Review of

**Doctoring data : How to sort out the medical advice from the medical nonsense**

*Malcolm Kendrick Columbus Publishing Ltd 2014, £14.99*

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The first reviewer read this book and enjoyed it, but was concerned to ensure that the facts stated about some of the medical risks were correct, so he enlisted the help of the other two reviewers, who helped to verify the results quoted in the book and also provided a student’s view of the book.

The author is already well known for criticising the evidence for the relationship between cholesterol levels and heart disease, and the use of statins. Here he takes on some more shibboleths, such as the link between Body Mass Index and death, and the medical risks of to high blood pressure. The first half of the book deals with much the same territory as is covered in a basic epidemiology course but in a highly entertaining albeit rather breathless, hyperbolic and scattergun manner. On the way, he adds in some very entertaining attacks on the misuse of statistics in medicine such as the problems with surrogate endpoints and references some very useful classic papers in these areas.

There are ten chapters and they are called ‘The 10 tools for establishing the truth’.

These are: 1) Association does not mean causation. 2) Lives cannot be saved, we are all going to die. 3) Relative mountains are made out of absolute molehills. 4) Things that are not true are often held to be true. 5) Reducing numbers does not equal reducing risk. 6) Challenges to the status quo are crushed- and how! 6) Games are played and the players are. 8) Doctors can seriously damage your health. 9) Never believe that something is impossible. 10) ‘Facts’ can be, and often are, plucked from thin air.

The first five chapters are essentially about how data can be misrepresented and the latter five more about the politics of medicine. These latter five are not about establishing the truth, but more about how doctors and the establishment behave when faced with challenges to their authority.

In the first chapter Dr Kendrick describes the problem of observational epidemiology and illustrates how the Women’s Health Initiative study reversed the observed association between taking Hormone Replacement Therapy and heart disease. The second chapter should be compulsory reading by all doctors. As I tell my students, doctors don’t save lives, they simply postpone death, but it could be one hour or 80 years. Having sat on a NICE Appraisal committee, one of the reviewers (MJC) can attest to the hype used by companies and patient groups who
refer to ‘life-saving’ drugs which at most add six months to life expectancy. In passing however Kendrick has a pop at NICE, which I would have thought would have been one of his good guys. In particular he complains about QALYs (and states incorrectly there has not been much discussion about how to measure them) yet he states that NICE uses different measures to compare cardiovascular drugs with cancer drugs when in fact NICE uses the QALY for both.

He then discusses how researchers misuse risk measures and contrasts merits of absolute versus relative risk. This third chapter is more statistical (although his definition of a confidence interval on page 49 is a bit casual). He makes a number of good points about the problems of using relative risk as a summary measure, and what survival means if we are all going to die anyway. He points out that most people will survive five years after diagnosis ‘apart from those who … die as their brain bursts during a vain attempt to understand medical statistics’. A great thing about the book is that he takes apart the results of actual studies to see what the numbers actually mean. A statistician may carp that he eschews any notation or definitions, and simply illustrates concepts such as relative and absolute risk with invented data. This means he doesn’t define risk as a measure over a given period of time, and he doesn’t define the Number Needed to Treat (NNT) as the inverse of the absolute risk. Thus, he can make out how ridiculous NNTs are, since they change as the follow-up period changes, but he doesn’t mention that NNTs are usually defined for a fixed time period and usually for things that happen over a short period of time, such as a rash going away (and he doesn’t address the many other problems with NNTs). He gives one of the best examples I have come across of clinical importance versus statistical significance (p55) ‘a difference of 9 deaths in 17354 patients over 5 years can be, somehow or other, turned into something that is statistically significant.’

Chapter 4 really belongs to the latter part of the book. Here he points out that things that are not true are often held to be true, by which he means that many hypotheses commonly held in medicine (such as red wine is beneficial for heart disease) have a very poor evidence base and arise because perhaps they are biologically plausible, or come from an observational study (see Chapter 1).

Chapter 5 is a splendid attack on what he calls the ‘linear model’. Again, without any equations, it is difficult to say exactly what is meant, but essentially the linear model postulates a linear relationship between a measure such as blood pressure and the risk of death or disease. He does call it log linear initially, then reverts to just ‘linear’ for simplicity, (p92). The main implication is that a reduction by a fixed amount of a risk factor has the same effect on a patient no matter where the patient starts from. The log-linear model was apparently key to analysing the famous Framingham cohort study which led to much of modern medical practice in the treatment of blood pressure. However a paper in 2000 (which included two statisticians as authors) showed that the results were non-linear and stated that "Statistical theory now tells us that paradigm MUST be false" p104. Statisticians, Kendrick notes, are ‘not normally noted for hyperbole’ (unlike himself). The implication of the linear model is, for example, that any reduction in blood pressure is worthwhile, whether one starts from a high value or a low value. Another implication is that different drugs which achieve a similar drop in blood pressure should have a similar effect on cause specific mortality. The author shows quite clearly that both of these conclusions are wrong. This is a fairly startling, and very bold conclusion, which he present in a dramatised fashion - "If the linear model were to be declared wrong, the whole edifice of blood pressure lowering would collapse"(p.116). Alongside the statistical examination of this topic, he also delves into the reasons
behind why and how ideas that may be wrong are often so hard to change, and persistently criticizes the pharmaceutical industry.

Chapter 6 shows just how vicious attacks can be on people who challenge the status quo, including attacks on Dr Kendrick, and the problem with peer review. Chapter 7 outlines the tortuous path research takes from funding to publication. Chapter 8 has some great examples of how medicine failed such as bed rest after surgery, or has very limited evidence for success such as coronary artery bypass grafts and bariatric surgery. He also talks again about the psychology of new ideas - how each generation thinks that be current practice, is in fact best practice, and that we believe were are immune to mistakes that past generations have made, when this is often simply not the case. Chapter 9 includes some stories of historical figures who challenged orthodoxy such as John Snow, and some more recent ones such as Andrew Wakefield. Whether they were right or wrong, he argues that it is always better to rationally examine (and then perhaps dismiss) these sort of claims, even if they are outlandish, rather than insulting and deriding the one making the claims which is commonly the case. Chapter 10 discussed some apparently arbitrary numbers which appear in health advice, such as ‘five-a –day’ for fruit consumption and a BMI over 30 as indicating obesity.

The three reviewers felt in general that this is a lively and well researched book that should be read, not just by medical statisticians but also by medical students. It is a both an exposition on why doctors need to have a basic grasp of statistics, and an easily readable textbook that teaches these concepts (a rarity?). Overall it is a plea for logic and rationality to prevail. However the topics covered varied greatly in depth and the persistently sarcastic tone detracts to some extent from the serious message, and may lead the reader to despair – is anything one reads in the medical literature worthwhile? Obviously the author wanted to provoke thought but the book is not balanced and it’s not a good idea to put medical students off reading medical literature, believing it all to be self-serving tosh. For a student, it is easy to induce cynicism, and perhaps some examples of medical wisdom would have balanced the tone, such as the treatment of stomach ulcers with antibiotics. If all were doom and gloom, why in the UK is the overall age-specific death rates are falling and life expectancy is increasing so fast? Whether this is due to modern medicine, or in spite of, is an interesting point.