

**Department of Defense - Defense Health Agency
Improper Payments Elimination and Recovery Act
FY 2014 Sampling Methodology
Military Healthcare Benefits Program**

Purpose:

This document provides background and requests approval from the Office of Management and Budget (OMB) on the Department of Defense (DoD), Defense Health Agency (DHA), Military Health Benefits Program (MHBP) fiscal year (FY) 2014 sampling plan, developed in accordance with the Improper Payment Information Act (IPIA) of 2002, as amended by the Improper Payments Elimination and Recovery Act (IPERA) of 2010. This plan includes calculation of sample sizes necessary to achieve precision goals, a description of the ratio estimator that will be used to calculate the error rate, and a description of the various calculations for the ratio estimator.

Background:

In accordance with Issuance of Revised Parts I and III to Appendix C of OMB Circular A-123, Part I, A) 7) steps one (1) and two (2), DHA performed a risk assessment (RA) for all purchased care contracts under the MHBP to determine contracts susceptible to erroneous payments. Table 1 below shows the MHBP contracts meeting the OMB step 1 guidelines and healthcare cost subject to IPIA sampling. Note that DHA reports payments in arrears, thus this FY 2014 sampling plan covers payments made during FY 2013¹.

FY 2013 Defense Health Agency Costs Subject to Sampling during FY 2014¹		
MHBP - Purchased Care Contracts	Billed Amount	Paid Amount
Active Duty Dental Program (ADDP)	\$ 204,317,011.00	\$ 153,782,647.00
Managed Care Support Contracts (MCSCs)		
MCSC - North Region	\$ 15,268,425,304.02	\$ 3,304,184,293.83
MCSC - South Region	\$ 20,420,101,676.86	\$ 4,037,020,525.48
MCSC - West Region	\$ 14,801,604,030.61	\$ 3,324,854,488.04
TRICARE Dual Eligible Fiscal Intermediary (TDEFIC)	\$ 70,025,810,996.18	\$ 3,160,760,084.81
TRICARE Overseas Program (TOP)	\$ 418,363,695.49	\$ 263,385,740.35
TRICARE Pharmacy Program (TPharm)	\$ 12,112,536,548.99	\$ 4,954,514,537.10
TOTAL	\$ 133,251,159,263.15	\$ 19,198,502,316.61

Table 1: DHA MHBP contracts subject to FY2013 testing

Audits include three sample types: a **paid** sample (to ensure payment accuracy by identifying underpayments and overpayments), a **denied** sample (to ensure proper claim denial), and an **occurrence** sample (to ensure the accurate reporting of healthcare data, regardless of payment accuracy). Paid samples are conducted as a stratified random sample based on paid amounts; denied samples are conducted as a stratified random sample based on billed amounts; and occurrence samples are conducted as a simple random sample with no stratification. DHA

¹ These figures reflect “net records” (adjudication totals after initial claim and any adjustments) as of April 25, 2014. These figures are subject to change through September 30, 2014 due to subsequent adjustments. Providers and beneficiaries have 12 months to submit claims for payment, thus DHA is potentially liable to pay for health care delivered/received in FY2013 until October 1, 2014 or beyond with agency approval.

continually evaluates the accuracy and design of its sampling methodologies for all contracts and implements revisions should they be warranted by audit universe distributions or the outcome of audit results.

Respective to TRICARE contract requirements, samples are drawn on either a quarterly or semi-annual basis and include underwritten and non-underwritten healthcare claims. In addition to quarterly and semi-annual audits, annual healthcare cost (AHCC) audits are performed on the MCSCs to determine the total overpayment amount for underwritten healthcare care costs that is recovered at the end of each option period.

