



IHA P4P Project Episode-Based Efficiency Measurement

Presented by:
William D. Marder, PhD
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HEALTHCARE



THOMSON REUTERS

Outline

- Context of the IHA project
- What did we do?
 - Collect claims and encounter data
 - Create episodes of care
 - Classify episodes of care
 - Compare each Physician Organization's (PO's) episodes to comparable episodes from across the state
 - Summarize the comparisons in a report
- What's next?



Integrated Healthcare Association

- Pay-for-performance
 - Quality
 - Efficiency
- Among the ways to measure cost efficiency is to look at the cost of treating different diseases and adjust for:
 - Disease severity
 - Patient complexity
- Compare adjusted costs across POs and potentially reward lower costs



What did we do?

- Collected 2006 claims and encounters from 6 health plans:
 - Aetna
 - Anthem Blue Cross
 - Blue Shield of California
 - Health Net
 - UnitedHealthcare/Pacificare
 - Western Health Advantage
- Evaluated data quality
 - Clearly issues
 - Ultimately dropped Outpatient Facility data



What did we do?

- Assigned standard costs to the claims and encounters
 - Comparisons really compare utilization differences and not negotiating strength on provider discounts
 - Particularly important for inpatient care
- Grouped claims and encounters into episodes of care using the Thomson Reuters Medical Episode Grouper (MEG)
 - MEG is based on Disease Staging



Disease Staging Framework

- Initially developed under contract to NCHSR with ongoing private development by Medstat/Jefferson teams
 - NCHSR became AHRQ
 - Medstat became Thomson Reuters
 - Thomas Jefferson University kept the same name
- Takes over 15,000 ICD-9-CM codes to 560 disease categories
- Independent of setting or treatment
- Etiology assigned to each category
- Severity stratification based on robust clinical criteria



Disease Staging Patient Classification System

- Definitions
 - Diseases - are viewed as well -defined models of disruption in the normal homeostasis of psychological and physiological systems.
 - Diagnoses - should have information documenting the four elements required to define disease problems: location, manifestation, cause and severity.
 - Severity - is defined as the likelihood of death or residual impairment as a result of a disease, without consideration of treatment.

Gonnella, JS, Hornbrook, MC, Louis, DZ, Staging of disease, a case-mix measurement, *JAMA*, Feb. 3, 1984, v251,5, pps. 637-644.



Severity of Illness

Severity...”measures can be broadly split into those that implicitly or explicitly define severity based on resource use (e.g., cost, length of stay) and those that focus on more clinical definitions (e.g., risk of death, treatment difficulty, clinical instability).”

Iezzoni, LI, ed. *Risk Adjustment for Measuring Health Care Outcomes*, Health Administration Press, Ann Arbor, MI, 1994, p.4.



Severity of Illness

- “Severe diseases may receive highly intensive treatments, and severe diseases may be fatal, but service intensity does not imply higher severity, and even the occurrence of death does not mean a particular disease was severe. “
- “To avoid confounding with health care provider responses to specific patients, disease severity should be measured prior to any intervention. Intervention, if appropriate, will reduce severity or even cure the disease. The main rationale for this distinction is that for a given severity level, we want to be able to relate quality of care to speed of response to therapy.”

Disease Severity Adjustment Software Evaluation For the Healthcare Cost and Utilization Project,” Deliverable #4, Final Report, Part 1: Technical Evaluation, Mark C. Hornbrook, PhD, submitted to Center for Organization and Delivery Studies, Agency for Healthcare Research and Quality, March 19, 2003.



Disease Staging Patient Classification System

Stage 0	History of a disease
Stage 1	Conditions with no complications or problems of minimal severity.
Stage 2	Problems limited to an organ system; significant increased risk of complications.
Stage 3	Multiple site involvement; generalized systemic involvement; poor prognosis.
Stage 4	Death



DISEASE: Coronary Artery Disease with prior Coronary Revascularization

ETIOLOGY: Degenerative, Genetic

STAGE	DESCRIPTION	DIAGNOSTIC FINDINGS	
1.1	Coronary atherosclerosis or asymptomatic chronic ischemic heart disease or old myocardial infarction	Coronary atherosclerosis OR asymptomatic chronic ischemic heart disease OR old myocardial infarction OR history of myocardial infarction ≥30 days old AND ejection fraction ≥ 50% [echocardiogram report or nuclear ejection fraction report]	Dx V4581, 99603, 41402-41407; (Dx 41181, 412, 41400-41405, 4292) + (Dx V4581, 99603)
1.2	Chronic stable exertional angina or chronic ischemic heart disease	Chronic stable exertional angina OR chronic ischemic heart disease	(Dx 4139, 4148-4149) + (Dx V4581, 99603)
2.1	Progressing angina pectoris or exertional myocardial ischemia at low workload or old myocardial infarction with low ejection fraction	Progressing angina pectoris OR exercise induced myocardial ischemia at < 6 METS [stress test report] OR history of prior myocardial infarction ≥ 30 days AND left ventricular ejection fraction < 50% [echocardiogram report or nuclear ejection fraction report] AND left ventricular ejection fraction >= 30% [echocardiogram report or nuclear ejection fraction report]	(Dx 4110, 41189) + (Dx V4581, 99603)
2.2	Prinzmetal's variant angina	Change in nature of onset of symptoms and severity of known anginal pain AND past history of angina OR angina occurring at rest AND ST-T elevations at time of pain [EKG report] OR Prinzmetal's variant angina	Dx 4130-4131 + (Dx V4581, 99603)

Episodes of Care

- Health care is typically provided in a series of separate but related services.
- All of these services must be included to produce a comprehensive economic analysis of the health care delivery system.
- Using an episode approach enables a more appropriate assessment of costs of care and lends itself to the analysis of the processes as well as the outcomes of care.

- Source: Hornbrook MC, Hurtado AV and Johnson RE, Health care episodes: definition, measurement and use, *Medical Care Review* 42:2 (Fall 1985)



Episode Construction

- Case Mix Adjustment - Diagnosis codes from healthcare claims and other administrative data are grouped into one of the over 560 Disease Staging disease categories and severity stages.
- Clean periods unique to each disease category are used to group each claim into an episode.
- Mappings of National Drug Codes (NDCs) to episode groups enables pharmacy claims to be grouped to relevant episodes.
- Less specific episode groups occurring in close proximity to specific episodes are combined with the specific episodes, e.g. "other gastrointestinal or abdominal symptoms" and "appendicitis".
- Lab and diagnostic imaging claims preceding an episode are examined to determine whether they should be combined with the episode.



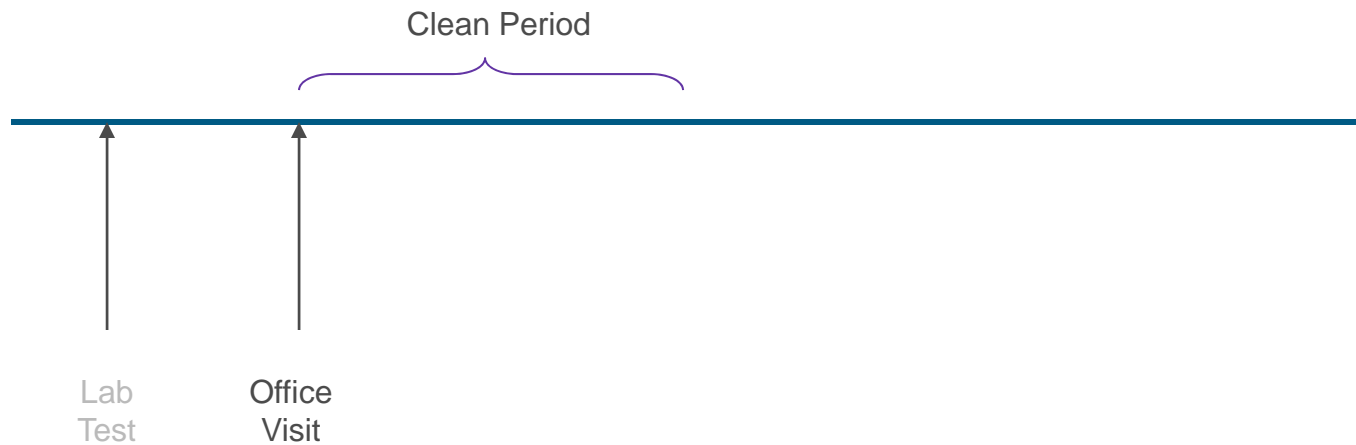
Episode Construction - Example



Diagnostic imaging and lab claims cannot open an episode.



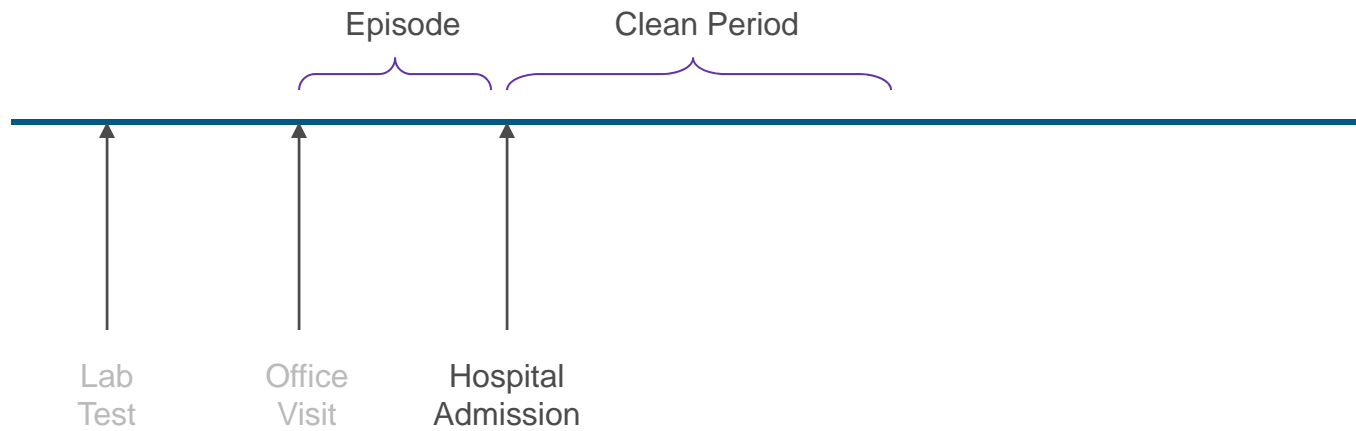
Episode Construction - Example



An office visit or hospital admission creates the episode and the clean period is established.



