6.12 Exercise: Inference with iNZight *(Lite version)*

This exercise will enable you to use iNZight to put intervals around the estimates of a population mean and proportions to allow for sampling error and compare groups.

The skills addressed are:

- Use iNZight Lite to get confidence interval for estimates of the population mean and make comparisons across sub-groups.
- Use iNZight Lite to build confidence intervals around estimates of population proportions and make comparisons between groups.

INSTRUCTIONS

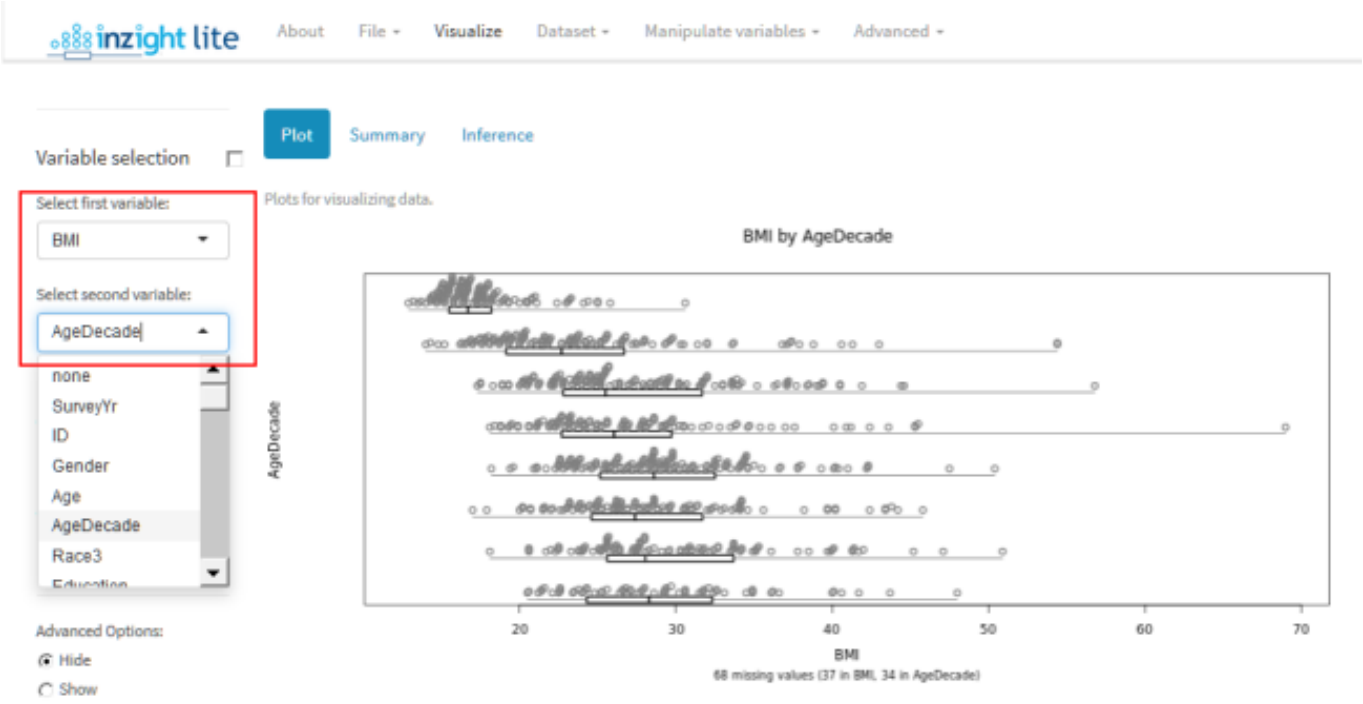
Start iNZight Lite and import the **NHANES-1000** dataset into iNZight using **File > Dataset Examples**. Select the **NHANES-1000** dataset from Data set Category **Future-Learn.**

If you have any problems during this exercise, see the **Common Questions** on the last page.

