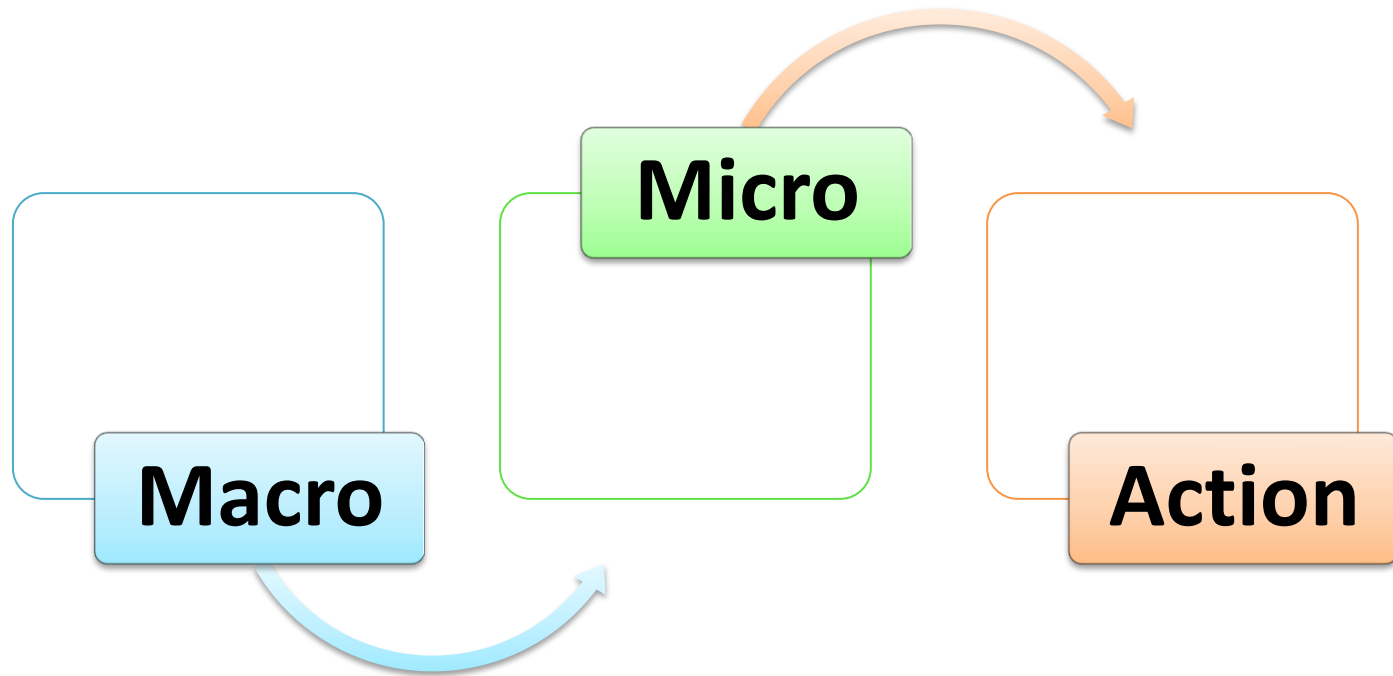


Strategies for Efficiency



OPES Group
March 16, 2011

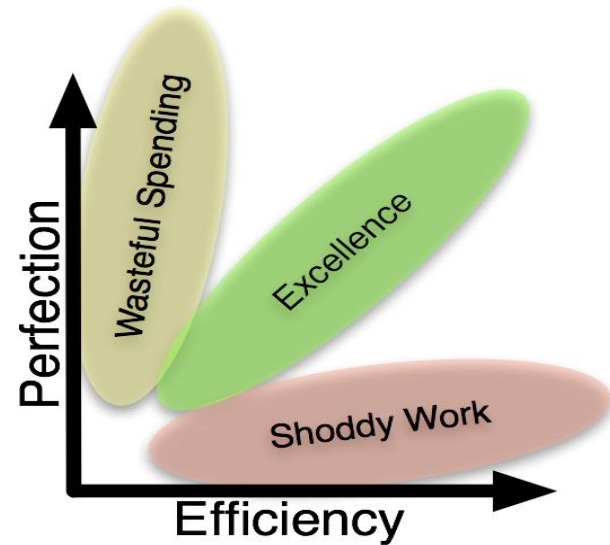
Objectives

- Provide an overview of an application of Efficiency Measurement within VHA.
- Provide insight into the ‘**operational**’ aspects of Efficiency Measurement as part of the HERC Efficiency Cyber Seminar Series.
 - “Overview of Health Care Efficiency Research”
February 23, 2011 session by Dr Paul Barnett
- Review the observed variation in efficiency within VHA. (macro, micro level)
- Relationship of Efficiency to Quality within VHA.
- Toolkit for sites to utilize to identify Efficiency Opportunities.

VHA has been a leader in Quality Measurement

Can we follow this tradition in Efficiency Measurement?


- In healthcare, measurement of efficiency has lagged behind that of quality.
- Common belief among providers that increased cost efficiency leads to decreased quality?
- AHRQ (2008) ideal healthcare efficiency measure does not exist. AHRQ has provided a framework that calls for efficiency measures to be:
 - 1) Important,
 - 2) Scientifically Sound,
 - 3) Feasible, and
 - 4) Actionable



SFA/DEA View of Efficiency

- **Stochastic Frontier Analysis (SFA)***
 - Involves regression and analysis of error term
 - Less sensitive to data noise and outliers
 - Statistical Model
- **Data Envelope Analysis (DEA)**
 - Uses linear programming, nonparametric
 - Mathematical Model

*Methods used by academic researchers not by providers
or health plans* Hussey et al 2009



**UNITED STATES DEPARTMENT OF VETERANS AFFAIRS
VHA SUPPORT SERVICE CENTER (VSSC)**

Home | Blog | My Metrics | My VSSC | News | Portals | Support | Training | User Acceptance Testing

A - Z Index: [1](#) | [2](#) | [A](#) | [B](#) | [C](#) | [D](#) | [E](#) | [F](#) | [G](#) | [H](#) | [I](#) | [L](#) | [M](#) | [N](#) | [O](#) | [P](#) | [Q](#) | [R](#) | [S](#) | [T](#) | [U](#) | [V](#) | [W](#)

| | | | |
|--|--|---|---|
| Business Operations <ul style="list-style-type: none"> CBI Metrics Facility Profile HIMS Improvement Opportunities Trip Pack | Capital and Planning <ul style="list-style-type: none"> Capital Reports Planning Reports Capital Portal Operational & Planning Tools Portal | Clinical Care <ul style="list-style-type: none"> Clinical Programs Nursing Outcomes (VANOD) Physician Productivity Primary Care Management Module (PCMM) OPES Portal | VHA Data Users Call 1-800-767-1750 #63073 3rd Thursday of the month. 3:00 - 4:00 EST Announcements <ul style="list-style-type: none"> 3/9/2011 Enrollment Data more» 3/3/2011 VSSC Tech Refresh more» |
|--|--|---|---|

OPES Portal located off the Main VSSC Website




Announcements

- FY11 Q1 Physician Productivity Cube Update: The cube was updated on March 3, 2011 and is now current through December 2010 (pay period Q1 FY 11 Ambulatory Care Sensitive Condition (ACSC) Hospitalization Data have been posted

FEATURED SITES

| | | |
|--|--|--|
|  <p>Productivity</p> <ul style="list-style-type: none"> Cube Authorized Users by VISN Physician Productivity Cube & Reports Physician Productivity Study Data |  <p>Efficiency</p> <ul style="list-style-type: none"> Stochastic Frontier Analysis Efficiency Efficiency Opportunity Grid ACSC Emergency Department ED Model Fee Care Model Pharmacy Model Operating Room (OR) Efficiency |  <p>Staffing</p> <ul style="list-style-type: none"> Specialty Physician Workforce Dialysis |
|--|--|--|

Efficiency

Home - Microsoft Internet Explorer provided by VA New England Health Care

http://opes.vssc.med.va.gov/SFA/Pages/default.aspx

File Edit View Favorites Tools Help

VHA OPES

OPES Office Of Productivity Efficiency Staffing

UNITED STATES DEPARTMENT OF VETERANS AFFAIRS
VHA OFFICE OF PRODUCTIVITY, EFFICIENCY, & STAFFING (OPES)

VHA OPES Reports & Data Team Links (Access Restricted)

View All Site Content

Stochastic Frontier Analysis

Documents

Recycle Bin

VHA OPES > Stochastic Frontier Analysis

OPES Office Of Productivity Efficiency Staffing

Stochastic Frontier Analysis

SFA Related Sites

SFA VISN Consolidated Services Survey

Back to OPES Site

VHA Operational Efficiency Analysis - A Stochastic Frontier Approach

Operational efficiency can be assessed by using stochastic frontier analysis (SFA) or data envelopment analysis (DEA). We chose SFA for its robustness in handling data noise. SFA is an advanced statistical method that takes into account relevant data, derives a cost frontier and identifies best practices. For a brief description of SFA and its application in VHA, please read the Analysis in Brief document below. For additional information about efficiency measurement in healthcare please visit <http://www.ahrq.gov/qual/efficiency/>

The SFA Model has been updated for fiscal year (FY) 2009. The results and data sets used to run the model can be found in the excel file below. An archive of prior years starting with FY 2008 is also available.

SFA Document Library

| Type | Name | Modified By |
|--------|--|-------------------|
| Folder | Archive - SFA FY08 Files | Peterson, Douglas |
| Excel | FY09 SFA Data and Results | Peterson, Douglas |
| PDF | Analysis in Brief - Stochastic Frontier Analysis | Peterson, Douglas |

Add new document

Efficiency

- Stochastic Frontier Analysis Efficiency
- Efficiency Opportunity Grid
- ACSC
- Emergency Department ED Model
- Fee Care Model
- Pharmacy Model
- Operating Room (OR) Efficiency

Stochastic Frontier Analysis

SFA is a specialized technique of general regression analysis

- The “stochastic” concept is to ...

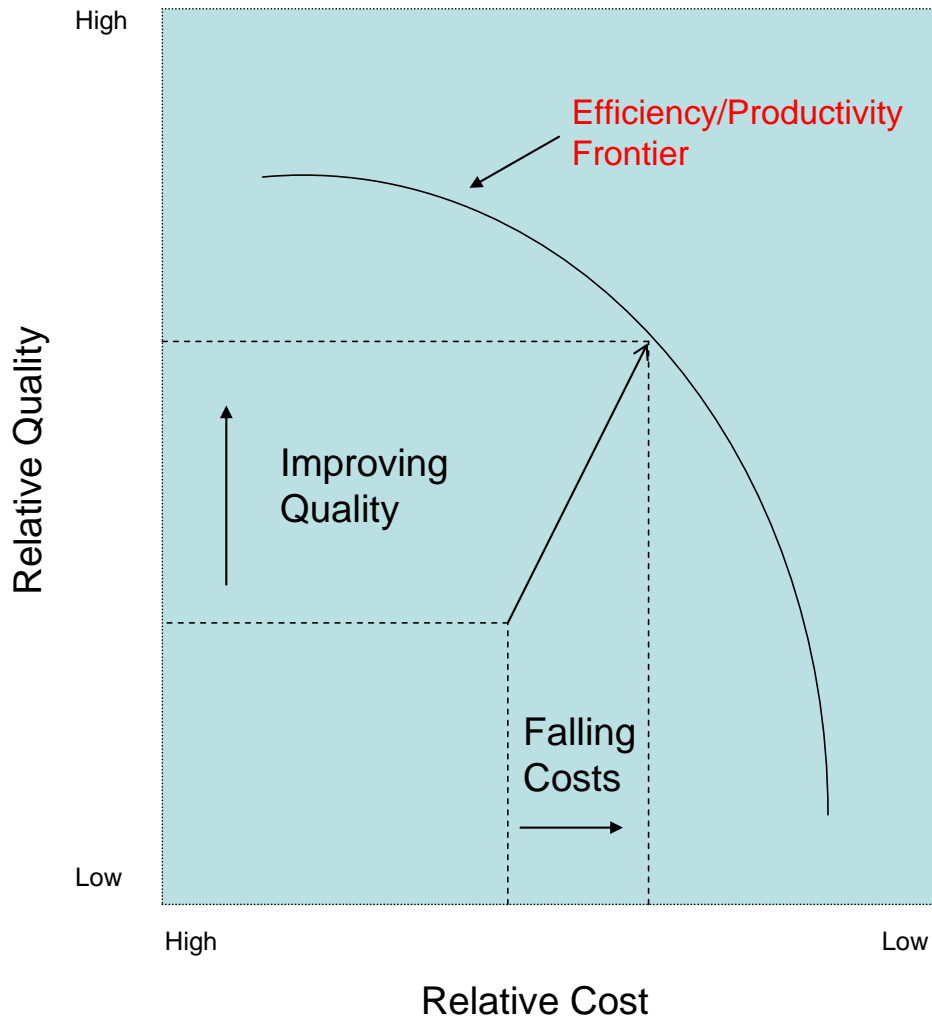
To separate the ‘random’ events from the ‘true’ inefficiency. Random events are considered not under the control of the managers (often referred to as ‘uncontrollable’ costs).

- The “frontier” concept is ...

The process of identifying the ‘most efficient’ level and/or use the technique to set efficiency targets.

Provides an efficiency score adjusting for variables that impact cost, such as, patient case-mix, patient demographics, geographic location , facility characteristics, facility infrastructure, etc.

Frontier and Quality



Incorporates all available best practices (protocols, technologies, drugs, etc.)

