Universidad Zaragoza

26130 - Analysis of Social Data

Syllabus Information

Academic Year: 2022/23
Subject: 26130 - Analysis of Social Data
Faculty / School: 108 - Facultad de Ciencias Sociales y del Trabajo
Degree: 274 - Degree in Social Work
ECTS: 5.0
Year:
Semester: Second semester
Subject Type: Optional
Module:

1. General information

2. Learning goals

3. Assessment (1st and 2nd call)

4. Methodology, learning tasks, syllabus and resources

4.1. Methodological overview

The learning process designed for this subject is based on the following:

After the exploration and description of the data, it will be necessary to learn new techniques (mainly inferential ones) in order to, from the information provided by samples (random, stratified, clustered, quota, random walks, ...), know how to extrapolate, and to what extent, such information.

4.2. Learning tasks

The program offered to the student to help him/her achieve the expected results comprises the following activities:

- Theoretical or technical activities, the basis of which will be provided by the professor.
- Theoretical-practical activities, for the development of statistical techniques with the support of statistical software. They will be initiated and guided by the professor working with microdata provided by different organizations.
- Both the practical part and the evaluable work (35% of the evaluation) will be carried out by the students mainly in the computer sessions. Although it is usual that the data file on which the work is done is provided by the teacher, students may submit other data files and use them, provided that the teacher considers them appropriate to develop the topics of the subject.

4.3. Syllabus

The contents of the subject are structured in three thematic blocks:

- Descriptive Statistics with one variable.
- Introduction to inferential statistics.
- Study of the relationship between variables.

Each topic involves the concepts, their application in practical assumptions and the interpretation of the results.

Descriptive Statistics with one variable

Review topic: Descriptive study of one variable. The purpose of this topic is twofold: on the one hand, to refresh the knowledge worked in the subject Statistics Applied to Social Research and, on the other hand, to introduce the use of statistical software.

Introduction to Inferential Statistics

Topic 1.- Introduction to Statistical Inference

1.1. Population and samples.

1.2. Probability distribution models.

1.3 Approximations to the Normal.

1.4. Statistics and parameters.

1.5. Sampling distributions: mean and standard error of sample means, mean and standard error of sample proportions.

Topic 2.- Parameter estimation

2.1 The basis of a confidence interval.

2.2 Confidence interval for a population mean.

2.3. Confidence interval for a population proportion.

Topic 3.- Hypothesis testing

3.1. The logic of hypothesis testing.

3.2. Null and alternative hypothesis. Unilateral and bilateral contrasts. Two types of errors. Level of significance and p-value.

3.3. Contrasts for a population mean.

3.4. Contrasts for a population proportion.

Study of the relationship between variables.

Topic 4.- Two-dimensional statistics.

4.1. Double-entry tables: Joint distribution, marginal and conditional distributions.

4.2. Statistical independence.

4.3. Study of the relationship between two variables: Objectives and procedures.

Topic 5.- Study of the relationship between two quantitative variables.

5.1. Graphical representation: the scatter diagram.

5.2. Measures of the linear relationship: covariance and Pearson's linear correlation coefficient.

5.3. Statistically significant correlation.

5.4. Simple linear regression model: the regression line.

5.5. Model assumptions. Adequacy of the model: analysis of the residuals.

5.6. Explanatory capacity of the fit: the coefficient of determination.

5.7. Prediction. Confidence interval for the prediction.

5.8. Curvilinear regression.

Topic 6. Study of the relationship between a quantitative variable and a qualitative variable.

6.1. Contrast for two means with independent samples.

6.2. Contrast for two means with paired samples.

Topic 7. Study of the relationship between two qualitative variables.

7.1. Measures of association between variables: Pearson's Chi-square.

7.2. Hypothesis testing on independence.

7.3. Intensity of the relationship: Cramer's V.

7.4. Tests for ordinal variables.

4.4. Course planning and calendar

The presential sessions will be held according to the schedules established by the Faculty and the academic calendar.

The final date for the presentation of the work will be communicated during the course, being prior to the end of the class period in case of continuous evaluation and prior to the call published by the Faculty in case of single evaluation.