NEW YORK STATE

Office of the Medicaid Inspector General

Sampling and Extrapolation

JULY 28, 2026

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Office of the Medicaid Inspector General

Overview

AGENCY OVERVIEW

- The Office of the Medicaid Inspector General (OMIG) is an independent entity created within the New York State Department of Health to promote and protect the integrity of the Medicaid program in New York State
- In carrying out its mission, OMIG conducts and coordinates the investigation, detection, audit, and review of Medicaid providers and recipients to ensure they are complying with the laws and regulations

OMIG'S MISSION

Our mission is to enhance the integrity of the New York State Medicaid program by preventing and detecting fraudulent, abusive, and wasteful practices within the Medicaid program and recovering improperly expended Medicaid funds while promoting high-quality patient care.

GUIDING PRINCIPLES

- Maximize Medicaid Program Integrity
- Improve Awareness and Stakeholder Relationships
- Strengthen Compliance and Encourage Self Disclosures
- Promote Quality of Care
- Preserve Medicaid Resources and Access to Care

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Sampling and Extrapolation

Sampling

- **Sampling**, a term used in statistics, is the process of selecting a representative subset of transactions or data from a larger population to draw conclusions about the entire population efficiently and reliably.

Sampling-Based Audits

- OMIG utilizes sampling for field audits
  - Note, a field audit doesn't necessarily involve an on-site visit
- The purpose of these audits is to determine whether a provider's claims for Medicaid reimbursement complied with applicable Federal and State laws, regulations, rules and policies governing the New York State Medicaid Program and to verify that:
  - Medicaid reimbursable services were rendered for the dates billed;
  - appropriate rate codes were billed for services rendered;
  - recipient related records contained the documentation required by the regulations; and,
  - claims for payment were submitted in accordance with Department regulations and the appropriate Provider Manuals.
- This type of audit begins with an entrance conference after receipt of an Audit Notification Letter

Audit Protocols

- Sampling and extrapolation is utilized for audits that follow an approved audit protocol posted to OMIG's website
    - E.g., ALP, DME, Pharmacy, Transportation
- Currently over 30 sets of protocols posted with more in development

Non-Sampling Audits

- OMIG does not utilize sampling for desk/data match audits
  - This type of audit involves the review and analysis of claims and/or encounters using internal data, such as claims data in the Medicaid Data Warehouse, to identify preliminary findings of overpayments
  - Audits begin with the issuance of a Draft Audit Report