Construct confidence intervals for sub-groups of a numeric outcome

We are revisiting **BMI** (Body Mass Index) for different age groups and using the **NHANES-1000** data, a sample of the American population. We will use our sample to estimate the mean BMI for different age groups. To do this we need to construct intervals around our estimates in order to allow for sampling error.

- Select **BMI** in the **first variable** slot
- Select **AgeDecade** in the **second variable** slot.



You should have a series of dot plots of BMI for different age groups in your plot window.

To get confidence and comparison intervals:

- On the **Add to Plot** tab select **Add Inference Information**
- Under **Type of Interval** select both **Confidence** and **Comparison** Intervals

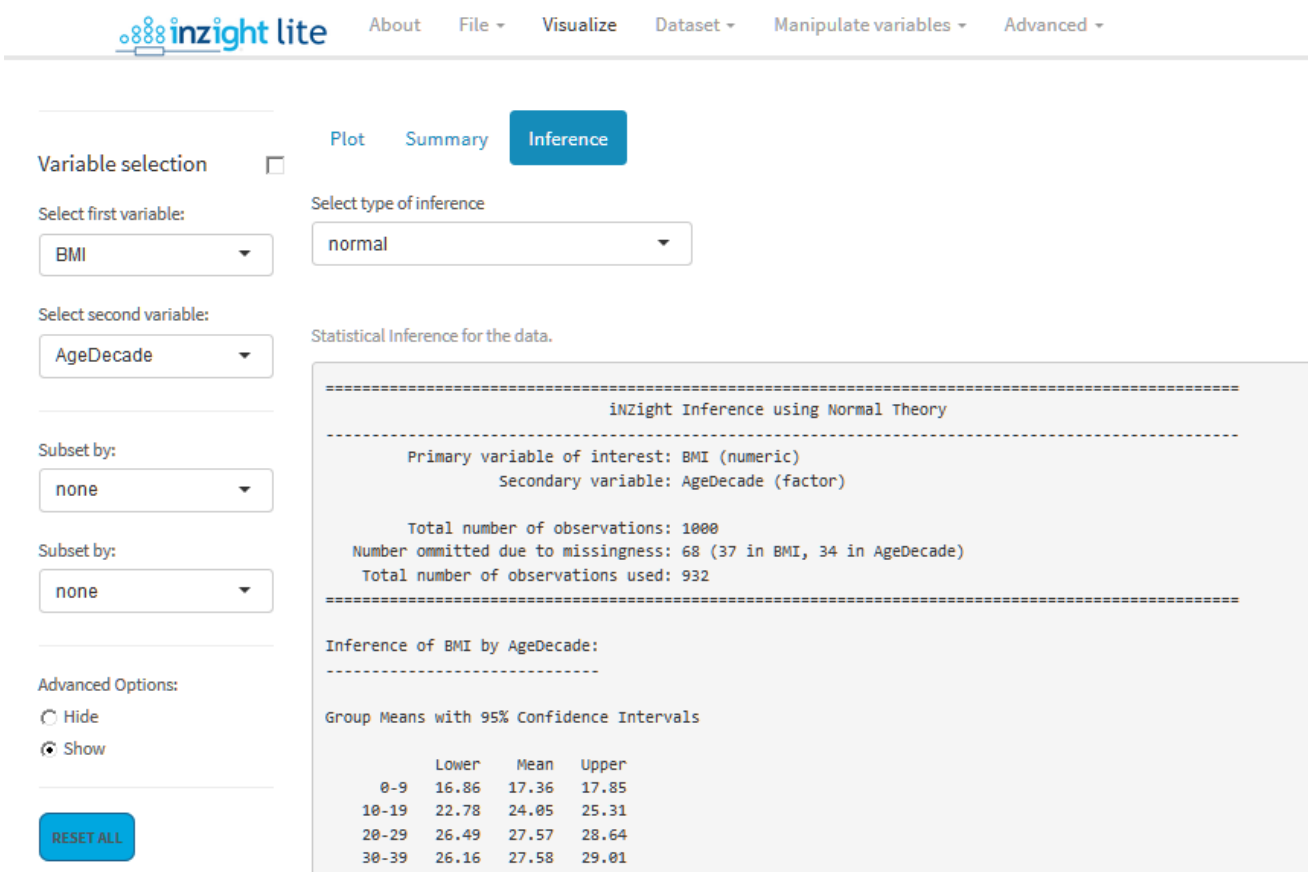
What do you see here? Remember that the blue lines are called 'comparison intervals' and are lines that we look at when observing any overlap.

