

## Chapter 209

# Descriptive Statistics – Summary Lists

## Introduction

This procedure is used to summarize continuous data. Large volumes of such data may be easily summarized in statistical lists of means, counts, standard deviations, etc. Up to 8 categorical group variables may be used to calculate summaries for individual group combinations. The summary lists may be output directly to a new dataset.

This procedure produces lists of the following summary statistics:

- Count
- Missing Count
- Sum
- Mean
- Standard Deviation (Std Dev)
- Standard Error (Std Error)
- Lower 95% Confidence Limit for the Mean (95% LCL)
- Upper 95% Confidence Limit for the Mean (95% UCL)
- Median
- Minimum
- Maximum
- Range
- Interquartile Range (IQR)
- 10th Percentile (10th Pctile)
- 25th Percentile (25th Pctile)
- 75th Percentile (75th Pctile)
- 90th Percentile (90th Pctile)
- Variance
- Mean Absolute Deviation (MAD)
- Mean Absolute Deviation from the Median (MADM)
- Coefficient of Variation (COV)
- Coefficient of Dispersion (COD)
- Skewness
- Kurtosis

## Data Structure

The data below are a subset of the Resale dataset provided with the software. This (computer simulated) data gives the selling price, the number of bedrooms, the total square footage (finished and unfinished), and the size of the lots for 150 residential properties sold during the last four months in two states. This data is representative of the type of data that may be analyzed with this procedure. Only the first 8 of the 150 observations are displayed.

### Resale dataset (subset)

| State | Price  | Bedrooms | TotalSqft | LotSize |
|-------|--------|----------|-----------|---------|
| Nev   | 260000 | 2        | 2042      | 10173   |
| Nev   | 66900  | 3        | 1392      | 13069   |
| Vir   | 127900 | 2        | 1792      | 7065    |
| Nev   | 181900 | 3        | 2645      | 8484    |
| Nev   | 262100 | 2        | 2613      | 8355    |
| Nev   | 147500 | 2        | 1935      | 7056    |

## Missing Values

Observations with missing values in either the group variables or the continuous data variables are ignored. The procedure also allows you to specify up to 5 additional values to be considered as missing in categorical group variables.

---

## Summary Statistics

The following sections outline the summary statistics that are available in this procedure.

---

### Count

The number of non-missing data values,  $n$ . If no frequency variable was specified, this is the number of rows with non-missing values.

---

### Missing Count

The number of missing data values. If no frequency variable was specified, this is the number of rows with missing values.

---

### Sum

The sum (or total) of the data values.

$$Sum = \sum_{i=1}^n x_i$$

---

### Mean

The average of the data values.

$$\bar{x} = \frac{\sum_{i=1}^n x_i}{n}$$

---

### Variance

The sample variance,  $s^2$ , is a popular measure of dispersion. It is an average of the squared deviations from the mean.

$$s^2 = \frac{\sum_{i=1}^n (x_i - \bar{x})^2}{n - 1}$$

## Standard Deviation (Std Dev)

The sample standard deviation,  $s$ , is a popular measure of dispersion. It measures the average distance between a single observation and the mean. It is equal to the square root of the sample variance.

$$s = \sqrt{\frac{\sum_{i=1}^n (x_i - \bar{x})^2}{n-1}}$$

## Standard Error (Std Error)

The standard error of the mean, a measure of the variation of the sample mean about the population mean, is computed by dividing the sample standard deviation by the square root of the sample size.

$$s_{\bar{x}} = \frac{s}{\sqrt{n}}$$

## 95% Confidence Interval for the Mean (95% LCL & 95% UCL)

This is the upper and lower values of a 95% confidence interval estimate for the mean based on a  $t$  distribution with  $n - 1$  degrees of freedom. This interval estimate assumes that the population standard deviation is not known and that the data for this variable are normally distributed.

$$95\% \text{ CI} = \bar{x} \pm t_{\alpha/2, n-1} s_{\bar{x}}$$

## Minimum

The smallest data value.

## Maximum

The largest data value.

## Range

The difference between the largest and smallest data values.

$$\text{Range} = \text{Maximum} - \text{Minimum}$$

## Percentiles

The  $100p^{\text{th}}$  percentile is the value below which  $100p\%$  of data values may be found (and above which  $100p\%$  of data values may be found). The  $100p^{\text{th}}$  percentile is computed as

$$Z_{100p} = (1-g)X_{[k1]} + gX_{[k2]}$$

where  $k1$  equals the integer part of  $p(n+1)$ ,  $k2=k1+1$ ,  $g$  is the fractional part of  $p(n+1)$ , and  $X_{[kj]}$  is the  $k^{\text{th}}$  observation when the data are sorted from lowest to highest.

## Median

The median (or 50th percentile) is the “middle number” of the sorted data values.

$$\text{Median} = Z_{50}$$

## Interquartile Range (IQR)

The difference between the 75th and 25th percentiles (the 3rd and 1st quartiles). This represents the range of the middle 50% of the data. It serves as a robust measure of the variation in the data.

$$\text{IQR} = Z_{75} - Z_{25}$$

## Mean Absolute Deviation (MAD)

A measure of dispersion that is not affected by outliers as much as the standard deviation and variance. It measures the average absolute distance between a single observation and the mean.

$$\text{MAD} = \frac{\sum_{i=1}^n |x_i - \bar{x}|}{n}$$

## Mean Absolute Deviation from the Median (MADM)

A measure of dispersion that is even more robust to outliers than the mean absolute deviation (MAD) since the median is used as the center point of the distribution. It measures the average absolute distance between a single observation and the median.