Change Scenarios:

1. Scenario 1

- Increase Quality
- Decrease Cost

2. Scenario 2

- Increase Quality
- Stable Costs

3. Scenario 3

- Stable Quality
- Decrease Costs

4. Scenario 4 (Unintended Outcome)

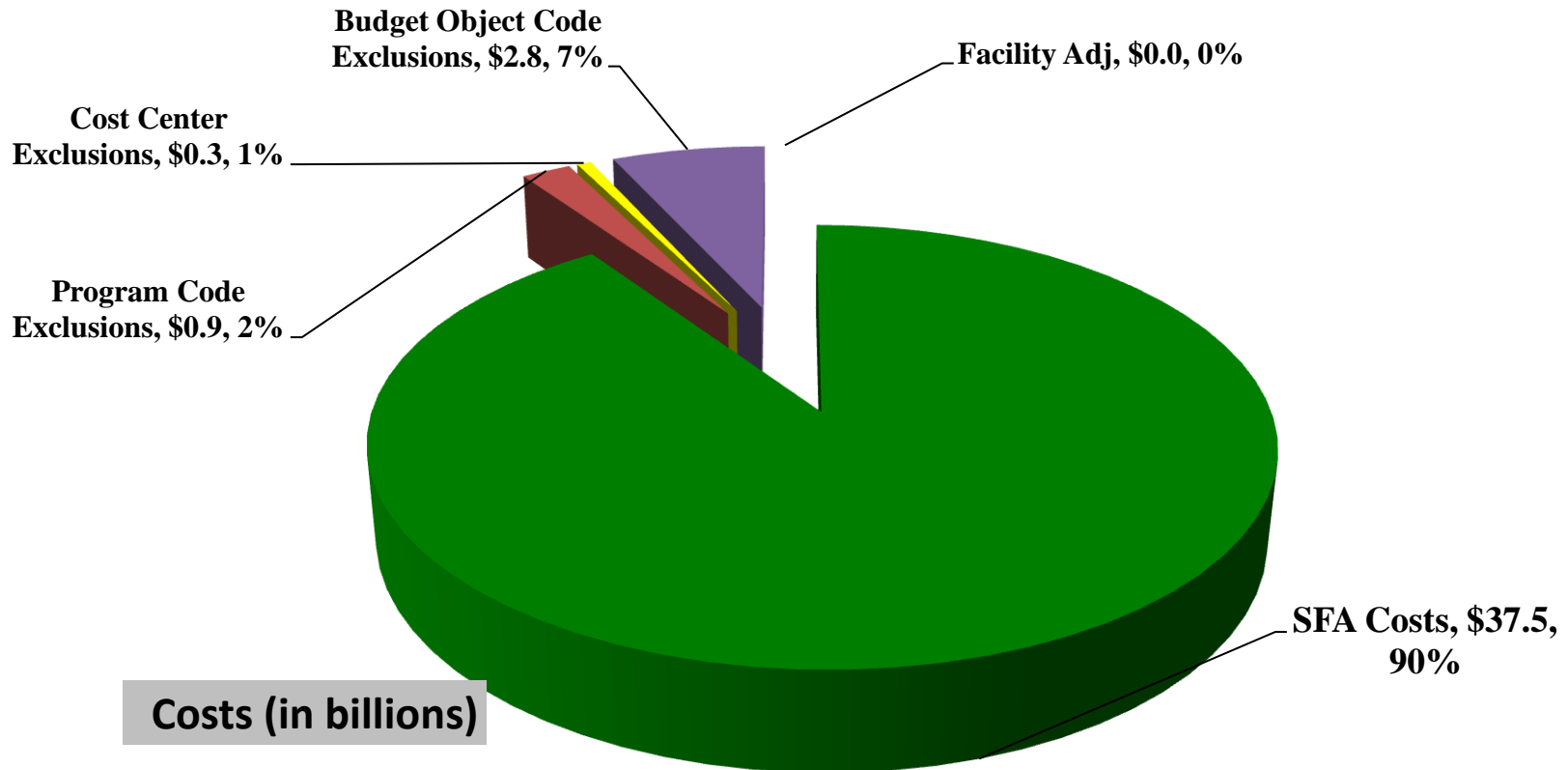
- Decrease Quality
- Decrease Cost

Dependent Variable: Cost

Total VHA Costs FY09: \$65.05 Billion

Less Stimulus and Hurricane Exclusions: \$23.60 Billion

VHA Healthcare Expenditures: \$41.45 Billion



Cost Logic

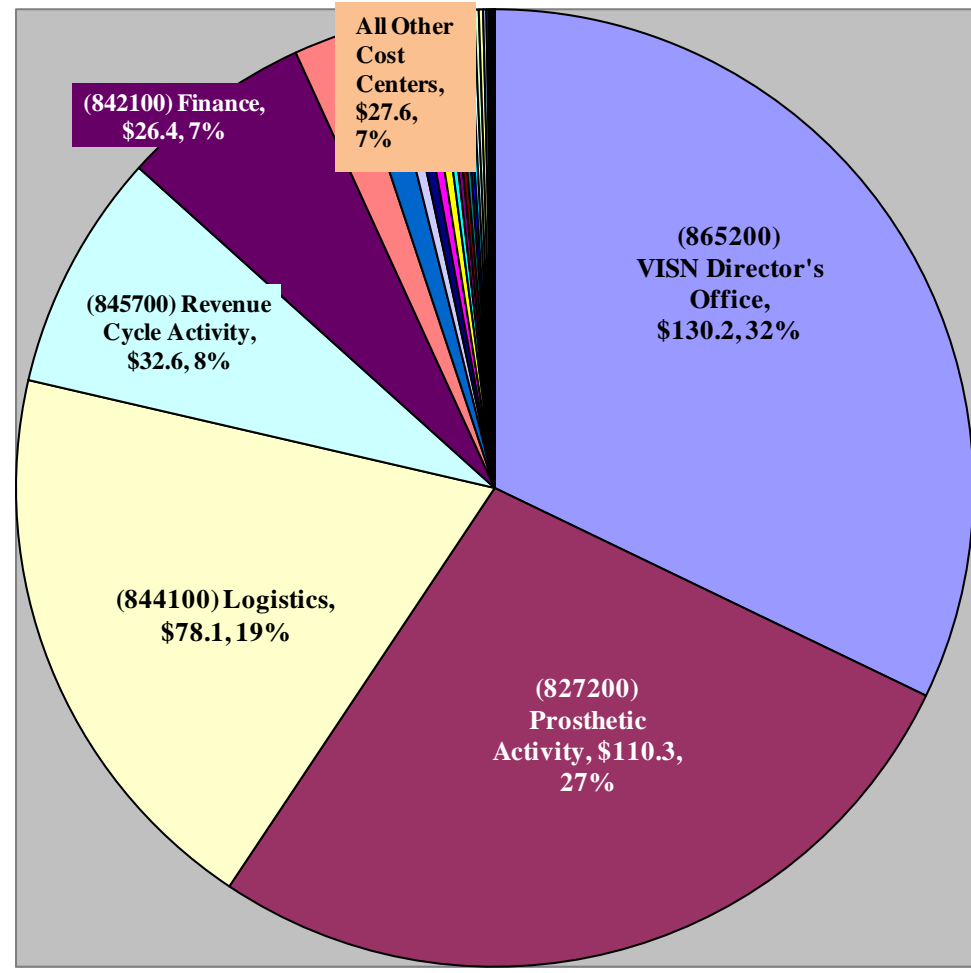
1. Begin with total costs in MA, MS, MF: \$41.45 Billion
2. Exclusion of non-operating costs

| Cost Exclusions | Amount Excluded | % of Total Cost Pool | Examples of Cost Pool Excluded |
|---------------------|-----------------|----------------------|--|
| Program Codes | \$0.90 Billion | 2.2% | State Home; Employee Training |
| VA Cost Centers | \$0.26 Billion | 0.6% | Non-VHA, VHACO, CWT State Home & Fire Dept. Cost Centers |
| Budget Object Codes | \$2.81 Billion | 6.8% | NRM and Equipment |

3. VISN level activities prorated across facilities (new FY09)
4. Facility specific cost adjustments (New FY09)

Changes in Cost Logic

Expenditure Manual Adj.
(in millions)



- VISN Level Activities

- Survey tool used to prorate VISN activities across all facilities:

- VISN Office
 - Prosthetic Activity
 - Logistics
 - Finance
 - Other Cost Centers

- Facility Specific Adjustments

- Canandaigua: National Suicide Hotline Excluded

**Total VISN Level Costs Prorated
(In millions)
\$405.2**

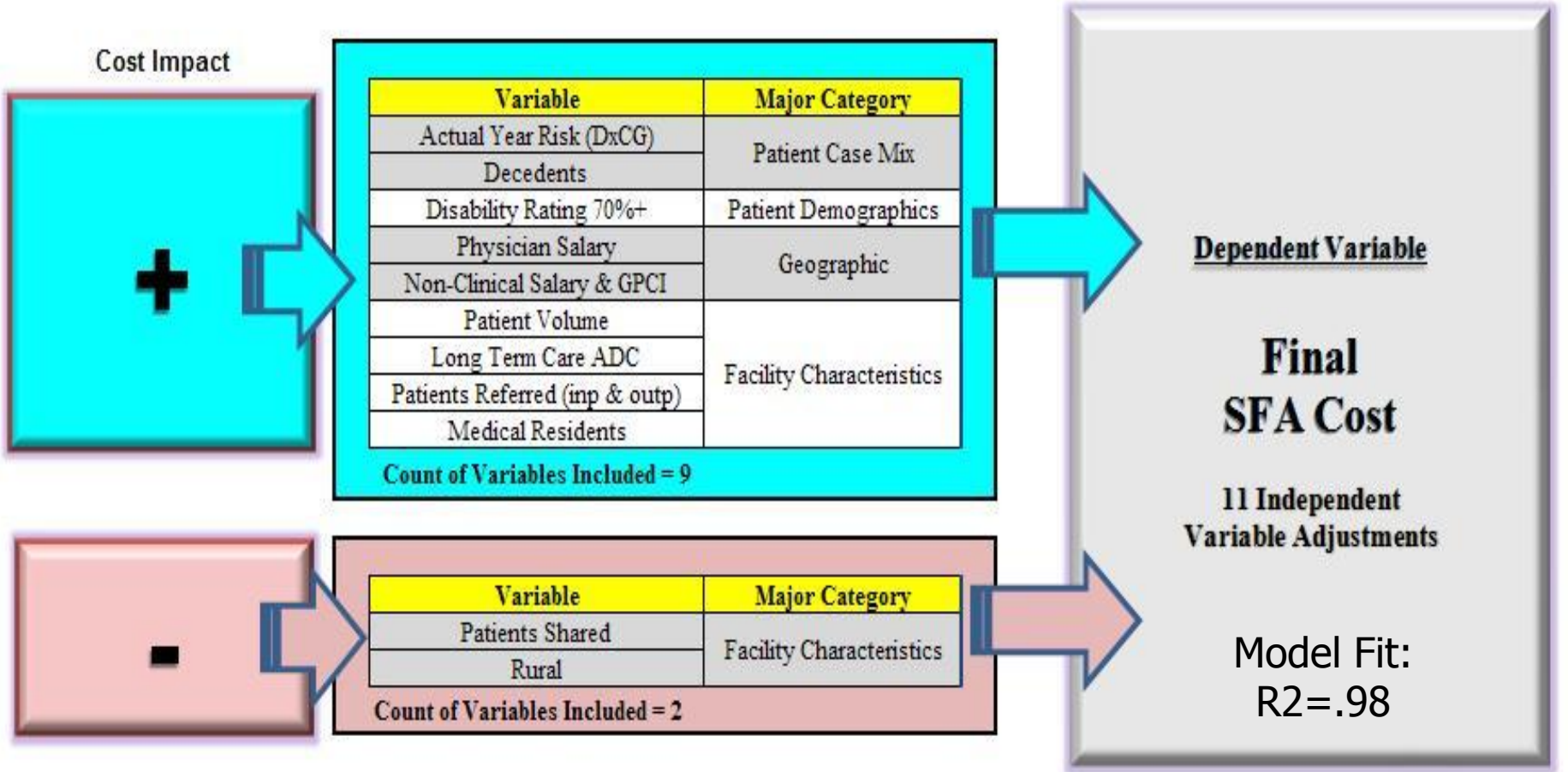
'Leveling the Playing Field'

- **Major categories tested**
 - Pt case mix
 - Pt demographics
 - Quality performance
 - Geographic
 - Facility characteristics
 - Infrastructure characteristics
- **Tested independent variables for significance in explaining cost variation**
 - **117** different variables tested for clinical and administrative cost significance
 - **11** variables determined to be statistically significant in explaining clinical costs
 - **11** variables determined to be statistically significant in explaining administrative costs
- **Examples of variables without statistical significance in explaining cost variation in the SFA Efficiency Model 2009:**
 - Lease costs
 - Gas prices
 - Percentage of Vietnam Era Veterans
 - Average annual snowfall

Independent Variables (Clinical)

