760	1448	6939	646	1285	2399	9972
50,000	381	772	1491	8056	655	1318	2520	12455
75,000	382	776	1506	8514	658	1330	2563	13583
100,000	383	778	1513	8762	659	1336	2585	14227
250,000	384	782	1527	9248	662	1347	2626	15555
500,000	384	783	1532	9423	663	1350	2640	16055
1,000,000	384	783	1534	9512	663	1352	2647	16317
2,500,000	384	784	1536	9567	663	1353	2651	16478
10,000,000	384	784	1536	9594	663	1354	2653	16560
100,000,000	384	784	1537	9603	663	1354	2654	16584
300,000,000	384	784	1537	9603	663	1354	2654	16586

SAMPLE SIZE



DESAIN PENELITIAN

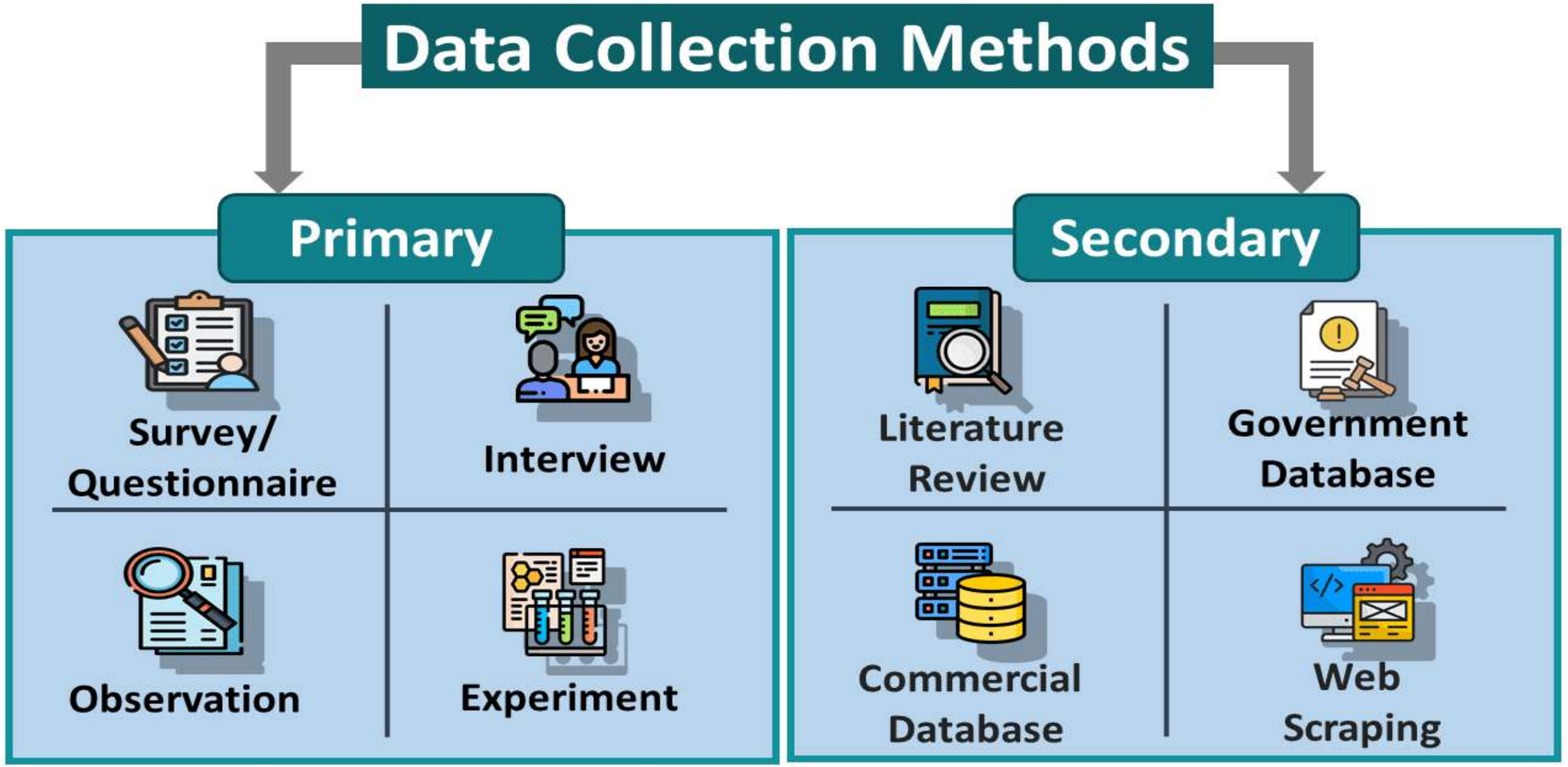
Quantitative data

- Administrative data collection
  - financial data
  - performance data
  - resource allocation
  - school census
- Surveys and questionnaires
  - door-to-door
  - election-type polls
  - national census
  - phone interviews
  - school/teacher interviews

Qualitative data

- Case studies
- Content analysis
- Focus groups
- Interviews (individual, community)
- Observations
- Research (action research)
- School inspections (formal education)
- Story-telling

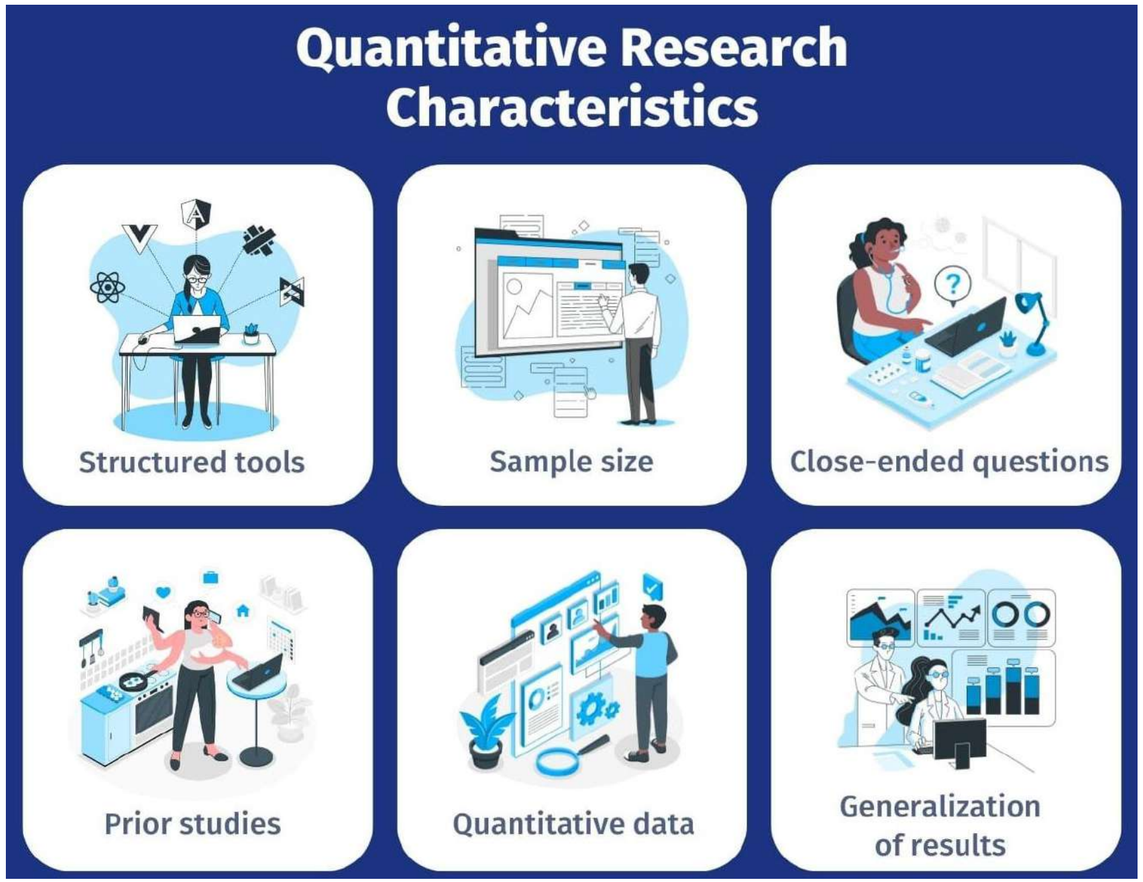
DESAIN PENELITIAN



DESAIN PENELITIAN

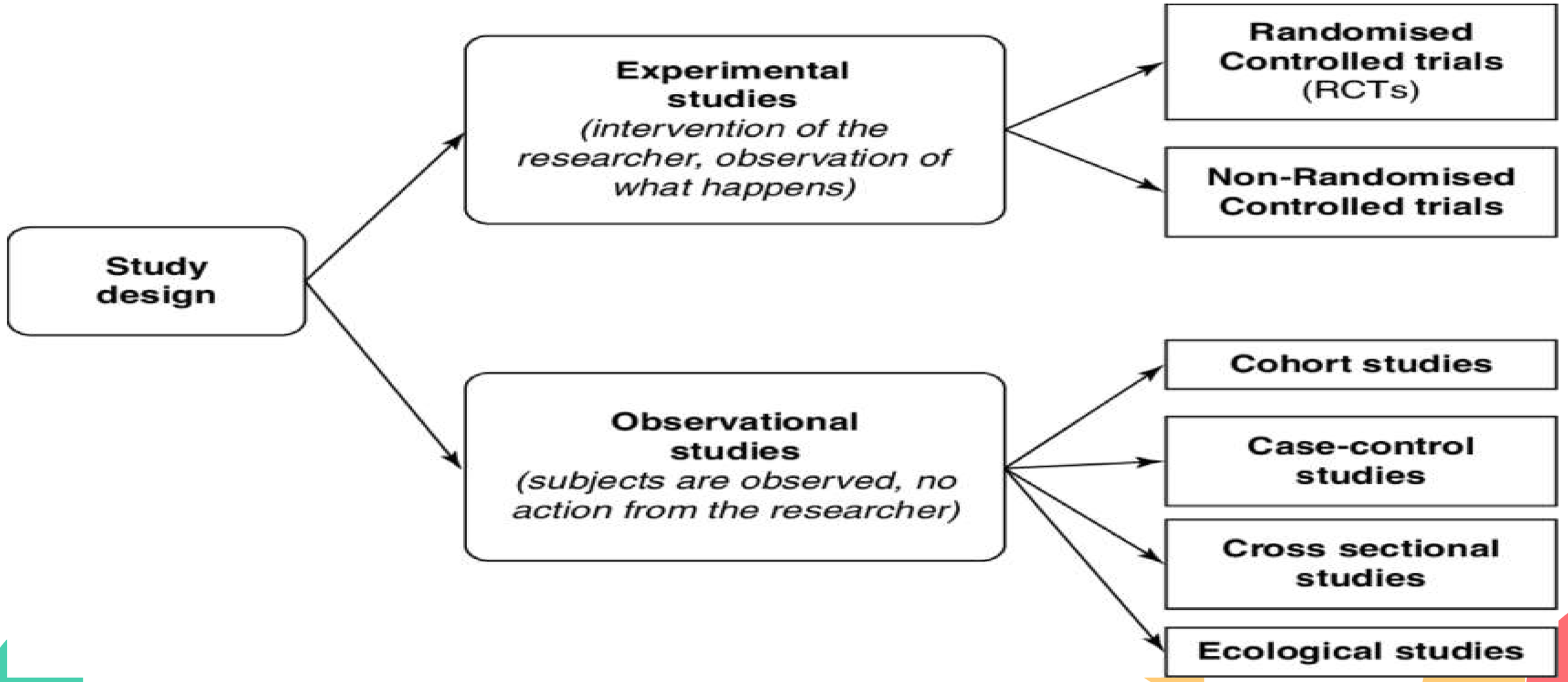
DATA COLLECTION METHODS	BENEFITS	LIMITATIONS
Individual interview	• Allows participants to express their own ideas • Allows interviewer to be responsive to individual differences and situational circumstances	• Minimal control over the order in which the topics are covered • Usually small sample size limited due to cost and time
Focus group interview	• Allows organised discussion structured in a flexible way • Provides opportunity for all to participate and give their opinions • Dominant and submissive participants can be directed and controlled • Discussion generated between participants • Large quantity of information collected in a short amount of time	• Researcher has less control over the flow of discussion • Facilitating focus group interviews requires considerable skill • Difficult to distinguish between individual view and group view • More difficult to organise and order data for analysis
Involved observation	• Allows researcher immersion and prolonged involvement with participants • Encourages free and open conversation with the participants	• Altered behaviours of observed groups by the presence of the researcher • Takes time to build trust with participants
Detached observation	• Reveals descriptions of behaviours by stepping outside the group • Allows identification of recurring patterns of behaviours that participants may be unable to recognise or reveal themselves	• Potential researcher bias in the design of a study • Sources or participants may not be equally credible • Analysis of observation can be biased

DESAIN PENELITIAN



Format	Example	Description
Closed ended question	Would you recommend our service? ☐ Yes ☐ No	Predetermined list of responses are provided
Open ended question	What are your reasons for choosing our health service? _____	No predetermined answers and allows for creative expressions
Numerical rating scale	How would you rate your pain level? No pain — Moderate pain — Worst pain 0 1 2 3 4 5 6 7 8 9 10	Simple rating that quantifies attitudes, emotions opinions on a scale
Symbols	Please rate your experience with us	Simple to use and can evoke responses from children or those with literacy problems
Adjectival scale	The service provided by the doctor was Worst imaginable · Awful · Poor · OK · Good · Excellent · Best imaginable	Provides adjectival descriptions as an add-on to define attitudes and opinions
Likert scale	The course material was well organised Strongly agree · Agree · Neutral · Disagree · Strongly disagree	The scale is framed on an agree-disagree continuum

DESAIN PENELITIAN



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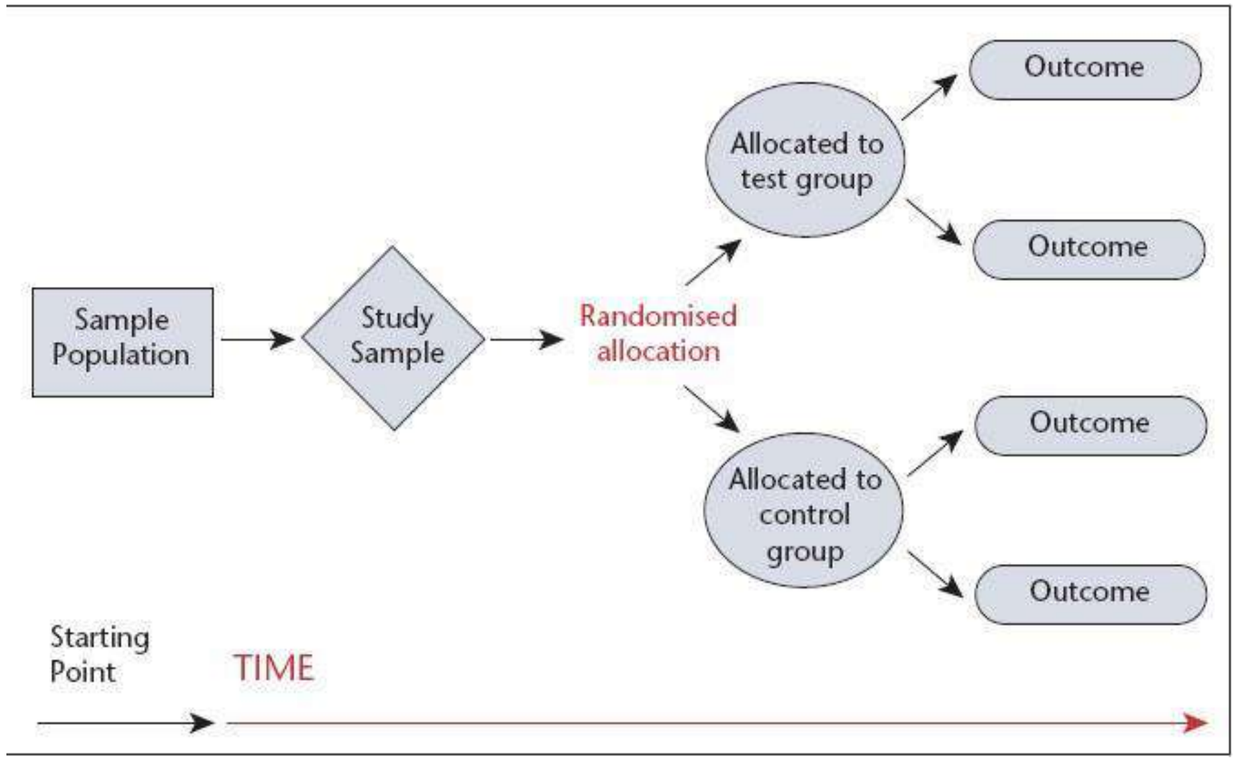
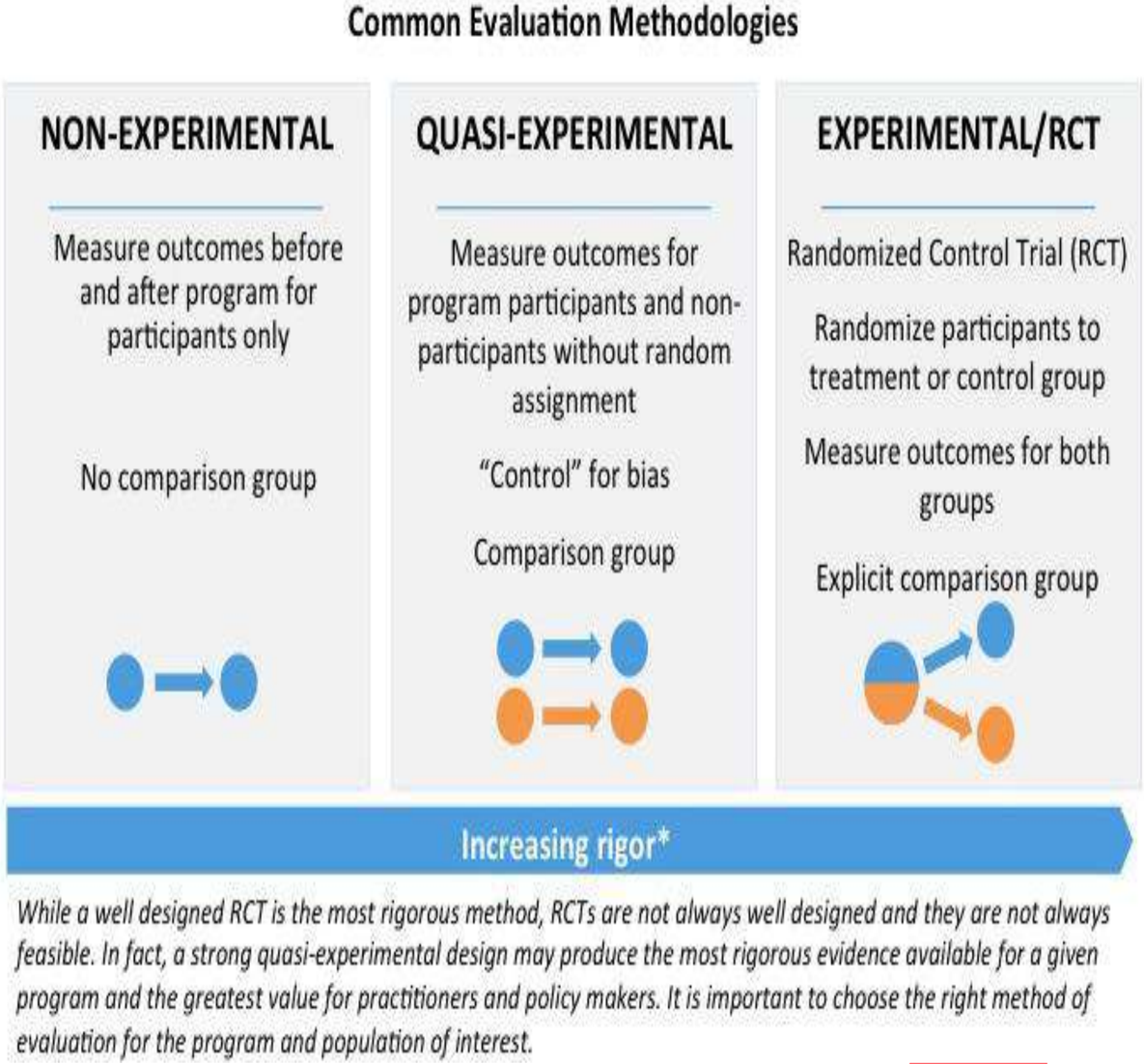
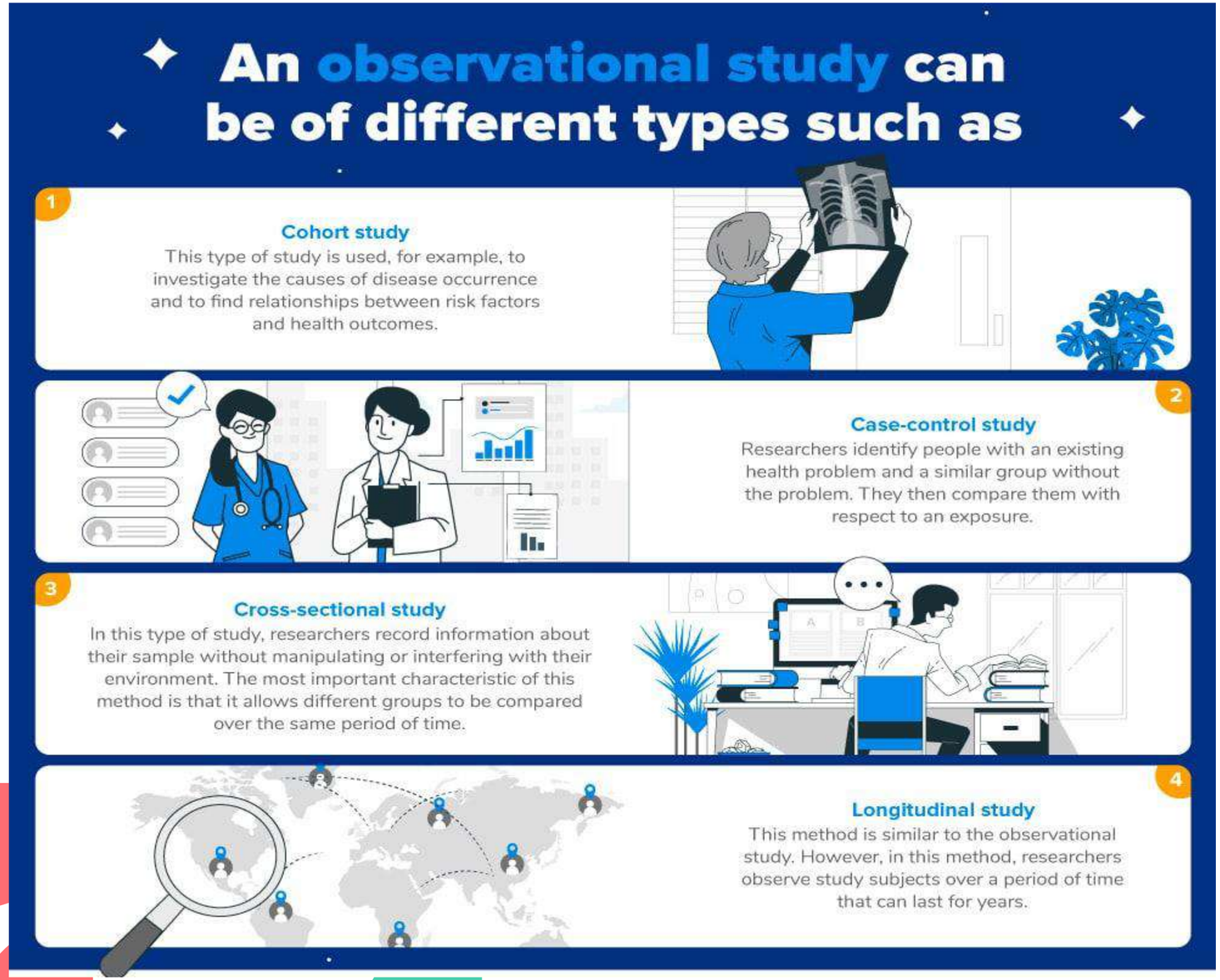
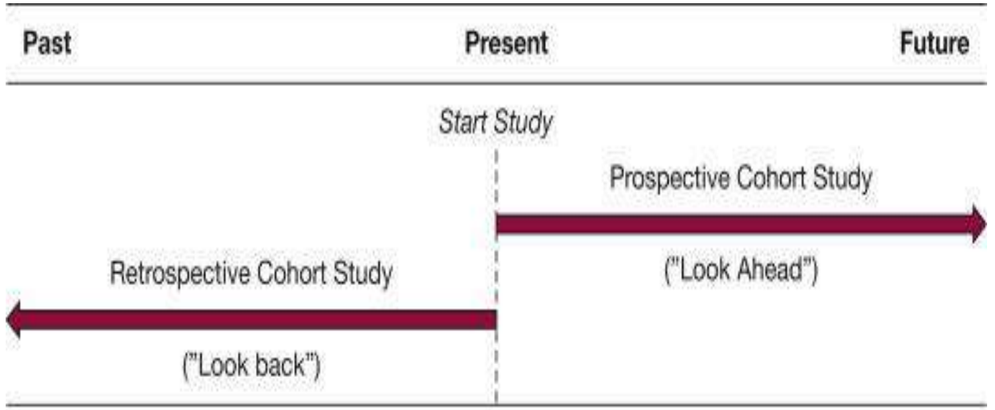