$$\text{MADM} = \frac{\sum_{i=1}^n |x_i - \text{Median}|}{n}$$

## Coefficient of Variation (COV)

A relative measure of dispersion used to compare the amount of variation in two samples. It is calculated by dividing the standard deviation by the mean. Sometimes it is referred to as COV or CV.

$$\text{COV} = \frac{s}{\bar{x}}$$

## Coefficient of Dispersion (COD)

A robust, relative measure of dispersion. It is calculated by dividing the robust mean absolute deviation from the median (MADM) by the median. It is frequently used in real estate or tax assessment applications.

$$\text{COD} = \frac{\text{MADM}}{\text{Median}} = \frac{\left( \frac{\sum_{i=1}^n |x_i - \text{Median}|}{n} \right)}{\text{Median}}$$

## Skewness

Measures the direction and degree of asymmetry in the data distribution.

$$\text{Skewness} = \frac{m_3}{m_2^{3/2}}$$

where

$$m_r = \frac{\sum_{i=1}^n (x_i - \bar{x})^r}{n}$$

---

## Kurtosis

Measures the heaviness of the tails in the data distribution.

$$\text{Kurtosis} = \frac{m_4}{m_2^2}$$

where

$$m_r = \frac{\sum_{i=1}^n (x_i - \bar{x})^r}{n}$$

---

## Procedure Options

This section describes the options available in this procedure. To find out more about using a procedure, turn to the Procedures chapter.

---

## Variables Tab

This panel specifies the variables that will be used in the analysis and the summary table contents and layout.

---

### Numeric Data Variables to Summarize

#### Data Variable(s)

Specify one or more variables whose descriptive statistics are to be calculated. These statistics, selected from those available, will be computed for each combination of the values in the categorical group variables (if any) that you have selected. The data in these variables must be numeric. Text values will be skipped in the calculations.

---

### Categorical Group Variables

#### Group Variable(s)

Specify up to 8 categorical group variables. The categories may be text (e.g. “Low, Med, High”) or numeric (e.g. “1, 2, 3”). Statistics are computed for each combination of group values from all variables entered here.

## Descriptive Statistics – Summary Lists

### Category Order

The data values in each variable will be sorted alpha-numerically before being listed in the table. If you want the values to be displayed in a different order, specify a custom value order for the data columns entered here using the Column Info Table on the Data Window.

---

## Frequency (Count) Variables

### Frequency Variable

Specify an optional frequency (count) variable. This data column contains integers that represent the number of observations (frequency) associated with each row of the dataset. If this option is left blank, each dataset row has a frequency of one. This variable lets you modify that frequency. This may be useful when your data are tabulated and you want to enter counts.

---

## Summary Statistics

### Statistics

Select one or more statistics to be included in the table(s) and plot(s). The statistics are computed separately for each Data Variable. If one or more Group Variables are entered, the statistics are computed for each combination of the group values. The order of the statistics on the table(s) and plot(s) can be changed using the up/down arrow buttons to the right.

---

## Summary List Storage

### Store the Summary List in a New NCSS Data File

When this box is checked, the current dataset will close and the resulting data summary list will be written to a new data table. You will be prompted to save any changes to the current dataset before continuing.

The new data table with the data summary list will automatically be saved in the output file entered below. If no output file is specified, no file will be saved. You can manually save the output data file to any file you wish.

### Output File Name

Enter an output file name in which to store the data. Double-click the box or click on the file selection button to browse for a file or folder. The selected output file will be overwritten and the current database will be closed, so make sure to save all data before continuing. If no output file is specified, no file will be automatically saved. You can manually save the output data file to any file you wish. If you have chosen to reopen the current dataset without entering an output file name, then the summary output data will be lost.

---

## Summary List Storage – Storage Options

### Data Variables

Select how the data variables will be stored in the output file. This option does not affect calculations.

The options are

- **Store as Rows**

Data variable names and associated summary statistics are stored row-by-row in the output data table.

| Variable | Group | Count | Mean |
|----------|-------|-------|------|
| Var 1    | A     | 12    | 15.7 |
| Var 1    | B     | 37    | 12.6 |
| Var 2    | A     | 12    | 27.5 |
| Var 2    | B     | 37    | 33.6 |

## Descriptive Statistics – Summary Lists

- **Store as Columns**

Data variable names and associated summary statistics are stored column-by-column in the output data table.

|       | Var 1 | Var 1 | Var 2 | Var 2 |
|-------|-------|-------|-------|-------|
| Group | Count | Mean  | Count | Mean  |
| A     | 12    | 15.7  | 12    | 27.5  |
| B     | 37    | 12.6  | 37    | 33.6  |

In both cases, the summary statistics for group variables (if entered) are listed row-by-row.

### Automatically Reopen the Current Dataset

Data storage requires the current dataset to close when the summary data is written to the data table. When this box is checked, the current dataset will automatically reopen once the process is complete.

### Unsaved Data Warning

If you have not saved the current dataset to a file, the data will not reopen and will be lost!

---

## Missing Values Tab

This panel lets you specify up to five missing values (besides the default of blank). For example, '0', '9', or 'NA' may be missing values in your database.

### Missing Value Inclusion

Specifies whether to include observations with missing values in the tables.

*Delete All* indicates that you want the missing values totally ignored.

*Include in All* indicates that you want the missing values treated just like any other category.

### Missing Values

Specify up to five individual missing values here, one per box.

---

## Report Options Tab

The following options control the format of the reports.