Post a comment if you have any interesting observations about the estimation of the population means for each age group and the differences between them.

For the actual (numerical) confidence intervals for the group means/medians and and also confidence intervals for the differences between them:

- click the **Inference** tab towards the top right of the page.

Clicking the **Summary** tab will show you sets of summary statistics for each group.



and more …

EXPLORE (~5 min)

Find another numeric variable in the NHANES-1000 dataset that you might like to explore across age groups, e.g. **Height**, and move it to the **first variable** slot. Use iNZight Lite to explore the estimates for the American population and build intervals around your estimates.

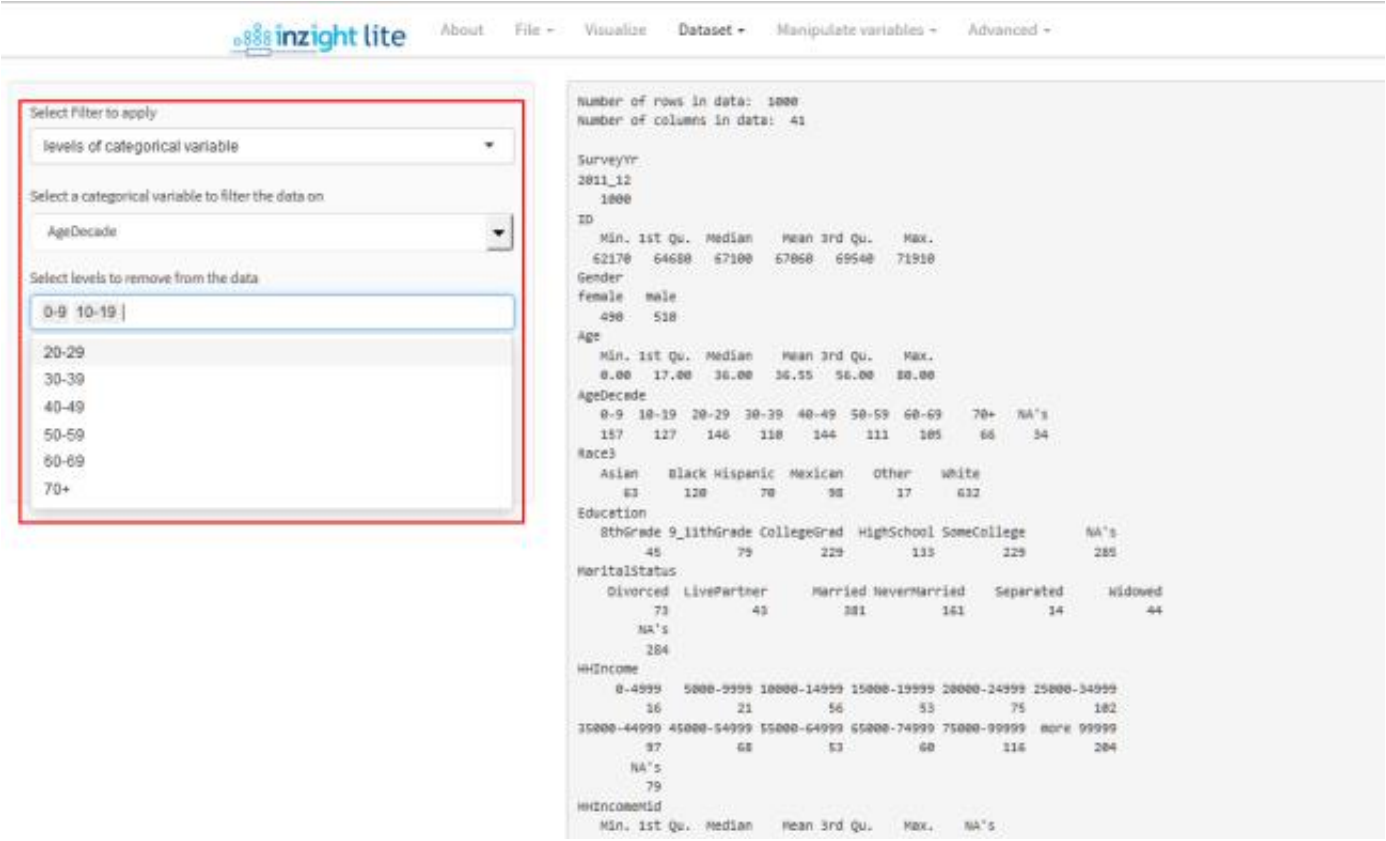
Post a comment if you see anything interesting.