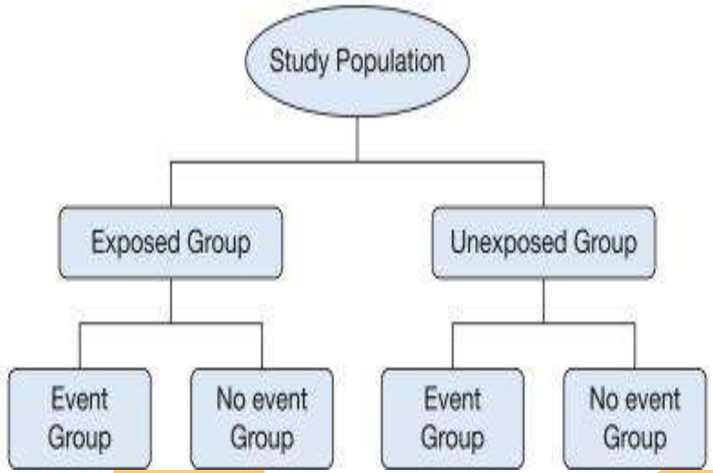


RCT, meaning **randomized controlled trial**, is a study design where participant are randomly assigned to either an experimental or control group. It measures the effectiveness of the intervention or treatment. The key elements in an RCT include the treatment, experimental group, and control group.

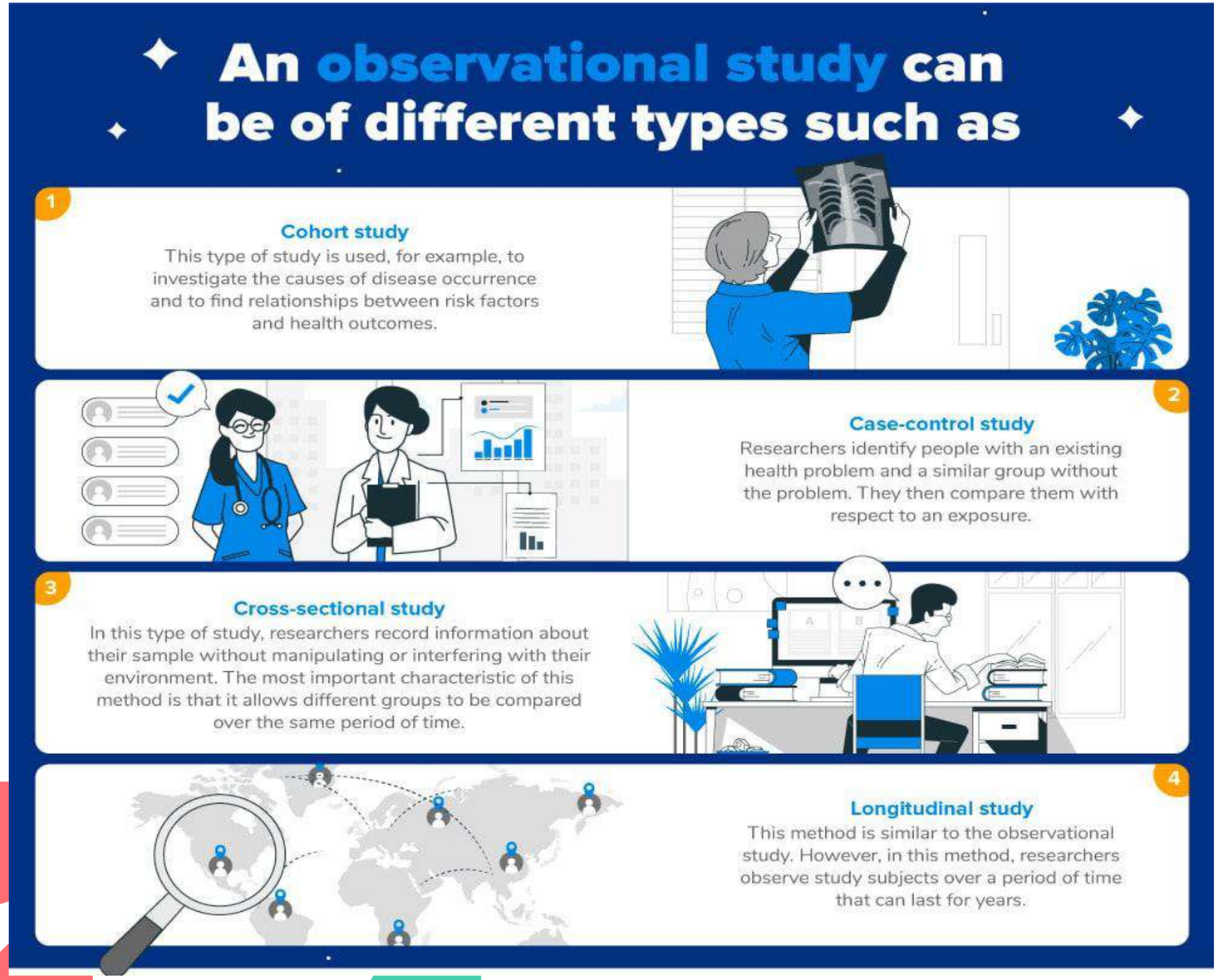
DESAIN PENELITIAN

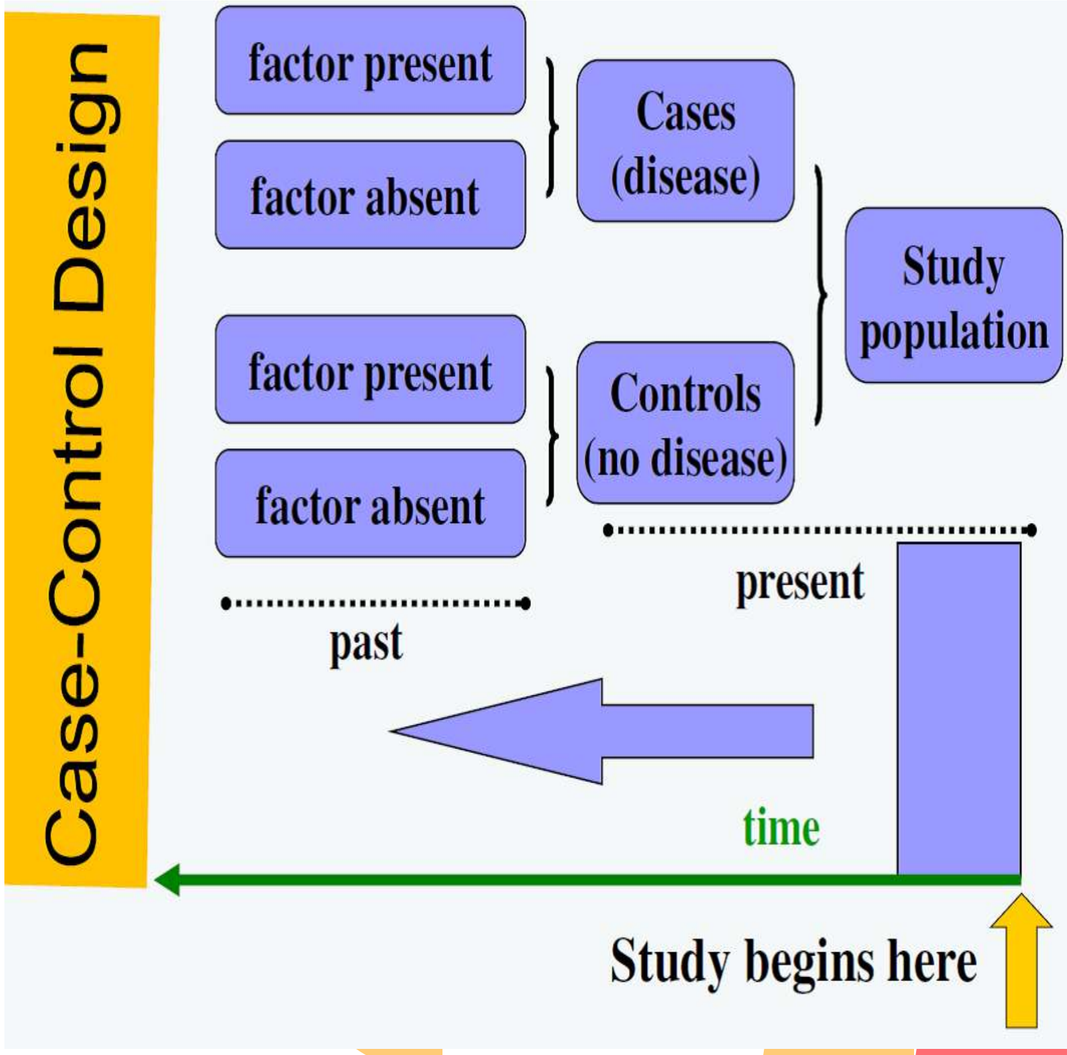






DESAIN PENELITIAN





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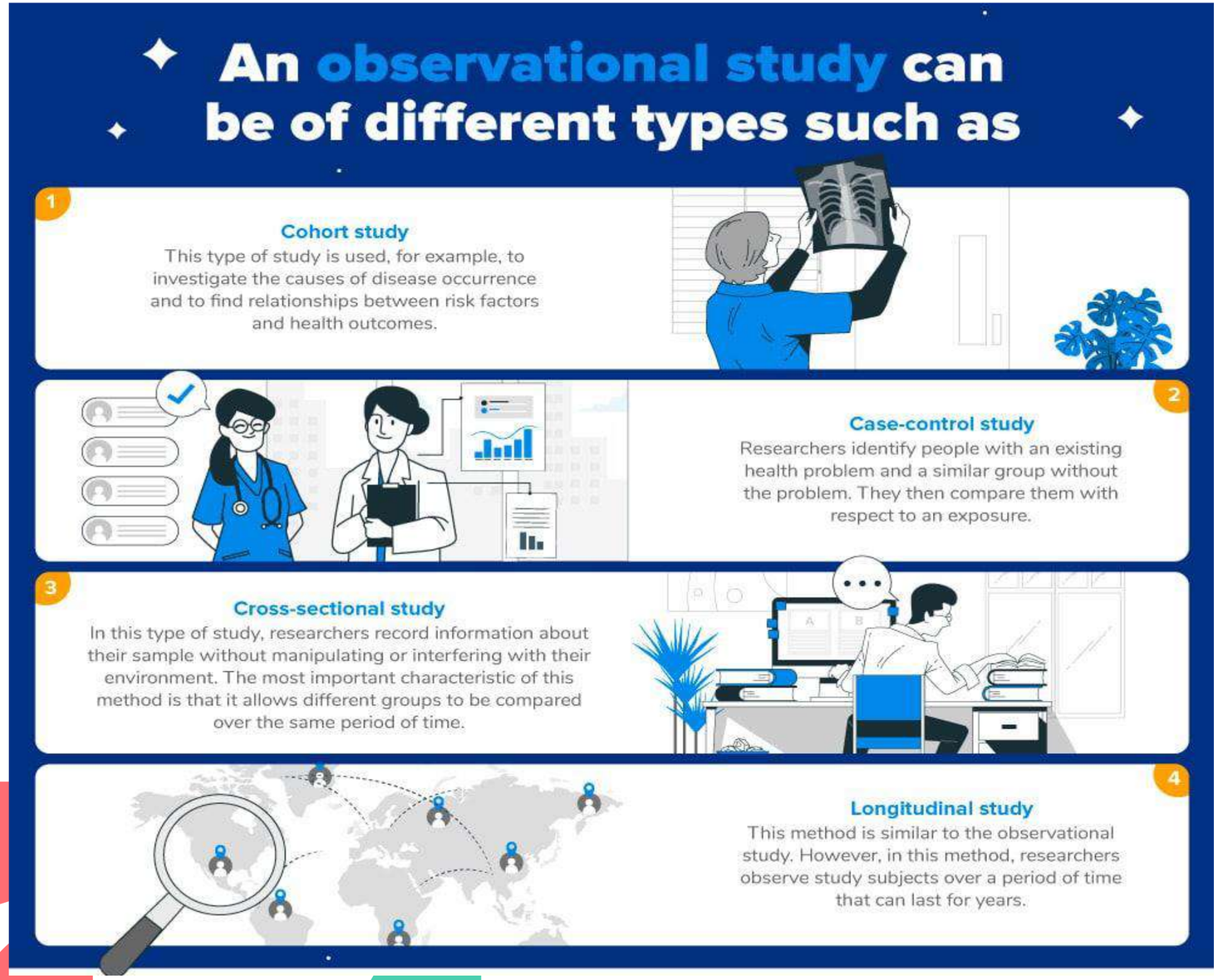
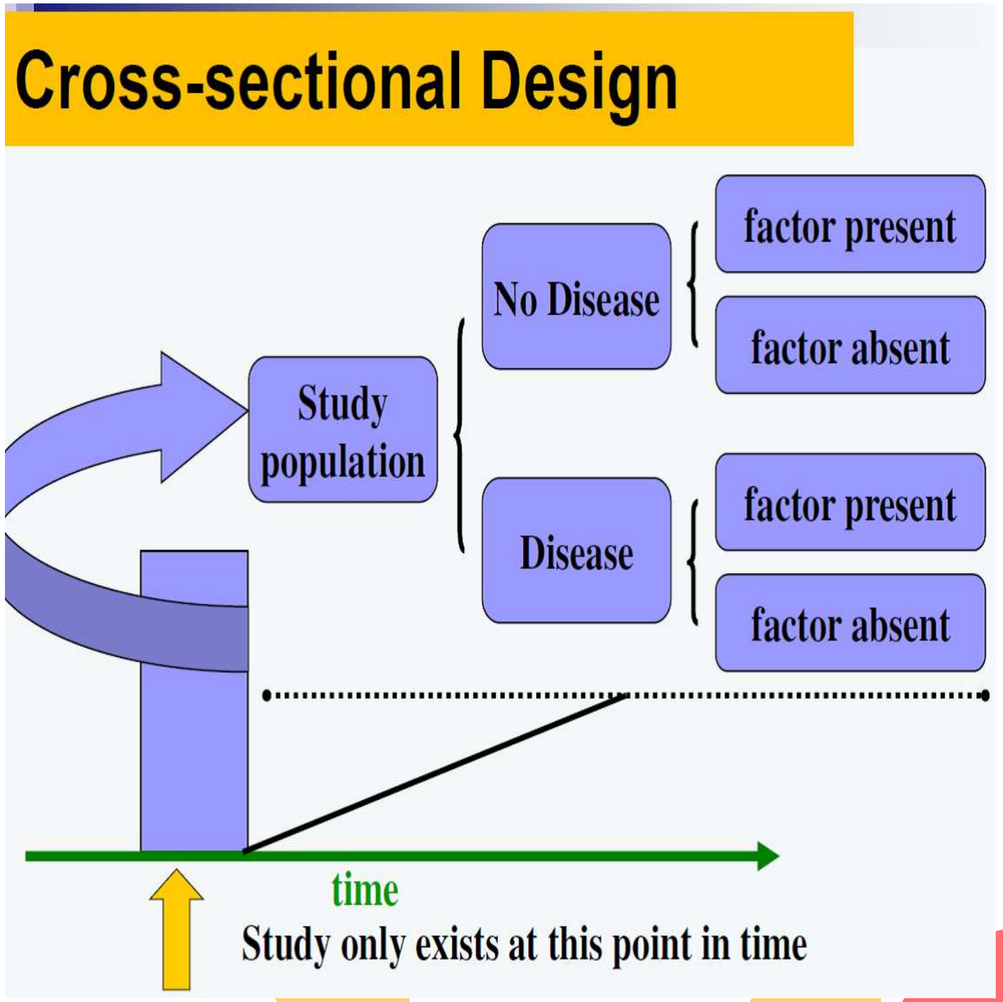




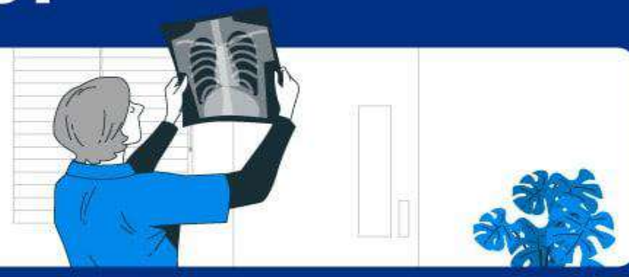
DESAIN PENELITIAN

An observational study can be of different types such as

1

Cohort study

This type of study is used, for example, to investigate the causes of disease occurrence and to find relationships between risk factors and health outcomes.



2

Case-control study

Researchers identify people with an existing health problem and a similar group without the problem. They then compare them with respect to an exposure.

3

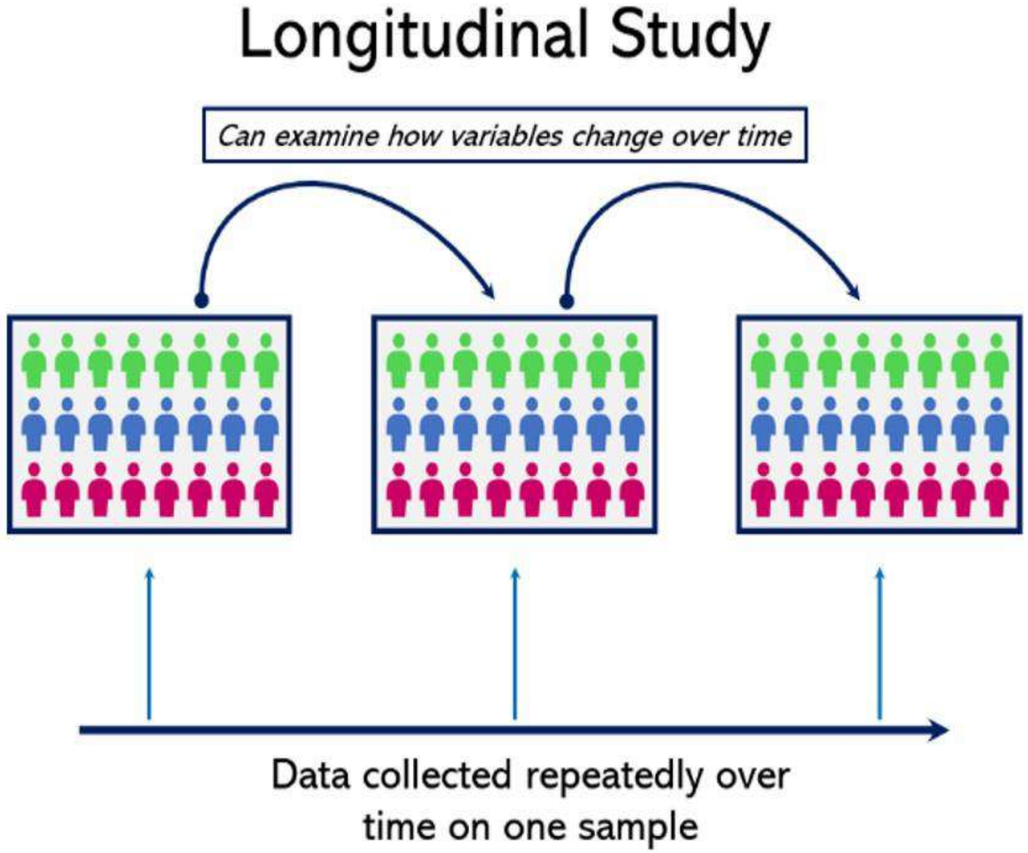
Cross-sectional study

In this type of study, researchers record information about their sample without manipulating or interfering with their environment. The most important characteristic of this method is that it allows different groups to be compared over the same period of time.

