

## **Comité d'éthique et de recherche de L'ATR**

**PROGRAMME DE FORMATION À LA RECHERCHE CLINIQUE DES  
RÉSIDENTS DE RÉANIMATION MÉDICALE**

**« STATISTIQUES DESCRIPTIVES, TESTS STATISTIQUES,  
ANALYSE MULTI VARIÉE »**

**Séance 4**

**Mardi 24 Mai 2022 à 14H**

Salle des conférences. Service de Réa Med, La Rabta

**Coordinateurs : Dr A Mokline, Dr S Ayed**

**Orateur : Dr Rejaibi Salsabil**

## Les tests statistiques

### **Cadre théorique 2 :**

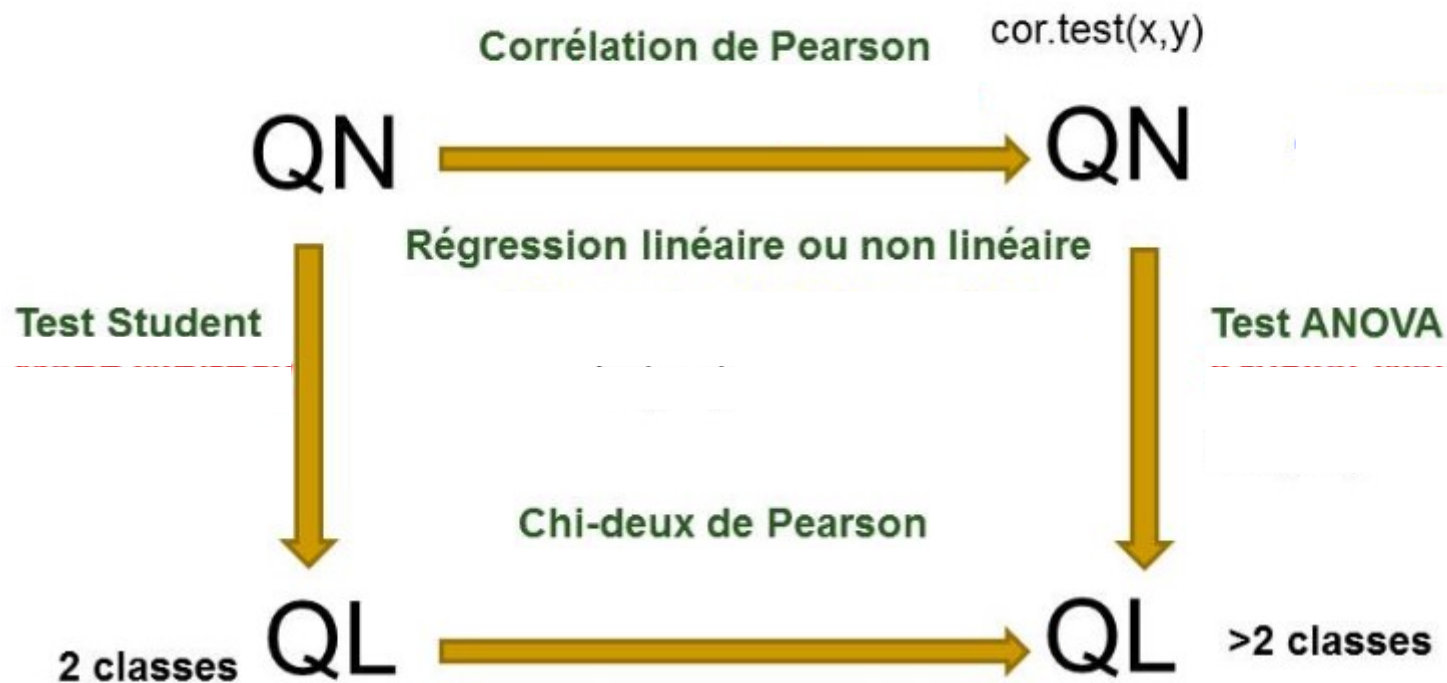
- \*Rappel sur les principaux tests statistiques et leurs indications selon les hypothèses énoncées
- \*Tests paramétriques et non paramétriques
- \*Calcul et interprétation des mesures d'association bruts

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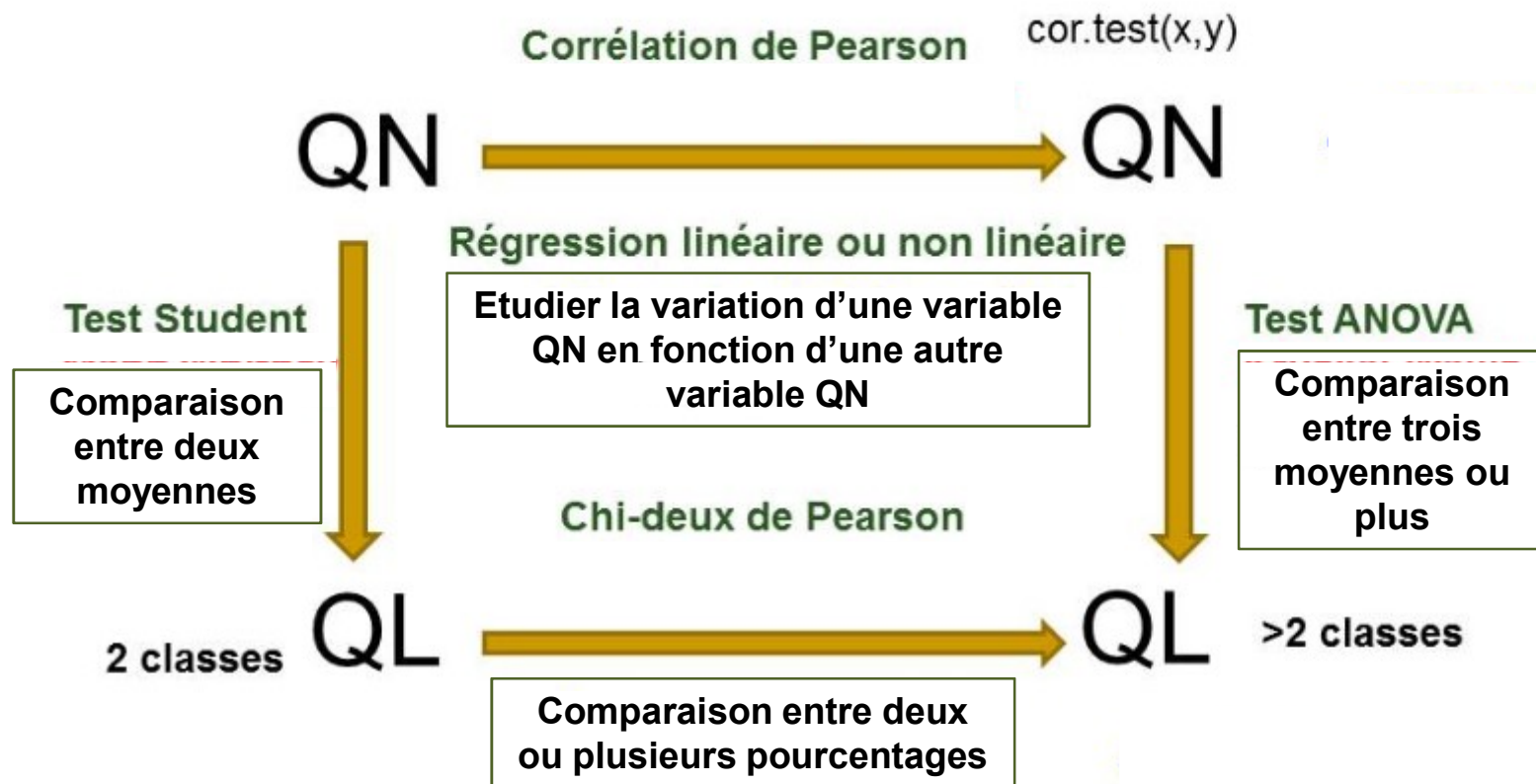
**Atelier pratique 2 :** Application pratique des différents tests sur la « base virose 2015 » (Chi2, T de Student, Anova à un facteur,...)

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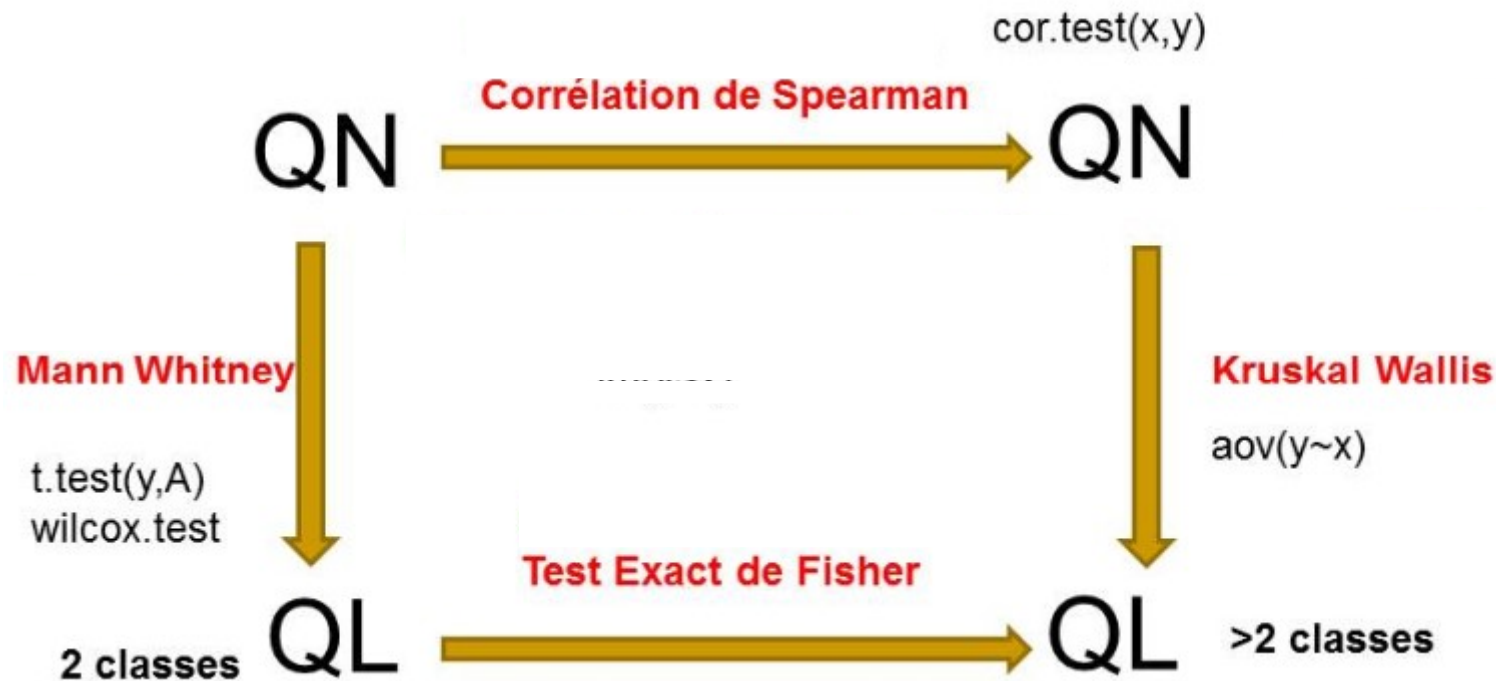
# Analyses bivariées/ Tests paramétriques



# Analyses bivariées/ Tests paramétriques

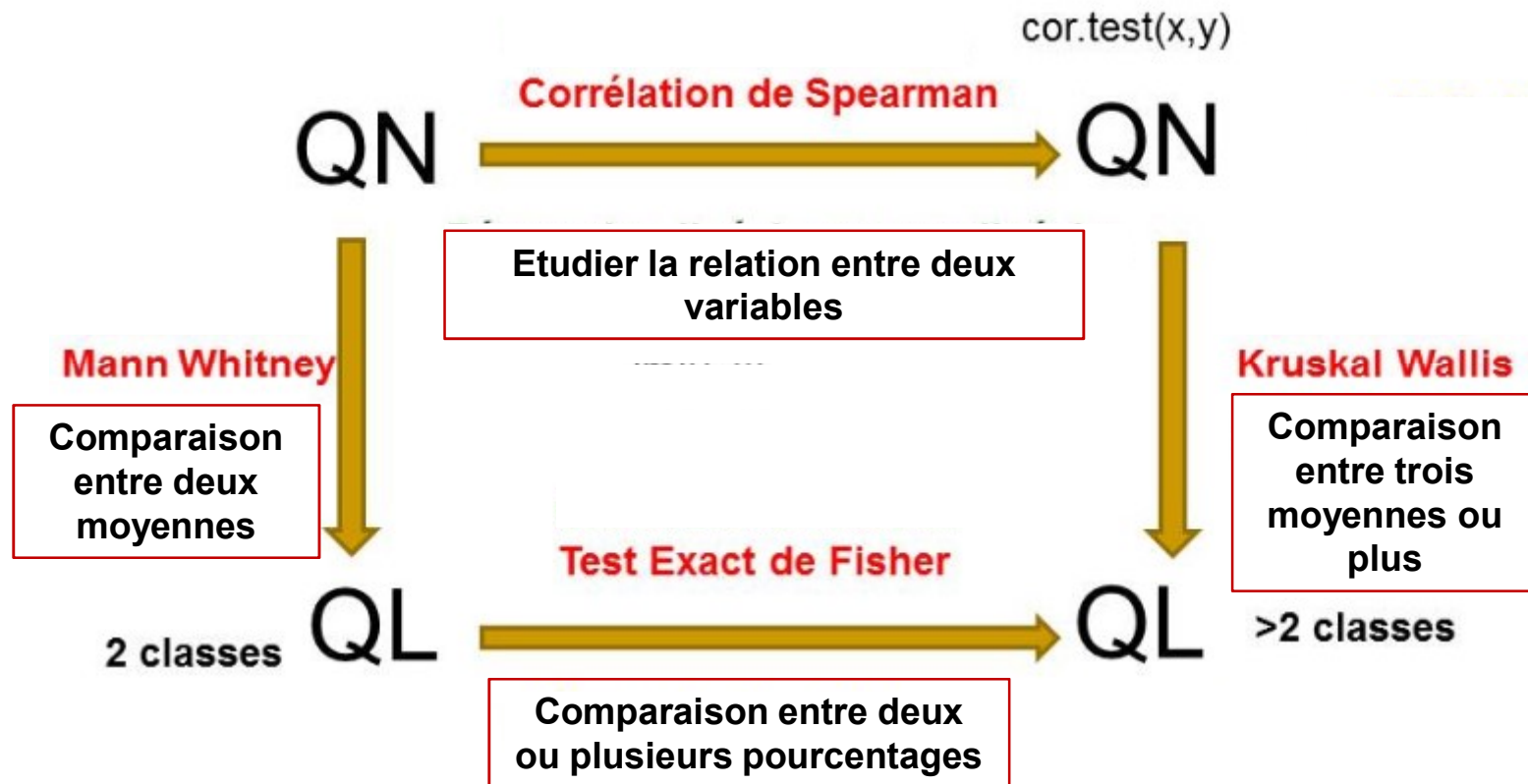


# Analyses bivariées/ Tests non paramétriques



En rouge les méthodes à utiliser en cas de non normalité ou petits échantillons ( $n < 30$ )

# Analyses bivariées/ Tests non paramétriques



En rouge les méthodes à utiliser en cas de non normalité ou petits échantillons ( $n < 30$ )

# Comparaison de pourcentages: test paramétrique

---

**Exemple 1:** Existe t-il une **association significative** entre le diabète (**QL binaire**: oui, non) et le lieu de résidence (**QL binaire**: urbain, rural)?

**Exemple 2:** Existe t-il une **association significative** entre le diabète (**QL binaire**: oui, non) et le lieu de résidence (**QL binaire**: urbain, rural, mixte)?

| Chi-Square Tests                                                                        |                      |    |                                   |                      |                      |
|-----------------------------------------------------------------------------------------|----------------------|----|-----------------------------------|----------------------|----------------------|
|                                                                                         | Value                | df | Asymptotic Significance (2-sided) | Exact Sig. (2-sided) | Exact Sig. (1-sided) |
| Pearson Chi-Square                                                                      | 138.926 <sup>a</sup> | 1  | .000                              | .000                 | .000                 |
| Continuity Correction <sup>b</sup>                                                      | 136.463              | 1  | .000                              |                      |                      |
| Likelihood Ratio                                                                        | 160.900              | 1  | .000                              |                      |                      |
| Fisher's Exact Test                                                                     |                      |    |                                   |                      |                      |
| Linear-by-Linear Association                                                            | 138.568              | 1  | .000                              |                      |                      |
| N of Valid Cases                                                                        | 388                  |    |                                   |                      |                      |
| a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 65.15. |                      |    |                                   |                      |                      |
| b. Computed only for a 2x2 table                                                        |                      |    |                                   |                      |                      |

# Comparaison de pourcentages: test non paramétrique

## → Crosstabs

### Case Processing Summary

|                       | Valid |         | Cases Missing |         | Total |         |
|-----------------------|-------|---------|---------------|---------|-------|---------|
|                       | N     | Percent | N             | Percent | N     | Percent |
| Dog Owner * Education | 30    | 100.0%  | 0             | 0.0%    | 30    | 100.0%  |

### Dog Owner \* Education Crosstabulation

|           |          | Education |             |          | Total |
|-----------|----------|-----------|-------------|----------|-------|
|           |          | Graduate  | High School | PostGrad |       |
| Dog Owner | No Dog   | 7         | 8           | 4        | 19    |
|           | Owns Dog | 8         | 2           | 1        | 11    |
| Total     |          | 15        | 10          | 5        | 30    |

### Chi-Square Tests

|                              | Value              | df | Asymptotic Significance (2-sided) | Exact Sig. (2-sided) | Exact Sig. (1-sided) | Point Probability |
|------------------------------|--------------------|----|-----------------------------------|----------------------|----------------------|-------------------|
| Pearson Chi-Square           | 3.589 <sup>a</sup> | 2  | .166                              | .263                 |                      |                   |
| Likelihood Ratio             | 3.690              | 2  | .158                              | .237                 |                      |                   |
| Fisher's Exact Test          | 3.286              |    |                                   | .263                 |                      |                   |
| Linear-by-Linear Association | 2.775 <sup>b</sup> | 1  | .096                              | .133                 | .076                 | .052              |
| N of Valid Cases             | 30                 |    |                                   |                      |                      |                   |

a. 3 cells (50.0%) have expected count less than 5. The minimum expected count is 1.83.

b. The standardized statistic is -1.666.

