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7100. QUALITY CONTROL SAMPLING

Sampling is the selection and study of a part of a whole, the universe, for the purpose of drawing conclusions about the universe. Sampling permits administrators to cut costs, reduce manpower requirements, gather vital information more quickly, obtain data not available otherwise, obtain more comprehensive data, and, in some instances, actually increase statistical accuracy.

In the Medicaid Eligibility Quality Control (MEQC) system, sampling is the only practical method of validating eligibility of the total caseload and determining the dollar value of errors. Any attempt to make such validations and determinations by reviewing every case would be an enormous and unwieldy undertaking. In addition to the considerable costs involved, the problems in administering such an operation would greatly increase the chance of obtaining poor quality data that could invalidate the findings.

The review of a sample is only incidentally concerned with identified errors. The prime concern is with the identification of types and amounts of errors for:

o Drawing inferences about the total caseload, and

o Utilizing the findings to develop cost-effective methods of eliminating errors that lead to erroneous Medicaid expenditures for the total caseload.

7102. OVERVIEW OF THE MEQC SYSTEM

A. Basis for MEQC System.--The MEQC system is based upon the following concepts:

o The sample unit is the Medicaid case as identified on the State eligibility file.

o The universe is the entire Medicaid caseload under consideration. This requires sample selection and data estimates for all appropriate categories of Medicaid cases.

o The review process uncovers misspent funds that result from eligibility errors.

o The sample includes:

- The AFDC-QC sample for that month, and

- A random sample of non-AFDC cases.

B. Steps in MEQC Process.--The essential steps in the MEQC process are:

o Selecting a monthly sample of Medicaid cases.

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o Determining the eligibility status of sampled cases for the review month.

o Collecting claims for services received during the review month which are paid during and for 4 months after the review month, and assembling them at the beginning of the sixth month following the review month.

o Calculating payment error rates using correct and incorrect payment amounts based on claims paid for services received during the review month.

7104. MEQC SAMPLING REQUIREMENTS

Though the basic MEQC sample requirements are the same for all States, there are variations in how the lists are established and how the selection proceeds.

The different categories of States are:

A. 1634 Contract States.--States in which Medicaid eligibility determinations for SSI recipients are made by the Federal Government under a contract with the State using primarily the same criteria as in SSI eligibility determination. In these States SSI cases are not sampled or reviewed.

B. 209(b)/1902(f) States.--States which make Medicaid eligibility determinations for SSI recipients and in which Medicaid benefits may not be afforded to all SSI recipients because Medicaid eligibility requirements are more stringent than SSI eligibility requirements. In these States SSI cases are sampled and reviewed.

C. State Determination/SSI Criteria States.--States which make Medicaid eligibility determinations for SSI recipients using primarily the same criteria the Federal Government uses in determining SSI eligibility. In these States SSI cases are also sampled and reviewed.

7109. TYPES OF ERRORS

In determining estimates of population characteristics two types of errors may occur:

A. Sampling Errors.--When a sample is selected through a random procedure the estimates of a universe characteristic from that sample generally will be different from the true value of the universe characteristic because the estimates are based upon a sample.

A sampling error may be defined as the difference between the value of the characteristic as estimated from the sample and the true universe value of the characteristic. Although such errors cannot be avoided, they can be controlled and measured (in probability samples).

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B. Nonsampling Errors.--Nonsampling errors generally are not measurable (except by the use of sample checks). They are usually of two types, both of which may result in biased data:

1. Errors Caused by People or Machines.--Mistakes in the collection of data, and in processing the data; e.g., errors in coding and errors in tabulating the results and making calculations; and

2. Errors Inherent in the Measurement Process.--Errors which result from many sources; e.g., dropped cases, "convenient" rather than scientific sampling, and use of improper methods of estimating from the sample.

7110. VALIDITY AND RELIABILITY OF STATISTICAL DATA

Sampling and statistical procedures by themselves cannot assure validity (or freedom from bias); i.e., that the errors found are "true" errors and that their correction is important to effective operation of the program. The validity of the data depends upon adequacy of the Review Schedule in relation to the scope, detail, and significance of the data collected and the degree to which reviews are carried out effectively.

Sound sampling procedures can assure a known degree of reliability (also referred to as precision) of statistical data. If sampling procedures are soundly based, the results obtained from one sample taken from the total caseload will be the approximate results obtained if the whole were reviewed.

