

A Staffing Model Approach: VHA Administrative Staffing Model

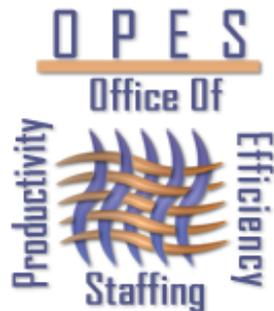
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(OPES)

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Topics for Today

- Brief Introduction to Office of Productivity, Efficiency & Staffing (OPES)
- OPES Modeling Framework
- Administrative Staffing Model

THE OFFICE OF PRODUCTIVITY, EFFICIENCY, & STAFFING (OPES)



The VHA Office of Productivity, Efficiency, and Staffing (OPES) is dedicated to enhancing VHA leadership decision-making through data-driven analytics. OPES develops management tools designed to monitor clinical productivity, to measure operational efficiency, and to promote the goal of clinical excellence through improved access and the provision of safe, efficient, effective compassionate care.

OPES tools supports informed decision-making by VHA leadership with the goal of aligning provider practice consistent with the demands and needs of the Veteran population. OPES analytic process emphasizes patient-centered and evidence-based processes for improving VHA health care delivery operations. For more information on

OPES operational tools like the Provider Productivity Cubes and Reports and the Efficiency Opportunity Grid, please visit the OPES website.

[OPES WEBSITE](#)

About the Team

- Composed of Health Care Economists and Data Analysts
- Small Group (12 FTE) Working Virtually
- Highly experienced with VA Data Sets, SAS, SQL, Reporting Services, Pyramid
- Operationally Motivated



OPES Work

Patient Risk Adjustment

Productivity

- Physician Productivity & Staffing Data Base
- Advanced Practice Provider Productivity & Staffing Data Base
- Physical Medicine & Rehabilitation Productivity & Staffing Data Base
- Social Work Productivity & Staffing Data Base

Staffing

- Administrative Staffing Model
- Medicine Sub-Specialty Staffing Model
- Surgical Sub-Specialty Staffing Model
- AdHoc Models: Audiology, Compensation and Pension, Gastroenterology & Nursing

Efficiency

- Overall Cost Efficiency Model– Stochastic Frontier Analysis
- Focused Utilization/Cost Efficiency Models (Bed Days, Emerg Visits, Pharmacy, Laboratory, Radiology)
- End of Life Care Expenditures Model
- Avoidable Hospitalization Model (Ambulatory Care Sensitive Conditions)