# Mesure d'association en épidémiologie?

# Mesures d'associations et d'impact

- Distinguer les mesures d'association interprétables au **niveau individuel**

- ☐ Risque relatif : RR
- ☐ Odds ratio : OR

NB : en épidémiologie les rapports de risque sont plus souvent utilisés que les écarts de risque.

- Mesures d'impact interprétables au **niveau de la population**

- ☐ Proportion de cas attribuable (PCA) = risque attribuable

# Analyse univariée

|             | cas   | témoins |
|-------------|-------|---------|
| exposés     | a     | b       |
| non exposés | c     | d       |
|             | a + c | b + d   |

cote d'exposition chez les cas

$$\frac{a / (a + c)}{c / (a + c)} = \frac{a}{c}$$

cote d'exposition chez les témoins

$$\frac{b / (b + d)}{d / (b + d)} = \frac{b}{d}$$

OR =  $\frac{a / c}{b / d} = \frac{ad}{bc}$   
Brut

Etude de la force de la relation entre la survenue d'un évènement de santé et une seule exposition

# Comparaison de moyennes (QL \* QN)

---

**Exemple 1:** Existe t-il une **association significative** entre le diabète (**QL binaire**: oui, non) et l'indice de masse corporelle IMC (**QN continue**)?

**Exemple 2:** Existe t-il une **association significative** entre le lieu de résidence (**QL à plusieurs modalités**: urbain, rural, mixte) et l'indice de masse corporelle IMC (**QN continue**) chez le sujet adulte en Tunisie?

# Comparaison de moyennes (QL \* QN)

---

**Exemple 1:** Existe t-il une **association significative** entre le diabète (**QL binaire**: oui, non) et l'indice de masse corporelle IMC (**QN continue**)?

→ **Test t de Student**

**Exemple 2:** Existe t-il une **association significative** entre le lieu de résidence (**QL à plusieurs modalités**: urbain, rural, mixte) et l'indice de masse corporelle IMC (**QN continue**) chez le sujet adulte en Tunisie?

→ **Test de l'analyse de la variance (ANOVA) à un facteur**

# Comparaison de moyennes (QL \* QN)

---

**Exemple 1:** Existe t-il une **association significative** entre le diabète (**QL binaire**: oui, non) et l'indice de masse corporelle IMC (**QN continue**)?

→ **Test t de Student**

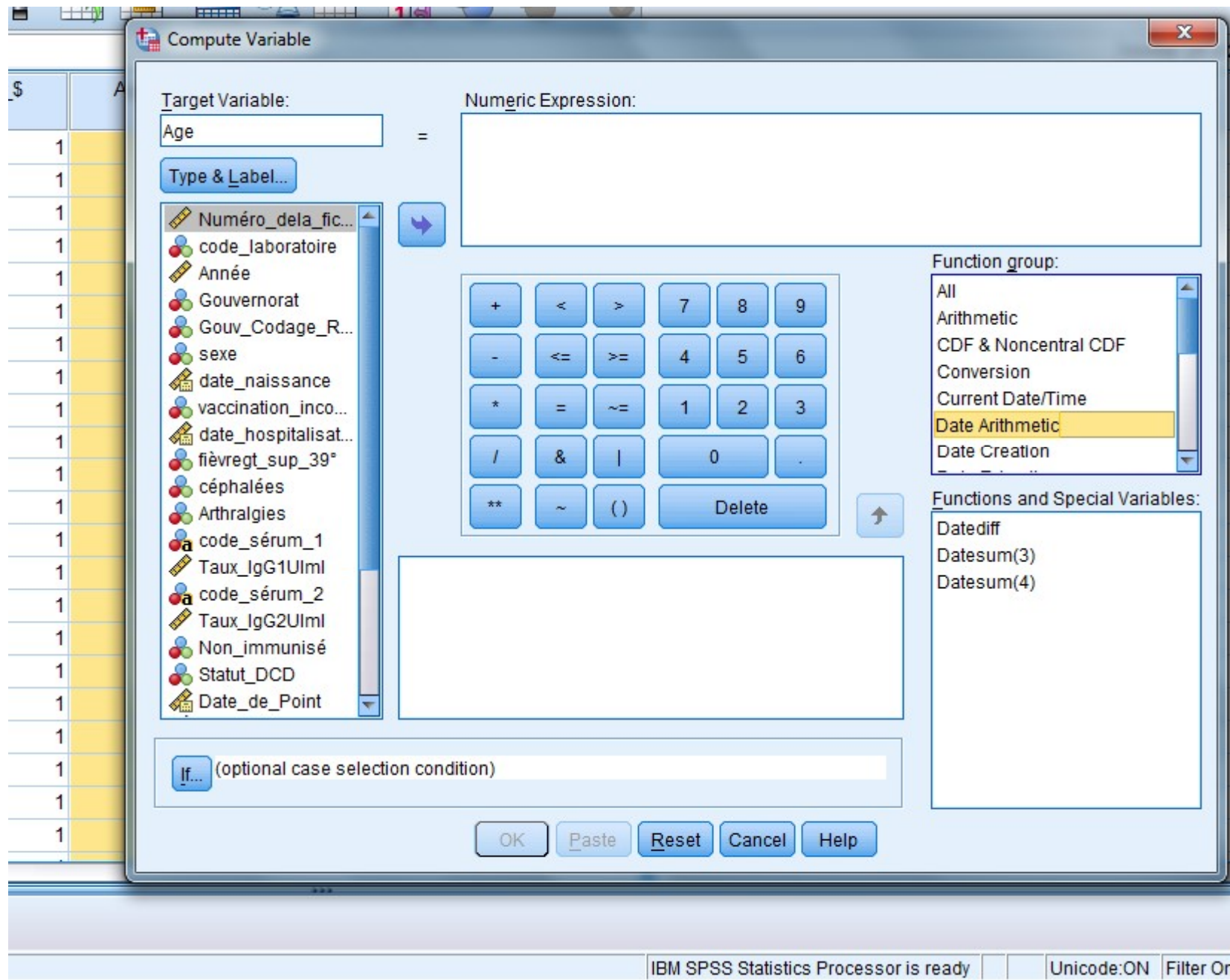
**Exemple 2:** Existe t-il une **association significative** entre le lieu de résidence (**QL à plusieurs modalités**: urbain, rural, mixte) et l'indice de masse corporelle IMC (**QN continue**) chez le sujet adulte en Tunisie?

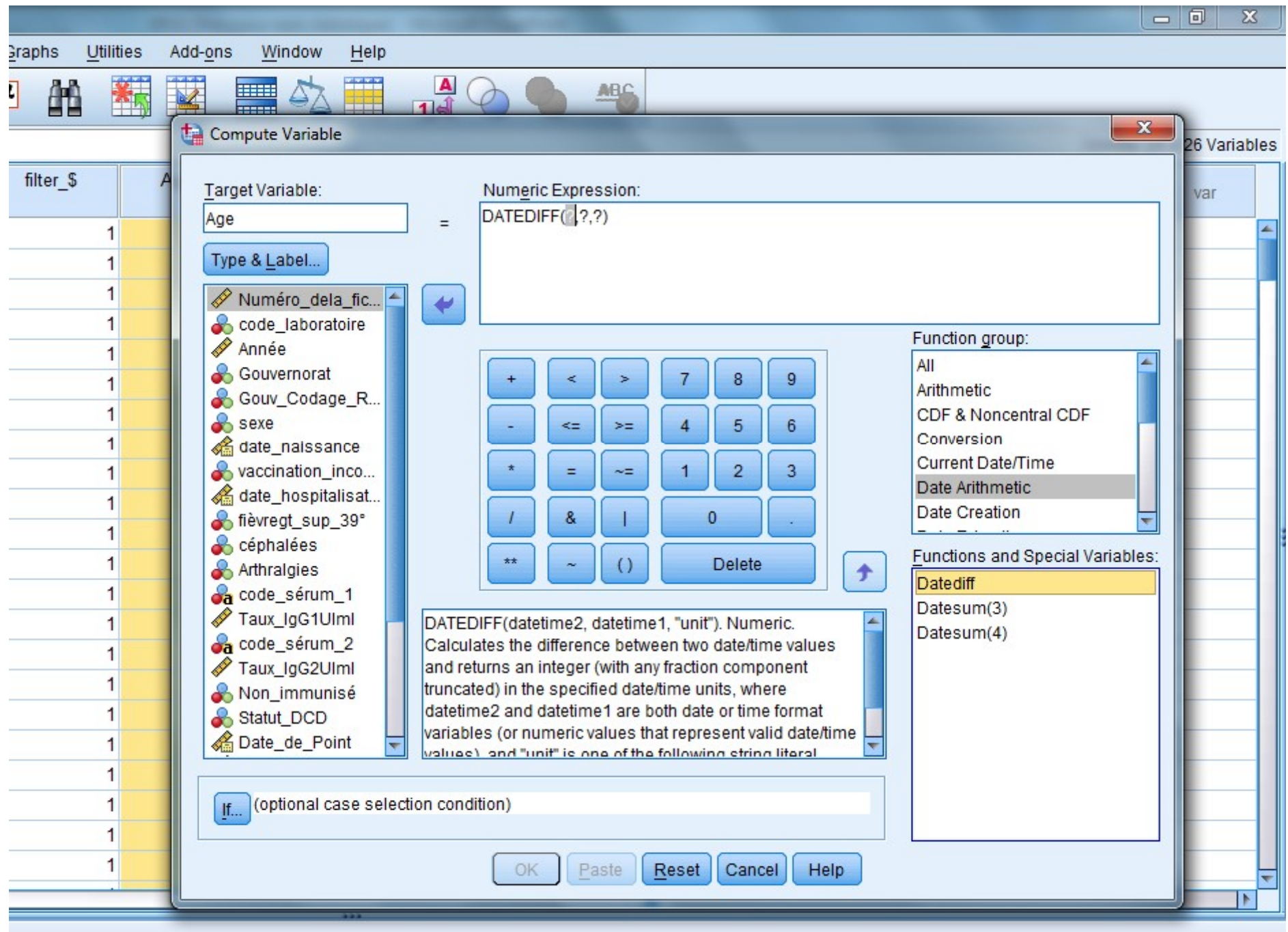
→ **Test de l'analyse de la variance (ANOVA) à un facteur**

**Test de la normalité de la variable QN**

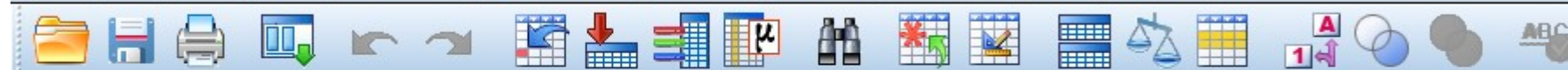
# Calcul de date et test de normalité

Data View Variable View









1 : Age

35

|    |    | Y_QL | Missing_QL | Missing_QNN_Moy | filter_\$ | Age | var | var | var | var | var |
|----|----|------|------------|-----------------|-----------|-----|-----|-----|-----|-----|-----|
| 1  | 12 | 1    | 1          | 12.0            | 1         | 35  |     |     |     |     |     |
| 2  | 35 | 0    | 0          | 85.0            | 1         | 35  |     |     |     |     |     |
| 3  | 76 | 0    | .          | 76.0            | 1         | 35  |     |     |     |     |     |
| 4  | 17 | 1    | .          | 47.0            | 1         | 35  |     |     |     |     |     |
| 5  | 35 | 0    | 0          | 85.0            | 1         | 34  |     |     |     |     |     |
| 6  | 30 | 0    | 0          | 80.0            | 1         | 34  |     |     |     |     |     |
| 7  | 54 | 1    | 1          | 54.0            | 1         | 34  |     |     |     |     |     |
| 8  | 77 | 0    | .          | 77.0            | 0         | 34  |     |     |     |     |     |
| 9  | 75 | 0    | .          | 75.0            | 1         | 34  |     |     |     |     |     |
| 10 | 74 | 0    | .          | 74.0            | 1         | 34  |     |     |     |     |     |
| 11 | 62 | 0    | 0          | 62.0            | 1         | 34  |     |     |     |     |     |
| 12 | 15 | 1    | 1          | 15.0            | 1         | 34  |     |     |     |     |     |
| 13 | 70 | 0    | 0          | 70.0            | 1         | 33  |     |     |     |     |     |
| 14 | 78 | 0    | 0          | 78.0            | 1         | 33  |     |     |     |     |     |
| 15 | 30 | 1    | 1          | 30.0            | 1         | 33  |     |     |     |     |     |
| 16 | 78 | 0    | 0          | 78.0            | 1         | 33  |     |     |     |     |     |
| 17 | 35 | 1    | 1          | 35.0            | 1         | 33  |     |     |     |     |     |
| 18 | 63 | 0    | 0          | 63.0            | 1         | 33  |     |     |     |     |     |
| 19 | 38 | 1    | 1          | 38.0            | 1         | 33  |     |     |     |     |     |
| 20 | 13 | 1    | 1          | 43.0            | 1         | 33  |     |     |     |     |     |
| 21 | 19 | 1    | 1          | 49.0            | 1         | 33  |     |     |     |     |     |
| 22 | .  | 1    | 1          | 53.6            | 1         | 33  |     |     |     |     |     |
| .. | 1  | .    | .          | ..              | .         | ..  |     |     |     |     |     |

Data View

Variable View

|    |    | Y_QL | Missing_Q |
|----|----|------|-----------|
| 1  | 12 | 1    |           |
| 2  | 35 | 0    |           |
| 3  | 76 | 0    |           |
| 4  | 17 | 1    |           |
| 5  | 35 | 0    |           |
| 6  | 30 | 0    |           |
| 7  | 54 | 1    |           |
| 8  | 77 | 0    |           |
| 9  | 75 | 0    |           |
| 10 | 74 | 0    |           |
| 11 | 62 | 0    |           |
| 12 | 15 | 1    |           |
| 13 | 70 | 0    |           |
| 14 | 78 | 0    |           |
| 15 | 30 | 1    |           |
| 16 | 78 | 0    |           |
| 17 | 35 | 1    |           |
| 18 | 63 | 0    |           |
| 19 | 38 | 1    |           |
| 20 | 13 | 1    |           |
| 21 | 19 | 1    |           |
| 22 | .  | 1    |           |
| 23 | 1  | .    |           |

- |                                                                                                               |   |
|---------------------------------------------------------------------------------------------------------------|---|
| Reports                                                                                                       | ▶ |
| <b>Descriptive Statistics</b>                                                                                 | ▶ |
| Tables                                                                                                        | ▶ |
| Compare Means                                                                                                 | ▶ |
| General Linear Model                                                                                          | ▶ |
| Generalized Linear Models                                                                                     | ▶ |
| Mixed Models                                                                                                  | ▶ |
| Correlate                                                                                                     | ▶ |
| Regression                                                                                                    | ▶ |
| Loglinear                                                                                                     | ▶ |
| Neural Networks                                                                                               | ▶ |
| Classify                                                                                                      | ▶ |
| Dimension Reduction                                                                                           | ▶ |
| Scale                                                                                                         | ▶ |
| Nonparametric Tests                                                                                           | ▶ |
| Forecasting                                                                                                   | ▶ |
| Survival                                                                                                      | ▶ |
| Multiple Response                                                                                             | ▶ |
|  Missing Value Analysis... |   |
| Multiple Imputation                                                                                           | ▶ |
| Complex Samples                                                                                               | ▶ |
|  Simulation...             |   |
| Quality Control                                                                                               | ▶ |
|  ROC Curve...              |   |

-  Frequencies...
-  Descriptives...
-  Explore...
-  Crosstabs...
- TURF Analysis
-  Ratio...
-  P-P Plots...
-  Q-Q Plots...

