

Statistics in Government, with Crime Statistics as a Case Study
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I sometimes describe statistics as providing a *window to the world*. By this I mean that statistics opens up and reveals to us structures, properties, characteristics, and relationships which are otherwise concealed from us. Of course, the world is an awesomely complex place, and just as looking through a window does not tell us everything about the world outside, so statistics cannot tell us everything about the world it describes. We have to decide what aspects upon which to focus our attention, and from what angles we should peer.

This question of perspective, angle, or viewpoint, is critical. Different perspectives can reveal different things about the world. In fact, these perspectives can sometimes appear to be contradictory, so it is vital to recognise that they are distinct perspectives.

The issue is ubiquitous. For example, it applies to attempts to rank hospitals, schools, and universities. I can recall hovering between being amused and appalled by a university ranking scheme which included as an input variable the number of papers in *Nature* and *Science*, and consequently gave a very low rank to the London School of Economics. Bernard Silverman's outline of crime statistics illustrated perfectly this potential for confusion if multiple, rather different definitions of crime are used.

The key message from these examples is that different measures measure different things. And it follows that, unless one has a highly specific aim in mind, it is probably dangerous to rely on a single summary statistic. I am sure you are all familiar with the parable of the elephant and the blind men, each of whom had an entirely different notion of what an elephant was, on the basis of their limited perspective.

It is certainly true that focusing exclusively on a single perspective leads us down the slope of Goodhart's Law, which states that "*any observed statistical regularity will tend to collapse once pressure is placed upon it for control purposes*". It also means that other non-targeted aspects of performance may deteriorate to unacceptable levels. Recall the classic of the nail factory, which met its target of weight of nails by producing a single gigantic nail. Focusing on a single perspective can often lead to ignoring other, equally important, aspects of performance. The inevitable conclusion is that we should embrace the use of multiple perspectives, of multiple statistical summary measures, recognising their distinctness and revelling in their diversity.

The UKSA report *Overcoming Barriers to Trust in Crime Statistics* first says: "*Having two different sources can undoubtedly cause confusion...*", but then it goes on to say "*but the answer is not to change either of them fundamentally. The two sets of statistics throw different lights on the incidence and experience of crime and we need both of them...*".

The confusion arising from having multiple measures can be alleviated, if not removed, by using different names for the different measures. We do this for money supply. And, of course, we do it for inflation measures. We can see the advantage of this – people recognise that the RPI and CPI are different – but we can also see from that example that it does not

completely solve the problem. In particular, it does not resolve the issue of which of the various measures is appropriate for which question. But moving from the position that statisticians don't know what they are talking about to the position that different measures measure different things is a great leap indeed. It is a leap from blind criticism, beyond blind acceptance, to critical assessment. And it is exactly this leap that the Royal Statistical Society's ten year statistical literacy campaign, *GetStats*, to which Sir Michael referred, is striving to promote.

As many of you will know, a 2007 Eurobarometer survey showed that public confidence in statistics in the UK was the lowest in Europe. Unfortunately, a 2009 survey showed that things had not improved, with only 33% agreeing that official statistics were accurate.

We clearly have a long way to go, but unfortunately I don't think I can add that we have already come a long way. Recall Sir Josiah Stamp, writing in 1929: *'The government are very keen on amassing statistics. They collect them, add them, raise them to the nth power, take the cube root and prepare wonderful diagrams. But you must never forget that every one of those figures comes in the first instance from the village watchman, who just puts down what he damn well pleases.'*

So this is the position of blind criticism – of unthinking suspicion. It is clearly an extreme position, and an unhelpful position. But what about the other extreme?

The UKSA report *Overcoming Barriers to Trust in Crime Statistics*, included the following comments: *"It is the job of the professional statistician in government to filter the signal from the noise and explain the results in a way that is trusted"*. But is that quite right? Bernard Madoff explained his investment results in a way that was trusted. It did not mean that they should have been trusted, or that they should not have been subjected to rigorous examination. We do not want to swing through 180 degrees, from Josiah Stamp's mistrust to uncritical accepting trust.