4

Longitudinal study

This method is similar to the observational study. However, in this method, researchers observe study subjects over a period of time that can last for years.



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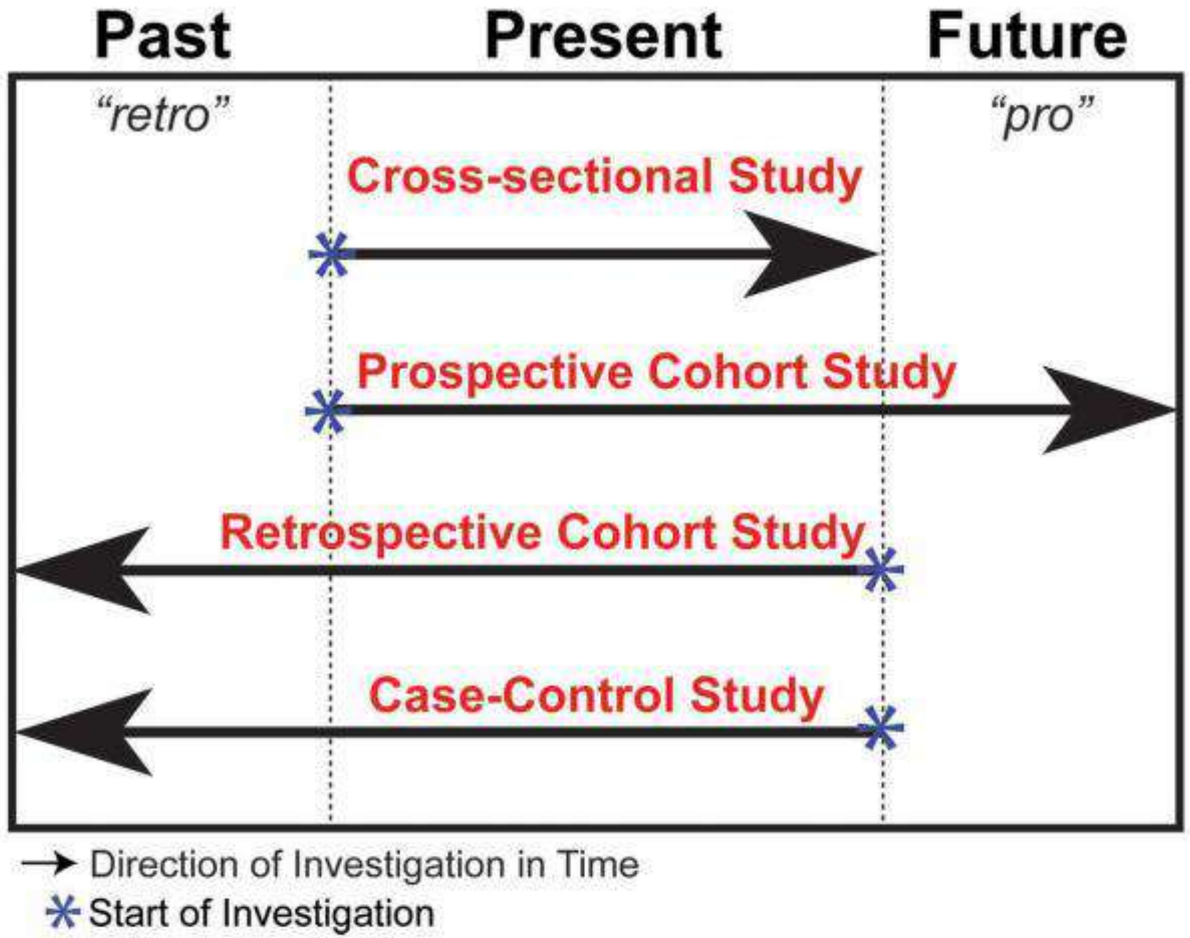
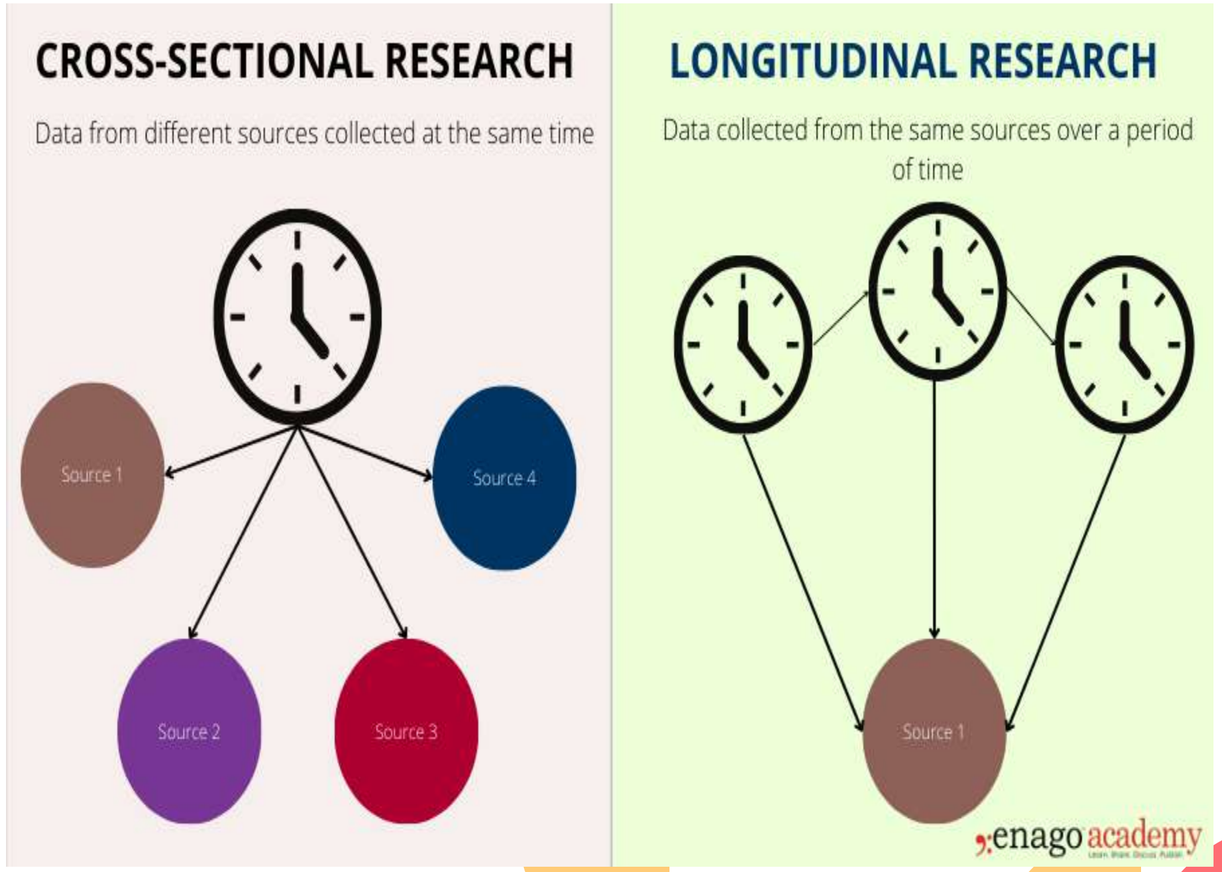
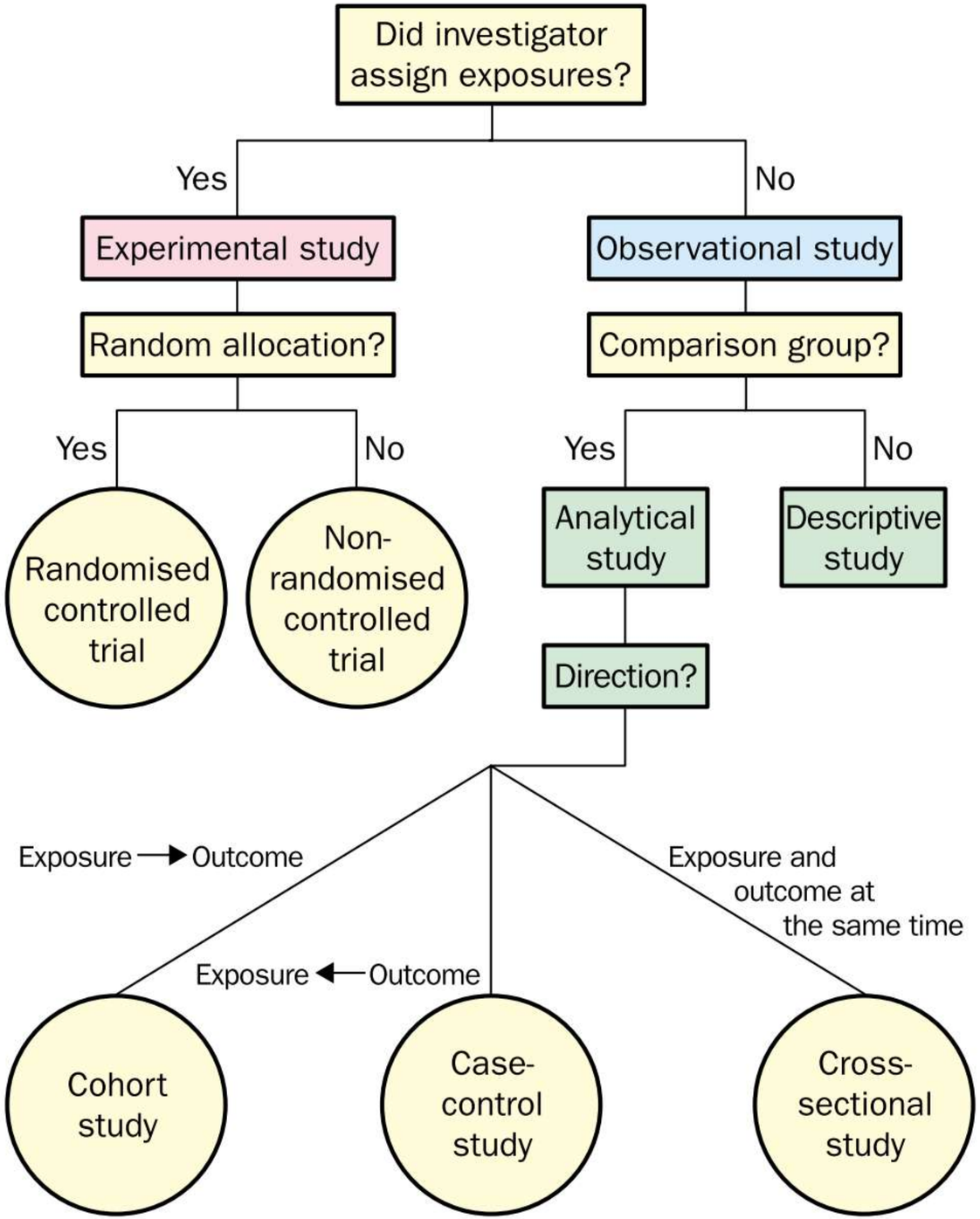
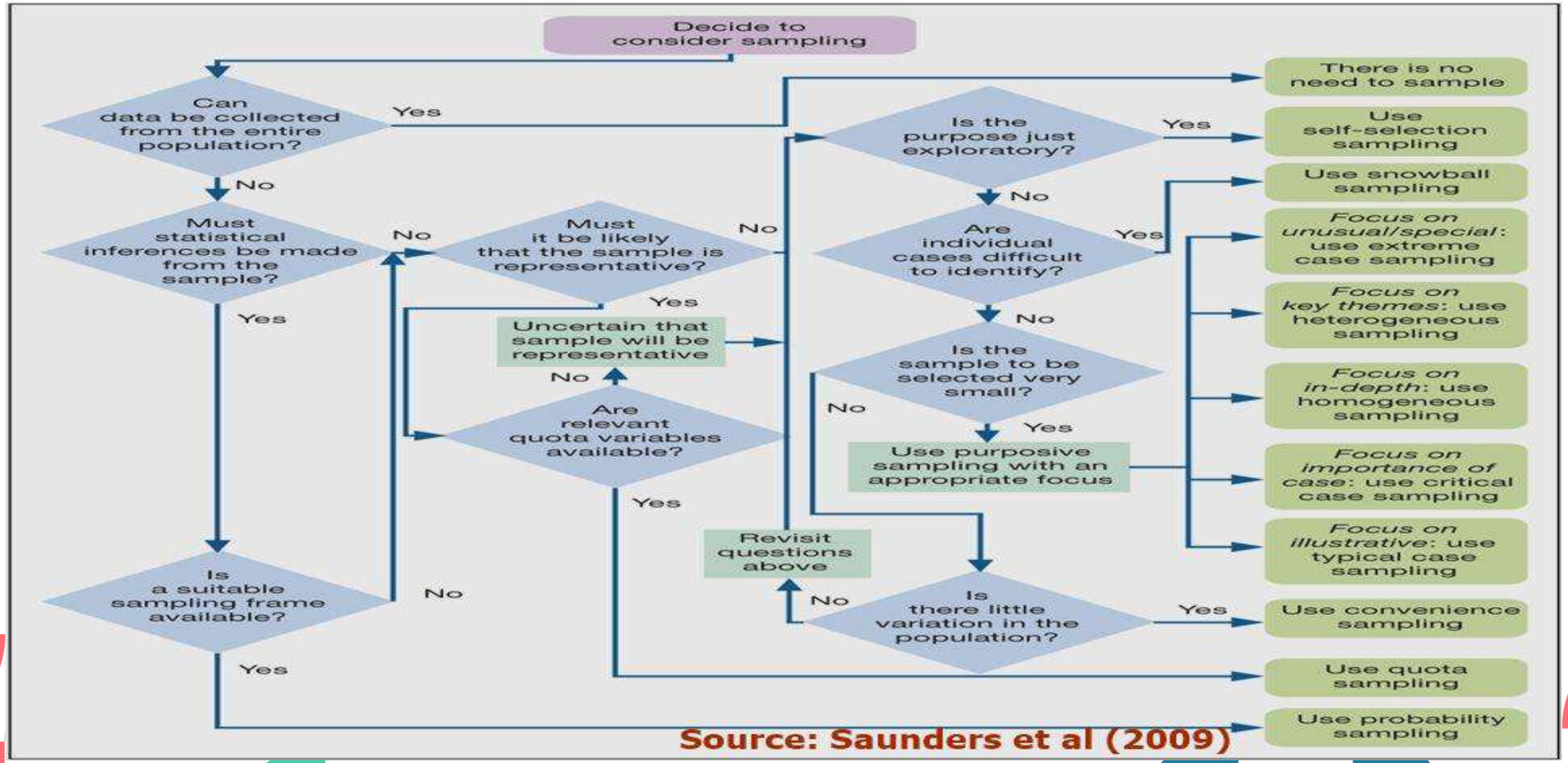




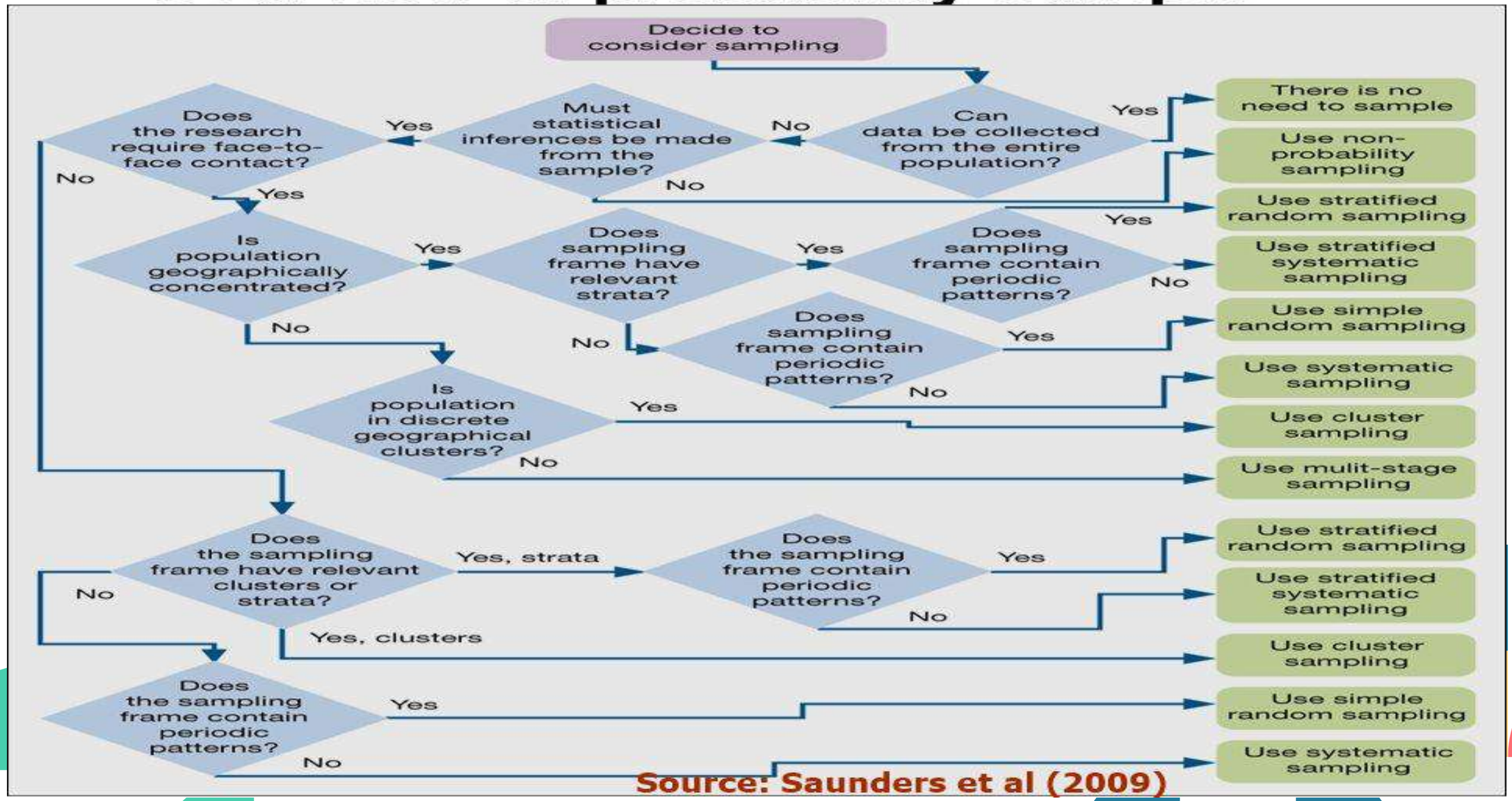

Did investigator assign exposures?
Yes
No
Experimental study
Observational study
Random allocation?
Comparison group?
Yes
No
Yes
No
Randomised controlled trial
Non-randomised controlled trial
Analytical study
Descriptive study
Direction?
Exposure → Outcome
Exposure ← Outcome
Exposure and outcome at the same time
Cohort study
Case-control study
Cross-sectional study

Overview of non-probability sample



Source: Saunders et al (2009)

Overview of probability sample



Source: Saunders et al (2009)

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2. Rawung, D. T. (2020). BAHAN AJAR. https://pusdiklat.bps.go.id/diklat/bahan_diklat/BA_2144.pdf
3. Taherdoost, H. (2018). Sampling Methods in Research Methodology; How to Choose a Sampling Technique for Research. SSRN Electronic Journal. https://doi.org/10.2139/SSRN.3205035

THANK YOU

STIKES NOTOKUSUMO YOGYAKARTA

STATISTIKA KESEHATAN

Pertemuan 3

apt. Trifonia RK., M.Biotech

TOPIK BAHASAN

- Data kualitatif dan kuantitatf
- Bentuk penyajian data

DATA

Pengertian

DATA adalah sekumpulan angka-angka yang berhubungan dengan observasi, menunjukkan sebuah fakta

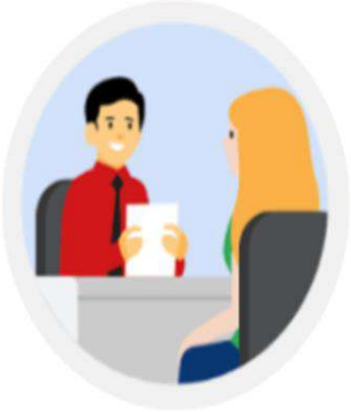
Data statistik memiliki ciri :

- Berupa data kuantitatif
- Dikumpulkan menurut metode statistik
- Nilai satu dengna nilai lain dalam suatu data dapat saling dibandingkan

DATA

Types of Research

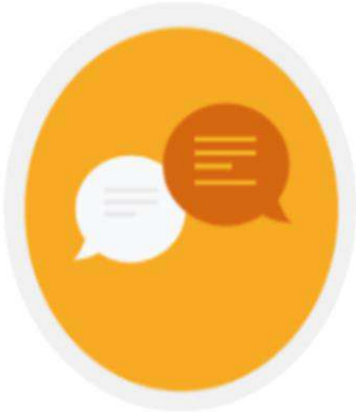
Who conducts the research



Primary research

Secondary research

Type of data collected



Qualitative research

Quantitative research

DATA

Quantitative data are measures of values or counts and are expressed as numbers.