[illegible]

\*Base\_virose\_2015.sav [DataSet1] - IBM SPSS Statistics Data Editor

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1 : Age 35

|    | Y_QL | Missing_QL | Missing_QNN_Moy | filter_\$ | Age | var | var | var | var | var |
|----|------|------------|-----------------|-----------|-----|-----|-----|-----|-----|-----|
| 1  | 12   | 1          | 1               | 12.0      | 1   | 35  |     |     |     |     |
| 2  | 35   | 0          | 0               | 85.0      | 1   | 35  |     |     |     |     |
| 3  | 76   | 0          | .               | 76.0      |     |     |     |     |     |     |
| 4  | 17   | 1          | .               | 47.0      |     |     |     |     |     |     |
| 5  | 35   | 0          | 0               | 85.0      |     |     |     |     |     |     |
| 6  | 30   | 0          | 0               | 80.0      |     |     |     |     |     |     |
| 7  | 54   | 1          | 1               | 54.0      |     |     |     |     |     |     |
| 8  | 77   | 0          | .               | 77.0      |     |     |     |     |     |     |
| 9  | 75   | 0          | .               | 75.0      |     |     |     |     |     |     |
| 10 | 74   | 0          | .               | 74.0      |     |     |     |     |     |     |
| 11 | 62   | 0          | 0               | 62.0      |     |     |     |     |     |     |
| 12 | 15   | 1          | 1               | 15.0      |     |     |     |     |     |     |
| 13 | 70   | 0          | 0               | 70.0      |     |     |     |     |     |     |
| 14 | 78   | 0          | 0               | 78.0      |     |     |     |     |     |     |
| 15 | 30   | 1          | 1               | 30.0      |     |     |     |     |     |     |
| 16 | 78   | 0          | 0               | 78.0      |     |     |     |     |     |     |
| 17 | 35   | 1          | 1               | 35.0      |     |     |     |     |     |     |
| 18 | 63   | 0          | 0               | 63.0      |     |     |     |     |     |     |
| 19 | 38   | 1          | 1               | 38.0      | 1   | 33  |     |     |     |     |
| 20 | 13   | 1          | 1               | 43.0      | 1   | 33  |     |     |     |     |
| 21 | 19   | 1          | 1               | 49.0      | 1   | 33  |     |     |     |     |
| 22 | .    | 1          | 1               | 53.6      | 1   | 33  |     |     |     |     |
| -- |      |            |                 |           |     |     |     |     |     |     |

1

Data View Variable View

IBM SPSS

Explore

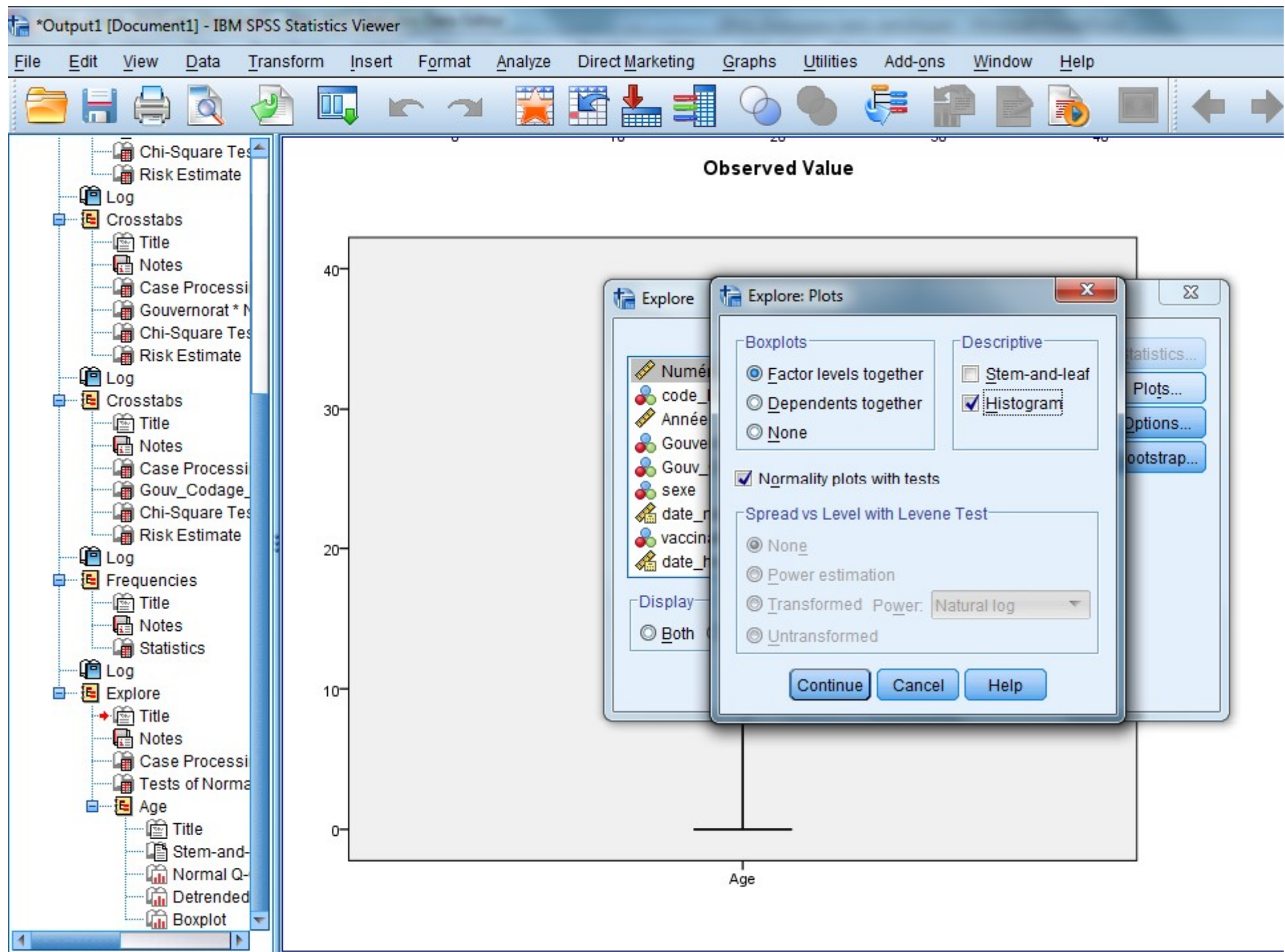
Dependent List: Age

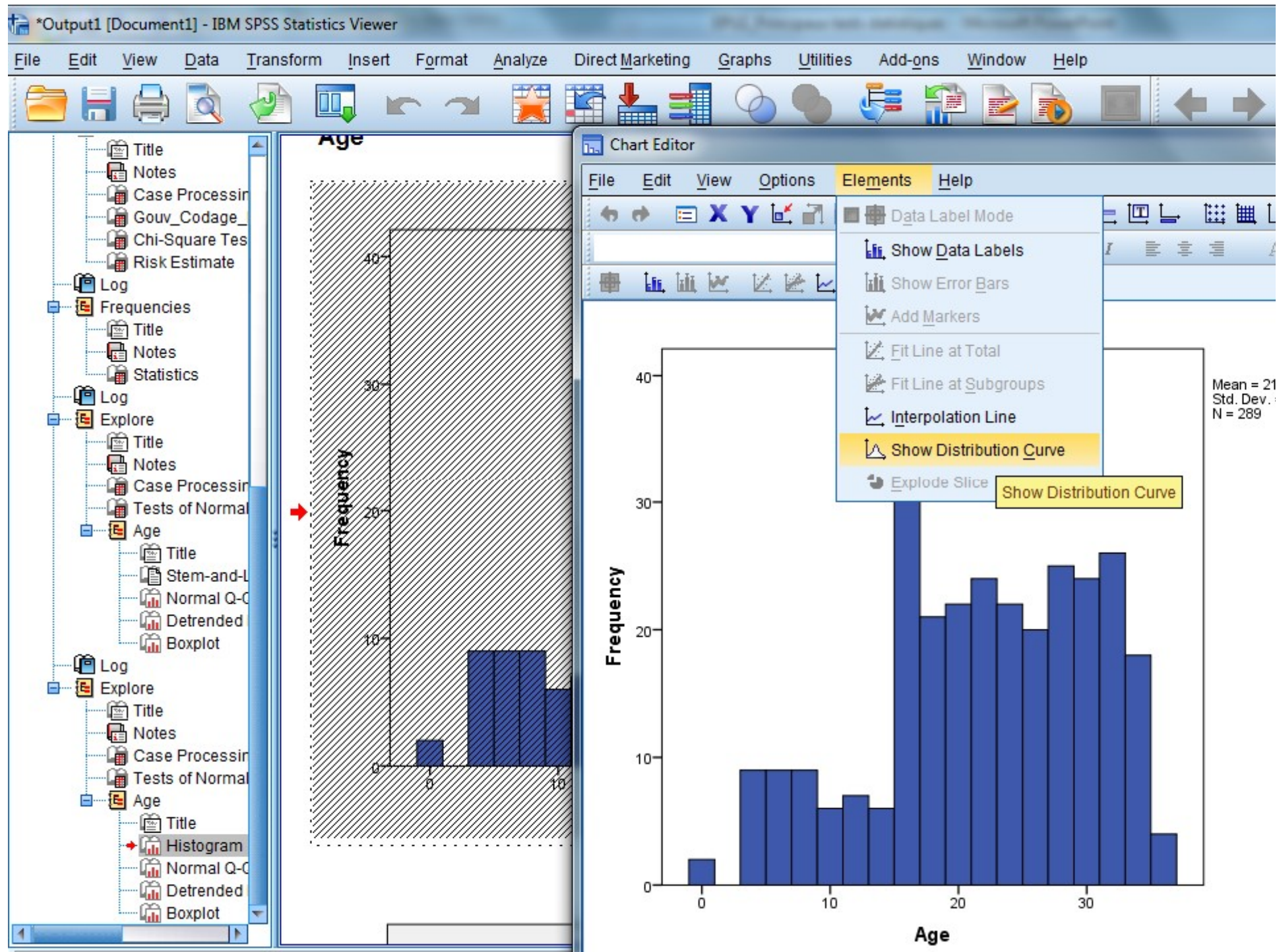
Factor List:

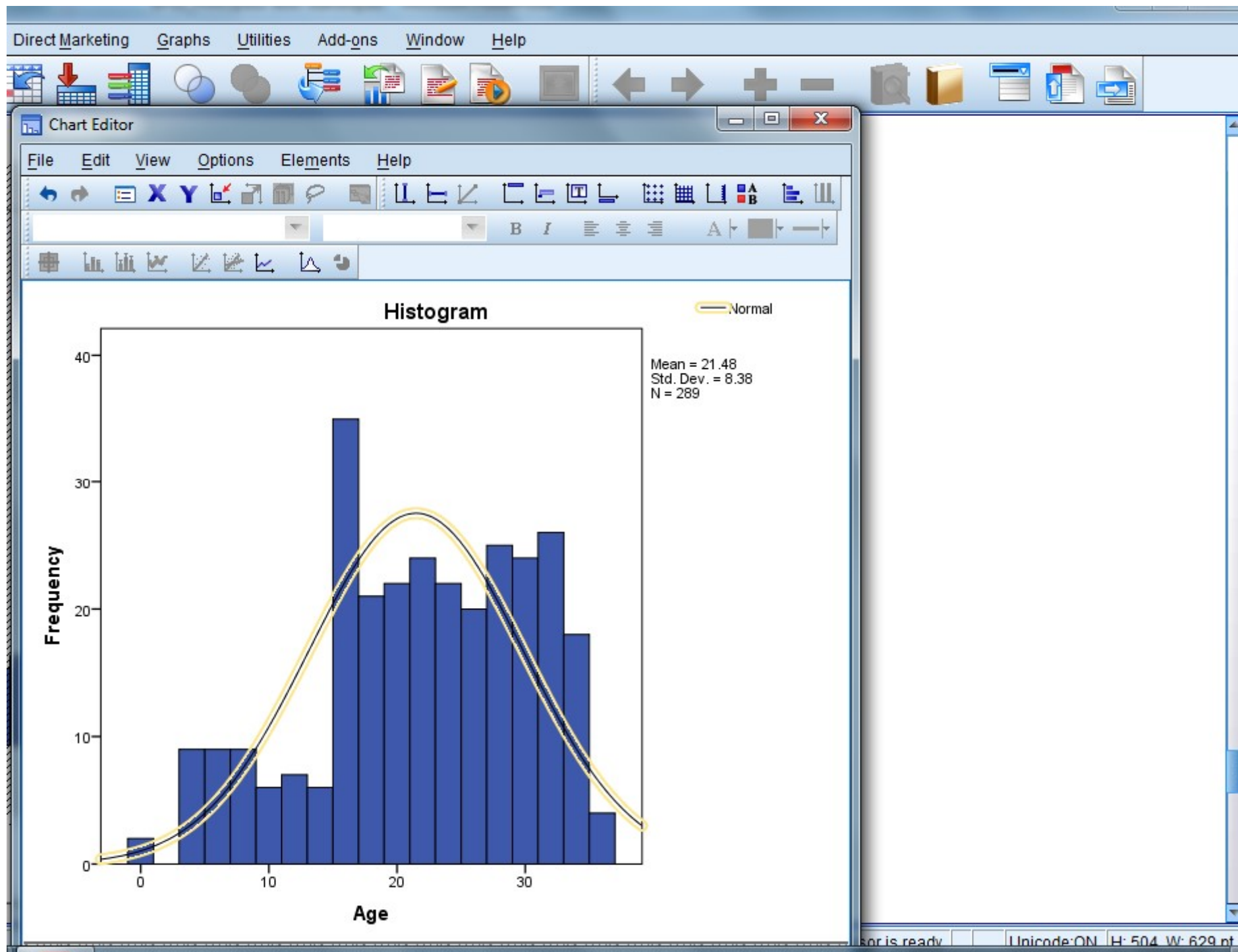
Label Cases by:

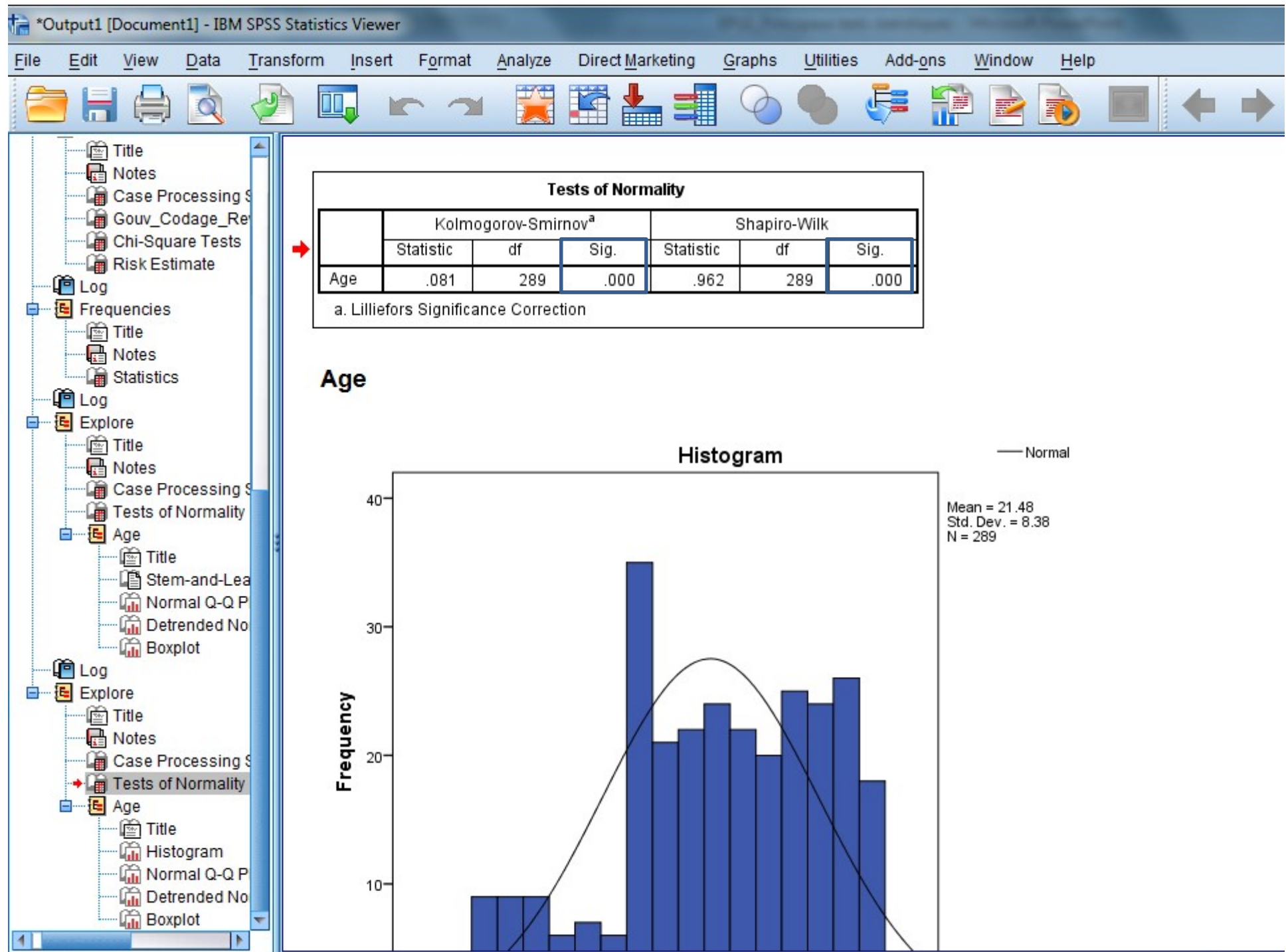
Display: ☐ Both ☐ Statistics ☒ Plots

OK Paste Reset Cancel Help









Tunis      Homme      11.08.2011      complète      12.10.2015      31.12.2015  
 complète      12.10.2015      31.12.2015

**Frequencies: Statistics**

**Percentile Values**

☐ Quartiles

☐ Cut points for: 10 equal groups

☐ Percentile(s):

Add

Change

Remove

**Central Tendency**

☒ Mean

☒ Median

☒ Mode

☐ Sum

☐ Values are group midpoints

**Dispersion**

☐ Std. deviation    ☐ Minimum

☐ Variance        ☐ Maximum

☐ Range            ☐ S.E. mean

**Distribution**

☐ Skewness

☐ Kurtosis

Continue    Cancel    Help

Variable(s):

Age

Statistics...

Charts...

Format...

Style...

Bootstrap...

