



UNIVERSIDADE DE LISBOA
Faculdade de Medicina Veterinária

Biostatistics and Scientific Research Principles

Curricular Year: 1st

Duration: 2nd Semester

Credits: 4 ECTS

Teachers: Isabel Neto (CCP e R).

Contact Hours: 50H Total.

24H Lectures; 26H Practical and laboratory teaching.

Learning objectives:

Use basic descriptive statistics to perform exploratory data analysis: produce and interpret graphical displays and numerical summaries.

Distinguish and interpret several study designs, and explain their advantages and limitations.

Demonstrate ability to use basic methods of statistical inference, both hypothesis tests and interval estimation, in a variety of settings.

Interpret and decide about sampling strategies and devise simple samplings.

Distinguish between cause-effect relationship and statistical association between variables.

Recognize the importance of information and communications technology.

Use standard statistical software, such as SPSS, R or SAS.

Prepare reports to conclude findings in data analysis and communicate the results using the scientific methodology.

Demonstrate awareness of ethical issues associated with sound statistical practice.

Perform literature search on online bibliographic databases.

Program contents:

Lectures: Descriptive statistical methods: frequency tables. Numerical measures for quantitative variables: percentiles, mean, mode and median, range, interquartile range, variance, standard deviation and coefficient of variation, kurtosis and skewness, proportions and ratios. Inferential statistical methods: central limit theorem, sampling distributions, standard error, confidence interval for a mean and for a proportion. Probability and probability distributions. Hypothesis testing. Regression analysis. Introduction to sampling methods, and to experimental design. Report and quote statistical analysis results in scientific publications.

Practical: Hardware and software (Excel and SPSS) are used for problem solving and practical application of the theoretical contents. Literature search on online databases. Critical reading of published papers and writing scientific reports.

Bibliography:

- Fligner, M.A., Moore, D. & Notz, W.I. (2014). A Estatística Básica e Sua Prática. 6ª edição. Editora LTC, Brasil.
- Lang, T.A. and Secic, M. (2006). How to report statistics in medicine: annotated guidelines for authors, editors, and reviewers. 2nd ed. Philadelphia: American College of Physicians.
- Oliveira, A. G. (2014). Bioestatística Descodificada. 2ªed. Lisboa-Porto: LIDEL.
- Pereira, A. & Poupá, C. (2018). Como Escrever uma Tese, Monografia ou Livro Científico Usando o Word. 7ª Edição. Edições Sílabo, Lda.



UNIVERSIDADE DE LISBOA

Faculdade de Medicina Veterinária

- Pestana, M.H. & Gageiro, J.N. (2014). *Análise de Dados para Ciências Sociais – a complementaridade do SPSS*. 6ª Edição. Edições Sílabo, Lda.
- Petrie, A. & Watson, P. (2013). *Statistics for Veterinary and Animal Science*. 3rd ed. Wiley Blackwell.
- Ruxton, G.D. & Colegrave, N. (2006). *Experimental design for the live sciences*. 2nd edition. Oxford University Press

Assessment:

Students' assessment will be summative and formative:

Summative assessment: *Students will be assessed by the theoretical component through an individual written exam (short answers and open-ended questions), carried out at the end of the semester, with a weight of 55% in the final grade), and by the continuous evaluation of the practical component (45%) that will result from the sum of the grades obtained in the following group work activities (4 students/group): (i) Literature search exercise; (ii) An exploratory data analysis report, from a database provided by the teacher, and the corresponding video of oral presentation of results, to be delivered at the end of the semester via submission on the Moodle platform;*

The course final classification will be obtained by the formula: $CF = 0.55 T + 0.45$ Group Work
Formative and diagnostic assessment: *Students, individually, will carry out weekly online mini-tests, via the Moodle platform, on the topics of the previous week's classes, which serve for the student's self-assessment. For the teacher, these mini-tests allow the diagnosis of possible problems in the comprehension/application of concepts, with a view to clarifying them in subsequent classes and making future adjustments in teaching.*