

Introduction to Medical Statistics with Jamovi

1st Edition

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Table of contents

Preface	1
License	2
1 Introduction	3
2 Sampling methods and study designs	5
3 Probability and distributions	7
4 Normal distribution	9
5 Foundations for statistical inference	11
6 Inference for numerical data: 2 samples	13
7 Inference for numerical data: >2 samples	15
8 Inference for categorical data	17
9 Correlation	19
10 Simple linear regression	21
11 Reporting the results of statistical analysis	23

Table of contents

References	25
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List of Figures

List of Figures

List of Tables

Preface

This textbook is for medical students, doctors, medical researchers, nurses, members of professions allied to medicine, and all others concerned with medical data.

While statistics books focus on mathematics, this textbook focuses on using a computer to conduct data analysis. That means using a statistical software package, in this case the [Jamovi](#) programming language for statistics and graphics. Our aim is to keep a balance between mathematical rigor and readability as well as learning R and statistics simultaneously.

Most of the examples discussed in this textbook are based on scientific studies whose data are publicly available. For each example, we provide the step-by-step application of R. Readers are encouraged to follow these steps while reading the textbook so that they can learn statistics through hands-on experience.

List of Tables

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1 Introduction

This is a book created from markdown and executable code.

See Knuth (1984) for additional discussion of literate programming.

```
1 + 1
```

```
[1] 2
```

1 Introduction

2 Sampling methods and study designs

2 Sampling methods and study designs

3 Probability and distributions

3 Probability and distributions

4 Normal distribution

4 *Normal distribution*

5 Foundations for statistical inference

5 Foundations for statistical inference

6 Inference for numerical data:

2 samples

Two sample t-test (Student's t-test) can be used if we have two independent (unrelated) groups (eg., males-females, unmatched case-controls, treatment-non treatment) and one quantitative variable of interest (e.g., age, weight, systolic blood pressure). For example, we may want to compare the age in males and females or the weights in two groups of children, each child being randomly allocated to receive either a dietary supplement or placebo.

Assumptions for conducting a Student's t-test

1. The groups are independent
2. The outcome of interest is continuous
3. The data is normally distributed in both groups
4. The data in both groups have similar standard deviations

6 Inference for numerical data: 2 samples

$$t = \frac{\bar{x}_1 - \bar{x}_2}{se_{dif}}$$

7 Inference for numerical data: >2 samples

7 Inference for numerical data: >2 samples

8 Inference for categorical data

8 Inference for categorical data

9 Correlation

9 *Correlation*

10 Simple linear regression

10 *Simple linear regression*

11 Reporting the results of statistical analysis

11 Reporting the results of statistical analysis

References

Knuth, Donald E. 1984. "Literate Programming." *Comput. J.* 27 (2): 97–111. <https://doi.org/10.1093/comjnl/27.2.97>.