The MEQC sample is designed so that the reliability of the sample results is measurable and can be shown to be relatively high. These results can be made more reliable through proper application of statistical methods as well as through an increase in sample size.

Because of their importance, examples of sources of bias (which affect validity) and explanations of the formulas involved in measuring precision (reliability) are detailed.

7110.1 Bias.--A biased sample does not represent the population or universe from which it was selected. For example, suppose that an opinion survey was conducted in the middle of the day by interviewing everyone on a busy street willing to stop for 10 minutes for the interview. If 90 percent of those interviewed had a favorable opinion on the issue involved it would not necessarily follow that about 90 percent of the city residents have a favorable opinion. People on a particular street at a particular time of day would more than likely be unrepresentative of the total city population. Also, the fact that the sample consisted only of individuals who could spare 10 minutes in the middle of the day may make the sample even more unrepresentative. Such a sample could contain bias.

One source of bias in QC deals with cases which cannot be reviewed. "Nonreviewed" cases fall into several categories. Such cases should have been included in the sample but could not be reviewed by the QC unit for certain reasons; e.g., beneficiaries who could not be located or were unwilling to give information.

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If the number of "nonreviewed" cases is small the bias resulting from their noncompletion also will be small. If the number of such cases is large a considerable bias may be introduced. In effect, a segment of the total caseload is unrepresented if the sample cases for that segment are not reviewed. If a substantial number of sample cases are not reviewed there is no assurance that conclusions drawn from the sample apply to the total caseload. The number of such cases can be anticipated and should be compensated for by oversampling. However, nonresponse bias may still be present.

Another source of bias is prior knowledge by the local agency as to which cases will be reviewed. This bias could result if the agency, intentionally or unintentionally, treats these cases in a special manner, thus making the QC results unrepresentative. Therefore, take special precautions to ensure that the cases selected are not known to the local agency earlier than required.

7110.2 Precision.--Findings computed from a sample are "point estimates." To predict the actual caseload error rate with any degree of certainty, a range of possible values (confidence interval) is computed. The first step is to compute the "variance" of the point estimate. For systematic random samples, when simulating random selection, the estimated variance of a rate of error (proportion) with a fixed sample size is computed approximately by the following equation:

VAR () =  x  (1-)

n

where the subscript p is the estimated case rate of error (proportion) in the sample, and n is the sample size.

The precision of a sample estimate is measured by the standard error of the estimate, SE (), which is the square root of the estimated variance.

SE() = VAR() or  (1-)

n

The precision specification consists of two elements. The administrative decision on the desired degree of reliability determines the sample size necessary to meet the specified probability level and precision range. For example, the administrator might specify that he would like his estimate of the ineligibility case rate in the caseload to be within one percentage point of the figure that would be obtained by a complete review of the entire caseload. This is the tolerance specification or limit.

Since the administrator is dealing with a sample he also assumes a certain degree of risk. Thus, in the example given above, if the sampling error had been computed so that the estimate plus or minus one percent includes the value estimated in 95 of 100 repeated samples of the same universe, the estimate plus or minus one percent is the 95-percent confidence interval. The 95-percent confidence interval is approximately equal to plus or minus two standard errors of the normal distribution and is expressed:

95% CI = + 2 SE ()

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This confidence interval covers the true value of "p" about 95 percent of the time when sampling repetitively. Expressed in another way, we can be reasonably confident that about 95 percent of the sample proportions will be within two standard errors of their corresponding population proportion.

By algebraic rearrangement it is possible to compute the sample size needed to obtain the minimum sample size required for 95- percent confidence that a sample proportion p will be within + 1 percent of the true proportion p when p is assumed to be 4 percent; the computation follows:

n = 4p (1-p)

e2

where e is the acceptable error in estimating p.

Substituting 4 percent for p

n = (4) (.04) (1-.04)

(.01)2

n = 1536

In MEQC the sample design is stratified. (See § 7113.) Precision for stratified samples is computed differently from the example shown.

In a stratified sample any estimate for the entire population is computed from information in each stratum or group. Likewise the variance of the estimate must take into account variance information from each stratum, appropriately weighted and combined.

