



# Statistics Done Wrong: The Woefully Complete Guide

*Alex Reinhart*

[Download now](#)

[Read Online](#) 

# Statistics Done Wrong: The Woefully Complete Guide

*Alex Reinhart*

## **Statistics Done Wrong: The Woefully Complete Guide** Alex Reinhart

Everyone knows that abuse of statistics is rampant in popular media. Politicians and marketers present shoddy evidence for dubious claims all the time. But smart people make mistakes too, and when it comes to statistics, plenty of otherwise great scientists--yes, even those published in peer-reviewed journals--are doing statistics wrong.

"Statistics Done Wrong" comes to the rescue with cautionary tales of all-too-common statistical fallacies. It'll help you see where and why researchers often go wrong and teach you the best practices for avoiding their mistakes.

In this book, you'll learn:

- Why "statistically significant" doesn't necessarily imply practical significance
- Ideas behind hypothesis testing and regression analysis, and common misinterpretations of those ideas
- How and how not to ask questions, design experiments, and work with data
- Why many studies have too little data to detect what they're looking for--and, surprisingly, why this means published results are often overestimates
- Why false positives are much more common than "significant at the 5% level" would suggest

By walking through colorful examples of statistics gone awry, the book offers approachable lessons on proper methodology, and each chapter ends with pro tips for practicing scientists and statisticians. No matter what your level of experience, "Statistics Done Wrong" will teach you how to be a better analyst, data scientist, or researcher.

## **Statistics Done Wrong: The Woefully Complete Guide Details**

Date : Published March 16th 2015 by No Starch Press (first published April 27th 2013)

ISBN : 9781593276201

Author : Alex Reinhart

Format : Paperback 176 pages

Genre : Science, Nonfiction, Mathematics

 [Download Statistics Done Wrong: The Woefully Complete Guide ...pdf](#)

 [Read Online Statistics Done Wrong: The Woefully Complete Guide ...pdf](#)

**Download and Read Free Online Statistics Done Wrong: The Woefully Complete Guide Alex Reinhart**

---

# From Reader Review **Statistics Done Wrong: The Woefully Complete Guide** for online ebook

## **Michael says**

Let me preface this review by saying that if you're looking for a book to learn statistics from, this is not it. The author assumes a certain knowledge on the subject matter and unless you have that, you probably won't get much out of this text as explanations are a bit on the terse side (though heavily referenced for additional reading).

So who is this book for then? Everyone who works with statistics and/or data analytics, and wants to get a handle on some of the most common mistakes and fallacies committed in the field, whether knowingly or unknowingly. Like mentioned before the style can be a bit terse, and I think occasionally chapters could have benefitted from slightly more background on the presented concepts, especially since this book is marketed as a "complete guide". I nonetheless consider it a good resource for people as myself, who mainly picked up their statistical knowledge in relation to their main interest, i.e. for machine learning or bioinformatics. If you feel like you have a decent handle on basic statistics, but wouldn't trust yourself to set up your own analysis or experiments, you'll certainly gain something from "Statistics Done Wrong".

On a stylistic note, I have to say that for a book on statistics, this has been a surprisingly entertaining read and the author deserves some bonus points for pointing out the irony of using published studies and papers to point out fallacies in other studies and papers.

If you are an experienced statistician you probably can give this one a pass, but if you want to freshen up or add to your existing basic statistics knowledge, this is a very enjoyable book.

---

## **Christina Jain says**

This is your go-to book if you need a breakneck primer on statistics. It only takes a few hours to read and at the end of it you'll be familiar with confidence intervals, standard error, power, catching multiple comparisons, truth inflation, and more! The goal of the book isn't to teach you how to do the calculations but rather to give you a basic understanding of the things statisticians concern themselves with and common misconceptions to watch out for.

---

## **Clintweathers says**

It was good.

Very much in the same vein as *How Not To Play Chess* by Znofsko-Borofsky.

Also very much aimed at the biostatistics realm, but applicable to everyone who does data work.

---

## **Anysha says**

Užitečná kniha upozorující na nešvary v designu dnešních výzkumů - dezinterpretace p hodnot, pseudoreplikace, nedostatečná statistická síla, publication bias... Autor je vtipný, aktuální a přidává řadu praktických tipů (např. na datová úložiště nebo stránky, kde je možné provést preregistraci vašeho výzkumu).

---

## **Jordan Peacock says**

God, this was depressing. Bitter pill, but better to swallow it now.

---

## **Ari says**

I liked this. It's a short, straightforward, and clear look at a variety of bad statistical practices. It won't tell you how to do a regression or a hypothesis test but it will discuss which to use. The narrative is clear and straightforward, and readily readable to anybody with a moderate mathematical or technical background.

It's mostly stuff I think I already knew, but it was helpful to have it systematically and clearly presented.

The author is a CMU statistics grad student with a physics background; despite this, the examples of mistakes tend to be drawn widely from the social and biological sciences, especially medicine. My sense is that this is necessary -- we need statistics a lot more in the life and social sciences than in the physical sciences. In physical science, we can typically scale the experiment up to the point where statistical error is insignificant; in the life or social sciences, often experimental size is more narrowly limited.