Confidence and comparison intervals for proportions

Now we'll use the NHANES-1000 dataset to form intervals around estimates of how people in the American population rate their general health at the time of the survey (to convey uncertainty). Are there any differences between age groups?

First, filter out people below the age of 20:

- Click **Dataset > Filter Dataset**
- Select **levels of a categorical variable**
- Filter data by: Select **AgeDecade**
- Select all of the age groups below the age of 20 to remove the unwanted levels.
- Click **Perform Operation**



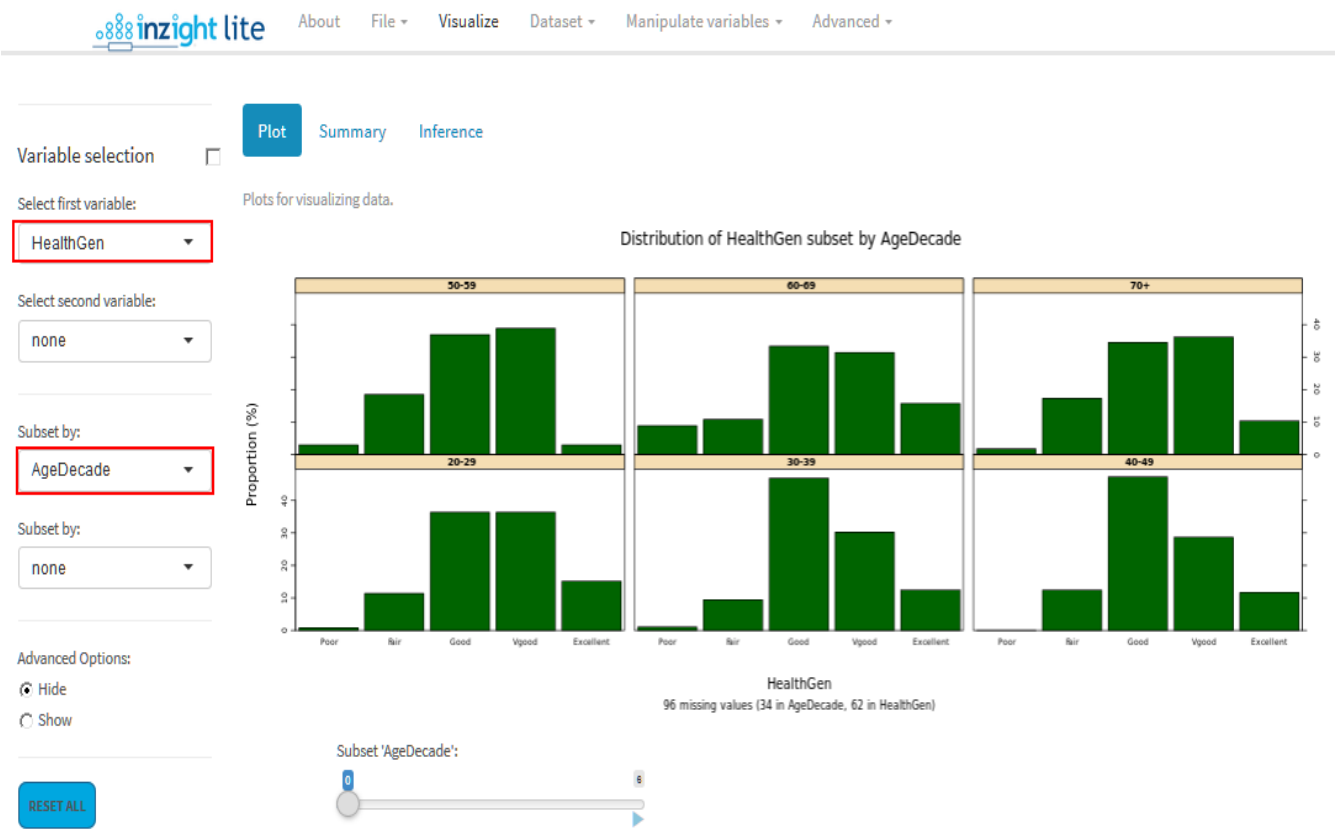
And

- Re-order the values for Health Gen setting from 1=Poor to 5=Excellent using **Manipulate Variables > Categorical Variables > Reorder Levels.**

Now construct the series of plots for **HealthGen** and **AgeDecade**:

- Select **HealthGen** in the **first variable** slot
- Select **AgeDecade** in the first **subset by** slot.

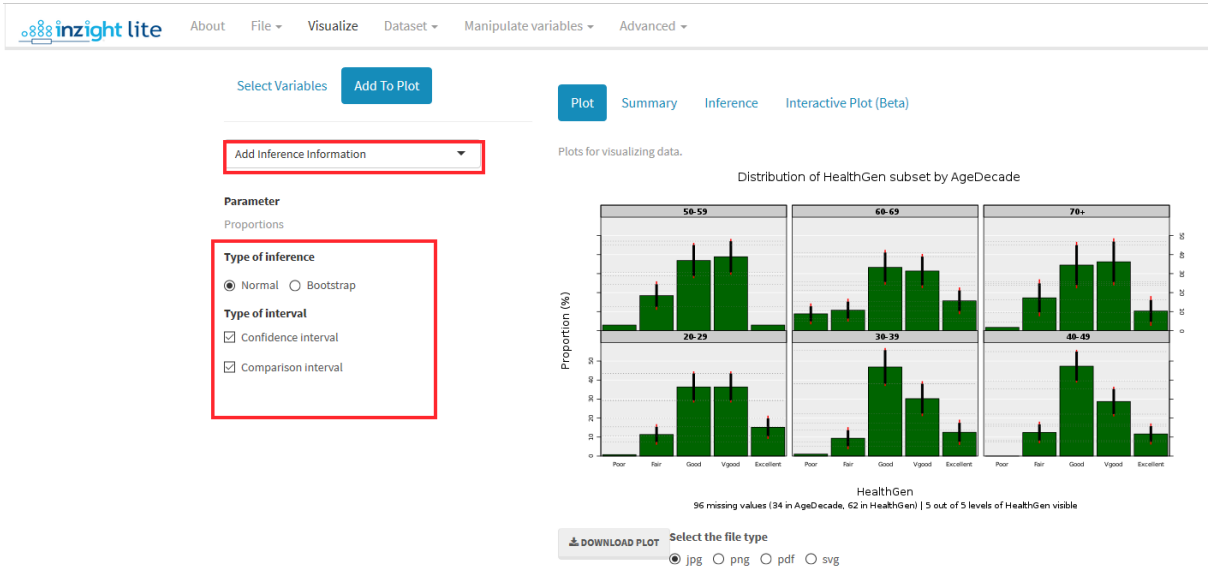
A series of graphs will appear in the plot window. It will help you see more of the detail if you enlarge your plot window.