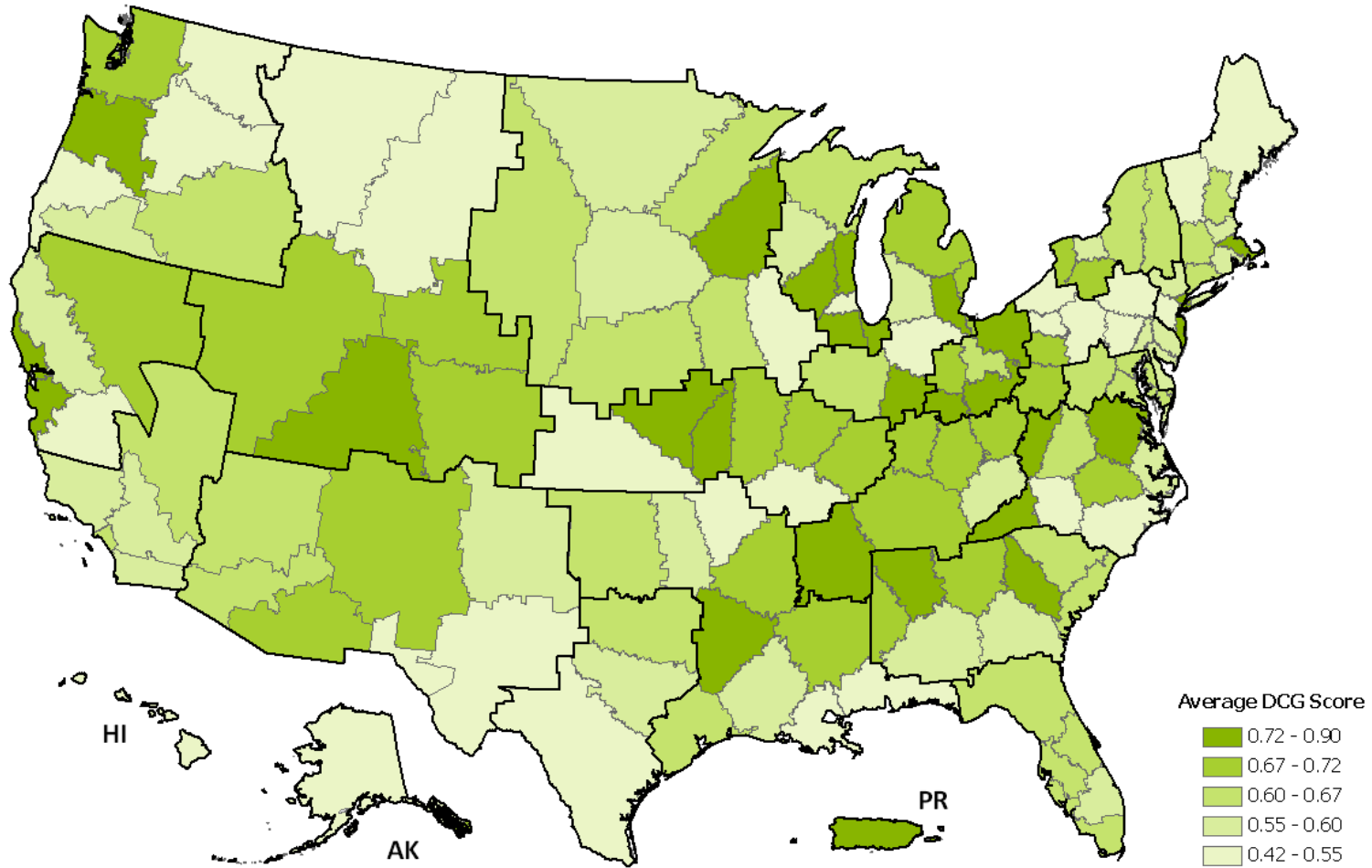
Level the Playing Field

Clinical Model



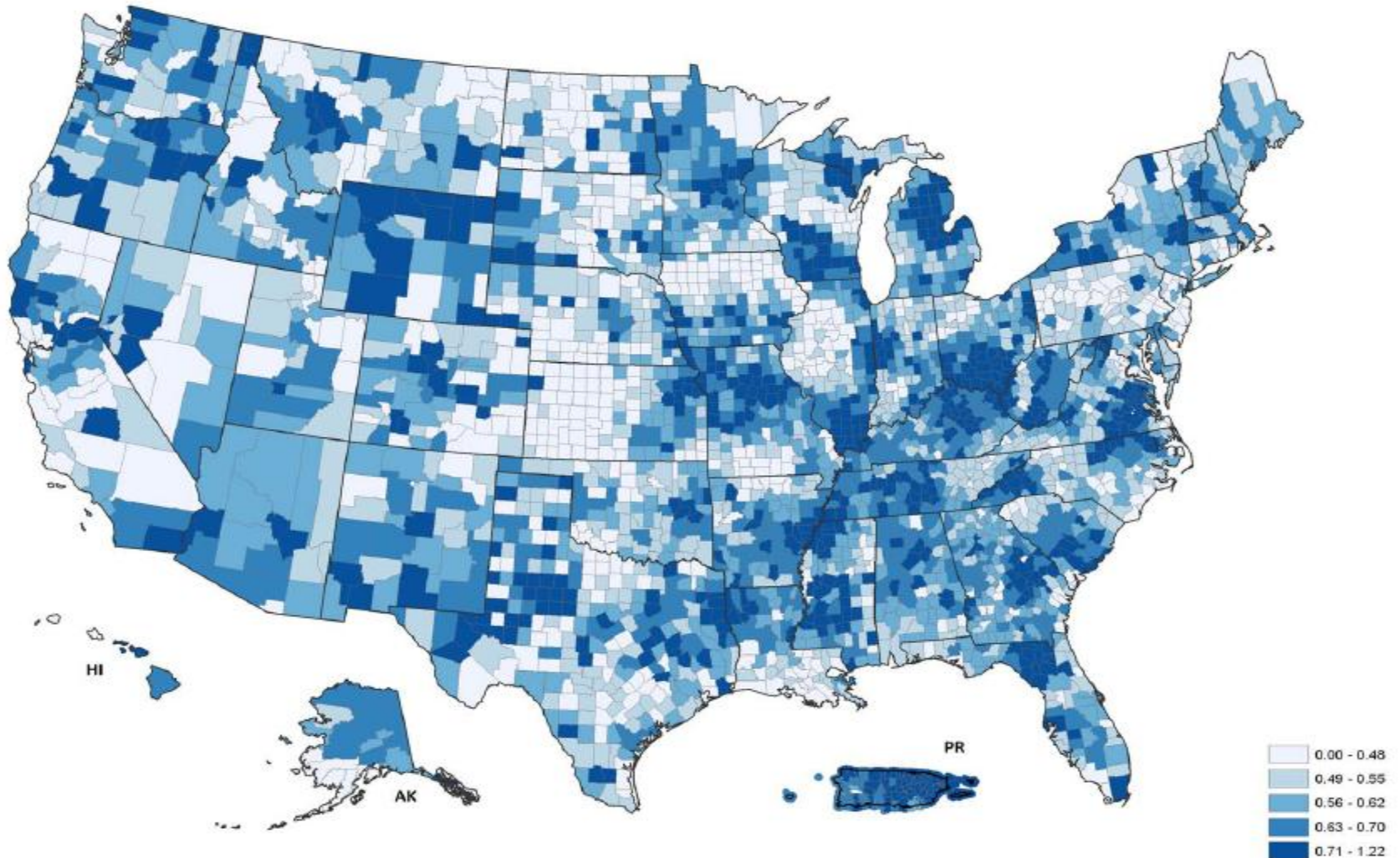
GPCI = Medicare Geographic Practice Cost Index

Average DCG by Facility (FY 09)



Variation in Disease Burden

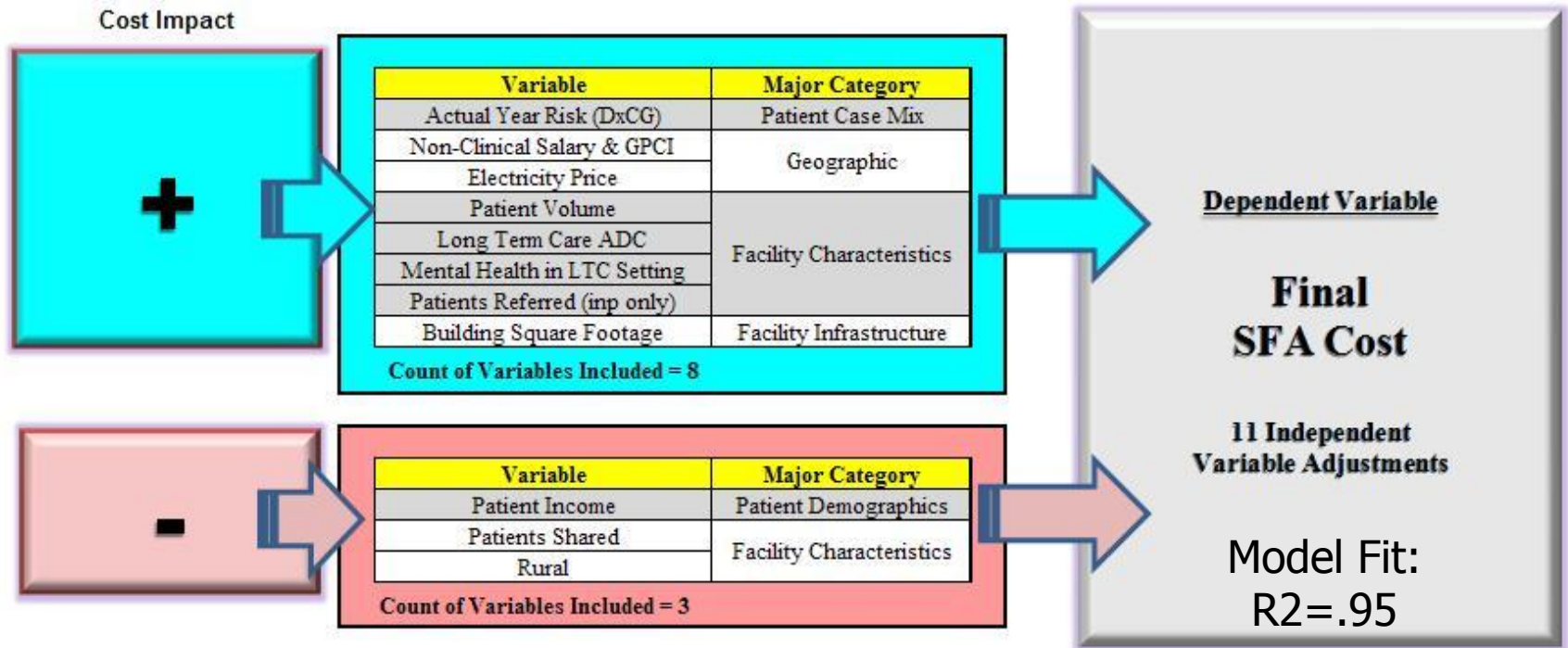
Average Patient DCG Scores by County



Independent Variables (Administrative)

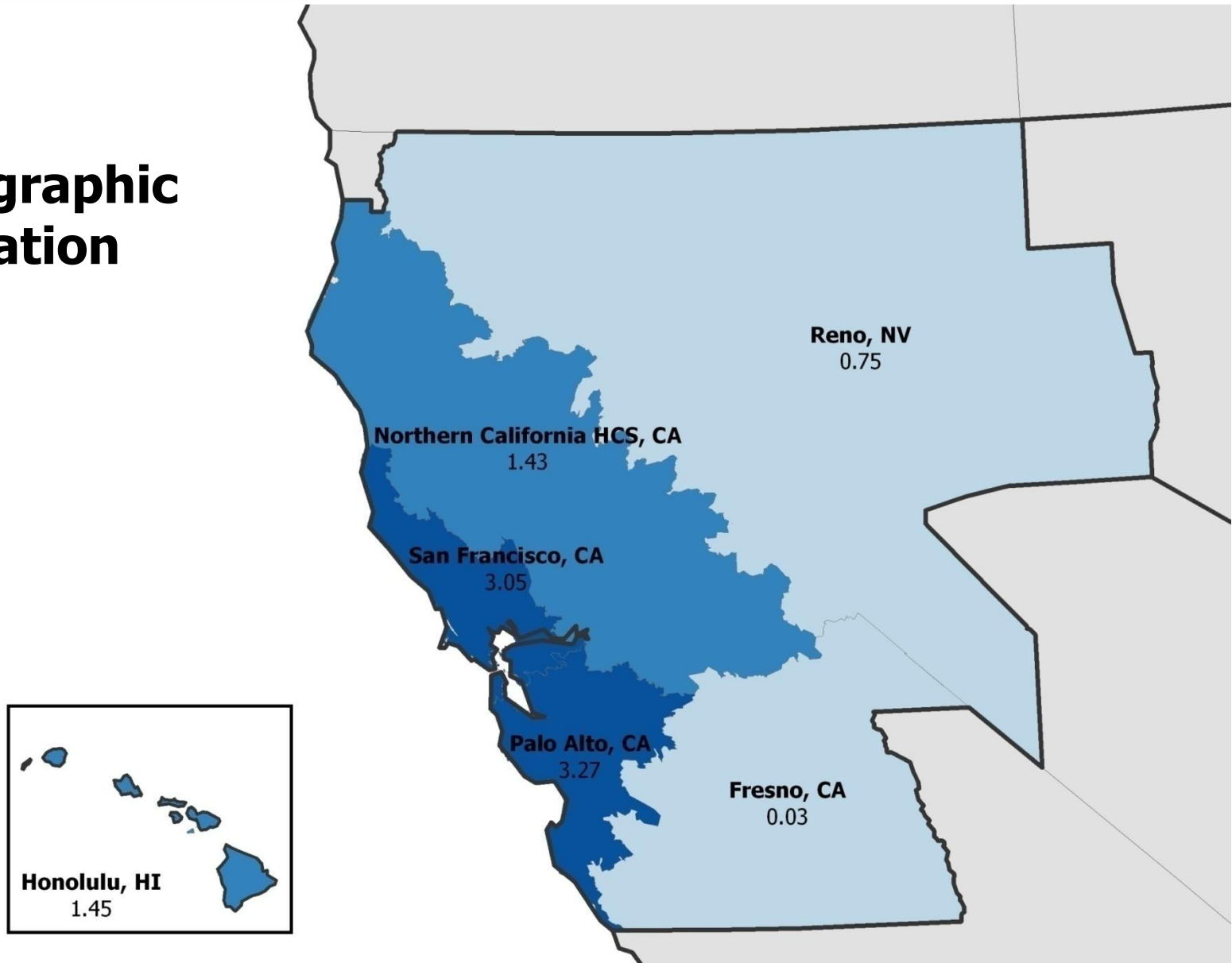
Level the Playing Field

Administrative Model



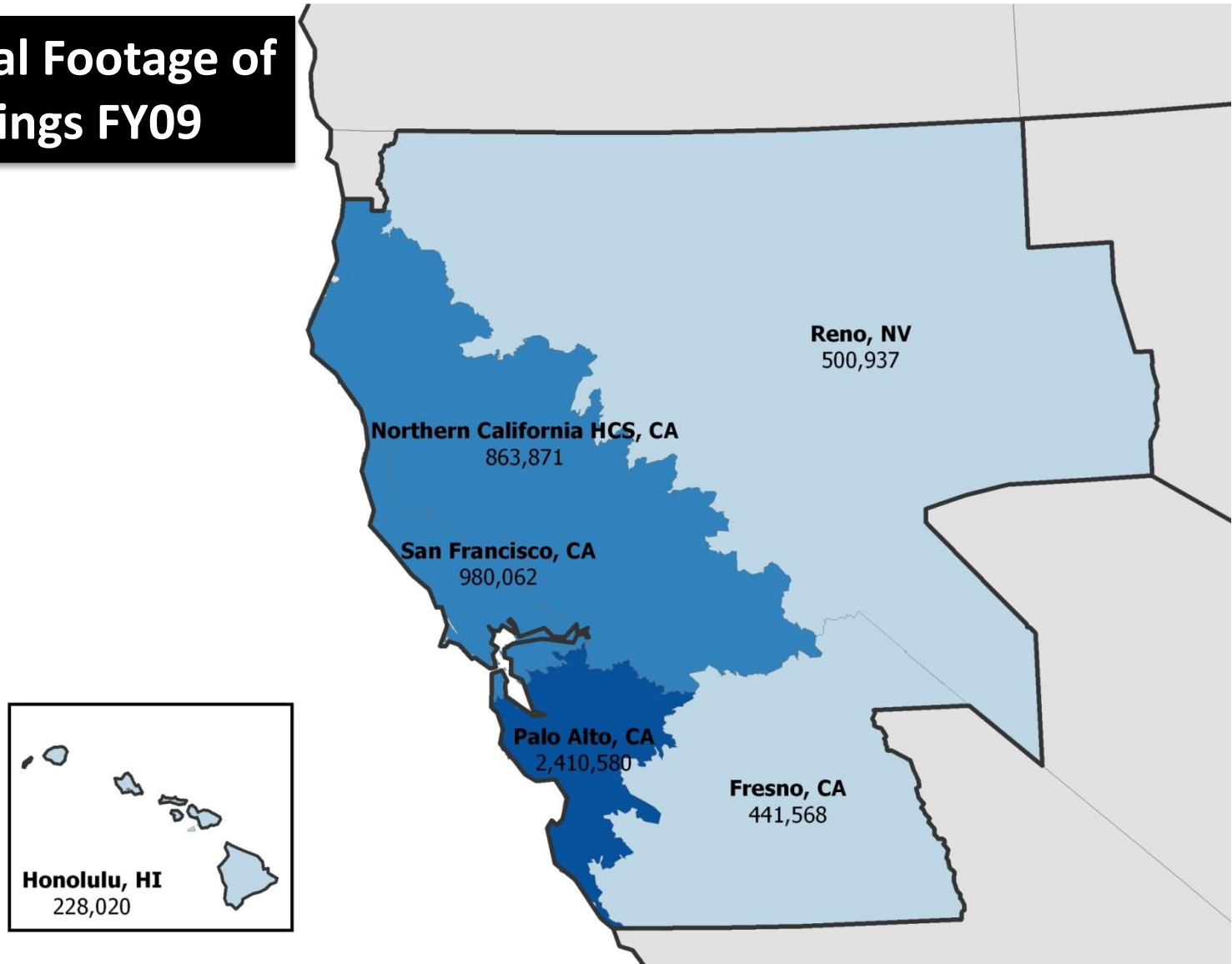
VISN 21 Standardized Non-Clinician Salary and Geographic Pricing Cost Indexing FY09

