How Big Should Your Sample Be?

The number of program participants will determine whether to include everyone in the evaluation or select a sample, i.e., a smaller group who can represent everyone else and from whom we can **generalize**.

The sample should be as large as a program can afford in terms of time and money. The larger the sample size (compared to the population size), the less error there is in generalizing responses to the whole population -- i.e., to all cases or clients in a program.

1st RULE OF THUMB: if the population is less than 100, include them all (and strive to get an 80% response rate); if the population is bigger than 100 select a **probability sample**. (See your guidebook for sampling strategies.)

Probability samples allow you to calculate the likely extent of the deviation of sample characteristics from population characteristics. **Sampling Error** is the term used to refer to the difference between the results obtained from the sample and the results obtained if data had been collected from the entire population.

The objective when drawing samples is to decrease sampling error and to assure confidence that the results are reliable. 2nd RULE OF THUMB: a common standard for program evaluation is 95% confidence with a sampling error of ± 5%. In English that means that you believe that 95 percent of the time the results from your sample, would be off by no more than 5% as compared to the results you would have gotten if you had collected data from everyone.

<u>It is the absolute size of the sample rather than the ratio of sample size to population size that affects the sampling error</u> (Comer and Welch, 1988, p. 192). Sample sizes for varying population sizes and differing sampling error rates have been calculated (see following page). If you wish for more precision use the following calculation (for 95% confidence, 5% error).

$$n=385 \div ((1+ (385/N))$$

Example: If your population is known to have 472 members, then a sample of 212 would be necessary to ensure 95% confidence with no more than 5% error.
$385 \div ((1+ (385/472)) = 212$

Relationship Between Sample Sizes and Sampling Error

Sample Sizes (n) @ 95% Confidence, with 3, 5 and 10% Sampling Error

	Sampling Error		
Population Size (N)	±3%	±5%	±10%
100	92	80 (80%)	49
250	203	152 (61%)	70
500	341	217 (43%)	81
750	441	254 (34%)	85
1,000	516	278 (28%)	88
2,500	748	333 (13%)	93
5,000	880	357 (7%)	94
10,000	964	370 (4%)	95
25,000	1,023	378 (2%)	96
50,000	1,045	381 (<1%)	96
100,000	1,056	383 (<1%)	96
1,000,000	1,066	384 (<1%)	96
100,000,000	1,067	384 (<1%)	96

** Adapted from Reisman, 2000, A Field-Guide to Outcomes-Based Program Evaluation*

- As shown above, when a sample is comparatively large, adding cases provides little additional precision.
- As population sizes increase, the total size of the sample becomes proportionately smaller without affecting error.
- When the population size is small, relatively large proportions are required to produce reasonable error rates.
- A standard proportion (e.g., 33%) will not work as a sampling strategy for varying population sizes.
- 3rd RULE OF THUMB you must always draw a larger sample than what is planned for because of refusal. To do this, you need to estimate the refusal rate and then factor that into your calculation. Desired sample size ÷ (1- refusal rate) = TOTAL SAMPLE.