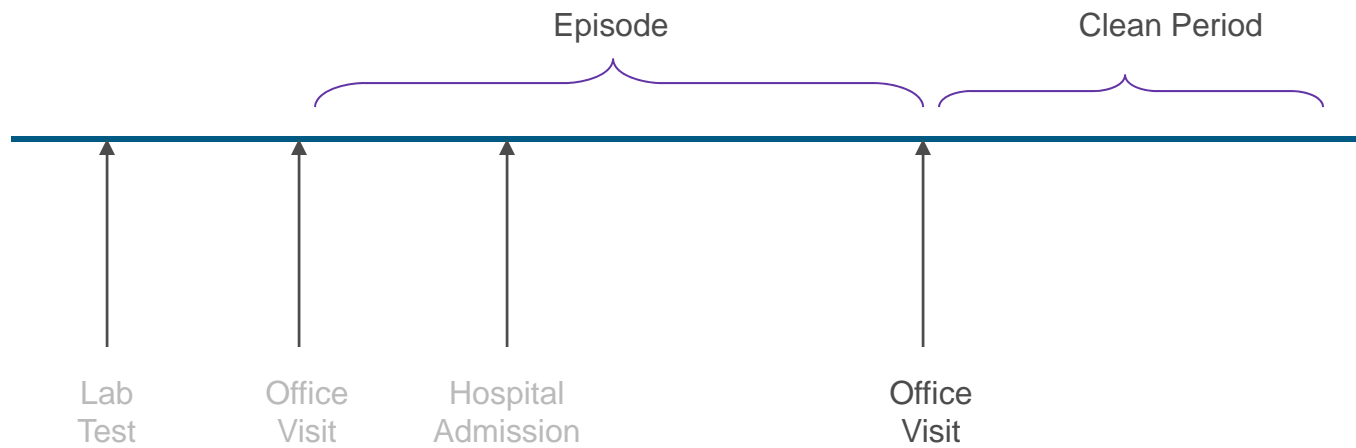
Episode Construction - Example



A second event, a hospital admission, falls within the clean period and extends the episode. The clean period is reset.



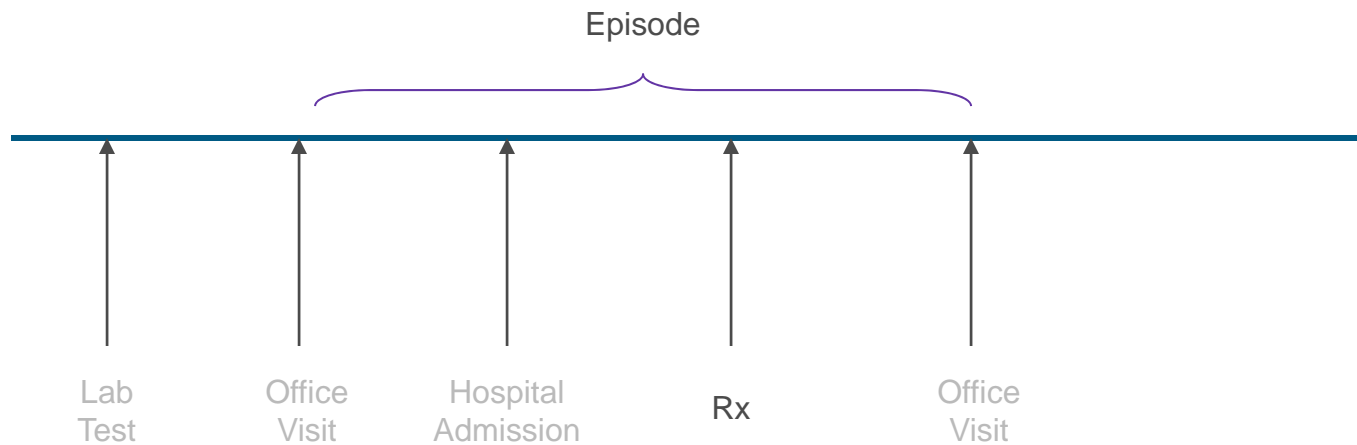
Episode Construction - Example



An office visit follows the hospital stay, falls within the clean period and extends the episode.



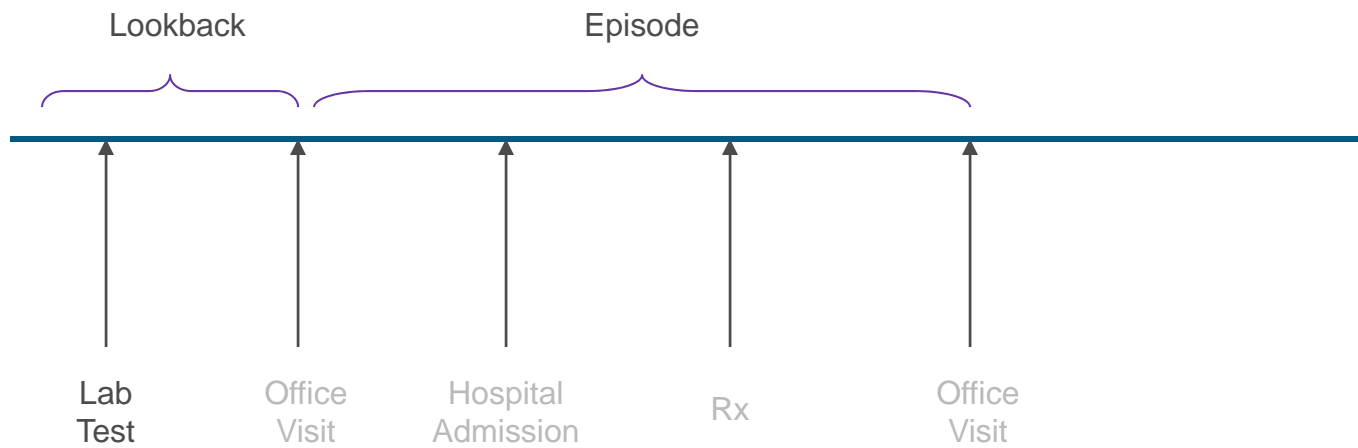
Episode Construction - Example



No additional claims related to the episode fall within the clean period and the episode ends. Drug claims are analyzed and mapped to the episode.



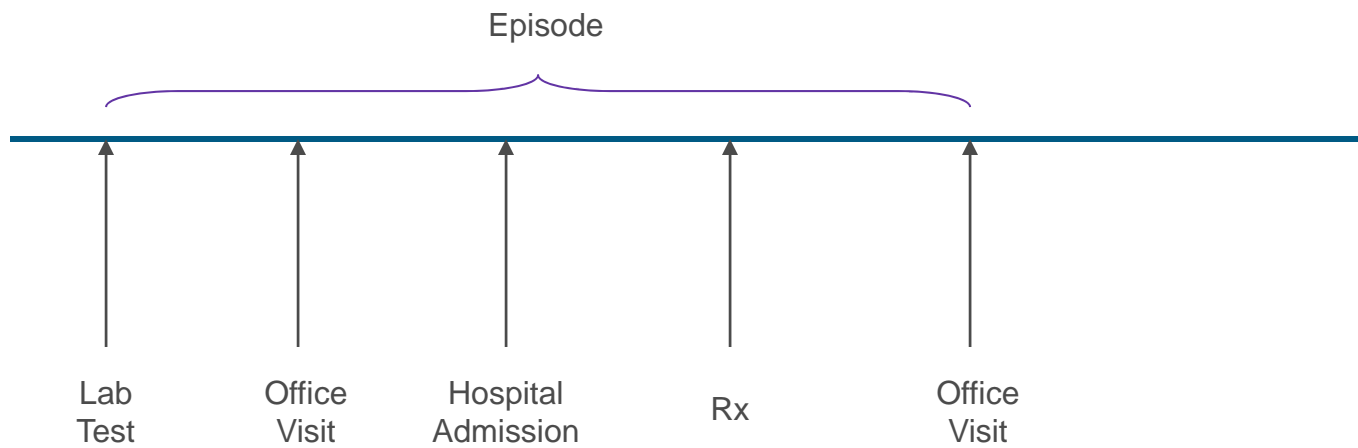
Episode Construction - Example



A lookback period is used to capture relevant diagnostic imaging and lab claims which precede the episode.



Episode Construction - Example



The complete episode ranges in time between the lab test and the final office visit



Risk Adjusted Episodes



The Problem



Patient A

Progressive Angina

2005 Costs ~ \$15,323

62 year old, Male

Comorbidities

- Diabetes
- Deep vein thrombosis
- Impaired fasting glucose
- COPD

Relative Risk Index = 56.38



Patient B

Progressive Angina

2005 Costs ~ \$5,974

58 year old, Female

Comorbidities

- Hypertension, minimal

Relative Risk Index = 5.54

Patients with at the same severity level within an episode can have significant cost variance....

...due to different comorbidity profiles.



Episodes and Population-based Risk Adjustment

- MEG
 - Disease-based episodes of care, e.g., Coronary Artery Disease and Diabetes.
 - Disease severity predicated on the progression of medical complications of a disease, e.g., Coronary Artery Disease:
 - Stage 1: Stable angina
 - Stage 2: Progressive Angina
 - Stage 3: AMI
 - Unit of analysis – an episode
- DCGs
 - Risk adjustment methodology used to predict current or future patient costs, e.g. relative risk score (RRS)
 - Unit of analysis – the patient
- Together, MEG and DCGs provide a complete picture of a patient.



Calculating a Patient's Risk Score

Risk Categories	Relative Risk Score
55 year old male	.45
<u>HCCs</u>	
Diabetes with renal manifestations	5.71
Type 1 diabetes	.95
Congestive heart failure	1.84
Acute myocardial infarction	.92
Vascular disease with complication	1.20
Vascular disease	0 (h)
Dialysis status	18.09
Diabetes with congestive heart failure	.46
	29.62