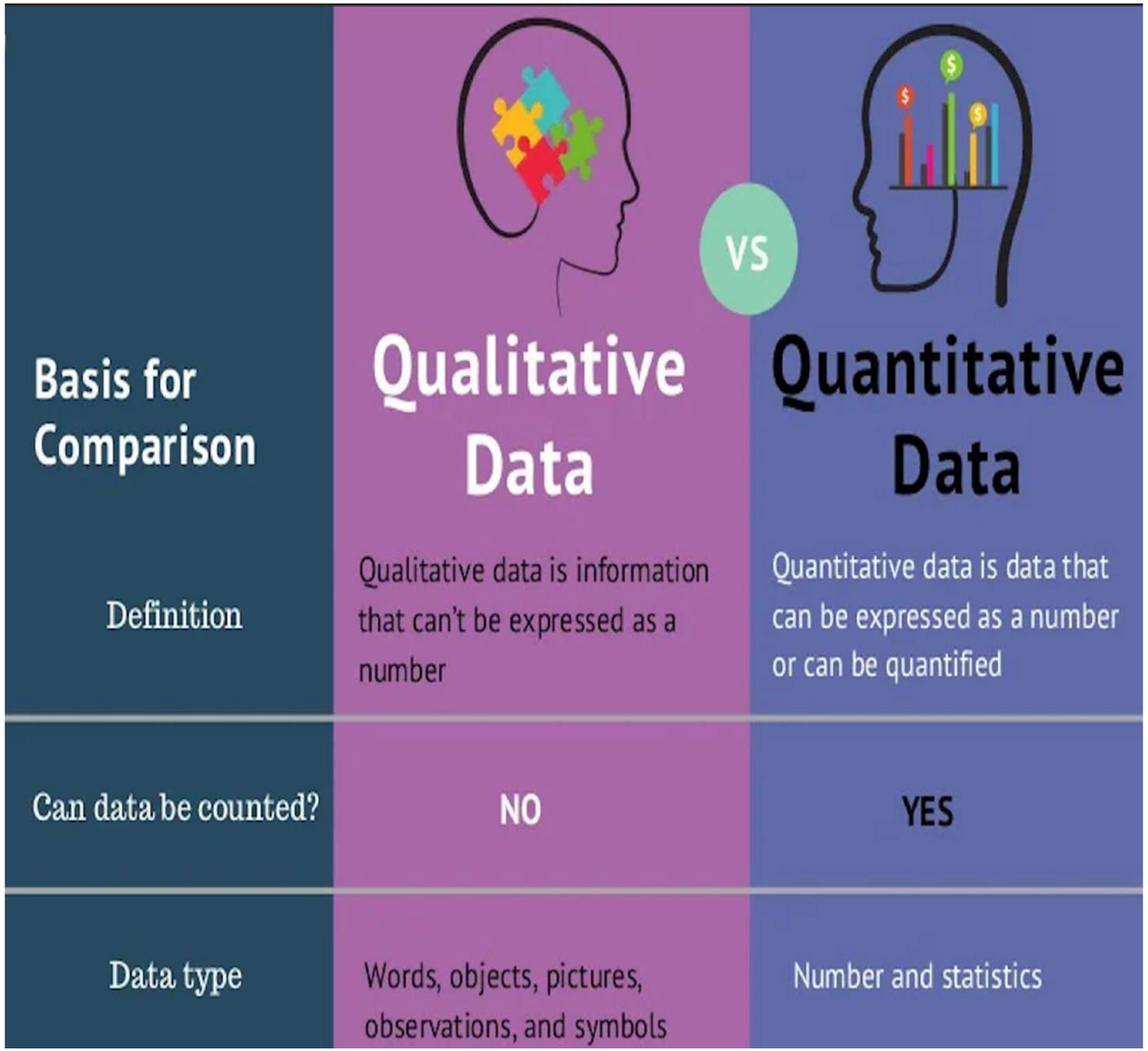
- Data about **numeric variables** (e.g. how many, how much or how often).

Qualitative data are measures of 'types' and may be represented by a name, symbol, or a number code.

- Qualitative data are **data about categorical variables** (e.g. what type).

Quantitative vs. Qualitative Data

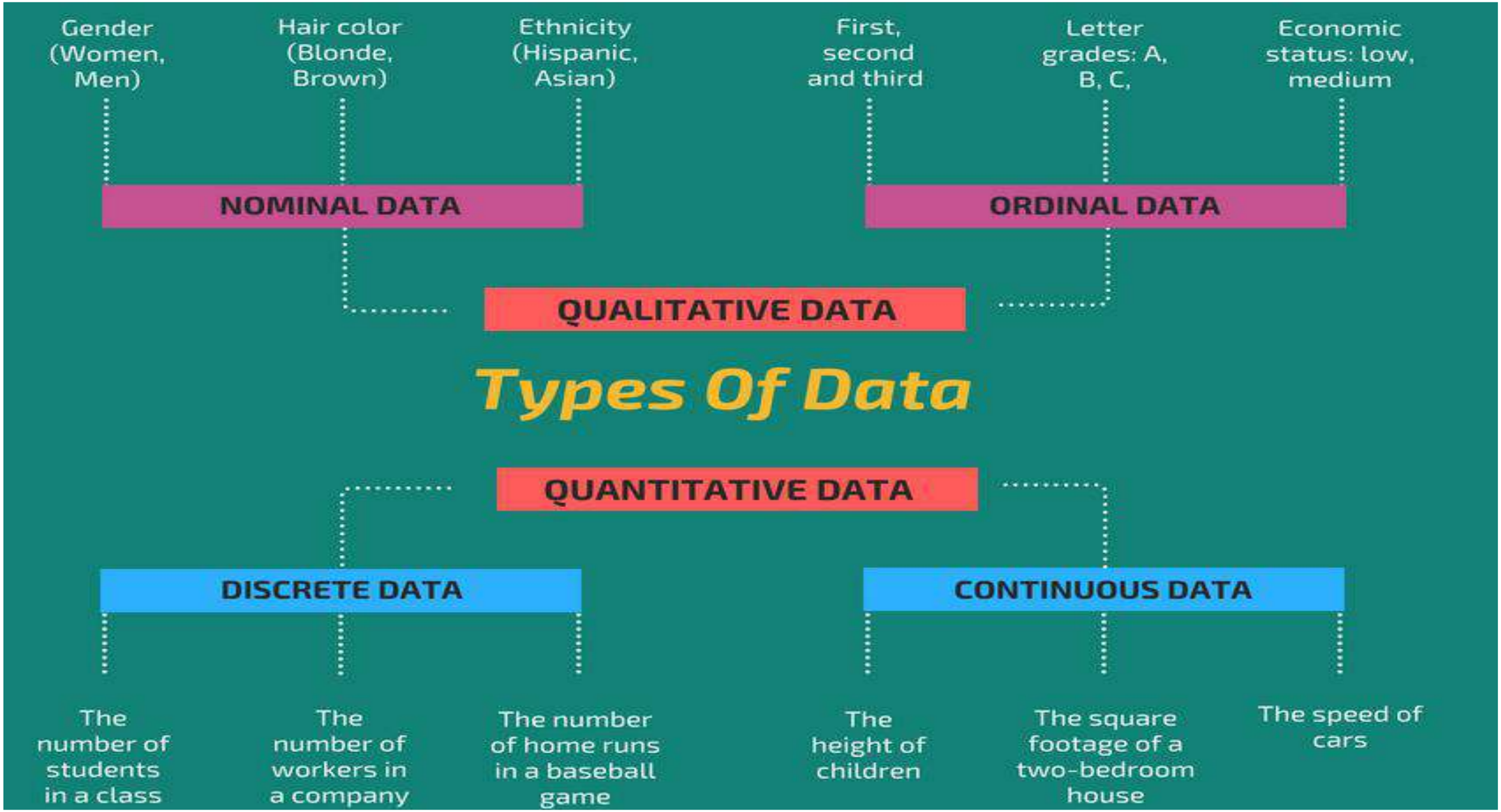
- If you've got numerical data, you've got **quantitative** data.
- If you don't have numbers, you've got **qualitative** data (non-numerical, or also called categorical data).



DATA

Example of how quantitative and qualitative data can be gathered from the same data unit

Data unit	Numeric variable = Quantitative data		Categorical variable = Qualitative data	
A person	"How many children do you have?"	4 children	"In which country were your children born?"	Australia
	"How much do you earn?"	$60,000 p.a.	"What is your occupation?"	Photographer
	"How many hours do you work?"	38 hours per week	"Do you work full-time or part-time?"	Full-time
A house	"How many square metres is the house?"	200 square metres	"In which city or town is the house located?"	Brisbane
A business	"How many workers are currently employed?"	264 employees	"What is the industry of the business?"	Retail
A farm	"How many milk cows are located on the farm?"	36 cows	"What is the main activity of the farm?"	Dairy

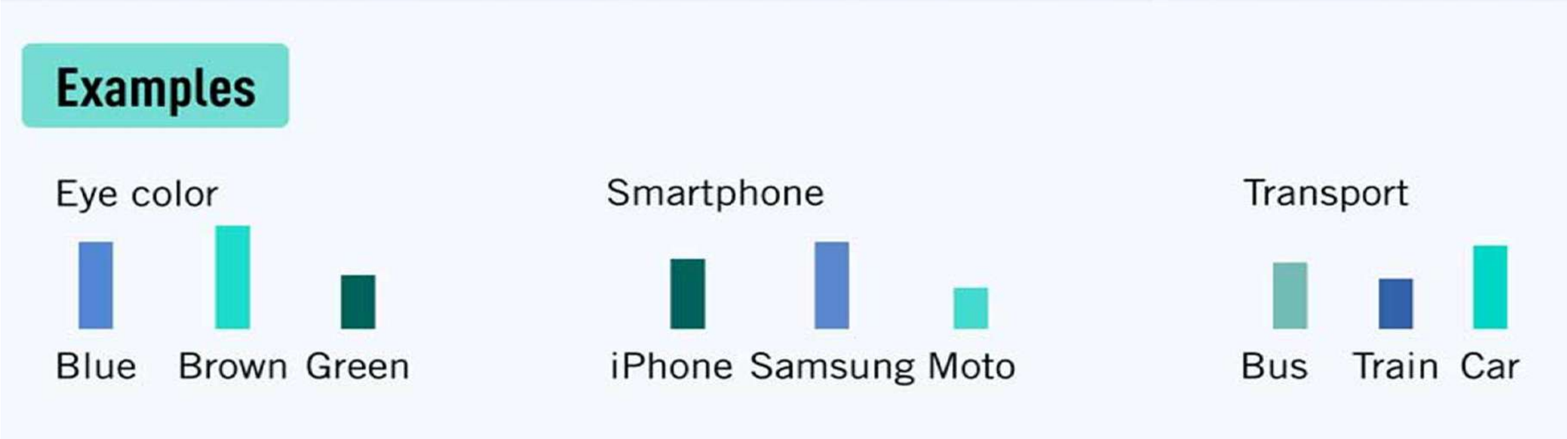

Gender (Women, Men)
Hair color (Blonde, Brown)
Ethnicity (Hispanic, Asian)
First, second and third
Letter grades: A, B, C,
Economic status: low, medium
NOMINAL DATA
ORDINAL DATA
QUALITATIVE DATA
Types Of Data
QUANTITATIVE DATA
DISCRETE DATA
CONTINUOUS DATA
The number of students in a class
The number of workers in a company
The number of home runs in a baseball game
The height of children
The square footage of a two-bedroom house
The speed of cars

DATA

Nominal is a data (also known as nominal scale) type of data that is used to **label variables** without providing any quantitative value. It is the simplest form of a scale of measure.

Characteristics :

- Can never be quantified
- Absence of order
- Qualitative property
- Cant calculate
- Conclude a mode
- Data is mostly alphabetical



DATA

Ordinal data is a statistical type of quantitative data in which variables exist in naturally occurring **ordered categories**. Likert Scale is a popular example of this data. However, it cannot be used to determine the distance between the two categories.

The main difference between ordinal and nominal data is that ordinal has an order of categories while nominal doesn’t.

Characteristics :

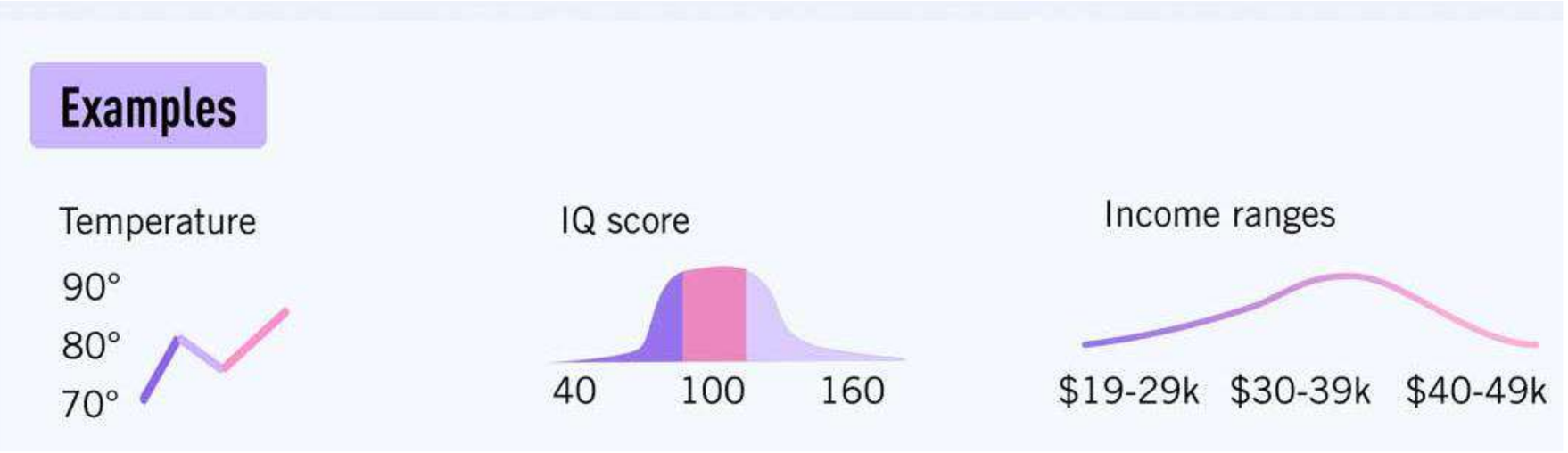
- Establish a relative rank
- Value of interval is unknown
- Measure non-numeric traits
- Add-on to nominal data
- Ordinal data has a median

DATA

Interval data, also called an integer, is defined as a data type which **is measured along a scale**, in which each point is placed at equal distance from one another. Interval data always appears in the form of numbers or numerical values where the distance between the two points is standardized and equal

Characteristics :

- Measurement
- Interval Difference
- Calculation
- Point Zero

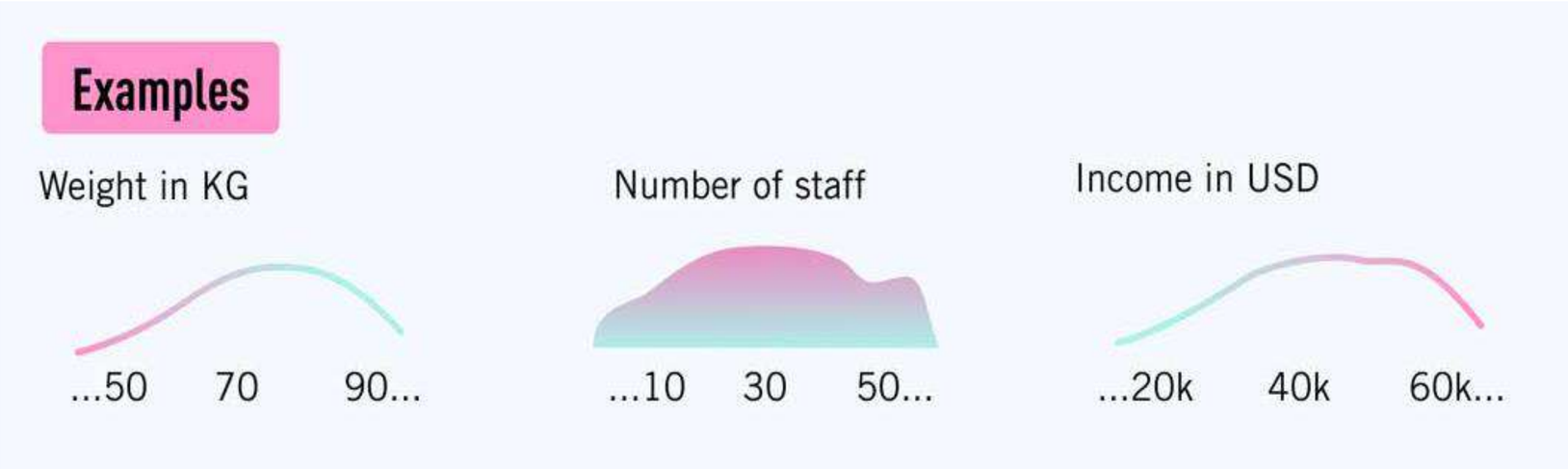


DATA

Ratio Data is defined as quantitative data, having the same properties as interval data, with an equal and definitive ratio between each data and **absolute "zero"** being treated as a point of origin. In other words, **there can be no negative numerical** value in ratio data.

Characteristics :

- Absolute Point Zero
- No Negative Numerical Value
- Calculation



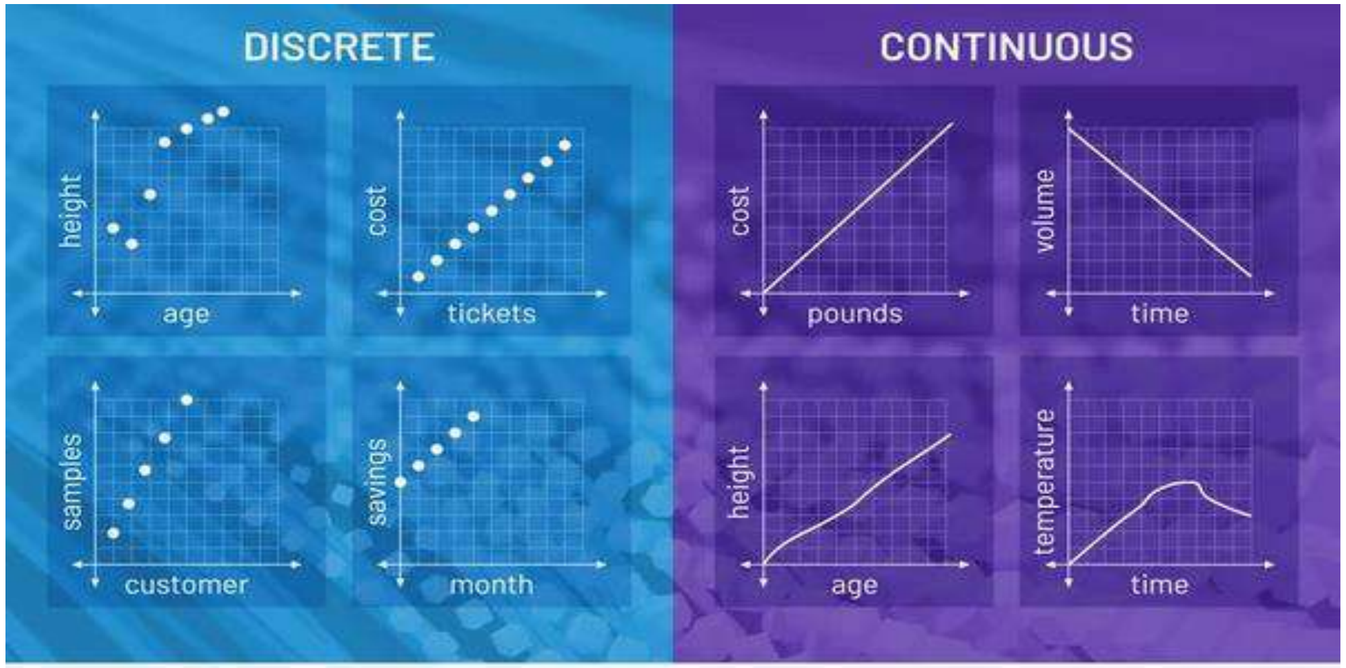
DATA

Discrete data is a numerical type of data that includes whole, concrete numbers with specific and fixed data values determined by counting.

Continuous data includes complex numbers and varying data values measured over a particular time interval.

Examples

Discrete	Continuous
• # of eggs in a basket • # of kids in a class • # of Facebook likes • # of diaper changes in a day • # of wins in a season • # of votes in an election	• Weight difference to 8 decimals before and after cookie binge. • Wind speed • Water temperature • Volts of electricity



Statistical data presentation

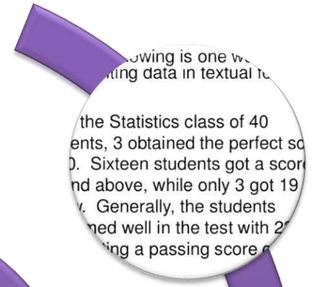
01 Since most data are available to researchers in a **raw format**, they must be **summarized, organized, and analyzed** to usefully derive information from them.

02 Furthermore, each data set needs to be presented in a certain way depending on what it is used for.

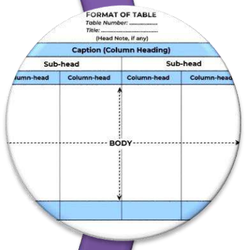
03 Planning how the data will be presented is essential before appropriately processing raw data.

Statistical data presentation

Data can be presented in one of the three ways:



as text



in tabular form

in graphical form

Presentation of data

- **Tabular**
  - Simple table
  - complex table
- **Graphical**
  - For quantitative data
    1. Histogram
    2. Frequency polygon
    3. Frequency curve
    4. Line chart
    5. Normal distribution curve
    6. Cumulative distribution curve
    7. Scatter diagram
  - For qualitative data
    1. Bar chart
    2. Pictogram
    3. Pie chart
    4. Map diagram

Statistical data presentation

Text is the main method of **conveying information** as it is used to explain results and trends, and provide contextual information.

Data are fundamentally presented in paragraphs or sentences. Text can be used to provide **interpretation or emphasize certain data**.