Reset    Cancel    Help

**Statistics**

|        |         |       |
|--------|---------|-------|
| Age    |         |       |
| N      | Valid   | 289   |
|        | Missing | 0     |
| Mean   |         | 21.69 |
| Median |         | 22.00 |
| Mode   |         | 15    |

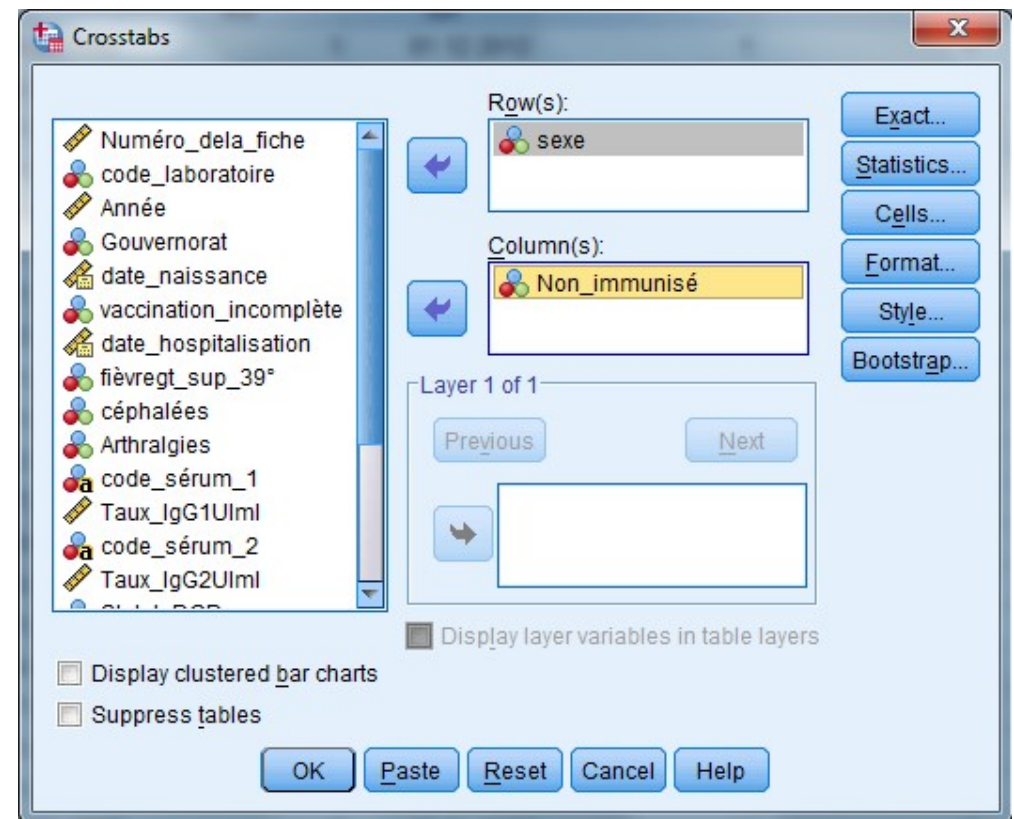
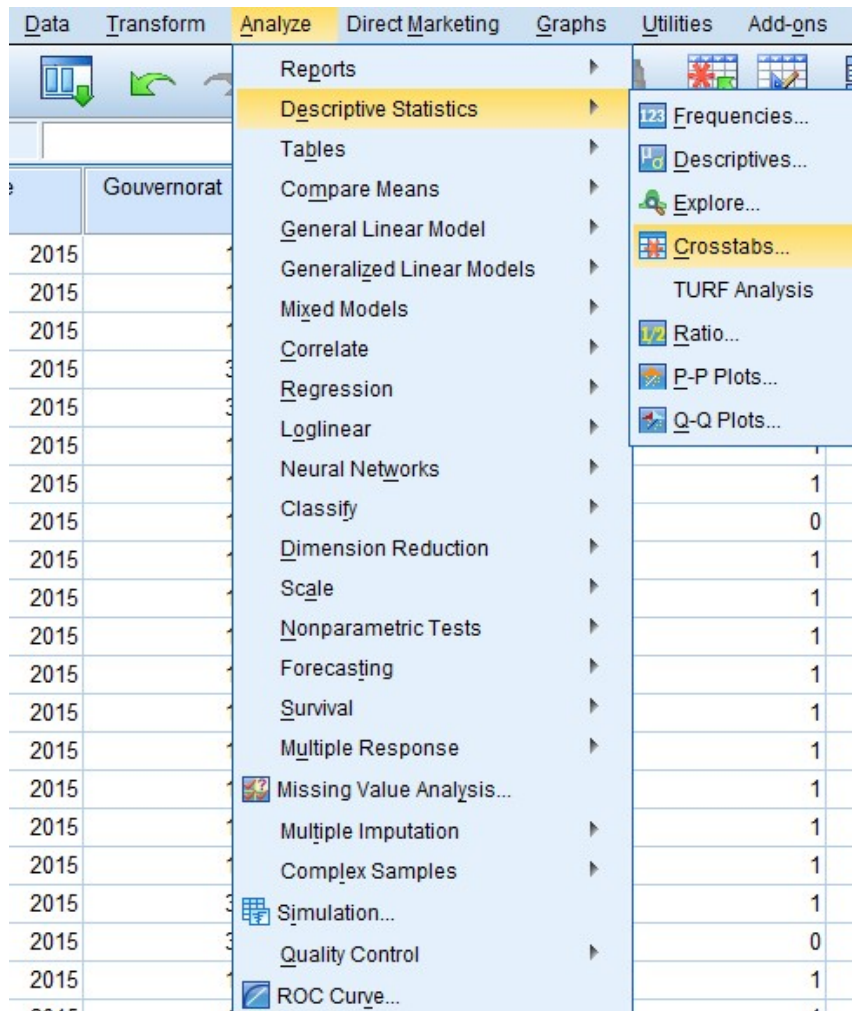
# Application sur spss

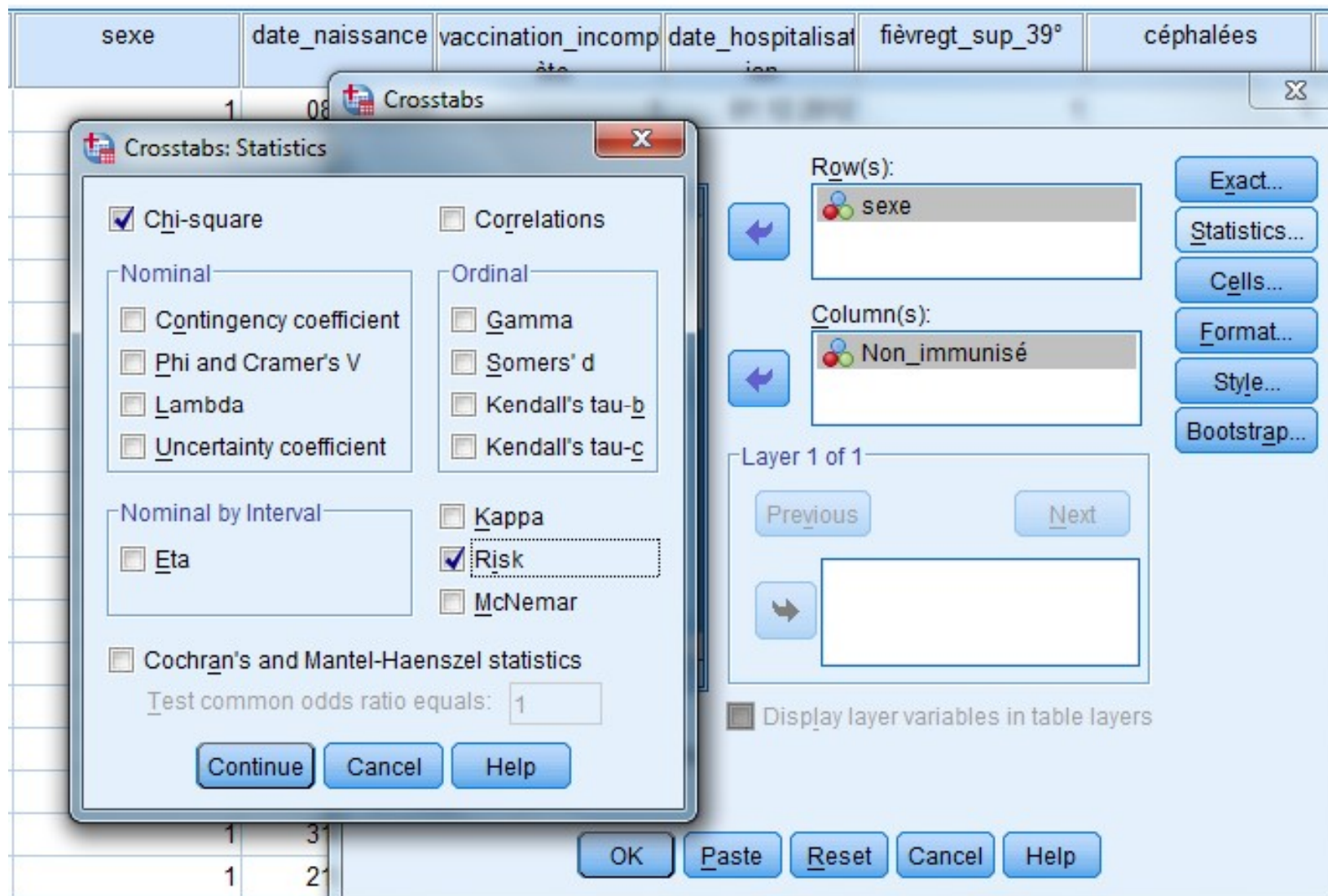
Association entre statut immunitaire et sexe ?

Association entre statut immunitaire et gouvernorat (Tunis et gabes)?

Association entre statut immunitaire et âge?

Association entre âge et gouvernorat ?





\*Base\_virose\_2015.sav [DataSet1] - IBM SPSS Statistics Data Editor

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Année Gouvernorat sexe date\_naissance vaccination\_incomp date\_hospitalisat fièvre\_sup\_39° céphalées

|    |      |   |   |            |   |            |   |
|----|------|---|---|------------|---|------------|---|
| 1  | 2015 |   |   |            |   |            |   |
| 2  | 2015 |   |   |            |   |            |   |
| 3  | 2015 |   |   |            |   |            |   |
| 4  | 2015 |   |   |            |   |            |   |
| 5  | 2015 |   |   |            |   |            |   |
| 6  | 2015 |   |   |            |   |            |   |
| 7  | 2015 |   |   |            |   |            |   |
| 8  | 2015 |   |   |            |   |            |   |
| 9  | 2015 |   |   |            |   |            |   |
| 10 | 2015 |   |   |            |   |            |   |
| 11 | 2015 |   |   |            |   |            |   |
| 12 | 2015 |   |   |            |   |            |   |
| 13 | 2015 |   |   |            |   |            |   |
| 14 | 2015 |   |   |            |   |            |   |
| 15 | 2015 |   |   |            |   |            |   |
| 16 | 2015 |   |   |            |   |            |   |
| 17 | 2015 |   |   |            |   |            |   |
| 18 | 2015 |   |   |            |   |            |   |
| 19 | 2015 | 3 | 1 | 21         |   |            |   |
| 20 | 2015 | 1 | 1 | 07.04.1997 | 1 | 10.01.2015 | 1 |
| 21 | 2015 | 1 | 1 | 31.03.1986 | 1 | 02.03.2015 | 1 |
| 22 | 2015 | 3 | 1 | 31.03.1987 | 1 | 11.03.2015 | 1 |

**Crosstabs: Cell Display**

**Counts**

- ☒ Observed
- ☐ Expected
- ☐ Hide small counts  
Less than 5

**z-test**

- ☐ Compare column proportions
- ☐ Adjust p-values (Bonferroni method)

**Percentages**

- ☒ Row
- ☒ Column
- ☐ Total

**Residuals**

- ☐ Unstandardized
- ☐ Standardized
- ☐ Adjusted standardized

**Noninteger Weights**

- ☒ Round cell counts
- ☐ Round case weights
- ☐ Truncate cell counts
- ☐ Truncate case weights
- ☐ No adjustments

Continue Cancel Help

**Crosstabs: Table Layout**

Row(s): sexe

Column(s): Non\_immunisé

Exact... Statistics... Cells... Format... Style... Bootstrap...

Previous Next

Reset Cancel Help

Data View Variable View

\*Output1 [Document1] - IBM SPSS Statistics Viewer

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Output

- Log
- Crosstabs
  - Title
  - Notes
  - Active Dataset
  - Case Processing
  - sexe \* Non\_immu
  - Chi-Square Tests
  - Risk Estimate

**sexe \* Non\_immunis  Crosstabulation**

|                       |                       |                       | Non_immunis  |        | Total  |
|-----------------------|-----------------------|-----------------------|--------------|--------|--------|
|                       |                       |                       | non          | oui    |        |
| sexe                  | Femme                 | Count                 | 38           | 86     | 124    |
|                       |                       | % within sexe         | 30.6%        | 69.4%  | 100.0% |
|                       |                       | % within Non_immunis  | 48.1%        | 41.0%  | 42.9%  |
|                       | Homme                 | Count                 | 41           | 124    | 165    |
|                       |                       | % within sexe         | 24.8%        | 75.2%  | 100.0% |
| % within Non_immunis  |                       | 51.9%                 | 59.0%        | 57.1%  |        |
| Total                 | Count                 | 79                    | 210          | 289    |        |
|                       | % within sexe         | 27.3%                 | 72.7%        | 100.0% |        |
|                       | % within Non_immunis  | 100.0%                | 100.0%       | 100.0% |        |

**Chi-Square Tests**

|                                    | Value              | df | Asymp. Sig. (2-sided) | Exact Sig. (2-sided) | Exact Sig. (1-sided) |
|------------------------------------|--------------------|----|-----------------------|----------------------|----------------------|
| Pearson Chi-Square                 | 1.198 <sup>a</sup> | 1  | .274                  | .288                 | .168                 |
| Continuity Correction <sup>b</sup> | .924               | 1  | .337                  |                      |                      |
| Likelihood Ratio                   | 1.192              | 1  | .275                  |                      |                      |
| Fisher's Exact Test                |                    |    |                       |                      |                      |
| Linear-by-Linear Association       | 1.193              | 1  | .275                  |                      |                      |
| N of Valid Cases                   | 289                |    |                       |                      |                      |

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 33.90.

b. Computed only for a 2x2 table

**Risk Estimate**

|  | 95% Confidence Interval |
|--|-------------------------|
|  |                         |

\*Output1 [Document1] - IBM SPSS Statistics Viewer

File Edit View Data Transform Insert Format Analyze Direct Marketing Graphs Utilities Add-ons Window Help

Output

- Log
- Crosstabs
  - Title
  - Notes
  - Active Dataset
  - Case Processing
  - sexe \* Non\_immu
  - Chi-Square Tests
  - Risk Estimate

**sexe \* Non\_immunis  Crosstabulation**

|       |       |                       | Non_immunis  |        | Total  |
|-------|-------|-----------------------|--------------|--------|--------|
|       |       |                       | non          | oui    |        |
| sexe  | Femme | Count                 | 38           | 86     | 124    |
|       |       | % within sexe         | 30.6%        | 69.4%  | 100.0% |
|       |       | % within Non_immunis  | 48.1%        | 41.0%  | 42.9%  |
|       | Homme | Count                 | 41           | 124    | 165    |
|       |       | % within sexe         | 24.8%        | 75.2%  | 100.0% |
|       |       | % within Non_immunis  | 51.9%        | 59.0%  | 57.1%  |
| Total |       | Count                 | 79           | 210    | 289    |
|       |       | % within sexe         | 27.3%        | 72.7%  | 100.0% |
|       |       | % within Non_immunis  | 100.0%       | 100.0% | 100.0% |

**Chi-Square Tests**

|                                    | Value              | df | Asymp. Sig. (2-sided) | Exact Sig. (2-sided) | Exact Sig. (1-sided) |
|------------------------------------|--------------------|----|-----------------------|----------------------|----------------------|
| Pearson Chi-Square                 | 1.198 <sup>a</sup> | 1  | .274                  | .288                 | .168                 |
| Continuity Correction <sup>b</sup> | .924               | 1  | .337                  |                      |                      |
| Likelihood Ratio                   | 1.192              | 1  | .275                  |                      |                      |
| Fisher's Exact Test                |                    |    |                       |                      |                      |
| Linear-by-Linear Association       | 1.193              | 1  | .275                  |                      |                      |
| N of Valid Cases                   | 289                |    |                       |                      |                      |

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 33.90.

b. Computed only for a 2x2 table

**Risk Estimate**

|  | 95% Confidence Interval |
|--|-------------------------|
|  |                         |

Est-ce que la  
prévalence vaccinale  
**(fréquence  
d'immunisation)** est  
significativement  
différente entre les  
garçons et les filles?

sexe \* Non\_immunisé Crosstabulation

|       |       |                       | Non_immunisé |        | Total  |
|-------|-------|-----------------------|--------------|--------|--------|
|       |       |                       | non          | oui    |        |
| sexe  | Femme | Count                 | 38           | 86     | 124    |
|       |       | % within sexe         | 30.6%        | 69.4%  | 100.0% |
|       |       | % within Non_immunisé | 48.1%        | 41.0%  | 42.9%  |
|       | Homme | Count                 | 41           | 124    | 165    |
|       |       | % within sexe         | 24.8%        | 75.2%  | 100.0% |
|       |       | % within Non_immunisé | 51.9%        | 59.0%  | 57.1%  |
| Total |       | Count                 | 79           | 210    | 289    |
|       |       | % within sexe         | 27.3%        | 72.7%  | 100.0% |
|       |       | % within Non_immunisé | 100.0%       | 100.0% | 100.0% |

Hypothèse 0: égalité  
des fréquences  
d'immunisation entre  
les sexes

Hypothèse 1: NON  
égalité des  
fréquences  
d'immunisation entre  
les sexes

Chi-Square Tests

|                                    | Value              | df | Asymp. Sig.<br>(2-sided) | Exact Sig. (2-<br>sided) | Exact Sig. (1-<br>sided) |
|------------------------------------|--------------------|----|--------------------------|--------------------------|--------------------------|
| Pearson Chi-Square                 | 1.198 <sup>a</sup> | 1  | .274                     | .288                     | .168                     |
| Continuity Correction <sup>b</sup> | .924               | 1  | .337                     |                          |                          |
| Likelihood Ratio                   | 1.192              | 1  | .275                     |                          |                          |
| Fisher's Exact Test                |                    |    |                          |                          |                          |
| Linear-by-Linear<br>Association    | 1.193              | 1  | .275                     |                          |                          |
| N of Valid Cases                   | 289                |    |                          |                          |                          |

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 33.90.

b. Computed only for a 2x2 table

Est-ce que la  
prévalence vaccinale  
(fréquence  
d'immunisation) est  
significativement  
différente entre les  
garçons et les filles?

