

Which Statistical Test Should I Use?

A one-page decision cheat sheet — with the R function for each test

Start with two questions: what is your goal, and what type is your outcome? Then read across to the test and the R function that runs it. If a continuous outcome isn't roughly normal, use the non-parametric row.

Comparing groups (continuous outcome)

Situation	Test	R function
One group vs a known value	One-sample t-test	<code>t.test(x, mu = 50)</code>
Two independent groups (normal)	Welch's t-test	<code>t.test(y ~ group)</code>
Two independent groups (non-normal)	Mann–Whitney U	<code>wilcox.test(y ~ group)</code>
Two paired measurements (normal)	Paired t-test	<code>t.test(x, y, paired = TRUE)</code>
Two paired (non-normal)	Wilcoxon signed-rank	<code>wilcox.test(x, y, paired = TRUE)</code>
Three or more groups (normal)	One-way ANOVA	<code>aov(y ~ group)</code>
Three or more groups (non-normal)	Kruskal–Wallis	<code>kruskal.test(y ~ group)</code>

Measuring association

Situation	Test	R function
Two continuous, linear	Pearson correlation	<code>cor.test(x, y)</code>
Two continuous, monotonic / outliers	Spearman correlation	<code>cor.test(x, y, method = "spearman")</code>
Two categorical (large sample)	Chi-square test	<code>chisq.test(table)</code>
Two categorical (small counts)	Fisher's exact test	<code>fisher.test(table)</code>

Modelling / predicting an outcome

Outcome	Model	R function
Continuous	Linear regression	<code>lm(y ~ x1 + x2)</code>
Binary (yes/no)	Logistic regression	<code>glm(y ~ x, family = binomial)</code>
Count	Poisson / negative binomial	<code>glm(y ~ x, family = poisson)</code>
Time-to-event	Cox proportional hazards	<code>coxph(Surv(time, event) ~ x)</code>

Before you trust the result

- **Check assumptions**, don't assume them — for a continuous outcome, is it roughly normal? (Shapiro–Wilk + Q–Q plot.) If not, use the non-parametric row.
- **Report an effect size and a confidence interval**, not just a p-value. Significance ≠ importance.
- **A significant ANOVA or chi-square** tells you a difference exists, not *which* — follow up with a post-hoc test.

Free statistics calculators, an interactive “which test?” tool and R tutorials: rverseanalytics.com/tools · Rverse Analytics — R consulting for statistical analysis, Shiny & reproducible reporting.