Geographic Variation



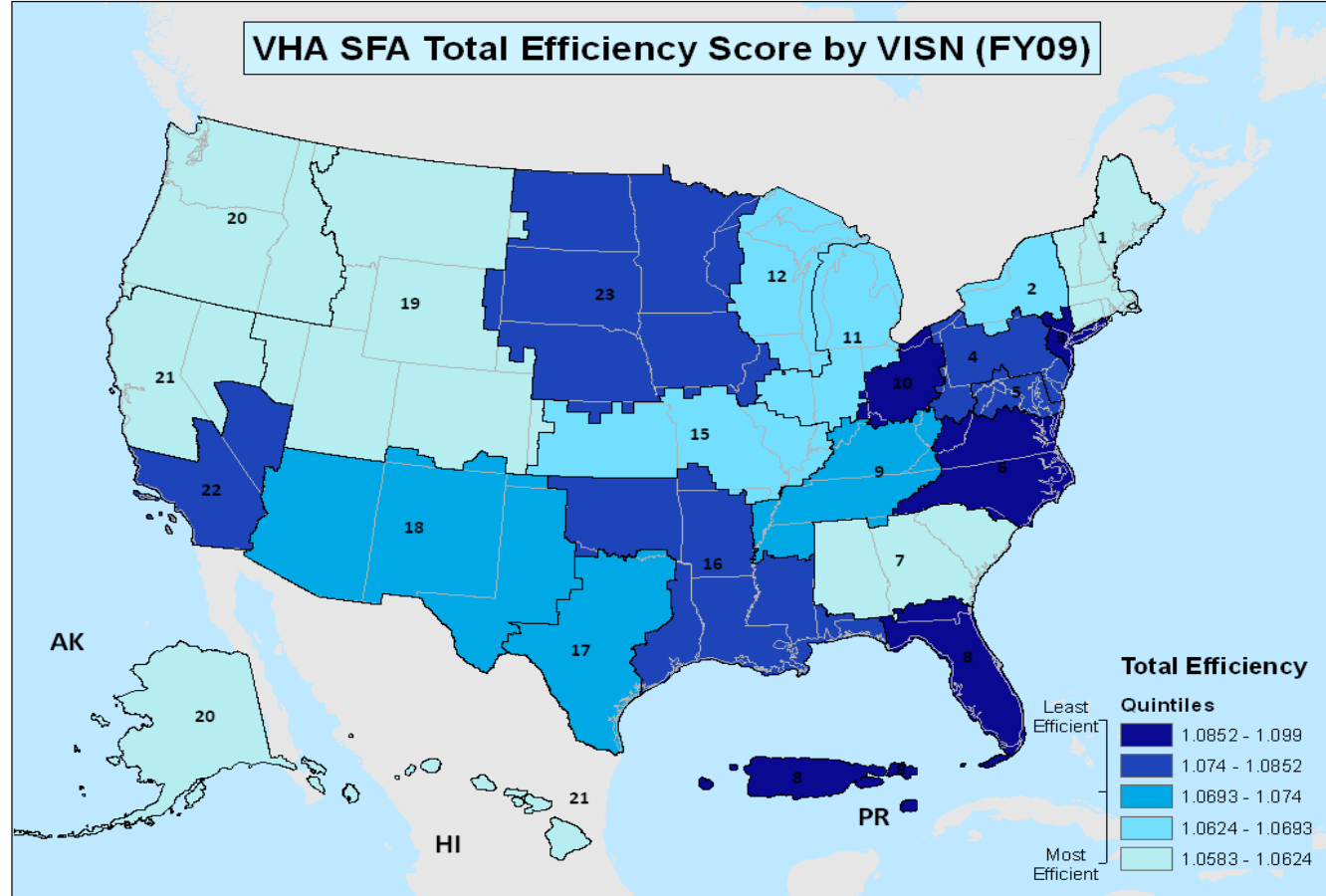
Variation in Facility Infrastructure

**VISN 21 Total Footage of
All Buildings FY09**

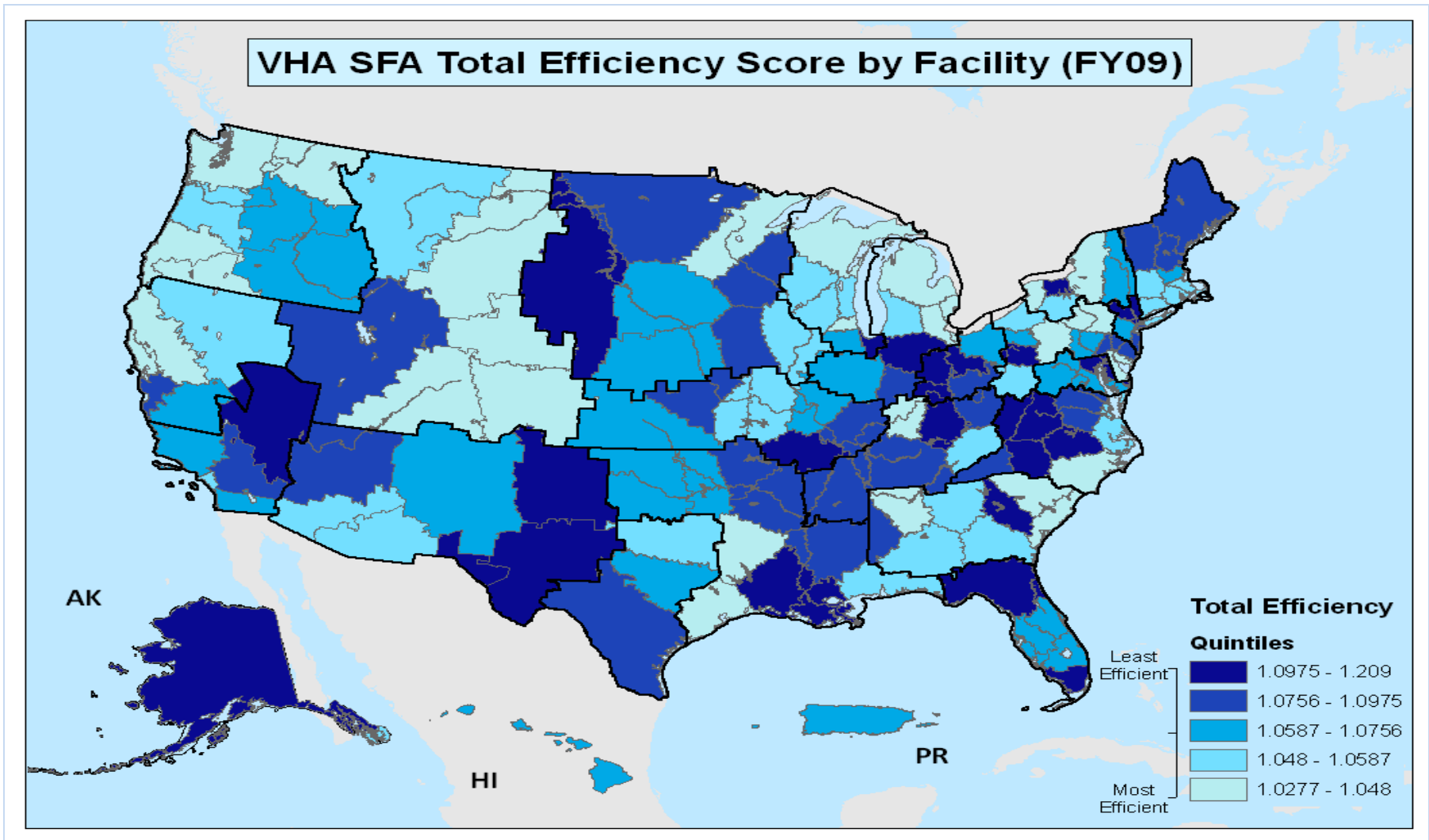


VISN Outcomes

| VISN | | Efficiency Level |
|------------------|--|------------------|
| 20 PORTLAND | <div style="display: flex; align-items: center; justify-content: center;"> <div style="writing-mode: vertical-rl; transform: rotate(180deg); font-weight: bold; margin-right: 10px;">Most Efficient</div> <div style="font-size: 2em; margin-right: 10px;">↑</div> <div style="writing-mode: vertical-rl; transform: rotate(180deg); font-weight: bold; margin-right: 10px;">↓</div> <div style="writing-mode: vertical-rl; transform: rotate(180deg); font-weight: bold; margin-left: 10px;">Least Efficient</div> </div> | 1.058 |
| 07 ATLANTA | | 1.059 |
| 19 DENVER | | 1.059 |
| 21 SAN FRANCISCO | | 1.060 |
| 01 BOSTON | | 1.062 |
| 11 ANN ARBOR | | 1.063 |
| 02 ALBANY | | 1.065 |
| 12 CHICAGO | | 1.066 |
| 15 KANSAS CITY | | 1.069 |
| 17 DALLAS | | 1.069 |
| 18 PHOENIX | | 1.073 |
| 09 NASHVILLE | | 1.073 |
| 16 JACKSON MS | | 1.074 |
| 04 PITTSBURGH | | 1.076 |
| 05 BALTIMORE | | 1.077 |
| 23 MINNEAPOLIS | | 1.078 |
| 22 LONG BEACH | | 1.085 |
| 08 BAY PINES | | 1.086 |
| 10 CINCINNATI | | 1.088 |
| 03 BRONX | | 1.089 |
| 06 DURHAM | 1.098 | |

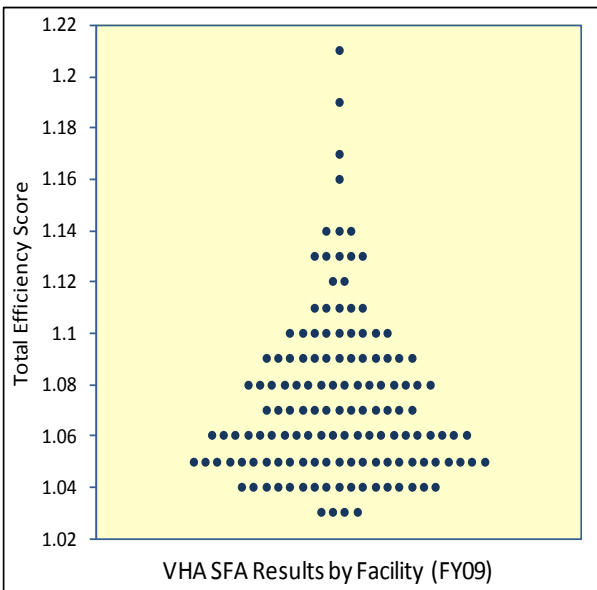


Medical Center Outcomes

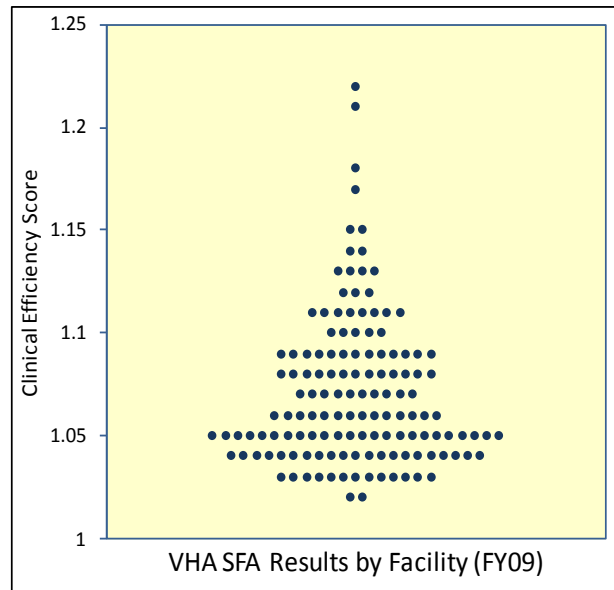


Medical Center Outcomes

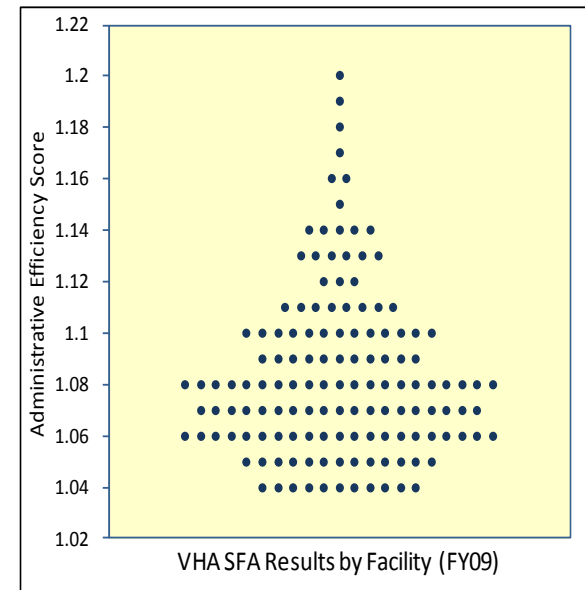
Overall Efficiency Score Distribution (FY09)



Clinical Efficiency Score Distribution (FY09)

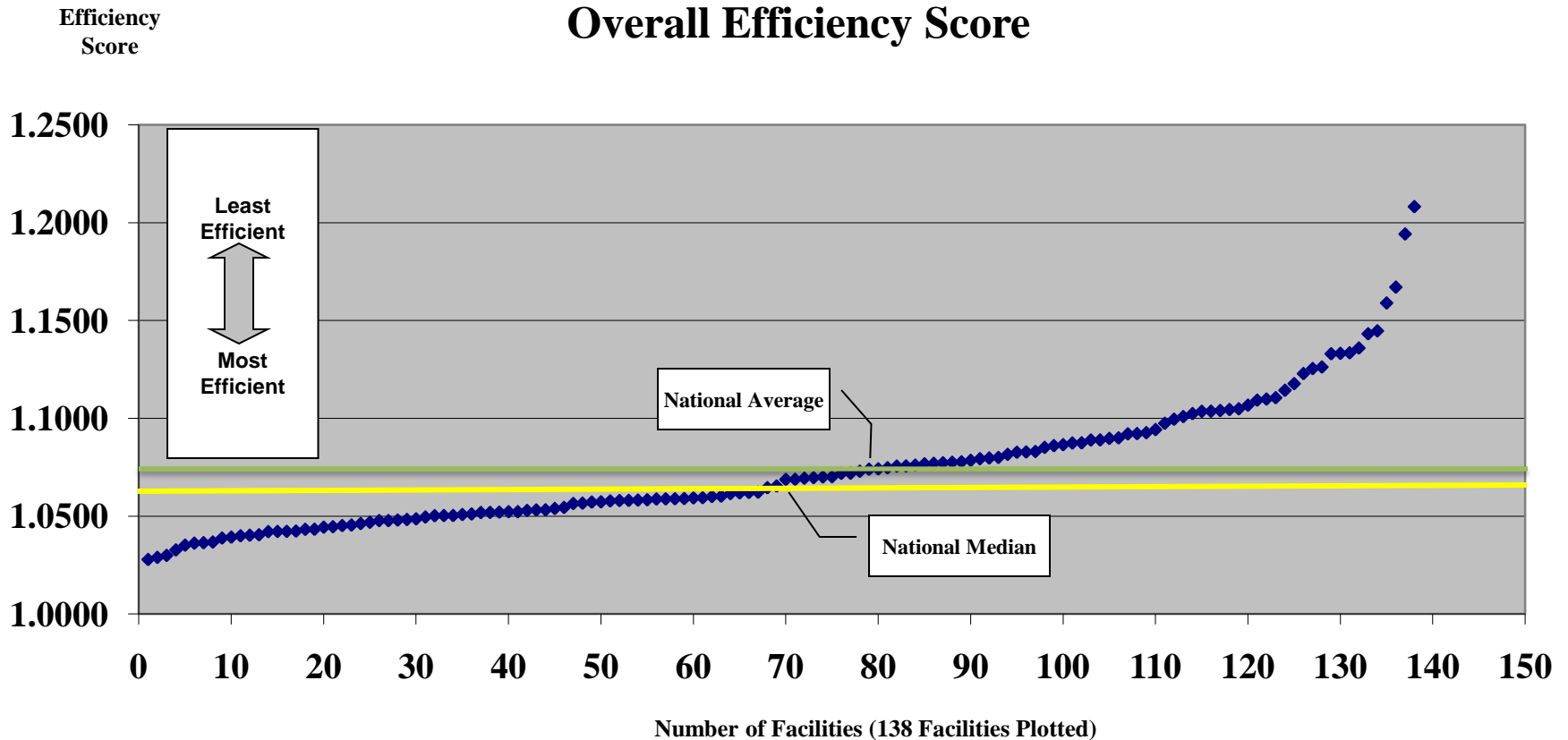


Administrative Efficiency Score Distribution (FY09)