- *Non-Underwritten* healthcare costs are defined as costs that are incurred when the Managed Care Support (MCS) contractor acts as a Fiscal Intermediary for the Government to distribute, or pass-through, Government funds for certain non-underwritten health care benefits. These are not costs to the MCS contractor(s) and are not costs that are reimbursed to the MCS contractor(s) by the Government.
- *Underwritten* healthcare costs are defined as costs that represent covered care unless specifically excluded by the managed care contracts. The underwritten mechanism consists of an underwriting fee which may be considered to be an underwritten premium associated with the risk assumed by the MCS contractor(s). There is potential for the MCS contractor(s) to earn a negative fee if the actual healthcare costs for a given contract year were significantly higher than a specified target cost for the year.

DHA Sampling Designs for FY 2014:

Non-Denied Payment Samples

Overview

Non-Denied payment samples are conducted to identify improper payments and measure payment accuracy.

Depending on the TRICARE contract type, the universe for a paid sample may contain between several hundred thousand to 30 million claims. All claims with a government payment amount above a high-dollar threshold (i.e., \$200,000) are reviewed, and claims below this threshold are randomly sampled based on stratification of the government payment amount. The high-dollar threshold may fluctuate from one audit to the next, depending on the composition of the claims payment universe. Low-dollar thresholds (i.e. claims with government payment amounts < \$100.00) have been established in some contracts for sample exclusion due to historically low error rates for these claims and to ensure efficient utilization of audit resources. DHA pays approximately \$100 per claim for the manual review/adjudication process, so including claims with payment amounts below this threshold does not meet the attempts of DHA and OMB Circular A-123, Appendix C to carry out a cost-effective program for identifying errors.

Stratification

Samples for paid claims include between four and 12 strata, depending on the composition of the claims in the universe. The distribution of claims payments is heavily positively skewed, with the majority of claims payments falling below \$1,000 and others being as high as millions of dollars. Visual analysis of the distribution of payments often yields no clues to any natural strata separation (see Figure 1 below for an illustrative example).

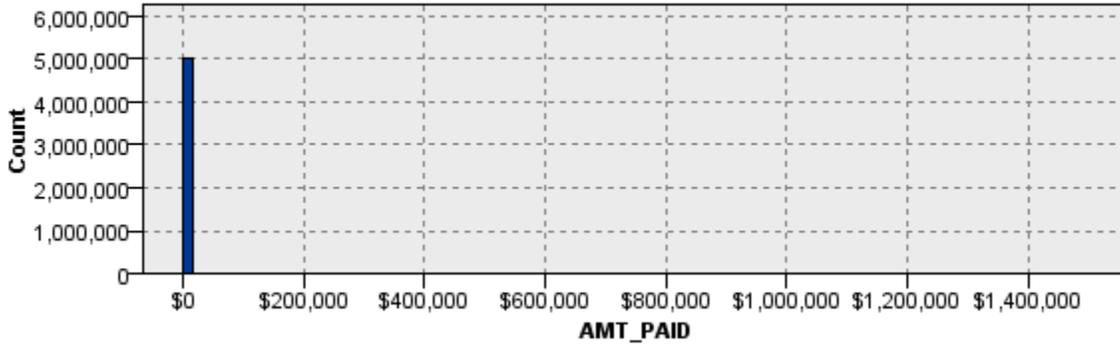


Figure 1 – Typical Distribution of Paid Amounts

Since strata cannot be easily identified via visual analysis of payment distributions, mathematical methods assist in the identification of optimal strata boundaries. The Cumulative Square Root Frequency (CSRf) method is effective for identifying strata boundaries in heavily skewed distributions and is often used in healthcare claims audits². The CSRf method can optimally stratify the universe of records (by payment amount) to reduce variability within each strata and achieve the most efficient sample design. DHA has simulated millions of samples and determined that the CSRf method is the most effective in delineating strata for our sampling needs.

Strata boundaries identified by the CSRf method are rounded slightly to allow generalization and avoid over fitting to one sample universe. For example, a boundary identified to be \$12,519.76 may be rounded to \$12,500.00; or a boundary calculated at \$237,904.12 may be rounded to \$240,000.00. This promotes a cleaner sample design.

