

It is important that a researcher knows the concepts of the basic statistical methods used for conduct of a research study.

This will help to conduct an appropriately well-designed study leading to valid and reliable results.

Inappropriate use of statistical techniques may lead to faulty conclusions, inducing errors and undermining the significance of the article.

Hence, an adequate knowledge of statistics and the appropriate use of statistical tests are important.

An appropriate knowledge about the basic statistical methods will go a long way in improving the research designs and producing quality research which can be utilized for formulating the evidence-based guidelines.

CENTER FOR RESEARCH, INNOVATION & DATA MANAGEMENT

To pursue the university's commitment to quality, the Center for Research Innovation & Data Management of the Lyceum of the Philippines University, has become the vital instrument in achieving the mission – vision of the university through institutionalizing research and strengthening the research culture and capability.

The center aims to institutionalize research by doing the following functions:

- *implement a sustainable research program for the institution as specified in the 5 year development plan;*
- *continuously serve as the central coordinating body which regulates, supervises, controls, evaluates and monitors the school's researches and recommends for dissemination and utilization;*
- *provide training and exposure for development to enhance research capability of school researchers;*
- *facilitate linkages with other institutions and find means to improve research capability, productivity, dissemination and utilization of research outputs;*
- *provide statistical services for student and faculty researchers.*

CONTACT US

Lyceum of the Philippines University Batangas
Main Campus, Admin Building
+63 43 723-0706 local 136-137
research@lpubatangas.edu.ph
crid_helpdesk@lpubatangas.edu.ph
<https://research.lpubatangas.edu.ph>



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Statistics: Types of Statistics Data types in Statistics Parametric and Non- parametric tests

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WHAT IS STATISTICS?

Statistics is the science of *designing studies or experiments, collecting data and modelling/analyzing data* for the purpose of decision making and scientific discovery when the available information is both limited and variable. That is, statistics is the science of Learning from Data.

What are the types of Statistics?

- **Descriptive statistics** are procedures used to summarize, organize, and make sense of a set of scores or observations.
- **Inferential statistics** are procedures used that allow researchers to infer or generalize observations made with samples to the larger population from which they were selected.

What are the Data types of Statistics?

Data Types are an important concept of statistics, which needs to be understood, to correctly apply statistical measurements to your data and therefore to correctly conclude certain assumptions about it.

Qualitative Data (Categorical Data)	Nominal: A scale which represents discrete units and is used to label variable that has no quantitative value.
	Ordinal: A scale which represents an ordered series of relationships or rank order.
Quantitative Data	Interval: A scale which represents quantity and has equal units
	Ratio: A scale which represents quantity and has equality of units. However, this scale also has an absolute zero (no numbers exist below the zero).

When to use parametric tests or non-parametric tests?

- **Parametric statistical procedures** rely on assumptions about the shape of the distribution (i.e., assume a normal distribution) in the underlying population and about the form or parameters (i.e., means and standard deviations) of the assumed distribution.
- **Nonparametric statistical procedures** rely on no or few assumptions about the shape or parameters of the population distribution from which the sample was drawn.

Parametric Tests versus Non-parametric Tests

Indicators	Parametric Tests	Non-parametric Tests
Information about the population	Requires knowledge about the population	Doesn't require previous knowledge about population
Sample size	Tend to need larger samples	Can be used on small samples
Sampling Technique	Samples should be drawn randomly from the population	Can be used where the samples are not randomly selected
Data Type	Applicable for Quantitative Data	Applicable for Qualitative/Categorical Data
Scale of Measurement	Applied for interval or ratio scale	Applied for nominal or ordinal scale
Distribution of the Data	Applied when the distribution is normal	Applied when there is a skewed distribution
Outliers	Results can be significantly affected by outliers	Results cannot be seriously affected by outliers
Assumptions	Make certain assumptions about the data	Make no assumptions about the data
Hypothesis	The null hypothesis is made on parameter of the population distribution	The null hypothesis is made on parameter of the population distribution
Measure of Central Tendency	If the mean is a better measure and you have a sufficiently large sample size, a parametric test usually is the better, more power choice	If the median is a better measure, consider a non-parametric test regardless of your sample size
Statistical Power	More powerful than non-parametric equivalent	Have less power than the equivalent parametric test
Correlation Test	Pearson	Spearman
Independent Sample 2 Groups	Independent Sample T-Test	Mann-Whitney Test (U-test)
Independent Sample more than 2 Groups	One way independent measures ANOVA	Kruskal-Wallis test
Repeated Measure 2 conditions	Paired t-test	Wilcoxon Test
Repeated Measure more than 2 conditions	One way repeated measures ANOVA	Friedman's Test