Ioana Gheorghiu, Cosmina-Ioana Bondor, Andreea Gheban-Roșca

Contents – Instructions for using Jamovi

2. Assessing the normality of a quantitative variable 1
2.1 Creating the histogram 2
2.2 Calculating the descriptive statistics 2
2.3 Interpreting normality 2
3. The 95% confidence interval for the **MEAN** 2
3.1 Interpreting the confidence interval 3
4. Selecting a **SUBGROUP** with a **FILTER** 3
4.1 Turning off or deleting a filter 4
5. The 95% confidence interval for the **MEAN** IN A **SUBGROUP** 5
5.1 Method 1: using a filter 5
5.2 Method 2: without a filter, using Split by 5
6. Creating a graph for a **QUALITATIVE** variable 6
7. The 95% confidence interval for a **FREQUENCY** (proportion) 6
7.1 Interpreting the confidence interval 7
8. The 95% confidence interval for a **FREQUENCY** in a **SUBGROUP** 7

1. Importing the dataset and checking the variables

1. Open **Jamovi**. From the main menu button (☰, top-left corner) go to: **Open → This PC → Browse → Estimates_BD.xlsx → Open**

Note! *The import steps are the same as in LP05 Instructions file, Section 1.*

2. Check the imported data: go to the **Data** tab, double-click the name of each variable and check its **Measure type**.

Variable	Recommended measure type in Jamovi
ID	ID
Sex	Nominal
Age (years)	Continuous
Total cholesterol (mg/dL)	Continuous
Blood glucose (mg/dL)	Continuous
Haemoglobin (g/dL)	Continuous
Area of residence	Nominal
Vitamin D2 deficiency	Nominal
D2 therapy	Nominal

3. For nominal and ordinal variables, check the order of the categories in the **Levels** box (e.g. Yes / No).

2. Assessing the normality of a quantitative variable

Normality is assessed using the methods: by a **graph** (histogram), by **descriptive statistics** (mean, median, mode, skewness, kurtosis).