Facility Complexity Model – Facility Characteristics

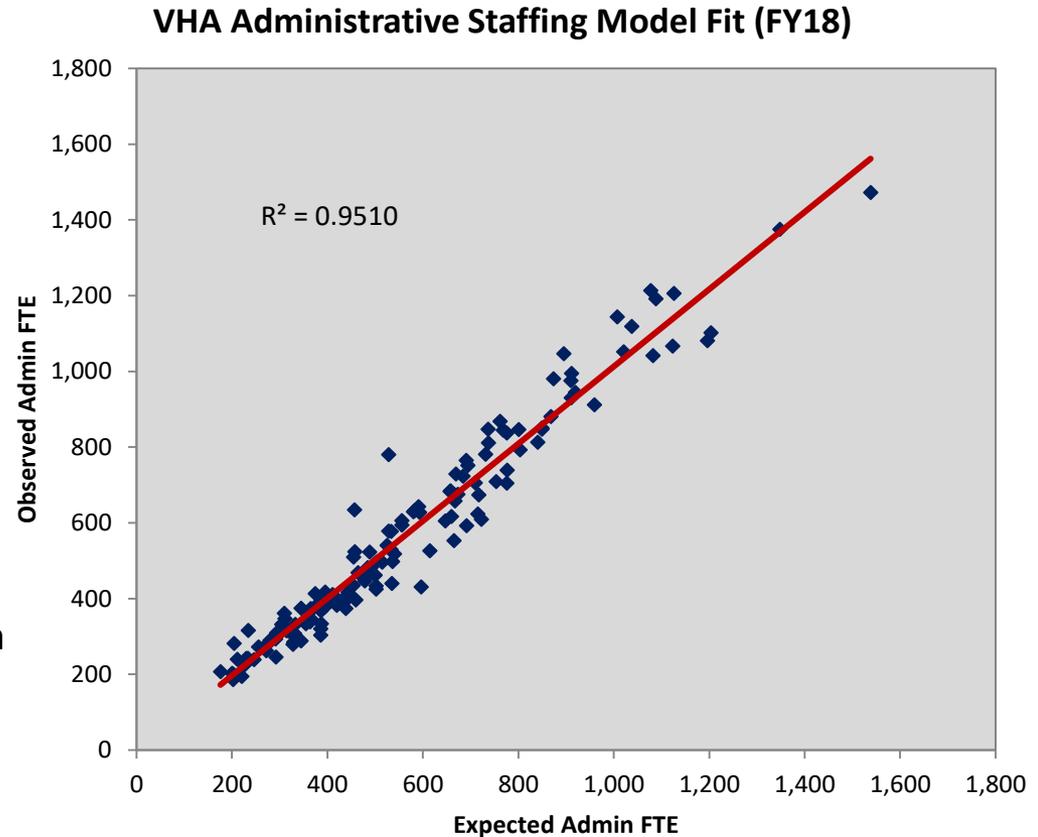


Modeling Framework

- Efficiency and staffing models use regression analysis to describe existing variation in utilization/FTE
 - Regression used to account for facility level variation in facility, patient, and geographic characteristics
 - Regression provides an objective approach to facility comparisons
- Models run at the parent facility level (*i.e.* Facility Director and their scope of control)
 - Models test for relationships with existing VHA datasets to identify known sources of variation

Linear Regression Modeling

- Ordinary least squares regression
 - Identifies the relationship between the dependent variable and the independent variables
 - Models use the Log-Linear regression form: $\ln(y_j) = b_0 + X_j b + \varepsilon_j$
- Model process
 - Test independent variables
 - Include statistically significant variables
 - Identify best model fit
- Expected value based on model prediction from facility independent variable values
 - Parameter estimates from regression results



Portfolio of Variables

Facility Characteristics

- Square Footage/Acreage
- Leased Space
- Bed Counts by Type
- Residents
- Research
- Emergency Department
- Operative Complexity
- In-house Specialty Counts
- Intensive Care Units
- Long Term Care
- CBOC Count

Patient Characteristics

- Pro-Rated Patients
- Patient Risk
- Patient Age
- Priority Grouping
- Service Connection
- Insurance Coverage
- Patient Income
- Patient Diagnoses
- High-Cost/Risk Cohorts
- Medicare Reliance

Geographic Characteristics

- CMS Geographic Price Index
- Average Salary
- Travel Time
- Travel Distance
- Choice Act Eligibility
- Utility Price
- Rural Facility
- Referral Patterns
- Weather Measures

