

UNIVERSITY OF STRATHCLYDE
DEPARTMENT OF MATHEMATICS & STATISTICS

MM104: Statistics and Data Presentation Semester 2
MM107: Statistics and Data Presentation

PROJECT 2: DESCRIPTIVE STATISTICS

Overview

In this project you will

1. Be introduced to working with large data-sets.
2. Decide whether or not data follow a symmetric or skewed distribution by inspecting histograms and obtain appropriate descriptive statistics to represent these data.
3. Use Minitab to obtain these histograms and descriptive statistics.
4. Calculate and interpret confidence intervals, if appropriate
5. Use your results to make conclusions
6. Use Word and PowerPoint for reports and presentations.
7. Further develop your presentation skills

In your groups, you will work with another large data-set, using the statistical package Minitab. Each data set involves numeric data for you to analyse and interpret using summary statistics and histograms to investigate the distribution of the data. Each group will focus on a sub-set of the data and create tables and charts to summarise results. You will then present your findings in the form of a PowerPoint Presentation and a Word Processed Report.

The Data Set

The data set is called **Treatment Paired Data** and is contained in an Excel file. The data set includes information about patients in a hospital in Scotland that were recruited onto a study to investigate the effectiveness of the treatments that the hospital offers for certain illnesses. Each patient, depending on their illness, was randomised to one of two treatment groups: those suffering from alcoholism were randomly assigned to alcoholics anonymous (AA) meetings or hypnotherapy; those wanting to give up smoking were randomly assigned to either nicotine patches or e-cigarettes/vapours and those suffering from the human immunodeficiency virus (HIV) were randomly assigned to antiretroviral regimens A or B. Each patient recorded their gender, age, baseline measured responses (i.e. their levels of nicotine, alcohol, or CD4 cell counts before receiving any treatment) and end of study measured responses (i.e. their levels of nicotine, alcohol, or CD4 cell counts at the end of the study taking place). The variables are described in Table 1. These are synthetic data based upon real studies.

Variable	Description
Treatment for Smoking	Nicotine Patches E-cigarettes/vapours
Treatment for Alcoholism	Alcoholic Anonymous (AA) meetings Hypnotherapy
Treatment for HIV	Antiretroviral regimens A Antiretroviral regimens B
Sex	Male (M) Female (F)
Age	Age in years
Baseline measured response: Smoking	Nicotine (mg)
Baseline measured response: Alcoholism	Units per week
Baseline measured response: HIV	CD4 cell count (per cubic millimetre of blood)
End of study measured response: Smoking	Nicotine (mg)
End of study measured response: Alcoholism	Units per week
End of study measured response: HIV	CD4 cell count (per cubic millimetre of blood)

Each group will work with one of the treatment group data sets as shown below:

Group Number	Topics
1	AA Meeting Treatment
2	Nicotine patches treatment
3	Antiretroviral regimen A
4	Hypnotherapy
5	E-Cigarettes/vapours

Tasks

For each treatment group you are expected to at least:

- Conduct background research on the illnesses and treatments under consideration.
- Form an expectation about what you would expect to occur in the context of the treatment group you have been given. This should be stated in the appropriate part of your report/presentation.
- Calculate the change in the response from baseline to end of study.

- Produce histograms of the measured responses and change, and decide whether the distribution of the responses is skewed or symmetric.
- Obtain and quote appropriate descriptive statistics, i.e. measures of location and spread for the measured responses of the treatment group.
- Calculate confidence intervals for the mean response and the mean change and provide an interpretation.
- Compare the change from baseline to end of study in men and women.
- Comment on the effectiveness of the treatment involved in the hospital's study that you have been assigned.

Report and Presentation

Your Word report should be at least 3 to 4 pages, and at least 750 words (excluding title page and references). Your report should have sections which correspond to the sections in your PowerPoint presentation as well as a references section. Your PowerPoint presentation should be 5-6 minutes.

Remember: the first or second page should contain a declaration section. This should list the names of all group members and sentence outlining each person's contribution to the project. Each person should sign this sheet electronically.

Tips

- Remember the importance of a group strategy for the week and allocate tasks.
- Everyone in your group will have different strengths and weaknesses; think about these when allocating tasks within your group.
- Make sure the content of your presentation is correct and make sure that everyone in your group reviews the presentation and report to check for typos.
- Make sure you save regularly and upload it to Myplace before the deadline.
- Start to experiment with PowerPoint a bit more so that your presentation and report look professional.
- Make sure you practise your presentation before recording it via Zoom.