



Parameter	Test	Hypotheses	Test Statistic	Distribution
Mean	Known Variance	$H_0 : \mu = \mu_0$ $H_1 : \mu > \mu_0$	$z = \frac{\bar{x} - \mu_0}{\sigma / \sqrt{n}}$	Normal
Mean	Unknown Variance	$H_0 : \mu = \mu_0$ $H_1 : \mu > \mu_0$	$t = \frac{\bar{x} - \mu_0}{s / \sqrt{n}}$ with $n - 1$ d.f.	Student-t
Mean	Comparison – Paired $d_i = x_{1i} - x_{2i}$	$H_0 : \mu_1 - \mu_2 = \mu_d$ $H_1 : \mu_1 - \mu_2 > \mu_d$	$t = \frac{\bar{d} - \mu_d}{s_d / \sqrt{n}}$ with $n - 1$ d.f.	Student-t
Mean	Comparison – Independent Known variances	$H_0 : \mu_1 - \mu_2 = \mu_d$ $H_1 : \mu_1 - \mu_2 > \mu_d$	$z = \frac{(\bar{x}_1 - \bar{x}_2) - \mu_d}{\sqrt{\frac{\sigma_1^2}{n_1} + \frac{\sigma_2^2}{n_2}}}$	Normal
Mean	Comparison – Independent Unknown and unequal Variances	$H_0 : \mu_1 - \mu_2 = \mu_d$ $H_1 : \mu_1 - \mu_2 > \mu_d$	$t = \frac{(\bar{x}_1 - \bar{x}_2) - \mu_d}{\sqrt{\frac{s_1^2}{n_1} + \frac{s_2^2}{n_2}}}$ with $\min(n_1 - 1, n_2 - 1)$ d.f. *	Student-t
Mean	Comparison – Independent Unknown but assumed equal variances	$H_0 : \mu_1 - \mu_2 = \mu_d$ $H_1 : \mu_1 - \mu_2 > \mu_d$	$t = \frac{(\bar{x}_1 - \bar{x}_2) - \mu_d}{s \sqrt{\frac{1}{n_1} + \frac{1}{n_2}}}$ where $s = \sqrt{\frac{(n_1 - 1)s_1^2 + (n_2 - 1)s_2^2}{n_1 + n_2 - 2}}$ with $n_1 + n_2 - 2$ df	Student-t
Proportion	Single	$H_0 : p = p_0$ $H_1 : p > p_0$	$z = \frac{\hat{p} - p_0}{\sqrt{\frac{p_0 q_0}{n}}}$ where $\hat{p} = \frac{r}{n}$	Normal
Proportion	Comparison	$H_0 : p_1 = p_2$ $H_1 : p_1 > p_2$	$z = \frac{\hat{p}_1 - \hat{p}_2}{\sqrt{\hat{p}\hat{q}\left(\frac{1}{n_1} + \frac{1}{n_2}\right)}}$ where $\hat{p} = \frac{r_1 + r_2}{n_1 + n_2}$, $\hat{p}_1 = \frac{r_1}{n_1}$, and $\hat{p}_2 = \frac{r_2}{n_2}$	Normal
Variance	Single	$H_0 : \sigma^2 = \sigma_0^2$ $H_1 : \sigma^2 > \sigma_0^2$	$\chi^2 = \frac{(n - 1)s^2}{\sigma_0^2}$ with $n - 1$ df	Chi-Square
Variance	Comparison	$H_0 : \sigma_1^2 = \sigma_2^2$ $H_1 : \sigma_1^2 > \sigma_2^2$	$F = \frac{s_1^2}{s_2^2}$ with num = $n_1 - 1$ df and denom = $n_2 - 1$ df	F

* Use Welch-Satterthwaite's formula for more accuracy:

$$df \approx \frac{\left(\frac{s_1^2}{n_1} + \frac{s_2^2}{n_2}\right)^2}{\frac{1}{n_1 - 1} \left(\frac{s_1^2}{n_1}\right)^2 + \frac{1}{n_2 - 1} \left(\frac{s_2^2}{n_2}\right)^2}$$