ROYAL STATISTICAL SOCIETY

DATA | EVIDENCE | DECISIONS

This document was prepared for the RSS Science Journalism Programme with assistance from Professor David Spiegelhalter and David Walker. It is not intended to be a prescriptive statement on what journalism students ought to know about statistics, rather, it is a guide to what those visiting media colleges might like to cover.

Practise good number hygiene

Whenever you come across a number in a story or press release, beware. Before making it your own, ask: who cooked it up; what are their credentials; are they selling something? If the number comes from a study or research, has anyone reputable said it is any good?

Surveys

Were those questioned a fair representation of the population at large? How were they selected for the survey? Do you know exactly what the sample group was asked? The wording of a question can hugely influence the answer you get.

Average

One number, the average, is often used to sum up results. But different averages measure different things. The mean, median and mode are each a different way of summarising members of a group, and can be influenced in different ways.

Margins of error

There is always a measure of uncertainty about a result. Reputable polling companies will note their margin of error. The norm is plus or minus three per cent: if the poll says 50% of people enjoy Phil Collins, the real value lies somewhere between 47% and 53%. League tables are gross simplifications, view them with scepticism.

Trends

An increase or decrease on last year's result does not make a trend. Blips happen often. Abnormal lows and highs – whether winning streaks or cold snaps – naturally return to normal after a time: so-called regression to the mean.

Causation and correlation

Without a carefully controlled experiment, it's very difficult state that a causes b. Instead, the numbers may show an association (a correlation) between two things. Beware spurious links (warm weather and headaches) which may be explained by a third or background factor (sangria). Recommendations for changing daily behaviour should never be based on speculative links.

Rare events

Unlikely events happen often given enough opportunity: every week, someone wins the lottery. Rare events, such as the death of a child, are naturally newsworthy, but care should be taken to set the event in context.

Reporting numbers

Billions and millionths are too big and too small to grasp. Numbers are easier to swallow when broken down. Dividing the cost of a government scheme by 1,370,000,000 gives the cost to each UK household, per week. Colourful comparisons can make risk intelligible: the risk of dying while being operated on under a general anaesthetic is, on average, the same as the risk of being killed while travelling 60 miles on a motorbike. Good reporting gives a balanced view of the size of the numbers being reported. The most likely outcome is more useful for your readers to know than the most extreme.

Risk

Risk is risky. A relative risk increase is meaningless without knowing the baseline absolute risk. Buying a second lottery ticket doubles your chance of winning, but the chance was so small to start with it's hardly a meaningful increase. If substance x increases the risk of cancer, describe how many extra cases it would produce in 100 people, or 1,000 people.

Infographics

The switch from print to digital brings opportunities to present numbers more dynamically and imaginatively. But the same rules of thumb apply whatever the medium: make sure your graphics tell the story as clearly and compellingly as your words.