Hypothèse 0: égalité  
des fréquences  
d'immunisation entre  
les sexes

~~Hypothèse 1: NON  
égalité des  
fréquences  
d'immunisation entre  
les sexes~~

sexe \* Non\_immunisé Crosstabulation

|       |       |                       | Non_immunisé |        | Total  |
|-------|-------|-----------------------|--------------|--------|--------|
|       |       |                       | non          | oui    |        |
| sexe  | Femme | Count                 | 38           | 86     | 124    |
|       |       | % within sexe         | 30.6%        | 69.4%  | 100.0% |
|       |       | % within Non_immunisé | 48.1%        | 41.0%  | 42.9%  |
|       | Homme | Count                 | 41           | 124    | 165    |
|       |       | % within sexe         | 24.8%        | 75.2%  | 100.0% |
|       |       | % within Non_immunisé | 51.9%        | 59.0%  | 57.1%  |
| Total |       | Count                 | 79           | 210    | 289    |
|       |       | % within sexe         | 27.3%        | 72.7%  | 100.0% |
|       |       | % within Non_immunisé | 100.0%       | 100.0% | 100.0% |

Chi-Square Tests

|                                    | Value              | df | Asymp. Sig. (2-sided) | Exact Sig. (2-sided) | Exact Sig. (1-sided) |
|------------------------------------|--------------------|----|-----------------------|----------------------|----------------------|
| Pearson Chi-Square                 | 1.198 <sup>a</sup> | 1  | .274                  |                      |                      |
| Continuity Correction <sup>b</sup> | .924               | 1  | .337                  |                      |                      |
| Likelihood Ratio                   | 1.192              | 1  | .275                  |                      |                      |
| Fisher's Exact Test                |                    |    |                       | .288                 | .168                 |
| Linear-by-Linear Association       | 1.193              | 1  | .275                  |                      |                      |
| N of Valid Cases                   | 289                |    |                       |                      |                      |

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 33.90.

b. Computed only for a 2x2 table

Est-ce que la  
prévalence vaccinale  
(fréquence  
d'immunisation) est  
significativement  
différente entre les  
garçons et les filles?

sexe \* Non\_immunisé Crosstabulation

|       |       |                       | Non_immunisé |        | Total  |
|-------|-------|-----------------------|--------------|--------|--------|
|       |       |                       | non          | oui    |        |
| sexe  | Femme | Count                 | 38           | 86     | 124    |
|       |       | % within sexe         | 30.6%        | 69.4%  | 100.0% |
|       |       | % within Non_immunisé | 48.1%        | 41.0%  | 42.9%  |
|       | Homme | Count                 | 41           | 124    | 165    |
|       |       | % within sexe         | 24.8%        | 75.2%  | 100.0% |
|       |       | % within Non_immunisé | 51.9%        | 59.0%  | 57.1%  |
| Total |       | Count                 | 79           | 210    | 289    |
|       |       | % within sexe         | 27.3%        | 72.7%  | 100.0% |
|       |       | % within Non_immunisé | 100.0%       | 100.0% | 100.0% |

Chi-Square Tests

|                                    | Value              | df | Asymp. Sig. (2-sided) | Exact Sig. (2-sided) | Exact Sig. (1-sided) |
|------------------------------------|--------------------|----|-----------------------|----------------------|----------------------|
| Pearson Chi-Square                 | 1.198 <sup>a</sup> | 1  | .274                  |                      |                      |
| Continuity Correction <sup>b</sup> | .924               | 1  | .337                  |                      |                      |
| Likelihood Ratio                   | 1.192              | 1  | .275                  |                      |                      |
| Fisher's Exact Test                |                    |    |                       | .288                 | .168                 |
| Linear-by-Linear Association       | 1.193              | 1  | .275                  |                      |                      |
| N of Valid Cases                   | 289                |    |                       |                      |                      |

a. 0 cells (.00%) have expected count less than 5. The minimum expected count is 33.90.

r a 2x2 table

Risk Estimate

|                                     | Value | 95% Confidence Interval |       |
|-------------------------------------|-------|-------------------------|-------|
|                                     |       | Lower                   | Upper |
| Odds Ratio for sexe (Femme / Homme) | 1.336 | .794                    | 2.248 |
| For cohort Non_immunisé = non       | 1.233 | .848                    | 1.794 |
| For cohort Non_immunisé = oui       | .923  | .797                    | 1.068 |
| N of Valid Cases                    | 289   |                         |       |

\*Output1 [Document1] - IBM SPSS Statistics Viewer

File Edit View Data Transform Insert Format Analyze Direct Marketing Graphs Utilities Add-ons Window Help

Output

- Log
- Crosstabs
  - Title
  - Notes
  - Active Dataset
  - Case Processing
  - sexe \* Non\_immu
  - Chi-Square Tests
  - Risk Estimate
- Log
- Crosstabs
  - Title
  - Notes
  - Case Processing
  - Gouvernorat \* Nor
  - Chi-Square Tests
  - Risk Estimate
- Log

|                       | % within Gouvernorat | 0.0% | 100.0% | 100.0% |
|-----------------------|----------------------|------|--------|--------|
| % within Non_immunisé | 0.0%                 | 9.0% | 6.6%   |        |
| Tunis                 | Count                | 73   | 22     | 105    |
| % with                |                      |      |        |        |
| % with                |                      |      |        |        |
| Total                 | Count                |      |        |        |
| % with                |                      |      |        |        |
| % with                |                      |      |        |        |

Chi-Square

|                              | Value |
|------------------------------|-------|
| Pearson Chi-Square           | 141   |
| Likelihood Ratio             | 15    |
| Linear-by-Linear Association | 12    |
| N of Valid Cases             |       |

a. 0 cells (0.0%) have expected count less than or equal to the minimum expected count of 5.19.

Risk Estimate

|                                             | Value |
|---------------------------------------------|-------|
| Odds Ratio for Gouvernorat (Gabès / Sousse) | a     |

a. Risk Estimate statistics cannot be computed. They are only computed for a 2\*2 table without empty cells.

USE ALL.

Crosstabs

Row(s): Gouvernorat

Column(s): Non\_immunisé

Layer 1 of 1

Previous Next

Display layer variables in table layers

Display clustered bar charts

Suppress tables

OK Paste Reset Cancel Help

\*Base\_virose\_2015.sav [DataSet1] - IBM SPSS Statistics Data Editor

File Edit View **Data** Transform Analyze Direct Marketing Graphs Utilities Add-ons Window Help

1 : Gouv\_Codage\_Rev

code\_la

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22

Define Variable Properties...  
 Set Measurement Level for Unknown...  
 Copy Data Properties...  
 New Custom Attribute...  
 Define Dates...  
 Define Multiple Response Sets...  
 Validation  
 Identify Duplicate Cases...  
 Identify Unusual Cases...  
 Compare Datasets...  
 Sort Cases...  
 Sort Variables...  
 Transpose...  
 Merge Files  
 Restructure...  
 Rake Weights...  
 Propensity Score Matching...  
 Case Control Matching...  
 Aggregate...  
 Split into Files  
 Orthogonal Design  
 Copy Dataset  
 Split File...  
 Select Cases...  
 Weight Cases...

| Gouv_Codage_Rev | sexe | date_naissance | vaccination_incomplete | date_hospitalisation |
|-----------------|------|----------------|------------------------|----------------------|
| 5               | 1    | 08.01.1995     | 1                      | 01.12.2012           |
| 5               | 1    | 05.03.1994     | 1                      | 12.12.2012           |
| 5               | 1    | 21.07.1988     | 1                      | 03.01.2015           |
| 1               | 1    | 31.03.1991     | 1                      | 08.10.2015           |
| 1               | 1    | 31.03.1992     | 1                      | 19.08.2015           |
| 5               | 1    | 12.02.1999     | 1                      | 07.10.2015           |
| 5               | 1    | 07.01.1982     | 1                      | 17.01.2015           |
| 5               | 1    | 12.02.1997     | 0                      | 03.02.2015           |
| 5               | 1    | 21.07.1992     | 1                      | 07.02.2015           |
| 5               | 1    | 31.03.1993     | 1                      | 04.01.2015           |
| 5               | 1    | 12.02.1998     | 1                      | 03.02.2015           |
| 5               | 1    | 07.04.1994     | 1                      | 18.07.2015           |
| 5               | 1    | 29.05.1986     | 1                      | 18.01.2015           |
| 5               | 1    | 25.07.1997     | 1                      | 31.01.2015           |
| 5               | 1    | 31.03.1994     | 1                      | 19.08.2015           |
| 5               | 1    | 04.03.1986     | 1                      | 14.07.2015           |
| 5               | 1    | 07.04.1995     | 1                      | 20.07.2015           |
| 1               | 1    | 31.03.1995     | 1                      | 18.03.2015           |
| 1               | 1    | 21.07.1994     | 0                      | 24.07.2015           |
| 5               | 1    | 07.04.1997     | 1                      | 10.01.2015           |
| 5               | 1    | 31.03.1986     | 1                      | 02.03.2015           |
| 1               | 1    | 31.03.1987     | 1                      | 11.03.2015           |

Data View Variable View

Select Cases IBM SPSS



|     | Codage_Rev | Gouv_RegLog | sexe  |
|-----|------------|-------------|-------|
| 281 | Tunis      | Tunis       | Femme |
| 282 | Tunis      | Tunis       | Homme |
| 283 | Tunis      | Tunis       | Homme |
| 284 | Tunis      | Tunis       | Homme |
| 285 | Tunis      | Tunis       | Homme |
| 286 | Tunis      | Tunis       | Femme |
| 287 | Tunis      | Tunis       | Femme |
| 288 | Tunis      | Tunis       | Homme |
| 289 | Tunis      | Tunis       | Femme |
| 290 |            |             |       |
| 291 |            |             |       |
| 292 |            |             |       |
| 293 |            |             |       |
| 294 |            |             |       |
| 295 |            |             |       |
| 296 |            |             |       |
| 297 |            |             |       |
| 298 |            |             |       |
| 299 |            |             |       |
| 300 |            |             |       |
| 301 |            |             |       |
| 302 |            |             |       |
| 303 |            |             |       |

**Select Cases**

Select

☐ All cases

☒ If condition is satisfied

If...

☐ Random sample of cases

Sample...

☐ Based on time or case range

Range...

☐ Use filter variable:

Output

☒ Filter out unselected cases

☐ Copy selected cases to a new dataset

Dataset name:

☐ Delete unselected cases

Current Status: Do not filter cases

OK Paste Reset Cancel Help

\*Output1 [Document1] - IBM SPSS Statistics Viewer

File Edit View Data Transform Insert Format Analyze Direct Marketing Graphs Utilities Add-ons Window Help

Output

- Log
- Crosstabs
  - Title
  - Notes
  - Active Dataset
  - Case Processing
  - sexe \* Non\_immu
  - Chi-Square Tests
  - Risk Estimate
- Log
- Crosstabs
  - Title
  - Notes
  - Case Processing
  - Gouvernorat \* Nor
  - Chi-Square Tests
  - Risk Estimate

Gouvernorat \*

Non\_immun

Gouvernorat

Total

Pearson Chi

Likelihood R

Linear-by-Li

Association

N of Valid Cases

289

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 5.19.

Select Cases: If

Gouvernorat = 1 | Gouvernorat = 3

Variable Information

Name: Gouvernorat

Label:

Value Labels:

- 1 Gabès
- 2 Sousse
- 3 Tunis

Custom Attributes:

Continue Cancel Help

\*Output1 [Document1] - IBM SPSS Statistics Viewer

File Edit View Data Transform Insert Format Analyze Direct Marketing Graphs Utilities Add-ons Window Help

Output

- Log
- Crosstabs
  - Title
  - Notes
  - Active Dataset
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  - sexe \* Non\_immu
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  - Risk Estimate
- Log
- Crosstabs
  - Title
  - Notes
  - Case Processing
  - Gouvernorat \* Nor
  - Chi-Square Tests
  - Risk Estimate
- Log

|                       | % within Gouvernorat | 0.0% | 100.0% | 100.0% |
|-----------------------|----------------------|------|--------|--------|
| % within Non_immunisé | 0.0%                 | 9.0% | 6.6%   |        |
| Tunis                 | Count                | 73   | 22     | 105    |
| % with                |                      |      |        |        |
| % with                |                      |      |        |        |
| Total                 | Count                |      |        |        |
| % with                |                      |      |        |        |
| % with                |                      |      |        |        |

Chi-Square

|                              | Value |
|------------------------------|-------|
| Pearson Chi-Square           | 141   |
| Likelihood Ratio             | 15    |
| Linear-by-Linear Association | 12    |
| N of Valid Cases             |       |

a. 0 cells (0.0%) have expected count less than or equal to the minimum expected count of 5.19.

Risk Estimate

|                                             | Value |
|---------------------------------------------|-------|
| Odds Ratio for Gouvernorat (Gabès / Sousse) | a     |

a. Risk Estimate statistics cannot be computed. They are only computed for a 2\*2 table without empty cells.

USE ALL.

Crosstabs

Row(s): Gouvernorat

Column(s): Non\_immunisé

Layer 1 of 1

Previous Next

Display layer variables in table layers

Display clustered bar charts

Suppress tables

OK Paste Reset Cancel Help

|           |                   |
|-----------|-------------------|
| Crosstabs | Title             |
|           | Notes             |
|           | Active Dataset    |
|           | Case Processing   |
|           | sexe * Non_immu   |
|           | Chi-Square Tests  |
|           | Risk Estimate     |
| Log       |                   |
| Crosstabs | Title             |
|           | Notes             |
|           | Case Processing   |
|           | Gouvernorat * Nor |
|           | Chi-Square Tests  |
|           | Risk Estimate     |
| Log       |                   |
| Crosstabs | Title             |
|           | Notes             |
|           | Case Processing   |
|           | Gouvernorat * Nor |
|           | Chi-Square Tests  |
|           | Risk Estimate     |

**Gouvernorat \* Non\_immunis  Crosstabulation**

|             |       |                       | Non_immunis  |        | Total  |
|-------------|-------|-----------------------|--------------|--------|--------|
|             |       |                       | non          | oui    |        |
| Gouvernorat | Gab s | Count                 | 7            | 158    | 165    |
|             |       | % within Gouvernorat  | 4.2%         | 95.8%  | 100.0% |
|             |       | % within Non_immunis  | 8.9%         | 82.7%  | 61.1%  |
|             | Tunis | Count                 | 72           | 33     | 105    |
|             |       | % within Gouvernorat  | 68.6%        | 31.4%  | 100.0% |
|             |       | % within Non_immunis  | 91.1%        | 17.3%  | 38.9%  |
| Total       |       | Count                 | 79           | 191    | 270    |
|             |       | % within Gouvernorat  | 29.3%        | 70.7%  | 100.0% |
|             |       | % within Non_immunis  | 100.0%       | 100.0% | 100.0% |

**Chi-Square Tests**

|                                    | Value                | df | Asymp. Sig. (2-sided) | Exact Sig. (2-sided) | Exact Sig. (1-sided) |
|------------------------------------|----------------------|----|-----------------------|----------------------|----------------------|
| Pearson Chi-Square                 | 128.289 <sup>a</sup> | 1  | .000                  | .000                 | .000                 |
| Continuity Correction <sup>b</sup> | 125.200              | 1  | .000                  |                      |                      |
| Likelihood Ratio                   | 137.745              | 1  | .000                  |                      |                      |
| Fisher's Exact Test                |                      |    |                       |                      |                      |
| Linear-by-Linear Association       | 127.814              | 1  | .000                  |                      |                      |
| N of Valid Cases                   | 270                  |    |                       |                      |                      |

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 30.72.

b. Computed only for a 2x2 table

**Risk Estimate**

### Chi-Square Tests

|                                    | Value                | df | Asymp. Sig. (2-sided) | Exact Sig. (2-sided) | Exact Sig. (1-sided) |
|------------------------------------|----------------------|----|-----------------------|----------------------|----------------------|
| Pearson Chi-Square                 | 128.289 <sup>a</sup> | 1  | .000                  | .000                 | .000                 |
| Continuity Correction <sup>b</sup> | 125.200              | 1  | .000                  |                      |                      |
| Likelihood Ratio                   | 137.745              | 1  | .000                  |                      |                      |
| Fisher's Exact Test                |                      |    |                       |                      |                      |
| Linear-by-Linear Association       | 127.814              | 1  | .000                  |                      |                      |
| N of Valid Cases                   | 270                  |    |                       |                      |                      |

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 30.72.

b. Computed only for a 2x2 table

### Risk Estimate

|                                            | Value | 95% Confidence Interval |       |
|--------------------------------------------|-------|-------------------------|-------|
|                                            |       | Lower                   | Upper |
| Odds Ratio for Gouvernorat (Gabès / Tunis) | .020  | .009                    | .048  |
| For cohort Non_immunisé = non              | .062  | .030                    | .129  |
| For cohort Non_immunisé = oui              | 3.047 | 2.293                   | 4.049 |
| N of Valid Cases                           | 270   |                         |       |