---

### Report Options

#### Variable Names

This option lets you select whether to display only variable names, variable labels, or both.

#### Value Labels

This option lets you select whether to display only values, value labels, or both. Use this option if you want the table to automatically attach labels to the values (like 1=Yes, 2=No, etc.). See the section on specifying *Value Labels* elsewhere in this manual.

---

## Summary Table Formatting

### Column Justification

Specify whether data columns in the tables will be left or right justified.

### Column Widths

Specify how the widths of columns in the contingency tables will be determined.

The options are

- **Autosize to Minimum Widths**  
Each data column is individually resized to the smallest width required to display the data in the column. This usually results in columns with different widths. This option produces the most compact table possible, displaying the most data per page.
- **Autosize to Equal Minimum Width**  
The smallest width of each data column is calculated and then all columns are resized to the width of the widest column. This results in the most compact table possible where all data columns have the same width. This is the default setting.
- **Custom (User-Specified)**  
Specify the widths (in inches) of the columns directly instead of having the software calculate them for you.

### Custom Widths

Enter one or more values for the widths (in inches) of columns in the contingency tables.

- **Single Value**  
If you enter a single value, that value will be used as the width for all data columns in the table.
- **List of Values**  
Enter a list of values separated by spaces corresponding to the widths of each column. The first value is used for the width of the first data column, the second for the width of the second data column, and so forth. Extra values will be ignored. If you enter fewer values than the number of columns, the last value in your list will be used for the remaining columns.  
  
Type the word “Autosize” for any column to cause the program to calculate its width for you. For example, enter “1 Autosize 0.7” to make column 1 be 1 inch wide, column 2 be sized by the program, and column 3 be 0.7 inches wide.

### Wrap Column Headings onto Two Lines

Check this option to make column headings wrap onto two lines. Use this option to condense your table when your data are spaced too far apart because of long column headings.

### Use Short Statistical Names on Reports and Plots

Normally, the names of the statistical items in the reports and plots are complete names, such as “Standard Deviation.” Checking this option causes a shorter name, such as “SD”, to be used instead so that more columns can be displayed together in tables and so that plot titles and labels are not so long. A maximum of 13 columns can be displayed on a single row.



---

## Decimal Places

### Item Decimal Places

These decimal options allow the user to specify the number of decimal places for items in the output. Your choice here will not affect calculations; it will only affect the format of the output.

- **Auto**

If one of the “Auto” options is selected, the ending zero digits are not shown. For example, if “Auto (0 to 7)” is chosen,

0.0500 is displayed as 0.05

1.314583689 is displayed as 1.314584

The output formatting system is not designed to accommodate “Auto (0 to 13)”, and if chosen, this will likely lead to lines that run on to a second line. This option is included, however, for the rare case when a very large number of decimals is needed.

---

## Plots Tab

The options on this panel control the appearance of the plots that may be displayed. Click the plot format button to change the plot settings.

### Show Statistic Plots

Check to display a separate plot for each statistic in each table. This may result in several plots being created for each table. Plots are created with a table's row item on the group axis. If there is only one row in a table, then no plot is output.

## Example 1 – Basic Summary List with No Group Variables

The data used in this example are in the Resale dataset. You may follow along here by making the appropriate entries or load the completed template **Example 1a** by clicking on Open Example Template from the File menu of the Descriptive Statistics – Summary Lists window.

### 1 Open the Resale dataset.

- From the File menu of the NCSS Data window, select **Open Example Data**.
- Click on the file **Resale.NCSS**.
- Click **Open**.

### 2 Open the Descriptive Statistics – Summary Lists window.

- Using the Analysis menu or the Procedure Navigator, find and select the **Descriptive Statistics – Summary Lists** procedure
- On the menus, select **File**, then **New Template**. This will fill the procedure with the default template.

### 3 Specify the variables.

- Select the **Variables** tab.
- For **Data Variable(s)**, select **Price, Bedrooms, Bathrooms, Garage, and TotalSqft**.

### 4 Specify the statistics.

- In the Table Statistics section, check **Count, Mean, Std Dev, 95% LCL, and 95% UCL**.