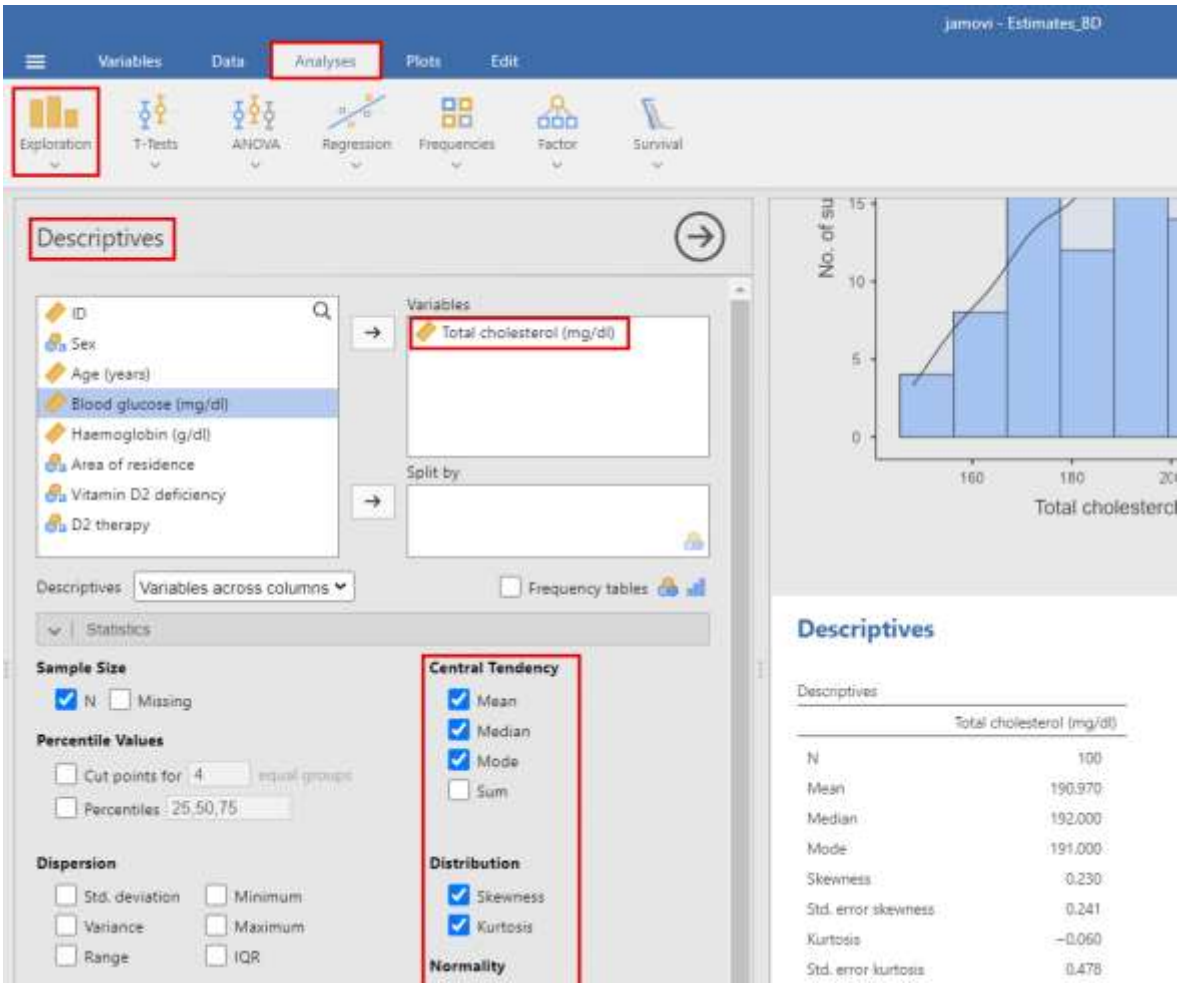
Example: We want to assess whether the variable Total cholesterol (mg/dL) is normally distributed.

2.1 Creating the histogram

Note! The steps for the histogram (titles, axes) are the same as in the **LP05 Hints** file.

2.2 Calculating the descriptive statistics

Note! The steps for the descriptive statistics are the same as in the **LP05 Hints** file.



2.3 Interpreting normality

Answer each question in **Table 2. Normality of the total cholesterol distribution** in your **Requests** file (point c of exercise 5), then copy the completed table into **Report PA06_LF.docx**.

The distribution can be considered normal if most of the criteria are met (most answers are "Yes").

> ***Example:*** For total cholesterol, the mean (191 mg/dL), median (192 mg/dL) and mode (191 mg/dL) are close to each other, skewness (0.230) and excess kurtosis (−0.060) are both between −1 and 1. So the distribution of total cholesterol can be considered normal.

