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POLITICS AND STATISTICS

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In February 2022, the Royal Statistical Society (RSS) reported the results of a poll they conducted on 101 UK MPs, who were asked three questions to test their statistical knowledge. Here are the questions; you might like to give your answer before looking at the correct answers given below.

1. If you toss a coin twice, what is the probability of getting two heads?
2. You roll a six-sided die; if the rolls are 1,3,4,1 and 6, what are the mean and mode values?
3. If you have taken a diagnostic test for a virus, what is the probability of having the virus when the false-positive rate (the proportion of those without the virus who get a positive result) is one in 1,000?

I ought to mention that there seems to be a bit of a problem with the reporting of the third question. On their website (*note 1*), the RSS gives the question as follows (italics inserted):

‘Suppose there was a diagnostic test for a virus. The false-positive rate (the proportion of people without the virus who get a positive result) is one in 1,000. You have taken the test *and tested positive*. What is the probability that *you* have the virus?’

They then provide the polling company’s webpage link (*note 2*) for ‘the full findings’ of the survey and this gives the third question as quoted at 3 above; this does not specify the result of your test.

Answers and results

Question 1. Fifty-two per cent, of MPs gave the correct answer of 25%. This is a likely improvement from when the RSS polled MPs with the same question in 2011, when 40% of MPs gave the correct answer. Thirty-two per cent of MPs gave the incorrect answer of 50%, compared to 45% of MPs in the 2011 survey.

To understand why the answer is 25% (1 in 4) consider that the sequence of two tosses of a coin could be (T for tails, H for heads) TT, TH, HT or HH, all equally probable.

Question 2. Sixty-four per cent of respondents were able to identify that the mean value was 3, while 63% gave the correct answer of 1 for the mode.

To arrive at the mean value, you add up the numbers thrown (15) and divide by the number of throws (5). The mode is the number that appears most.

I don’t know how the MPs’ performance so far compares with that of the general adult population, but I think it’s pretty disappointing. At least our representatives might think twice next time they are tempted to disparage the educational attainments of today’s schoolchildren.

Question 3. Sixteen per cent of the MPs gave the correct answer that there was not enough information (which is correct for either version of the question). One essential piece of information is the prior probability of your having the virus when you took the test (i.e. the percentage of people in the general population who were affected at that time). The lower this is, the higher the false positive rate (see note 3).

This type of question foxes most people and we might be more forgiving of the poor performance of MPs, except that at the present time we would expect them to be more clued-up on such matters if they are empowered to make supposedly authoritative statements and decisions about how to handle the Covid pandemic (note 4).

Ignorance or dishonesty?

Most people would probably accept that ignorance on the part of our politicians is less of a fall from grace than dishonesty. Yet, though politicians have always lied, or at least deliberately distorted or concealed the truth, we still elect and re-elect them. Perhaps these days there are more people prepared to publicly call out our politicians for their dishonesty, and more opportunities—the Office for Statistics Regulation, fact-checking websites, BBC Radio 4’s ‘More or Less’, and so on (but beware of *false* fact-checking sites). Even so, there seems to be more than a rumour running around that our present political leaders have a unusually strained relationship with the truth. Perhaps this is not surprising when, in his previous journalistic endeavours, the Prime Minister himself had a habit of making up stories, and indeed was once sacked as a newspaper columnist because of this.

As an example, consider the report mentioned in ‘Medicine on the Fringe’ in the Autumn 2021 *Skeptical Intelligencer* that the government, in its attempt to fulfil its promise to build 48 new hospitals, has redefined the term ‘new hospital’ to include any major refurbishment or new wing or unit at an existing NHS site (note 5). (More recently, we have had the ‘Partygate’ scandal and the redefinition of ‘a party’ as ‘a work event’ [note 6].) Another example of redefining what is being measured is provided by the annual crime figures for the year ending September 2021 which, on 31.1.22, Boris Johnson announced in the House of Commons showed that crime had **fallen** by 14% (note 7). Crime had in fact **risen** by 14%. Mr Johnson had redefined crime to exclude fraud, which had risen by 47%. This new definition of crime has the support of the Business Secretary Kwazii Kwartang, who said on television that ‘people are talking particularly about burglaries, about personal injury, about physical crimes (note 8). Next there is Mr Johnson’s boast about the UK having the fastest-growing economy of the G7 countries (or the major European economies). It depends what period you’re looking at—the last two years, no; the last quarter, no; the last year, yes—but the UK economy had further to bounce back from as it had endured the deepest recession of any major developed economy. Next is our Prime Minister’s repeated claim that the UK now had 430,000 more people in employment than before the pandemic. It didn’t. Data from the Office for National Statistics at the time showed the total number of people in employment was actually about 588,000 below the level just prior to the pandemic according to sources such as Full Fact (note 9). Mr Johnson and other ministers have redefined ‘people in employment’ by excluding the self-employed. There is yet more (*sorry, we’ve run out of space—Ed.*).

With so much disinformation and fake news swirling around, what hope is there when we cannot even trust what our elected politicians are telling us?

Notes

1. <https://tinyurl.com/yckkdrz4>

2. <https://tinyurl.com/2wuasay9>
3. <https://tinyurl.com/2p86j58m>
4. <https://tinyurl.com/bdf8w32m>
5. <https://tinyurl.com/vmf595f3>
6. <https://tinyurl.com/bh75mau5>
7. <https://tinyurl.com/mr2kcpby>
8. <https://tinyurl.com/ytusr5f4>
9. <https://tinyurl.com/mwnrn23v>