Using R as a Research Tool. Part 2: Basic statistics and report writing.

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1 Introduction

This practical will follow on from the previous practical in data manipulation and visualisation, exploring how to write reports in **R** Markdown and how to conduct simple statistical tests in **R**. By the end of the practical, you should be able to:

- Create data visualisations for statistical tests.
- Carry out basic statistics, including:
 - Linear regression with lm()
 - 2-sample t-test with t.test()
 - Chi-squared test with chisq.test()
- Write, embed and render code and results into an HTML document.

2 The basics of R Markdown.

R Markdown is a tool for writing, reproducible reports in **R**. It can be used to produce documents with embedded code and figures in HTML, Word and PDF format, and can also be used to create webpages and slideshows.

```
1_Stats_Course_Notes-knitr.Rnw* × Duntitled1 ×
      🍓 Insert 🕶 🔐 🕒 I 🗪 Run 🕶 🔸 🗏
     title: "Introduction to Statistics in R"
author: "Susan Johnston"
date: "21 November 2017"
     output: html_document
     '``{r setup, include=FALSE}
knitr::opts_chunk$set(echo = TRUE)
 10
11
 12
    → ## R Markdown
 13
 14
     This is an R Markdown document. Markdown is a simple formatting syntax for authoring HTML, PDF, and MS Word
      when you click the **Knit** button a document will be generated that includes both content as well as the output of any embedded R code chunks within the document. You can embed an R code chunk like this:
 17
 18
 19 summary(cars)
20
 21
22
23
24
     ## Including Plots
     You can also embed plots, for example:
 25
26
      ```{r pressure, echo=FALSE}
 27
28
 plot(pressure)
 Note that the `echo = FALSE` parameter was added to the code chunk to prevent printing of the R code that
 30
 31
 4:25
 Introduction to Statistics in R $
```

Figure 1: R Markdown Template.

## 2.1 Creating an R Markdown Document.

Create a new document by going to File > New File > R Markdown.... In the window, name your document, select HTML and click OK. RStudio should automatically create a template as in Figure 1. Don't worry if not - it is saved in the file R\_Markdown\_Template.Rmd. To render the document, click the button that says Knit. You may have to save it first. As you can see