### 5 Run the procedure.

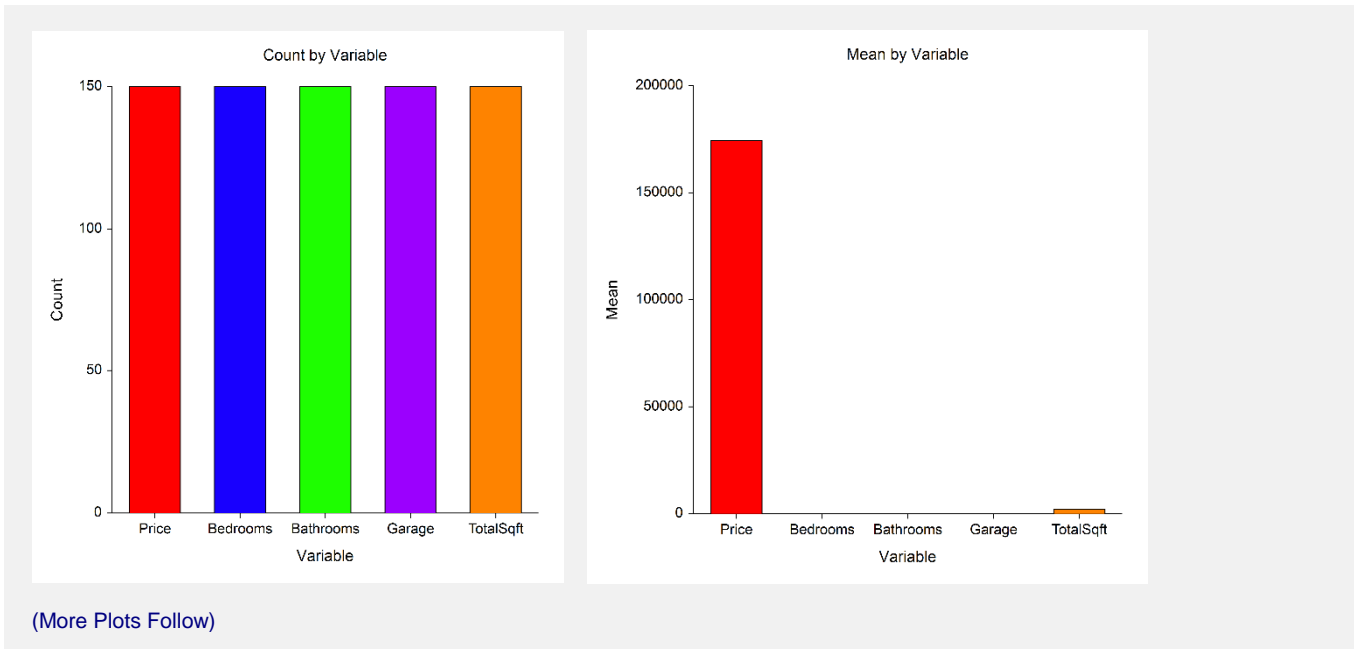
- From the Run menu, select **Run Procedure**. Alternatively, just click the green **Run** button.

## Summary List

| Variable  | Statistics |          |           |                 |                 |
|-----------|------------|----------|-----------|-----------------|-----------------|
|           | Count      | Mean     | SD        | 95% LCL<br>Mean | 95% UCL<br>Mean |
| Price     | 150        | 174392   | 97656.81  | 158636          | 190148          |
| Bedrooms  | 150        | 2.42     | 0.8919476 | 2.276093        | 2.563908        |
| Bathrooms | 150        | 2.4      | 0.8047677 | 2.270158        | 2.529842        |
| Garage    | 150        | 1.266667 | 0.5636252 | 1.175731        | 1.357602        |
| TotalSqft | 150        | 1893.38  | 754.2496  | 1771.689        | 2015.071        |

The data summary list is presented with each variable represented on a single row.

## Plots of Each Statistic



The plots are not very informative because the variables have vastly different scales.

## Example 1b – Storing the Summary List in a New NCSS Data File

To store the data summary list in a new data file, simply go back to the Descriptive Statistics – Summary Lists procedure window and check **Store the Summary List in a New NCSS Data File** (or load the completed template **Example 1b** by clicking on Open Example Template from the File menu) and run the procedure again to get the results.

**Be careful because any unsaved data will be lost!**

### 6 Specify the data storage.

- In the Summary List Storage section, check **Store the Summary List in a New NCSS Data File**.
- For **Output File Name**, enter **%mydocs\_NCSS%\Data\ResaleSummary.NCSS**.
- Uncheck **Automatically Reopen the Current Dataset after the Save Operation Completes** so that we can review the summary data file that has been created.

#### Summary List Storage Information

Output Data File Name: {NCSS Documents Folder}\Data\ResaleSummary.NCSS  
 Original Raw Data File: {Example Data Folder}\Resale.NCSS  
 Data Variable(s): (5) Price, Bedrooms, Bathrooms, Garage, TotalSqft  
 Group Variable(s): (0)  
 Summary Statistic(s): (5) Count, Mean, SD, 95% LCL Mean, 95% UCL Mean

(Summary List Report and Plots Follow)

The data summary list output data file is described in this report. Go to the data table to see the new summary data file that has been created.

## Example 2 – Summary List with One Group Variable

The data used in this example are in the Pain dataset. You may follow along here by making the appropriate entries or load the completed template **Example 2a** by clicking on Open Example Template from the File menu of the Descriptive Statistics – Summary Lists window.

### 1 Open the Pain dataset.

- From the File menu of the NCSS Data window, select **Open Example Data**.
- Click on the file **Pain.NCSS**.
- Click **Open**.

### 2 Open the Descriptive Statistics – Summary Lists window.

- Using the Analysis menu or the Procedure Navigator, find and select the **Descriptive Statistics – Summary Lists** procedure
- On the menus, select **File**, then **New Template**. This will fill the procedure with the default template.

### 3 Specify the variables.

- Select the **Variables** tab.
- For **Data Variable(s)**, select **Pain**.
- For **Group Variable(s)**, select **Drug**.

### 4 Specify the statistics.

- In the Summary Statistics section, click the **Uncheck All** button to uncheck all selected statistics.
- In the Summary Statistics section, check **Mean, Median, Minimum, Maximum, 25<sup>th</sup> Pctile, and 75<sup>th</sup> Pctile**.
- Use the up/down arrow buttons to move the checked statistics so that the order is **Mean, Minimum, 25<sup>th</sup> Pctile, Median, 75<sup>th</sup> Pctile, then Maximum**. It does not matter if there are unchecked statistics between checked statistics. Checked statistics will be output in the order they are listed.

