RAT-STATS v.2019
New Version, Same Magic

City of
Philadelphia

Agenda

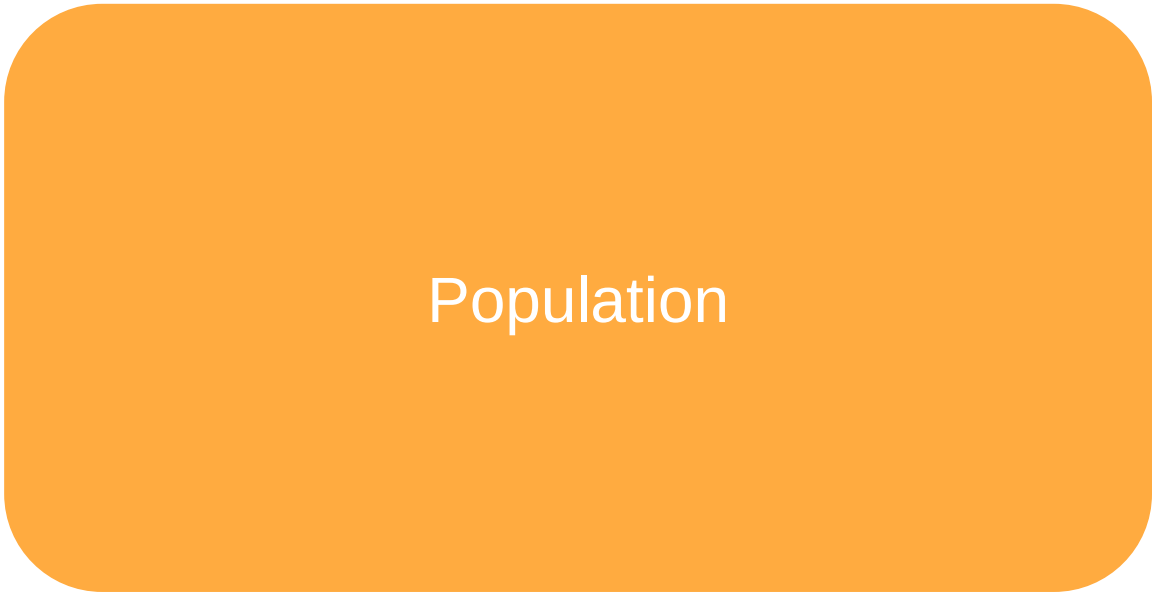
Part I – Let’s Review

Part II – What’s New

Part III – The How To

Let’s Review: Sampling

Sampling is the process by which a subset (sample) of a population is obtained.



Common Terms

Population - The entire pool from which a statistical sample is drawn

Sample - A subset of the population

Sample Frame – Subset of the population defined as variables of interest from which the sample will be randomly selected and over which the sample will be extrapolated

Sampling Unit – What is measured in the audit

Confidence Interval – The probability that the value of a parameter falls within a specified range of values

Common Terms

Precision Point – A measure of the closeness of the sample estimate and the corresponding population value

*Simple random sampling** – The probability of being selected into the sample is known and equal for all members of the population.

Stratification – The process of dividing the population into different sub-groups or strata

Stratified sampling – separates the population into different subgroups and then samples all the subgroups

When Can It Be Used?

- Probe Audit
  - Monitoring tool to assess risk within your agency
- Self Audit
  - Following a probe audit or to investigate an allegation
  - According to OIG Self Disclosure Protocol:

    (1) Review all the claims affected

    OR

    (2) Review a statistically valid random sample of the claims

The Process

1 – Define the population

2 – Identify the sampling frame

3 – Select a sampling design or procedure

4 – Determine sample size

5 – Draw the sample

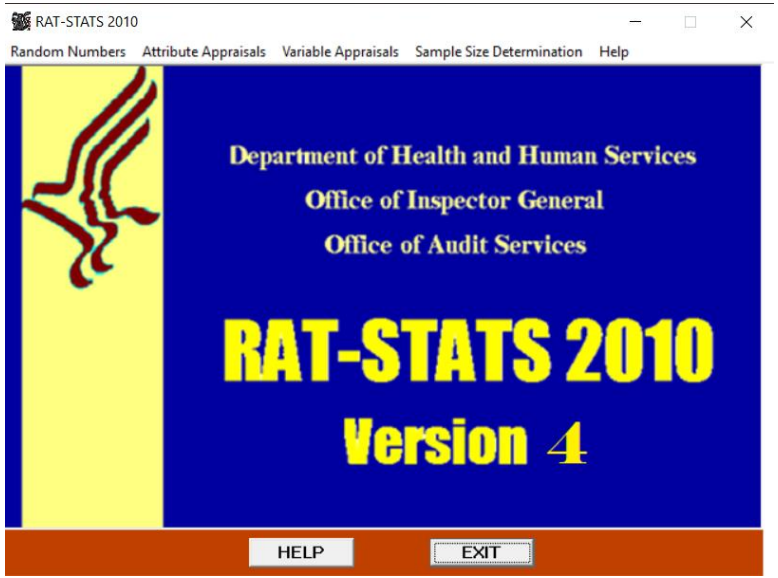
Trust the Process!

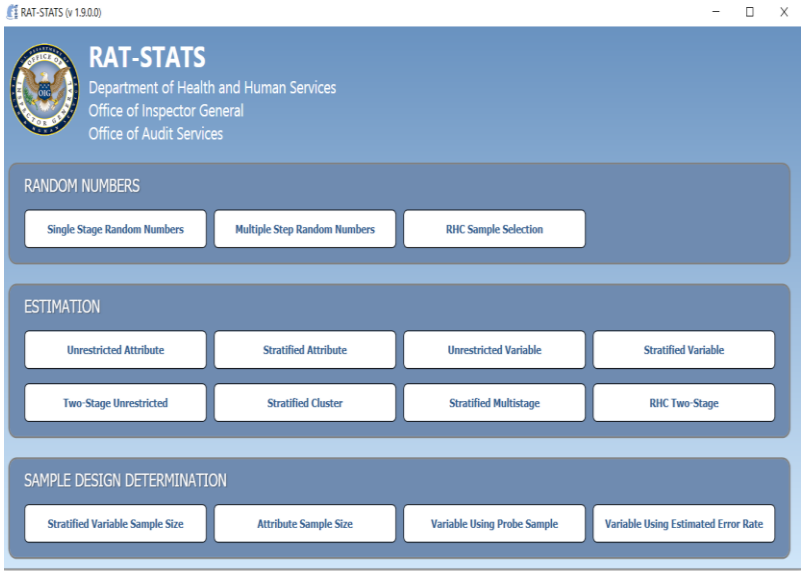
- *If a particular probability sample design is properly executed, i.e., defining the universe, the frame, the sampling units, using proper randomization, accurately measuring the variables of interest, and using the correct formulas for estimation, then assertions that the sample and its resulting estimates are "not statistically valid" cannot legitimately be made. In other words, a probability sample and its results are always "valid."*

CMS Medicare guidelines
CMS Pub.100-08 Chapter 3 Section 10.2

What’s New: RAT-STATS

Out with the old, in with the new…sort of





Overview of Changes

- Capable of replicating same data as 2010 version
- Bug Fixes
- Modules Removed
  - Unused by OIG in past 5 years.
- New Features
  - Option to calculate a confidence interval using the empirical likelihood3 approach for unrestricted and stratified variable appraisals.
  - Option to generate custom confidence levels in the Unrestricted Attribute and Stratified Attribute Appraisal modules.
  - All content able to be displayed in text alternative file.

What Can It Do?

- Determines statistically valid sample size
- Generates replicable random number sets through seed numbers*
- Determines a range of financial impacts based on the sample reviewed

*Always document the seed number, so that your work can be replicated either by another person in your agency or an outside source

The Magic Illustrated

02884	51660	70826	85588	18274	08052	18961	14256	38058	56342	76167
93679	32247	13901	70616	14186	86081	31327	06546	66771	72200	66356
12336	10034	48014	59603	91995	62098	43701	41903	62012	26290	53394
30669	24170	91952	87500	72920	94218	16402	35367	90672	81904	55516
99833	77732	66855	99773	93907	51588	02050	48899	07396	53529	94004
00726	72459	34205	11878	08881	71552	91247	02786	75048	81377	61797
24547	34264	17729	48237	57758	94812	80546	51413	98351	47669	23073
60444	73735	51582	08636	34439	59882	93752	05295	99956	21851	57281
52033	71254	60923	18668	58928	16413	52912	85303	56215	57974	52960
03439	19812	50666	11931	85406	36923	35296	75157	69385	89015	91935
63643	14169	11439	91839	77757	07399	50034	46195	29263	34156	50939
84413	75487	50353	25236	70894	16752	49434	84365	49392	38607	36825
39788	22564	88266	17815	42957	44916	50629	67469	08766	28179	83777
65497	89521	98888	20220	26678	39695	72219	53670	90999	77713	90221
45133	84470	81225	65416	33222	37416	95751	26745	59514	52703	92393
50480	41957	81926	62575	87711	04801	94784	44824	03488	94897	37218
68890	45536	13515	84574	40166	85835	55242	96525	17910	36805	74718
97551	55884	37226	17927	20397	23014	53829	39137	68705	67276	78490