Blind, unthinking, uncritical trust, leads to its own problems. What we really need to promote is *critical assessment* of statistics in general. Sir Michael pointed out that we needed to *'give people more reason to have trust and confidence in official statistics, through understanding and knowledge.'* And that is the key. We need to enable people to recognise the building blocks and to have elementary building expertise, so that they can see that the statistical structures are sound. Richard Alldritt has commented that there are *'lots of untrustworthy statistics. We want people to trust statisticians to explain statistics, rather than promote uncritical acceptance.'*

Critical assessment would include an evaluation of the source from which the statistics arose. In the present context, one might hope that the public would grow to recognise and appreciate the painstaking rigour that goes into the collection of government statistics by official statisticians. And one might hope the public would be able to contrast this with the bizarre lack of rigour that goes into such things as man-of-the-year polls. One might also hope that the public would appreciate the absurdity of university league tables based on student surveys in which the respondents are self-selected.

So I have shifted the emphasis from trust to critical assessment, with the latter being a precursor to the former, in those cases where the inference is justified.

But this is only one interpretation of ‘trust’. One can mistrust statistics because one doubts their accuracy. One can also mistrust the intended use to which statistical descriptions will be put. This ‘conspiracy theory’ of government statistics is also one which needs to be tackled by education. By helping people to understand the uses to which the statistics will be put, and the benefits which will derive from them.

The role of the media in all this is critical, and I think it is also inevitable in the nature of at least some media outlets that they will always want simple snap answers. I think this is unfortunate, and that the onus is upon them to recognise that sometimes, rather than bending the truth to permit a pseudo-answer which is readily comprehensible without effort, it is necessary to make the effort to understand the unbent truth. I am reminded of one variant of Murphy’s Law, which says that complex problems have simple, easy to understand, wrong answers.

When I gave my presidential address to the Royal Statistical Society, I remarked that statistics was widely misunderstood. I noted that, to many statisticians, who use their skills and tools to dig deep into data, gaining insights and understanding, and unearthing previously undiscovered and possibly unsuspected knowledge, this was rather puzzling. How could such a modern voyage of discovery be anything but incredibly exciting?

I think the answer lies in several areas.

One is the lack of trust that I have already discussed.

Another is innumeracy and number phobia.

A third reason is surely a failure to recognise that statistical summaries are measurements, of some aspect of a population, and should be expected to change as time elapses, *or as further data become available*. If a statistical estimate is later updated as more data become available, it is not a mark of a poor initial analysis, but of an increasingly refined measurement procedure. Recall Keynes’s *‘when the facts change, I change my mind’*.

A fourth area which contains part of the answer to the strange lay misconception of statistics is simply a lack of appreciation of just how widely statistics does impact our lives. This sort of thing is not helped by an unwillingness of people to use the word ‘statistics’ when they can use other words, such as freakonomics, even though they are really describing the use of statistics.

As I said at the start, statistics provide a window to the world. Without the views provided by statistics we could neither create nor monitor housing policies, we would not know where were the greatest needs, nor where to locate a new retail outlet, nor how our local schools or hospitals were doing, nor how to adapt our transport policies. And neither would we know whether crime was increasing or decreasing.

Coming back to crime also brings me back to the need for critical assessment. Without an awareness of the complexities, and the assumptions on which the different measures are based, no rational conversation is possible. And without such an awareness, the cloth is all too easily pulled over our eyes. Think of the efforts to conceal and confuse the impact of climate change, leaded petrol, and cigarette smoking, to name just three areas.

I have used the confusion over crime statistics, described so lucidly by Bernard, as a launch pad for a more general discussion of official statistics and the public's perception of official statistics. But there is another aspect which I feel I should at least mention, and which neither of the two previous speakers may have felt able to mention. This is that the public includes our politicians. During my presidency of the Royal Statistical Society I have engaged with representatives of both the previous and the present administration. For example, raising such things as the importance of the census. Not everyone appreciates the multiple uses to which census data are put. Nor that, for example, census data will be used to guide the distribution of a trillion pounds of public money to local authorities over the next ten years, at a cost of less than one half of one tenth of one percent of that amount. That sort of efficiency ratio is one which most commercial organisations would be proud to achieve.

Other issues we have discussed include the importance of a national address list, pre-release access, and, today's hot topic, how vital it is that the view from the window of statistics is not clouded by uncoordinated cuts in statistical measurement across different departments. There can be few issues which span government departments in the way that statistics does, so a piecemeal approach to cuts courts disaster.

It is just as important, one might argue far more important, that our politicians understand the view that they see from the window of statistics, as it is that the wider public understands the view. Anyone who is not educated in statistical understanding is using a window with the blinds still drawn. In 1938 H.G.Wells wrote "*A certain elementary training in statistical methods is becoming as necessary for anyone living in this world of today as reading and writing*". Our *GetStats* campaign is aiming to promote that necessary elementary understanding. It would be nice if we could achieve it before we had progressed too far into the twenty first century.