If, in each stratum, a systematic sample (approximating a simple random sample) is chosen the formula for estimating the overall error rate () and its variance is:

=

Nh

  o h and

h=1

VAR () = k (Nn)5 o h (1-h)



h=1 N nh

where:

K is the number of strata,

Nh is the population size in stratum h,

N is the total population size,

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h is the estimated case error rate in stratum h, and

nh is the sample size in stratum h.

The standard error of h is the square root of the estimated variance and is used in the calculation of confidence intervals which are calculated in the same manner as for the nostratified sample.

For example, a sample is drawn from two strata. The population sizes in the strata are 1,000 and 4,000, the sample sizes are 50 and 200, and the case error rate estimates are .05 and .2, respectively. The overall error rate estimate is:

= (.05 x 1000) + (.2 x 4000) = .17

5000 5000

and

Var() = (1000)2 x ((.05)(.95)) + (4000)2 x (.2)(.8)

5000 50 5000 200

= .00055

and SE () = var() = .00055 = .023.

The resulting 95-percent confidence interval is .17 + 2 (.023) or from .124 to .216.

7112. TYPES OF ESTIMATORS

Among the measures computed from sample results are:

A. Totals.--Total dollars paid or total dollars paid in error.

B. Averages.--Average dollars in error per case.

C. Proportions.--The proportion of cases in error.

D. Ratios.--The proportion of dollars in error to total dollars.

E. Regression estimates.--Projections of values based on linear relationships.

Note that all of these estimates have different implicit formulas for the computation of the respective point estimates and confidence intervals. The examples in §7110.2 are based on estimates of proportions, which are simple estimates from a computational standpoint. Ratio estimates of dollar values are more complex and require more sophisticated computations, and thus are not shown here.

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7113. STRATIFICATION

In many populations, the elements may differ markedly, and the measure of variability may be relatively high. Consequently, when a sample is selected, it may be necessary to use a relatively large sample size to achieve a given level of precision. To reduce the sample size for a given level of precision, the universe may be divided into several homogeneous groups so that the elements in each group are more alike than the elements in the total universe. Each group is called a stratum, and the process of dividing the population into groups is called stratification. In general, this allows greater precision for a given sample size or allows a smaller total sample for a given level of precision.

Stratification may be used for other reasons. These include obtaining estimates for particular portions of the population and administrative convenience. (The population may be stratified by geographic locations or some other organization of the population when the population is "naturally stratified.")

The sample selection is performed independently in each stratum, and results are combined based on universe weights. (See §7110.2.)

7120. GENERAL SAMPLING REQUIREMENTS OF MEQC

The MEQC system operates on a 6-month sampling cycle. There are two cycles in each Federal fiscal year. The first is October 1 through March 31, and the second is April 1 through September 30. Each cycle is divided into six monthly periods. Approximately one-sixth of the 6-month sample is selected for each of the 6 review months. (See §§7133 and 7134.) Conduct the reviews according to the MEQC review process. (See Chapter 3.)

To minimize the effort required to select the sample and conduct the required reviews, the AFDC-QC sample is integrated into the MEQC sample to represent that portion of the Medicaid population who are also AFDC recipients.

7121. SAMPLE UNIT

The sample MEQC unit is the Medicaid case. A Medicaid case is:

o For the AFDC population, the case which receives a payment for the month; and

o For noncash payment cases, a group of Medicaid beneficiaries which are subject to Federal matching of State funds for the cost of medical services and are identified on the State eligibility file as a case. Cases are typically identified by a case number which includes a suffix used to identify individual members within the case. In this situation, the sample unit is the higher level case number, ignoring the case member suffix. If you identify cases by multiple level identifiers, e.g., by coverage codes within household groups, then either grouping is acceptable, provided the grouping is defined in the sampling plan. The cases on the file must be mutually exclusive, i.e., Medicaid eligible beneficiaries must not have multiple chances of being selected in the sample. All individuals must be subject to sampling.

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7122. SAMPLE SIZES

Minimum numbers of case reviews to be completed have been established for the medical assistance only (MAO) stratum. (See §7123.) The minimum case reviews to be completed for the AFDC stratum are determined by AFDC-QC. If AFDC-QC sample sizes or requirements change, then MEQC requirements reflect these changes.

Exhibit 1 shows the minimum numbers of case reviews that you are required to complete. Base the number of cases to be selected on these minimum numbers of required case reviews. Select a larger sample than the prescribed minimum sample in consideration of a number of variables, e.g., dropped cases. Federal matching is available for all costs associated with the selection and review (if necessary) of samples larger than the minimum.

