

Marketing Seminars & Conferences

Sample size for testing

Suppose you have an opportunity to rent a 100,000-name list for a national promotional campaign. Prior to renting the entire list, you'd like to know the response rate or the number of attendees per thousand names that the list is likely to generate. To estimate this overall response rate, you decide to use a sample of names from the list. However, you're wondering how many sample names should be selected to provide results that are representative of the entire list.

To calculate sample size, first decide on the response rate you require from the list. The following formula can be used to calculate your required response rate:

$$\text{Required Response Rate (RRR)/1000} = \frac{\text{cost/1,000 names in the mail}}{(\text{price of seminar}) (\text{percent of total revenue allocated to promotion})}$$

Suppose the course price equals \$400, that the cost of the promotion package in the mail is \$300/1,000, and that 25% of total revenue should be spent on promotion, then:

$$\text{RRR} = \frac{\$300}{(\$400) (.25)}$$

After calculating the required response rate of 0.3% next decide on the margin of error (ME) you're willing to live with. In other words, how much above and below .3% will you tolerate the response rate to vary. Let's assume that you're willing to accept a .1% margin of error. Next, decide on the confidence level you must have. Ask yourself what percentage of the time will you require that the response rate from the sample (give or take the margin of error) represent the response rate for the whole list. Let's assume that you require the sample results (plus or minus the error) to be right 95% of the time. Given these variables, you can use the following formula to calculate same size (SS).

$$\text{SS} = (\text{CLF}/\text{ME})^2 \text{RRR} (1-\text{RRR})$$

Where:

SS = Sample Size

RRR = Required Response Rate

ME = Margin of Error

CLF = Confidence Level Factor based on the standard deviation of a normal curve and is 1.960 for 95%. The CLF for 80%, 90%, and 99% are 1.282, 1.645 and 2.572 respectively.

Substituting the values given above in to the equation yields the following results:

$$\text{SS} = (1.96/0.001) (0.003) (1-0.003)$$

$$\text{SS} = (1960)^2 (0.003) (0.997)$$

$$\text{SS} = (3,841,600) (.002991)$$

$$\text{SS} = 11,488$$

Now, divide the 11,488 into 100,000 to calculate the Nth factor for sampling from the total list. The resulting value of 8.70 means that you tell your mail-

ing list broker to give you every 9th name for the test. The names used for this Nth sampling are recorded in a special file. Later, should you use the whole list, the test records can be excluded from the printout so that you don't have to mail the test names twice.

If the test results from the example above yield a 0.3% response rate, you can proceed with using the balance of the list being 95% certain that you will receive 0.3%, give or take 0.1%. Alternatively, you may want to use sequential sampling. Rather than use the balance of a list, you could keep taking successive bites as long as the results hold up.

As indicated by the formula, the size of the test sample has nothing to do with the size of the total list. Instead, sample size depends on the confidence level, the error limit, and the desired response rate. Sample size varies directly with the confidence level and the response rate and indirectly with the error limit.

In some cases, your calculations may show that the sample size almost equals the size of the total list. If this is the case, go ahead and use the entire list.

The formula can also be used to calculate error limits you should assign to an arbitrarily selected sample size and resulting response rate. Suppose a sample of 9,749 names from a 100,000 list yielded 50 responses or a 0.5% response rate. What's the margin of error associated with the estimate? Rearranging the above formula gives us:

$$\text{ME} = \pm \text{CLF} \sqrt{\frac{\text{RR} (1 - \text{RR})}{\text{SS}}}$$

$$\text{ME} = + 1.96 * \text{square root of } 0.005 * (1 - 0.005) \\ (9749)$$

$$\text{ME} = + .14\%$$

In this case, you can be 95% certain that the remainder of the list will return .5% sales, give or take .14%. In other words, your response may go as low as .36% or as high as .64%.

Looking for new customers for our seminar/conferences is like looking for "needles in a haystack." List testing allows us to locate the best prospects from a wide range of potential list choices. However, you must select a sample size that tests for your desired response rate and at the same time has statistical validity.

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