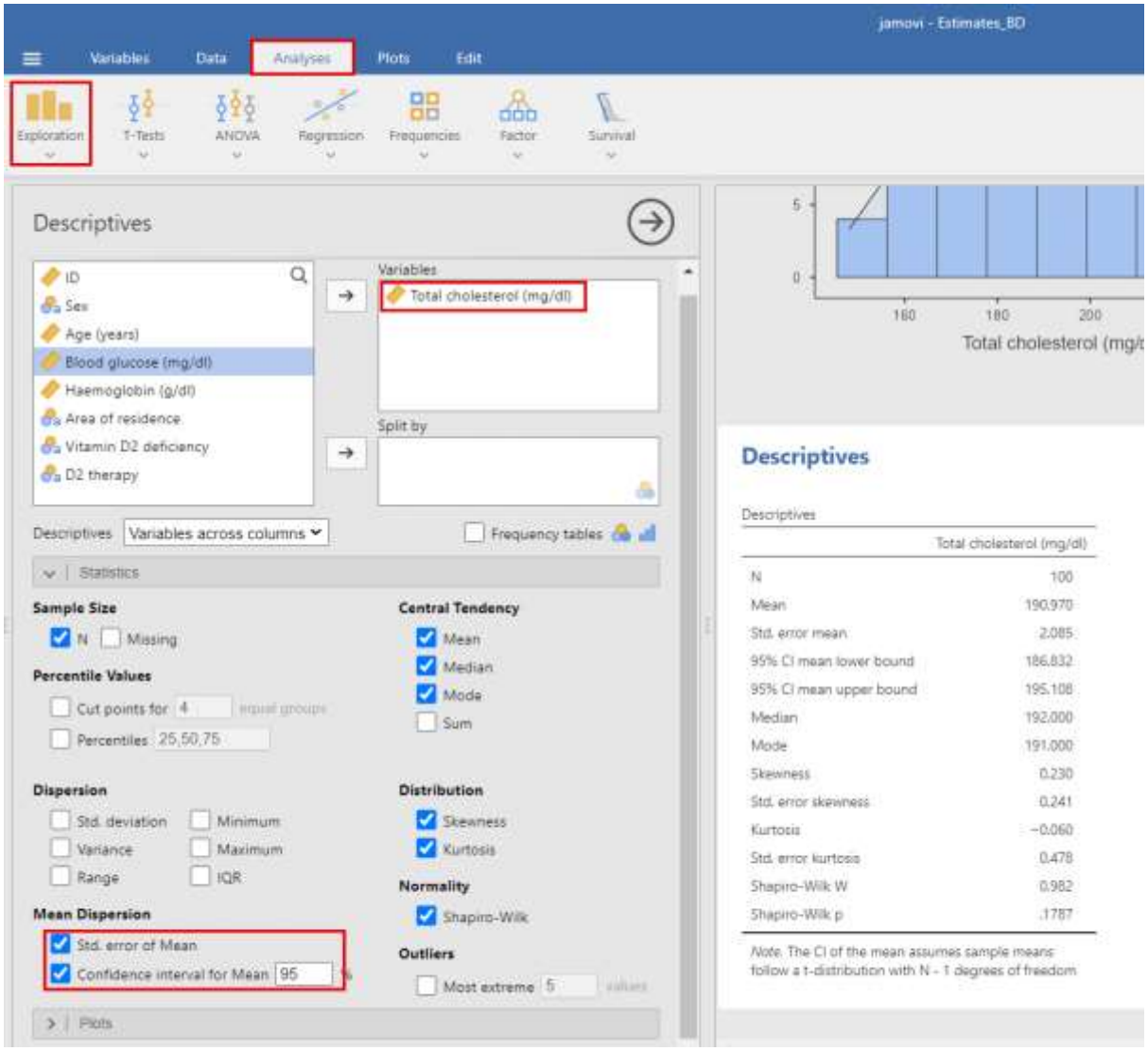
3. The 95% confidence interval for the **MEAN**

1. From the main menu, go to: **Analyses → Exploration → Descriptives**
2. Move the variable **Total cholesterol (mg/dL)** into the Variables box.

3. In the **Statistics** section:
    a) Under **Mean Dispersion**, select **Std. error of Mean** and **Confidence interval for Mean**.
    b) Check that the value **95** is entered into the % box (this is the default).

Jamovi adds two rows to the table: **95% CI mean lower bound** (lower limit) and **95% CI mean upper bound** (upper limit).

Note! *Jamovi uses Student's t-distribution:* ***$\bar{x} \pm t(0.975; n-1) \times SE$****, where* ***$SE = s/\sqrt{n}$*** *is the standard error of the mean.*



3.1 Interpreting the confidence interval

> ***Example:*** The mean total cholesterol in the study sample was 190.97 mg/dL. We are 95% confident that the true mean total cholesterol (the population mean) in adults with iron deficiency lies in the interval [187; 195] mg/dL.