### 5 Run the procedure.

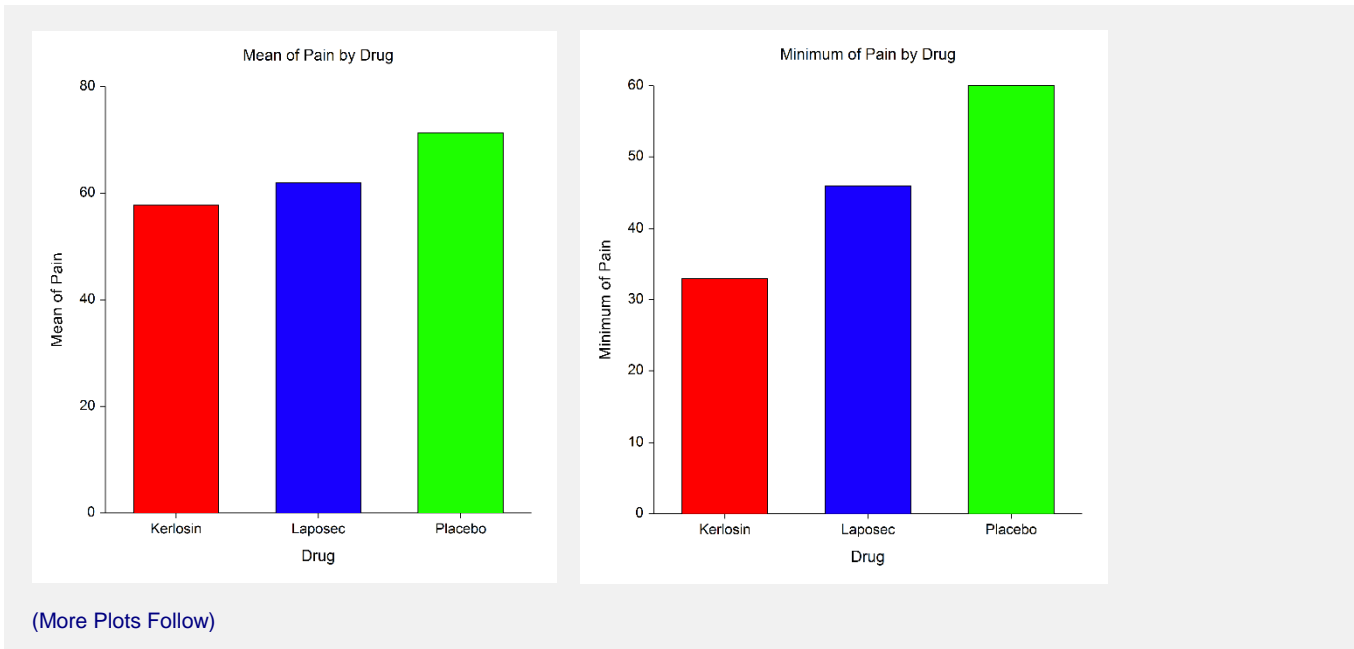
- From the Run menu, select **Run Procedure**. Alternatively, just click the green **Run** button.

## Summary List

| <u>Statistics for Pain</u> |             |                |                    |               |                    |                |
|----------------------------|-------------|----------------|--------------------|---------------|--------------------|----------------|
| <u>Drug</u>                | <u>Mean</u> | <u>Minimum</u> | <u>25th Pctile</u> | <u>Median</u> | <u>75th Pctile</u> | <u>Maximum</u> |
| Kerlosin                   | 57.78571    | 33             | 44.5               | 60            | 69.5               | 83             |
| Laposec                    | 62          | 46             | 54.75              | 63.5          | 68.5               | 79             |
| Placebo                    | 71.33334    | 60             | 66                 | 70            | 76                 | 87             |

The summary list is presented with each level of Drug represented on a single row. The various statistics are listed in columns.

## Plots of Each Statistic



Individual plots for each statistic are created with the Group Variable, “Drug,” on the group (X) axis. These plots are very useful for seeing overall trends. From the plots shown here, it is apparent that the average and minimum pain response is lower for both drugs than for placebo. Kerlosin appears to control pain the best from these results. Statistical tests would need to be performed, however, to assert statistical significance in the differences.

## Example 2b – Storing the Summary List in a New NCSS Data File

To store the data summary list in a new data file, simply go back to the Descriptive Statistics – Summary Lists procedure window and check **Store the Summary List in a New NCSS Data File** (or load the completed template **Example 2b** by clicking on Open Example Template from the File menu) and run the procedure again to get the results.

**Be careful because any unsaved data will be lost!**

### 6 Specify the data storage.

- In the Summary List Storage section, check **Store the Summary List in a New NCSS Data File**.
- For **Output File Name**, enter **%mydocs\_NCSS%\Data\PainDrugSummary.NCSS**.
- Uncheck **Automatically Reopen the Current Dataset after the Save Operation Completes** so that we can review the summary data file that has been created.

#### Summary List Storage Information

Output Data File Name: {NCSS Documents Folder}\Data\PainDrugSummary.NCSS  
 Original Raw Data File: {Example Data Folder}\Pain.NCSS  
 Data Variable(s): (1) Pain  
 Group Variable(s): (1) Drug  
 Summary Statistic(s): (6) Mean, Minimum, 25th Pctile, Median, 75th Pctile, Maximum

(Summary List Report and Plots Follow)

The data summary list output data file is described in this report. Go to the data table to see the new summary data file that has been created.

---

## Example 3 – Summary List with Two Group Variables

The data used in this example are in the Pain dataset. In this example we'll show you how to make even more customizations to adjust the appearance of the tables and plots. You may follow along here by making the appropriate entries or load the completed template **Example 3a** by clicking on Open Example Template from the File menu of the Descriptive Statistics – Summary Lists window.

