

Understanding Survey Research

Survey Sampling

We systematically select households from a geocoded United States Postal Service (USPS) address list to ensure that only households located within the boundaries of a community are surveyed. Systematic sampling is a procedure whereby a complete list of all eligible addresses is culled, selecting every Nth one (a number that changes depending on the size of the population and the sample size to be selected) until the appropriate number of addresses is sampled. Not only does NRC scientifically and randomly sample households to participate in The NCS, but we also select, without bias, the household member to participate. This methodology helps ensure that the attitudes expressed by our respondent sample closely approximate the attitudes of all adult residents living in the community. Without controlling who in the household participates, it is likely that results would be biased towards those who are more sedentary and those without jobs (who may have different opinions about some services).

The Basic Service of The NCS includes mailing to randomly selected households. Though response rates across the US have dipped in recent years, the response rate for most administrations of The NCS ranges between 20% and 40%, which yields between 300 and 480 completed surveys.

Margin of Error and Confidence Intervals

It is customary to describe the precision of estimates made from surveys by a “level of confidence” and accompanying “confidence interval” (or margin of error). A traditional level of confidence, and the one used for The NCS, is 95%. The 95% confidence interval can be any size and quantifies the sampling error or imprecision of the survey results because *some* residents’ opinions are used to estimate *all* residents’ opinions. The relationship between sample size and precision of estimates or margin of error (at the 95% confidence level) is shown in the adjacent table. With a typical sample size for The NCS, this means an estimated margin of error at the 95% confidence level of plus or minus four to six percentage points.

Number of completed surveys	Margin of error
100	±9.8%
300	±5.7%
400	±4.9%
500	±4.4%
750	±3.6%

A 95% confidence interval indicates that for every 100 random samples of the same number of residents, 95 of the confidence intervals created will include the “true” population response. This theory is applied in practice to mean that the “true” perspective of the target population lies within the confidence interval created for a single survey. For example, if 75% of residents rate a service as “excellent” or “good,” then the 4% margin of error (for the 95% confidence interval) indicates that the range of likely responses for the entire community is between 71% and 79%. This source of uncertainty is called sampling error. In addition to sampling error, other sources of error may affect any survey, including the non-response of residents with opinions different from survey responders. Though standardized on The NCS, on other surveys, differences in question wording, order, translation and data entry, as examples, can lead to somewhat varying results.

For subgroups of responses, the margin of error increases because the sample size for the subgroup is smaller. For subgroups of approximately 100 respondents, the margin of error is plus or minus 10 percentage points.

Non-response Bias

Knowing that residents in single family dwellings are more likely to respond to a mail survey, NRC oversamples residents of multi-family dwellings to ensure their proper representation in the sample data. Rather than giving all residents an equal chance of receiving the survey, this is systematic, stratified sampling, which gives each resident of the community a known chance of receiving the survey (and apartment dwellers, for example, a greater chance than single family home dwellers).

Weighting

The first step in preparing the data for analysis is to weight the data to reflect the demographic profile of the residents of the community being surveyed. Weighting is the approach used by quality survey consultancies to ensure that the demographic characteristics of the sample mirror the overall population. It is an important method to adjust for potential non-response bias. NRC uses a special software program of mathematical algorithms to calculate the appropriate weights. Several different weighting “schemes” may be tested to ensure the best fit for the data.

“Don’t know” Responses

Generally, a small portion of respondents select “don’t know” for most survey items and inevitably some items have a larger “don’t know” percentage. Comparing responses to a set of items on the same scale can be misleading when the “don’t know” responses have been included. If two items have disparate “don’t know” percentages (2% versus 17%, for example), any apparent similarities or differences across the remaining response options may disappear once the “don’t know” responses are removed. Such an example is shown below.

When comparing the community as a place to live to the community as a place to work, it would appear that 76% of respondents rated the community as a place to live as “excellent” or “good” compared to just 63% for the community as a place to work. However, the community as a place to work has a much higher proportion of respondents answering “don’t know” (17% compared to 2%).

	Place to live		Place to work	
	Number	Percent	Number	Percent
Excellent	48	25%	38	20%
Good	97	51%	81	43%
Fair	23	12%	22	12%
Poor	19	10%	17	9%
Don’t know	3	2%	32	17%
Total	190	100%	190	100%

If we remove the three “don’t know” responses from the community as a place to live and the 32 “don’t know” responses from the community as a place to work, the two items are actually much more similar in their evaluations: 78% “excellent” or “good” place to live compared to 75% “excellent” or “good” place to work.

	Place to live		Place to work	
	Number	Percent	Number	Percent
Excellent	48	26%	38	24%
Good	97	52%	81	51%
Fair	23	12%	22	14%
Poor	19	10%	17	11%
Total	187	100%	158	100%

Response Scale

The scale on which respondents are asked to record their opinions about service and community quality is “excellent,” “good,” “fair” or “poor” (EGFP). This scale has important advantages over other scale possibilities (very good to very bad; very satisfied to very dissatisfied; strongly agree to strongly disagree, as examples). EGFP is used by the plurality of communities conducting citizen surveys across the U.S. The advantage of familiarity was one that NRC did not want to dismiss when crafting The NCS questionnaire, because elected officials, staff and residents already are acquainted with opinion surveys measured this way. EGFP also has the advantage of offering three positive options, rather than only two, over which a resident can offer an opinion. While symmetrical scales often are the right choice in other measurement tasks, NRC has found that ratings of almost every local government service in almost every community tend, on average, to be positive (that is, above the scale midpoint). Therefore, to permit finer distinctions among positively rated services, EGFP offers three options across which to spread those ratings. With questions worded for EGFP, responses are more neutral because they require no positive statement of service quality to judge (as agree-disagree scales require) and, finally, EGFP intends to measure absolute quality of service delivery or community quality (unlike satisfaction scales which ignore residents’ perceptions of quality in favor of their report on the acceptability of the level of service offered).