<u>Glossary</u>

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. Discrete Distribution

In probability theory and statistics, a discrete probability distribution is a probability distribution characterized by a probability mass function.

3. Frequentist Statistics

Frequentist statistics is one of a number of possible techniques of formulating generally applicable schemes for making statistical inference: that implies of drawing conclusions from sample data by the emphasis on the frequency or proportion of the data. An alternative name is frequentist inference.

4. Nonparametric Tests

In statistical inference procedures (hypothesis tests and confidence intervals), nonparametric procedures are those that are relatively free of assumptions about population parameters.

5. Non-Randomized test

A test T of a hypothesis H is said to be non randomized if the hypothesis H_0 is rejected on the basis that a test statistic belongs to the critical region C.

6. Null Hypothesis

The null hypothesis, H_0 , 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. Parametric Tests

Parametric procedures are those that incorporate assumptions about population parameters.

8. Power

The power of a statistical hypothesis test measures the test's ability to reject the null hypothesis when it is actually false - that is, to make a correct decision. In other words, the power of a hypothesis test is the probability of not committing a type II error. It is calculated by subtracting the probability of a type II error from 1, usually expressed as: Power = 1 - P (type II error) = $(1 - \beta)$

9. P-Value

The probability value (p-value) of a statistical hypothesis test is the probability of getting a value of the test statistic as extreme as or more extreme than that observed by chance alone, if the null hypothesis H_0 , is true. It is the probability of wrongly rejecting the null hypothesis if it is in fact true.

10. Randomized test

A randomized test T is the one in which no test statistic is used.

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 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 pre-determined threshold probability, the significance level.

13. Test Statistic

A test statistic is a quantity calculated from our sample of data. Its value is used to decide whether or not the null hypothesis should be rejected in our hypothesis test. The choice of a test statistic will depend on the assumed probability model and the hypotheses under question.

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.