Sample Size Calculation

Once the number of strata is chosen and strata boundaries are identified, the sample size for each individual stratum is calculated via **Formula 1** (below) to yield an estimate with a minimum of 90% confidence plus or minus 2.5 percentage points. If additional resources are available, these parameters may be made stricter (up to 99% confidence and/or plus or minus as little as 0.5 percentage point) to be conservative and result in a larger sample size, which would in turn increase the likelihood that the sample meets precision targets.

² Buddhakulsomsiri, J., Parthanadee, P., Kachhal, S. “A Stratified Sampling Plan for Billing Accuracy in Healthcare Systems.” Department of Industrial and Manufacturing Systems Engineering, University of Michigan-Dearborn; Department of Agro-Industry Technology Management, Kasetsart University, Thailand.
http://www.iienet2.org/uploadedfiles/SHSNew/Tools_and_Resources/Sampling%20Plan%20for%20Billing%20Accuracy%20Paper.pdf

Formula 1³:
$$n = \frac{z^2 NV_x^2}{z^2 V_x^2 + (N-1)\epsilon^2}$$

Where:

- n = sample size
- z = reliability coefficient (1.96 for a 95% confidence level)
- N = population size
- V_x^2 = relative variance for the variable x , calculated as $\frac{\sigma_x^2}{\bar{x}^2}$
- ϵ = acceptable error amount expressed as a percentage (i.e., 5%)

The MCSC AHCC audits include up to 10,000 underwritten healthcare claims. This sample size is larger than the result of **Formula 1** (above) to be conservative and provide additional assurance that precision targets are met, which is important since results from AHCC audits are extrapolated to determine the total overpayment amount of the claims universe (discussed in further detail below).

Appendix C of OMB Circular A-123⁴ includes a formula to calculate sample size based on the estimated percentage of improper payments. DHA’s audits consistently show very low payment error rates, with contracts achieving less than a 1.5% payment error rate. Using these error rates in the OMB Circular formula yields sample sizes that are much lower than **Formula 1** and that DHA feels are inadequate to provide acceptable results for our sampling needs.

Further, the OMB Circular notates that the formula “provides for an improper payment rate estimate, but not an estimate of improperly paid dollars.” Also, the formula “assumes that a simple random sample of cases is drawn for review.” Since DHA’s paid samples are intended to estimate improperly paid dollars in addition to the payment error rate, via stratified random sampling rather than simple random sampling, **Formula 1** is more appropriate to calculate sample sizes.

In addition, DHA realizes that the Levy & Lemeshow reference (from which **Formula 1** was obtained) includes alternative formulas to calculate an overall sample size that is then allocated among individual strata. The overall sample size derived via these alternative formulas will be less than the sum of the individual sample sizes calculated via **Formula 1**. After reviewing results of historical audits, DHA chose to practice a conservative approach by sampling a larger number of records for a greater chance of identifying rarely occurring payment errors and to better meet precision targets.

Case Selection Probability

Once claims are stratified and sample sizes are calculated, claims for each stratum are selected via simple random sample. Claims are selected with equal probability. Again, 100% of claims are selected in the stratum covering high-dollar claims.

³ Formula 3.14, page 62; *Sampling of Populations: Methods and Applications*; Levy, P. S. & Lemeshow, S. (1991); New York: John Wiley & Sons.

⁴ Page 7; http://www.whitehouse.gov/sites/default/files/omb/assets/a123/a123_appx-c.pdf

Predictive Analytics

As discussed above, DHA follows a conservative approach to select more records for paid samples than the bare minimum required. While this may result in greater auditing expenses, it better ensures that precision targets will be met for samples. It also helps DHA prepare for upcoming predictive analytics efforts, which can identify problematic areas and trends within the claim adjudication process that lead to payment errors. Predictive models (such as decision trees, neural networks, and logistic regression) are more useful when trained on large data sets (much larger than the minimum sample size needed for target precision levels). DHA understands the balance between short-term efficiency (small sample sizes) and long-term gains (utilizing predictive models to identify problematic areas in claims processing) and follows an approach to balance both goals.

