[Who This Book is For 2](#_Toc132366291)

[About This Book 2](#_Toc132366292)

[Part 1: Illuminate 2](#_Toc132366293)

[Part 2: Communicate 3](#_Toc132366294)

[Part 3: Automate 3](#_Toc132366295)

Introduction

In early 2020, as the world struggled to contain the spread of COVID, one country succeeded where others did not: New Zealand. There are many reasons New Zealand was able to tackle COVID. One of these was the R programming language (yes, really).

How did a humble tool for data analysis help New Zealand fight COVID? It allowed a team at the Ministry of Health to generate daily reports on cases throughout New Zealand. These reports enabled officials to develop policies that kept the country largely COVID free. The team was small, however, so producing these reports every day with a tool like Excel wouldn’t have been feasible. As team leader Chris Knox told me, “Trying to do what we did in a point-and-click environment is not possible.”

Instead, a few staff members wrote R code that they could re-run every day to produce updated reports. These reports did not involve any complicated statistics; they were literally counts of COVID cases. Their value came from everything else R can do: data analysis and visualization, report creation, and workflow automation.

In this book, I show you how to do many of the same tasks in R. You’ll learn how to:

Make professional-quality data visualizations, maps, and tables.

Replace a clunky multi-tool workflow for creating reports with R Markdown.

Use R Markdown and parameterized reporting to generate multiple reports at once.

Generate slideshow presentations and websites using R Markdown.

Automate the process of importing online data from Google Sheets and the US Census Bureau.

Create your own functions to automate tasks you do repeatedly.

Bundle your functions into a package that you can share with others.

If R can help the New Zealand Ministry of Health keep COVID at bay, think of what it can do for you.

Isn’t R Just a Tool for Statistical Analysis?

Many people think of R as simply a tool for hardcore statistical analysis. Coming from a non-quantitative background, I used to feel ashamed about the way I use R. But, over a quarter of a century since its creation, R can do much more than manipulate numerical values.

No matter what else you do in R, you have to illuminate your findings and communicate your results. And, the more you use R, the more you’ll find yourself wanting to automate things you used to do manually. I realize now that the things that I use R for are the things that everyone uses R for. That’s because R is good at these things. The ggplot2 package is the tool of choice for many of the world’s top information designers. R’s ability to automate reporting through the use of R Markdown has seen it taken up by users around the world who want to make their work more efficient. When I started using R, I thought it would simply replace tools I was previously using. What I found was that it allowed me to do things I was already doing better, and allowed me to do things I didn’t know were possible.

I’m excited to be your guide on this journey through the ways you can use R without statistics. If I, a qualitatively-trained anthropologist whose most complex statistical use for R is calculating averages, can find value in R, so can you.

Who This Book Is For

No matter your background, using R can transform your work. This book is for you if you are either a current R user keen to explore new ways of using R or a non-R user wondering if R is right for you. I’ve written R Without Statistics so that it should make sense even if you’ve never written a line of R code. But if you have written many lines of R code, the book should help you learn plenty of new techniques to up your R game.

R is a great tool for anyone who works with data. Maybe you’re a researcher looking for a new way to do things. Perhaps you’re a journalist looking to analyze public data more efficiently. Or maybe you’re a data analyst tired of working in expensive, proprietary tools. If you have to work with data, you will get value from R.

About This Book

This book explores the many ways that people use R to communicate and automate tasks. Each chapter focuses on one use of the language and includes examples of real R projects that used the technique. We’ll dive into their code, breaking it down to help you understand how it works, and suggest ways of going beyond the example. After a chapter that explains the basics of R for those new to it, the book has three parts:

Part 1:Visualizations

In the first part of the book, you’ll learn about ways to use R to visualize data.

Chapter 2: Principles of Data Visualization

Breaks down a visualization created for Scientific American on drought conditions in the United States. In doing so, it introduces you to the ggplot2 package for data visualization and addresses important principles that can help you to make high-quality graphics.

Chapter 3: Making Your Own ggplot Theme

Describes how journalists at the BBC made a custom theme for the ggplot2 data visualization package. We’ll walk through the package they created, and in the process, you’ll learn how to make your own theme.

Chapter 4: Creating Maps

Walks through the process of making maps in R using simple features data. You’ll learn how to write map-making code, find geospatial data, choose appropriate projections, and apply data visualization principles to make the map appealing.

Chapter 5: Crafting High-Quality Tables

Shows you how to use the gt package to make high-quality tables in R. We draw from a conversation with R table connoisseur Tom Mock to learn how to apply design principles that ensure your tables communicate effectively.

Part 2: Reports, Presentations, and Websites

The second part of the book focuses on using R Markdown to communicate efficiently. You’ll learn how to incorporate visualizations like the ones discussed in Part 1 into complete reports, slideshow presentations, and static websites generated entirely using R code.

Chapter 6: Writing Reports in R Markdown

Introduces R Markdown, a tool that allows you to generate a professional report in R. This chapter will cover the structure of an R Markdown document, show you how to use inline code to automatically update your report’s text when data values change, and discusses the tool’s many export options.

Chapter 7: Using Parameters to Automate Reports

Covers one of the advantages of using R Markdown: the fact that you can produce multiple reports at the same time using a technique called parameterized reporting. We explore how staff members at the Urban Institute used R to generate fiscal briefs for all 50 US states. In the process, you’ll learn how parameterized reporting works and how you can use it.

Chapter 8: Making Slideshow Presentations with xaringan

Explains how to use R Markdown to make slides with the xaringan package. You’ll learn how to make your own presentations, adjust your content to fit on a slide, and add effects to your slideshow.

Chapter 9: Building Websites with distill

Shows you how to create your own website with R Markdown and the distill package. We explore how distill works by considering a website about COVID-19 rates in Westchester County, New York. In the process, we cover how to create pages on your site, add interactivity through R packages, and deploy your website using several options.

Part 3: Automation and Collaboration

The last part of the book focuses on ways you can use R to automate your work and share it with others.

Chapter 10: Accessing Online Data

Explores two R packages that let you automatically import data from the internet: googlesheets4 for working with Google Sheets and tidycensus for working with United States Census Bureau data. You’ll learn how the packages work and how to use them to automate the process of accessing data.

Chapter 11: Creating Your Own R Packages

Shows you how to create your own functions and packages to share your code with others. One of the major benefits of R is that you can create your own functions to automate common tasks, then bundle them into a package other users can import. This chapter covers a few example functions. Then you’ll learn how to create your own package by learning from R developers who built packages to improve the work of researchers at the Moffitt Cancer Center.

By the end of the book, you’ll be able to use R for a wide range of non-statistical tasks. You’ll know how to use R to effectively visualize and communicate with data visualizations, maps, and tables. You’ll be able to communicate results using R Markdown, efficiently generating reports, slideshow presentations, and websites. And you’ll understand how to automate many tedious tasks using packages others have built, and ones you yourself can develop. Ready to learn how to use R without statistics? Let’s dive in.