If quantitative information to be conveyed consists of one or two numbers, it is more appropriate to use written language than tables or graphs

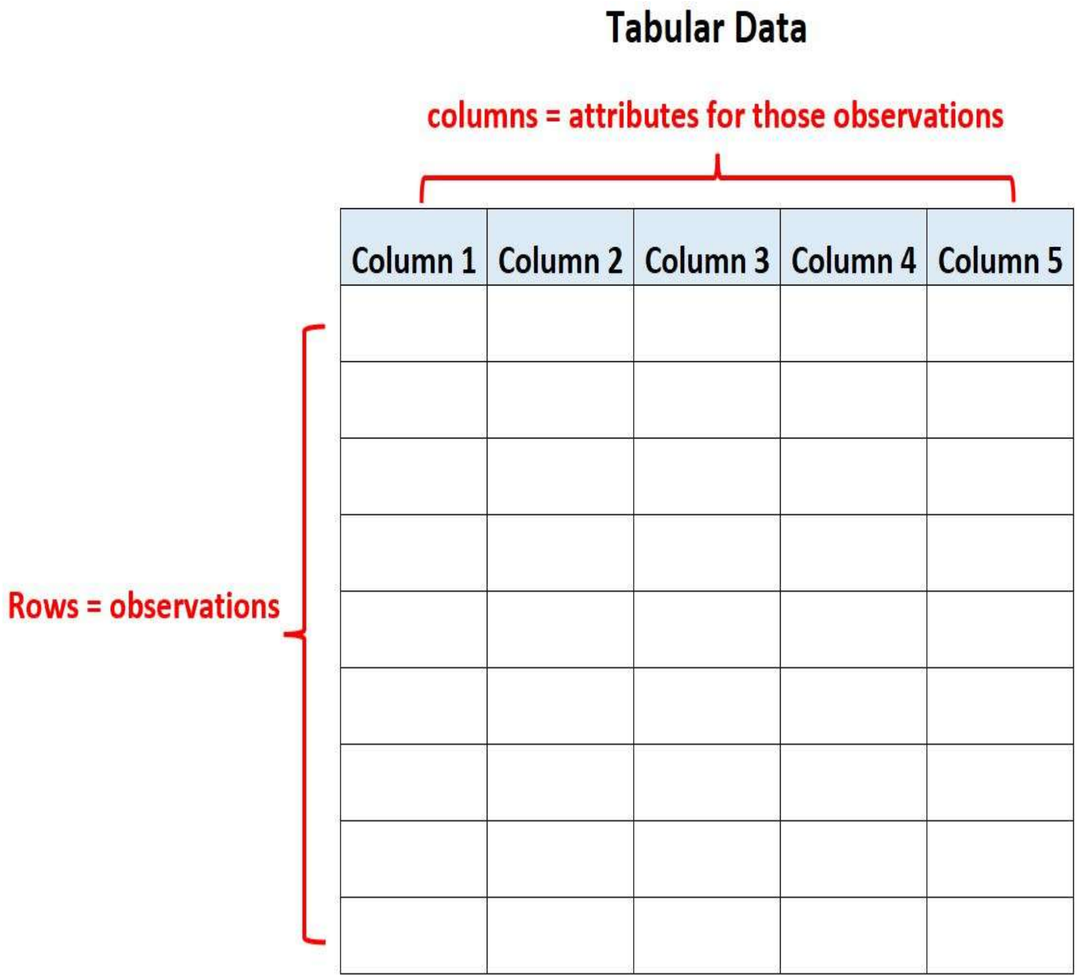
“The incidence rate of delirium following anesthesia was 11% in 2016 and 15% in 2017; no significant difference of incidence rates was found between the two years”

Statistical data presentation

Tables, which convey information that has been converted into words or numbers in **rows and columns**,

Tables are the most appropriate for **presenting individual information**, and can present both quantitative and qualitative information.

The strength of tables is that they can **accurately present information** that cannot be presented with a graph. A number such as “132.145852” can be accurately expressed in a table

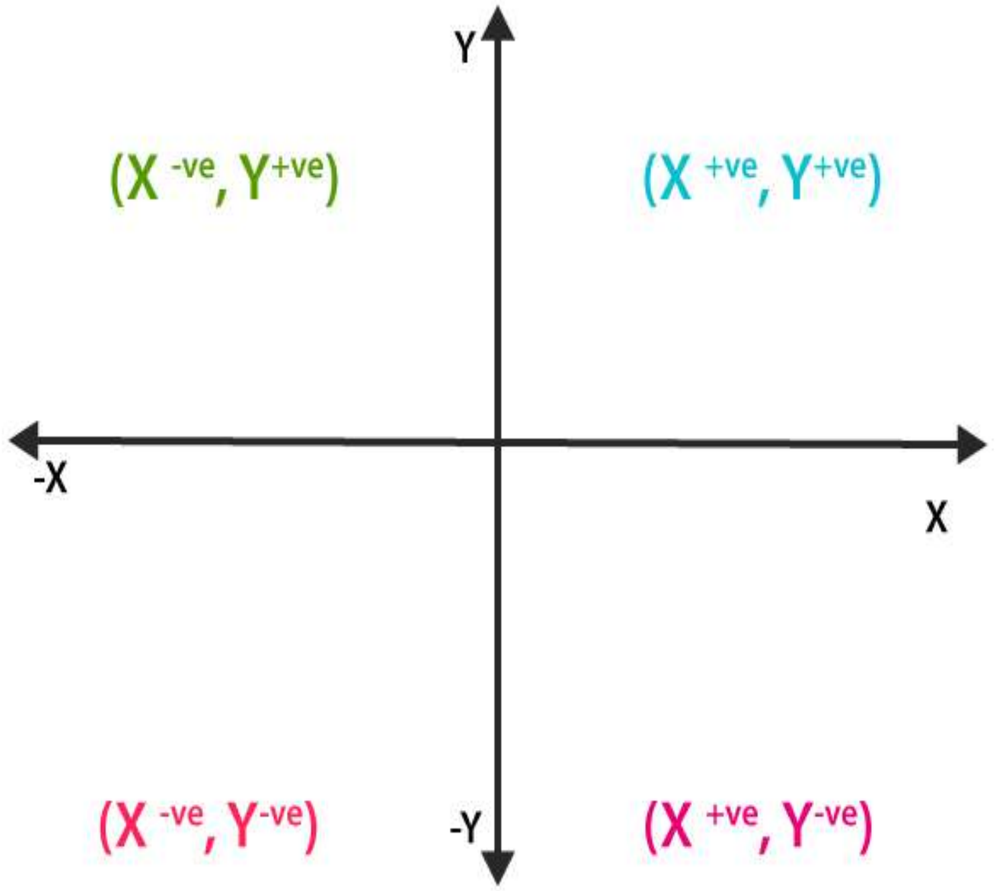


Statistical data presentation

Whereas tables can be used for presenting all the information, graphs **simplify complex information** by using **images** and emphasizing data patterns or trends, and are useful for **summarizing, explaining, or exploring** quantitative data

While graphs are effective for presenting large amounts of data, they can be used in place of tables to present small sets of data.

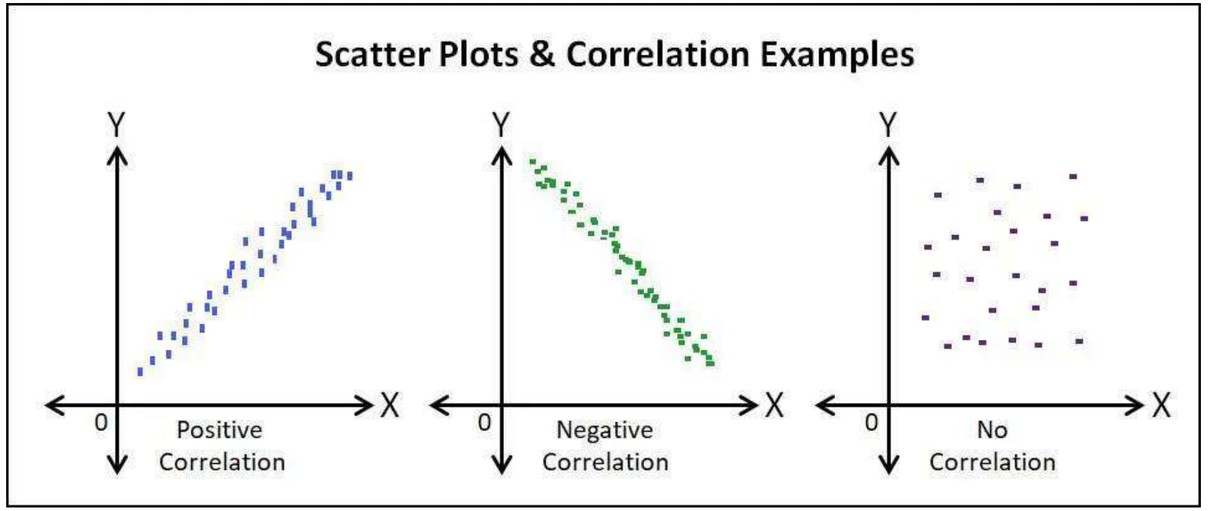
A graph format that best presents information must be chosen so that readers and reviewers can easily understand the information.

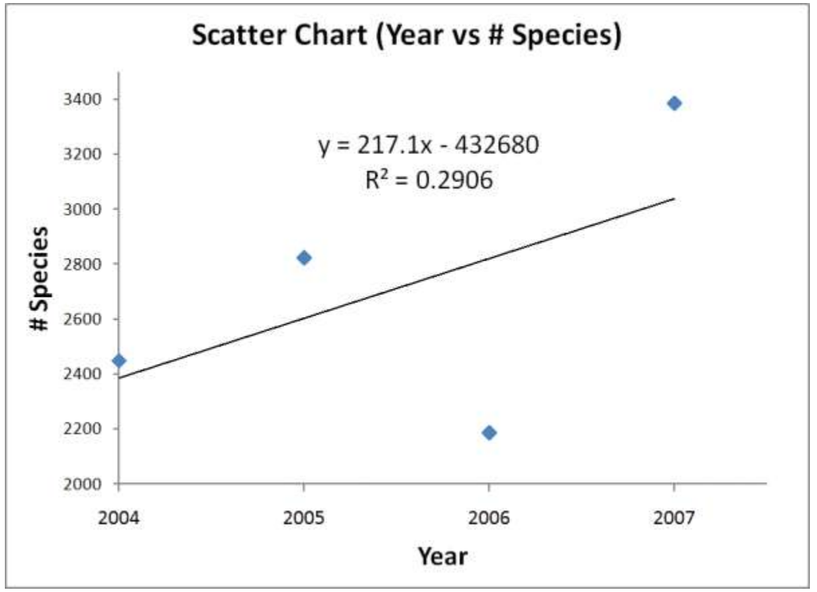


Statistical data presentation : GRAPHICAL

Scatter plot

- Scatter plots present data on the *x*- and *y*-axes and are used **to investigate an association between two variables**.
- A point **represents each individual or object**, and an association between two variables can be studied by analyzing patterns across multiple points.
- A regression line is added to a graph to determine whether the association between two variables can be explained or not

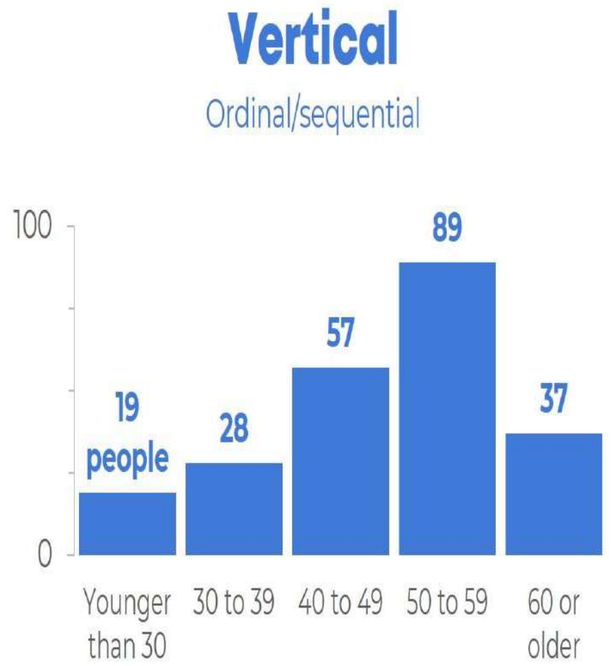


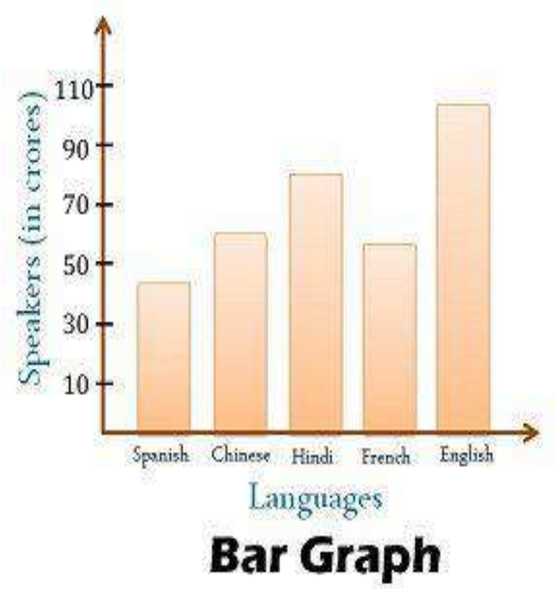


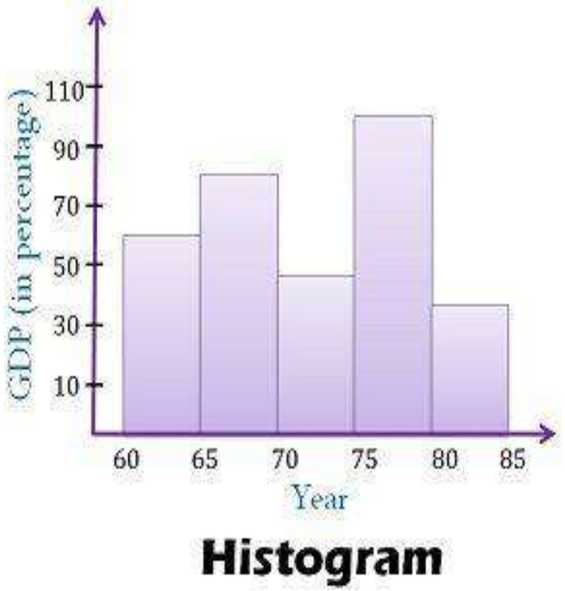
Statistical data presentation : GRAPHIC

Bar graph and histogram

- A bar graph is used to **indicate and compare values** in a discrete category or group, and the frequency or other measurement parameters (i.e. mean).
- Depending on the number of categories, and the size or complexity of each category, bars may be created **vertically or horizontally**.
- The height (or length) of a **bar represents the amount of information in a category**.
- Bar graphs are flexible, and can be used in a grouped or subdivided bar format in cases of two or more data sets in each category.



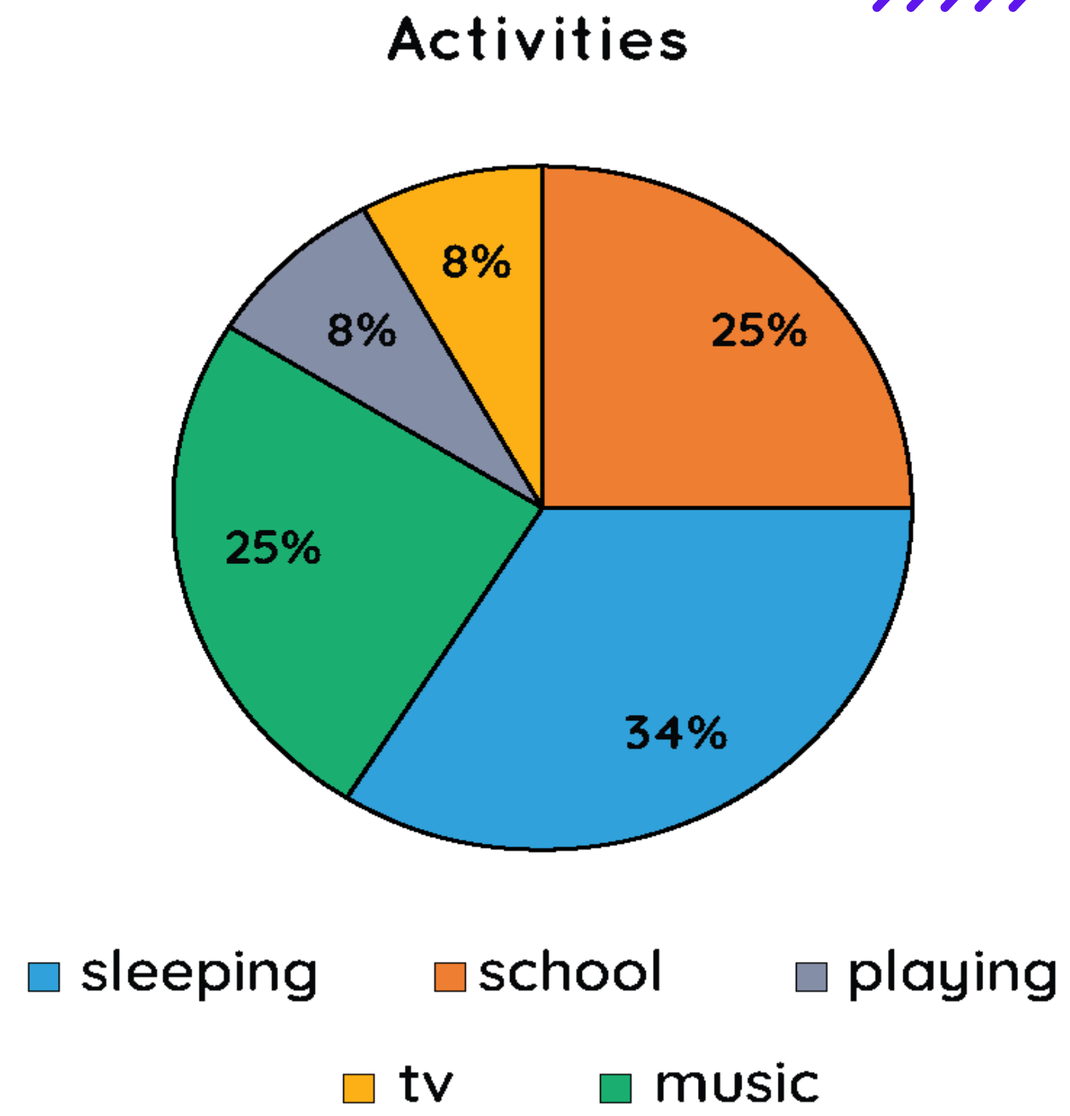




Statistical data presentation : GRAPHICAL

Pie chart

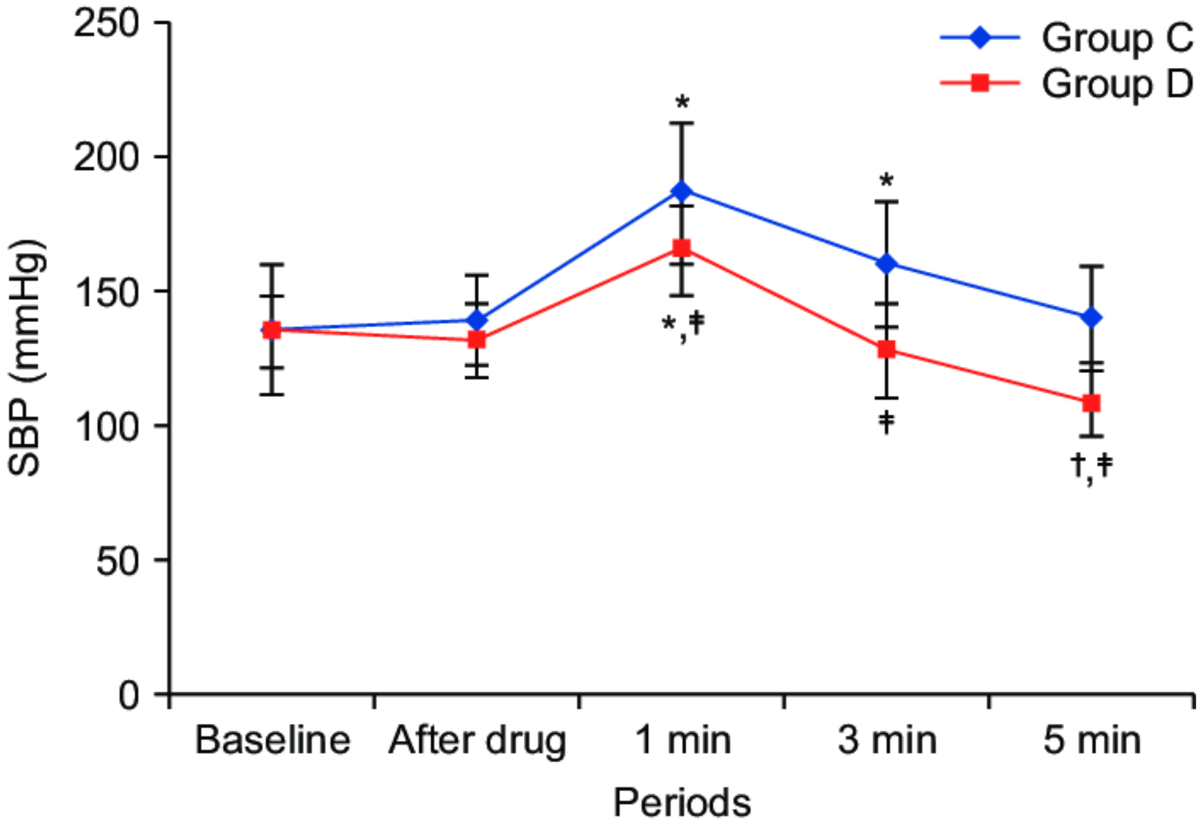
- A pie chart, which is used to represent **nominal data** (in other words, data classified in different categories), **visually represents** a distribution of categories.
- It is generally the most appropriate format for representing information grouped into a small number of categories.
- It is also used for data that have no other way of being represented aside from a table (i.e. frequency table)
- A pie chart is also commonly used to illustrate the number of votes each candidate won in an election.



