Glossary

1. Alternative Hypothesis

The alternative hypothesis, H1, is a statement of what a statistical hypothesis test is set up to establish. For example, in a clinical trial of a new drug, the alternative hypothesis might be that the new drug has a different effect, on average, compared to that of the current drug.

2. **Biostatistics**

Biostatistics is the application of statistics to a wide range of topics in biology. The science of biostatistics encompasses the design of biological experiments, especially in medicine and agriculture; the collection, summarization, and analysis of data from those experiments; and the interpretation of, and inference from, the results.

3. Data Analysis

Analysis of data is a process of inspecting, cleaning, transforming, and modelling data with the goal of highlighting useful information, suggesting conclusions, and supporting decision making.

4. **False Negative Error**

A false negative error is where a test result indicates that a condition failed, while it actually was successful.

5. False Positive Error

A false positive error is where a test result indicates that a condition turned out successful, while it actually was a failure.

6. Null Hypothesis

The null hypothesis, H0, represents a theory that has been put forward, either because it is believed to be true or because it is to be used as a basis for argument, but has not been proved. For example, in a clinical trial of a new drug, the null hypothesis might be that the new drug is no better, on average, than the current drug.

7. **Probability**

A probability provides a quantitative description of the likely occurrence of a particular event. Probability is conventionally expressed on a scale from 0 to 1; a rare event has a probability close to 0, a very common event has a probability close to 1

8. Sample

A sample is a group of units selected from a larger group (the population). By studying the sample it is hoped to draw valid conclusions about the larger group.

9. Sample mean

The sample mean is an estimator available for estimating the population mean. It is a measure of location, commonly called the average, often symbolised \overline{x} .

10. Sampling Distribution

The sampling distribution describes probabilities associated with a statistic when a random sample is drawn from a population. The sampling distribution is the probability distribution or probability density function of the statistic.

11. Significance level

The significance level of a statistical hypothesis test is a fixed probability of wrongly rejecting the null hypothesis H0, if it is in fact true.

12. Statistical Inference

Statistical Inference makes use of information from a sample to draw conclusions (inferences) about the population from which the sample was taken.

13. Statistical Hypothesis

A statistical hypothesis test is a method of making decisions using data, whether from a controlled experiment or an observational study (not controlled). In statistics, a result is called statistically significant if it is unlikely to have occurred by chance alone, according to a predetermined threshold probability, the significance level.

14. **Type I Error**

In a hypothesis test, a type I error occurs when the null hypothesis is rejected when it is in fact true; that is, H0 is wrongly rejected.

15. Type II Error

In a hypothesis test, a type II error occurs when the null hypothesis H0, is not rejected when it is in fact false.