Used with permission of DxCG



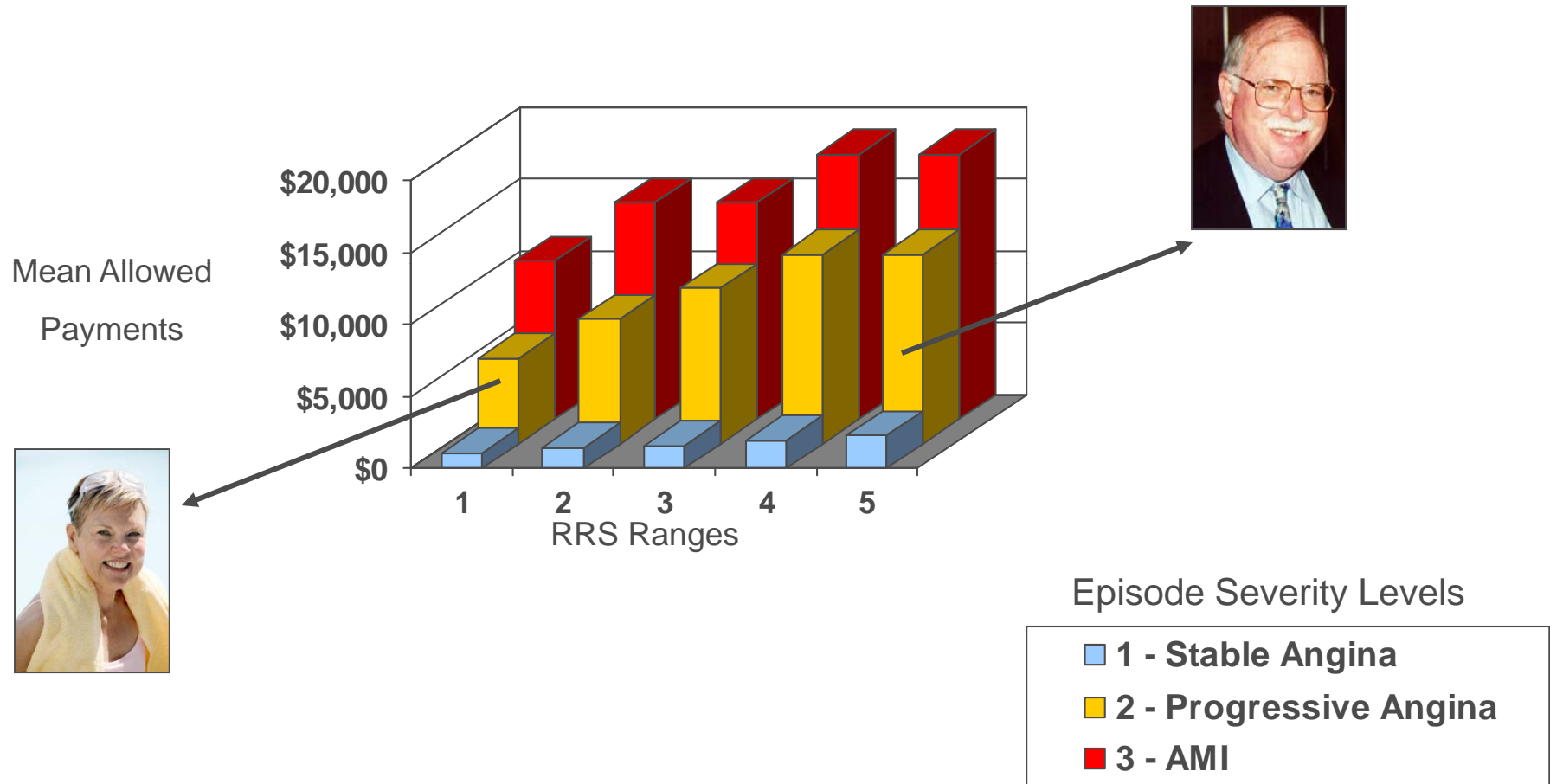
Coronary Artery Disease

	Severity Stage	Complexity Levels				
		Mean Allowed Payments				
		1	2	3	4	5
Stable Angina	1	\$1,080	\$1,424	\$1,679	\$1,940	\$2,246
Progressive Angina	2	\$5,974	\$8,704	\$10,825	\$13,173	\$10,609
Acute Myocardial Infarction	3	\$11,041	\$15,041	\$15,041	\$18,423	\$18,423

Source: Medstat Health Plan Customer, 83 million claims, 2003-2004



Dimensions of Risk – Coronary Artery Disease



Source: Medstat Health Plan Customer, 83 Million Claims, 2003-2004

What did we do?

- Collect claims and encounter data
- Create episodes of care
- Classify episodes of care
- **Compare each Physician Organization's (PO's) episodes to comparable episodes from across the state**
- Summarize the comparisons in a report



Episode-Based Efficiency Measurement

- New analytic method (published in MedPAC report) now available to quantify efficiency by episode of care:

“Are resources used by a PO to treat its mix of patients more or less efficient than average resources used in California to treat patients with the same characteristics?”

- New approach for including service categories in efficiency measure

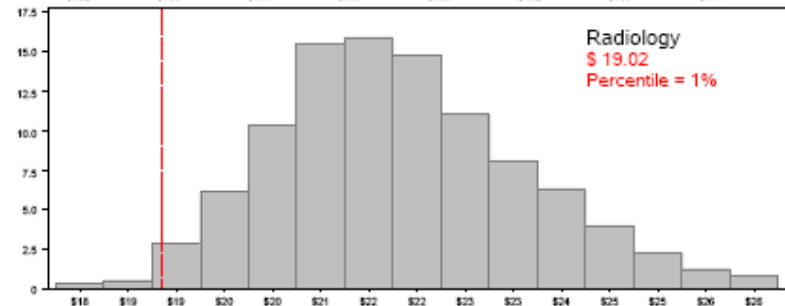
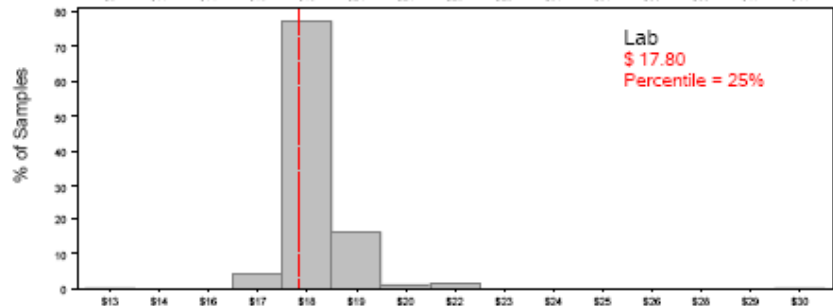
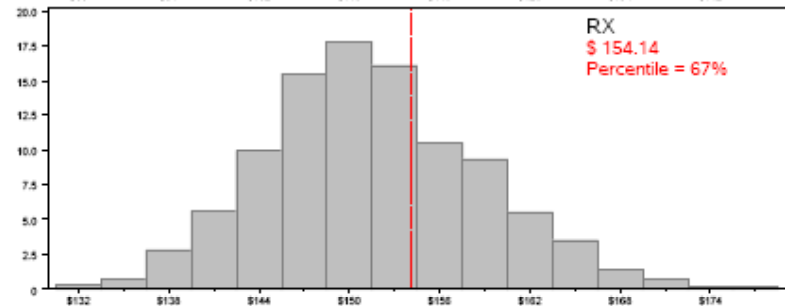
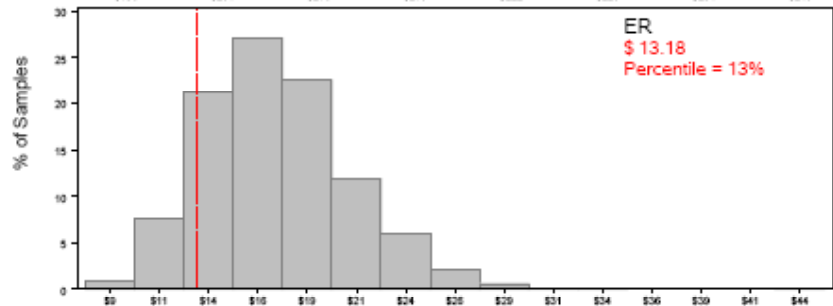
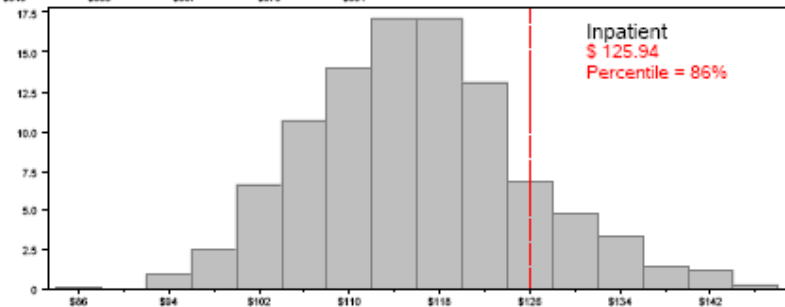
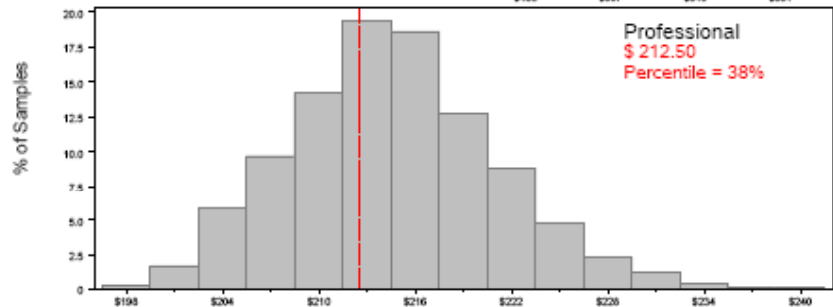
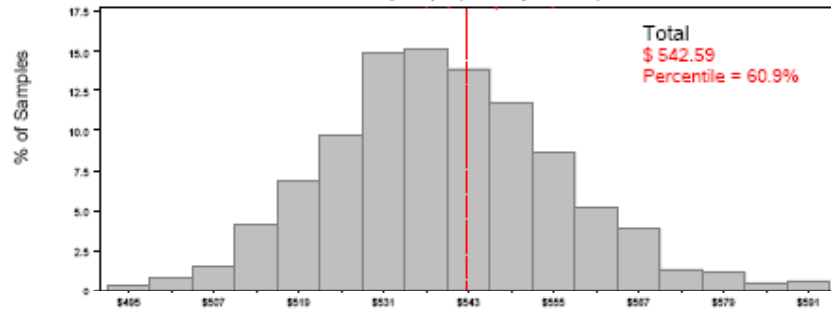


Use the combined 2006 data asset for comparison

- Classify all episodes of care from all plans/POs
- Create samples for each PO that mirror that PO's mix of episodes/patients
- Compare the actual experience of the PO to the distribution of outcomes from the comparative samples
 - Overall
 - For the component parts
 - For selected conditions



PO Episode Efficiency Results
 Episode = Overall Episode Efficiency
 PO = Group A (29,387 Episodes)

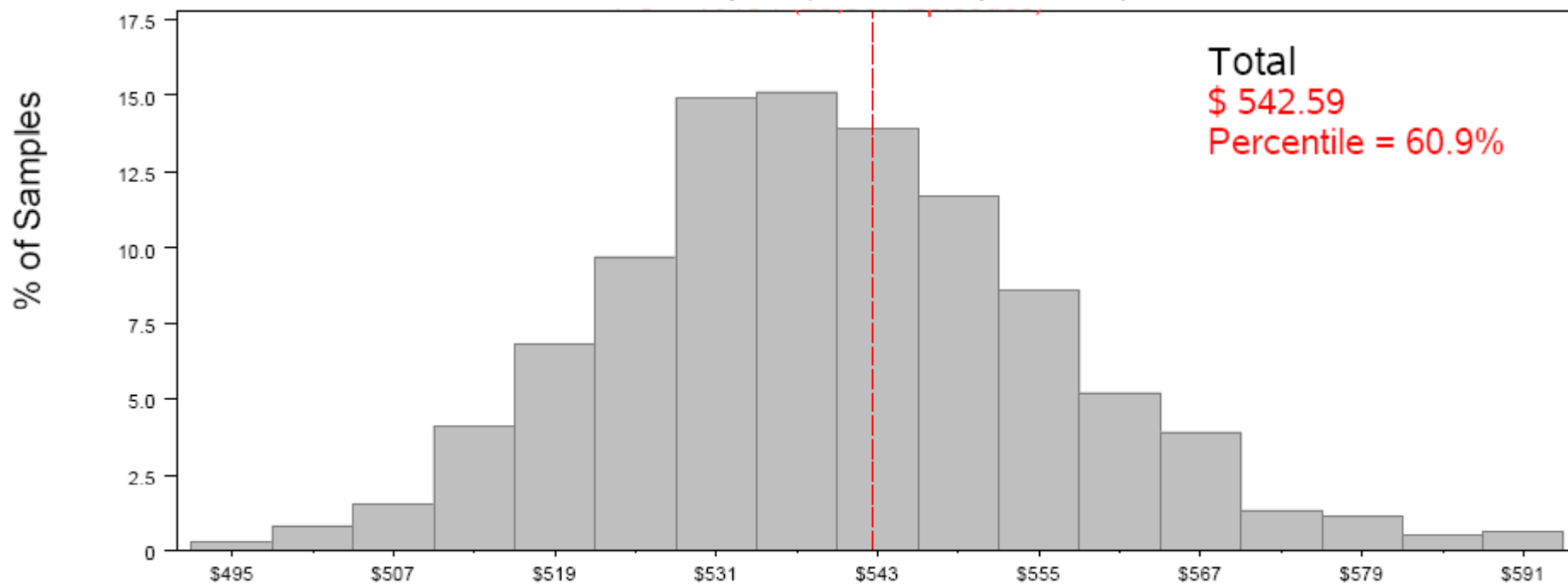


Mean Standardized Costs

Mean Standardized Costs

Note: The green bar next to each histogram indicates the percentage of total dollars represented by that service category.