**Gouv\_Codage\_Rev \* Non\_immunisé Crosstabulation**

|                 |       |                          | Non_immunisé |        | Total  |
|-----------------|-------|--------------------------|--------------|--------|--------|
|                 |       |                          | non          | oui    |        |
| Gouv_Codage_Rev | Tunis | Count                    | 72           | 33     | 105    |
|                 |       | % within Gouv_Codage_Rev | 68.6%        | 31.4%  | 100.0% |
|                 |       | % within Non_immunisé    | 91.1%        | 17.3%  | 38.9%  |
|                 | Gabès | Count                    | 7            | 158    | 165    |
|                 |       | % within Gouv_Codage_Rev | 4.2%         | 95.8%  | 100.0% |
|                 |       | % within Non_immunisé    | 8.9%         | 82.7%  | 61.1%  |
|                 | Total | Count                    | 79           | 191    | 270    |
|                 |       | % within Gouv_Codage_Rev | 29.3%        | 70.7%  | 100.0% |
|                 |       | % within Non_immunisé    | 100.0%       | 100.0% | 100.0% |

**Risk Estimate**

|                                                | Value  | 95% Confidence Interval |         |
|------------------------------------------------|--------|-------------------------|---------|
|                                                |        | Lower                   | Upper   |
| Odds Ratio for Gouv_Codage_Rev (Tunis / Gabès) | 49.247 | 20.800                  | 116.598 |
| For cohort Non_immunisé = non                  | 16.163 | 7.740                   | 33.755  |
| For cohort Non_immunisé = oui                  | .328   | .247                    | .436    |
| N of Valid Cases                               | 270    |                         |         |

**Chi-Square Tests**

|                                    | Value                | df | Asymp. Sig. (2-sided) | Exact Sig. (2-sided) | Exact Sig. (1-sided) |
|------------------------------------|----------------------|----|-----------------------|----------------------|----------------------|
| Pearson Chi-Square                 | 128.289 <sup>a</sup> | 1  | .000                  | .000                 | .000                 |
| Continuity Correction <sup>b</sup> | 125.200              | 1  | .000                  |                      |                      |
| Likelihood Ratio                   | 137.745              | 1  | .000                  |                      |                      |
| Fisher's Exact Test                |                      |    |                       |                      |                      |
| Linear-by-Linear Association       | 127.814              | 1  | .000                  |                      |                      |
| N of Valid Cases                   | 270                  |    |                       |                      |                      |

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 30.72.

b. Computed only for a 2x2 table

\*Base\_virose\_2015.sav [DataSet1] - IBM SPSS Statistics Data Editor

File Edit View Data Transform Analyze Direct Marketing Graphs Utilities Add-ons Window Help

1 : Gouv\_Codage\_Rev 5

|    | code_laboratoire | Année | Gouvernorat | Gouv |
|----|------------------|-------|-------------|------|
| 1  | 1                | 2015  | 1           |      |
| 2  | 1                | 2015  | 1           |      |
| 3  | 1                | 2015  | 1           |      |
| 4  | 1                | 2015  | 3           |      |
| 5  | 1                | 2015  | 3           |      |
| 6  | 1                | 2015  | 1           |      |
| 7  | 1                | 2015  | 1           |      |
| 8  | 1                | 2015  | 1           |      |
| 9  | 1                | 2015  | 1           |      |
| 10 | 1                | 2015  | 1           |      |
| 11 | 1                | 2015  | 1           |      |
| 12 | 1                | 2015  | 1           |      |
| 13 | 1                | 2015  | 1           |      |
| 14 | 1                | 2015  | 1           |      |
| 15 | 1                | 2015  | 1           |      |
| 16 | 1                | 2015  | 1           |      |
| 17 | 1                | 2015  | 1           |      |
| 18 | 1                | 2015  | 3           |      |
| 19 | 1                | 2015  | 3           |      |
| 20 | 1                | 2015  | 1           |      |
| 21 | 1                | 2015  | 1           |      |
| 22 | 1                | 2015  | 3           |      |

Select Cases

Select

☒ All cases

☐ If condition is satisfied

If... Gouvernorat = 1 | Gouvernor...

☐ Random sample of cases

Sample...

☐ Based on time or case range

Range...

☐ Use filter variable:

Output

☒ Filter out unselected cases

☐ Copy selected cases to a new dataset

Dataset name:

☐ Delete unselected cases

Current Status: Filter cases by values of Missing\_QNN\_Moy

OK Paste Reset Cancel Help

Data View Variable View

IBM SPSS

Data View Variable View

\*Base\_virose\_2015.sav [DataSet1] - IBM SPSS Statistics Data Editor

File Edit View Data Transform Analyze Direct Marketing Graphs Utilities Add-ons Window Help

1 : Age 35

|    | Y_QL | Missing_QL | Missing_QNN_Moy | filter_\$ | Age | var | var | var | var | var |
|----|------|------------|-----------------|-----------|-----|-----|-----|-----|-----|-----|
| 1  | 12   | 1          | 1               | 12.0      | 1   | 35  |     |     |     |     |
| 2  | 35   | 0          | 0               | 85.0      | 1   | 35  |     |     |     |     |
| 3  | 76   | 0          | .               | 76.0      | 1   | 35  |     |     |     |     |
| 4  | 17   | 1          | .               | 47.0      |     |     |     |     |     |     |
| 5  | 35   | 0          | 0               | 85.0      |     |     |     |     |     |     |
| 6  | 30   | 0          | 0               | 80.0      |     |     |     |     |     |     |
| 7  | 54   | 1          | 1               | 54.0      |     |     |     |     |     |     |
| 8  | 77   | 0          | .               | 77.0      |     |     |     |     |     |     |
| 9  | 75   | 0          | .               | 75.0      |     |     |     |     |     |     |
| 10 | 74   | 0          | .               | 74.0      |     |     |     |     |     |     |
| 11 | 62   | 0          | 0               | 62.0      |     |     |     |     |     |     |
| 12 | 15   | 1          | 1               | 15.0      |     |     |     |     |     |     |
| 13 | 70   | 0          | 0               | 70.0      |     |     |     |     |     |     |
| 14 | 78   | 0          | 0               | 78.0      |     |     |     |     |     |     |
| 15 | 30   | 1          | 1               | 30.0      |     |     |     |     |     |     |
| 16 | 78   | 0          | 0               | 78.0      |     |     |     |     |     |     |
| 17 | 35   | 1          | 1               | 35.0      | 1   | 33  |     |     |     |     |
| 18 | 63   | 0          | 0               | 63.0      | 1   | 33  |     |     |     |     |
| 19 | 38   | 1          | 1               | 38.0      | 1   | 33  |     |     |     |     |
| 20 | 13   | 1          | 1               | 43.0      | 1   | 33  |     |     |     |     |
| 21 | 19   | 1          | 1               | 49.0      | 1   | 33  |     |     |     |     |
| 22 | .    | 1          | 1               | 53.6      | 1   | 33  |     |     |     |     |
| .. |      |            |                 |           |     |     |     |     |     |     |

1

Data View Variable View

### Independent-Samples T Test

Test Variable(s): Age

Grouping Variable: Non\_immunisé(? ?)

Define Groups...

OK Paste Reset Cancel Help

Arthralgies  
code\_sérum\_1  
Taux\_IgG1U/ml  
code\_sérum\_2  
Taux\_IgG2U/ml  
Statut\_DCD  
Date\_de\_Point  
X\_QN  
Missing\_QNN  
Y\_QL

Options...  
Bootstrap...

\*Base\_virose\_2015.sav [DataSet1] - IBM SPSS Statistics Data Editor

File Edit View Data Transform Analyze Direct Marketing Graphs Utilities Add-ons Window Help

1 : Age 35

|    | Y_QL | Missing_QL | Missing_QNN_Moy | filter_\$ | Age | var | var | var | var | var |
|----|------|------------|-----------------|-----------|-----|-----|-----|-----|-----|-----|
| 1  | 12   | 1          | 1               | 12.0      | 1   | 35  |     |     |     |     |
| 2  | 35   | 0          | 0               | 85.0      | 1   | 35  |     |     |     |     |
| 3  | 76   | 0          | .               | 76.0      | 1   | 35  |     |     |     |     |
| 4  | 17   | 1          | .               | 47.0      |     |     |     |     |     |     |
| 5  | 35   | 0          | 0               | 85.0      |     |     |     |     |     |     |
| 6  | 30   | 0          | 0               | 80.0      |     |     |     |     |     |     |
| 7  | 54   | 1          | 1               | 54.0      |     |     |     |     |     |     |
| 8  | 77   | 0          | .               | 77.0      |     |     |     |     |     |     |
| 9  | 75   | 0          | .               | 75.0      |     |     |     |     |     |     |
| 10 | 74   | 0          | .               | 74.0      |     |     |     |     |     |     |
| 11 | 62   | 0          | 0               | 62.0      |     |     |     |     |     |     |
| 12 | 15   | 1          | 1               | 15.0      |     |     |     |     |     |     |
| 13 | 70   | 0          | 0               | 70.0      |     |     |     |     |     |     |
| 14 | 78   | 0          | 0               | 78.0      |     |     |     |     |     |     |
| 15 | 30   | 1          | 1               | 30.0      |     |     |     |     |     |     |
| 16 | 78   | 0          | 0               | 78.0      |     |     |     |     |     |     |
| 17 | 35   | 1          | 1               | 35.0      | 1   | 33  |     |     |     |     |
| 18 | 63   | 0          | 0               | 63.0      | 1   | 33  |     |     |     |     |
| 19 | 38   | 1          | 1               | 38.0      | 1   | 33  |     |     |     |     |
| 20 | 13   | 1          | 1               | 43.0      | 1   | 33  |     |     |     |     |
| 21 | 19   | 1          | 1               | 49.0      | 1   | 33  |     |     |     |     |
| 22 | .    | 1          | 1               | 53.6      | 1   | 33  |     |     |     |     |
| -- |      |            |                 |           |     |     |     |     |     |     |

Independent-Samples T Test

Arthralgies  
code\_sérum  
Taux\_IgG1U  
code\_sérum  
Taux\_IgG2U  
Statut\_DCD  
Date\_de\_Po  
X\_QN  
Missing\_QNN\_Moy  
Y\_QL

Define Groups

☒ Use specified values

Group 1: 0

Group 2: 1

☐ Cut point:

Continue Cancel Help

Options... Bootstrap...

OK Paste Reset Cancel Help

Data View Variable View

IBM SPSS

## → T-Test

**Group Statistics**

|     | Non_immunisé | N   | Mean  | Std. Deviation | Std. Error Mean |
|-----|--------------|-----|-------|----------------|-----------------|
| Age | non          | 79  | 20.82 | 9.409          | 1.059           |
|     | oui          | 210 | 21.72 | 7.969          | .550            |

**Independent Samples Test**

|     |                             | Levene's Test for Equality of Variances |      | t-test for Equality of Means |         |                 |                 |                       |                                           |       |
|-----|-----------------------------|-----------------------------------------|------|------------------------------|---------|-----------------|-----------------|-----------------------|-------------------------------------------|-------|
|     |                             | F                                       | Sig. | t                            | df      | Sig. (2-tailed) | Mean Difference | Std. Error Difference | 95% Confidence Interval of the Difference |       |
|     |                             |                                         |      |                              |         |                 |                 |                       | Lower                                     | Upper |
| Age | Equal variances assumed     | 4.730                                   | .030 | -.814                        | 287     | .416            | -.901           | 1.107                 | -3.079                                    | 1.277 |
|     | Equal variances not assumed |                                         |      | -.755                        | 122.453 | .452            | -.901           | 1.193                 | -3.262                                    | 1.460 |

\*Base\_virose\_2015.sav [DataSet1] - IBM SPSS Statistics Data Editor

File Edit View Data Transform **Analyze** Direct Marketing Graphs Utilities Add-ons Window Help

1 : Age 35

|    | Y_QL | Missing_QL |
|----|------|------------|
| 1  | 12   | 1          |
| 2  | 35   | 0          |
| 3  | 76   | 0          |
| 4  | 17   | 1          |
| 5  | 35   | 0          |
| 6  | 30   | 0          |
| 7  | 54   | 1          |
| 8  | 77   | 0          |
| 9  | 75   | 0          |
| 10 | 74   | 0          |
| 11 | 62   | 0          |
| 12 | 15   | 1          |
| 13 | 70   | 0          |
| 14 | 78   | 0          |
| 15 | 30   | 1          |
| 16 | 78   | 0          |
| 17 | 35   | 1          |
| 18 | 63   | 0          |
| 19 | 38   | 1          |
| 20 | 13   | 1          |
| 21 | 19   | 1          |
| 22 | .    | 1          |

Age var var var var var

1 35  
1 35  
1 35  
1 35  
1 34  
1 34  
1 34  
0 34  
1 34  
1 34  
1 33  
1 33  
1 33  
1 33  
1 33  
1 33  
1 33

**Analyze** menu items:

- Reports
- Descriptive Statistics
- Tables
- Compare Means
- General Linear Model
- Generalized Linear Models
- Mixed Models
- Correlate
- Regression
- Loglinear
- Neural Networks
- Classify
- Dimension Reduction
- Scale
- Nonparametric Tests**
  - One Sample...
  - Independent Samples...**
  - Related Samples...
  - Legacy Dialogs
- Forecasting
- Survival
- Multiple Response
- Missing Value Analysis...
- Multiple Imputation
- Complex Samples
- Simulation...
- Quality Control
- ROC Curve...

Data View Variable View

Nonparametric Tests

\*Base\_virose\_2015.sav [DataSet1] - IBM SPSS Statistics Data Editor

File Edit View Data Transform Analyze Direct Marketing Graphs Utilities Add-ons Window Help

1 : Age 35

|    |    | Y_QL | Missing_QL |
|----|----|------|------------|
| 1  | 12 | 1    | 1          |
| 2  | 35 | 0    | 0          |
| 3  | 76 | 0    | .          |
| 4  | 17 | 1    | .          |
| 5  | 35 | 0    | 0          |
| 6  | 30 | 0    | 0          |
| 7  | 54 | 1    | 1          |
| 8  | 77 | 0    | .          |
| 9  | 75 | 0    | .          |
| 10 | 74 | 0    | .          |
| 11 | 32 | 0    | 0          |
| 12 | 15 | 1    | 1          |
| 13 | 70 | 0    | 0          |
| 14 | 78 | 0    | 0          |
| 15 | 30 | 1    | 1          |
| 16 | 78 | 0    | 0          |
| 17 | 35 | 1    | 1          |
| 18 | 33 | 0    | 0          |
| 19 | 38 | 1    | 1          |
| 20 | 13 | 1    | 1          |
| 21 | 19 | 1    | 1          |
| 22 | .  | 1    | 1          |

1

Data View Variable View

### Nonparametric Tests: Two or More Independent Samples

Objective Fields Settings

Identifies differences between two or more groups using nonparametric tests. Nonparametric tests do not assume you the normal distribution.

What is your objective?

Each objective corresponds to a distinct default configuration on the Settings Tab that you can further customize, if de

- ☐ Automatically compare distributions across groups
- ☐ Compare medians across groups
- ☒ Customize analysis

Description

Customize analysis allows you fine-grained control over the tests performed and their options. Other tests available ( Settings tab are the Kolmogorov-Smirnov, Moses extreme reaction, and Wald-Wolfowitz for 2 samples, and the Jonckheere-Terpstra for k samples. An optional confidence interval (Hodges-Lehmann estimate) is also available fo

Run Paste Reset Cancel Help

\*Base\_virose\_2015.sav [DataSet1] - IBM SPSS Statistics Data Editor

File Edit View Data Transform Analyze Direct Marketing Graphs Utilities Add-ons Window Help

1 : Age 35

|    |    | Y_QL | Missing_QL |
|----|----|------|------------|
| 1  | 12 | 1    | 1          |
| 2  | 35 | 0    | 0          |
| 3  | 76 | 0    | .          |
| 4  | 17 | 1    | .          |
| 5  | 35 | 0    | 0          |
| 6  | 30 | 0    | 0          |
| 7  | 54 | 1    | 1          |
| 8  | 77 | 0    | .          |
| 9  | 75 | 0    | .          |
| 10 | 74 | 0    | .          |
| 11 | 62 | 0    | 0          |
| 12 | 15 | 1    | 1          |
| 13 | 70 | 0    | 0          |
| 14 | 78 | 0    | 0          |
| 15 | 30 | 1    | 1          |
| 16 | 78 | 0    | 0          |
| 17 | 35 | 1    | 1          |
| 18 | 63 | 0    | 0          |
| 19 | 38 | 1    | 1          |
| 20 | 13 | 1    | 1          |
| 21 | 19 | 1    | 1          |
| 22 | .  | 1    | 1          |

Nonparametric Tests: Two or More Independent Samples

Objective Fields Settings

☐ Use predefined roles  
☒ Use custom field assignments

Fields:

Sort: None

- Gouv\_Codage\_Rev
- sexe
- date\_naissance
- vaccination\_incomplète
- date\_hospitalisation
- fièvregt\_sup\_39°
- céphalées
- Arthralgies
- code\_sérum\_1
- Taux\_IgG1U/ml
- code\_sérum\_2
- Taux\_IgG2U/ml
- Statut\_DCD
- Date\_de\_Point
- X\_QN
- Missing\_QNN
- Y\_QL
- Missing\_QL
- SMEAN(Missing\_QNN)
- Gouvernorat = 1 | Gouvernorat =

Test Fields:

Age

Groups:

Non\_immunisé

Run Paste Reset Cancel Help

Data View Variable View

\*Base\_virose\_2015.sav [DataSet1] - IBM SPSS Statistics Data Editor

File Edit View Data Transform Analyze Direct Marketing Graphs Utilities Add-ons Window Help