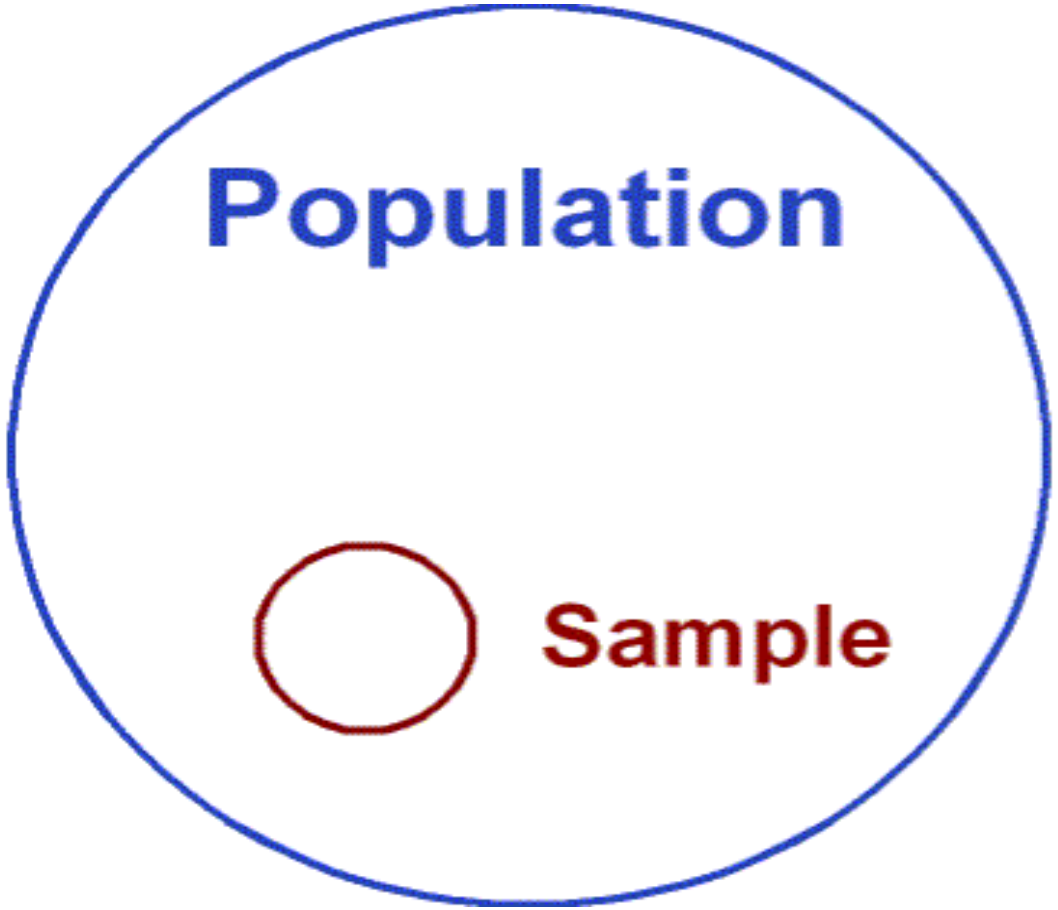
Universe

- The population or universe represents the entire group of units that is the focus of the audit.
    - In an OMIG audit, the population typically consists of all services paid to a particular facility for a specific type of service and time-period.
    - Generally, a universe is defined by claims paid to a single MMIS #, for a three-year period (or less), for select rate codes and/or category of service.

Sample Methodology

- Simple Random Sample
  - service
  - case
- Stratified Sample

Simple Random Sampling: Service



Simple Random Sample of 100 unique services (claims)

Simple Random Sampling - Case

- Patient or Case Sample
- Universe is defined by the unique patient/recipients with paid services during the time period
- Sample unit consists of all paid services within time period for each randomly selected patient/recipient case.
    - Typically, 100 patient/recipient cases

Stratified Sample

- Stratification is the process of dividing the universe into mutually and exhaustive subgroups called strata
- No universe element is excluded
- Often include a larger sample size (up to 250 claims)

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Other Types of Samples

Beneficiary Month Samples

- All services provided to one recipient for one month
- Based on date of services
- Stratified samples of 50

What is Extrapolation?

- A statistical method used to estimate values for an entire population based on a smaller, randomly selected sample. It allows auditors to project findings from a manageable subset of claims to the full universe, saving time and resources while maintaining statistical integrity.

Extrapolation

- 18 NYCRR 519.18(g)
- “An extrapolation based upon an audit utilizing a statistical sampling method certified as valid will be presumed, in the absence of expert testimony and evidence to the contrary, to be an accurate determination of the total overpayments made or penalty to be imposed.”

Extrapolation

- 18 NYCRR 519.18(g)
  - the appellant may submit expert testimony challenging the extrapolation by the department or an actual accounting of all claims paid in rebuttal to the department's proof.

Sample Procedure

- Sample Request
- Sample Creation – OMIG Bureau of Business Intelligence (BBI)
- Sample Finalization
- Claim Analysis/Documentation Review
- Audit Reports

Sample Request

- Provider Name: Great Health Hospital
  - Type: Sample
  - By: Service
  - By: Date of Payment
  - By: Provider ID
  - By: Statewide
  - Sample Size: 100
  - Audit Type: TBI
  - Provider ID: 01234567
  - Category of Service: 0263
  - Payment Period: 01/01/2010 to 12/31/2012
  - Rate Codes: 9850, 9851, 9863

Bureau Of Business Intelligence

- Since claims can be adjusted by a provider for the same service, OMIG staff refines the database to include only one record for each unique claim number
- OMIG utilizes a computer application developed using Wolfram Mathematica, a computational software program used in many scientific, engineering, mathematical and computing fields, based on symbolic mathematics

Bureau Of Business Intelligence

- Mathematica accepts a user generated sampling frame from which to select a user specified sample size
- The application uses the PCs clock to set the seed, selects the necessary number of sampled items, then returns a sample file