4. Selecting a **SUBGROUP** with a **FILTER**

A filter keeps only the rows that meet a condition in the analysis.

Example: We want to analyse only female patients.

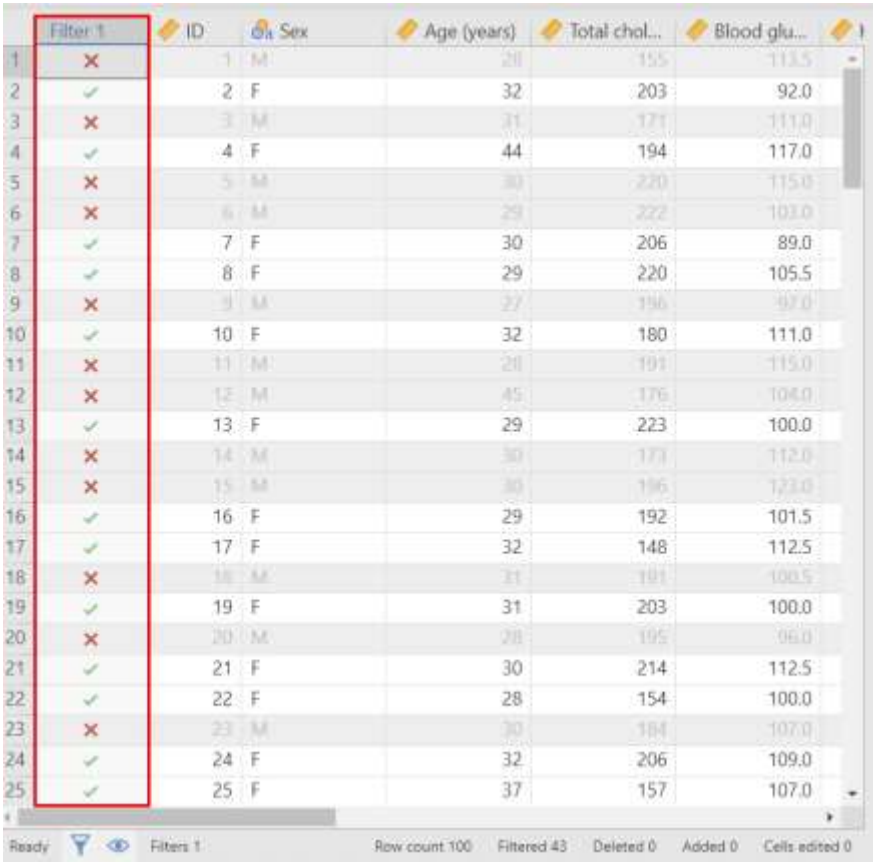
Ioana Gheorghiu, Cosmina-Ioana Bondor, Andreea Gheban-Roșca

1. Go to the **Data** tab and click the **Filters** button (funnel icon).
2. The **Filter 1** panel opens. In the box after the **=** sign, type the condition and press **Enter**:

   Sex == "F"



3. Jamovi adds a new column, **Filter 1**: included rows are marked with a green tick, excluded rows are greyed out with a red X.
4. Check the number of included rows in the status bar at the bottom of the window (**Filtered** / **Row count**).



	Filter 1	ID	Sex	Age (years)	Total chol...	Blood glu...
1	✗	1	M	28	155	113.5
2	✓	2	F	32	203	92.0
3	✗	3	M	31	171	111.0
4	✓	4	F	44	194	117.0
5	✗	5	M	30	220	115.0
6	✗	6	M	29	222	103.0
7	✓	7	F	30	206	89.0
8	✓	8	F	29	220	105.5
9	✗	9	M	27	196	97.0
10	✓	10	F	32	180	111.0
11	✗	11	M	28	191	115.0
12	✗	12	M	45	176	104.0
13	✓	13	F	29	223	100.0
14	✗	14	M	30	173	112.0
15	✗	15	M	30	196	123.0
16	✓	16	F	29	192	101.5
17	✓	17	F	32	148	112.5
18	✗	18	M	31	191	100.5
19	✓	19	F	31	203	100.0
20	✗	20	M	28	195	96.0
21	✓	21	F	30	214	112.5
22	✓	22	F	28	154	100.0
23	✗	23	M	30	184	107.0
24	✓	24	F	32	206	109.0
25	✓	25	F	37	157	107.0