PO Episode Efficiency Results
Episode = Overall Episode Efficiency
PO = Group A (29,387 Episodes)



Total
\$ 542.59
Percentile = 60.9%



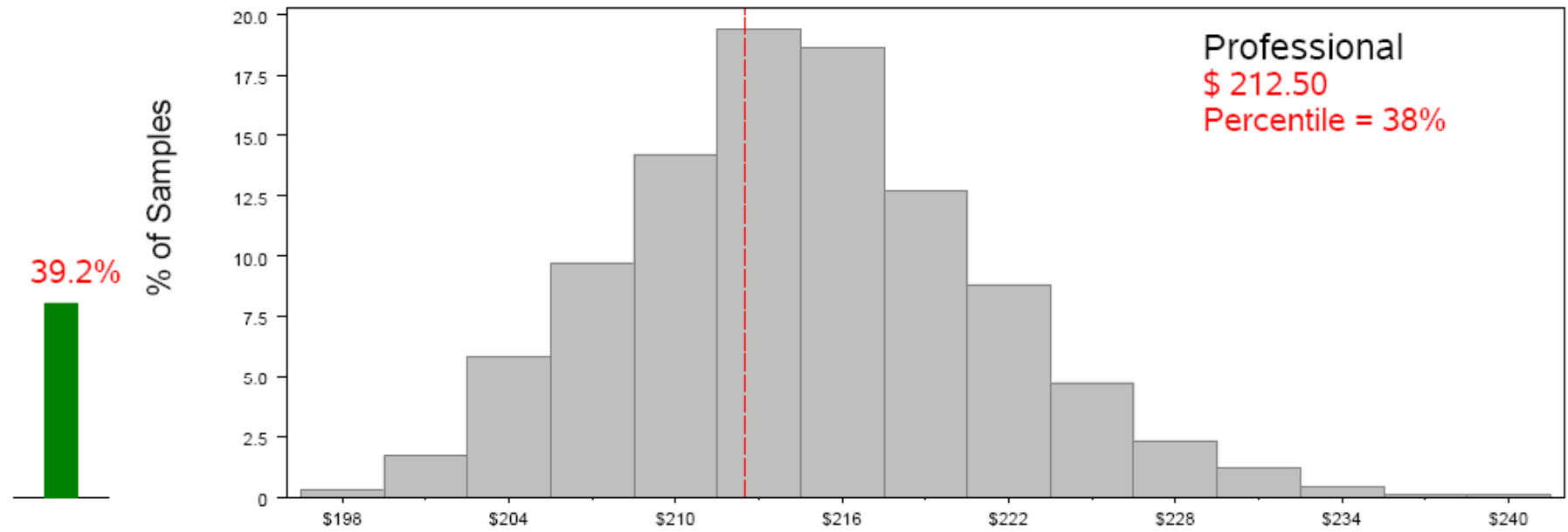
COMPONENT PARTS



PO Episode Efficiency Results

Episode = Overall Episode Efficiency

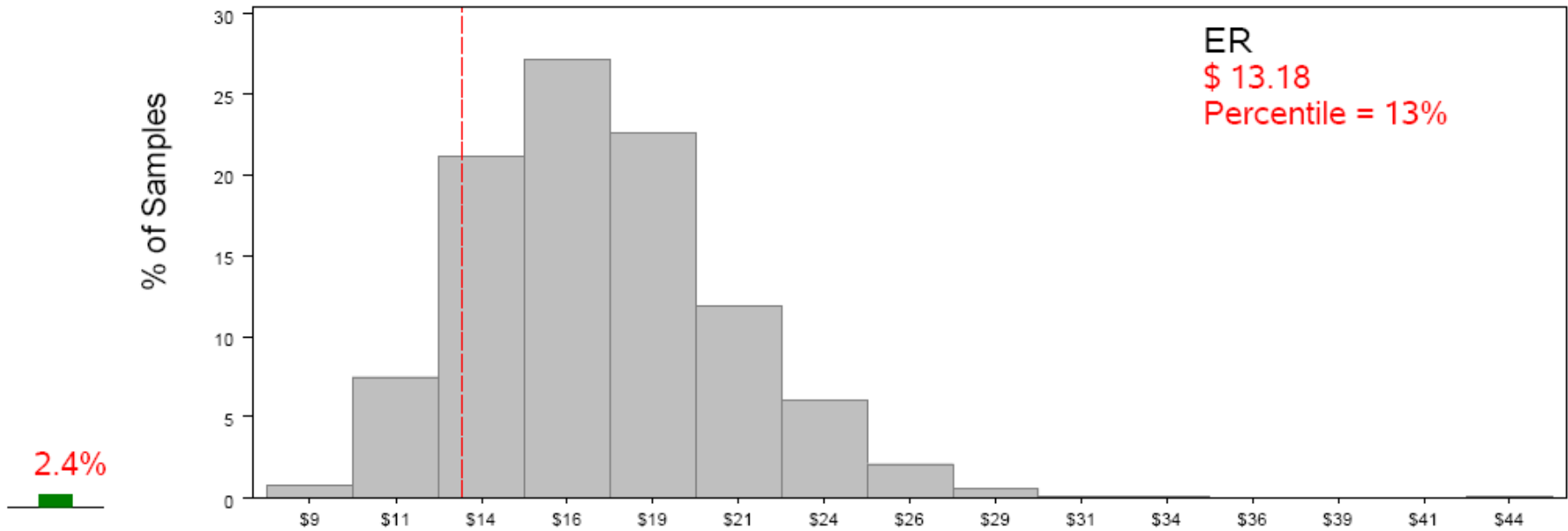
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PO Episode Efficiency Results

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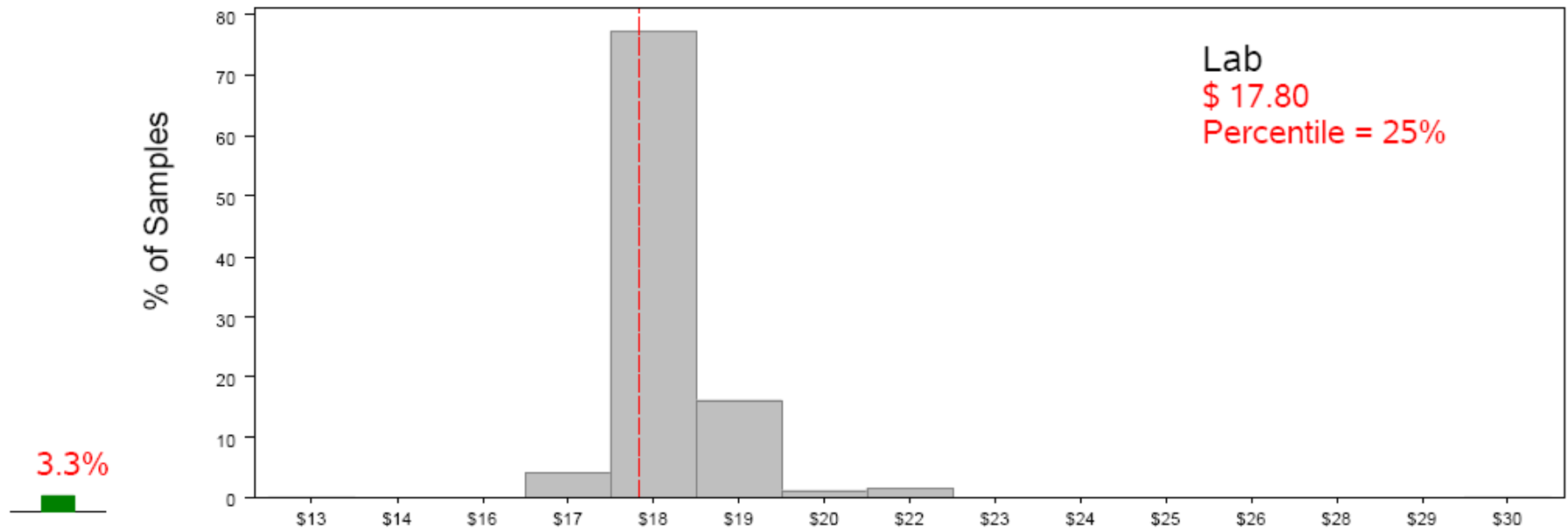
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PO Episode Efficiency Results

