	Parameter	Statistic	Null Hypothesis in Hypothesis Test	Standard Error	Test Statistic for Hypothesis Test	z or t ?	Degrees of Freedom	Conditions for Inference
Mean of a Population (known standard deviation)	μ	$\bar{x}$	$\mu = \mu_0$	$\frac{\sigma}{\sqrt{n}}$	$\frac{\bar{x} - \mu}{\sigma/\sqrt{n}}$	z		σ known
Mean of a Population (unknown standard deviation)	μ	$\bar{x}$	$\mu = \mu_0$	$\frac{s}{\sqrt{n}}$	$\frac{\bar{x} - \mu}{s/\sqrt{n}}$	t	$n - 1$	$n < 15$ + Normally dist. pop.: OK $n < 15$ + skewed dist./outliers.: not OK $n \geq 15$ + strong skew./ extreme outliers.: not OK $n \geq 40$: OK
Matched Pairs	μ_{diff}	$\bar{x}_{\text{diff}}$	$\mu_{\text{diff}} = 0$	$\frac{s_{\text{diff}}}{\sqrt{n}}$	$\frac{\bar{x} - \mu}{s_{\text{diff}}/\sqrt{n}}$	t	$n - 1$	
Means of Two Populations	$\mu_1 - \mu_2$	$\bar{x}_1 - \bar{x}_2$	$\mu_1 = \mu_2$	$\sqrt{\frac{s_1^2}{n_1} + \frac{s_2^2}{n_2}}$	$\frac{\bar{x}_1 - \bar{x}_2}{\sqrt{\frac{s_1^2}{n_1} + \frac{s_2^2}{n_2}}}$	t	↓	Same as above, replacing n with $n_1 + n_2$ $n_1 \geq 5$ & $n_2 \geq 5$ n_1, n_2 roughly the same size

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

	Parameter	Statistic	Null Hypothesis in Hypothesis Test	Standard Error for Confidence Interval	Standard Error for Hypothesis Test	Test Statistic for Hypothesis Test	z or t ?	Conditions for Inference
Proportion of a Population	p	$\hat{p}$	$p = p_0$	$\sqrt{\frac{\hat{p}(1-\hat{p})}{n}}$	$\sqrt{\frac{p_0(1-p_0)}{n}}$	$\frac{\hat{p}-p_0}{\sqrt{\frac{p_0(1-p_0)}{n}}}$	z	CI: at least 15 successes and 15 failures HT: $np_0 \geq 10$, $n(1-p_0) \geq 10$
Proportion of a Population (plus four)	p	$\tilde{p}$	X	$\sqrt{\frac{\tilde{p}(1-\tilde{p})}{n+4}}$	X	X	z	$n > 10$ Confidence Level $\geq 90\%$
Proportion of Two Populations	$p_1 - p_2$	$\hat{p}_1 - \hat{p}_2$	$p_1 = p_2$	$\sqrt{\frac{\hat{p}_1(1-\hat{p}_1)}{n_1} + \frac{\hat{p}_2(1-\hat{p}_2)}{n_2}}$	$\sqrt{\hat{p}(1-\hat{p})\left(\frac{1}{n_1}+\frac{1}{n_2}\right)}$	$\frac{\hat{p}_1-\hat{p}_2}{\sqrt{\hat{p}(1-\hat{p})\left(\frac{1}{n_1}+\frac{1}{n_2}\right)}}$	z	CI: at least 10 successes and 10 failures in each sample HT: at least 5 successes and 5 failures in each sample
Proportion of Two Populations (plus four)	$p_1 - p_2$	$\tilde{p}_1 - \tilde{p}_2$	X	$\sqrt{\frac{\tilde{p}_1(1-\tilde{p}_1)}{n_1+2} + \frac{\tilde{p}_2(1-\tilde{p}_2)}{n_2+2}}$	X	X	z	$n_1 \geq 5$ $n_2 \geq 5$