

Cambridge University Press
978-1-108-97815-6 — Making Sense of Medical Statistics
Munier Hossain
Frontmatter
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‘This is an excellent introductory book for medical statistics. It’s well written, easy to read, with some great examples of statistics in everyday clinical practice. The question and answer format is especially useful in reinforcing key concepts discussed in the chapter. There are lots of additional learning material included in the online resource for those seeking a more detailed understanding of the topic. The author is to be congratulated on making an important but difficult subject appear relatively straightforward and interesting to even the non-expert.’

Professor Paul Banaszkiewicz, Consultant Orthopaedic Surgeon North East NHS Surgical Centre (NENSC), Gateshead, UK, and Visiting Professor Northumbria University, Newcastle-upon-Tyne, UK

‘An accessible book by a practising doctor, aimed at other doctors, which explains key statistical concepts in words and pictures. An excellent foundation for those seeking to understand the numbers in medical journal articles and quantitative reports.’

Professor Trish Greenhalgh, University of Oxford, UK

‘The book provides a light-hearted introduction to the basic concepts in medical statistics. A couple of hundred pages long with short chapters, the book delivers with clear focus the key statistical concepts alongside some general knowledge to lighten what is sometimes a very arid subject. The description of concepts with graphs and figures support the visual learner. I thoroughly enjoyed the quick questions presented alongside the description of concepts to test understanding, with the answers at the end of chapter which linked to bullet point summaries, help to consolidate the concepts covered. I thought it was an excellent way for someone to start on their path to understanding this area. Finally, I particularly appreciated the last chapter with its focus on the work by our dear friend Doug Altman.’

Professor Rafael Perera, Professor of Medical Statistics, University of Oxford, UK

‘Statistics forms the starting point for evidence based medicine, though most medics would argue that their own statistical awareness is still near the starting point! This book eases you into the awesome, exciting, exhilarating world of statistics, and makes you understand just how cool it really is. It will unleash your inner statistician that no-one knew existed – especially you!’

Professor Dan Perry, Children’s Orthopaedic Surgeon and Fellow of Wolfson College, University of Oxford, UK

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In memory of

Mr Ismail Hossain BA, LLB, Dip Air and Space Law, LLM (McGill)

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Online content which can be found at www.cambridge.org/medicalstatistics

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Preface

What is the point of another book on medical statistics? That is a question I have grappled with for some time. The more so when one considers that the subject is so well served by the most eminent of statisticians. I am not a statistician by training and only have an amateur interest in this subject. What do I hope to contribute to this crowded field?

I have been trying to learn and teach medical statistics for nearly a decade. Over the years I have come to appreciate the difficulty my peers face when trying to learn it. The available books mostly aim to turn health professionals into budding statisticians. They are full of complex formulas and problems, but health professionals don't need to be statisticians, nor do they need to learn any equations. Rather, they need a working understanding. Health professionals need to understand the principles of medical statistics so that they can understand what questions to ask, when to ask, which tests to employ to get the answers and how to interpret the results correctly.

I tried to make statistics learning fun, interactive and easy. The concepts of statistics can be difficult to understand from words alone. Hence, I wanted to make use of illustrations to communicate with my readers and make statistics learning easier. I also wanted to see if I could employ some of the principles of adult learning, which I use in my courses, directly into a book. This book does not offer an in-depth look at medical statistics. The chapters are bite-sized in length so that readers do not lose grip of their attention span. My emphasis has been on teaching the concepts and encouraging the learner to think and ask questions along the way. Thus, the book is intended as a guide, not a preacher. I hope it will provide the reader with enough of a foundation to find his/her way through the maze of medical statistics.

I wanted the book to be relevant to medics' working life and their exam preparation. That is why, in addition to the print version, we included online material that contains single best answers in the format of professional exams, references and resources for further learning as well as links to statistical software and questions to practice data analysis.

