

# Sampling and Extrapolation Process

## For the Section of Program Integrity

### **Purpose of audit sampling and extrapolation**

The Section of Program Integrity (PI), within the Washington Health Care Authority (HCA), makes payments to providers of medical goods and services provided to Medicaid qualified recipients. As part of the payment process, PI conducts post-payment reviews to validate payments made.

When there is a large volume of claims involved in a population (universe), auditing the entire population is typically not viable. Therefore, pursuant to WAC 182-502A-0900, a random sample of claims can be selected for the audit. When calculating the amount to be recovered, PI ensures that all improper payments are totaled and extrapolated to the paid claims universe from which the sample was drawn.

### **Universe and Sample Selection Processes**

Statistical methods described in books such as, *Sampling Techniques* by William C. Cochran, have been used to build the claims sampling program in the Fraud and Abuse Detection System (FADS) used by PI. The automated statistical procedures in the FADS comply with generally accepted statistical audit and governmental accounting standards.

Once the provider is selected, the auditor creates a paid claims universe from the data in the FADS warehouse populated by the payment history in ProviderOne. PI may review up to six years of paid claims. It is a general practice to look at 36 months' worth of claims for most audit purposes. The FADS program is used to calculate the statistical characteristics of the paid claims universe and produce a statistical random sample of claims for the agency's auditors to review. Since the focus is on paid claims for amounts paid greater than zero, claims paid at zero and Medicare crossover claims are excluded.

### **Random Sample Selection**

PI stratifies by dollar amount and utilizes a statistical method known as stratified random sampling. The

total sample size is based on a traditional statistical formula (subject to a minimum amount selected). The ultimate sample size depends on the number of claims within certain dollar amount ranges, the variation of claims amounts, and the levels of precision and confidence desired.

PI typically uses a sample size formula that produces with 95% confidence that the upper bound of the estimated claim amount is within 5% of the estimated total correct claim amount.


### **Extrapolation/projection of findings**

The results of the sample claim audit are extrapolated by using a regression estimator and a Normal approximation with a 95% confidence limit. The overpayment amount used by PI is the upper limit of a one-sided 95% confidence interval based on the Normal distribution. All of the research applicable to the process employed by PI consistently supports the conclusion that the regression estimator and the normal approximation of the one-sided confidence limit are slightly conservative to the benefit of the provider.

### **The basis of PI audit sampling and extrapolation**

The core of PI's documentation on audit statistics consists of opinions and validations from independent experts on the topic. A practical definition of well-established statistical techniques is a book by William G. Cochran (1977), *Sampling Techniques*, John Wiley and Sons, New York, third edition. See also Tamura, H. and the Panel on Nonstandard Mixtures of Distributions (1989). *Statistical Models and Analysis in Auditing*. Statistical Science. 4, 1-33.

PI's software implementation of these techniques have been evaluated and validated by independent experts, Dr. John W. Leo (2005) with the firm of Milliman (Seattle) and Lewis and Ellis, Inc. –



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## Definitions

**Claim**-Each item/service/procedure or encounter billed by a provider and paid by the State's Health Care Authority and assigned a claim number (TCN).

**Extrapolation**-The methodology of estimating an unknown value by projecting with a calculated precision (i.e. margin of error) the results of an audited sample to the universe from which the sample was drawn.

**Paid Claims Universe**-A defined population of claims submitted by a provider for payment during a specific time period.

**Sample**-A selection of claims reviewed under a defined audit process.