

Comparing two samples with Confidence Intervals

1. Go to <http://statprep.org/> then click on resources, and select “Little Apps”.
2. Open the “Two-sample t” applet, and keep the NHANES data (should be default)
3. Choose the “home_type” as your Explanatory variable and “Age” as the response variable.
4. Fill out the following table:

| Variable | Categorical or Quantitative |
|-------------|-----------------------------|
| “home_type” | |
| “Age “ | |

5. Click on the “Show Confidence Interval” and “Show mean”
Who seems to have a higher average age? How can you tell?

The screenshot shows the StatPrep applet interface. On the left, under 'Data source', the 'Data frame' is set to 'NHANES'. Under 'Variables selected', 'Response' is 'age' and 'Explanatory' is 'home_type'. On the right, under 'Sample', there is a 'New sample' button, 'Sample size n' is 50, and 'Stratify' is unchecked. Under 'Inference', 'Show mean' and 'Show conf. interval' are both checked, and 'Confidence level' is 95%.

6. Trying going from a confidence level of 50% to a confidence level of 99%, what do you notice happens?
7. Finish this statement: The higher the confidence level, the _____ the interval gets.
8. Now try changing the sample size: Go from $n = 50$ to $n = 200$, what do you notice happens?
9. Finish this statement: The bigger the sample size, the _____ the interval gets.

10. Click on the “Show t Interval” and you should see a p-value pop on the screen. Write down your p-value. This is the probability of getting your samples this different or more by chance.

11. Are your confidence intervals overlapping? Does there seem to be a significant difference in ages between the average person who owns a house and the average person who rents?

Play around with it, find variables that you think and do have a difference/no difference based on data. Try not using gender as one of your variables. Explore!!!

| Explanatory Variable | Response Variable | Seems significant Different? | Overlapping Confidence interval (Click on “Conf.Interval”) | P-value (Click on t) |
|----------------------|-------------------|------------------------------|--|----------------------|
| HomeOwn | Poverty | Yes | No overlap | 0.0011 |
| HomeOwn | BMI | No | Lot of overlap | 0.88 |
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12. What are you noticing about the relationships between if something seems significantly different, confidence intervals overlapping or not, and what the corresponding p-value would be? Write at least four sentences.