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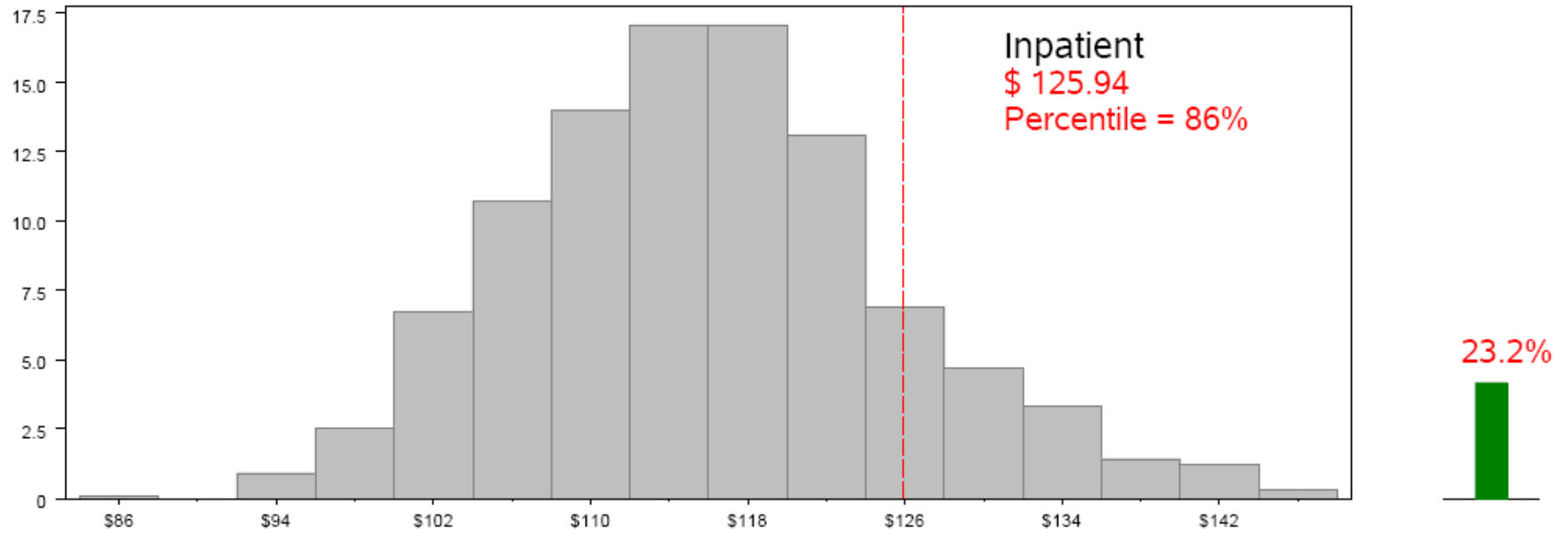
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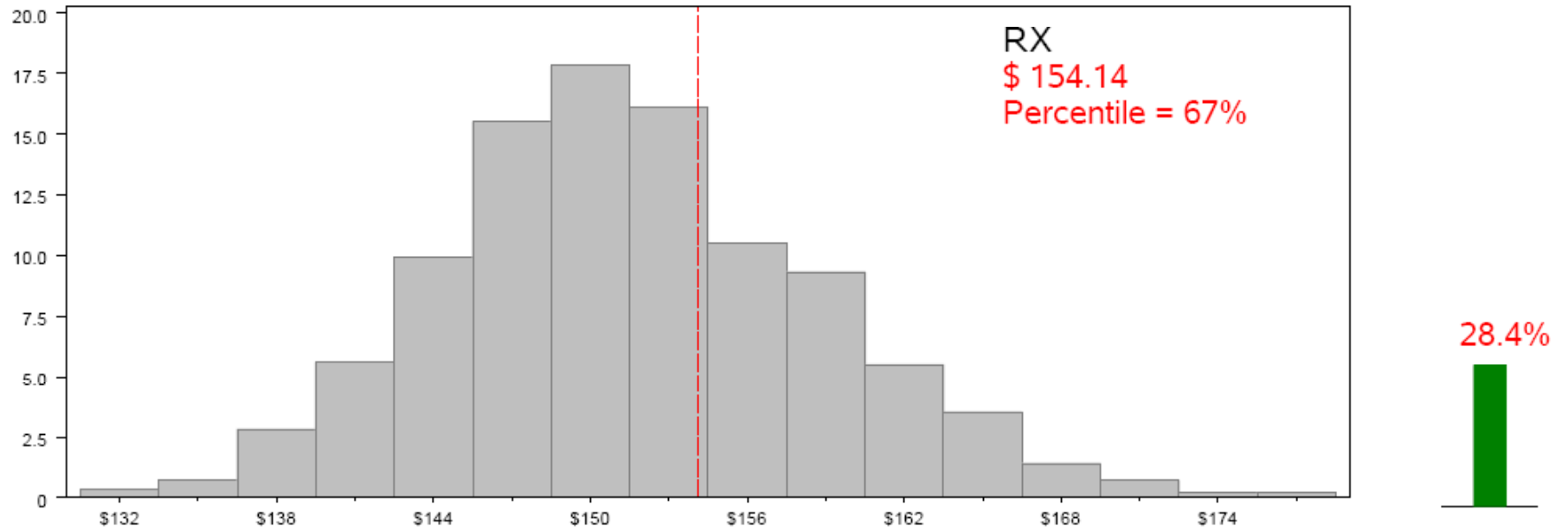
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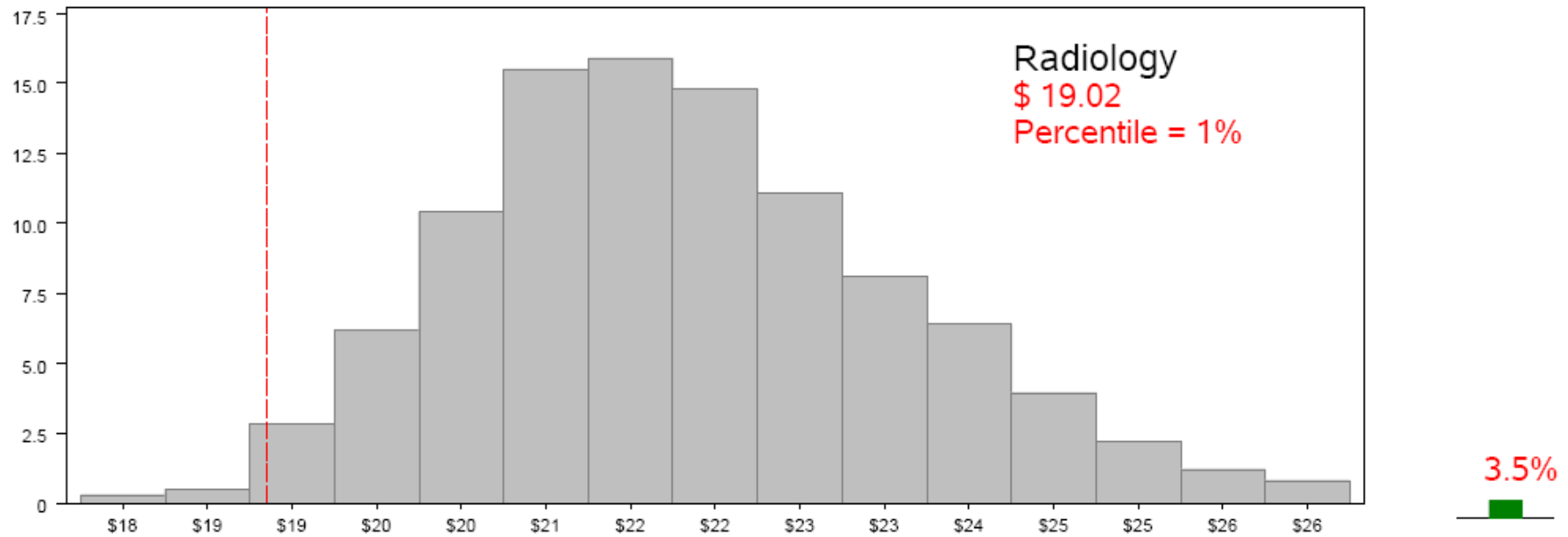
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PO Episode Efficiency Results

Episode = Overall Episode Efficiency

PO = Group A (29,387 Episodes)



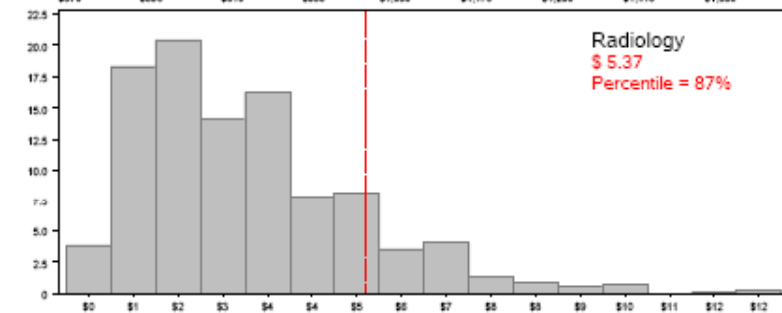
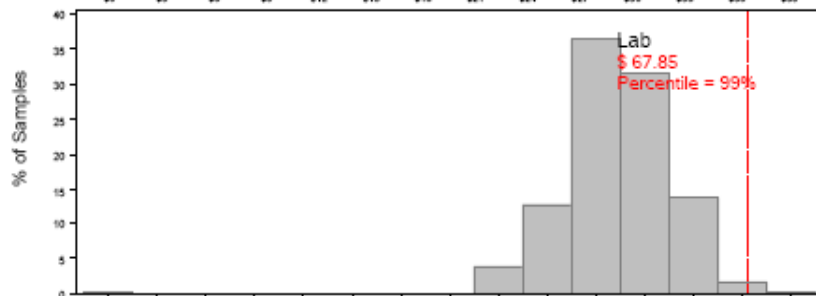
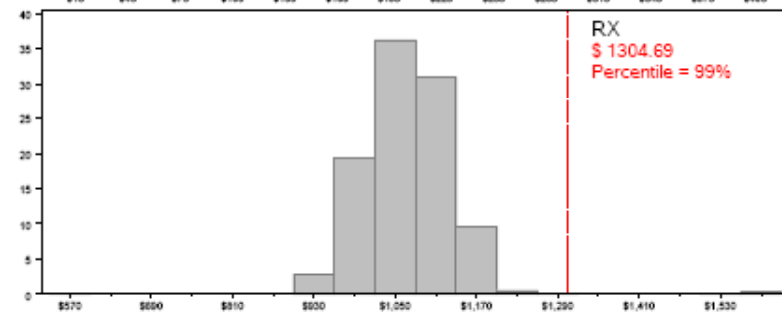
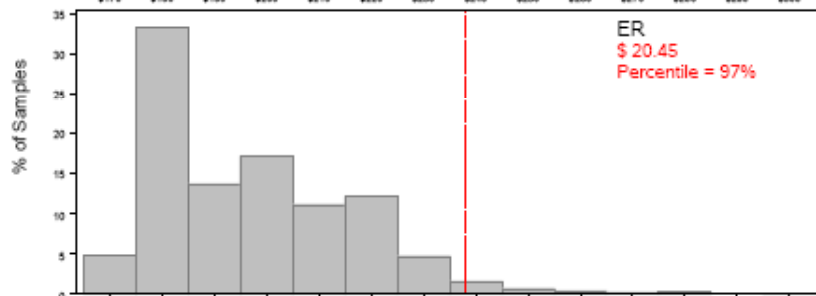
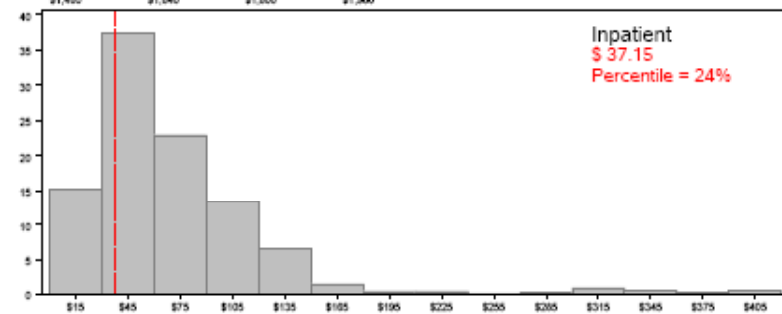
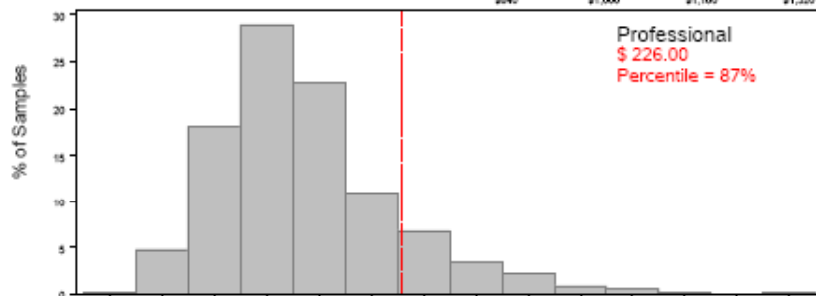
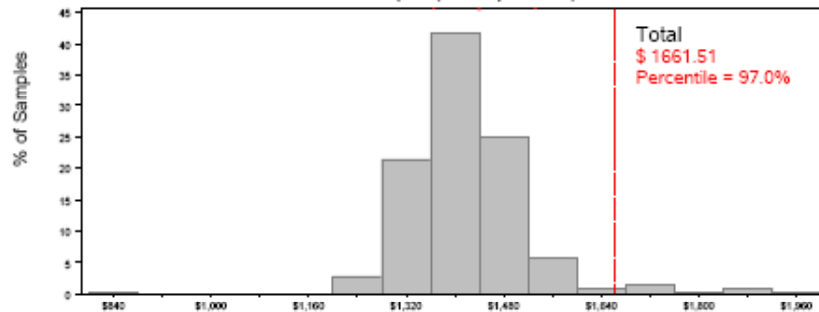
SELECTED CONDITIONS