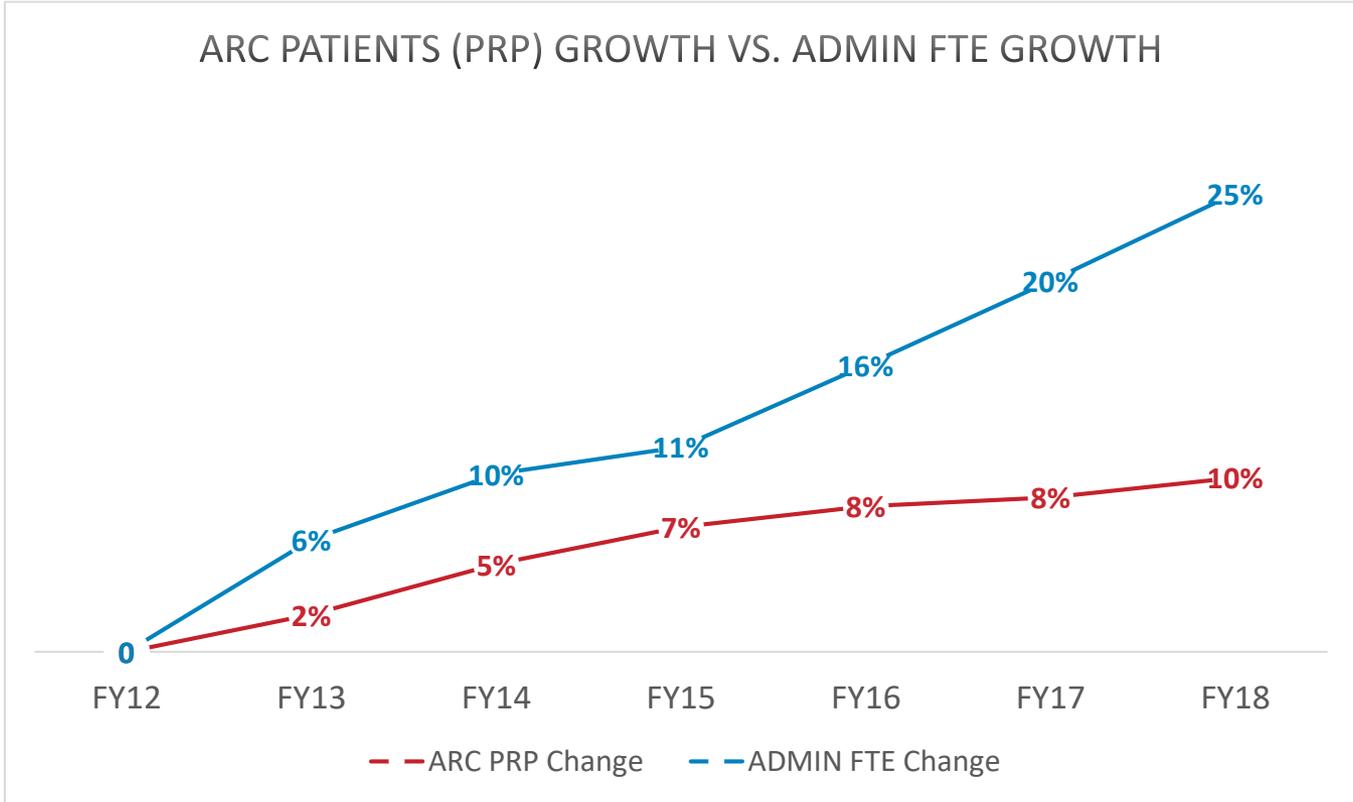


Administrative FTE Model

Objectives

- To develop an apples-to-apples model for monitoring Administrative FTE across facilities and VISNs
- To reveal the trends in Administrative FTE in the VHA
- To identify rates of administrative staffing for Title 38 employees (clinical staff serving as administrators)
- To monitor variation in a key cost driver (administrative staffing)

Administrative FTE Model National Trends



	FY12	FY13	FY14	FY15	FY16	FY17	FY18
ARC PRP	5,891,325	6,011,798	6,175,399	6,296,054	6,362,377	6,391,576	6,455,655
Admin FTE	63,409	67,316	69,615	70,557	73,401	76,337	79,396

Administrative FTE Model

Dependent Variable

Dependent variable: Administrative FTE

- **Data sources**

- FMS 830 Cube (BOC 1001, 1002 FTE)
- ALBCC Cube (Labor Mapping for Title 38 staff)

- **Dependent variable cost logic (BOC 1001/1002)**

- Exclude non-VHA funds, VACO station numbers, non-operational VA cost centers (using the cost logic from the stochastic frontier analysis (SFA))
- Include BOC 1001, 1002
- Redistribute VISN and 8652 FTE
- Adjust BOC 1002 by standardizing BOC 1002 employees to the cost of BOC 1001

