

## When is statistical significance significant?

*Martin James*



For better or for worse politics today is marked by populism. Knee-jerk responses to issues of low priority to both voters and the political process (pokie debate as a good example) mark the headlines of the press on a daily basis, and illustrate this phenomenon.

It is no surprise therefore that political polling has taken on a far more prominent role in policy making than in the past. While politicians, in response to a negative polling number, invariably proclaim “The only poll we are interested in is the one on election day”, the reality is very different. I doubt there is a MP who doesn’t know the details of the very latest Nielsen, Newspoll and Galaxy Research results. Polling is now the “brand-health tracking” of political parties and policies.

Further, political commentators and politicians themselves often refer to the “error band” of the results. This is sometimes an “out” for politicians, allowing them to dismiss a decline in polling numbers as “within the band of statistical error”, and therefore not worth discussing.

But what is this “band of statistical error”?

While popular belief is that the only determinant of “statistical confidence” is the size of the sample, the reality is very different.

Yes, the larger a sample, the smaller the random error, but there are two further parameters very seldom, if ever, discussed which impact upon this.

The first parameter is the level of confidence we are prepared to accept in the results gathered. This is entirely a matter of judgment on the part of the analyst. All polls use the convention of accepting a 95% chance that the results fall within a statistical band. This is, however, a convention alone (which is why this parameter is a nice round 95%). But is it sensible to describe a result as falling within an error range with confidence these results will be 95% accurate? Why not 90%, or 80%, or for that matter, on the other side of the coin, why not 99% accuracy?

The third parameter affecting statistical significance, and one almost never reported upon, is that error ranges around smaller proportions are far smaller than the error band measured when proportions fall around 50% *while using the same sample size*.

So, how then to interpret polling and market research results?

In light of the above three parameters affecting error ranges, we can conclude that all differences in results are significant, or not significant, depending on the level of confidence and the error band the research user is prepared to accept. Common sense is therefore required when making this judgment. A good way of envisioning the nature of random error is to flick a coin as many times as the sample size used, and record the heads versus tails incidence. The coin-tosser will notice a very fast convergence of results to 50%. 1200 is the typical sample size employed in polls. Only the most accuracy obsessed would want to flick a coin 1,200 times to measure the incidence of heads versus tails.

By definition there are no certainties when using statistics. At the end of the day the best way to interpret a result is to simply accept it as reflective of the views, attitudes, opinions and behaviour of voters and consumers.

*Martin James is managing director of Celsius Research.*