



## Lies, damned lies ...

by Jo Whelan

'There are three kinds of lies: lies, damned lies and statistics'. It's the hackneyed quote that leaps into every English speaker's mind in response to the word 'statistics', but who first said it? It is commonly attributed to Benjamin Disraeli, British Prime Minister in 1868 and from 1874 to 1880, but cursory internet research into its origins suggests that this is probably false. The phrase was popularised by Mark Twain in his book *Autobiography* (1924, published after his death), and it is Twain who attributes it to Disraeli. But according to the *Quote ... Unquote* website, linked to the BBC radio programme of the same name (<http://tinyurl.com/2vkzpj>), there is no evidence that Disraeli ever said it.

An unnamed author on the University of York's maths department website (<http://tinyurl.com/lz4dt8>) notes that the phrase was used in the publication *Notes and Queries* in 1891. An anonymous questioner asked the origin of the phrase 'There are three degrees of falsehood: the first is a fib, the second is a lie, and then come statistics'. A reply from a WD Gainsford, quoted on the site, says that "There used to be a somewhat better version of this saying current in Lincoln's Inn years ago, of a judge who recognised three degrees in liars: the liar simple, the d---d liar, and the expert witness." Another *Notes and Queries* contributor, FWG, says "the three degrees of liars [which] are said to be the liar, the d---d liar, and the mining engineer." It's interesting to speculate on which profession might replace mining engineers in a modern version. The site goes on to list various other early uses of the saying.

So, the phrase was not a brilliant original coinage by Disraeli, but seems to reflect a distrust of 'experts' and their statistics which was already well established in Britain well over 100 years ago. This may be partly a cultural phenomenon, based on Britain's tendency to anti-intellectualism.

The *Quote ... Unquote* site also says that this is the most widely used quotation in the British media, showing perhaps that the general public are inherently suspicious when people try to prove things to them with statistics. On balance this is probably a good thing, though it can be frustrating for public health authorities, for example. There is a tendency to latch on enthusiastically to statistics that reinforce what we already believe or want to believe, while dismissing or giving less weight to those that cast doubt on our established beliefs or that simply don't suit us. This tendency seems to exist in many contexts, from conspiracy theorists to anti-vaccination campaigners and from politi-

cal parties to the marketing departments of pharmaceutical companies.

Statistics are often used as a badge of objectivity by those who cite them to support their arguments. But as everyone knows, selective use of statistics can bolster a biased point of view. Another common practice in the commercial world is just not to do statistical analyses at all, with raw numbers from questionnaires or surveys cited uncritically as though they prove a point.

Perhaps some medical writers, physicians and pharma industry scientists need to brush up on their statistics too. I recently came across a scientific poster produced by a named medical communications company for a pharma company, and presented at an international conference. The named authors were a number of clinicians, including a senior international expert, and a couple of scientists from the pharma company.

The poster gave the results for some secondary endpoints from a major clinical trial. Let's say that in this trial, some patients in both the standard and Drug X arms needed Smarties during treatment to make them feel better. According to the poster, rates of Smartie use during treatment 'appeared lower' in the Drug X arm. The raw numbers were indeed slightly lower, but the difference wasn't very large and it was impossible to form an opinion of its significance because there was no statistical analysis. I think that if I dug out my notes on basic statistics from university I could quickly perform a test to see if there was actually a statistically significant difference in Smartie use between the two populations. In fact, the whole thing bore a strong resemblance to a typical exam question in an undergraduate 'statistics for biologists' module. Yet this group of scientists and communicators seemed unable to be any more specific than saying that rates of Smartie use 'appeared lower'. Didn't they want to find out (after all, this was the main topic of the poster)?

There is worse. Rates of Fingernails Turning Blue 'showed a consistent trend in the same direction [as Smartie use], appearing slightly lower with Drug X'. 6% of Drug X patients had their nails turn blue compared with 7% of standard patients. Again, no statistical analysis. I suspect if you stopped people on the street and asked them if this difference 'appeared' meaningful, most would say it didn't. Few would attribute it to a 'consistent trend'. Yet the first sentence of the poster's conclusion is that 'Drug X appeared to be associated with fewer Blue Fingernail events'. This

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will doubtless be cited in future publications, whose readers won't go back to the source data. How much of our 'knowledge' originates in this way?

A statistician friend has done the analyses from the poster data. The difference in Smartie use was statistically significant (which would have been nice to know) but the difference in Blue Fingernail events between the two study arms was not even close to significance. It seems that when statistics don't suit their purposes, people can suddenly become mystified by them. Their capacity for simple statistical analysis deserts them, and suddenly it becomes OK to talk to an international scientific audience about how things 'appear', and to offer this as a conclusion drawn from your study. This is no more valid than the baseless conclusions drawn from medical research by the mass media. But it is

harder to forgive from people who should so obviously know better. Of course it is likely that the analyses were done, and then discarded when one was unfavourable.

It's worth asking ourselves where we would stand as medical writers if asked to ignore our scientific training in this way. Richard Clark addressed this question in the last issue of *TWS* in his thought-provoking article on the importance of good science over good presentation [1].

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**Reference**

1. Clark R. Bad science and good writing or good science and bad writing? *TWS* 2009; 18(2):85-86.



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