BBI - Sample Finalization

- The sample file is subjected to a number of statistical tests, all of which must be passed prior to finalizing the sample

Entrance Conference Meeting

- The audit team explains the Sample Methodology to the provider
  - verbally
  - in writing

Entrance Conference Meeting

- The providers receive a copy of the Sampling Methodology attached to the entrance conference outline

Sampling Methodology – Service Sample

Sampling based audits commence with extractions of a universe of claims from electronic payment records based upon the parameters (such as date range, service types, or rate codes) for the particular audit. This universe is refined into unique claims from which the sample is randomly selected (sampling frame). Since claims can be adjusted by a provider for the same service, OMIG staff refines the database to include only one record for each unique claim number. The unique claims, or sampling frame, are maintained in a file called "Unique IDs.txt" which contains the unique claim identifier and the dollar amount paid for each claim in the sample frame. The universe of claims, which is contained in a Microsoft database, includes claim detail for each of the claims identified in UniqueIDs.txt before the claims were refined into single lines. As a result, the universe of claims includes all of the adjustments made by a provider in seeking reimbursement for a single service up to the date on which the sample and universe were extracted.

OMIG utilizes a computer application developed using Wolfram Mathematica, a computational software program used in many scientific, engineering, mathematical and computing fields, based on symbolic mathematics.

Mathematica accepts a user generated sampling frame from which to select a user specified sample size. The application uses the PCs clock to set the seed, selects the necessary number of sampled items, then returns a sample file called UniqueIDsSample. The resulting sample file is subjected to a number of statistical tests, all of which must be passed prior to finalizing the sample. The application also retains the seed for documentation purposes.

The application also produces an additional file named UniqueIDsDocumentation. This file contains the seed, population mean, sample mean, population size, sample size, results of the statistical tests and the resulting random numbers.

The selected sample records are used to create a table called "Sample Detail". This table includes all original records as well as adjusted records for the unique claims selected as part of the sample. This Sample Detail table contains the claim samples to be reviewed during the course of the audit.

Audit staff reviews the randomly selected sample claims and makes findings of disallowed claims, if any. The disallowed amounts in the sample are then projected over the sampling frame (universe of claims) to arrive at an estimate of the mean dollars in error which is reported in the Draft Audit Report. OMIG's auditors may also calculate the lower confidence limit for a given confidence level and report this information in the Draft Audit Report.

The auditors consider all responses from a provider for each finding associated with each sample. If one finding is eliminated based on a provider response, audit staff considers the remaining findings associated with that sample. Any sample with one or more finding remaining is disallowed on audit. As a result of this, providers should respond to each category of disallowance identified for each sample in an audit.

In cases where there is more than one category of disallowance, a single sample will only be disallowed once in each audit.

Field Work/Analysis

- The Record Review
  - example: 100 services sample
  - the entire audit period is requested for each unique recipient in the sample
    - requested timeframes may be shortened depending on type of audit and the documents being requested

Field Work/Analysis

- The Record Review
  - auditors review all documentation that corresponds to the sample of claims selected for audit
  - if documentation does not support the paid claim, a finding and overpayment amount is identified for that sample

Post Field Work

- Exit Conference Meeting
- Draft Audit Report
- Final Audit Report

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Exit Conference Summary Report

- Prior to the Exit Conference Meeting, OMIG shares with the provider the list of random numbers used to generate the sample, along with the universe and sample information of claims under review in the audit

Exit Conference Summary Report

- Information shared includes:
  - ExitConferenceReport.pdf (random numbers)
  - Access database containing the following four tables:
    - Sample – Random numbers selected for sample and the CRN/TCN of the corresponding claims
    - Sample Detail – Claim detail information for the claims in the sample
    - Unique ID – CRN/TCNs for the universe of claims with the corresponding random numbers and amount paid values
    - Universe – Claim detail information for the universe of claims for the audit period

Audit Reports - Sample Design

- The sample design used for Audit # XX-XXXX was as follows:
  - universe - Medicaid claims for “Type of Service” services paid during the period Month XX, 20XX, through Month XX, 20XX
  - universe size – the universe size is XXX,XXX claims