### 1 Open the Pain dataset.

- From the File menu of the NCSS Data window, select **Open Example Data**.
- Click on the file **Pain.NCSS**.
- Click **Open**.

### 2 Open the Descriptive Statistics – Summary Lists window.

- Using the Analysis menu or the Procedure Navigator, find and select the **Descriptive Statistics – Summary Lists** procedure
- On the menus, select **File**, then **New Template**. This will fill the procedure with the default template.

### 3 Specify the variables.

- Select the **Variables** tab.
- For **Data Variable(s)**, select **Cov** and **Pain**.
- For **Group Variable(s)**, select **Drug** and **Time**.

### 4 Specify the statistics.

- In the Summary Statistics section, check **Count**, **Mean**, and **Std Dev**.

### 5 Specify the report options and format.

- Click on the **Report Options** tab.
- Uncheck **Use Short Statistical Names on Reports and Plots**.
- Change the **Decimal Places for Sum, Mean, CI Limits** to **2** to limit the width of the displayed values.
- Change the **Decimal Places for SD, SE, Var, MAD, MADM** to **2** to limit the width of the displayed values.

### 6 Specify the plots.

- Click on the **Plots** tab.
- Click on the **Plot Format** button.
- On the **Bar Chart Format** window, select the **Group Axis** tab and click on the **Layout** button for the **Lower Axis Tick Label**.
- Change **Alignment** to **Right**, **Rotation Angle** to **90**, and **Margin Above the Text** to **10**.
- Click **OK** to save the layout settings and **OK** again to save the plot settings.

### 7 Run the procedure.

- From the Run menu, select **Run Procedure**. Alternatively, just click the green **Run** button.

Descriptive Statistics – Summary Lists

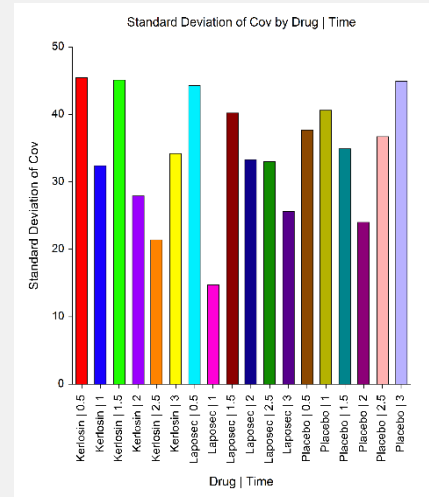
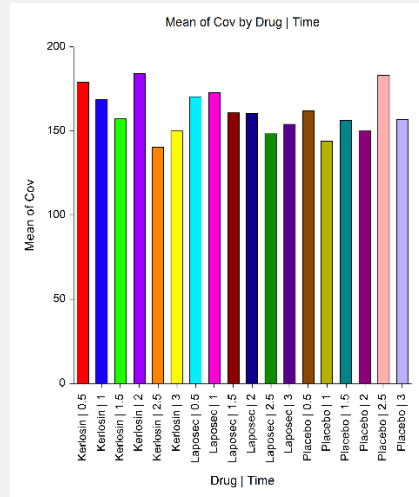
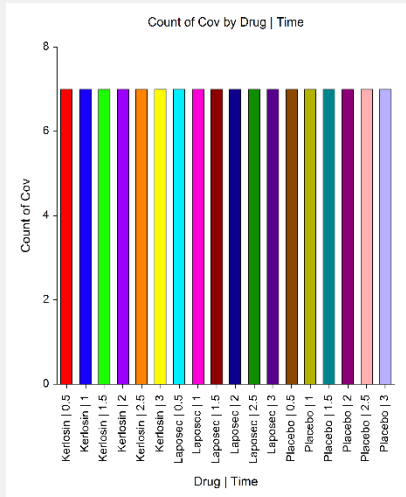
Output

Summary List of Cov

Statistics for Cov

| <u>Drug   Time</u> | <u>Count</u> | <u>Mean</u> | <u>Standard Deviation</u> |
|--------------------|--------------|-------------|---------------------------|
| Kerlosin   0.5     | 7            | 179.00      | 45.41                     |
| Kerlosin   1       | 7            | 168.71      | 32.39                     |
| Kerlosin   1.5     | 7            | 157.14      | 45.13                     |
| Kerlosin   2       | 7            | 184.14      | 27.89                     |
| Kerlosin   2.5     | 7            | 140.43      | 21.42                     |
| Kerlosin   3       | 7            | 150.14      | 34.16                     |
| Laposec   0.5      | 7            | 170.43      | 44.29                     |
| Laposec   1        | 7            | 172.86      | 14.70                     |
| Laposec   1.5      | 7            | 160.71      | 40.22                     |
| Laposec   2        | 7            | 160.29      | 33.33                     |
| Laposec   2.5      | 7            | 148.57      | 33.04                     |
| Laposec   3        | 7            | 154.00      | 25.65                     |
| Placebo   0.5      | 7            | 162.14      | 37.65                     |
| Placebo   1        | 7            | 144.14      | 40.58                     |
| Placebo   1.5      | 7            | 156.29      | 34.93                     |
| Placebo   2        | 7            | 150.14      | 23.96                     |
| Placebo   2.5      | 7            | 183.14      | 36.72                     |
| Placebo   3        | 7            | 156.86      | 44.89                     |