Ultimately, this book is about you, the learner. If you have benefitted, please let us know. If you find mistakes, please leave us feedback. If you have suggestions for improvement, please get in touch. We would be delighted to acknowledge your contribution in future editions.

You can get in touch via medstatsfeedback@gmail.com

Acknowledgements

I want to start by thanking God Almighty for everything. On a more prosaic level, there are a lot of people without whose help and support this book would never have seen the light of the day. I am genuinely grateful to you all. Of those who deserve a special mention, let me start by thanking my parents first. My wife and daughter have been my biggest supporters. Thank you for your patience and understanding. My parents-in-law also offered me constant encouragement.

My teachers at the Centre for Evidence-Based Medicine, University of Oxford taught me the craft of medical statistics and the art of effective teaching. The ideas expounded in this book are an extension of what I learnt in Oxford.



Jean Williams and Kim O'Neill of Postgraduate Centre, Ysbyty Gwynedd offered me the first platform to teach medical statistics. Paul Banaszkiwicz and Sattar Alshryda asked me to write a chapter on medical statistics for the British Orthopaedic Association Wikipaedics project that, although unsuccessful, sparked my earliest interest in writing this book. Paul has also been a rock of support behind this project from day one. Paul Banaszkiwicz, Vijay Bhalai, Badri Narayan, David Green, Rajesh Power and Hidayah Ma offered helpful comments on the earliest draft. Nik Abidin's suggestions helped me to improve my punctuation and grammar. Daniel Green and Rebecca Simpson, both academic statisticians from the University of Sheffield, diligently went through the draft copy. Their input was crucial in correcting mistakes and improving the contents. Sir Iain Chalmers, despite his hectic schedule, went through some chapters in great detail, pointed out errors and suggested improvements. I am also grateful to Professor Trish Greenhalgh for her kind endorsement. Inda Zubir, a talented young architect and graphic artist, took my raw diagrams and turned them into superb illustrations. She also did the formatting. The lion's share of the credit for the visual appeal of this book goes to Inda. A very special thanks to her.

I am indebted to the Editorial Committee of the Bone and Joint Journal and the Cochrane Collaboration for allowing me to reproduce some copyrighted figures. Numerous images have been reproduced courtesy of the Creative Commons licence. I am grateful for and acknowledge their contribution to keeping the frontiers of knowledge open. I am thankful to the Cambridge University Press and especially Nick Dunton who was brave enough to bank on an unknown author of no proven pedigree in a crowded and well-catered-for field. Jessica Papworth, Katy Nardoni, Olivia Boulton, Bethan Lee and many others have worked hard behind the scenes to make this book a reality. My thanks to them all.



Finally, all the delegates who attended my courses over the years, your appreciation and feedback spurred me on.

How to Get the Most Out of This Book





Throughout the book we tried to make learning fun, relevant, interactive and visual. Keeping in mind the differing needs of learners we tried to cater to everyone’s needs by dividing each chapter into different levels of learning. Before you delve into them it may help to get familiar with the icons displayed in each chapter. Here is a road-map for the journey ahead.....

-  Every chapter starts with defined learning outcomes
-  and ends with important take home messages.

Your core learning content is in between these two icons. If interested, you will find additional learning material further afield...

-  A more advanced Bonus section that may contain formulas!
-  This is the section with answers to all the brain-teasers.

There is even more material online.

-  Single Best Answer questionnaires in the format of professional exams.
-  Software and practice corner with questions and solutions, to get you up to speed with data analysis.
-  References and recommended reading.
-  List of useful books, free statistical software, helpful webpages and YouTube videos.

There is something for everyone. Happy reading!!

What’s the sidebar for?

There is a sidebar in every page with the following icons:

Did You Know?



Interesting anecdotes to spice up your reading!

Bullet Points



Key information is emphasised to help reinforce your memory.

Think About It!



A bit of brainwork to fire up the neurons and support your learning.

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