Audit Reports - Sample Design

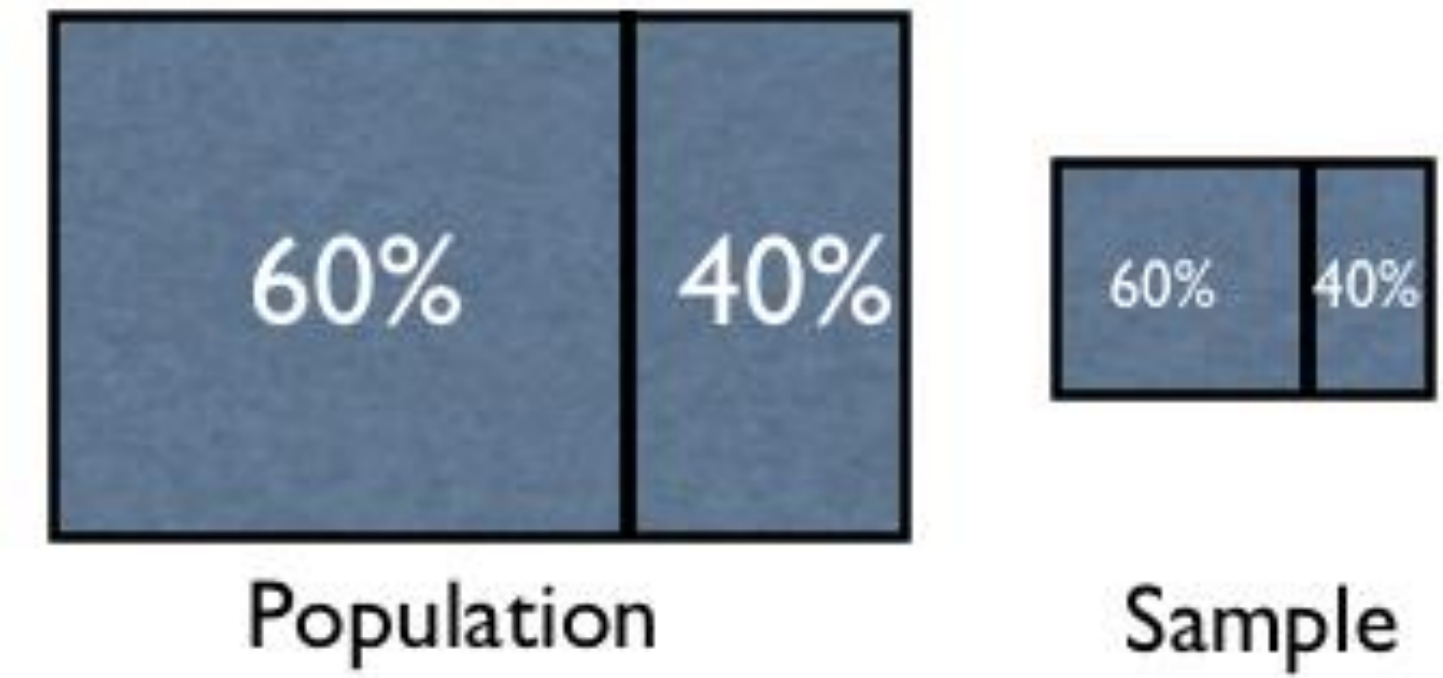
- Sampling Frame - the sampling frame for this objective is the Medicaid electronic database of Provider claims for Type of Service services paid during the period Month XX, 20XX, through Month XX, 20XX
- Sample Unit - The sample unit is a Medicaid claim paid during the period Month XX, 20XX, through Month XX, 20XX
- Sample Design – Simple/Stratified sampling was used for sample selection
- Sample Size – The sample size is XXX claims

Financial Impact – Point Estimate ("Mean")

- The disallowed amounts in the sample are projected over the sampling frame (universe of claims) to arrive at an estimate of the mean dollars in error or point estimate
- Upon completion of the sample review, the point estimate is calculated using the following formula:

  Total Dollar Amount Disallowed in Sample (÷) Number of Claims in Sample (x) Number of Claims in Universe

Audit Results – "MEAN"



Example

- 100 claims were selected from a universe of 12,395 claims
- Total amount disallowed for sample = $1,486.14
- Point estimate = $1,486.14 / 100 * 12,395 = $184,207
- If all claims within the universe were to be reviewed, the actual disallowance could be higher or lower

