# <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. Critical function

With each test for testing a null hypothesis against an alternative hypothesis a function is associated called the critical function of a test. The critical function of a test is that function which gives the probability of rejecting the null hypothesis.

# 3. Critical Value

The critical value in a hypothesis test is the value of the test statistic beyond which we would reject the null hypothesis. The critical value is set so that the probability that the test statistic is beyond the critical value is at most equal to the significance level if the null hypothesis be true

## 4. Discrete Distribution

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

### 5. Homoscedasticity

In statistics, a sequence or a vector of random variables is homoscedastic if all random variables in the sequence or vector have the same finite variance. This is also known as homogeneity of variance.

### 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. One-Tailed Test

A test of a statistical hypothesis, where the region of rejection is on only one side of the sampling distribution, is called a one-tailed test.

### 8. Region of Acceptance

The range of values that leads the researcher to accept the null hypothesis is called the region of acceptance.

#### 9. Region of rejection

The range of values that leads the researcher to reject the null hypothesis is called the region of rejection.

#### 10. 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.

#### **11. 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.

#### 12. 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.

#### 13. Two-Tailed Test

A two-tailed test is a hypothesis test in which the null hypothesis is rejected if the observed sample statistic is more extreme than the critical value in either direction (higher than the positive critical value or lower than the negative critical value). A two-tailed test this has two critical regions.

#### 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,  $H_0$  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.