Statistical data presentation : GRAPHICAL

Line plot with whiskers

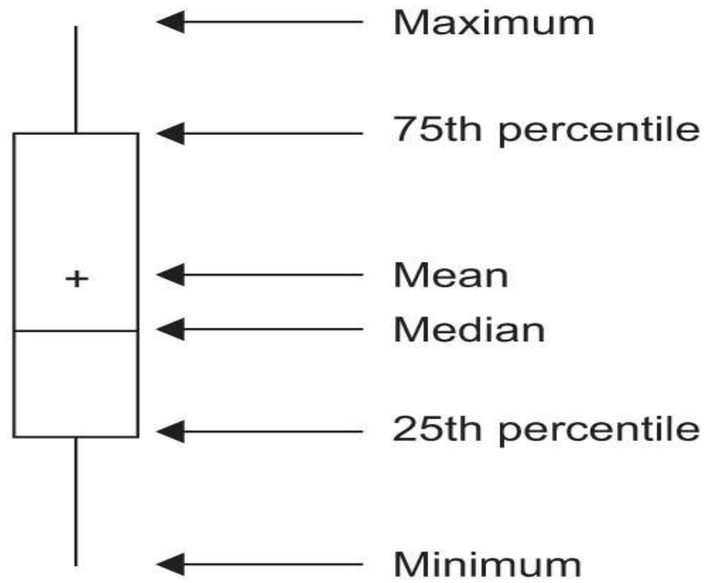
- A line plot is useful for representing **time-series data** such as monthly precipitation and yearly unemployment rates; in other words, it is used to study variables that are **observed over time**.
- Line graphs are especially useful for **studying patterns and trends** across data that include climatic influence, large changes or turning points, and are also appropriate for representing not only time-series data, but also data measured over the **progression of a continuous** variable such as distance.

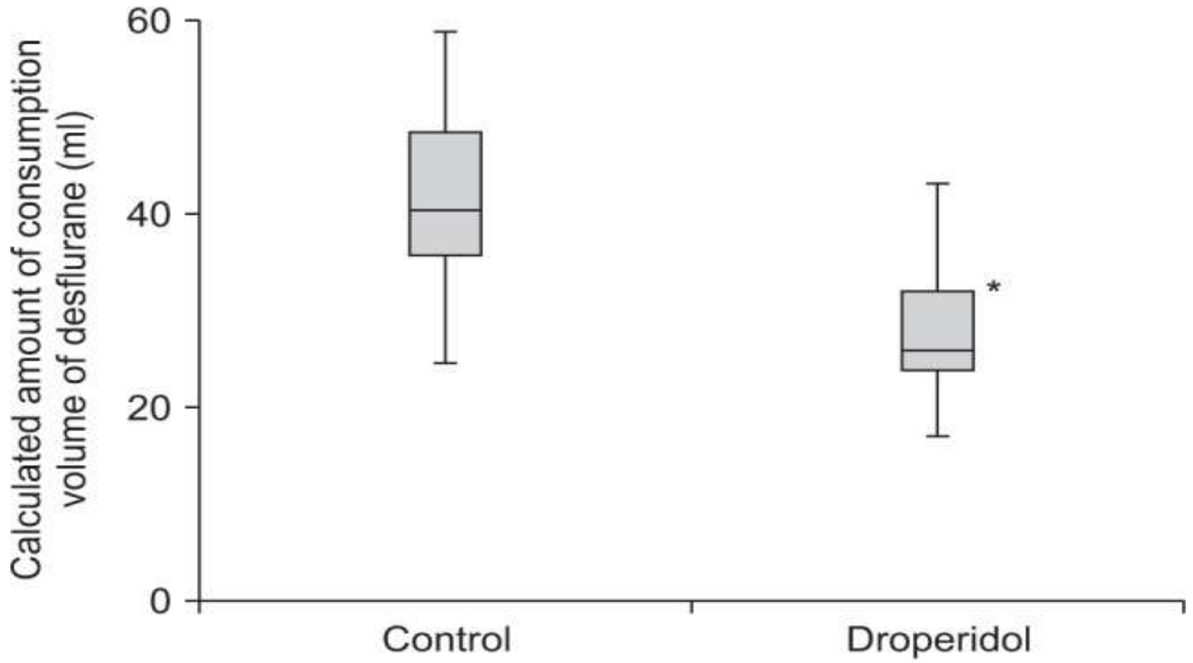


Statistical data presentation : GRAPHICAL

Box and whisker chart

- A box and whisker chart does not make any assumptions about the underlying statistical distribution, and **represents variations in samples of a population**; therefore, it is appropriate for representing nonparametric data.
- Whiskers presented as lines outside of the boxes. Whiskers can be used to present the **largest and smallest values** in a set of data or only a part of the data (i.e. 95% of all the data).

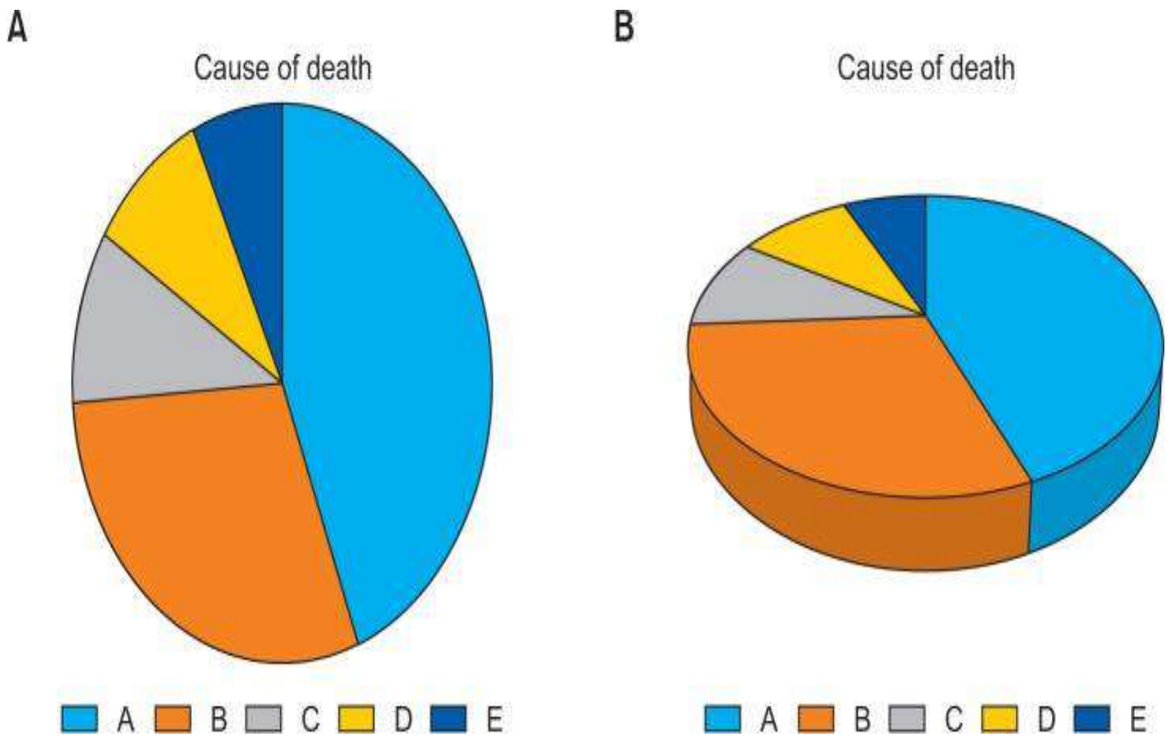




Statistical data presentation : GRAPHICAL

Three-dimensional effects

- The 3D effects can **add depth and perspective to a graph**. However, since they may make reading and interpreting data more difficult, they must only be used after careful consideration.

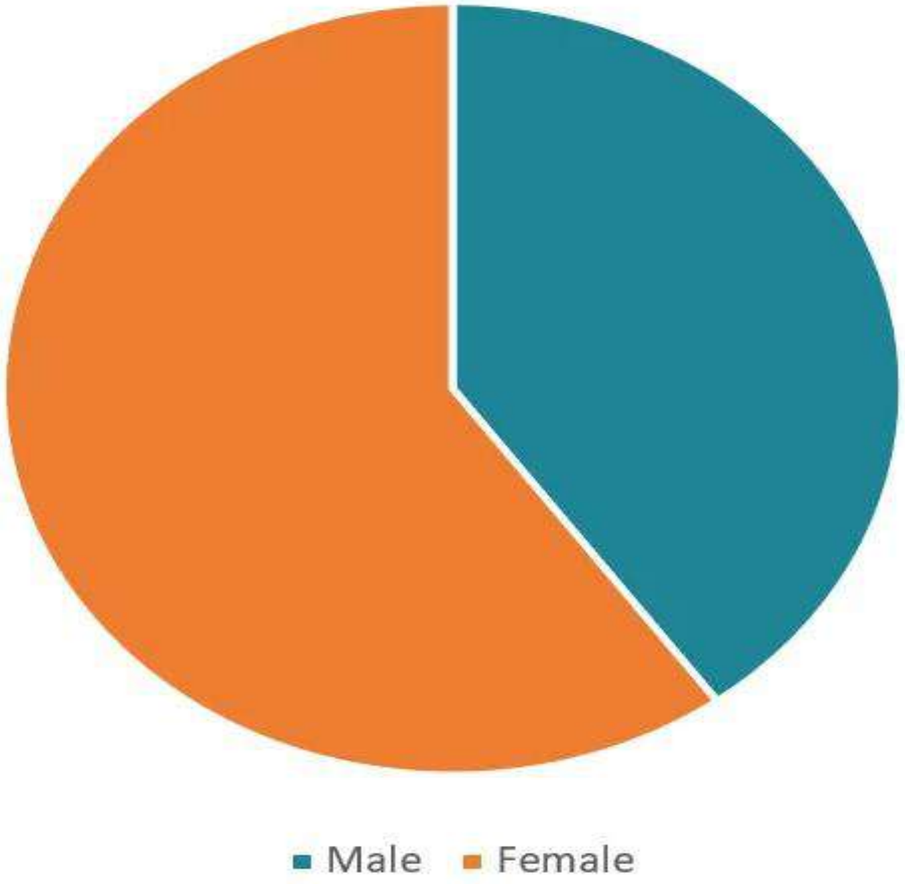


Statistical data presentation

Types of Charts Depending on the Method of Analysis of the Data

Analysis	Subgroup	Number of variables	Type
Comparison	Among items	Two per items	Variable width column chart
		One per item	Bar/column chart
	Over time	Many periods	Circular area/line chart
		Few periods	Column/line chart
Relationship		Two	Scatter chart
		Three	Bubble chart
Distribution		Single	Column/line histogram
		Two	Scatter chart
		Three	Three-dimensional area chart
Comparison	Changing over time	Only relative differences matter	Stacked 100% column chart
		Relative and absolute differences matter	Stacked column chart
	Static	Simple share of total	Pie chart
		Accumulation	Waterfall chart
		Components of components	Stacked 100% column chart with subcomponents

TEST



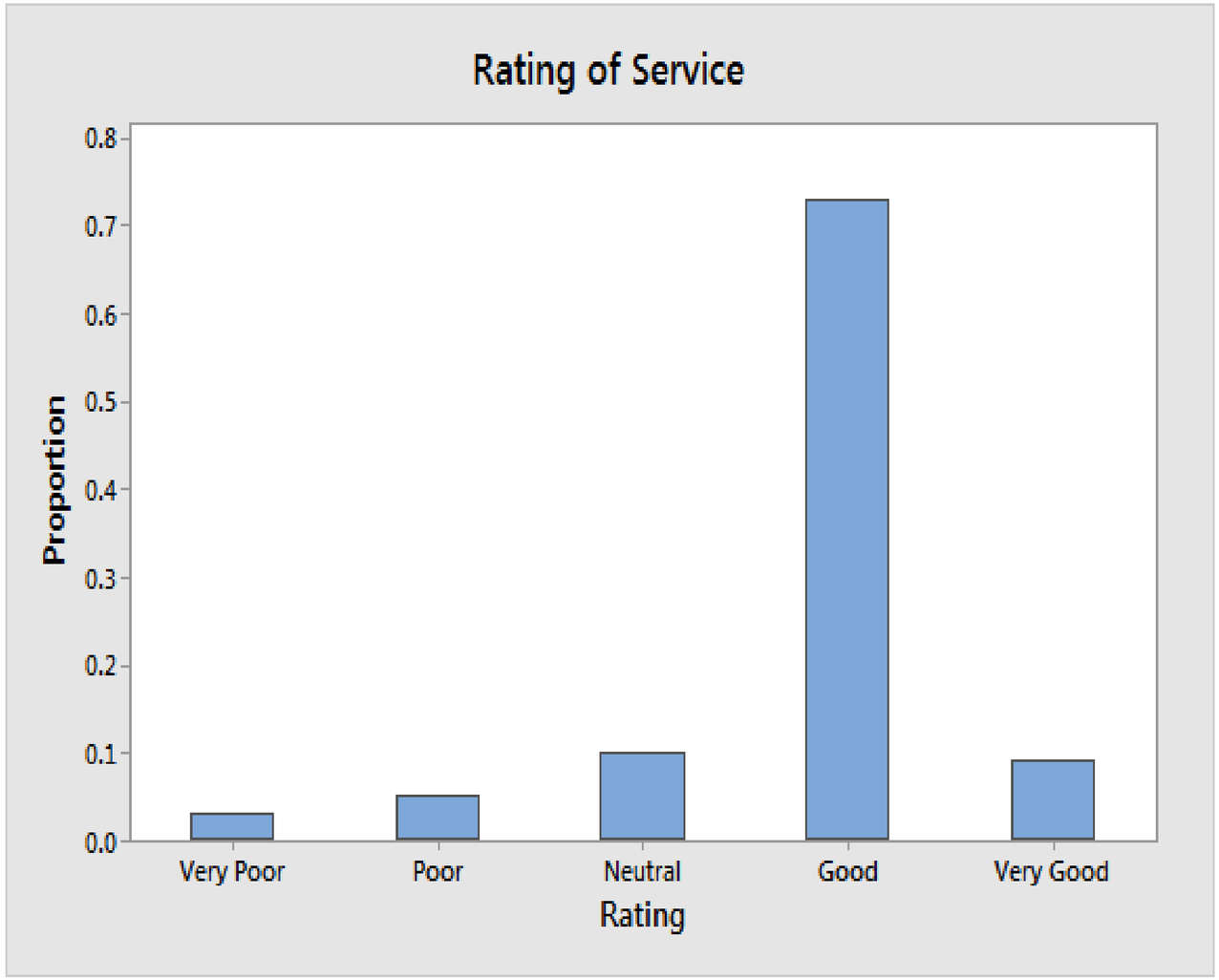
Jenis Data

- Nominal

Jenis penyajian data

- Pie chart

TEST



Jenis Data

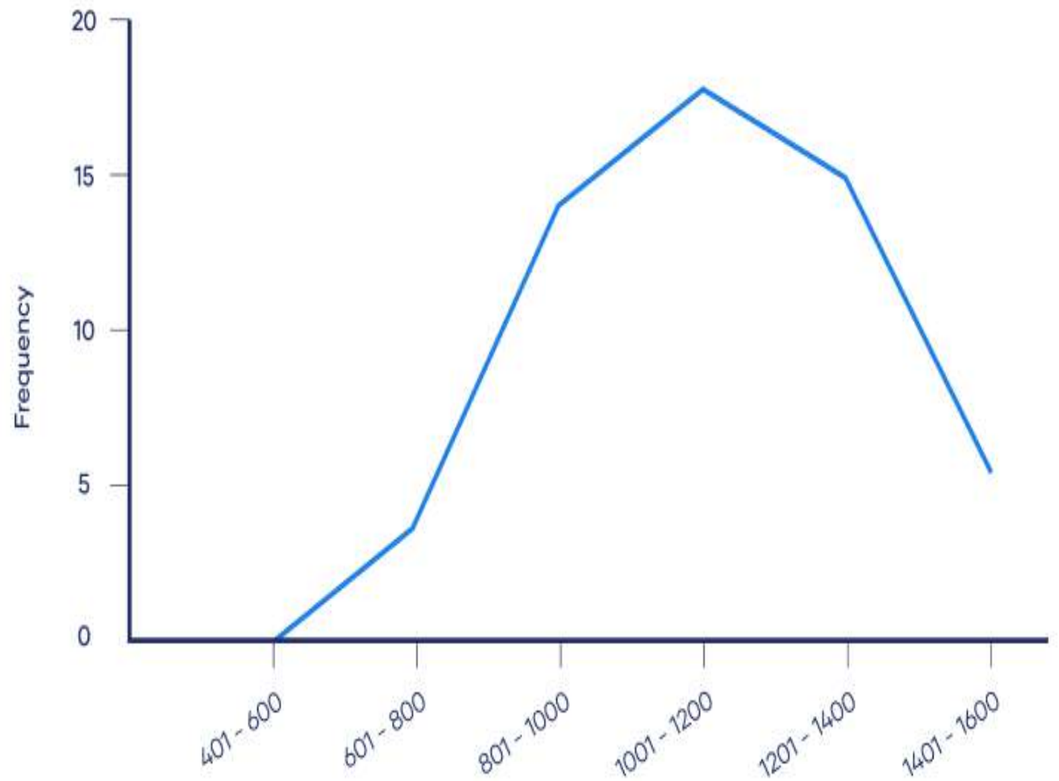
- Ordinal

Jenis penyajian data

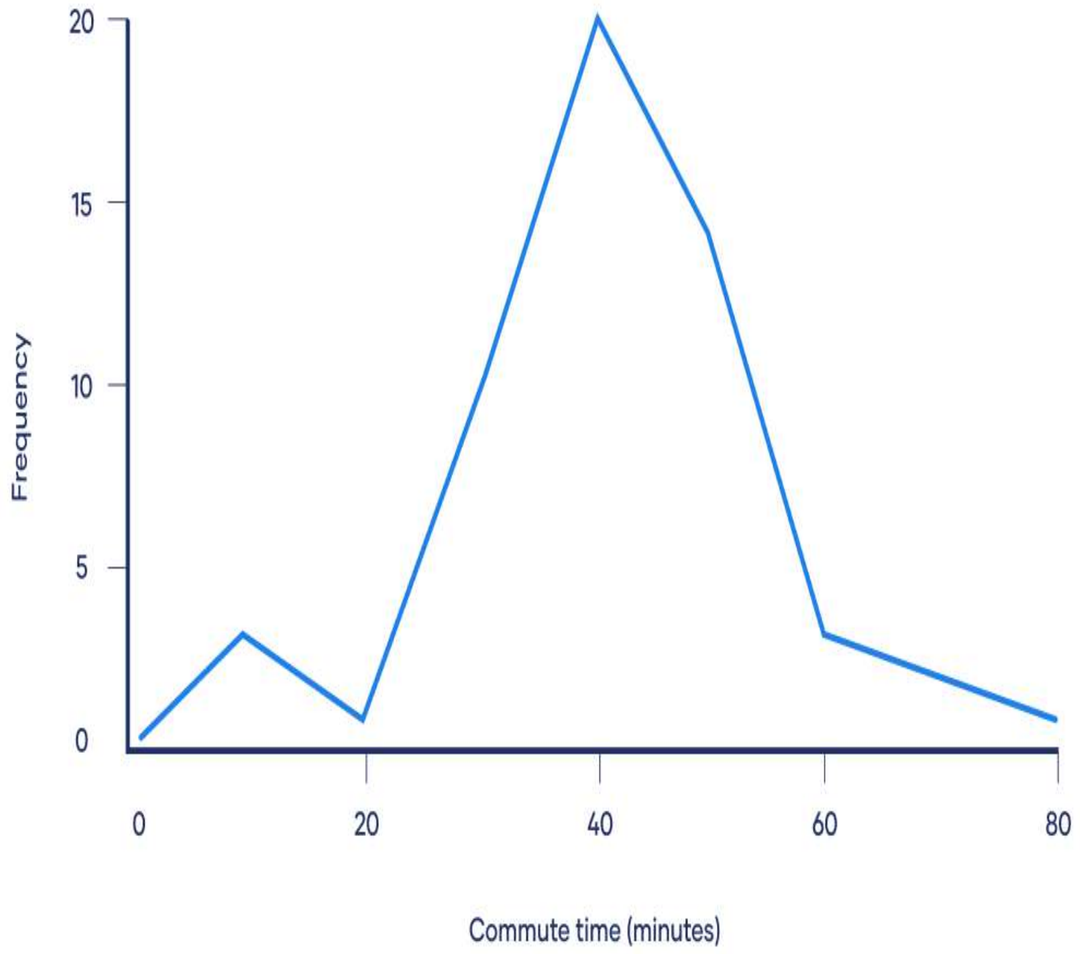
- Grafik batang (*Bar Graph*)