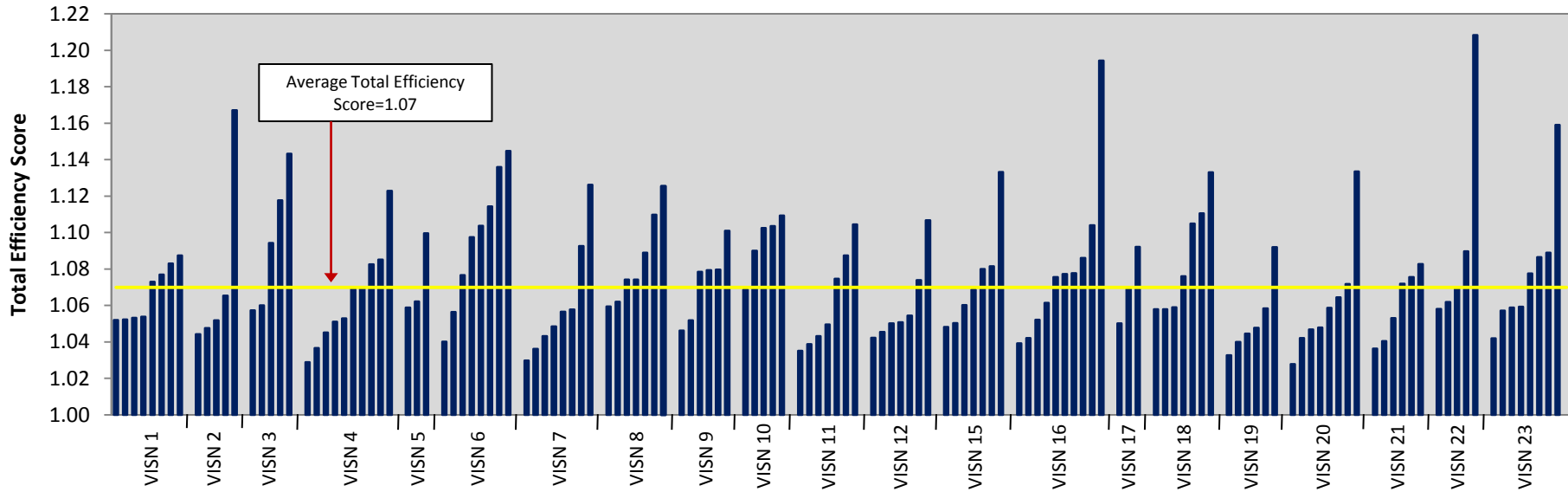
Medical Center Outcomes

Overall Efficiency Score

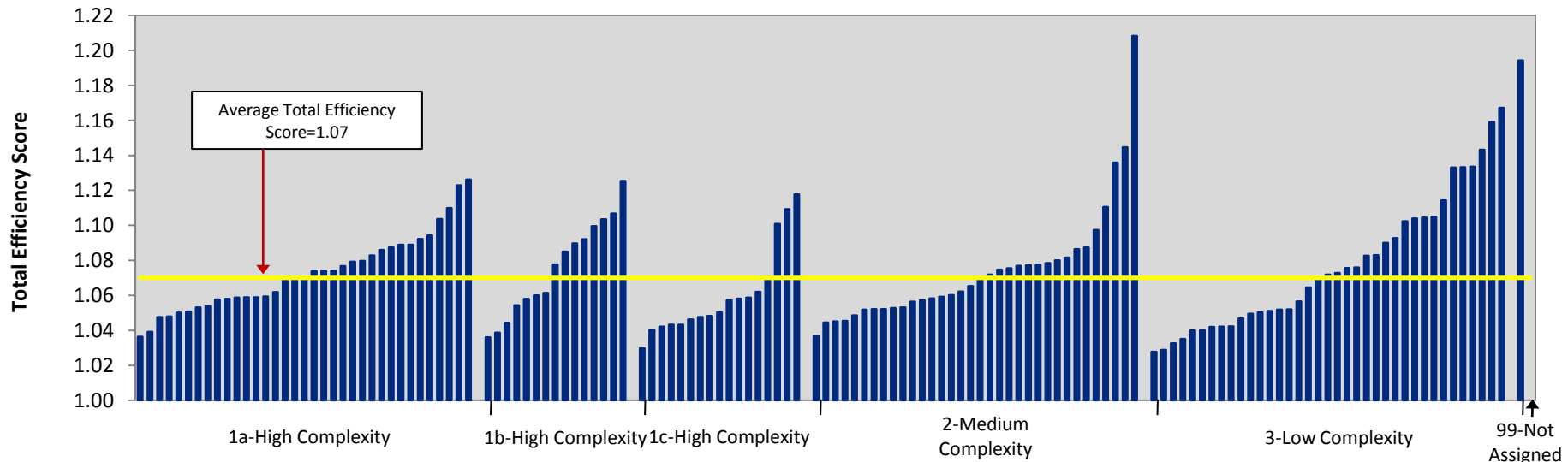


FY 2009 SFA Total Efficiency

FY09 Total Efficiency by VISN (FY09)

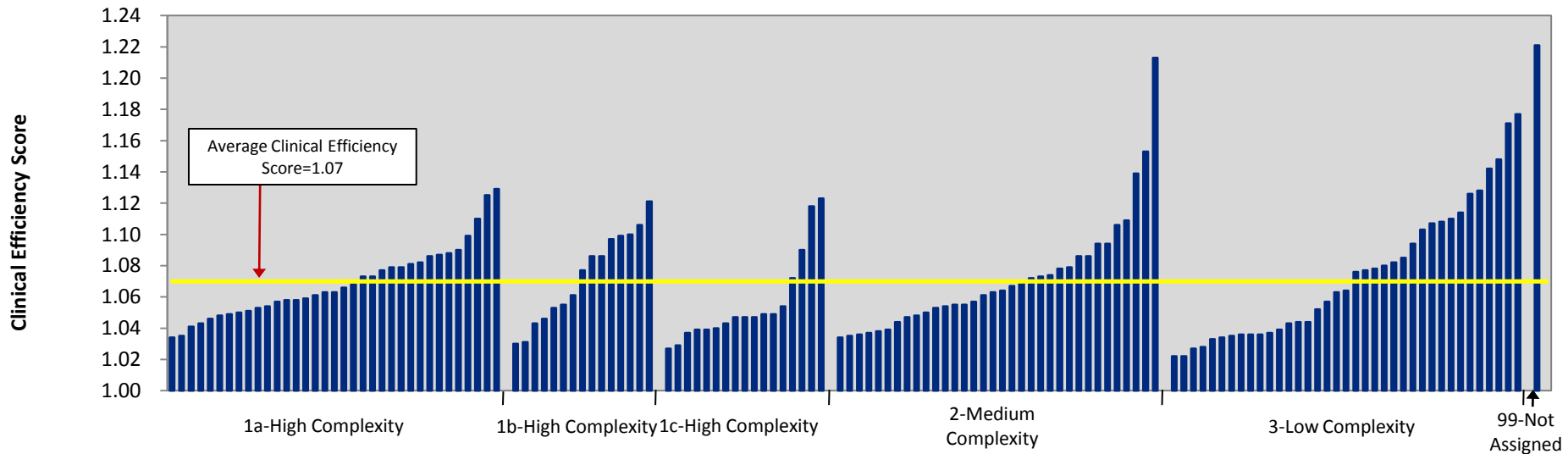
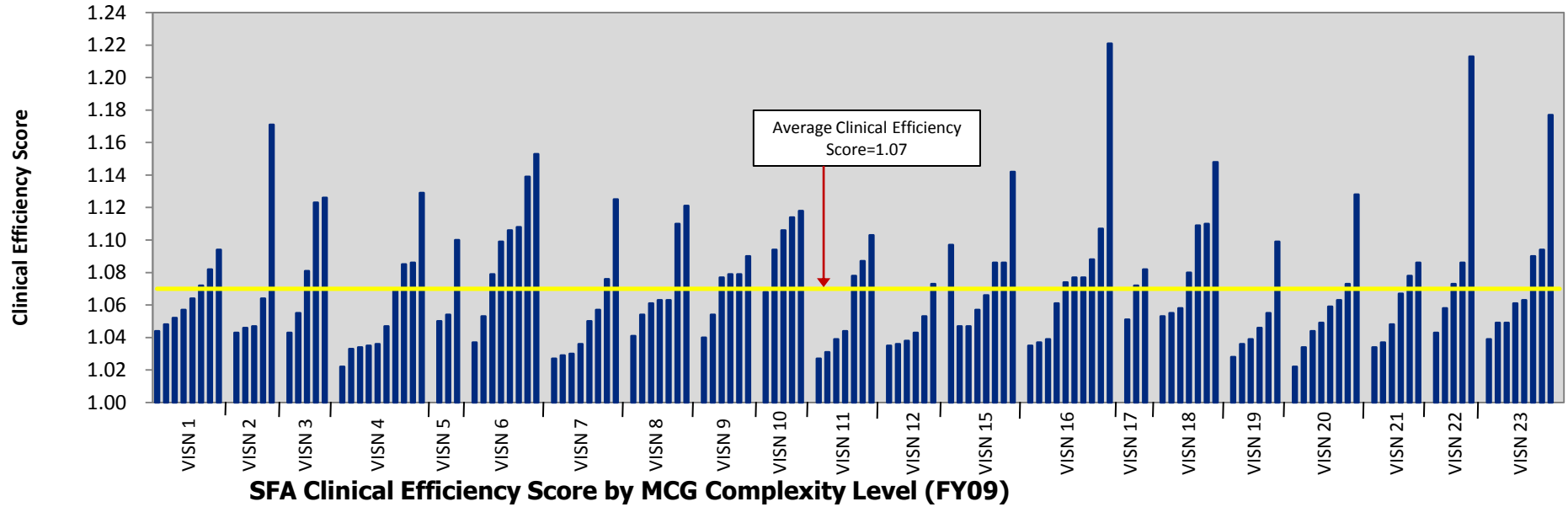


SFA Total Efficiency Score by MCG Complexity (FY09)



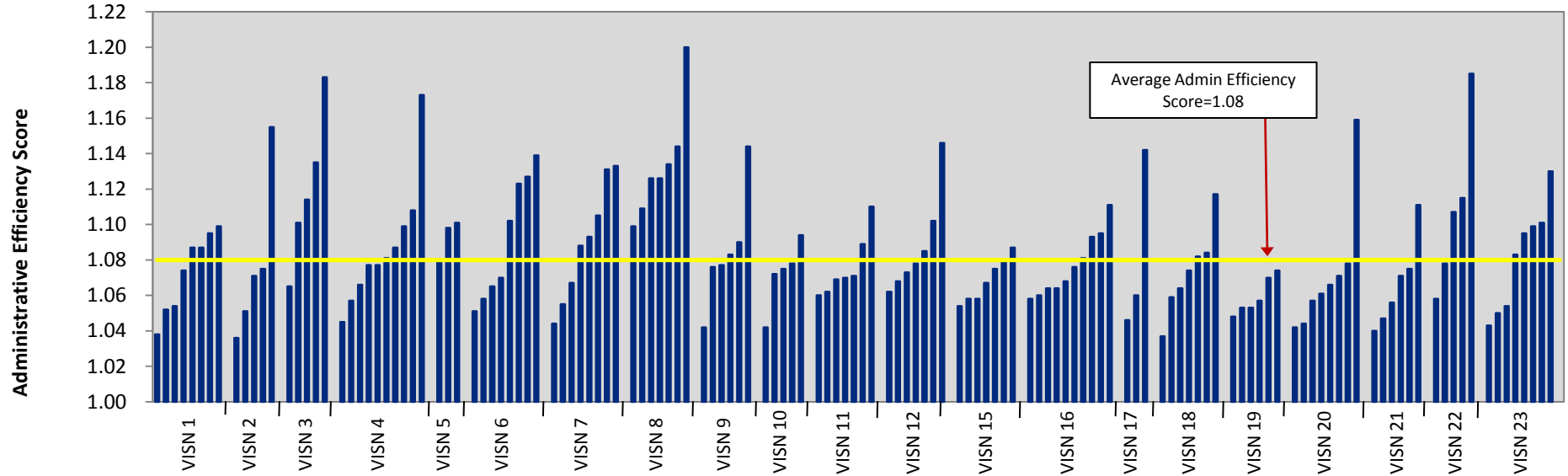
FY 2009 SFA Clinical Efficiency

SFA Clinical Efficiency by VISN (FY09)

