

Statistical hypothesis tests

Data and comparison type	Alternative hypotheses	Parametric test Stata command	Non-parametric test Stata command
Numerical; One mean	$H_a: \mu \neq \mu_a$ (two-sided) $H_a: \mu > \mu_a$ or $\mu < \mu_a$ (one-sided)	Z or t-test • <code>ttest var1=hypoth val.*</code>	
Numerical; Two means, <u>paired data</u>	$H_a: \mu_1 \neq \mu_2$ (two-sided) $H_a: \mu_1 > \mu_2$ or $\mu < \mu_a$ (one-sided)	Paired t-test • <code>ttest var1=var2*</code>	Sign test • <code>signtest var1=var2</code> • Wilcoxon Signed-Rank <code>signrank var1=var2</code>)
Numerical; Two means, independent data	$H_a: \mu_1 \neq \mu_2$ (two-sided) $H_a: \mu_1 > \mu_2$ or $\mu < \mu_a$ (one-sided)	T-test (equal or unequal variance) • <code>ttest var1, by(byvar) unequal</code>	Wilcoxon rank-sum test • <code>ranksum var1, by(byvar)</code>
Numerical, Two or more means, independent data	$H_a: \mu_1 \neq \mu_2$ or $\mu_1 \neq \mu_3$ or $\mu_2 \neq \mu_3$ etc.	ANOVA • <code>oneway var1 byvar</code>	Kruskal Wallis test • <code>kwallis var1, by(byvar)</code>
Dichotomous; One proportion	$H_a: p \neq p_a$ (two-sided) $H_a: p > p_a$ or $p < p_a$ (one-sided)	Proportion test • <code>prtest var1=hypoth value*</code> • <code>bitest var1=hypoth value</code>	
Dichotomous; two proportions	$H_a: p_1 \neq p_2$ (two-sided) $H_a: p_1 > p_2$ (one-sided)	Proportion test (z-test) • <code>prtest var1, by(byvar)</code>	Chi-square test • <code>tab var1 var2, chi exact</code> McNemar's for paired data: • <code>mcc var1 var2</code>
Categorical by categorical (nxk)	H_a : The rows not independent of the columns		Chi-square test • <code>tab var1 var2, chi exact</code>