Plots of each Statistic for Cov



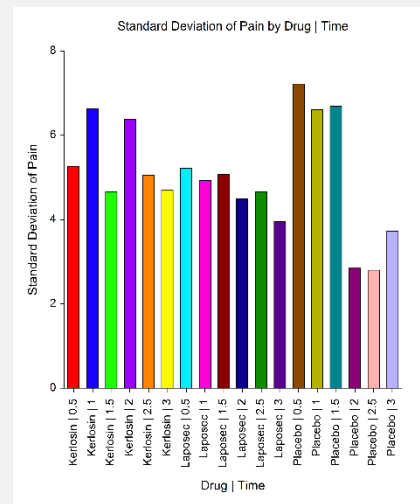
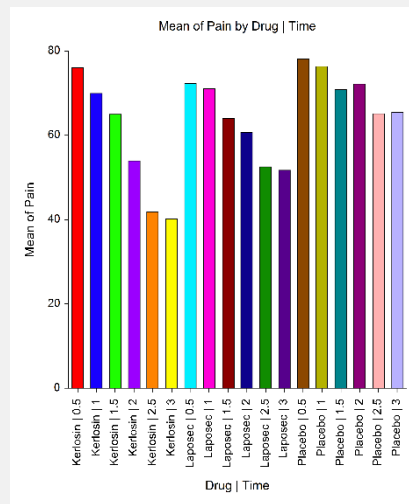
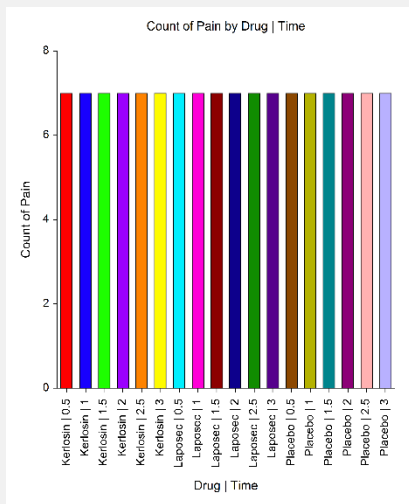
Descriptive Statistics – Summary Lists

Summary List of Pain

Statistics for Pain

| <u>Drug   Time</u> | <u>Count</u> | <u>Mean</u> | <u>Standard Deviation</u> |
|--------------------|--------------|-------------|---------------------------|
| Kerlosin   0.5     | 7            | 76.00       | 5.26                      |
| Kerlosin   1       | 7            | 69.86       | 6.62                      |
| Kerlosin   1.5     | 7            | 65.00       | 4.65                      |
| Kerlosin   2       | 7            | 54.00       | 6.38                      |
| Kerlosin   2.5     | 7            | 41.71       | 5.06                      |
| Kerlosin   3       | 7            | 40.14       | 4.71                      |
| Laposec   0.5      | 7            | 72.29       | 5.22                      |
| Laposec   1        | 7            | 71.00       | 4.93                      |
| Laposec   1.5      | 7            | 64.00       | 5.07                      |
| Laposec   2        | 7            | 60.57       | 4.50                      |
| Laposec   2.5      | 7            | 52.43       | 4.65                      |
| Laposec   3        | 7            | 51.71       | 3.95                      |
| Placebo   0.5      | 7            | 78.14       | 7.22                      |
| Placebo   1        | 7            | 76.29       | 6.60                      |
| Placebo   1.5      | 7            | 70.86       | 6.69                      |
| Placebo   2        | 7            | 72.14       | 2.85                      |
| Placebo   2.5      | 7            | 65.14       | 2.79                      |
| Placebo   3        | 7            | 65.43       | 3.74                      |

Plots of each Statistic for Pain



Summary list tables are presented separately for the data variables, Cov and Pain, with each combination of Drug and Time represented on a single row. The various statistics are listed in columns. From the plots shown here, it is apparent that the average and minimum pain response is lower for both drugs than for placebo and that the pain control is better over time. Kerlosin appears to control pain the best from these results. Statistical tests would need to be performed, however, to assert statistical significance in the differences.



## Example 3b – Storing the Summary List in a New NCSS Data File (Row-by-Row)

To store the data summary list in a new data file row-by-row, simply go back to the Descriptive Statistics – Summary Lists procedure window and check **Store the Summary List in a New NCSS Data File** (or load the completed template **Example 3b** by clicking on Open Example Template from the File menu) and run the procedure again to get the results.

**Be careful because any unsaved data will be lost!**

### 8 Specify the data storage.

- In the Summary List Storage section, check **Store the Summary List in a New NCSS Data File**.
- For **Output File Name**, enter **%mydocs\_NCSS%\Data\PainDrugTimeSummary1.NCSS**.
- Uncheck **Automatically Reopen the Current Dataset after the Save Operation Completes** so that we can review the summary data file that has been created.

#### Summary List Storage Information

Output Data File Name: {NCSS Documents Folder}\PainDrugTimeSummary1.NCSS  
 Original Raw Data File: {Example Data Folder}\Pain.NCSS  
 Data Variable(s): (2) Cov, Pain  
 Group Variable(s): (2) Drug, Time  
 Summary Statistic(s): (3) Count, Mean, SD

(Summary List Report and Plots Follow)

The data summary list output data file is described in this report. Go to the data table to see the new summary data file that has been created.