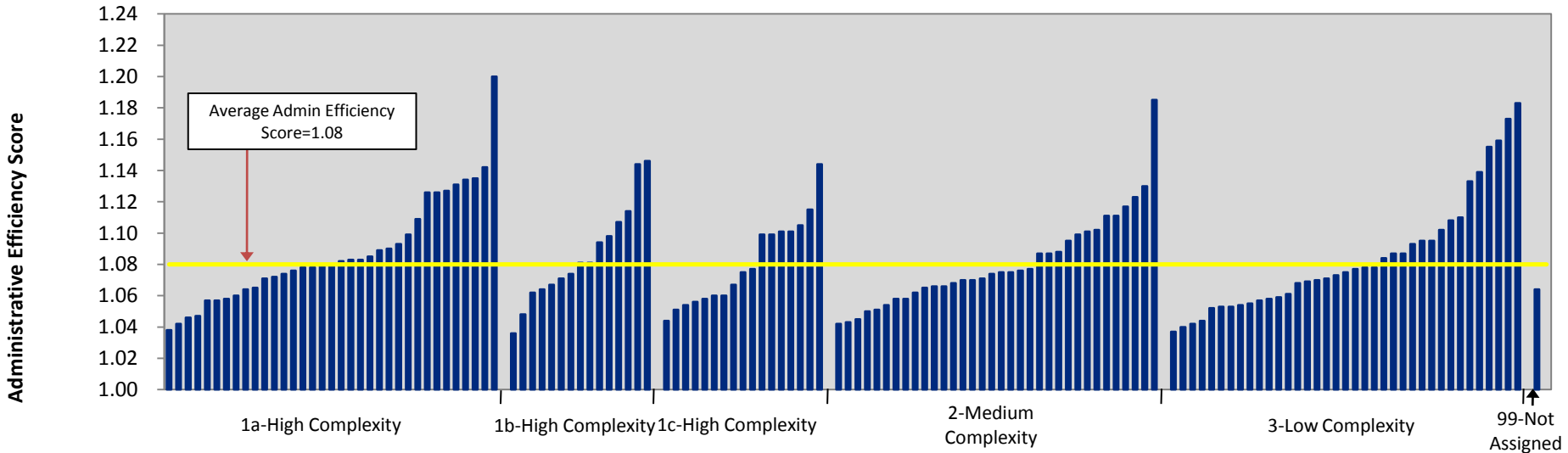


FY 2009 Administrative Efficiency

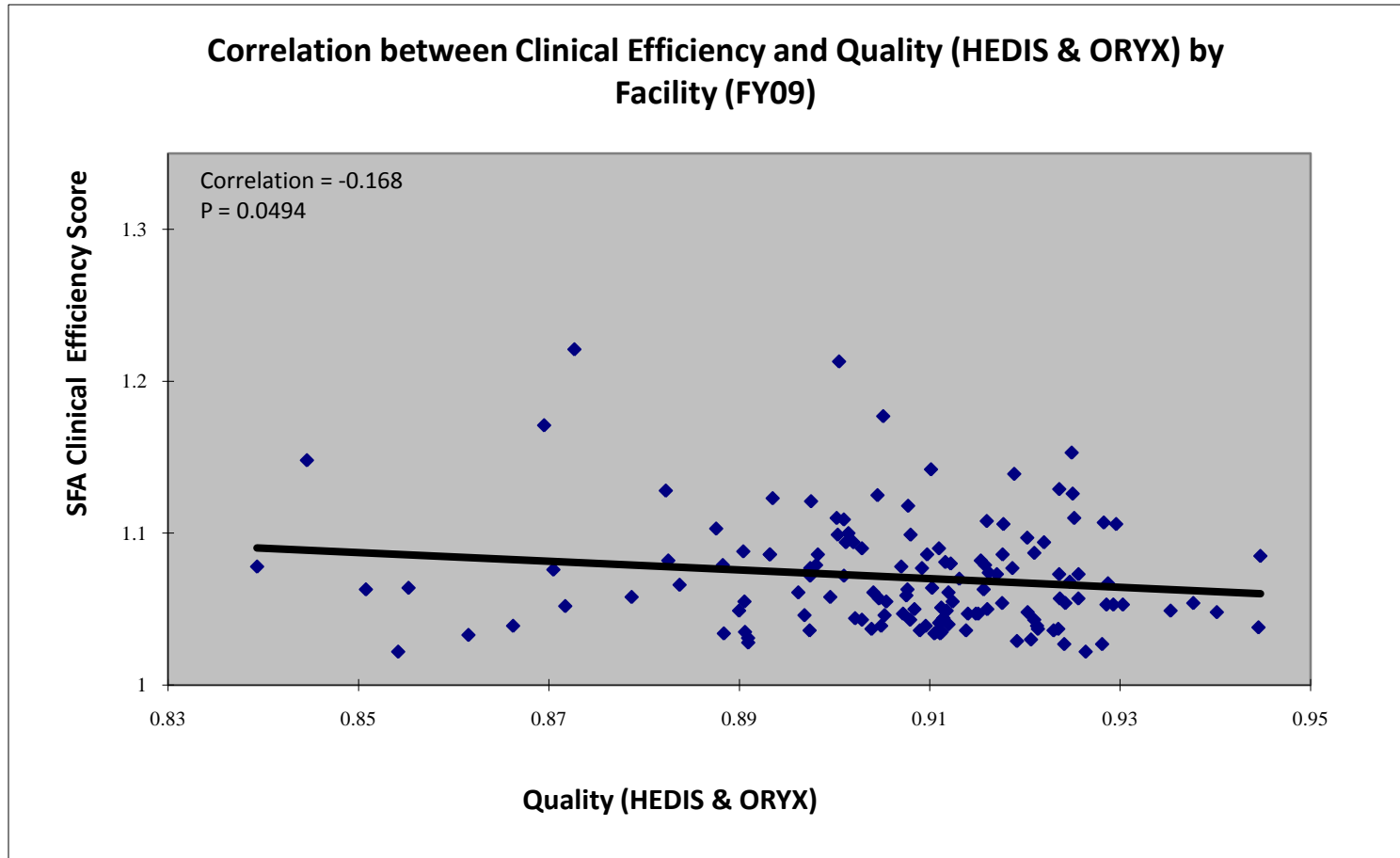
SFA Administrative Efficiency by VISN (FY09)



SFA Administrative Efficiency Score by MCG Complexity Level (FY09)

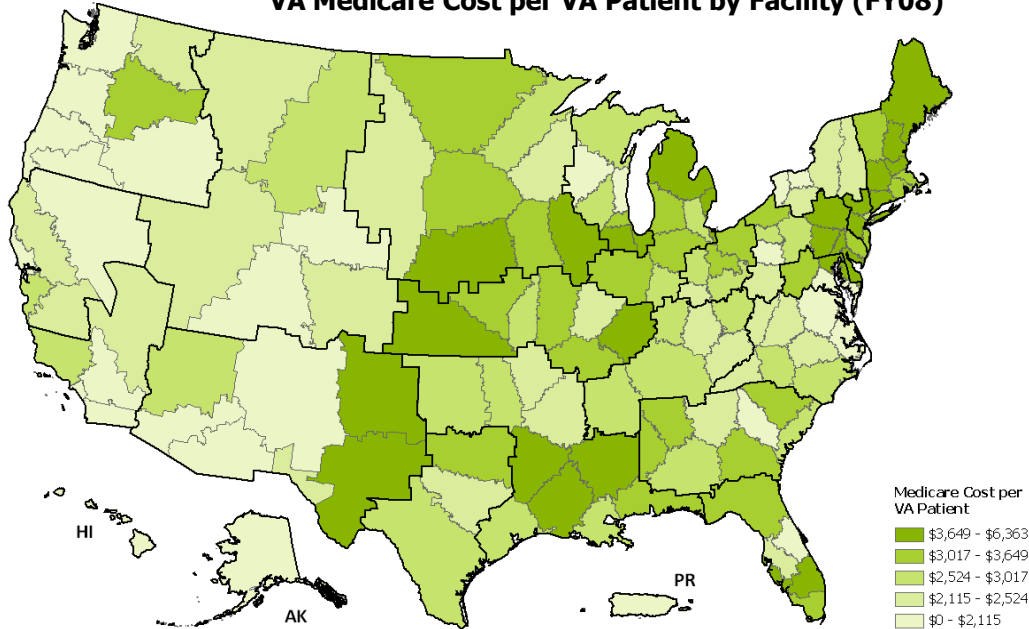


Relationship of Efficiency to Quality



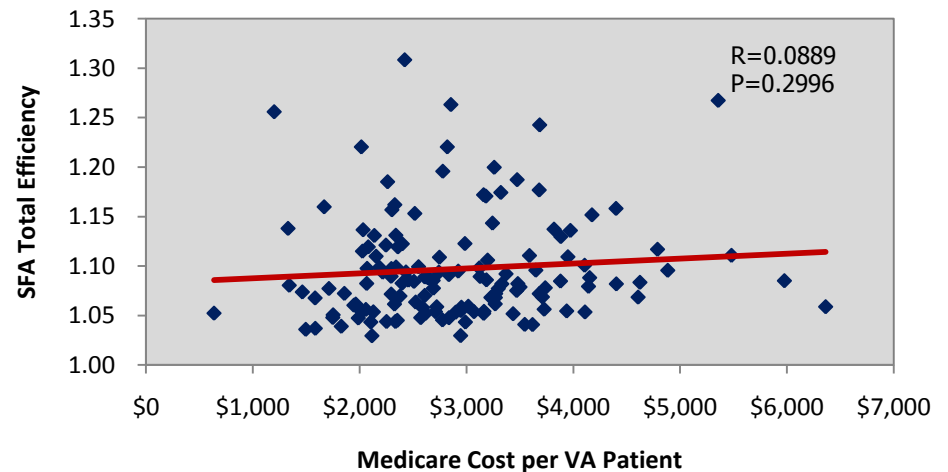
Variation in Reliance

VA Medicare Cost per VA Patient by Facility (FY08)

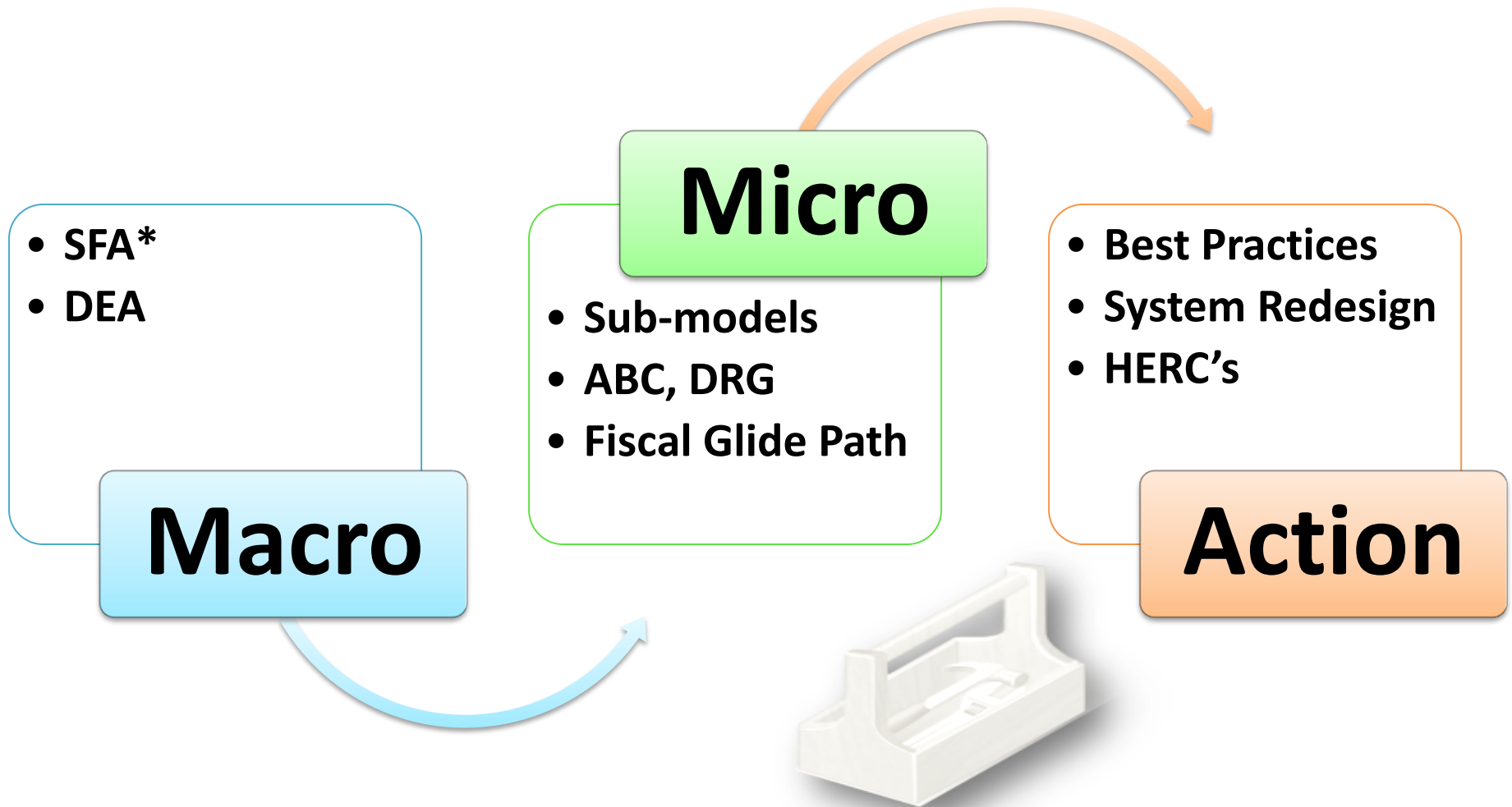


VHA Reliance is an issue that we need to consider; however, Medicare data generally lag so only available retrospectively

Correlation between Medicare Cost per VA Patient and SFA Total Efficiency Score by Facility (FY08)



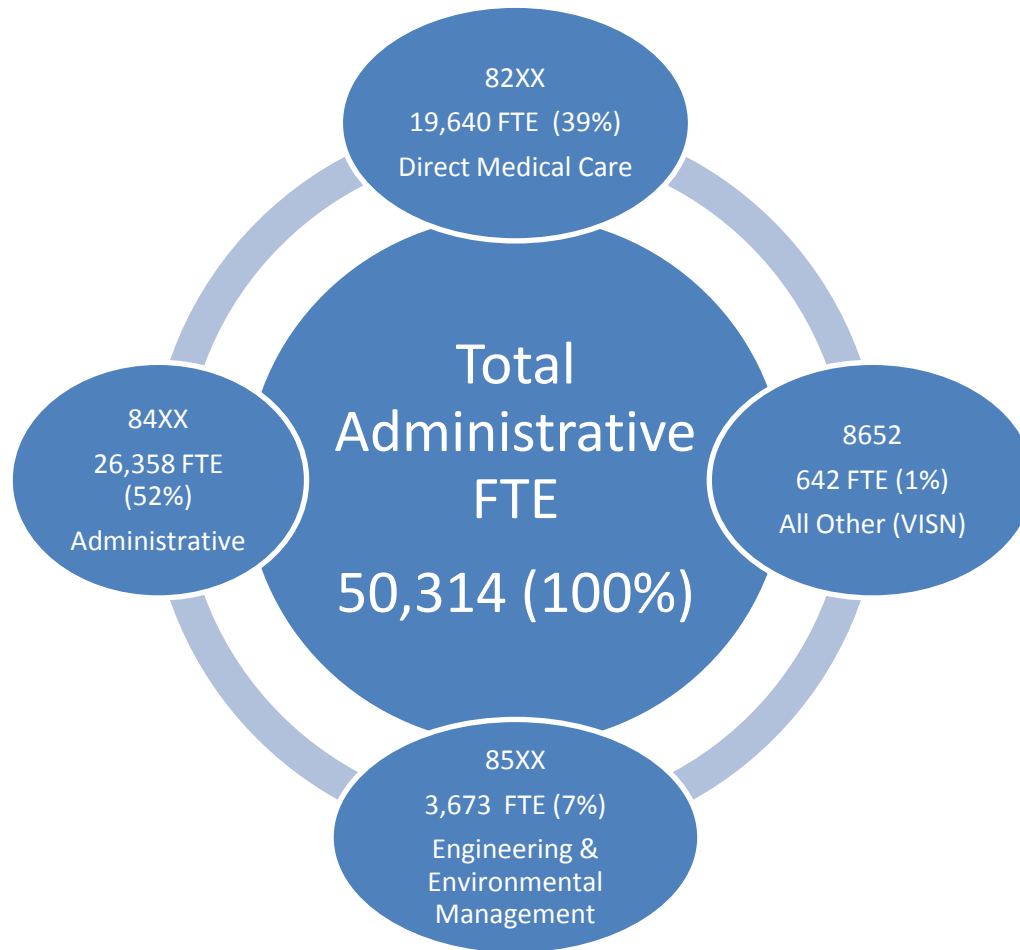
Strategy for Looking at Efficiency



Administrative FTE Model

Distribution of Administrative FTE

“Administrative FTE not Otherwise Classified (BOC 1001). Title 38 Employees working in Admin.
Excludes secretaries and all other clerical-type employees.”