Ready | Filters 1 | Row count 100 | Filtered 43 | Deleted 0 | Added 0 | Cells edited 0

4.1 Turning off or deleting a filter

- The **active** switch in the filter panel turns the filter off temporarily (all rows return to the analysis).
- The **+** button adds a new filter (Filter 2); the ✕ button next to a filter deletes it.

Note! If a variable name contains spaces, type it between backticks in the filter, e.g. **`Area of residence` == "Urban"**. Category values must be written exactly as they appear in the dataset.

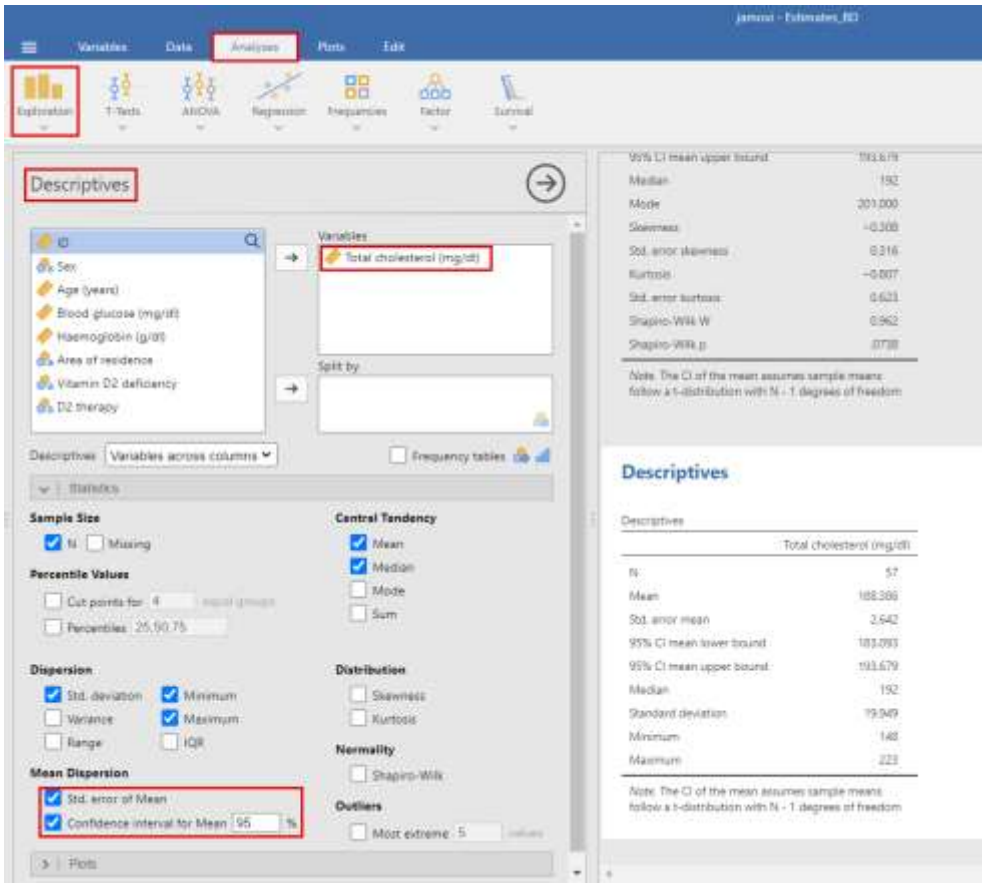
A filter applies to all analyses in the file, and results are recalculated automatically. Copy your results into Word before changing the filter.

