

Sampling 101

Understanding sampling methods and implications

NRC Health provides organizations the most reliable and actionable patient experience data by determining the right sampling plan at the start.

To help you select the best sampling model for your organization, we consider the characteristics of the patient population, the desired precision of measurement, the minimum desired reporting level (e.g., hospital, unit, department, clinic, or physician) and financial considerations. Here is a brief sampling primer to help you and your teams fully understand this critical step in the measurement process.

Basic Definitions

SAMPLE STATISTIC

Random sampling allows us to use what we know about the sample and apply it to the entire population. Metrics gathered from a random sample are called 'sample statistics' and can be used to estimate parameters in the larger population.

SIMPLE RANDOM SAMPLE

A sample by which each member of a population has an equal chance of being selected. By this method, we are able to select a relatively small, representative subset of the population from which we can identify the general pattern of opinions, attitudes and behaviors of that population.

REPRESENTATIVE SAMPLE

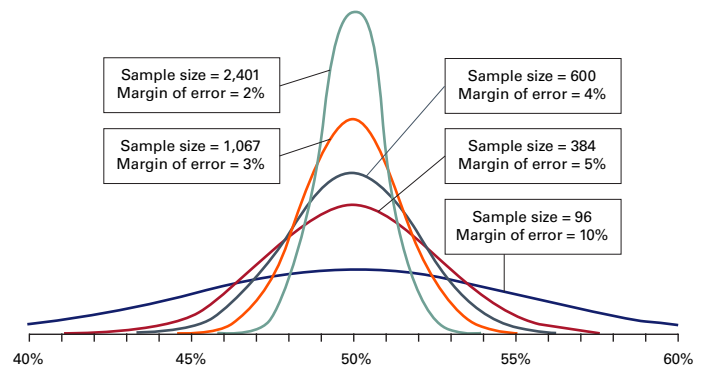
A sample that is representative of the population being surveyed — and whose distribution approximates the distribution of population characteristics within a margin defined by the sampling error.

SAMPLING ERROR

The degree of uncertainty that our sample is perfectly representative of the actual population. Therefore, it is the probability that the information collected on the individuals in a sample does not perfectly reflect that of the actual population.

SEE FIGURE 1

FIGURE 1



CONFIDENCE LEVEL

The probability that our sample will display the same characteristics as the actual population. In other words, this is the degree to which we can be confident about a given sample statistic. The industry standard as well as NRC Health's standard is to reach a 95% confidence level.

CONFIDENCE INTERVAL

Defines the range of values that is likely to include the population parameter. The confidence interval is always described in conjunction with the confidence level. For example, 'we are 95% confident (the confidence level) that the true score lies between 75% and 85% (the confidence interval)'. Generally, NRC Health, along with others in the survey research field, sets a minimum confidence interval of $\pm 5\%$. That is, we make every effort to collect enough survey responses from your population to reach a 95% confidence level with an error range of + or - 5%. SEE FIGURE 2

Another way to think of samples with different levels of confidence is to imagine each sample as an image of a subject — the actual population — displayed at different levels of resolution: the lower the resolution of the image, the less sharp/clear it will be. You don't need 100% resolution to interpret what the image is telling you, just as you don't need an error-free sample. However, if the resolution is too low, it is not possible to understand the subject of the image. SEE FIGURE 3

National Education Association

NEA Sampling Model



NRC Health employs the National Education Association (NEA) Model to determine appropriate sample sizes. Rather than sampling a set number of patients at the overall level, NRC Health recommends identifying the lowest level of analysis desired for reporting and using the NEA Model to determine appropriate sample sizes for each based on volumes. Using this model, results are more representative of the patient population and provide a truer perspective of the quality of the patient experience.

NEA MODEL

The NEA Model (SEE FIGURE 2) is widely accepted and used broadly in research. The formula recommended by the NEA provides an easy reference for sampling the lowest reporting level at a 90, 95 or 99% confidence level. The majority of NRC Health clients use the NEA Model to sample at a 95% confidence level. By collecting enough survey responses from a target population, we can state that the result obtained using the NEA sampling method is accurate within $\pm 5\%$ of the patient population from which it was drawn. The NEA's sampling formula provides a standard that balances "image resolution" so there is enough information to interpret the subject without needing to survey the entire population.

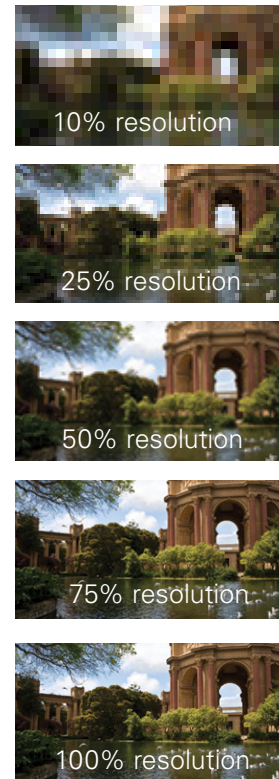
The sample sizes recommended by NRC Health are calculated using the formula created and tested by the NEA. Figure 2 depicts the results of the calculation at a 95% confidence interval with a 5% margin of error.

FIGURE 2

N	S
1000	278
1500	306
2000	322
2500	334
3000	341
3500	346
4000	351
5000	357
10000	370
25000	379
50000	381
100000	384

N is Population size;
S is Sample size.
(This chart assumes that the samples are randomly generated.)

FIGURE 3



The pictures displayed at different resolution intervals provide a visual illustration of different confidence levels.