1 : Age 35

|    | Y_QL | Missing_QL |
|----|------|------------|
| 1  | 12   | 1          |
| 2  | 35   | 0          |
| 3  | 76   | 0          |
| 4  | 17   | 1          |
| 5  | 35   | 0          |
| 6  | 30   | 0          |
| 7  | 54   | 1          |
| 8  | 77   | 0          |
| 9  | 75   | 0          |
| 10 | 74   | 0          |
| 11 | 62   | 0          |
| 12 | 15   | 1          |
| 13 | 70   | 0          |
| 14 | 78   | 0          |
| 15 | 30   | 1          |
| 16 | 78   | 0          |
| 17 | 35   | 1          |
| 18 | 63   | 0          |
| 19 | 38   | 1          |
| 20 | 13   | 1          |
| 21 | 19   | 1          |
| 22 | .    | 1          |

1

Nonparametric Tests: Two or More Independent Samples

Objective Fields Settings

Select an item:

- Choose Tests
- Test Options
- User-Missing Values

☐ Automatically choose the tests based on the data

☒ Customize tests

Compare Distributions across Groups

☒ Mann-Whitney U (2 samples)

☐ Kruskal-Wallis 1-way ANOVA (k samples)

Multiple comparisons: All pairwise

☐ Kolmogorov-Smirnov (2 samples)

☐ Test for ordered alternatives (Jonckheere-Terpstra for k samples)

Hypothesis order: Smallest to largest

Multiple comparisons: All pairwise

☐ Test sequence for randomness (Wald-Wolfowitz for 2 samples)

Compare Ranges across Groups

☐ Moses extreme reaction (2 samples)

☒ Compute outliers from sample

☒ Custom number of outliers

Outliers: 1

Compare Medians across Groups

☐ Median test (k samples)

☒ Pooled sample median

☒ Custom

Median: 0

Multiple comparisons: All pairwise

Estimate Confidence Interval across Groups

☐ Hodges-Lehmann estimate (2 samples)

Run Paste Reset Cancel Help

Data View Variable View

Output1 [Document1] - IBM SPSS Statistics Viewer

EditViewDataTransformInsertFormatAnalyzeDirect MarketingGraphsUtilitiesAdd-onsWindowHelp

Statistics

re

Title

Notes

Case Processing Summary

Tests of Normality

Age

Title

Stem-and-Leaf Plot

Normal Q-Q Plot

Detrended Normal Q-Q

Boxplot

re

Title

Notes

Case Processing Summary

Tests of Normality

Age

Title

Histogram

Normal Q-Q Plot

Detrended Normal Q-Q

Boxplot

st

Title

Notes

Group Statistics

Independent Samples Test

Parametric Tests

Title

Notes

Model Viewer

|     |     |       |       |      |
|-----|-----|-------|-------|------|
| oui | 210 | 21.72 | 7.969 | .550 |
|-----|-----|-------|-------|------|

Independent Samples Test

|     |                             | Levene's Test for Equality of Variances |      | t-test for Equality of Means |         |                 |                 |                 |
|-----|-----------------------------|-----------------------------------------|------|------------------------------|---------|-----------------|-----------------|-----------------|
|     |                             | F                                       | Sig. | t                            | df      | Sig. (2-tailed) | Mean Difference | Std. Difference |
| Age | Equal variances assumed     | 4.730                                   | .030 | -.814                        | 287     | .416            | -.901           |                 |
|     | Equal variances not assumed |                                         |      | -.755                        | 122.453 | .452            | -.901           |                 |

Nonparametric Tests

Hypothesis Test Summary

|   | Null Hypothesis                                                        | Test                                    | Sig. | Decision                    |
|---|------------------------------------------------------------------------|-----------------------------------------|------|-----------------------------|
| 1 | The distribution of Age is the same across categories of Non_immunisé. | Independent-Samples Mann-Whitney U Test | .607 | Retain the null hypothesis. |

Asymptotic significances are displayed. The significance level is .05.

\*Base\_virose\_2015.sav [DataSet1] - IBM SPSS Statistics Data Editor

File Edit View Data Transform **Analyze** Direct Marketing Graphs Utilities Add-ons Window Help

1 : Age 35

atut\_DCD Date\_de\_Point

1 0 31.12.2015

2 0 31.12.2015

3 1 31.12.2015

4 0 31.12.2015

5 0 31.12.2015

6 0 31.12.2015

7 0 31.12.2015

8 0 31.12.2015

9 1 31.12.2015

10 0 31.12.2015

11 0 31.12.2015

12 0 31.12.2015

13 0 31.12.2015

14 0 31.12.2015

15 0 31.12.2015

16 0 31.12.2015

17 0 31.12.2015

18 0 31.12.2015

19 0 31.12.2015

20 0 31.12.2015

21 0 31.12.2015

22 1 31.12.2015

25

Reports

Descriptive Statistics

Tables

**Compare Means**

General Linear Model

Generalized Linear Models

Mixed Models

Correlate

Regression

Loglinear

Neural Networks

Classify

Dimension Reduction

Scale

Nonparametric Tests

Forecasting

Survival

Multiple Response

Missing Value Analysis...

Multiple Imputation

Complex Samples

Simulation...

Quality Control

ROC Curve...

Means...

One-Sample T Test...

Independent-Samples T Test...

Paired-Samples T Test...

**One-Way ANOVA...**

ssing\_QNN\_Moy filter\_\$

12.0 1

85.0 1

76.0 1

47.0 1

85.0 1

80.0 1

54.0 1

77.0 0

75.0 1

74.0 1

62.0 1

15.0 1

70.0 1

78.0 1

30.0 1

78.0 1

35.0 1

63.0 1

38.0 1

43.0 1

49.0 1

53.6 1

Data View Variable View

One-Way ANOVA

IBM

\*Base\_virose\_2015.sav [DataSet1] - IBM SPSS Statistics Data Editor

File Edit View Data Transform Analyze Direct Marketing Graphs Utilities Add-ons Window Help

1 : Age 35

|    | atut_DCD | Date_de_Point | X_QN | Missing_QNN |
|----|----------|---------------|------|-------------|
| 1  | 0        | 31.12.2015    | 12   | 12          |
| 2  | 0        | 31.12.2015    | 85   | 85          |
| 3  | 1        | 31.12.2015    | 76   | 76          |
| 4  | 0        | 31.12.2015    | 47   | 47          |
| 5  | 0        | 31.12.2015    | 85   | 85          |
| 6  | 0        | 31.12.2015    | 80   | 80          |
| 7  | 0        | 31.12.2015    | 54   | 54          |
| 8  | 0        | 31.12.2015    | 77   | 77          |
| 9  | 1        | 31.12.2015    | 75   | 75          |
| 10 | 0        | 31.12.2015    | 74   | 74          |
| 11 | 0        | 31.12.2015    | 62   | 62          |
| 12 | 0        | 31.12.2015    | 15   | 15          |
| 13 | 0        | 31.12.2015    | 70   | 70          |
| 14 | 0        | 31.12.2015    | 78   | 78          |
| 15 | 0        | 31.12.2015    | 30   | 30          |
| 16 | 0        | 31.12.2015    | 78   | 78          |
| 17 | 0        | 31.12.2015    | 35   | 35          |
| 18 | 0        | 31.12.2015    | 63   | 63          |
| 19 | 0        | 31.12.2015    | 38   | 38          |
| 20 | 0        | 31.12.2015    | 43   | 43          |
| 21 | 0        | 31.12.2015    | 49   | 49          |
| 22 | 1        | 31.12.2015    | 25   | .           |

One-Way ANOVA

Dependent List: Age

Factor: Gouvernorat

OK Paste Reset Cancel Help

| 0 | 0 | 62.0 | 1 |  |  |  |  |  |  |
|---|---|------|---|--|--|--|--|--|--|
| 1 | 1 | 15.0 | 1 |  |  |  |  |  |  |
| 0 | 0 | 70.0 | 1 |  |  |  |  |  |  |
| 0 | 0 | 78.0 | 1 |  |  |  |  |  |  |
| 1 | 1 | 30.0 | 1 |  |  |  |  |  |  |
| 0 | 0 | 78.0 | 1 |  |  |  |  |  |  |
| 1 | 1 | 35.0 | 1 |  |  |  |  |  |  |
| 0 | 0 | 63.0 | 1 |  |  |  |  |  |  |
| 1 | 1 | 38.0 | 1 |  |  |  |  |  |  |
| 1 | 1 | 43.0 | 1 |  |  |  |  |  |  |
| 1 | 1 | 49.0 | 1 |  |  |  |  |  |  |
| 1 | 1 | 53.6 | 1 |  |  |  |  |  |  |

Data View Variable View

IBM SPSS

\*Base\_virose\_2015.sav [DataSet1] - IBM SPSS Statistics Data Editor

File Edit View Data Transform Analyze Direct Marketing Graphs Utilities Add-ons Window Help

1 : Age 35

|     | atut_DCD | Date_de_Point | X_QN | Missing_QNN | Y_QL | Missing_QL | Missing_QNN_Moy | filter_\$ | A |
|-----|----------|---------------|------|-------------|------|------------|-----------------|-----------|---|
| 1   | 0        | 31.12.2015    | 12   | 12          | 1    | 1          | 12.0            | 1         |   |
| 2   | 0        | 31.12.2015    | 85   | 85          | 0    | 0          | 85.0            | 1         |   |
| 3   | 1        | 31.12.2015    | 76   | 76          | 0    | .          | 76.0            | 1         |   |
| 4   | 0        | 31.12.2015    | 47   | 47          |      |            |                 | 1         |   |
| 5   | 0        | 31.12.2015    | 85   | 85          |      |            |                 | 1         |   |
| 6   | 0        | 31.12.2015    | 80   | 80          |      |            |                 | 1         |   |
| 7   | 0        | 31.12.2015    | 54   | 54          |      |            |                 | 1         |   |
| 8   | 0        | 31.12.2015    | 77   | 77          |      |            |                 | 0         |   |
| 9   | 1        | 31.12.2015    | 75   | 75          |      |            |                 | 1         |   |
| 10  | 0        | 31.12.2015    | 74   | 74          |      |            |                 | 1         |   |
| 11  | 0        | 31.12.2015    | 62   | 62          |      |            |                 | 1         |   |
| 12  | 0        | 31.12.2015    | 15   | 15          |      |            |                 | 1         |   |
| 13  | 0        | 31.12.2015    | 70   | 70          |      |            |                 | 1         |   |
| 14  | 0        | 31.12.2015    | 78   | 78          |      |            |                 | 1         |   |
| 15  | 0        | 31.12.2015    | 30   | 30          |      |            |                 | 1         |   |
| 16  | 0        | 31.12.2015    | 78   | 78          |      |            |                 | 1         |   |
| 17  | 0        | 31.12.2015    | 35   | 35          | 1    | 1          | 35.0            | 1         |   |
| 18  | 0        | 31.12.2015    | 63   | 63          | 0    | 0          | 63.0            | 1         |   |
| 19  | 0        | 31.12.2015    | 38   | 38          | 1    | 1          | 38.0            | 1         |   |
| 20  | 0        | 31.12.2015    | 43   | 43          | 1    | 1          | 43.0            | 1         |   |
| 21  | 0        | 31.12.2015    | 49   | 49          | 1    | 1          | 49.0            | 1         |   |
| 22  | 1        | 31.12.2015    | 25   | .           | 1    | 1          | 53.6            | 1         |   |
| ... |          |               |      |             |      |            |                 |           |   |

Boxplot

Simple

Clustered

Data in Chart Are
 

☒ Summaries for groups of cases
 ☐ Summaries of separate variables

Define

Cancel

Help

Data View

Variable View

IBM SPSS

\*Base\_virose\_2015.sav [DataSet1] - IBM SPSS Statistics Data Editor

File Edit View Data Transform Analyze Direct Marketing Graphs Utilities Add-ons Window Help

1 : Age 35

|    | statut_DCD | Date_de_Point | X_QN | Missing_QNN | Y_QL | Missing_QL | Missing_QNN_Moy | filter_\$ | A |
|----|------------|---------------|------|-------------|------|------------|-----------------|-----------|---|
| 1  | 0          | 31.12.2015    | 12   |             |      |            |                 |           |   |
| 2  | 0          | 31.12.2015    | 85   |             |      |            |                 |           |   |
| 3  | 1          | 31.12.2015    | 76   |             |      |            |                 |           |   |
| 4  | 0          | 31.12.2015    | 47   |             |      |            |                 |           |   |
| 5  | 0          | 31.12.2015    | 85   |             |      |            |                 |           |   |
| 6  | 0          | 31.12.2015    | 80   |             |      |            |                 |           |   |
| 7  | 0          | 31.12.2015    | 54   |             |      |            |                 |           |   |
| 8  | 0          | 31.12.2015    | 77   |             |      |            |                 |           |   |
| 9  | 1          | 31.12.2015    | 75   |             |      |            |                 |           |   |
| 10 | 0          | 31.12.2015    | 74   |             |      |            |                 |           |   |
| 11 | 0          | 31.12.2015    | 62   |             |      |            |                 |           |   |
| 12 | 0          | 31.12.2015    | 15   |             |      |            |                 |           |   |
| 13 | 0          | 31.12.2015    | 70   |             |      |            |                 |           |   |
| 14 | 0          | 31.12.2015    | 78   |             |      |            |                 |           |   |
| 15 | 0          | 31.12.2015    | 30   |             |      |            |                 |           |   |
| 16 | 0          | 31.12.2015    | 78   |             |      |            |                 |           |   |
| 17 | 0          | 31.12.2015    | 35   |             |      |            |                 |           |   |
| 18 | 0          | 31.12.2015    | 63   |             |      |            |                 |           |   |
| 19 | 0          | 31.12.2015    | 38   |             |      |            |                 |           |   |
| 20 | 0          | 31.12.2015    | 43   |             |      |            |                 |           |   |
| 21 | 0          | 31.12.2015    | 49   | 49          | 1    | 1          | 49.0            | 1         |   |
| 22 | 1          | 31.12.2015    | 25   | .           | 1    | 1          | 53.6            | 1         |   |

Define Simple Boxplot: Summaries for Groups of Cases

Variable: Age

Category Axis: Gouvernorat

Label Cases by:

Panel by

Rows:

Columns:

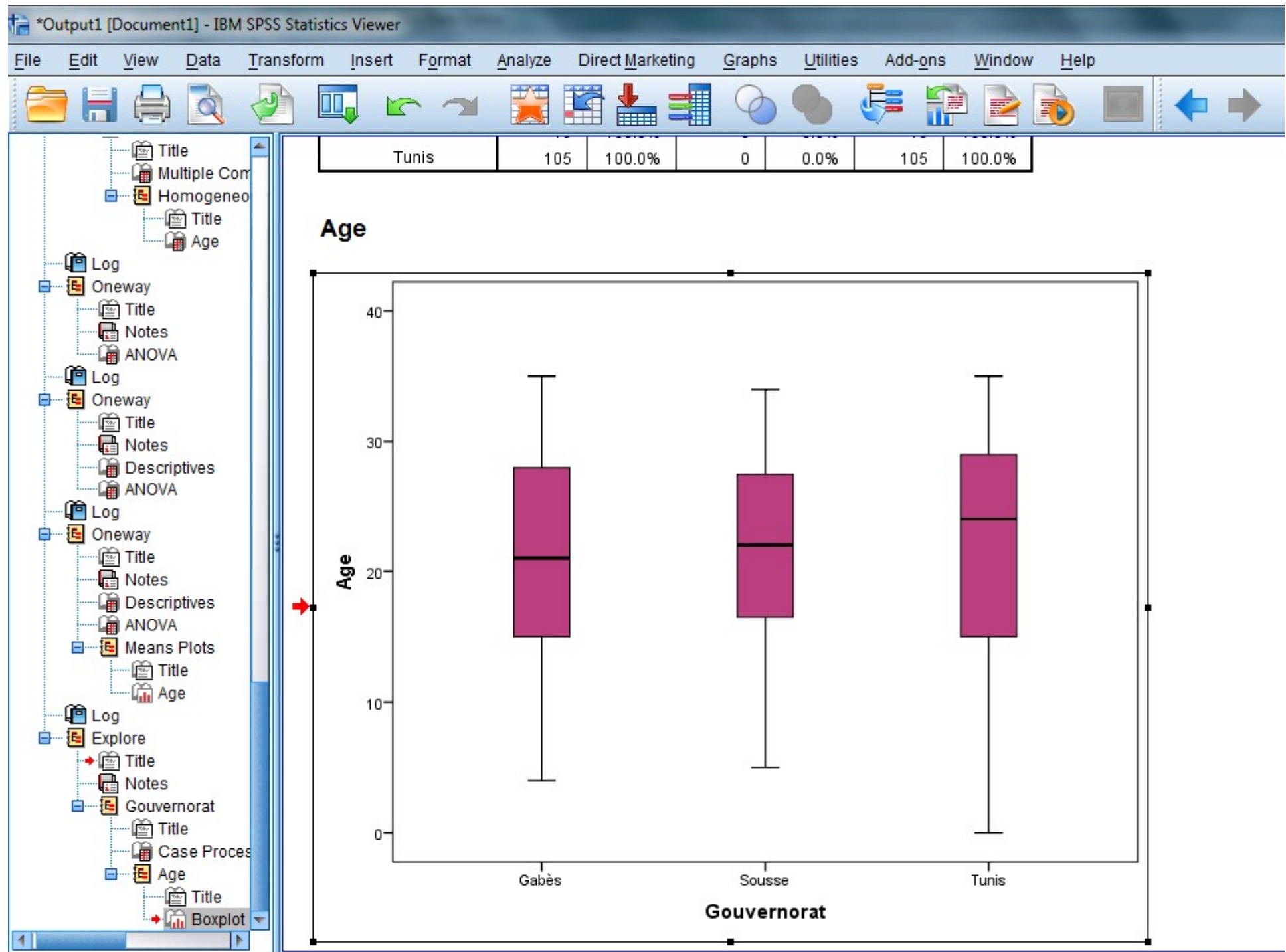
Nest variables (no empty rows)

Nest variables (no empty columns)

