The Myth of the Random Sample

By Steve Letovsky

The concepts of statistical reliability and random sampling are inextricably linked, inasmuch as a statistically reliable conclusion can only be reached through polling a random sample. Too often, pollsters and their clients alike make claims of statistical reliability based on samples that are not random. Indeed, in our view, it is virtually impossible in today's world to draw a truly random sample, and therefore most polls do not reflect the level of statistical reliability they claim to reflect.

Telephone research is by far the most prevalent methodology used when statistically reliable data is deemed necessary; and certainly random digit dial (RDD) is a credible attempt to obtain a random sample. However, currently, nearly all cell phones are excluded in RDD samples. Therefore the 6.4% of Canadians, overall, that use only a cell phone; and the much higher (and growing) proportion of young people that do not subscribe to land-line telephone services that are behind this statistic are not represented in a typical RDD sample. Add to this those without a land line and those who do not answer their land line phone (voice mail) and it seems probable that about 12% of the population is not represented in random digit dial (RDD) surveys. Of course, weights can be (and are) assigned to reduce the resulting biases, but clearly, under-coverage problems are going to become more important for standard RDD surveys as the prevalence of cell phones continues to grow.

Furthermore, simply adding cell phones to the mix doesn't solve the problem, since we are then using both personal devices and household devices to communicate with the sample. So is the sampling unit the person who answers the phone or the household? In short, a whole new set of biases is created if cell phone numbers are included in the RDD number database.

According to ITU[1], 28 million Canadians, or 84.3% of the population had internet access in 2008. In gross terms, this suggests that about 15% of the population would not be represented in a web survey (as opposed to 12% in an RDD survey), and in this aspect, the reliability gap between the two methodologies is rapidly closing.

[1] International Telecommunication Union

Data gathered in web surveys can (and is) weighted in an attempt to reduce under-coverage biases, just as it is for telephone surveys. However, inasmuch as web surveys typically generate far more raw data than telephone surveys, it is often easier and more practical to adjust for over-coverage in the former. More often than not, thanks to the comparatively massive number of respondents in web survey, one can even randomize and apply appropriate weighting factors to the data sub-sets.

On-line panels, which are basically nothing more than very large Focus Groups seem to be the "flavour of the month" among client-side researchers. And while such panels certainly have their place, all too often we see researchers who should know better using on-line panels to elicit information which would be far more useful and credible were it statistically reliable. It is as though the message that the statistical reliability of telephone research is suspect has gotten through, leading to a complete abandonment of attempts to achieve the gold standard of statistical reliability in favour of a methodology which is cheap and easy.

In conclusion, one could compare the three methodologies discussed in this article as follows:

Methodology	**Statistical Reliability**	**Cost**
Telephone	Less than in the past	High
Web survey	Comparable to telephone	Low
On-line panel	No	Low

Web surveys are greatly underused, and deserve renewed consideration from client-side researchers who have abandoned telephone research and now rely on on-line panels to provide needed information. As indicated in the foregoing Table, web surveys can provide the best of both worlds.

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