Administrative FTE Model

Dependent Variable = FY 2009 Parent Station Admin FTE (BOC=1001 & Title 38 in Admin)

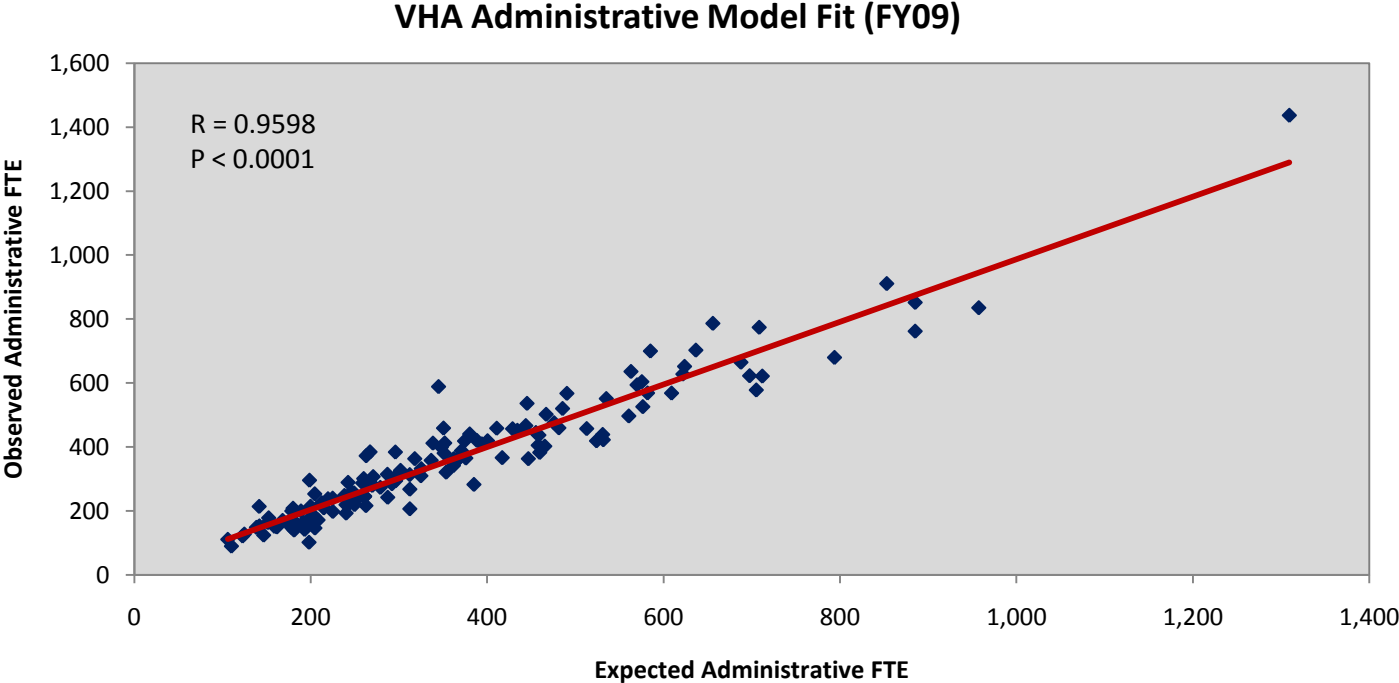
+

- Patients (volume)
- DxCG (patient risk)
- LTC ADC (facility characteristic)
- Salary/GPCI (Geographic)
- Residents –Program Count (Teaching Mission)
- Multi-Division Facility

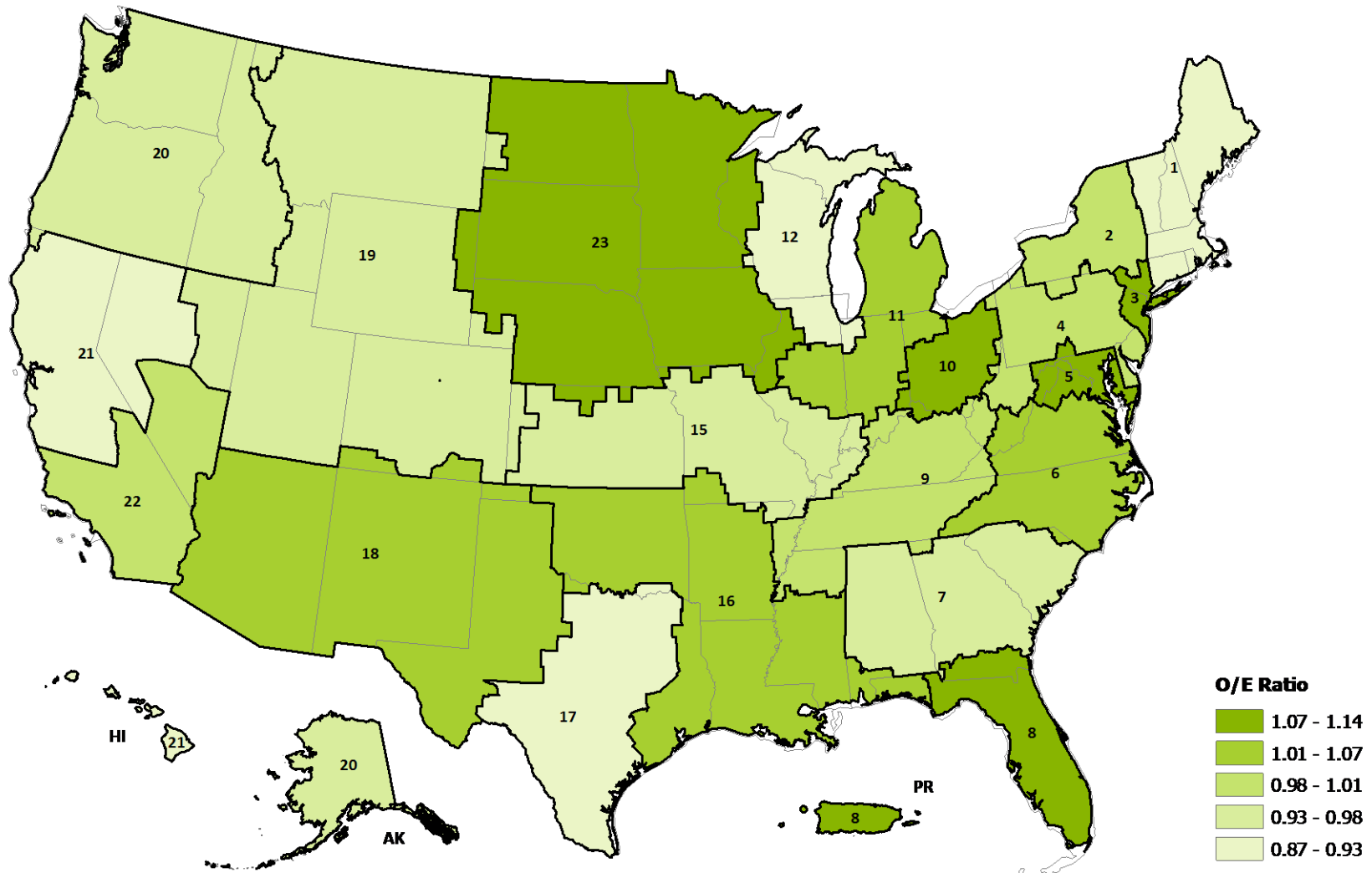
-

- Patient Income
- Travel Time
- Shared Workload

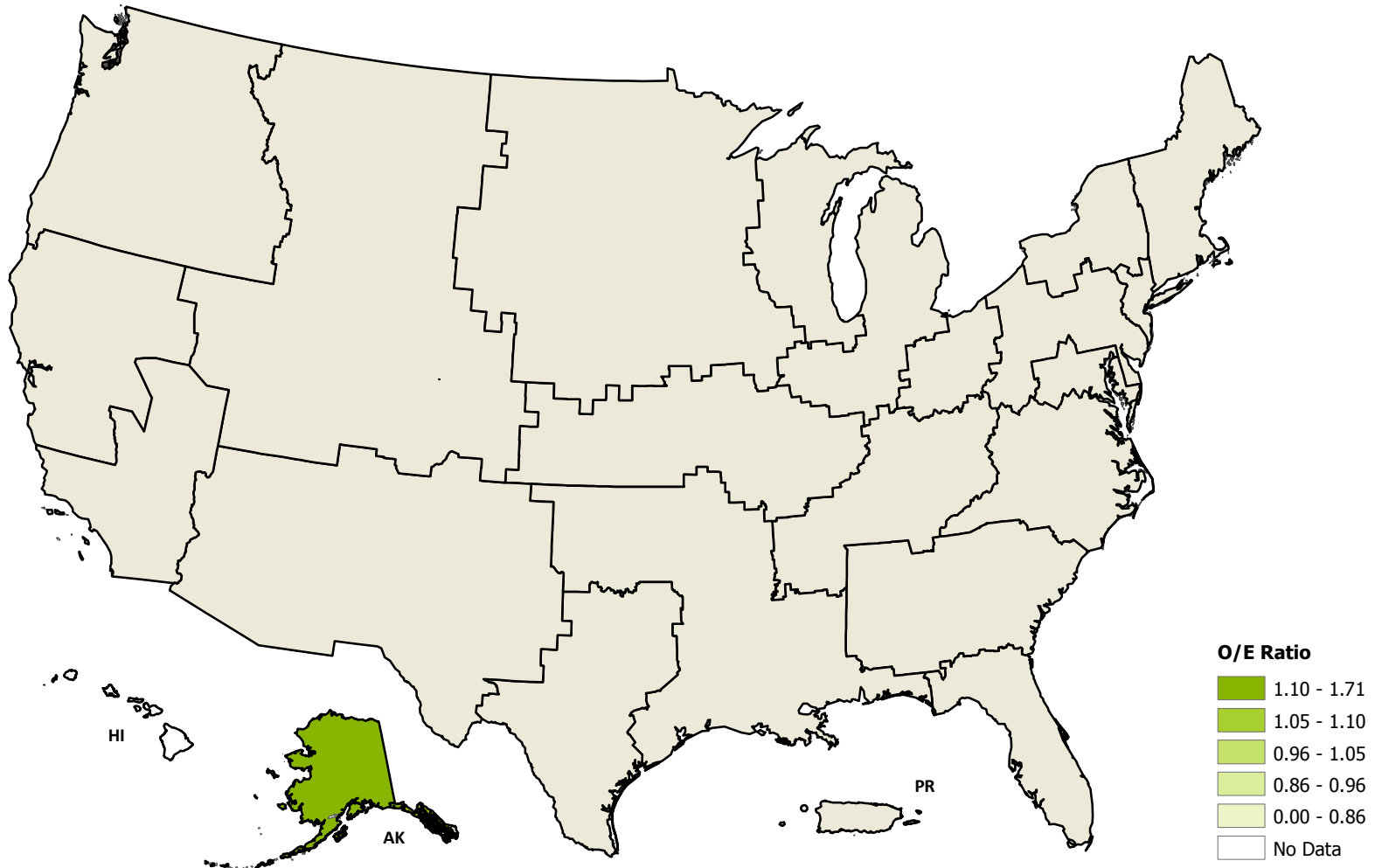
How Well Does the Model Fit?



VHA Administrative FTE O/E Ratio by VISN (FY09)

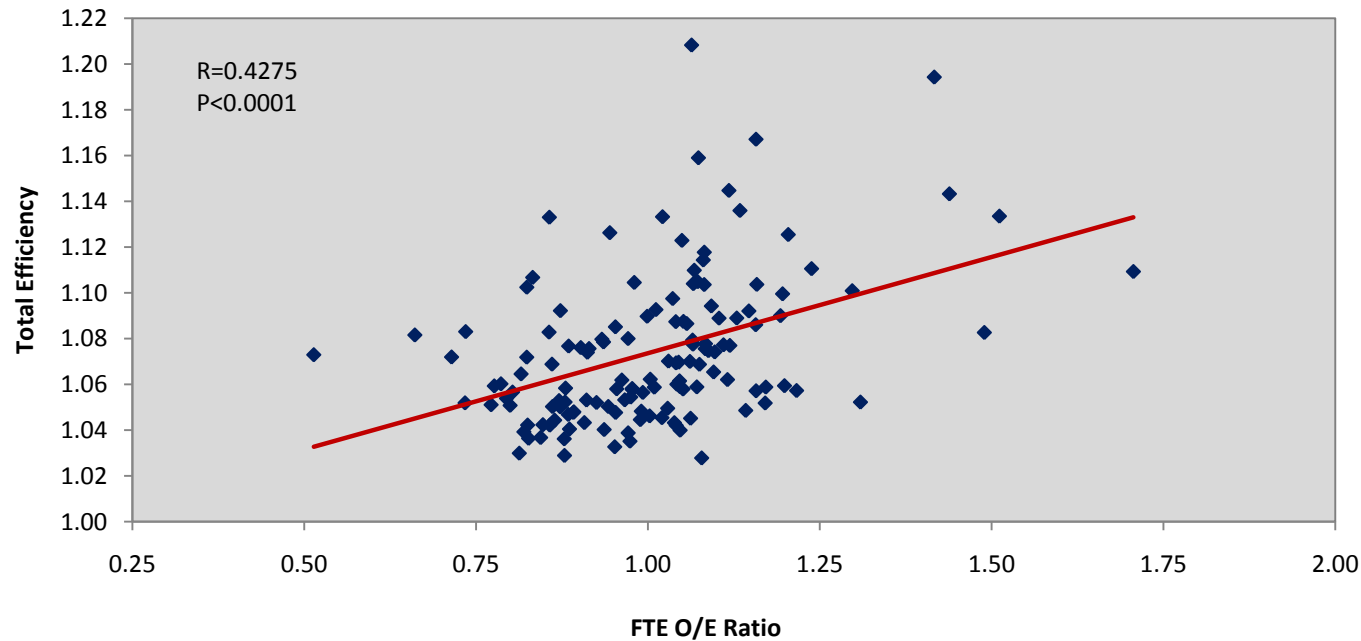


VHA Administrative FTE O/E Ratio by Facility (FY09)



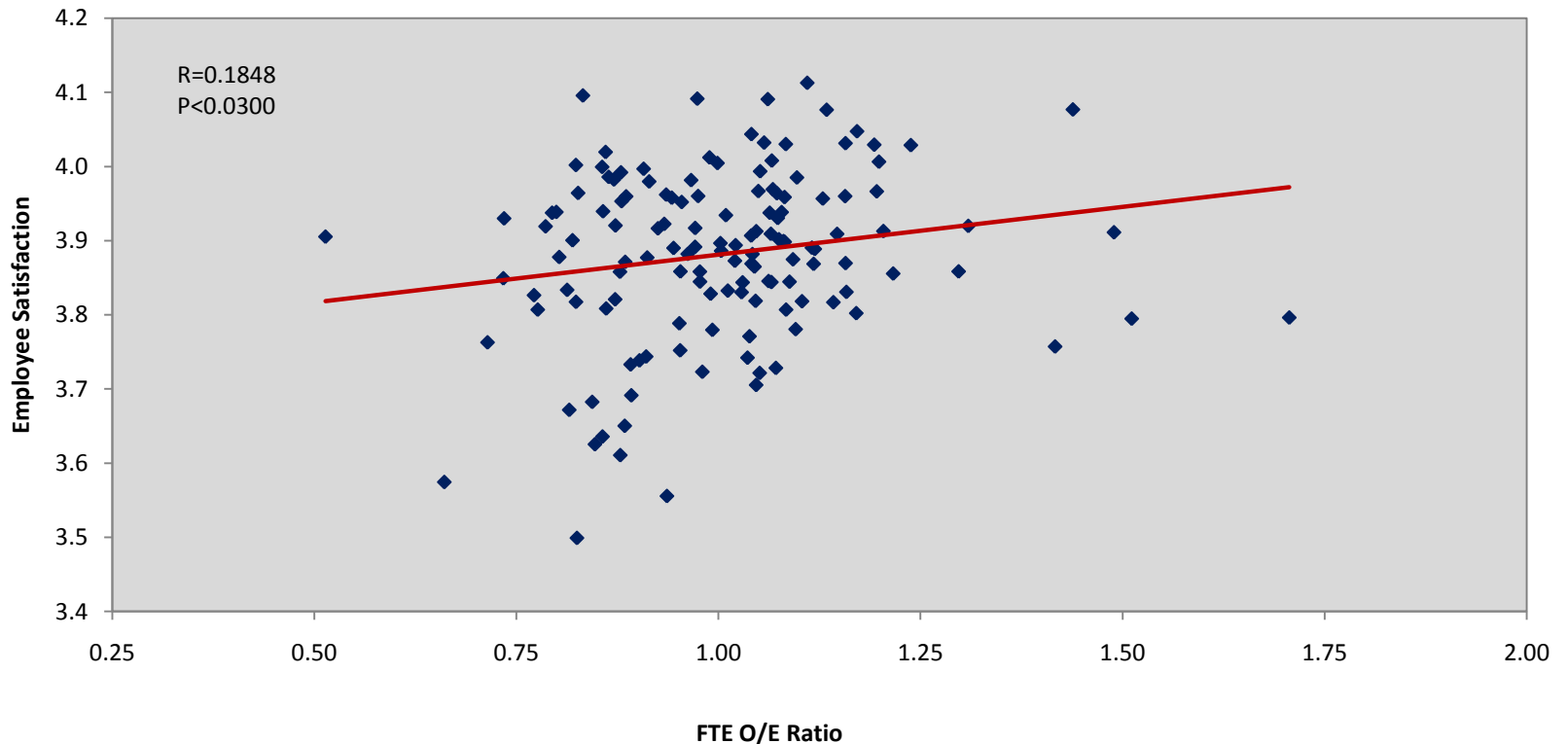
Is there a Correlation Between Admin FTE O/E and SFA Total Efficiency ?

