2010 EXTERNAL QUALITY REVIEW (EQR) PROTOCOLS

APPENDIX II: SAMPLING APPROACHES

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PURPOSE OF THE APPENDIX

This Appendix provides an overview of potential sampling methods that may be used in Protocols 3, 5, 7, and 8. A statistician or staff with expertise in the design and implementation of sampling should advise the State and/ or EQRO of the most appropriate sampling strategy.

PROBABILITY SAMPLING

Probability (or random) sampling methods leave selection of population units totally to chance and not to preference on the part of the individuals conducting or otherwise participating in the study. Biases are removed in these methods. There are several types of probability (or random) sampling:

Simple Random Sampling

Simple random sampling is used when members of the study population have an equal chance of being selected for the sample. Population members are numbered and random numbers generated by a computer select units from the population. This sampling approach ensures that all members of the target population have an equal chance of selection and assure the sample is fully representative of the population.

Systematic Random Sampling

Systematic random sampling is used when the *n*th unit in a list is selected. This can be used when a sampling frame is organized in a way that does not bias the sample.

Steps to organize and select a systematic sample are:

1. Construct a comprehensive sampling frame (e.g., list of all beneficiaries);
2. Divide the size of the sampling frame by the required sample size to produce a sampling interval or skip interval (e.g., if there are 250 beneficiaries and a sample of 25 is needed, then divide 250/25 = 10);
3. From a random number table select a random number between 1 and 10;
4. Count down the list to get the Nth name (i.e., the # identified in step 3);
5. Skip down 10 names on the list and select a second name. Repeat the process as many times as needed until the required sample size has been reached.

Stratified Random Sampling

Stratified random sampling is used when the target population consists of independent sub-groups or strata. This technique divides the population into specific, strata or subgroups that are homogeneous (same) within a strata and heterogeneous (different) between strata with respect to certain characteristics such as ethnicity (e.g., Hispanic, non-Hispanic), age (e.g., under 30, over 30, or diagnosis (e.g., diabetic, non-diabetic). Stratification is done both to improve the accuracy of estimating the total population's characteristics and to provide information about the characteristics of interest within subgroups. Stratified random sampling requires more information about the population and requires a larger overall sample size than simple random sampling. Once strata are identified and selected, sampling must be conducted within each strata using probability (or random) sampling. As a result, it is typically more expensive than simple random sampling. Stratified sampling may also involve "weighting" the sample. In this process, a survey selects a disproportionately larger number of units of analysis from one or more of the strata to allow the survey to produce information on that particular stratum (e.g., individuals dually receiving both Medicare and Medicaid).

Cluster Sampling

Cluster sampling is used when a comprehensive sampling frame is NOT available. Units in the population are gathered or classified into groups, similar to stratified sampling. Unlike the stratified sampling method, the groups must be heterogeneous with respect to the measured characteristic. This method requires prior knowledge about the population. Once clusters are identified, a random sample of clusters is selected.

NON-PROBABILITY SAMPLING

Non-probability sampling methods are used when subjects are scarce and the study relies on volunteers, or for comparisons of a subset of the population with a large population or comparisons of non-stratified groups. They are based on the choice of those administering the survey rather than chance; therefore, some bias can be expected. Non-random sampling methods do not lend themselves to statistical analysis. Considering the risk of biased results and the obstacles to statistical analysis, non-probability sampling is discouraged. However, at times it can be an appropriate and efficient way of collecting needed information. The following are types of non-probability sampling:

a. Judgment sampling- units are selected based on whether they are judged to be representative of the population. By doing so, the sample is constructed to be a sub-population.
b. Convenience sampling- uses readily available or convenient units. For example, if the objective was beneficiary opinions regarding a group practice, patients in the office on any given day or during a specific month could be interviewed.
c. Quota sampling- ensures that units in the sample appear in the same proportion as in the population. For instance, if a certain target population is 55 percent female and 45 percent male, the quota sample requires a similar female/male distribution.