OK Paste Reset Cancel Help

Data View Variable View

IBM SPSS



\*Base\_virose\_2015.sav [DataSet1] - IBM SPSS Statistics Data Editor

File Edit View Data Transform Analyze Direct Marketing Graphs Utilities Add-ons Window Help

1 : Age 35

|    | atut_DCD | Date_de_Point | X_QN | Missing_QNN |
|----|----------|---------------|------|-------------|
| 1  | 0        | 31.12.2015    | 12   | 12          |
| 2  | 0        | 31.12.2015    | 85   | 85          |
| 3  | 1        | 31.12.2015    | 76   | 76          |
| 4  | 0        | 31.12.2015    | 47   | 47          |
| 5  | 0        | 31.12.2015    | 85   | 85          |
| 6  | 0        | 31.12.2015    | 80   | 80          |
| 7  | 0        | 31.12.2015    | 54   | 54          |
| 8  | 0        | 31.12.2015    | 77   | 77          |
| 9  | 1        | 31.12.2015    | 75   | 75          |
| 10 | 0        | 31.12.2015    | 74   | 74          |
| 11 | 0        | 31.12.2015    | 62   | 62          |
| 12 | 0        | 31.12.2015    | 15   | 15          |
| 13 | 0        | 31.12.2015    | 70   | 70          |
| 14 | 0        | 31.12.2015    | 78   | 78          |
| 15 | 0        | 31.12.2015    | 30   | 30          |
| 16 | 0        | 31.12.2015    | 78   | 78          |
| 17 | 0        | 31.12.2015    | 35   | 35          |
| 18 | 0        | 31.12.2015    | 63   | 63          |
| 19 | 0        | 31.12.2015    | 38   | 38          |
| 20 | 0        | 31.12.2015    | 43   | 43          |
| 21 | 0        | 31.12.2015    | 49   | 49          |
| 22 | 1        | 31.12.2015    | 25   | .           |

One-Way ANOVA

Dependent List: Age

Factor: Gouvernorat

OK Paste Reset Cancel Help

| 0 | 0 | 62.0 | 1 |  |  |  |  |  |  |
|---|---|------|---|--|--|--|--|--|--|
| 1 | 1 | 15.0 | 1 |  |  |  |  |  |  |
| 0 | 0 | 70.0 | 1 |  |  |  |  |  |  |
| 0 | 0 | 78.0 | 1 |  |  |  |  |  |  |
| 1 | 1 | 30.0 | 1 |  |  |  |  |  |  |
| 0 | 0 | 78.0 | 1 |  |  |  |  |  |  |
| 1 | 1 | 35.0 | 1 |  |  |  |  |  |  |
| 0 | 0 | 63.0 | 1 |  |  |  |  |  |  |
| 1 | 1 | 38.0 | 1 |  |  |  |  |  |  |
| 1 | 1 | 43.0 | 1 |  |  |  |  |  |  |
| 1 | 1 | 49.0 | 1 |  |  |  |  |  |  |
| 1 | 1 | 53.6 | 1 |  |  |  |  |  |  |

Data View Variable View

IBM SPSS

\*Base\_virose\_2015.sav [DataSet1] - IBM SPSS Statistics Data Editor

File Edit View Data Transform Analyze Direct Marketing Graphs Utilities Add-ons Window Help

1 : Age 35

|    | atut_DCD | Date_de_Point | X_QN | Missing_QNN |   |   |  |      |   |
|----|----------|---------------|------|-------------|---|---|--|------|---|
| 1  | 0        | 31.12.2015    | 12   | 12          |   |   |  |      |   |
| 2  | 0        | 31.12.2015    | 85   | 85          |   |   |  |      |   |
| 3  | 1        | 31.12.2015    | 76   | 76          |   |   |  |      |   |
| 4  | 0        | 31.12.2015    | 47   | 47          |   |   |  |      |   |
| 5  | 0        | 31.12.2015    | 85   | 85          |   |   |  |      |   |
| 6  | 0        | 31.12.2015    | 80   | 80          |   |   |  |      |   |
| 7  | 0        | 31.12.2015    | 54   | 54          |   |   |  |      |   |
| 8  | 0        | 31.12.2015    | 77   | 77          |   |   |  |      |   |
| 9  | 1        | 31.12.2015    | 75   | 75          |   |   |  |      |   |
| 10 | 0        | 31.12.2015    | 74   | 74          |   |   |  |      |   |
| 11 | 0        | 31.12.2015    | 62   | 62          | 0 |   |  |      |   |
| 12 | 0        | 31.12.2015    | 15   | 15          | 1 |   |  |      |   |
| 13 | 0        | 31.12.2015    | 70   | 70          | 0 | 0 |  | 70.0 | 1 |
| 14 | 0        | 31.12.2015    | 78   | 78          | 0 | 0 |  | 78.0 | 1 |
| 15 | 0        | 31.12.2015    | 30   | 30          | 1 | 1 |  | 30.0 | 1 |
| 16 | 0        | 31.12.2015    | 78   | 78          | 0 | 0 |  | 78.0 | 1 |
| 17 | 0        | 31.12.2015    | 35   | 35          | 1 | 1 |  | 35.0 | 1 |
| 18 | 0        | 31.12.2015    | 63   | 63          | 0 | 0 |  | 63.0 | 1 |
| 19 | 0        | 31.12.2015    | 38   | 38          | 1 | 1 |  | 38.0 | 1 |
| 20 | 0        | 31.12.2015    | 43   | 43          | 1 | 1 |  | 43.0 | 1 |
| 21 | 0        | 31.12.2015    | 49   | 49          | 1 | 1 |  | 49.0 | 1 |
| 22 | 1        | 31.12.2015    | 25   | .           | 1 | 1 |  | 53.6 | 1 |

One-Way ANOVA: Options

Statistics

- ☐ Descriptive
- ☐ Fixed and random effects
- ☒ Homogeneity of variance test
- ☐ Brown-Forsythe
- ☐ Welch
- ☐ Means plot

Missing Values

- ☒ Exclude cases analysis by analysis
- ☐ Exclude cases listwise

Continue Cancel Help

One-Way ANOVA

Numéro\_d  
code\_labo  
Année  
Gouv\_Cod  
sexe  
date\_naiss  
vaccination  
date\_hosp  
fièvrent su

Data View Variable View

IBM SPSS

\*Base\_virose\_2015.sav [DataSet1] - IBM SPSS Statistics Data Editor

File Edit View Data Transform Analyze Direct Marketing Graphs Utilities Add-ons Window Help

1 : Age 35

|    | atut_DCD | Date_de_Point | X_QN | Missing_QNN   |
|----|----------|---------------|------|---------------|
| 1  | 0        | 31.12.2015    | 12   |               |
| 2  | 0        | 31.12.2015    | 85   |               |
| 3  | 1        | 31.12.2015    | 76   |               |
| 4  | 0        | 31.12.2015    | 47   |               |
| 5  | 0        | 31.12.2015    | 85   |               |
| 6  | 0        | 31.12.2015    | 80   |               |
| 7  | 0        | 31.12.2015    | 54   |               |
| 8  | 0        | 31.12.2015    | 77   |               |
| 9  | 1        | 31.12.2015    | 75   |               |
| 10 | 0        | 31.12.2015    | 74   |               |
| 11 | 0        | 31.12.2015    | 62   |               |
| 12 | 0        | 31.12.2015    | 15   |               |
| 13 | 0        | 31.12.2015    | 70   | 70 0 0 70.0 1 |
| 14 | 0        | 31.12.2015    | 78   | 78 0 0 78.0 1 |
| 15 | 0        | 31.12.2015    | 30   | 30 1 1 30.0 1 |
| 16 | 0        | 31.12.2015    | 78   | 78 0 0 78.0 1 |
| 17 | 0        | 31.12.2015    | 35   | 35 1 1 35.0 1 |
| 18 | 0        | 31.12.2015    | 63   | 63 0 0 63.0 1 |
| 19 | 0        | 31.12.2015    | 38   | 38 1 1 38.0 1 |
| 20 | 0        | 31.12.2015    | 43   | 43 1 1 43.0 1 |
| 21 | 0        | 31.12.2015    | 49   | 49 1 1 49.0 1 |
| 22 | 1        | 31.12.2015    | 25   | 25 1 1 53.6 1 |

One-Way ANOVA: Post Hoc Multiple Comparisons

Equal Variances Assumed

☐ LSD ☐ S-N-K ☐ Waller-Duncan  
☐ Bonferroni ☒ Tukey Type I/Type II Error Ratio: 100  
☐ Sidak ☐ Tukey's-b ☐ Dunnett  
☐ Scheffe ☐ Duncan Control Category: Last  
☐ R-E-G-W F ☐ Hochberg's GT2  
☐ R-E-G-W Q ☐ Gabriel Test  
☒ 2-sided ☐ < Control ☐ > Control

Equal Variances Not Assumed

☐ Tamhane's T2 ☒ Dunnett's T3 ☐ Games-Howell ☐ Dunnett's C

Significance level: 0.05

Continue Cancel Help

Data View Variable View

IBM SPSS

\*Output1 [Document1] - IBM SPSS Statistics Viewer

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Asymptotic significances are displayed. The significance level is .05.

ONEWAY Age BY Gouvernorat  
 /STATISTICS HOMOGENEITY  
 /MISSING ANALYSIS  
 /POSTHOC=TUKEY T3 ALPHA(0.05) .

➔ **Oneway**

**Test of Homogeneity of Variances**

Age

| Levene Statistic | df1 | df2 | Sig. |
|------------------|-----|-----|------|
| .904             | 2   | 286 | .406 |

**ANOVA**

Age

|                | Sum of Squares | df  | Mean Square | F    | Sig. |
|----------------|----------------|-----|-------------|------|------|
| Between Groups | 41.912         | 2   | 20.956      | .297 | .743 |
| Within Groups  | 20184.192      | 286 | 70.574      |      |      |
| Total          | 20226.104      | 288 |             |      |      |

**Post Hoc Tests**

\*Output1 [Document1] - IBM SPSS Statistics Viewer

File Edit View Data Transform Insert Format Analyze Direct Marketing Graphs Utilities Add-ons Window Help

Boxplot

Log

Explore

Title

Notes

Case Processing

Tests of Normality

Age

Title

Histogram

Normal Q-Q

Detrended

Boxplot

Log

T-Test

Title

Notes

Group Statistics

Independent Samples

Nonparametric Test

Title

Notes

Model Viewer

Log

Oneway

Title

Notes

Test of Homogeneity of Variances

ANOVA

Post Hoc Tests

Title

Multiple Comparisons

Homogeneity of Variance

Title

Age

### Age

|                | Sum of Squares | df  | Mean Square | F    | Sig. |
|----------------|----------------|-----|-------------|------|------|
| Between Groups | 41.912         | 2   | 20.956      | .297 | .743 |
| Within Groups  | 20184.192      | 286 | 70.574      |      |      |
| Total          | 20226.104      | 288 |             |      |      |

### Post Hoc Tests

#### Multiple Comparisons

Dependent Variable: Age

|            | (I) Gouvernorat | (J) Gouvernorat | Mean Difference (I-J) | Std. Error | Sig.  | 95% Confidence Interval |             |
|------------|-----------------|-----------------|-----------------------|------------|-------|-------------------------|-------------|
|            |                 |                 |                       |            |       | Lower Bound             | Upper Bound |
| Tukey HSD  | Gabès           | Sousse          | -.081                 | 2.035      | .999  | -4.88                   | 4.71        |
|            |                 | Tunis           | -.799                 | 1.049      | .727  | -3.27                   | 1.67        |
|            | Sousse          | Gabès           | .081                  | 2.035      | .999  | -4.71                   | 4.88        |
|            |                 | Tunis           | -.718                 | 2.094      | .937  | -5.65                   | 4.22        |
|            | Tunis           | Gabès           | .799                  | 1.049      | .727  | -1.67                   | 3.27        |
|            |                 | Sousse          | .718                  | 2.094      | .937  | -4.22                   | 5.65        |
| Dunnett T3 | Gabès           | Sousse          | -.081                 | 1.904      | 1.000 | -4.97                   | 4.81        |
|            |                 | Tunis           | -.799                 | 1.080      | .842  | -3.40                   | 1.80        |
|            | Sousse          | Gabès           | .081                  | 1.904      | 1.000 | -4.81                   | 4.97        |
|            |                 | Tunis           | -.718                 | 2.001      | .978  | -5.79                   | 4.36        |
|            | Tunis           | Gabès           | .799                  | 1.080      | .842  | -1.80                   | 3.40        |
|            |                 | Sousse          | .718                  | 2.001      | .978  | -4.36                   | 5.79        |

### Homogeneous Subsets

Base\_virose\_2015.sav [DataSet1] - IBM SPSS Statistics Data Editor

File Edit View Data Transform Analyze Direct Marketing Graphs Utilities Add-ons Window Help

Nonparametric Tests: Two or More Independent Samples

Objective Fields Settings

☐ Use predefined roles  
☒ Use custom field assignments

Fields:

Sort: None

- sexe
- date\_naissance
- vaccination\_incomplète
- date\_hospitalisation
- fièvregt\_sup\_39°
- céphalées
- Arthralgies
- code\_sérum\_1
- Taux\_IgG1U/ml
- code\_sérum\_2
- Taux\_IgG2U/ml
- Non\_immunisé
- Statut\_DCD
- Date\_de\_Point
- X\_QN
- Missing\_QNN
- Y\_QL
- Missing\_QL
- SMEAN(Missing\_QNN)
- Gouvernorat = 1 | Gouvernorat =

Test Fields:

Age

Groups:

Gouvernorat

Run Paste Reset Cancel Help

|    | Numéro_dela_fiche | code_laboratoire |
|----|-------------------|------------------|
| 1  | 82                |                  |
| 2  | 111               |                  |
| 3  | 86                |                  |
| 4  | 94                |                  |
| 5  | 276               |                  |
| 6  | 83                |                  |
| 7  | 87                |                  |
| 8  | 141               |                  |
| 9  | 164               |                  |
| 10 | 95                |                  |
| 11 | 96                |                  |
| 12 | 110               |                  |
| 13 | 112               |                  |
| 14 | 11                |                  |
| 15 | 91                |                  |
| 16 | 113               |                  |
| 17 | 165               |                  |
| 18 | 199               |                  |
| 19 | 109               |                  |
| 20 | 123               |                  |
| 21 | 128               |                  |
| 22 | 184               |                  |

Data View Variable View

Base\_virose\_2015.sav [DataSet1] - IBM SPSS Statistics Data Editor

File Edit View Data Transform Analyze Direct Marketing Graphs Utilities Add-ons Window Help

Nonparametric Tests: Two or More Independent Samples

Objective Fields Settings

Select an item:

- Choose Tests
- Test Options
- User-Missing Values

☐ Automatically choose the tests based on the data

☒ Customize tests

Compare Distributions across Groups

☐ Mann-Whitney U (2 samples)

☒ Kruskal-Wallis 1-way ANOVA (k samples)

Multiple comparisons: All pairwise

☐ Kolmogorov-Smirnov (2 samples)

☐ Test for ordered alternatives (Jonckheere-Terpstra for k samples)

Hypothesis order: Smallest to largest

Multiple comparisons: All pairwise

☐ Test sequence for randomness (Wald-Wolfowitz for 2 samples)

Compare Ranges across Groups

☐ Moses extreme reaction (2 samples)

☒ Compute outliers from sample

☒ Custom number of outliers

Outliers: 1

Compare Medians across Groups

☐ Median test (k samples)

☒ Pooled sample median

☒ Custom

Median: 0

Multiple comparisons: All pairwise

Estimate Confidence Interval across Groups

☐ Hodges-Lehmann estimate (2 samples)

Run Paste Reset Cancel Help

|    | Numéro_dela_fiche | code_laboratoire |
|----|-------------------|------------------|
| 1  | 82                |                  |
| 2  | 111               |                  |
| 3  | 86                |                  |
| 4  | 94                |                  |
| 5  | 276               |                  |
| 6  | 83                |                  |
| 7  | 87                |                  |
| 8  | 141               |                  |
| 9  | 164               |                  |
| 10 | 95                |                  |
| 11 | 96                |                  |
| 12 | 110               |                  |
| 13 | 112               |                  |
| 14 | 11                |                  |
| 15 | 91                |                  |
| 16 | 113               |                  |
| 17 | 165               |                  |
| 18 | 199               |                  |
| 19 | 109               |                  |
| 20 | 123               |                  |
| 21 | 128               |                  |
| 22 | 184               |                  |

Data View Variable View

\*Output1 [Document1] - IBM SPSS Statistics Viewer

File Edit View Data Transform Insert Format Analyze Direct Marketing Graphs Utilities Add-ons Window Help

Output

- Log
- Nonparametric Tests
  - Title
  - Notes
  - Active Dataset
  - Model Viewer

```

GET
  FILE='C:\Users\Salsabil\Desktop\ATR 2022\Base_virose_2015.sav'.
DATASET NAME DataSet1 WINDOW=FRONT.
*Nonparametric Tests: Independent Samples.
NPTESTS
  /INDEPENDENT TEST (Age) GROUP (Gouvernorat) KRUSKAL_WALLIS (COMPARE=PAIRWISE)
  /MISSING SCOPE=ANALYSIS USERMISSING=EXCLUDE
  /CRITERIA ALPHA=0.05 CILEVEL=95.
  
```

➔ **Nonparametric Tests**

[DataSet1] C:\Users\Salsabil\Desktop\ATR 2022\Base\_virose\_2015.sav

**Hypothesis Test Summary**

|   | Null Hypothesis                                                       | Test                                    | Sig. | Decision                    |
|---|-----------------------------------------------------------------------|-----------------------------------------|------|-----------------------------|
| 1 | The distribution of Age is the same across categories of Gouvernorat. | Independent-Samples Kruskal-Wallis Test | .575 | Retain the null hypothesis. |

Asymptotic significances are displayed. The significance level is .05.

**Merci de votre attention**