DIABETES



PO Episode Efficiency Results
 Episode = Diabetes Mellitus Type 2 and Hyperglycemic States, Chronic Maintenance
 PO = Group A (537 Episodes)

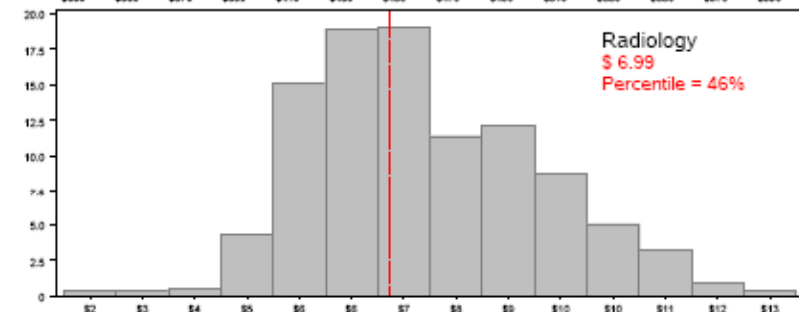
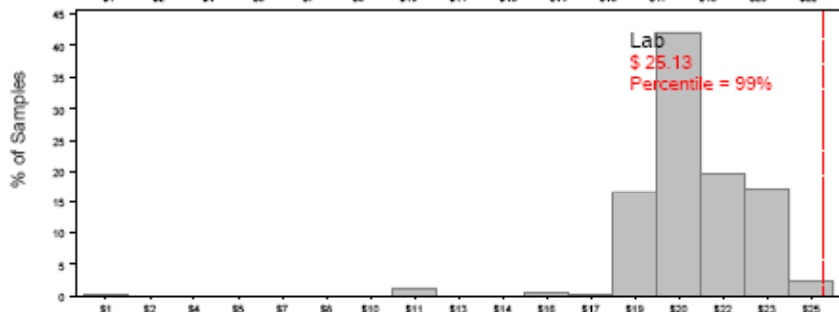
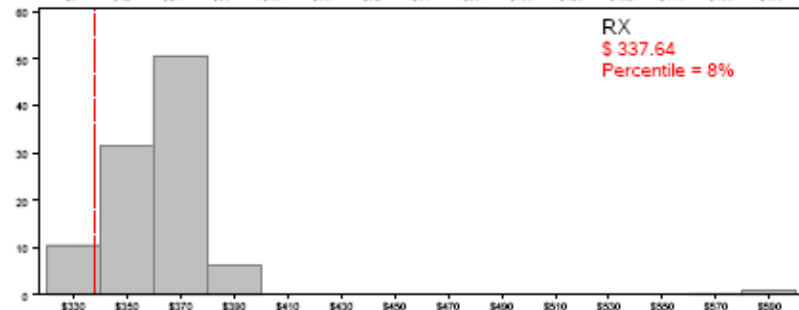
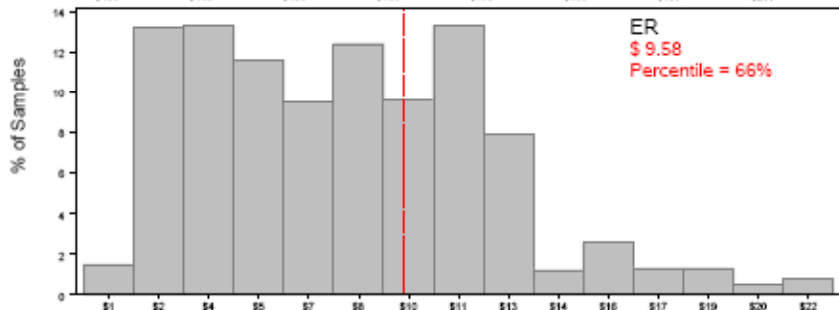
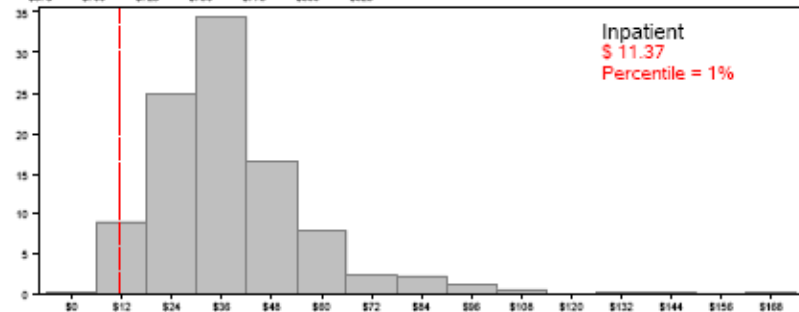
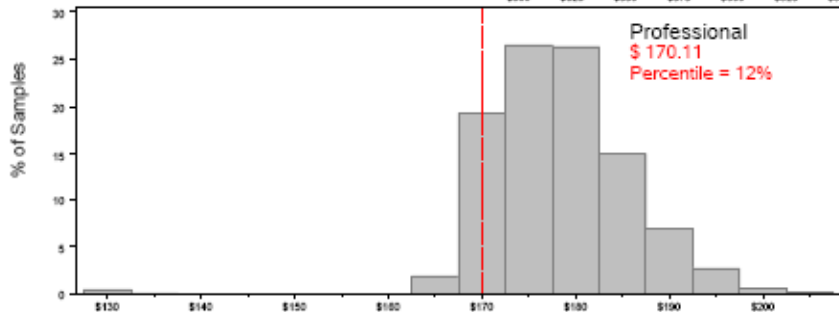
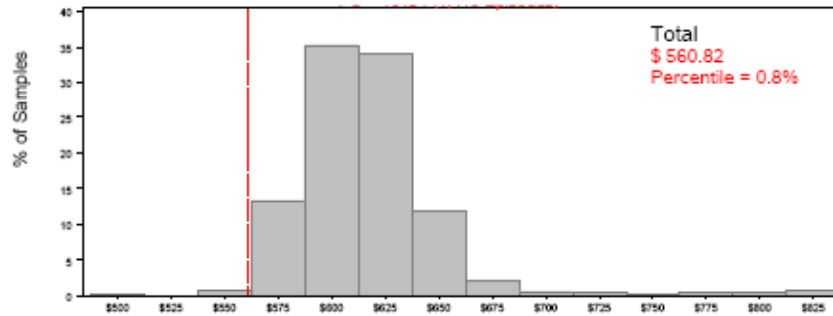


Mean Standardized Costs
 Note: The green bar next to each histogram indicates the percentage of total dollars represented by that service category.

HYPERTENSION



PO Episode Efficiency Results
 Episode = Essential Hypertension, Chronic Maintenance
 PO = Group A (1,419 Episodes)