TEST

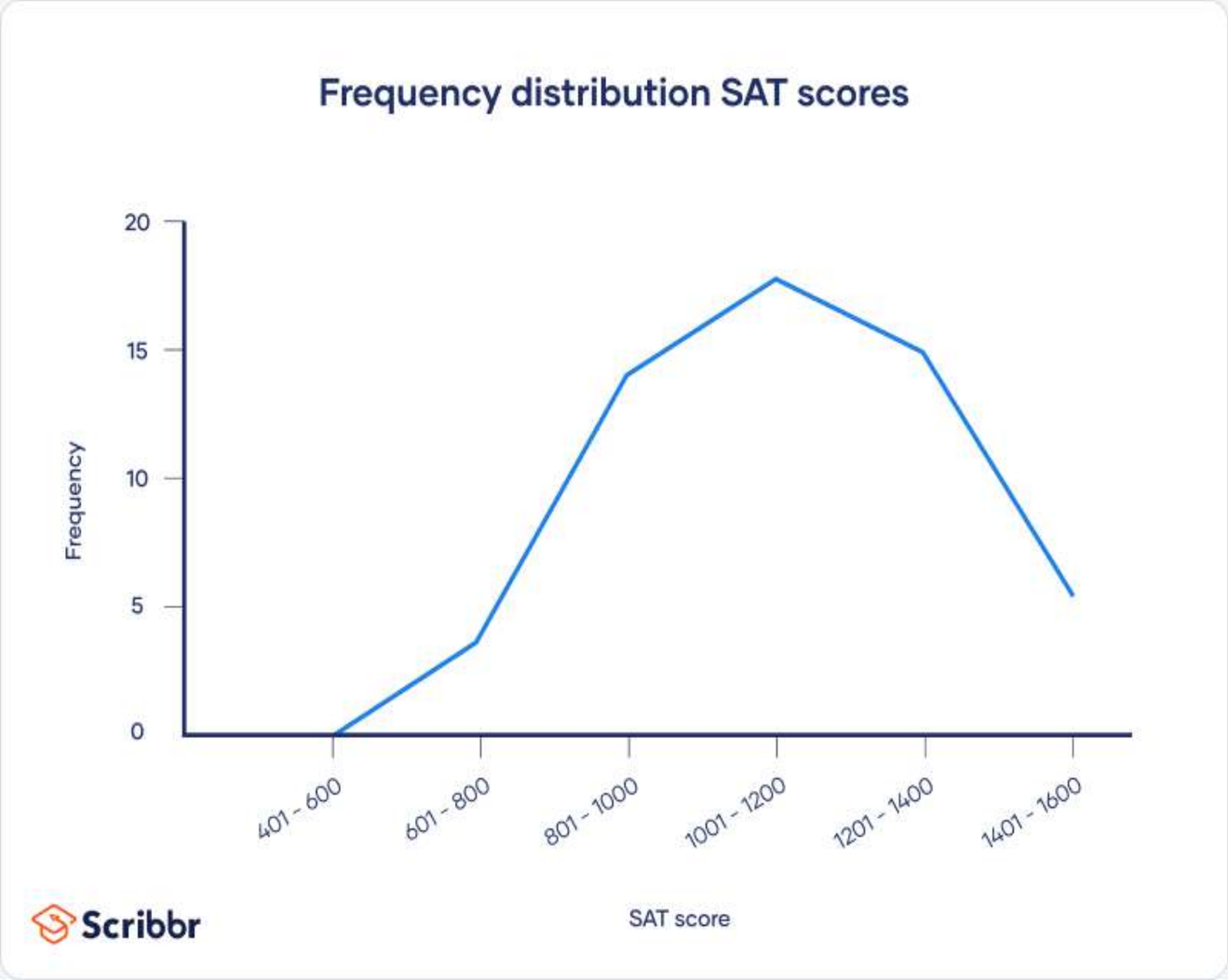
A


Frequency distribution SAT scores
Frequency
20
15
10
5
0
401 - 600
601 - 800
801 - 1000
1001 - 1200
1201 - 1400
1401 - 1600

B


Frequency
20
15
10
5
0
0
20
40
60
80
Commute time (minutes)

TEST



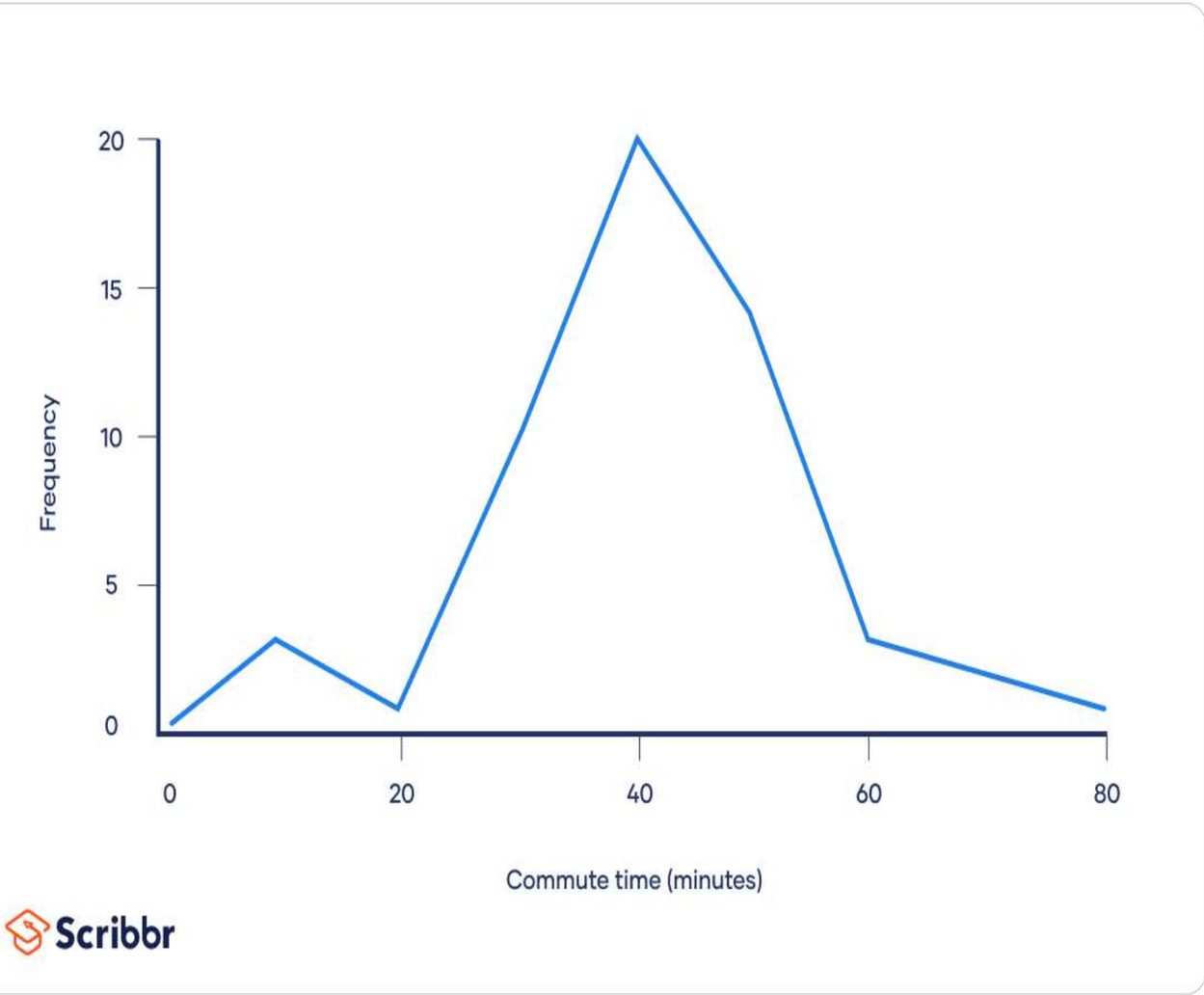
Jenis Data

- Interval

Jenis penyajian data

- Grafik garis (Line Graph)

TEST



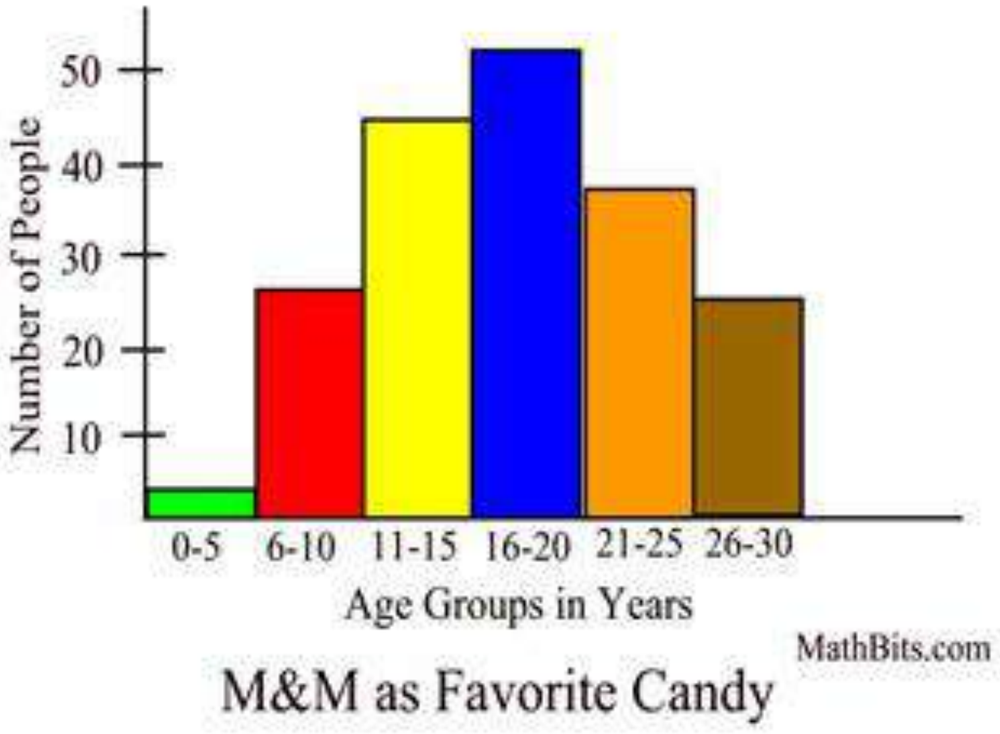
Jenis Data

- Ratio

Jenis penyajian data

- Grafik garis (Line Graph)

TEST

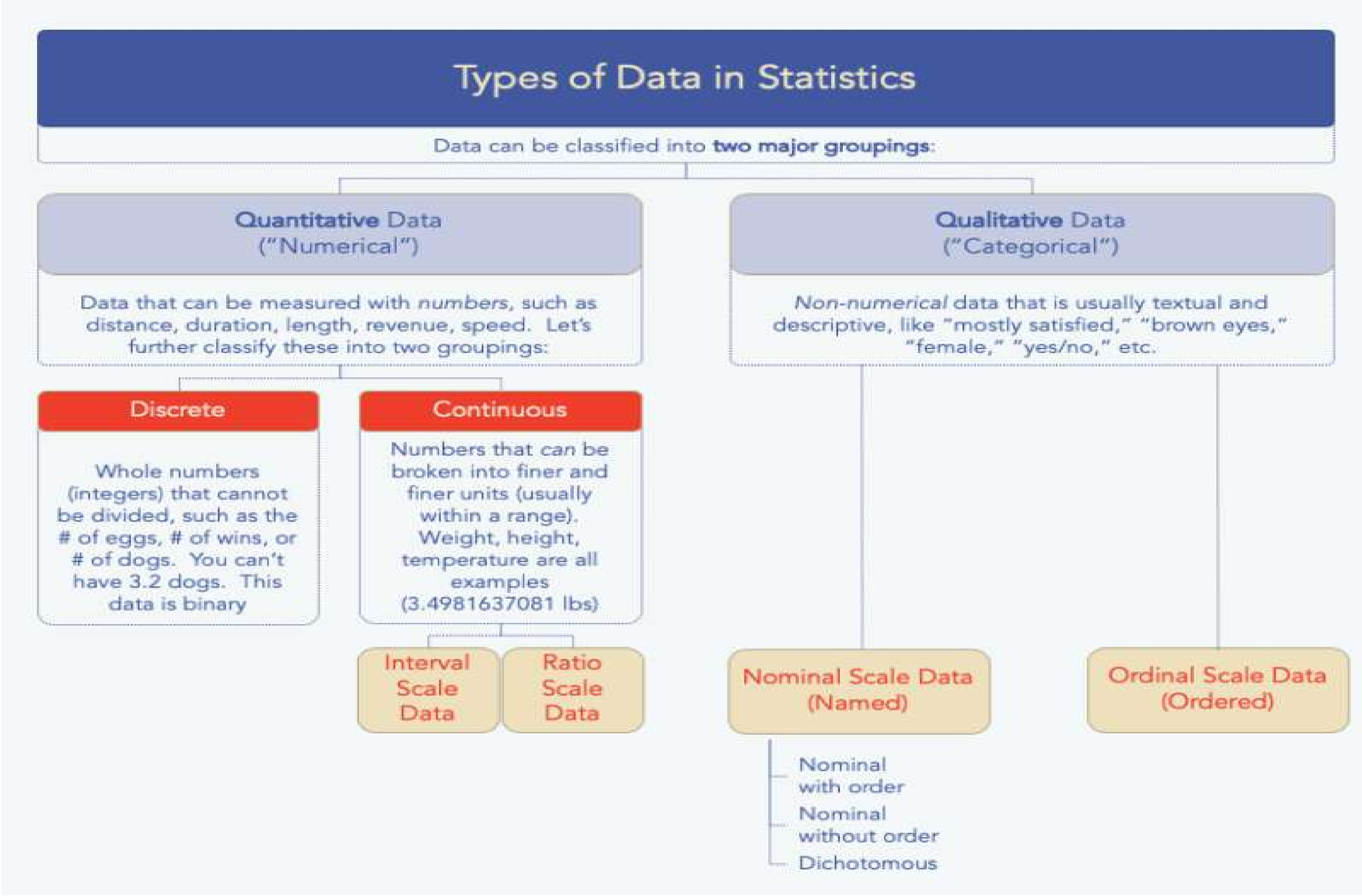


Jenis Data

- Ratio

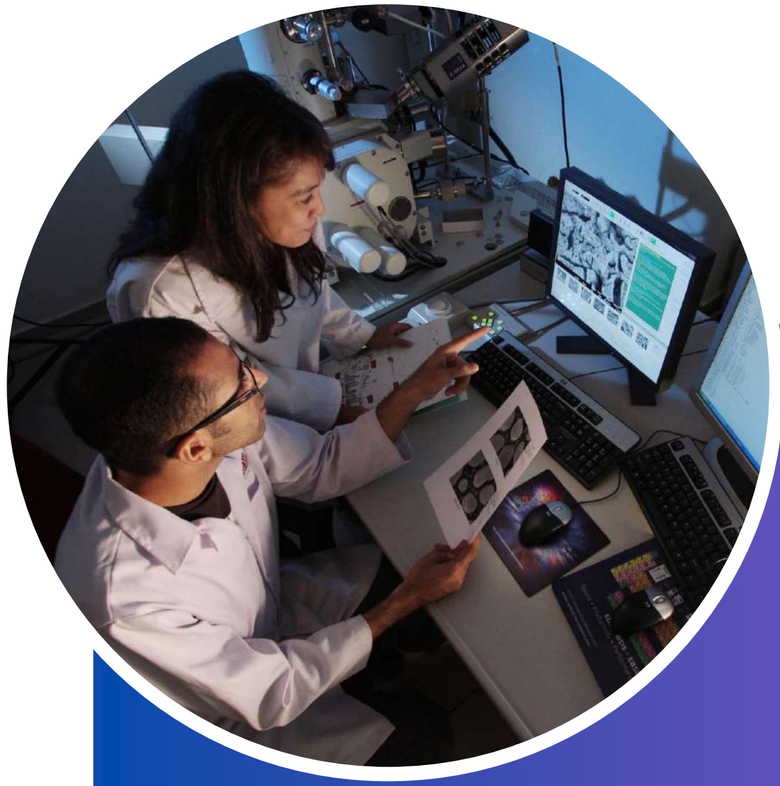
Jenis penyajian data

- Histogram batang (Bar histogram)


Types of Data in Statistics
Data can be classified into two major groupings:
Quantitative Data ("Numerical")
Data that can be measured with numbers, such as distance, duration, length, revenue, speed. Let's further classify these into two groupings:
Discrete
Whole numbers (integers) that cannot be divided, such as the # of eggs, # of wins, or # of dogs. You can't have 3.2 dogs. This data is binary
Continuous
Numbers that can be broken into finer and finer units (usually within a range). Weight, height, temperature are all examples (3.4981637081 lbs)
Interval Scale Data
Ratio Scale Data
Qualitative Data ("Categorical")
Non-numerical data that is usually textual and descriptive, like "mostly satisfied," "brown eyes," "female," "yes/no," etc.
Nominal Scale Data (Named)
Nominal with order
Nominal without order
Dichotomous
Ordinal Scale Data (Ordered)

Types of data on the basis of measurement

Scale	True Zero	Equal Intervals	Order	Category	Example
Nominal	No	No	No	Yes	Marital Status, Sex, Gender, Ethnicity
Ordinal	No	No	Yes	Yes	Student Letter Grade, NFL Team Rankings
Interval	No	Yes	Yes	Yes	Temperature in Fahrenheit, SAT Scores, IQ, Year
Ratio	Yes	Yes	Yes	Yes	Age, Height, Weight



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TERIMA KASIH

STIKES NOTOKUSUMO
YOGYAKARTA

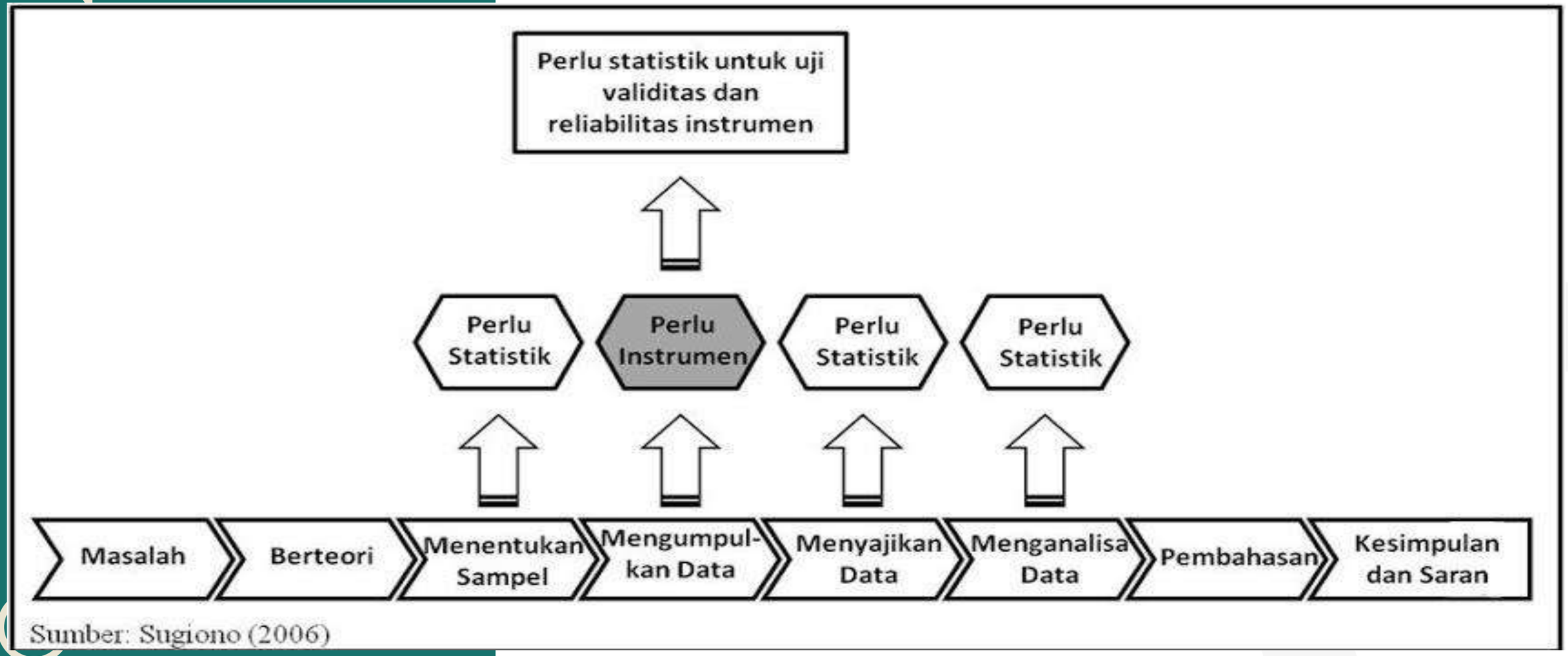
STATISTIKA KESEHATAN

Pertemuan 4

apt. Trifonia Rosa K., M.Biotech

TABLE OF CONTENT

ANALISIS UNTUK KUISIONER



Sumber: Sugiono (2006)

PENDAHULUAN

A questionnaire is a **research instrument** that consists of a set of questions to collect information from a respondent.

A research questionnaire is typically a mix of close-ended questions and open-ended questions.

PENDAHULUAN

OPEN-ENDED QUESTIONNAIRE

As the name states, these questions are open for the respondent to answer with more freedom. Instead of presenting a set of answers choices, the respondent writes as much is as little as they want. It is ideal for exploratory questionnaires which collect **Qualitative data analysis**.

CLOSED QUESTIONNAIRE

Closed questionnaires structure the appropriate response by just permitting reactions which fit into pre-chosen classes. Information that can be put into a classification is called ostensible information. The classification can be limited to as not many as two choices, i.e., dichotomous (e.g., ‘yes’ or ‘no,’ ‘male’ or ‘female’), or incorporate very unpredictable arrangements of choices from which the respondent can pick (e.g., multiple choices).
Closed questionnaires can likewise give ordinal information (which can be positioned).

PENDAHULUAN

Closed-Ended Questions	Open-Ended Questions
"Do you like our product/service?"	"What do you find most useful about our product/service?"
"Did you find this meeting helpful?"	"How do you feel about this meeting?"
"Would you consider using our product/service again?"	"What would make you consider using our product/service again?"