VHA ADM FTE O/E Ratio vs. Total Efficiency Score by Facility (FY09)



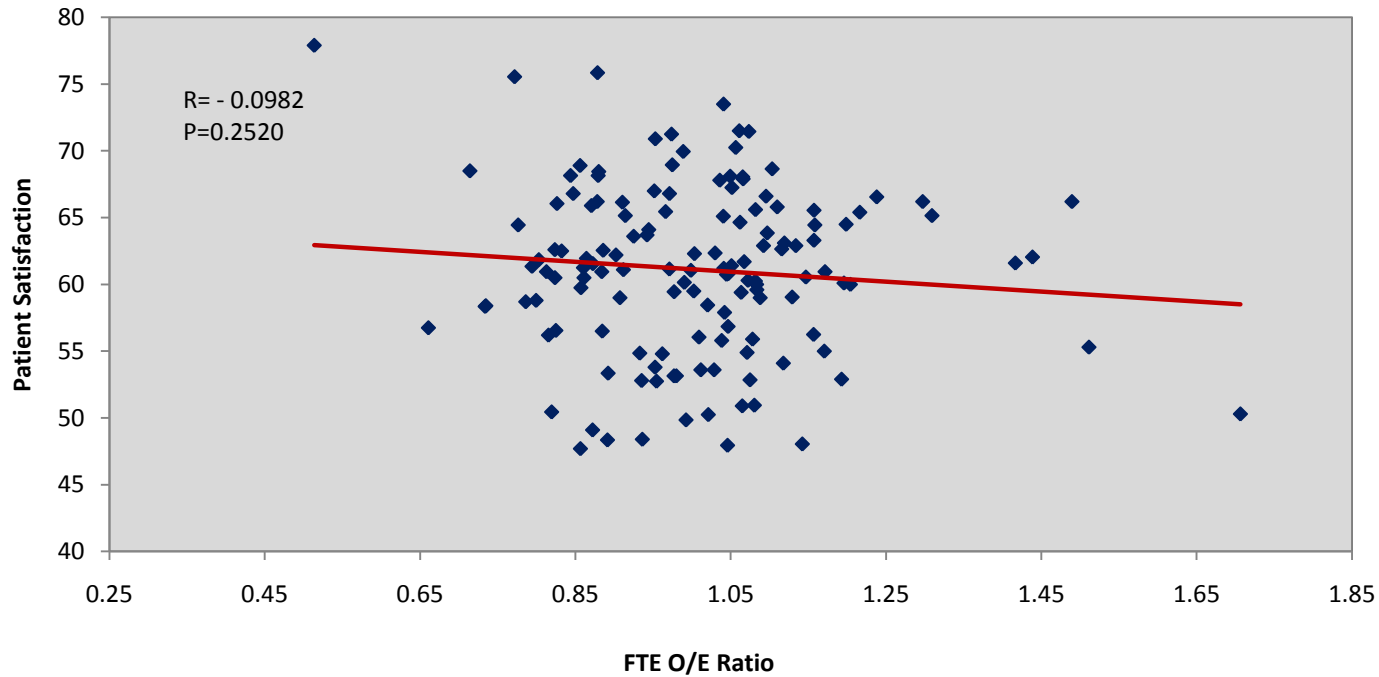
Does having more Admin. Staff lead to Better AES Scores?

VHA ADM FTE O/E Ratio vs. Employee Satisfaction by Facility (FY09)



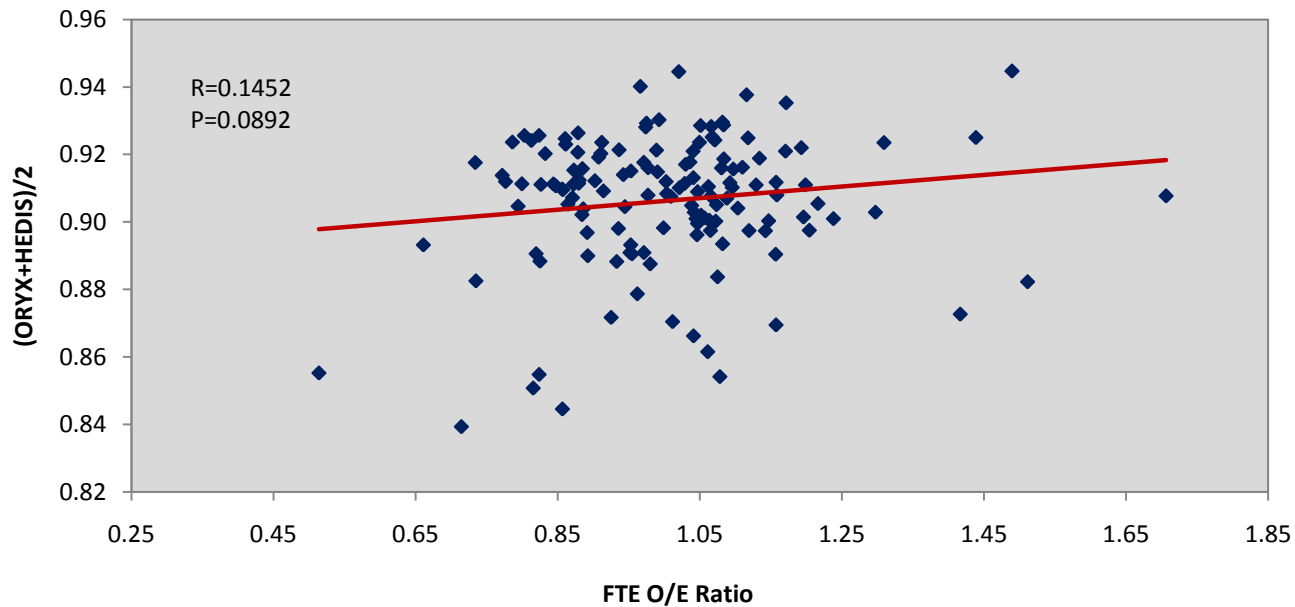
Does having more Admin. Staff Lead to Higher Patient Satisfaction Scores?

VHA ADM FTE O/E Ratio vs. Patient Satisfaction by Facility (FY09)



Does more Admin Staff lead to Better Quality Metrics?

VHA ADM FTE O/E Ratio vs. (ORYX+HEDIS)/2 by Facility (FY09)





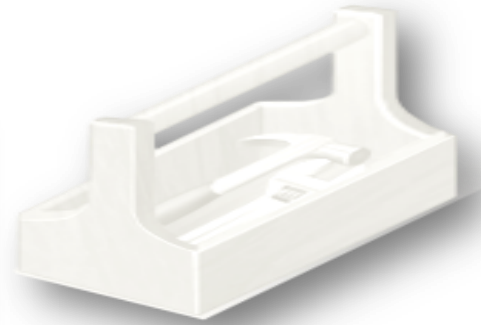
Efficiency

- Stochastic Frontier Analysis Efficiency
- Efficiency Opportunity Grid**
- ACSC
- Emergency Department ED Model
- Fee Care Model
- Pharmacy Model
- Operating Room (OR) Efficiency

EFFICIENCY OPPORTUNITY GRID



[VISN/Facility Lookup](#)
[MCG/Facility Comparison](#)
[Efficiency Opportunity Grid](#)



Instructions: Select a VISN and then select a parent facility from within that VISN.

Step 1: **VISN:** [Dropdown menu]

Step 2: **Parent Facility:** [Dropdown menu]

Facility Specifics

Parent Facility Station Number (STA5A): [Dropdown menu]

Parent Facility Station Number (STA3N): [Dropdown menu]

Parent Facility Complexity Level:
1a

Parent Facility Designation:
Tertiary

O/E Ratio OME (if performing higher than Expected)

| | | | |
|-------------------------------|--------------------------------|-------|-------------|
| SFA Model | FY09 Overall: | 1.083 | |
| | FY09 Clinical: | 1.086 | |
| | FY09 Administrative: | 1.071 | |
| Ambulatory Care Models | FY11Q1 ACSC (All) Model: | 0.83 | |
| | FY11Q1 CHF ACSC Model: | 0.77 | |
| | FY11Q1 Pneumonia ACSC Model: | 0.54 | |
| Specialty Care Models | FY09 Specialty Care Model: | 0.78 | |
| | FY09 Medical / Surgical Model: | 0.80 | |
| | FY09 ED model: | 0.82 | |
| Staffing Models | FY09 Admin FTEE Model: | 0.86 | |
| Direct Cost Models | FY08 Pharmacy Model: | 1.06 | \$542,599 |
| | FY10 Fee Model: | 1.23 | \$8,453,053 |
| | FY09 EOL Care Model: | 0.68 | |
| Inpatient Models | FY10 Acute OMELOS: | -0.41 | |
| | FY10 ICU OMELOS: | -0.31 | |
| | FY10 Readmissions: | 11.1% | |



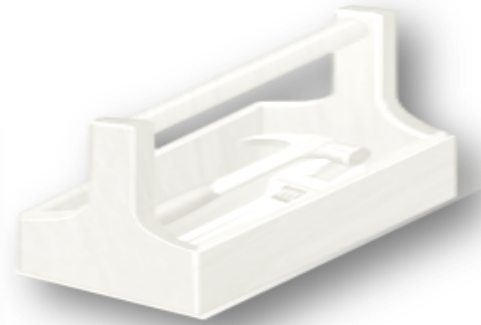
Efficiency

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EFFICIENCY OPPORTUNITY GRID



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Step 2: **Parent Facility:**

Facility Specifics

Parent Facility Station Number (STA5A):

Parent Facility Station Number (STA3N):

Parent Facility Complexity Level:
1a

Parent Facility Designation:
Tertiary

O/E Ratio OME (if performing higher than Expected)

| | | | |
|-------------------------------|---------------------------------------|-------|-------------|
| SFA Model | FY09 Overall: | 1.087 | |
| | FY09 Clinical: | 1.087 | |
| | FY09 Administrative: | 1.089 | |
| Ambulatory Care Models | FY11Q1 ACSC (All) Model: | 1.16 | 176.2 |
| | FY11Q1 CHF ACSC Model: | 0.97 | |
| | FY11Q1 Pneumonia ACSC Model: | 1.20 | 33.9 |
| Specialty Care Models | FY09 Specialty Care Model: | 0.90 | |
| | FY09 Medical / Surgical Model: | 1.04 | 4,913 |
| | FY09 ED model: | 0.96 | |
| Staffing Models | FY09 Admin FTEE Model: | 1.04 | 17.61 |
| Direct Cost Models | FY08 Pharmacy Model: | 1.10 | \$9,970,768 |
| | FY10 Fee Model: | 1.36 | \$7,907,737 |
| | FY09 EOL Care Model: | 0.90 | |
| Inpatient Models | FY10 Acute OMELOS: | -0.69 | |
| | FY10 ICU OMELOS: | -0.63 | |
| | FY10 Readmissions: | 14.6% | |



Efficiency

- Stochastic Frontier Analysis Efficiency
- **Efficiency Opportunity Grid**
- ACSC
- Emergency Department ED Model
- Fee Care Model
- Pharmacy Model
- Operating Room (OR) Efficiency

EFFICIENCY OPPORTUNITY GRID



[VISN/Facility Lookup](#)
[MCG/Facility Comparison](#)
[Efficiency Opportunity Grid](#)



Instructions: Select a VISN and then select a parent facility from within that VISN.

Step 1: **VISN:**

Step 2: **Parent Facility:**

Facility Specifics

Parent Facility Station Number (STA5A):

Parent Facility Station Number (STA3N):

Parent Facility Complexity Level:

Parent Facility Designation:

O/E Ratio OME (if performing higher than Expected)

| | | | |
|------------------------|--------------------------------|-------|-------------|
| SFA Model | FY09 Overall: | 1.062 | |
| | FY09 Clinical: | 1.054 | |
| | FY09 Administrative: | 1.099 | |
| Ambulatory Care Models | FY11Q1 ACSC (All) Model: | 1.04 | 39.3 |
| | FY11Q1 CHF ACSC Model: | 1.42 | 98.7 |
| | FY11Q1 Pneumonia ACSC Model: | 1.03 | 5.7 |
| Specialty Care Models | FY09 Specialty Care Model: | 1.09 | 36,608 |
| | FY09 Medical / Surgical Model: | 1.28 | 38,758 |
| | FY09 ED Model: | 0.80 | |
| Staffing Models | FY09 Admin FTEE Model: | 1.12 | 47.54 |
| Direct Cost Models | FY08 Pharmacy Model: | 0.91 | \$1,559,642 |
| | FY10 Fee Model: | 1.05 | \$1,499,132 |
| | FY09 EOL Care Model: | 1.13 | \$1,775,633 |
| Inpatient Models | FY10 Acute OMELOS: | -0.67 | |
| | FY10 ICU OMELOS: | -1.05 | |
| | FY10 Readmissions: | 10.0% | |

Summary

- SFA is a Macro model looking at overall health care system efficiency adjusting for uncontrollable site characteristics
- Sub-models (micro) allow drill down (tools) in specific areas so sites can custom design where to act
- SFA is an internal benchmark and, therefore, does not reflect private sector differences but differences within VHA
- Limited in how often model can be built each year (Annual, Bi-annual)
- Future work: longitudinal efficiency measurement, additional micro models for drill down