---

## **Unwisely says**

A quick read and entertaining. I think I learned some things (although I honestly think I'm more confused about some things after this). Worthwhile for the curious, I guess, although I am not sure how it compares to other books on the topic. (I will say the examples of Simpson's Paradox were the exact same two used in a video I watched about that topic recently. I assume this has happened more than twice, but those must be the most famous examples, because that was weird.)

I consider myself reasonably statistically sophisticated, but he still managed to come up with a couple of new concepts for me (statistical power, for example, which seems like it should be something I've heard of before) as well as mistakes I didn't know you could make. (Luckily I don't think I'm making any of them.)

At the end it gives a link for "*updates, errata, and other information*". I looked, and to save you the trouble, there are only two minor corrections. Also some glowing reviews, although no updates that I could find.

---

## **Michael says**

I should have taken more math in college. Great book.

---

## **SocProf says**

If you're used to statistical analysis, you won't much that is new here: pay attention to statistical power, beware of multiple comparisons and repeated measurements without post-hoc tests and measure of effect size. However, the book is a good series of cautionary tales for new students in statistics and research methods. It is highly readable.

Towards the end, the book veers a bit off course and get more into the ethics of research and research publication. It is interesting (but not really new... especially in light of the whole recent Lacour fiasco) but it does not necessarily have to do with statistics done wrong.

Nevertheless, if you teach intro to statistics, the book is a good additional reading as it is not so much about computation, and more about statistical reasoning and understanding the strengths and weaknesses of different tests.

---

## **Amy says**

Fun, quick read covering much the same territory as *The Cult of Statistical Significance*. Well-written and not totally pessimistic about the state of scientific analysis today, despite many examples of fairly severe ineptitude.

---

## **Bastian Greshake Tzovaras says**

If you haven't had a good introduction into statistics: This might just be what you're looking for. Explains all the honest mistakes (and evil hacks) you can make while analysing data. If you're already familiar with stats it still might be a nice book to refresh your knowledge (and laugh a lot, because it's written very well).

---

## **Philipp says**

You could say this is a mix of Motulsky's *Intuitive Biostatistics* and Goldacre's essays. The first half of *Statistics Done Wrong* are plain English essays on various problems encountered in modern science related to statistics, problems which crop up again and again, such as the multiple comparison problem, over-reliance on p-values, etc. (similar to Motulsky Reinhart prefers 95% Confidence Intervals). The second half focuses more on reproducibility, statistical fishing etc.

It's a very well-written short overview of the most egregious errors in science, so I think it's a good fit for working scientists interested in improving their statistical analyses. It won't make you a statistician, for that it's too short.

---

## Pat says

Reinhart gives a highly readable and surprisingly fun roundup of common errors in statistical analysis in the spirit of books like *Innumeracy* and *How To Lie With Statistics*. Although this account differs from those particularly in its focus and thorough documentation (like most great non-fiction it has added several entries to my to-read list). The focus here seems to be of the "for the working scientist" sort in both its selections of errors as demonstrations and in its practical means for avoiding these errors.

Aside from being just thoroughly enjoyable to read, I particularly commend the author for wide net the book casts in terms of readership. It will certainly appeal to working scientists, but I think also it will be enjoyed and understood by those non-specialist interested in science or statistics as a whole. Additionally, I think this would make a very nice supplemental reading text for an introductory stat course. I plan on doing this next time I'm schedule to teach such a course. Overall, I would say this is something that just about everybody should read.

Unimportant closing points: For a first edition the book is impressively free of errors and clunkiness. Also, the print edition is very nicely bound on high quality paper.

---

## Trang says

This was a decent short read about poor practices in conducting research and reporting results, especially in the medical & neuroscience domains. Some of the examples cited were especially troubling:

- "If you administer questions like this one [a typical question about base rate fallacy] to statistics students and scientific methodology instructors, more than a third fail. If you ask doctors, two thirds fail." Yikes
- "of the top-cited research articles in medicine, a quarter have gone untested after their publication, and a third have been found to be exaggerated or wrong by later research." Double Yikes

There were some parts of the book that would probably be unclear without basic stats background (most notably the explanations in Multiple Comparisons), while some other basic concepts were explained in a somewhat lengthy way (e.g. standard deviation -- I would have preferred a concise equation).

This book is available online: <https://www.statisticsonwrong.com/i...>

---

## Gina says

I'm a sociologist who's taken several statistics course in both undergrad and grad school, have worked at a research center, and have taught research methods at the undergraduate level. I tell you all that because you need to understand statistics is one of my particular flavors of nerd. I find it infinitely frustrating when a student will find a peer reviewed, scientific article on which to base their position only to dismiss the multiple peer reviewed, scientific articles published later which question the earlier research findings. It is for this reason, this quote particularly caught my attention: "Misconceptions are like cockroaches: you have no idea where they came from, but they're everywhere—often where you don't expect them—and they're impervious to nuclear weapons."

Despite the cartoonish cover, Reinhart seeks to seriously critically examine much of the published statistical analysis, particularly in the medical field among others, in several key areas: lack of education in statistics leading to misinterpretation of findings, bias - both intentional and unintentional, statistically significant findings v. practically significant findings, fraud, data set errors. There is much math within, but I found it well explained and approachable for even those with no prior statistics knowledge. I thought the discussions of regression analysis, p values, and confidence intervals were especially well done, and the examples he uses are interesting. I highly recommend this as a beginner's guide to anyone considering statistical research in any field.

---