Ioana Gheorghiu, Cosmina-Ioana Bondor, Andreea Gheban-Roșca

5. The 95% confidence interval for the **MEAN** IN A **SUBGROUP**

5.1 Method 1: using a filter

1. Apply the filter for the subgroup you need (section 4), e.g. `Sex == "F"`.
2. Go to **Analyses → Exploration → Descriptives** and repeat the steps in section 3 (Mean, Std. error of Mean, Confidence interval for Mean 95%).
3. Check the value of **N** in the table: it must equal the number of patients in the subgroup.



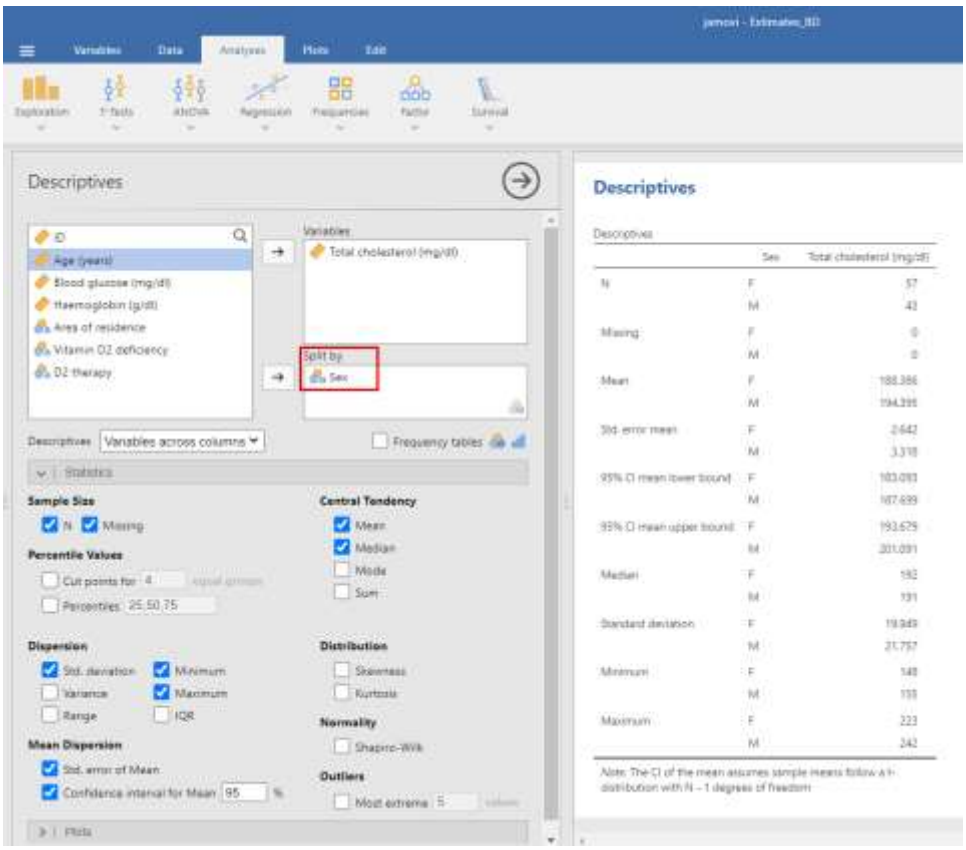
Example: The mean total cholesterol among women in the sample was 188 mg/dL (n = 57). We are 95% confident that the true mean total cholesterol in the population of adult women with iron deficiency lies in the interval [183; 194] mg/dL.

5.2 Method 2: without a filter, using Split by

In **Analyses → Exploration → Descriptives**, move the quantitative variable into **Variables** and the grouping variable (e.g. Sex) into **Split by**. Jamovi calculates the confidence interval separately for each category.

Note! *Make sure no filter is active before using method 2.*

Ioana Gheorghiu, Cosmina-Ioana Bondor, Andreea Gheban-Roșca



6. Creating a graph for a **QUALITATIVE** variable

Example: We want to plot the distribution of the variable Vitamin D2 deficiency.

