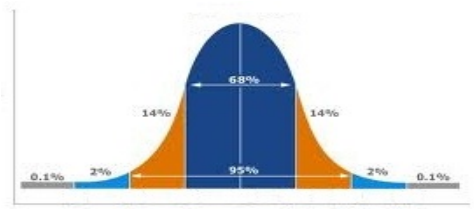
Witan Wisdom

RANGE OF ERROR

The most precise (and expensive) way to understand or measure a group would be to conduct a *census (i.e. interview everyone).* Statistical science shows we can save time and budget by using a *sample* instead...and end up with answers *very close to* that of a census. Range of error is the statistical measure of how close. *(We think it should be called "range of precision"... as "error" implies mistakes).*

Answers from a sample are actually the *midpoint of a range*. For example; an answer of 50% from a survey with about +/-5% range of error, means that a census' answer would likely fall between 45% and 55%.

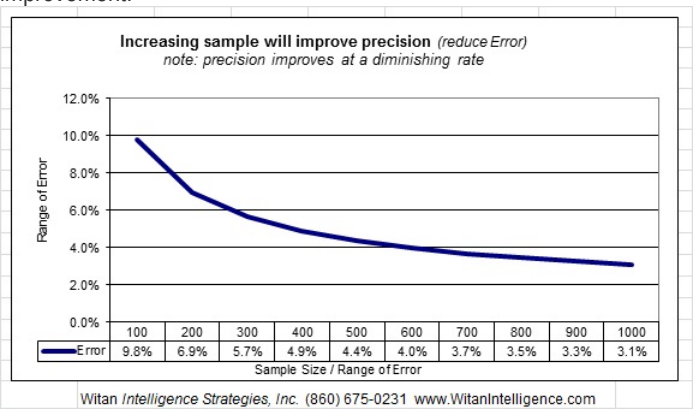
Of course a sample of 1,000 has a smaller range and is thus more precise than one of 100, but its answer isn't any more accurate...or "better" per se. In fact, if we did the small survey again 100 times, *most of the answers* would cluster at the 50% midpoint reported in the survey of 1,000...under a typical bell curve, with only a few near the tails on either side of the range.



Recently, a politician criticized a poll that had reported that many Latino voters had not heard of her. She dismissed the poll of 100 as being too small and thus "suspect." While the poll's accurate answer of 50% could indeed range from 40% to 60%, even at its lowest, the poll's conclusion was valid. Turns out she lost the election and a few more points of support from Latinos would have put her over the top.

The lesson is; don't dismiss answers from small surveys as being wrong. Do consider their precision in the context of a range tolerable for the decision or statement being made.

The chart below shows the precision of samples improving from +/- 10% to +/- 3% as sample increases from 100 to 1,000. Note the diminishing rate of improvement.



WITAN WISDOM

Choosing Sample Sizes

Precision vs Budget:

Increasing sample size improves precision...and it increases interviewing cost.

How important is precision?

Consider the scale of the investment at stake hinging on decisions from the survey results. What is the opportunity and the downside risk?

FYI: Many corporate surveys are based on samples of just 400 (<5% error). Experts consider polls of 1,100 (<3% error) sufficient to represent *national* opinion.

Use larger samples when:

-*Small changes* must be measured (e.g. political polls, awareness tracking).

-*Sub-group differences* must be analyzed (e.g. men vs women, customers vs noncustomers).

Cost-Saving Hint: Try "*Oversampling"* for a sub-group of interest that would normally appear in only small percentages of a random sample

FREQUENTLY ASKED QUESTION

What does the .95 Confidence Limit mean?

A: "CL" is Confidence Limit. A .95 CL means that if the same survey were conducted 100 times, 95 of the answers would fall within the range of error.

By convention, market researchers use the .95 CL. It's not uncommon for some other sciences to use .90 CL. So, the full expression of range of error should define the CL *(e.g. "The maximum Range of Error of a sample of 1,000 at the .95 CL is +/- 3.1%.)*

That's because technically, for any given sample size, you could choose any CL...and get its different Range of Error. *(e.g. the .90 CL would demand that only 90 instead of 95 of 100 surveys fall within the range of error) So, the Range of Error at .90 smaller than for the same sample at the .95 CL! Is it any more precise?*

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