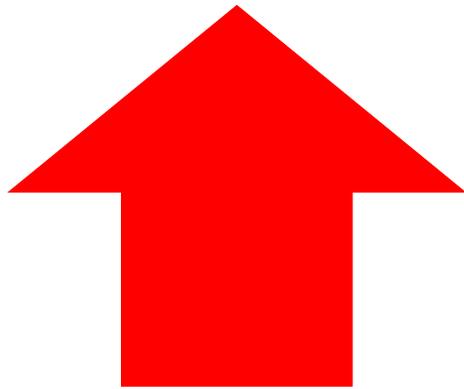
- **Dependent variable cost logic (Title 38 FTE)**

- MCA Extract #1
 - Clinical staff (identified by BOC)
 - In an admin cost center (400, 500, or 600 series)
 - Doing admin, research or training work (identified by costs mapped to those three MCA production units)
- MCA Extract #2
 - Clinical staff (identified by BOC)
 - In clinical cost centers (200, 300)
 - With time mapped to an admin cost center (400, 500)

Final dependent variable

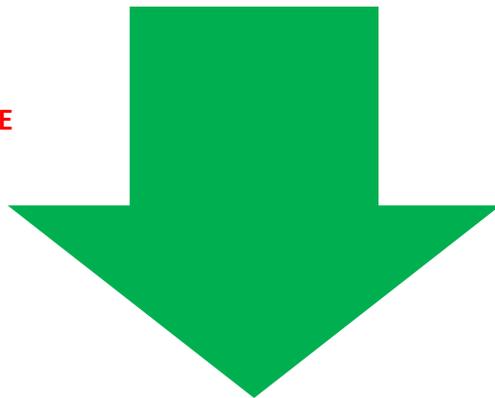
- Sum of BOC 1001, adjusted BOC 1002, VISN redistribution, Title 38 FTE

Administrative FTE Model Independent Variables



ARC PRP
CPM Risk Score
LTC ADC
Residents
Multiple ED/UGC
Patients from Other Facilities

$R^2 = 0.95$
79,396 Total FTE



Rural Core Patient %



Choose VA

VA



U.S. Department
of Veterans Affairs

Patient Population Measures

Workload Measure

Allocation Resource Center (ARC) PRP

- ARC uses PRPs for assigning patients to facilities in the Veterans Equitable Resource Allocation (VERA) model
 - This is the gold standard for weighted workload within VHA
 - Veterans are pro-rated based on their cost to parent facilities
- [ARC website](#)
- Data based on End of FY16 (prior year) ARC PRP

Patient Risk Measure

Facility Risk Model Score (CPM Risk)

- OPES annually develops a risk model at the patient level that adjusts for the relative cost of patients
- Risk score is aggregated to the facility level to identify relative patient severity
- [OPES risk website](#)
- Data based on FY16 (prior year) age and diagnosis information



FY18 Model Results

VHA Administrative Staffing (BOC=1001&1002&T38) Profile by VISN (FY18)								
VISN	Observed FTEs	Expected FTEs	ARC PRP	FTEs per1,000 PRP	Expected FTEs per 1,000 PRP	Observed over Expected Ratio (O/E)	Observed Minus Expected (OME)	
1V02	4,310	4,622	299,336	14.4	15.4	0.93	-312	
1V04	3,590	3,821	292,742	12.3	13.1	0.94	-230	
1V05	2,726	2,859	200,843	13.6	14.2	0.95	-132	
2V09	3,323	3,373	281,622	11.8	12.0	0.99	-49	
1V06	4,466	4,515	389,422	11.5	11.6	0.99	-48	
3V10	6,173	6,239	505,029	12.2	12.4	0.99	-66	
1V01	3,753	3,750	259,880	14.4	14.4	1.00	3	
4V19	3,516	3,508	311,447	11.3	11.3	1.00	8	
2V08	6,916	6,892	588,468	11.8	11.7	1.00	24	
4V17	4,777	4,759	414,350	11.5	11.5	1.00	18	
3V23	3,886	3,852	331,852	11.7	11.6	1.01	35	
5V22	5,933	5,867	496,398	12.0	11.8	1.01	66	
5V21	4,423	4,345	338,791	13.1	12.8	1.02	78	
3V15	3,196	3,128	251,696	12.7	12.4	1.02	69	
2V07	5,217	5,012	448,363	11.6	11.2	1.04	205	
5V20	3,766	3,582	320,071	11.8	11.2	1.05	184	
4V16	5,085	4,782	425,192	12.0	11.2	1.06	303	
3V12	4,336	3,929	300,153	14.4	13.1	1.10	407	
VHA Total	79,396	79,396	6,455,653	12.3	12.3	1.00	0	

Administrative FTE Model

Turning the Model into Action - Operations

What does this mean?

