

SAMPLING

Introduction

Sampling is a process of selecting a representative part of a population in order to estimate the organization's performance, without collecting data for its entire population. Using a statistically valid sample, an organization can measure its performance in an effective and efficient manner. Sampling is a particularly useful technique for performance measures that require primary data collection from a source such as the medical record. Sampling should not be used unless the organization has a large number of cases in the measure population because a fairly large number of sample cases are needed to achieve a representative sample of the population of interest. Organizations with large patient volumes may perform data collection on a sample of the total population, but sampling is not required.

To obtain statically valid sample data, the sample size should be carefully determined and the sample cases should be randomly selected in such a way that the individual cases in the population have an equal chance of being selected. Only when the sample data truly represent the whole population can the sample-based performance measure data be meaningful and useful.

Disease Specific Care (DSC) certified programs must meet the following sampling requirements:

Sampling Availability

Sampling is done by diagnosis and should be done using available databases that contain monthly patient discharge information, ICD-9-CM diagnosis codes, and other necessary administrative data (e.g., only patients 18 and older are included in the DSC stroke measures).

The DSC-Stroke measure set sampling populations are defined below:

- Patients with ICD-9-CM Codes for Ischemic Stroke as defined in the Appendices, Table 1
- Patients with ICD-9-CM Codes for Hemorrhagic Stroke as defined in the Appendices, Table 2

Sample Size Requirements

Programs selecting sample cases for the stroke measures should ensure that its measure population(s) and sample size(s) meet the following conditions:

- The patient population includes stroke patients with an ICD-9-CM Principal Diagnosis Code as listed in Table 1 or Table 2 (See Appendices).

- The sampling methodology is as follows:

Monthly Sample Size Based on Population Size

Patient Volume	Sample Size
1 - 9	100%
10 - 49	10
50 - 99	20%
> 100	20

Sample Size Examples

- A program has 8 discharges in the first reporting month. All 8 cases (100%) should be reviewed.
- A program has 47 discharges in the second reporting month. The sample size for this month would be 10 cases.
- A program has 95 discharges in the third reporting month. The sample size would be 20% of 95, or 19 cases.
- A program has 360 discharges in the fourth reporting month. The sample size would be 20 cases (maximum monthly sample size).

Systematic Random Sampling Approach

Systematic random sampling requires selecting every k^{th} record from a population of size N in such a way that a sample size of n is obtained, where $k \leq N/n$. The first sample record (i.e., the starting point) must be randomly selected before taking every k^{th} record. This is a two-step process:

- a) Select the starting point; and
- b) Then select every k^{th} record thereafter until the selection of the sample size is completed.

Example:

For a program with a population size of 360 discharges per month, the sample size would be 20. To select a random sample of 20 cases:

- 1) Determine the population size (total discharges) for the month;
- 2) Determine the sample size using the above table;
- 3) Divide the population size by the sample size and take the quotient (i.e., the integer as the sampling interval k . The sampling interval $k = 360/20 = 18$. Thus, every 18th patient record will be selected from the measure population until 20 cases are selected.)
- 4) To ensure that each patient has an equal chance of being selected, the “starting point” must be randomly determined before selecting every 18th record. Therefore a simple approach to determine where to start would be to write the numbers 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18 on separate pieces of paper and place the numbers in a container and pull one piece of paper. For example if you draw the number 3, start with the 3rd case on your list and select every 18th case after that until you reach 20 cases.