You have the option of targeting 25 percent of your MAO sample on focused reviews. You may choose the type of targeted sample selected. The review activity associated with this targeted sample can also be restricted to specific problem areas. The sample selection can be done on a nonrandom basis since the targeted case findings are excluded from the error rate calculation. Your error rate calculation is, therefore, based upon 75 percent of your MAO minimum required sample size.

This 25 percent targeted sample is not intended to reduce your workload. You must maintain equal workload requirements with that currently being done. For example, if you find that you are doing limited reviews requiring half the work with the 25 percent sample, then you must review twice as many targeted cases. The addition of more focused review cases in no way diminishes your responsibility to review 75 percent of the original MAO sample to determine your error rate. The main objective of these targeted reviews is to collect as much information as possible for corrective action purposes. Therefore, target these reviews on problem areas to determine causes and solutions of misspent dollars.

7123. POPULATIONS TO BE SAMPLED

The Medicaid case population in each sample month includes all cases which were listed as eligible for Medicaid during any part of the month (excluding retroactive cases except when using retrospective sampling). The definitions of inclusions and exclusions in the AFDC population are determined by AFDC-QC.

When primary samples are selected prior to the end of the sample month, select a supplemental sample from cases determined eligible between the primary selection and the end of the sample month. Although cases making application in the sample month may not be determined eligible for months subsequent to the sample month, you are not responsible for sampling cases added to the eligibility file after the last day of the sample month. If you select primary samples before the end of the sample month, select a supplemental sample covering cases added up to the end of the month, as identified up to the first file update including the last day of the month.

The eligibility of every Medicaid beneficiary is subject to a review except for:

o Those cases for which Medicaid eligibility was determined by SSA in 1634 contract States;

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o Cases eligible for Medicaid based on title IV-E adoption or foster care;

o Cases funded 100 percent by the Federal Government (e.g., Indo-Chinese, Cuban refugees); and

o Retroactively eligible cases (except in States using retrospective sampling).

Other cases may not be reviewed for other reasons. (See §7230.) However, these cases are not generally identifiable as drops during the sampling process. Any beneficiary not shown as an exception above whose eligibility is not subject to review as part of the AFDC-QC system is included in the MAO populations and thus subject to MEQC eligibility review. Therefore, even if Medicaid beneficiaries' financial circumstances are used in determining the amount of the grant for AFDC, but eligibility for these beneficiaries would not be established in an AFDC-QC review, group them as a case in the medical assistance only population, e.g., an AFDC group with a dependent child not eligible for AFDC because of school attendance or enumeration requirements. Include the following in populations to be sampled:

A. AFDC.--Members of AFDC families who receive cash payments, excluding:

o Presumptive eligibility;

o Death of a payee or applicant;

o Cases in which a check was not received for the review month even

though the name appeared on the payroll from which the sample was drawn (e.g., canceled checks, withheld checks, returned checks);

o AFDC foster care; and

o Emergency assistance.

B. Medical Assistance Only (Non-AFDC Cases).--See §7272 for individual category listings of these cases.

7124. SAMPLING FRAMES

Sampling frames for each population must contain all cases in the population. However, additional items (i.e., listed-in-error (LIE) cases) may be on the list if it is difficult to remove them before sampling. Discard such LIE cases if they were drawn in the sample.

To minimize the risk of bias due to excessive numbers of LIE cases, demonstrate that your sampling frames are at least 98 percent accurate. Perform this demonstration the first time a new sampling frame or program identifier coding scheme is used. This is necessary to ensure that significant numbers of cases are not improperly excluded from sampling due to their being sampled in the wrong stratum. States which do not successfully document 98 percent accuracy must sample from the entire eligibility file or equivalent and determine program participation or LIE status through a field investigation as part of the MEQC review.

To demonstrate sample frame accuracy, select a sample of 400 cases from the entire active Medicaid eligibility list and determine the actual program status of each. Verify program status for AFDC and SSI cash assistance cases (where applicable) by checking AFDC payroll and SDX tape records to verify cash payment. Verify program status for any noncash-based case types against the local case record. If at least 392 of the 400 cases selected are included in the appropriate stratum, the sample frame is considered acceptable. Consider cases which have minor coding errors which do not cause improper omission of a case from a sampling frame as correct for purposes of this test.

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