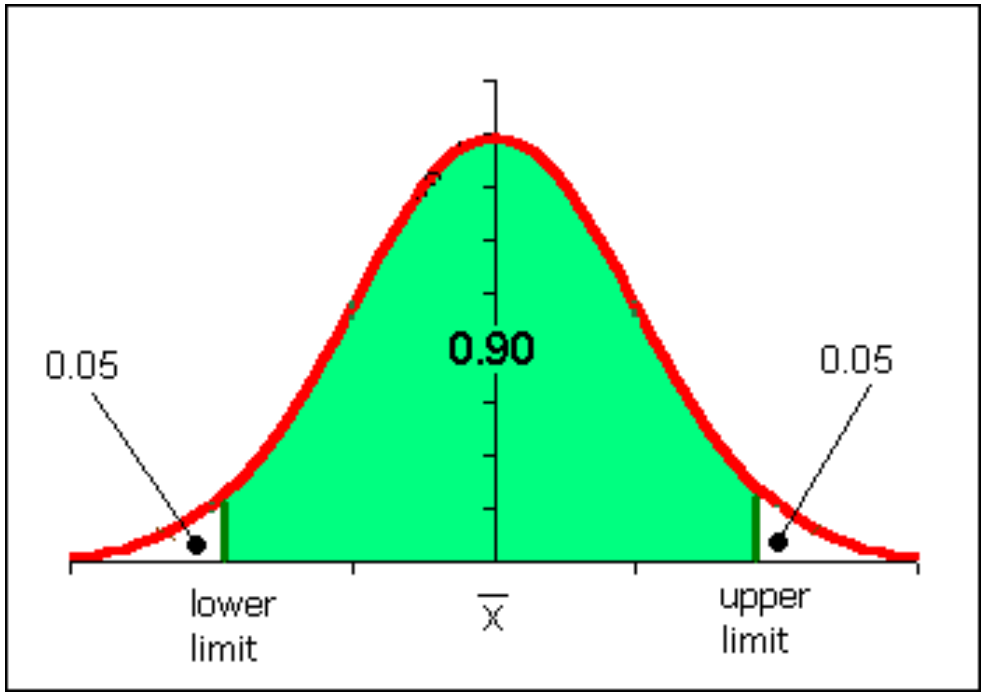
Lower Confidence Interval

CONFIDENCE INTERVAL

$$\text{Confidence Interval} = \pm 1.66039116 \times \frac{\text{Universe Size}}{\text{SQRT of Sample Size}} \times \text{Sample Standard Deviation} \times \text{SQRT}\left(1 - \frac{\text{Sample Size}}{\text{Universe Size}}\right)$$

Low Point Estimate

- Applying the calculated intervals to the point estimate shows the range of values within which there is a 90% certainty the actual disallowance will fall
- This provides a 95% certainty the actual disallowance is greater than the lower limit of the confidence interval
- The midpoint and lower confidence limit amounts are presented to the provider at the Exit Conference and in the Draft and Final Audit Reports



Benefits to the Provider Community

- Statistical sampling and extrapolation result in the estimation of a range of possible values relative to the audit disallowance
- This benefits the provider under audit as OMIG issues audit reports citing the lowest value in that range of possible values (the Low Point)
- OMIG can state with statistical certainty that the Agency is 95% certain that the actual disallowance is greater than this Low Point estimate. Providers may resolve an audit for the low point.
    - Note: At a hearing, OMIG will defend the point estimate

Potential Impacts If Extrapolation Was No Longer Used

- Increased fiscal and administrative burden imposed on providers and administrative agencies
- Limiting OMIG's potential findings and recoveries to only claims directly audited, subsequently requiring OMIG to undertake a claim-by-claim review. As a result, the state would be exposed to liability for findings identified by federal reviews for inappropriate claims it is unable to recover from providers

Summary

- Extrapolation is employed by CMS and HHS OIG in their program integrity functions
- February 2020 HHS OIG Audit: New York Claimed Tens of Millions of Dollars for Opioid Treatment Program Services That Did Not Comply With Medicaid Requirements Intended To Ensure the Quality of Care Provided to Beneficiaries A-02-17-01021 02-04-2020 (hhs.gov)

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Questions

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