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## Confidence Intervals Display: Two-Group

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# Startup Guide

or

by  
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[www.StatLit.org/pdf/](http://www.StatLit.org/pdf/)  
*2013-Schild-Confidence-Intervals-Display-6up.pdf*  
*2013-Schild-Confidence-Intervals-Display-1up.pdf*

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## Confidence Intervals

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Confidence intervals are arguably the simplest and easiest way to show sampling error.

Generating confidence intervals on a common outcome for two groups allows us to see if the difference in means is statistically-significant.

Excel doesn't have a command to generate confidence intervals for one or two groups. It doesn't have a simple way of creating a graphic. These slides show how to do it all using Excel and an Excel template.

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## Approach

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1. This presentation assumes that summary statistics on an outcome (average or proportion, sample size and standard deviation) are available for two subgroups.
2. Given these statistics, the Margin of Error and associated confidence intervals can be generated.
3. Non-overlapping confidence intervals indicate statistical-significance. But this may be hard to see.
4. Excel can be used to generate visual display of confidence intervals. This involves some unusual uses of Excel. This will be shown in the next slides.

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## Excel Template

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1. An Excel template is available that converts summary statistics for two groups into two horizontal bars symbolizing the associated confidence intervals.
2. Whether or not the bars overlap or touch is easily seen – and can be copied into a document or slide.
3. Download a template from [www.StatLit.org/Excel/Display-Confidence-Intervals-2Group-Excel-2003.xls](http://www.StatLit.org/Excel/Display-Confidence-Intervals-2Group-Excel-2003.xls)
4. This template works with Excel 2003 and subsequent versions. It does not have any macros.

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## Input for Proportions

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0.950	Confidence Level				Manual
<b>Gals who Work</b>		<b>Guys who Work</b>			
40.0%	p = proportion	55.0%	p		Manual
84	Sample Size	100	Count		Manual
49.0%	SD=Std. Deviation	49.7%	SD		
2.283	t = TINV(p, df)	2.276	t-critical		
12.2%	ME = t*StdDev/Sqrt(n)	11.4%	ME		
27.8%	CI-Lower = Ave - ME	43.6%	CI-Lower		
52.2%	CI-Upper = Ave + ME	66.4%	CI-Upper		

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## Output for Proportions

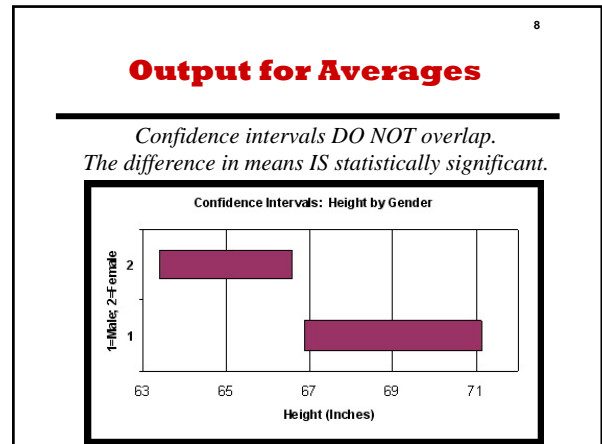
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Confidence intervals DO overlap.  
The difference in means is NOT statistically significant.\*

**Input for Averages**

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0.950	Confidence Level				Manual
<b>Male Height</b>		<b>Female Height</b>			
69.0	<b>Average</b>	65.0	<b>Average</b>		Manual
4.0	<b>SD=Std. Deviation</b>	3.0	<b>SD</b>		Manual
16	<b>Sample Size</b>	16	<b>Count</b>		Manual
2.13	t = TINV(p, df)	2.13	t-critical		
2.1	ME = t*StdDev/Sqrt(n)	1.6	ME		
66.9	CI-Lower = Ave - ME	63.4	CI-Lower		
71.1	CI-Upper = Ave + ME	66.6	CI-Upper		



**Chart Options**

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Under the Titles tab, enter the chart title, X-axis title, and the Y-axis title.  
Note: graph is rotated.  
Press "OK"

- Conclusion**
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- Excel can generate visual confidence intervals.
  - If the 95% bars do NOT overlap, the difference in means IS statistically significant. If the 95% bars do overlap, the difference in means is NOT statistically significant\*.
- \* Note: This confidence-interval overlap test is very conservative. If the bars barely overlap, see a statistician for a more accurate test. The difference may still be statistically significant.