30.3%

1.7%

4.5%

2.0%

60.2%

1.2%

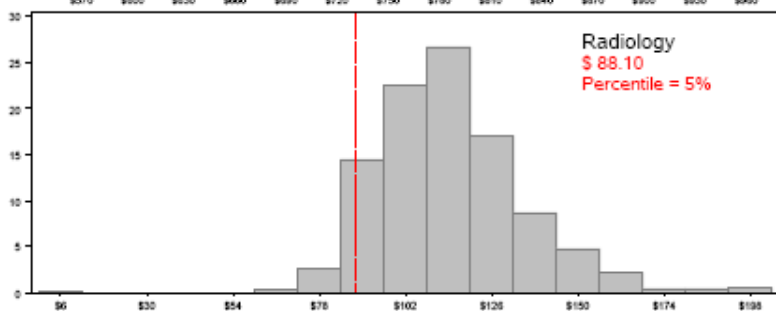
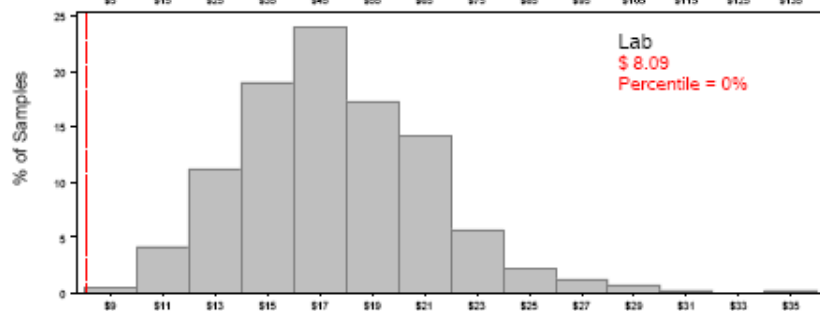
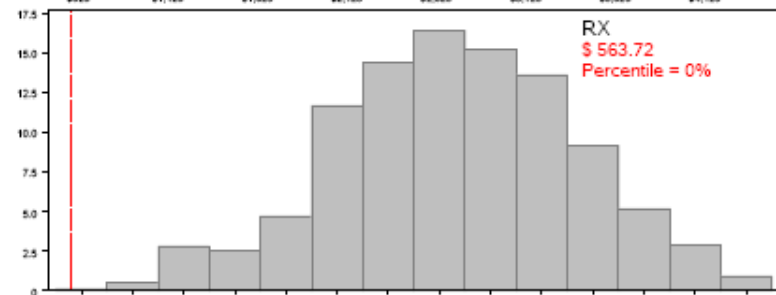
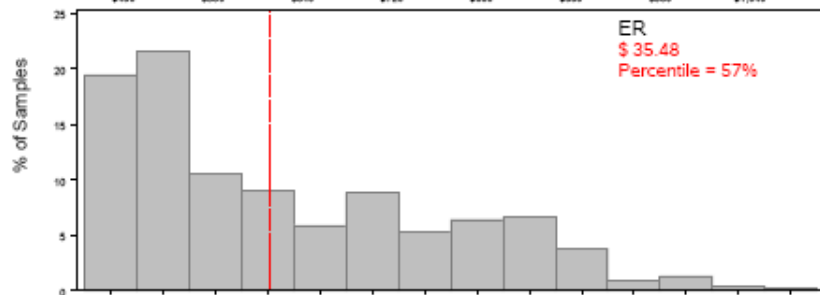
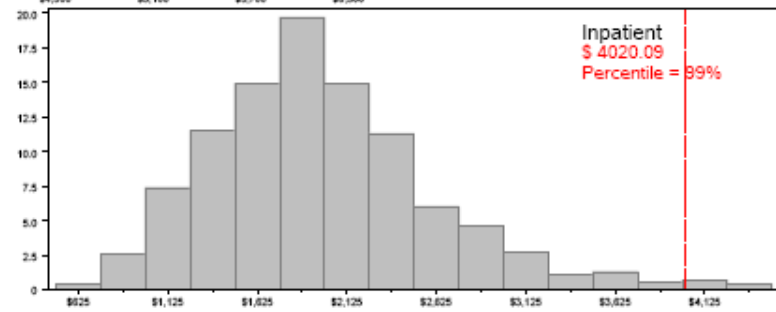
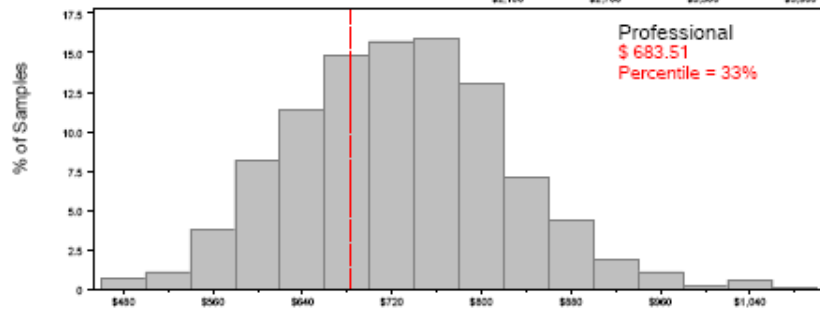
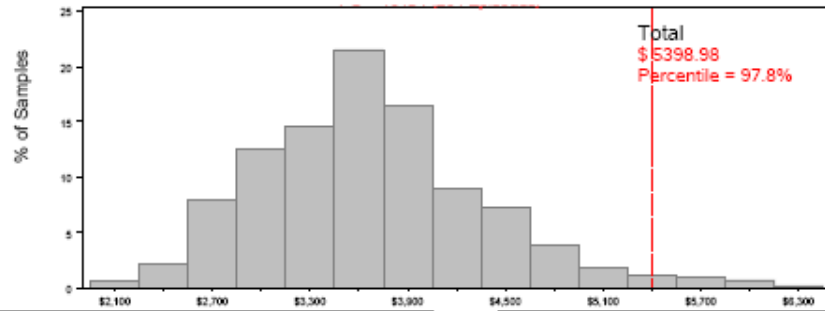
Mean Standardized Costs

Note: The green bar next to each histogram indicates the percentage of total dollars represented by that service category.

ANGINA PECTORIS



PO Episode Efficiency Results
 Episode = Angina Pectoris, Chronic Maintenance
 PO = Group A (204 Episodes)



12.7%

0.7%

0.1%

74.5%

10.4%

1.6%

Mean Standardized Costs

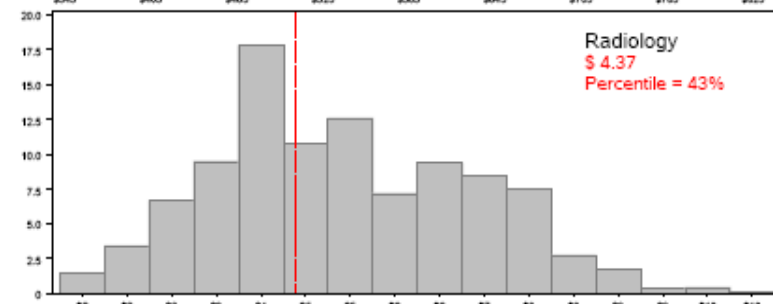
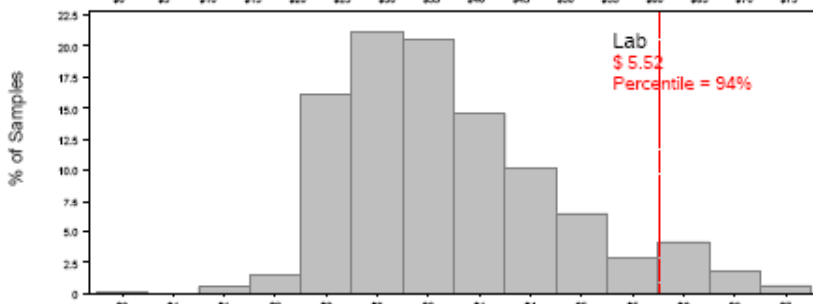
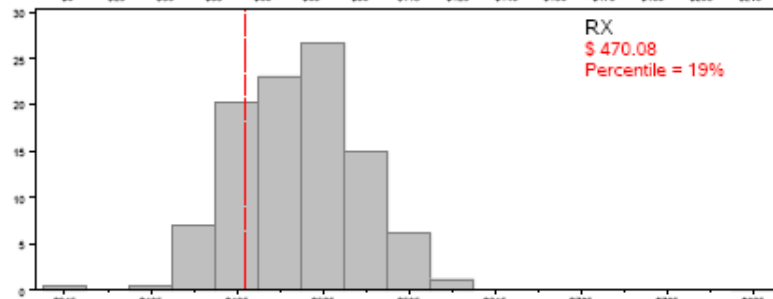
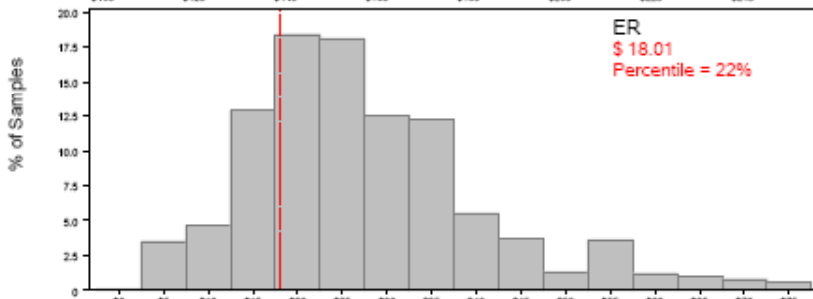
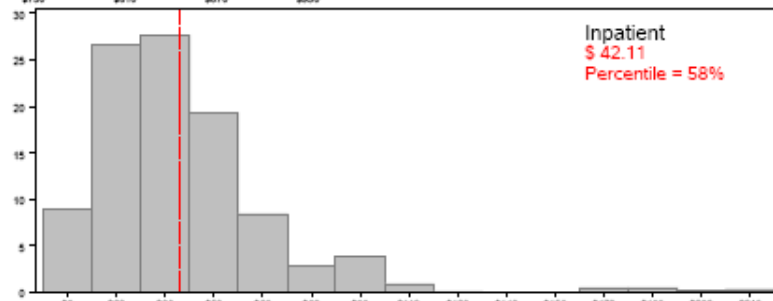
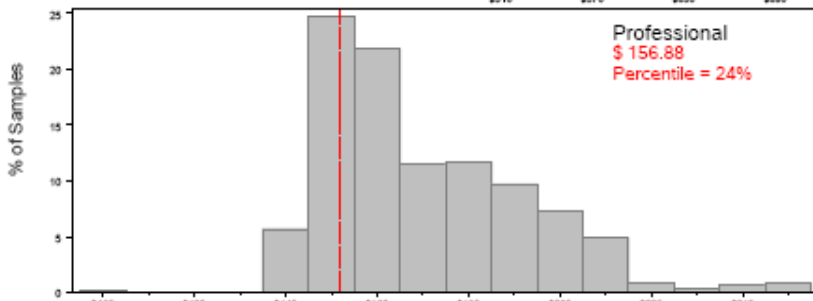
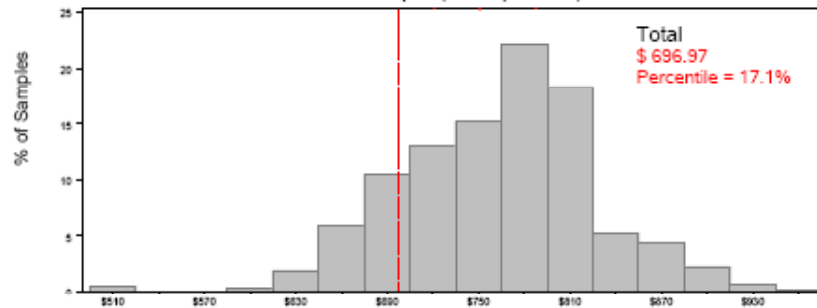
Mean Standardized Costs

Note: The green bar next to each histogram indicates the percentage of total dollars represented by that service category.