^Example of a Random Number Set

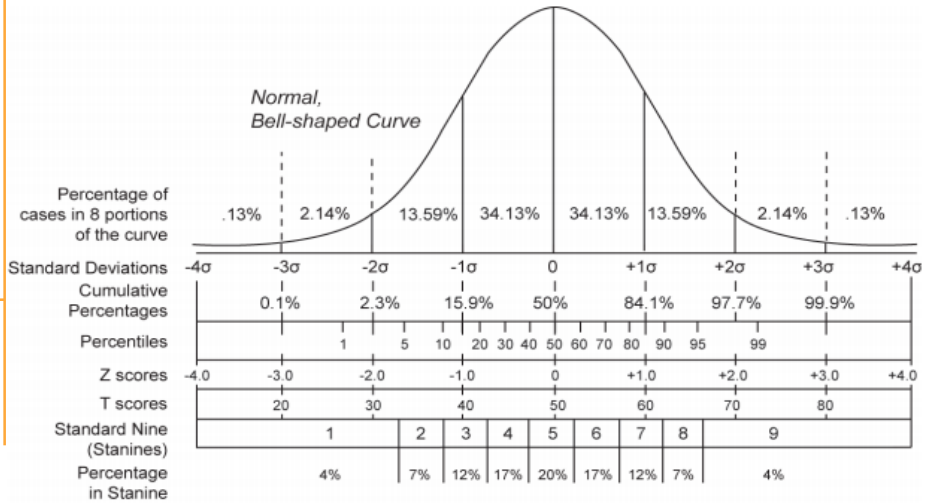
$$Point\ estimate \pm \alpha \frac{chosen\ confidence}{2} \cdot sample\ sd \cdot \sqrt{\frac{frame\ size(frame\ size - sample\ size)}{sample\ size}}$$

^Formula to determine Confidence

$$n = \frac{(StdDev \times N)^2}{(\frac{E}{ZVAL})^2 + N \times (StdDev)^2}$$

$$sample\ size = \frac{(StdDev \times frame\ size)^2}{(\frac{\frac{Chosen\ Precission}{100} \cdot frame\ mean \cdot frame\ size}{chosen\ confidence\ level})^2 + frame\ size \times (StdDev)^2}$$

$$sample\ size = \frac{(StdDev \times frame\ size)^2}{(\frac{10\% \cdot frame\ mean \cdot frame\ size}{90})^2 + frame\ size \times (StdDev)^2}$$



How To: Application

Takeaways

- RAT-STATS software used by both OIG and CMS
  – Also used by CBH to develop samples in both probe audits and targeted audits
- Strengthens agency's ability to monitor for issues related to Fraud, Waste, and Abuse
- Can also be used for internal audits and sample creation for self audits
- Sampling with RAT-STATS is both efficient and accurate

References

- Center for Medicare and Medicaid Services. 2018. *Publication 100-08 - Medicare Program Integrity Manual*. https://www.cms.gov/Regulations-and-Guidance/Guidance/Manuals/Internet-Only-Manuals-IOMs-Items/CMS019033.html.
- Office of Inspector General - U.S. Department of Health & Human Services. 2013. *Provider Self-Disclosure Protocol*. https://oig.hhs.gov/compliance/self-disclosure-info/protocol.asp.
- RAT-STATS Statistical Software - https://oig.hhs.gov/compliance/rat-stats/index.asp

Here to Help!

RAT-STATS Walkthrough Guide

https://cbhphilly.org/cbh-providers/oversight-and-monitoring/audit-tools/

Got questions? No problem, we are here to help!

cbh.compliancecontact@phila.gov


Thank you!
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