To add confidence and comparison intervals to the graph:

- Click **Add to Plot** and select **Add Inference Information**
- Under **Type of Interval** select both **Confidence** and **Comparison** Intervals (they may still be selected from your work above).

Add Confidence Intervals and Comparison Intervals to the plot

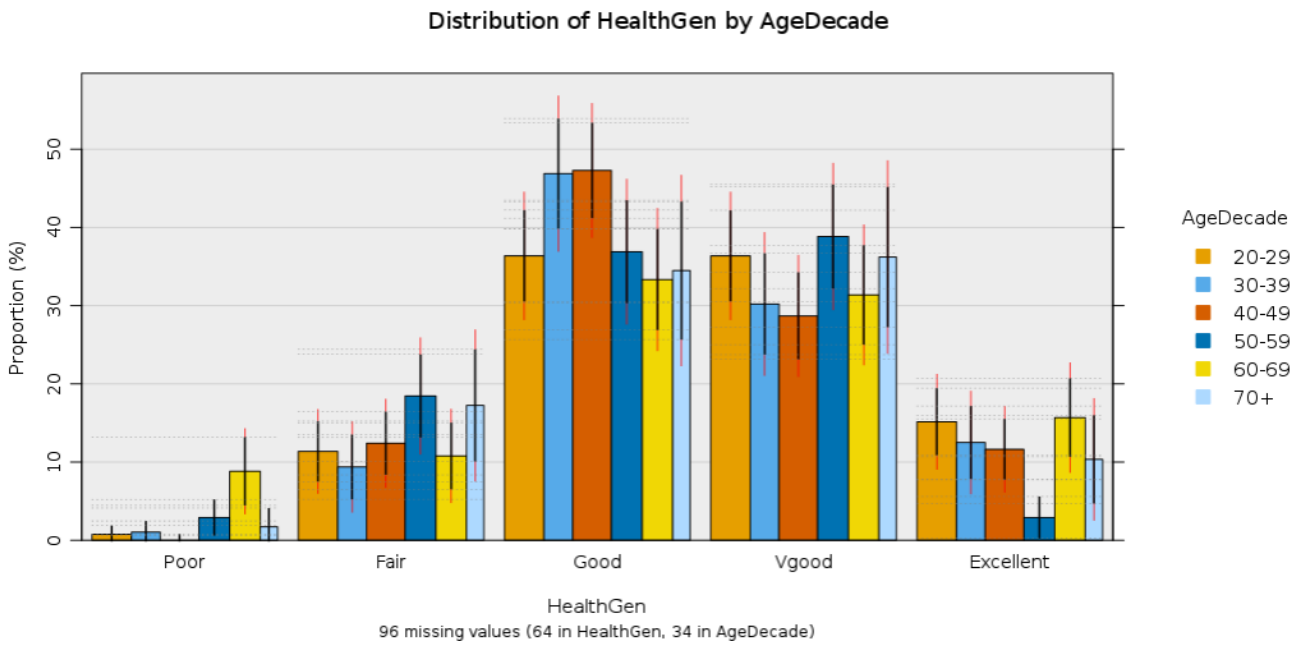


What does this graph tell you? What can you infer about true differences between the percentages in each health category?
Select the **Inference** tab to see the actual confidence intervals around each proportion and for the differences between them.

Now construct the series of plots for **HealthGen** by **AgeDecade**:

- Select **HealthGen** in the **first variable** slot
- Select **AgeDecade** in the **second variable** slot.

A graph will appear in the plot window. (see over page).



If the intervals do not appear intervals use **Add Inference Information** as before.

What does this graph tell you about age-differences in the percentages for each health category (e.g. differences between age groups in the percentages saying they are in very good health)?

Use the **Inference** tab to see the exact numerical confidence intervals for differences between the true proportions.