ASTHMA



PO Episode Efficiency Results
 Episode = Asthma, Chronic Maintenance
 PO = Group A (685 Episodes)



Mean Standardized Costs

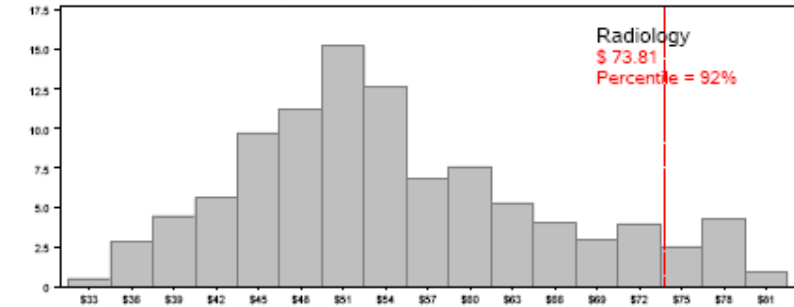
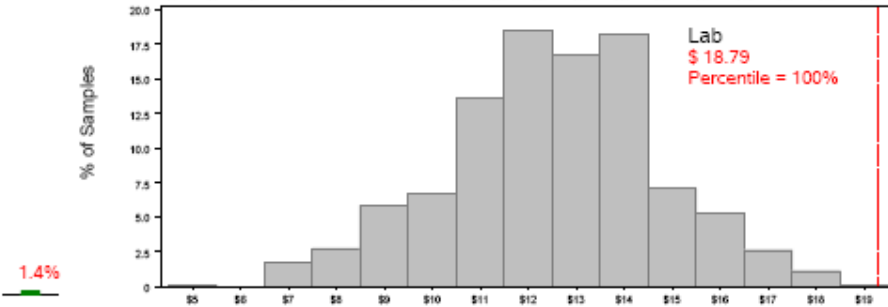
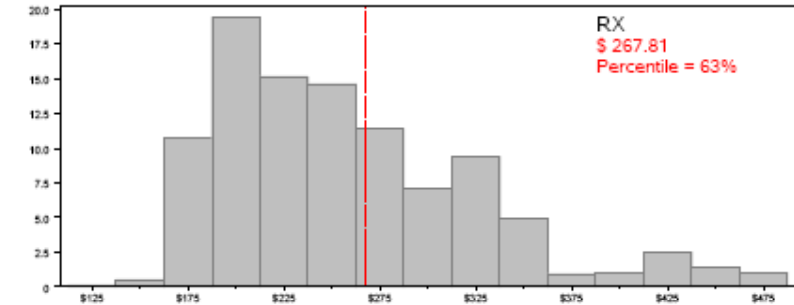
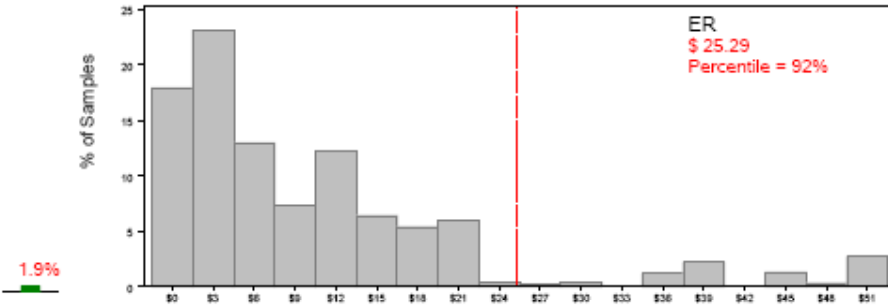
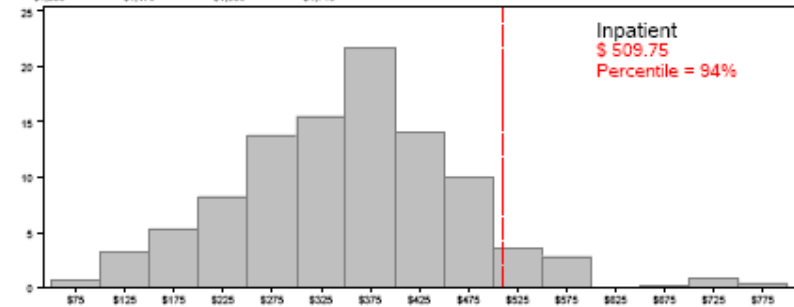
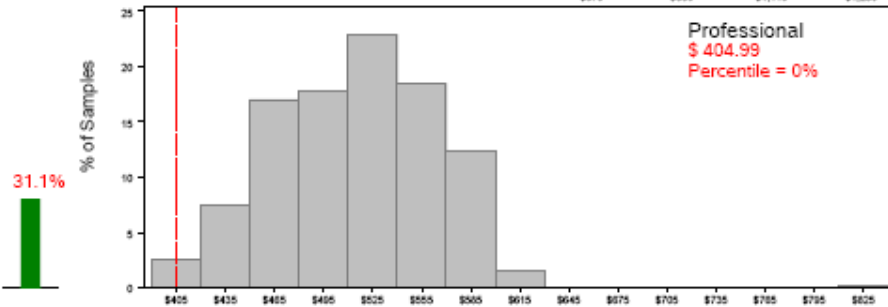
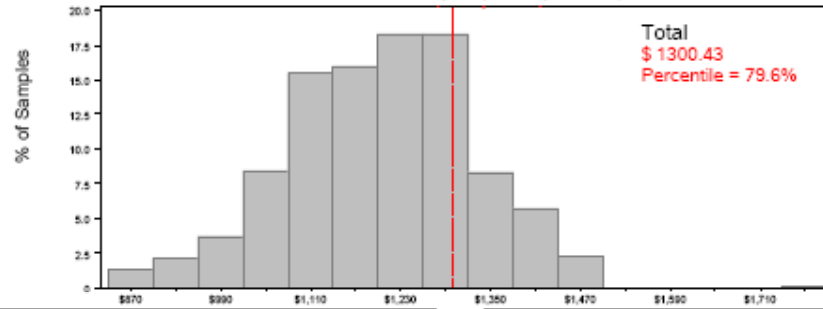
Mean Standardized Costs

Note: The green bar next to each histogram indicates the percentage of total dollars represented by that service category.

OSTEOARTHRITIS, EXCEPT SPINE



PO Episode Efficiency Results
 Episode = Osteoarthritis, Except Spine
 PO = Group A (304 Episodes)



Mean Standardized Costs

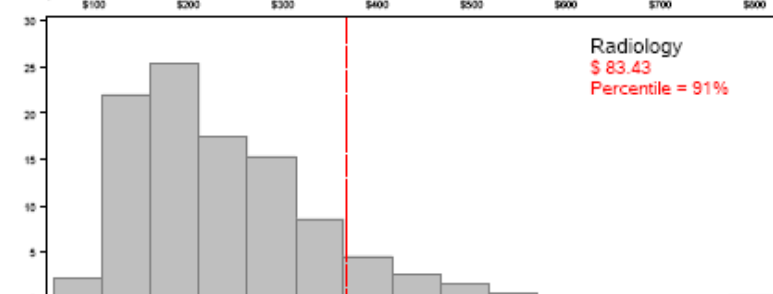
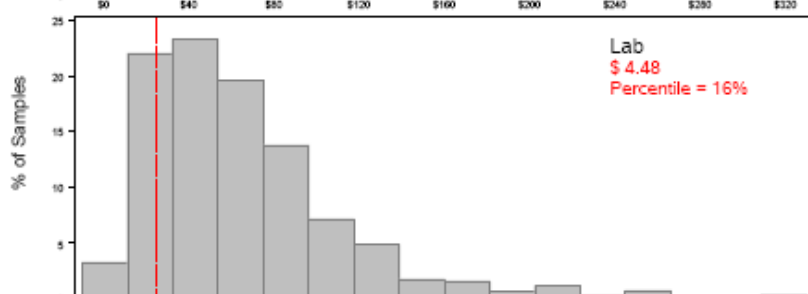
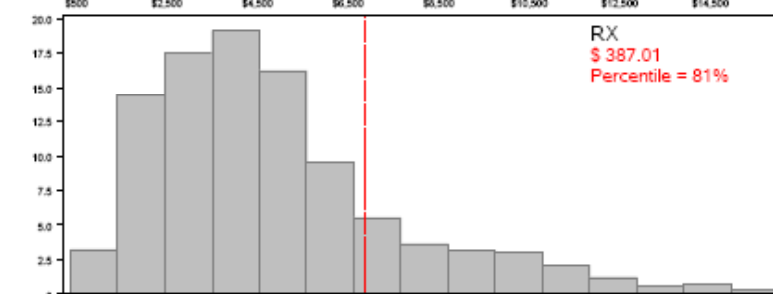
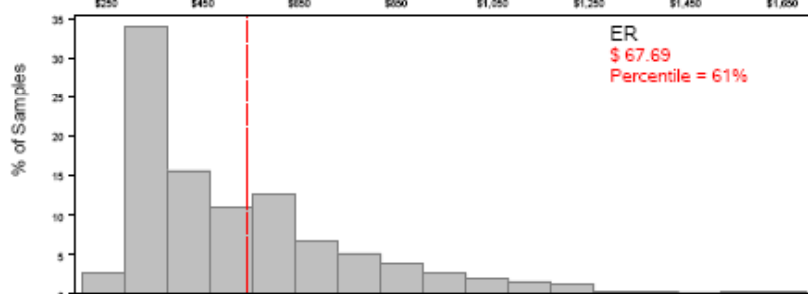
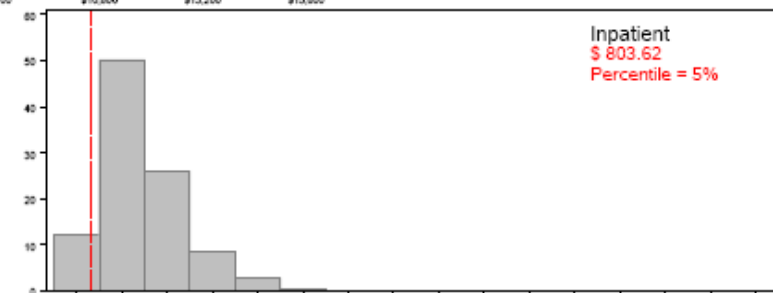
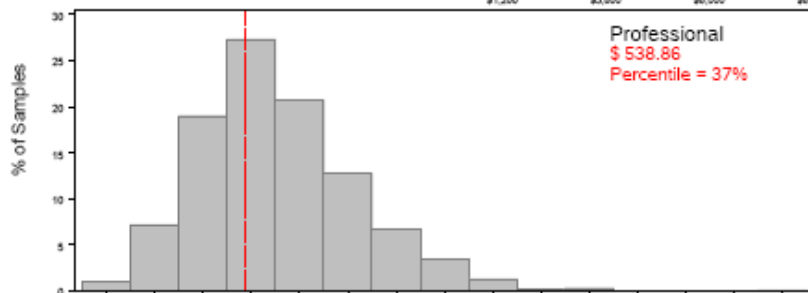
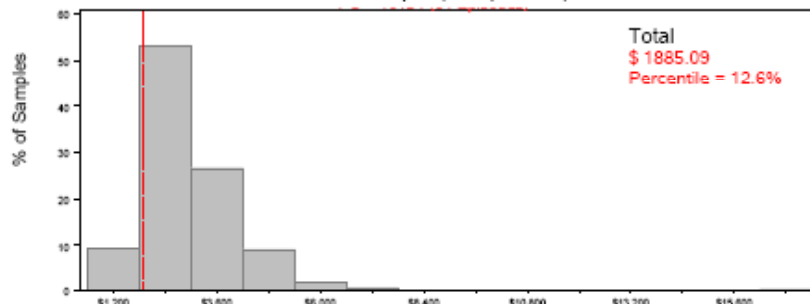
Mean Standardized Costs

Note: The green bar next to each histogram indicates the percentage of total dollars represented by that service category.

COMPLICATIONS OF CARE



PO Episode Efficiency Results
 Episode = Complications of Surgical and Medical Care
 PO = Group A (64 Episodes)



28.6%

3.6%

0.2%

42.6%

20.5%

4.4%

Mean Standardized Costs

Note: The green bar next to each histogram indicates the percentage of total dollars represented by that service category.

What's next?

- It depends on your input
- One possibility
 - Update with more recent data
 - Use the update to drive data quality improvement
 - Use the update to drive improved cost efficiency
- Seeking your input on:
 - Format of the report
 - Content of the report
 - Actionability of the information
 - Other

