Data—Categorical OR Quantitative (Numerical)
Categorical Data—Nominal OR Ordinal
Quantitative Data—Continuous OR Discrete

Normal Distribution-68% values lie within the range Mean +/- 1SD
95% values lie within the range Mean +/- 2 SD
99.7% values lie within the range Mean +/- 3 SD

To test whether data is normally distributed→ Kolmogorov-Smirnov test

Variance= Σ (X-x)^2/n-1   where X=variable value, x=mean, n=number of variable

Standard deviation (σ) is the square root of variance. SD is a measure of variance, does not depend on sample size in its magnitude but does so for accuracy.

Coefficient of Variation→ for repeated measurements of a given parameter

Standard Error of Mean =SD/ sq root n. SE M is a measure of the precision of an estimate, decreases in magnitude as the sample size increases.

Type I error (alpha)→ to reject null hypothesis when it is in fact true→set at 5%
Type II error (beta)→ to accept null hypothesis when it is in fact false→ set at 20%

Power of a study= 1-β

N= 16σ^2/d^2

Where σ= SD & d=expected difference

Paired tests of significance are necessary for paired samples as each subject acts as its own control and the variability between subjects is removed

Chi Square (χ^2)Test→ by default are 2-sided; carried out on actual numbers, rather than on derived statistics (%, ratio, proportion). Use 2x2 contingency tables for quick analysis.
When numbers analysed are small (eg if the total <100 or any one cell <10), then either one should apply Yates' correction OR apply Fischer's exact t test. Fischer's t Test will have 2 p values-conventional, corresponding to χ^2 test without Yates' correction and mid-p value, which corresponds to the value of p obtained using χ^2 test with the correction.

McNemar's test→ for paired nominal data. It is a variant of χ^2 test.

Quantitative / Ordinal Non-parametricData→ if paired→ use Wilcoxon signed ranks test
If unpaired→ use Mann Whitney U test

Correlation→ association between 2 quantitative variables
Regression→ estimation of best straight line to summarise the association
Correlation analysis for non-parametric data→Spearman's Rank Correlation Coefficient (r_s)

Correlation analysis for parametric data→ Pearson's Correlation Coefficient (r) . Values between –1 and +1 depending on direction of correlation. Value of 0 means there is no correlation

Graphical plotting regression→ use the dependant variable as the ordinate (Y-axis) and the independent variable as the abcissa (X-axis)

To test whether association is merely apparent and might have arisen by chance→ t test

Regression→ average value of y (dependant) is a function of x (independent)

Regression equation→ $y= \alpha+\beta x$

Regression coefficient→ β

Survival analysis→ studying time between entry to a study and a subsequent event

Kaplan Meyer survival curve
Log Rank test→ To compare 2 survival curves. Assumes that data are ordinal/ continuous and that risk of an event in one group relative to the other does not change with time

SIGNIFICANCE TESTS FOR PAIRED OBSERVATIONS

Nominal→ McNemar's test
Ordinal→ Wilcoxon signed ranks test
Quantitative (non-parametric) → Wilcoxon signed ranks test
Quantitative (parametric)→ Paired t test

SIGNIFICANCE TESTS FOR UNPAIRED OBSERVATIONS (2)

Nominal→ χ^2 / Fischer's test
Ordinal→ χ^2 / Mann-Whitney U test
Quantitative discrete→ Mann-Whitney U test
Quantitative non-parametric→ Mann-Whitney U test/ Log rank test
Quantitative parametric→ Student t test

SIGNIFICANCE TESTS FOR > 2UNPAIRED OBSERVATIONS

Ordinal/ Quantitative Discrete/ Quantitative Nonparametric→ Kruskall-Wallis test
Quantitative parametric→ One way ANOVA (Analysis of Variance)

Nominal data:

Paired→ McNemar's test
Unpaired→ χ^2 / Fischer's test

Ordinal data:

Paired→ Wilcoxon signed ranks test test
Unpaired→ χ^2 / Mann-Whitney U test

Quantitative data (Non-parametric) :

Paired→ Wilcoxon signed ranks test test
Unpaired→ Mann-Whitney U test

Quantitative data (Parametric) :

Paired→ Paired t test
Unpaired→ Independent t test

Quantitative data (paired) :

Parametric→ Paired t test
Non-parametric→ Wilcoxon signed ranks test test

Quantitative data (unpaired) :

Parametric→ Independant t test
Non-parametric→ Mann-Whitney U test