1. From the main menu, go to: **Plots → Bar Plot**, then under Variable type choose **Categorical**.
2. Under **Variable** type, choose **Categorical**.
3. Move **Vitamin D2 deficiency** into the variable box.

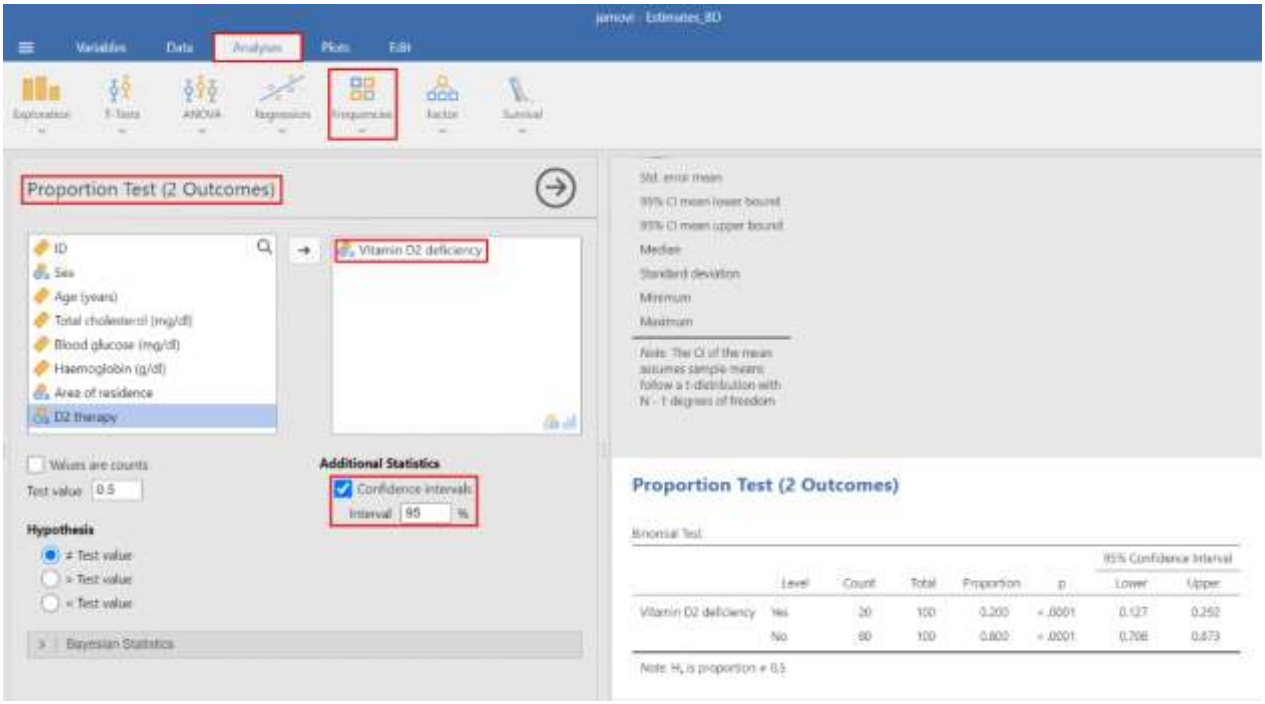
Note! The remaining steps for the bar chart are the same as in the **LP05 Hints** file.

7. The 95% confidence interval for a **FREQUENCY** (proportion)

Example: We want to estimate the frequency of vitamin D2 deficiency.

