

Choosing the Appropriate Statistical Test

Purpose of test	Example	Parametric test	Equivalent non-parametric test
Compares two independent samples drawn from the same population	To compare baby girls' weights with baby boys' weights	Two sample (unpaired) t test	Mann-Whitney U test
Compares two sets of observations on a single sample	To compare weight of infants before and after a week in NICU	Matched sample (paired) t test	Wilcoxon matched pairs test
Compares three or more groups of observations	To determine differences in weight loss to three types of diets	One way ANOVA (F test)	Kruskal-Wallis analysis of variance by ranks
Tests the influence (and interaction) of two different covariates	In the above diet example, to determine if the weight loss differs in male and female subjects and by diet type	Two way ANOVA	Two way analysis of variance by ranks
Tests the influence (and interaction) of two different covariates, repeated over time	In the above diet example, to assess weight at baseline, after 3 months among 3 diets and by gender	Repeated Measures ANOVA	Two way analysis of variance by ranks
Tests if distribution of a categorical variable is the same in two (or more) independent samples	To assess whether the CVD risk increases with socioeconomic deprivation	χ^2 test (goodness-of-fit)	Fisher's exact test Kruskal-Wallis test
Assesses the strength of linear association between two continuous variables.	To assess whether and to what extent HBA1c is related to waist circumference and BMI in diabetic patients	Pearson's correlation coefficient	Spearman's rank correlation coefficient Kendall's tau
Describes relationship between two quantitative variables, allowing one value to be predicted from the other	To see how BMI varies with height	Simple Linear Regression	Non-parametric regression (various tests)
Describes the relationship between a dependent variable and several predictor variables (covariates)	To determine whether and to what extent a person's age, BMI, and gender affect their blood pressure	Multivariate linear regression	Non-parametric regression (various tests)
Predicts the likelihood of an event based on an associated risk factor	To see how influenza vaccination uptake is associated with educational attainment	Simple logistic Regression	Loglinear models
Predicts the likelihood of an event based on several associated risk factors	To see how influenza vaccination uptake is associated with educational attainment, gender and age	Multiple logistic Regression	Loglinear models