- Sites with O/E above 1.0 have higher than expected Administrative FTE after adjusting for relevant facility variation
- Variation can be explained by:
 - Data validity issues
 - Random variation
 - Controllable variation
 - Model incompleteness
- An O/E above 1.0 is an indicator that a particular area may have more opportunity for efficiency gains than other areas of focus

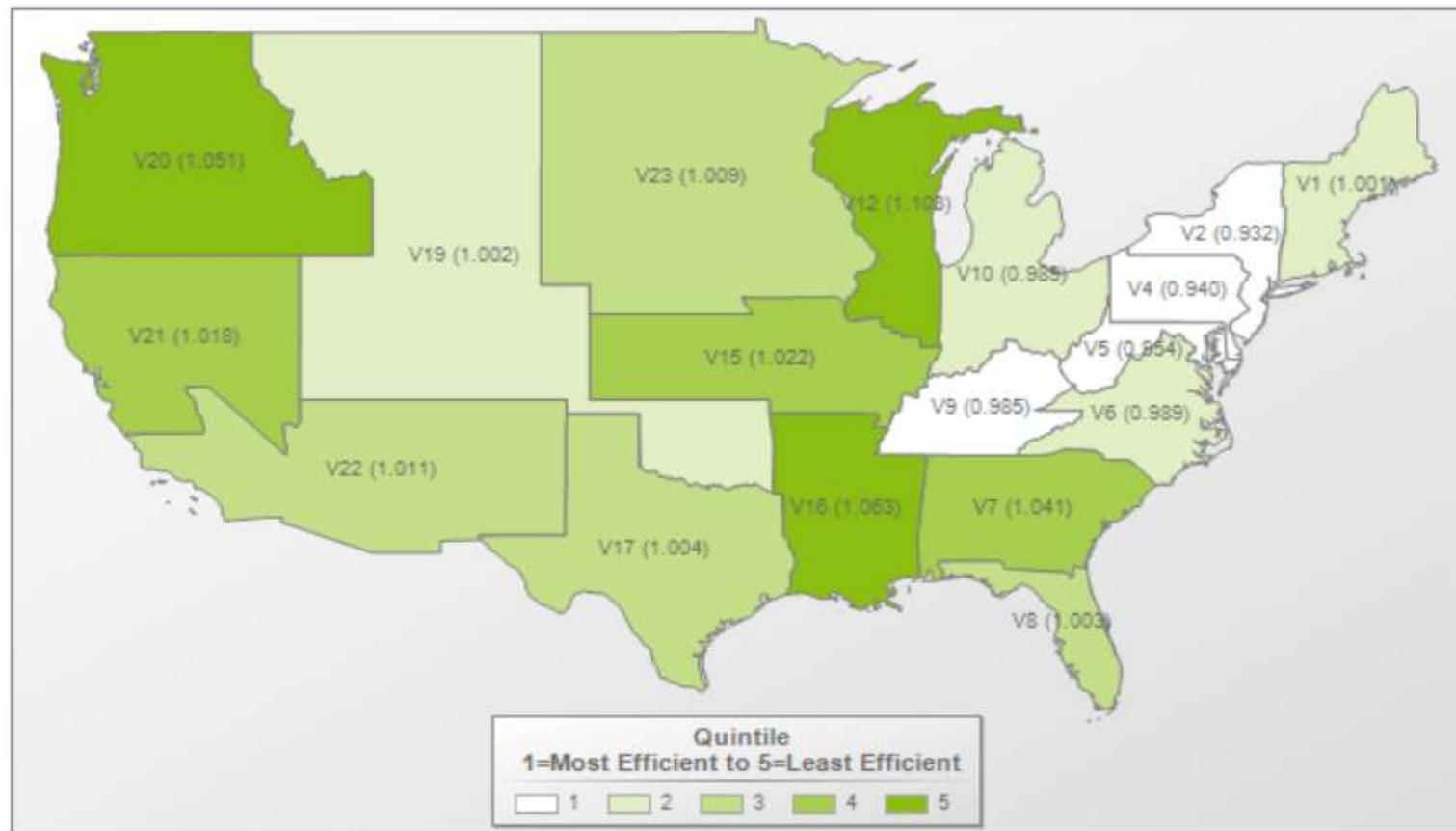
What now?