1. From the main menu, go to: **Analyses → Frequencies → 2 Outcomes – Binomial test** (under One Sample Proportion Tests).
2. Move the variable **Vitamin D2 deficiency** into the Variables box.
3. Under **Additional Statistics**:
    a) Tick **Confidence intervals**.
    b) Check that the value **95** is entered in the **Interval** box.
4. Jamovi produces the **Binomial Test** table, with one row per category (Yes, No): Count, Total, **Proportion**, p and **95% Confidence Interval** (Lower, Upper).
5. Read the row for the category of interest (Yes). **Ignore the p-value: it is not needed for this exercise.**

Ioana Gheorghiu, Cosmina-Ioana Bondor, Andreea Gheban-Roșca



7.1 Interpreting the confidence interval

> ***Example:*** in the study sample, 20% of patients (20 of 100) had vitamin D2 deficiency. We are 95% confident that the true relative frequency of vitamin D2 deficiency (the population frequency) in adults with iron deficiency lies between 12.7% and 29.2%.

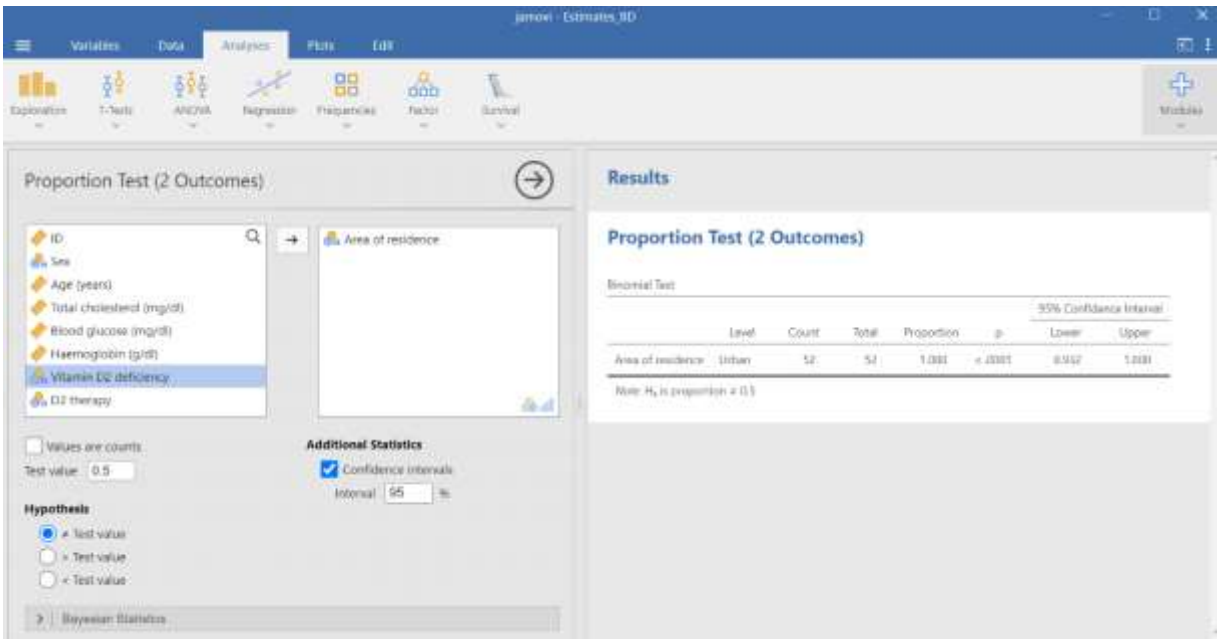
8. The 95% confidence interval for a **FREQUENCY** in a **SUBGROUP**

1. Turn off or delete any previous filters (see section 4).
2. In the **Data → Filters** tab, create the filter (variable names containing spaces must be written between backticks ` `): **`Area of residence` == "Urban"**



3. Go to **Analyses → Frequencies → 2 Outcomes – Binomial test** and repeat the steps in section 7.

Ioana Gheorghiu, Cosmina-Ioana Bondor, Andreea Gheban-Roșca



Example: In urban areas, 26.9% of patients (14 of 52) had vitamin D2 deficiency. We are 95% confident that the true relative frequency of vitamin D2 deficiency in the population of urban adults with iron deficiency lies between 15.6% and 41%.