Denied Payment Samples

Overview

The primary purpose of the denied payment sample is to ensure that health care/supplies are not being denied inappropriately by contractors. TRICARE is a triple option benefit plan offering a Health Maintenance Organization (HMO) option, Preferred Provider Organization (PPO) option, and a fee for service option to its over 9.6 million TRICARE eligible beneficiaries. A “payment not made” under this program design is an area that is monitored, as inappropriate denials of claims or obstacles in access to care can occur with managed care.

The TRICARE records that encompass the denied payment sample universe include records with government payment amounts equal to zero as a result of claim cancellation, denial of healthcare services, or claims with zero payment due to 100% payment by Other Health Insurance (OHI).

Stratification

The denied payment sample is similar in design to the payment sample; the primary difference is that the denied sample is stratified based on *billed amount* since the *paid amount* for a denied claim will be \$0. Depending on the contract type, a denied audit universe may contain between several thousand to more than 1 million claims. All claims with billed amounts above a high-dollar threshold (i.e., billed amounts \geq \$200,000) are audited, and similar to the design of the payment sample, a low-dollar threshold may also be implemented. These thresholds may fluctuate across audit cycles and are dependent on the composition of claims in the audit universe. Claims between the thresholds are stratified on the billed amount, and samples include between four and 12 strata. Similar to paid amounts in the payment sample, the distribution of billed amounts is always heavily positively skewed, and the CSRF method is used to identify strata boundaries.

Sample Size Calculation

Once the number of strata is chosen and strata boundaries are identified, the sample size for each individual stratum is calculated to yield an estimate with a minimum of 90% confidence plus or minus up to 7.5 percentage points (via **Formula 1**). If additional resources are available, these parameters may be made stricter to follow a conservative approach that results in a larger sample

size, which would provide additional assurance that precision targets are met. DHA understands that 90% confidence and 15% precision do not conform to IPIA guidance, but the denied claims have zero government liability, so the sampling parameters required to measure payment errors are unjustified. Again, the purpose of the denied sample is to ensure that claims are being denied appropriately, not to measure the accuracy of *paid amounts*.

Case Selection Probability

Similar to the design of the payment sample, claims for each stratum are selected via simple random sample, with equal probability. Again, 100% of claims are selected in the stratum covering high-dollar claims.

Occurrence Samples

Overview

The occurrence sample is intended to monitor and evaluate the accuracy of TRICARE Encounter Data (TED) record coding by the TRICARE contractors, as opposed to identifying payment errors. Accordingly, these records are selected via a simple random sample rather than a stratified random sample. A flat sample size (of up to 350 records) is selected for each occurrence sample, and each record in the sample contains approximately 90+ data fields that are reviewed for accuracy. Records for the occurrence sample are selected with equal probability.

Calculations for Estimating DHA Error Rates and Error Amounts:

Calculation for Determining Payment Error Rate (PER) for IPIA

Once results are obtained for a sample, the payment error rate is calculated for IPIA reporting. The payment error rate is weighted appropriately based on the number of claims in each stratum. This error rate is calculated for all quarterly and semi-annual audits via **Formula 2** below.

Formula 2:
$$PER = \frac{\sum_{h=1}^L N_h \bar{y}_h}{\sum_{h=1}^L P_h}$$

- where:
- PER = Payment Error Rate
 - N_h = number of elements in stratum h
 - \bar{y}_h = mean absolute payment error (in dollars) for stratum h
 - P_h = total paid amount for stratum h

Note:

Historically (FY2013 and prior), DHA used the *billed amount* rather than the *paid amount* as the denominator in **Formula 2**. This was intentional and was required to derive a total payment error rate that combined *paid claims* and *denied claims*. Using the *paid amount* for denied claims that were denied in error would result in an increase to the absolute payment error (numerator) but zero change to the payment amount (denominator), which inflated the overall Payment Error Rate. However, per audit recommendations/findings by the Department of Defense Inspector General (DoD IG) and the Government Accountability Office (GAO), DHA modified the formula to calculate the Payment Error Rate for IPIA reporting purposes. The historical calculation, relying on the billed amount as the denominator, is shown below as **Formula 2b**; this formula is spelled out in detail in MHBP contracts and the TRICARE manuals and is still used to measure contractors' compliance with payment accuracy standards to determine financial awards or penalties as appropriate. However, **Formula 2** (defined above) is now used to calculate error rates for IPIA reporting.

Formula 2b:
$$PR = \frac{\sum_{h=1}^L y_h}{\sum_{h=1}^L b_h}$$

where: PR = Performance Rate
 y_h = total absolute payment error for stratum h
 b_h = total billed amount for stratum h

Note that **Formula 2b** is used to measure contractor performance only; it is not used to report IPIA error rates.

Calculation for Determining the Recovery Amount for the Annual Healthcare Cost (AHCC) Audit

For MCSC AHCC audits, sample overpayments are extrapolated across the universe to project the total overpayment amount. Underpayments are set to zero so as *not* to offset overpayments. The point estimate (E) of total overpayments in the universe, calculated via **Formula 3** below, will be deemed the unallowable cost amount, provided that the lower bound (LB) of a one-sided ninety-percent (90%) confidence interval for E, calculated via **Formula 4** below, is at least 95% as large as E. Otherwise, LB will be deemed as the unallowable cost amount. The unallowable cost amount is recovered from the MCS contractor(s) on an annual basis (through the withholding of future payments or via a direct payment).

Formula 3:⁵

$$X' = \sum_{h=1}^L (N_h \times \bar{x}_h)$$

⁵ Formula 5.6, page 112; *Sampling of Populations: Methods and Applications*; Levy, P. S. & Lemeshow, S. (1991); New York: John Wiley & Sons.

where: X' = Total Overpayment Amount (Point Estimate)
 L = number of strata
 N_h = number of elements in stratum h
 \bar{x}_h = average overpayment amount for stratum h

Formula 4:⁶ $LB = X' - z \times \widehat{SE}(X')$

where: LB = Lower Bound of Total Overpayment Amount
 X' = Total Overpayment Amount
 z = reliability coefficient (1.282 for a one-sided 90% confidence level)
 $\widehat{SE}(X')$ = Estimated standard error of Total Overpayment Amount, defined as⁷

$$\widehat{SE}(X') = \sqrt{\sum_{h=1}^L N_h^2 \times \frac{s_{hx}^2}{n_h} \left(\frac{N_h - n_h}{N_h} \right)}$$

where: $\widehat{SE}(X')$ = Estimated standard error of Total Overpayment Amount
 L = number of strata
 N_h = number of elements in stratum h
 s_{hx} = variance of overpayments in stratum h
 n_h = number of elements sampled in stratum h

Calculation for Determining Occurrence Error Rate

For occurrence samples, which measure the accuracy of TED record coding by the TRICARE contractors, as opposed to determining the accuracy of claims payment, occurrence errors are calculated. This error is measured against contractual performance standards to determine whether contractors receive financial incentives (for meeting performance standards) or withholds (for failing to meet performance standards). The occurrence error rate is calculated via **Formula 5** below.

Formula 5: $OER = \frac{\sum E}{\sum F}$

where: OER = Occurrence Error Rate
 E = Number of errors
 F = Number of data fields

Sampling Plan Certified by:
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⁶ Page 122; *Sampling of Populations: Methods and Applications*; Levy, P. S. & Lemeshow, S. (1991); New York: John Wiley & Sons.

⁷ Formula 6.7, page 121; *Sampling of Populations: Methods and Applications*; Levy, P. S. & Lemeshow, S. (1991); New York: John Wiley & Sons.