The summary data values are stored in **PainDrugTimeSummary1.NCSS** as follows

| Variable | Drug     | Time | Count | Mean             | SD               |
|----------|----------|------|-------|------------------|------------------|
| Cov      | Kerlosin | 0.5  | 7     | 179              | 45.4129203347828 |
| Cov      | Kerlosin | 1    | 7     | 168.714285714286 | 32.3867991920283 |
| Cov      | Kerlosin | 1.5  | 7     | 157.142857142857 | 45.1347189771118 |
| Cov      | Kerlosin | 2    | 7     | 184.142857142857 | 27.8892367018089 |
| Cov      | Kerlosin | 2.5  | 7     | 140.428571428571 | 21.4231739234032 |
| Cov      | Kerlosin | 3    | 7     | 150.142857142857 | 34.1585937036278 |
| Cov      | Laposec  | 0.5  | 7     | 170.428571428571 | 44.2939316492946 |
| Cov      | Laposec  | 1    | 7     | 172.857142857143 | 14.7017977520729 |
| Cov      | Laposec  | 1.5  | 7     | 160.714285714286 | 40.2231868690779 |
| Cov      | Laposec  | 2    | 7     | 160.285714285714 | 33.3302379515173 |
| Cov      | Laposec  | 2.5  | 7     | 148.571428571429 | 33.0396587091793 |
| Cov      | Laposec  | 3    | 7     | 154              | 25.6450125105578 |
| Cov      | Placebo  | 0.5  | 7     | 162.142857142857 | 37.6538115442451 |
| Cov      | Placebo  | 1    | 7     | 144.142857142857 | 40.5767937431753 |
| Cov      | Placebo  | 1.5  | 7     | 156.285714285714 | 34.9319065502886 |
| Cov      | Placebo  | 2    | 7     | 150.142857142857 | 23.9612782869123 |
| Cov      | Placebo  | 2.5  | 7     | 183.142857142857 | 36.7216038657925 |
| Cov      | Placebo  | 3    | 7     | 156.857142857143 | 44.8940551796804 |
| Pain     | Kerlosin | 0.5  | 7     | 76               | 5.25991127935317 |
| Pain     | Kerlosin | 1    | 7     | 69.8571428571429 | 6.61887632529297 |
| Pain     | Kerlosin | 1.5  | 7     | 65               | 4.65474668125631 |
| .        | .        | .    | .     | .                | .                |
| .        | .        | .    | .     | .                | .                |
| .        | .        | .    | .     | .                | .                |

## Example 3c – Storing the Summary List in a New NCSS Data File (Column-by-Column)

To store the data summary list in a new data file column-by-column, simply go back to the Descriptive Statistics – Summary Lists procedure window and check **Store the Summary List in a New NCSS Data File** (or load the completed template **Example 3c** by clicking on Open Example Template from the File menu) and run the procedure again to get the results.

**Be careful because any unsaved data will be lost!**

### 9 Specify the data storage.

- In the Summary List Storage section, check **Store the Summary List in a New NCSS Data File**.
- For **Output File Name**, enter **%mydocs\_NCSS%\Data\PainDrugTimeSummary2.NCSS**.
- For **Data Variable Storage**, enter **Store as Columns**.
- Uncheck **Automatically Reopen the Current Dataset after the Save Operation Completes** so that we can review the summary data file that has been created.

#### Summary List Storage Information

Output Data File Name: {NCSS Documents Folder}\PainDrugTimeSummary2.NCSS  
 Original Raw Data File: {Example Data Folder}\Pain.NCSS  
 Data Variable(s): (2) Cov, Pain  
 Group Variable(s): (2) Drug, Time  
 Summary Statistic(s): (3) Count, Mean, SD

(Summary List Report and Plots Follow)

The data summary list output data file is described in this report. Go to the data table to see the new summary data file that has been created.

The summary data values are stored in **PainDrugTimeSummary2.NCSS** as follows

| Drug     | Time | Cov_Count | Cov_Mean         | Cov_SD           | Pain_Count | ... |
|----------|------|-----------|------------------|------------------|------------|-----|
| Kerlosin | 0.5  | 7         | 179              | 45.4129203347828 | 7          | .   |
| Kerlosin | 1    | 7         | 168.714285714286 | 32.3867991920283 | 7          | .   |
| Kerlosin | 1.5  | 7         | 157.142857142857 | 45.1347189771118 | 7          | .   |
| Kerlosin | 2    | 7         | 184.142857142857 | 27.8892367018089 | 7          | .   |
| Kerlosin | 2.5  | 7         | 140.428571428571 | 21.4231739234032 | 7          | .   |
| Kerlosin | 3    | 7         | 150.142857142857 | 34.1585937036278 | 7          | .   |
| Laposec  | 0.5  | 7         | 170.428571428571 | 44.2939316492946 | 7          | .   |
| Laposec  | 1    | 7         | 172.857142857143 | 14.7017977520729 | 7          | .   |
| Laposec  | 1.5  | 7         | 160.714285714286 | 40.2231868690779 | 7          | .   |
| Laposec  | 2    | 7         | 160.285714285714 | 33.3302379515173 | 7          | .   |
| Laposec  | 2.5  | 7         | 148.571428571429 | 33.0396587091793 | 7          | .   |
| Laposec  | 3    | 7         | 154              | 25.6450125105578 | 7          | .   |
| Placebo  | 0.5  | 7         | 162.142857142857 | 37.6538115442451 | 7          | .   |
| Placebo  | 1    | 7         | 144.142857142857 | 40.5767937431753 | 7          | .   |
| Placebo  | 1.5  | 7         | 156.285714285714 | 34.9319065502886 | 7          | .   |
| Placebo  | 2    | 7         | 150.142857142857 | 23.9612782869123 | 7          | .   |
| Placebo  | 2.5  | 7         | 183.142857142857 | 36.7216038657925 | 7          | .   |
| Placebo  | 3    | 7         | 156.857142857143 | 44.8940551796804 | 7          | .   |