PENDAHULUAN

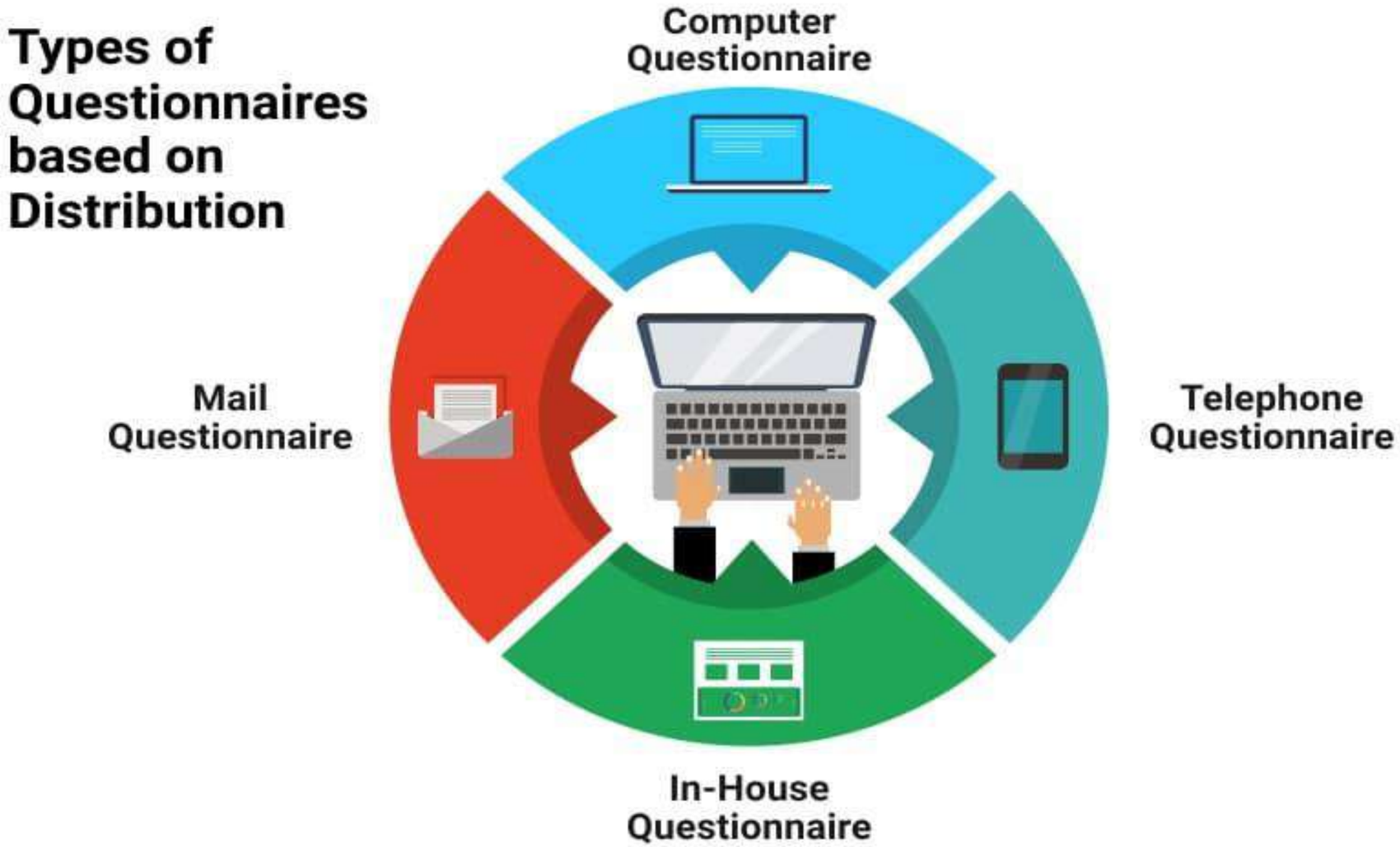
Open-Ended Questions

- **Open** the conversation: gets people talking
- Uncover **unexpected** stories and insights
- Facilitate **exploration** of a topic
- Used heavily in interviews and **qualitative** usability tests

Closed Questions

- **Close** or **limit** the scope of the conversation
- Uncover **details** or provide **clarification**
- Support **quantification** of responses
- Used heavily in surveys and **quantitative** research

PENDAHULUAN



PENDAHULUAN

A good questionnaire should be valid, reliable, clear, interesting and succinct.

VALID

- A valid questionnaire should ask what it intends to ask, i.e. the questions should be phrased in such a way that the respondent understands the objective of the question.
- To achieve this, the questionnaire **should be reviewed by the "content expert"** during the pilot test (e.g. if the target respondent is a diabetic patient, then a diabetic patient should comment whether he understands the questionnaire).
- Any uncertainties and queries should be clarified till the question is clearly understood.

PENDAHULUAN

A good questionnaire should be valid, reliable, clear, interesting and succinct.

RELIABLE

- A reliable questionnaire should yield the same answer if the same question is posed to the respondent repeatedly in a short span of time.
- This can be achieved by **performing a "test-retest"**, i.e. administer the same questionnaire to the respondent a second time and check for consistency of the answer.
- Any discrepancy in the answers could be due to lack of clarity of the questions and this should be reviewed and rephrased

PENDAHULUAN

A good questionnaire should be valid, reliable, clear, interesting and succinct.

INTERESTING

- An interesting questionnaire is more likely to be completed by the respondent and hence yields a better response rate.
- This requires the researcher to put some thoughts into asking questions that are **relevant** to the respondent and in a logical sequence.

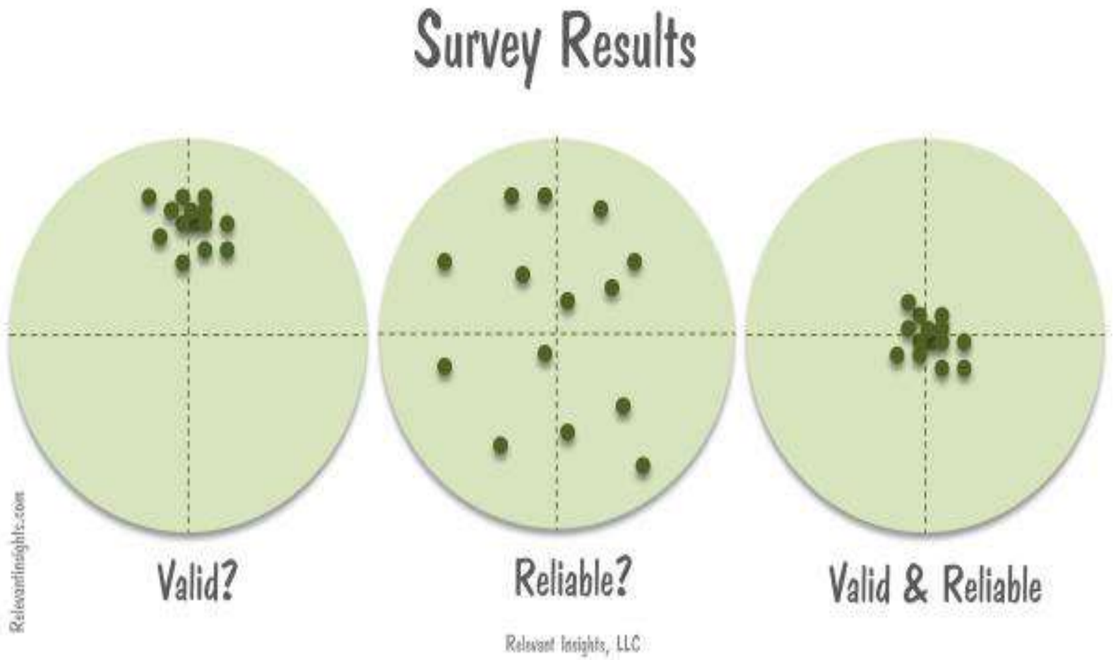
PENDAHULUAN

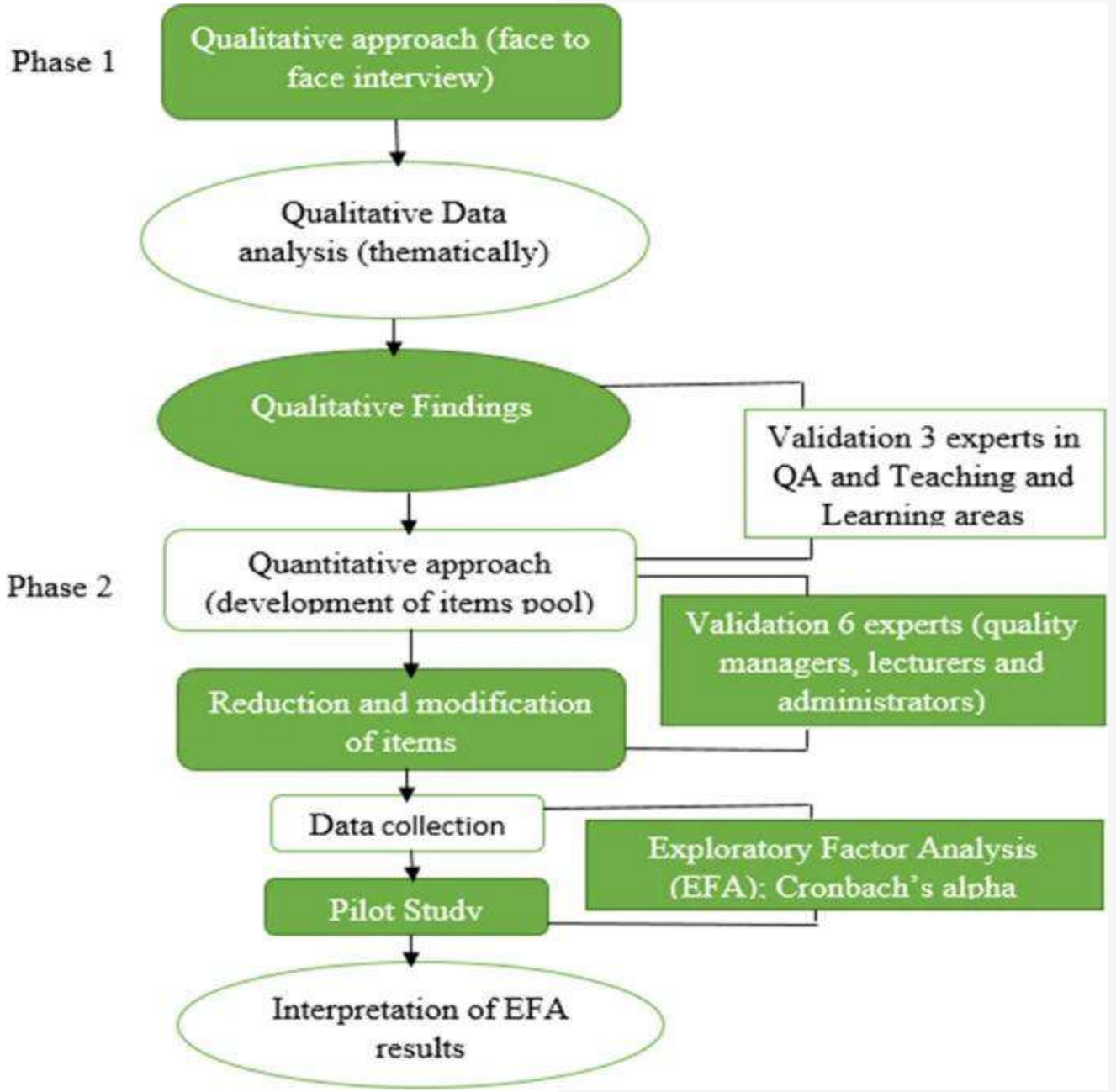
A good questionnaire should be valid, reliable, clear, interesting and succinct.

SUCCINCT

- A succinct questionnaire asks questions that aim to answer only the research objectives.
- Any questions beyond the scope of the research should be excluded. It is common for researchers to “cast the net wider” so that they will collect more data, regardless of whether these data are important or not.
- This usually happens when the researcher has not properly thought through the research objectives. It runs the risk of asking too many questions and the questionnaire runs into many pages.

PENDAHULUAN





Flowchart of the methodological approach

UJI VALIDITAS

01 TUJUAN

Uji validitas digunakan untuk mengetahui kelayakan tiap pertanyaan yang mendukung suatu kelompok variabel tertentu

02 Berdasarkan nilai ***r* hitung**

- Hasil *r* hitung dibandingkan dengan **r tabel**, dimana df=n-2 dengan siq 5%.
- Jika r tabel < r hitung, maka pertanyaan dinyatakan valid.
- Uji validitas menggunakan Teknik korelasi **Product moment** dengan menggunakan rumus :

$$r = \frac{n\sum xy - (\sum x)(\sum y)}{\sqrt{[n\sum x^2 - (\sum x)^2][n\sum y^2 - (\sum y)^2]}}$$

Tabel r

df = (N-2)	Tingkat signifikansi untuk uji satu arah				
	0.05	0.025	0.01	0.005	0.0005
	Tingkat signifikansi untuk uji dua arah				
	0.1	0.05	0.02	0.01	0.001
1	0.9877	0.9969	0.9995	0.9999	1.0000
2	0.9000	0.9500	0.9800	0.9900	0.9990
3	0.8054	0.8783	0.9343	0.9587	0.9911
4	0.7293	0.8114	0.8822	0.9172	0.9741
5	0.6694	0.7545	0.8329	0.8745	0.9509
6	0.6215	0.7067	0.7887	0.8343	0.9249
7	0.5822	0.6664	0.7498	0.7977	0.8983
8	0.5494	0.6319	0.7155	0.7646	0.8721
9	0.5214	0.6021	0.6851	0.7348	0.8470
10	0.4973	0.5760	0.6581	0.7079	0.8233
11	0.4762	0.5529	0.6339	0.6835	0.8010
12	0.4575	0.5324	0.6120	0.6614	0.7800
13	0.4409	0.5140	0.5923	0.6411	0.7604
14	0.4259	0.4973	0.5742	0.6226	0.7419
15	0.4124	0.4821	0.5577	0.6055	0.7247
16	0.4000	0.4683	0.5425	0.5897	0.7084
17	0.3887	0.4555	0.5285	0.5751	0.6932
18	0.3783	0.4438	0.5155	0.5614	0.6788
19	0.3687	0.4329	0.5034	0.5487	0.6652
20	0.3598	0.4227	0.4921	0.5368	0.6524
21	0.3515	0.4132	0.4815	0.5256	0.6402
22	0.3438	0.4044	0.4716	0.5151	0.6287
23	0.3365	0.3961	0.4622	0.5052	0.6178
24	0.3297	0.3882	0.4534	0.4958	0.6074
25	0.3233	0.3809	0.4451	0.4869	0.5974
26	0.3172	0.3739	0.4372	0.4785	0.5880
27	0.3115	0.3673	0.4297	0.4705	0.5790
28	0.3061	0.3610	0.4226	0.4629	0.5703
29	0.3009	0.3550	0.4158	0.4556	0.5620
30	0.2960	0.3494	0.4093	0.4487	0.5541

df = (N-2)	Tingkat signifikansi untuk uji satu arah				
	0.05	0.025	0.01	0.005	0.0005
	Tingkat signifikansi untuk uji dua arah				
	0.1	0.05	0.02	0.01	0.001
31	0.2913	0.3440	0.4032	0.4421	0.5465
32	0.2869	0.3388	0.3972	0.4357	0.5392
33	0.2826	0.3338	0.3916	0.4296	0.5322
34	0.2785	0.3291	0.3862	0.4238	0.5254
35	0.2746	0.3246	0.3810	0.4182	0.5189
36	0.2709	0.3202	0.3760	0.4128	0.5126
37	0.2673	0.3160	0.3712	0.4076	0.5066
38	0.2638	0.3120	0.3665	0.4026	0.5007
39	0.2605	0.3081	0.3621	0.3978	0.4950
40	0.2573	0.3044	0.3578	0.3932	0.4896
41	0.2542	0.3008	0.3536	0.3887	0.4843
42	0.2512	0.2973	0.3496	0.3843	0.4791
43	0.2483	0.2940	0.3457	0.3801	0.4742
44	0.2455	0.2907	0.3420	0.3761	0.4694
45	0.2429	0.2876	0.3384	0.3721	0.4647
46	0.2403	0.2845	0.3348	0.3683	0.4601
47	0.2377	0.2816	0.3314	0.3646	0.4557
48	0.2353	0.2787	0.3281	0.3610	0.4514
49	0.2329	0.2759	0.3249	0.3575	0.4473
50	0.2306	0.2732	0.3218	0.3542	0.4432

UJI VALIDITAS

Contoh soal

NOMOR	PERTANYAAN	SKALA			
		TS (1)	S (2)	SS (3)	SSS (4)
1	Apakah karyawan di apotek kami ramah				
2	Apakah karyawan di apotek kami cepat tanggap				
3	Apakah karyawan di apotek kami memberikan pelayanan yang sesuai keinginan pasien				
4	Apakah karyawan di apotek kami memberikan informasi obat yang jelas				
5	Apakah pasien mendapat pelayanan yang baik dari apotek kami				

TS : Tidak Setuju (nilainya 1)
S ; Setuju (nilainya 2)
SS : Sangat setuju (nilainya 3)
SSS : Sangat setuju sekali (nilainya 4)

UJI VALIDITAS

Contoh soal

JAWAB RESPONDEN ATAS PERTANYAAN				
P1	**P2**	**P3**	**P4**	**P5**
4	4	1	4	4
1	1	1	3	4
2	4	1	1	4
3	4	3	2	4
1	3	4	2	3
3	2	3	1	3
4	2	4	2	1
2	3	1	4	2
2	4	2	1	2
3	3	3	2	3

UJI VALIDITAS

Contoh soal

JAWAB RESPONDEN ATAS PERTANYAAN						
Sampel	**P1**	**P2**	**P3**	**P4**	**P5**	**Total**
1	4	4	1	4	4	**17**
2	1	1	1	3	4	**10**
3	2	4	1	1	4	**12**
4	3	4	3	2	4	**16**
5	1	3	4	2	3	**13**
6	3	2	3	1	3	**12**
7	4	2	4	2	1	**13**
8	2	3	1	4	2	**12**
9	2	4	2	1	2	**11**
10	3	3	3	2	3	**14**

UJI VALIDITAS

Contoh soal

Mencari validitas P1

Sampel	X	Y	X.X	Y.Y	X.Y
1	4	17	16	289	68
2	1	10	1	100	10
3	2	12	4	144	24
4	3	16	9	256	48
5	1	13	1	169	13
6	3	12	9	144	36
7	4	13	16	169	52
8	2	12	4	144	24
9	2	11	4	121	22
10	3	14	9	196	42
Jumlah	**25**	**130**	**73**	**1732**	**339**

UJI VALIDITAS

Contoh soal

Mencari validitas P1

$$r = \frac{n\sum xy - (\sum x)(\sum y)}{\sqrt{[n\sum x^2 - (\sum x)^2][n\sum y^2 - (\sum y)^2]}}$$

$$r = \frac{(10\times339) - (25\times130)}{\sqrt{[(10\times73) - 25^2][(10\times1732) - 130^2]}}$$

r=0,6667 → r hitung

r tabel

df=10-2 = 8, *Lihat tabel r*

r tabel =0,549

Hasil uji validitas :

r hitung > r tabel

VALID

UJI RELIABILITAS

01 TUJUAN

Reliabilitas merupakan ukuran suatu kestabilan dan konsistensi responden dalam menjawab hal yang berkaitan dengan pertanyaan.

02 Berdasarkan nilai α

- Dapat dilakukan bersama-sama untuk semua pertanyaan dalam kuisioner.
- Jika nilai Alpha > 0,60 maka kuisioner dinyatakan reliabel.
- Rumusnya sebagai berikut :

$$r = \left[\frac{k}{(k-1)}\right]\left[1 - \frac{\sum \sigma_b^2}{\sigma_t^2}\right]$$

- r = koefiesn reliability instrument (Cronbach alpha)
- k = banyaknya butir pertanyaan
- $\sum \sigma_b^2$ = total varian butir
- σ_t^2 = total varian

Hasil uji Reliabilitas :

1. Jika Alpha > 0,6 = pertanyaan reliabel
2. Jika Alpha < 0,6 = pertanyaan tidak reliabel

UJI RELIABILITAS

Contoh soal

Jawab responden atas pertanyaan							
SAMPEL	**P1**	**P2**	**P3**	**P4**	**P5**	**TOTAL**	**TOTAL KUADRAN**
1	4	4	1	4	4	17	289
2	1	1	1	3	4	10	100
3	2	4	1	1	4	12	144
4	3	4	3	2	4	16	256
5	1	3	4	2	3	13	169
6	3	2	3	1	3	12	144
7	4	2	4	2	1	13	169
8	2	3	1	4	2	12	144
9	2	4	2	1	2	11	121
10	3	3	3	2	3	14	196
Jumlah	**25**	**30**	**23**	**22**	**30**	**130**	**1732**
Jumlah kuadran	**73**	**100**	**67**	**60**	**100**		

Cara menghitung jumlah kuadran per butir pertanyaan :

P1 → $4^2 + 1^2 + \cdots \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots + 3^2 = 73$

UJI RELIABILITAS

Contoh soal

JAWAB RESPONDEN ATAS PERTANYAAN							
Sampel 10	**P1**	**P2**	**P3**	**P4**	**P5**	**Total**	**Total Kuadran**
Jumlah	**25**	**30**	**23**	**22**	**30**	**130**	**1732**
Jumlah kuadran	**73**	**100**	**67**	**60**	**100**		

Menghitung varian tiap pertanyaan

$$\sigma_b^2 = \frac{73 - \frac{25^2}{10}}{10}$$

$$\sigma_b^2 = 1{,}05$$

σ_b^2	Varian
P1	1,05
P2	1
P3	1,41
P4	1,16
P5	1
Jumlah	**5,62**

Menghitung total varian

$$\sigma_t^2 = \frac{1732 - \frac{130^2}{10}}{10}$$

$$\sigma_t^2 = 4{,}2$$

UJI RELIABILITAS

Contoh soal

	Varian
P1	1,05
P2	1
P3	1,41
P4	1,16
P5	1
Jumlah	**5,62**

$$\sigma_t^2 = 4{,}2$$

$$r = \left[\frac{k}{(k-1)}\right]\left[1 - \frac{\sum \sigma_b^2}{\sigma_t^2}\right]$$

$$r = \left[\frac{5}{(5-1)}\right]\left[1 - \frac{5{,}62}{4{,}2}\right]$$

$$r = -0{,}4226 \ll 0{,}6$$

Pertanyaan tidak reliabel !

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THANK YOU

FOR YOUR NICE ATTENTION

HASIL UJI VALIDITAS

Pertanyaan	Nilai r Hitung	Nilai r Tabel	Keterangan
P1	0,6667	0,549	Valid
P2	0,537	0,549	Tidak valid
P3	0,164	0,549	Tidak valid
P4	0,317	0,549	Tidak valid
P5	0,293	0,549	Tidak valid