- Sites should complete a detailed focus on the model:
 - Ensure validity of dependent variable
 - Identify errors
 - Fix errors in relevant data systems
 - Look at variation in dependent variable
 - Complexity (MCG) Group
 - Peer sites
 - Year over year
 - Internal variation

Administrative FTE Model

VISN Observed to Expected Ratio

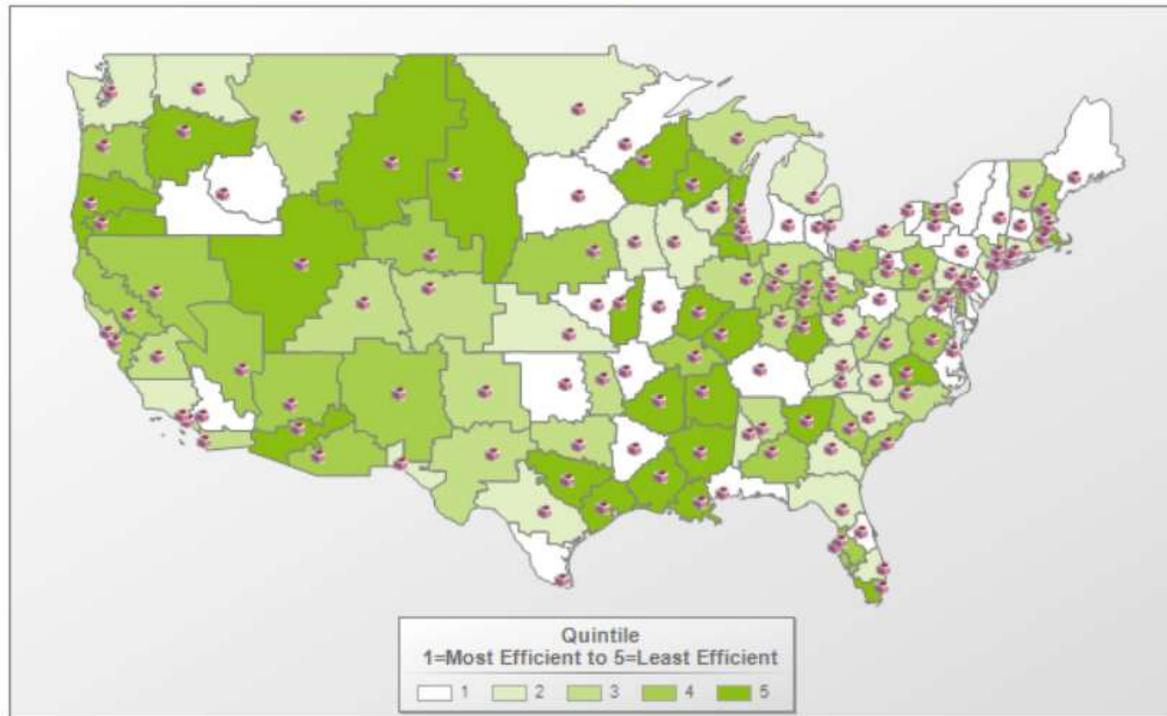
FY2019 Admin FTEE Model
VISN Observed to Expected (OE) Values



Administrative FTE Model

Facility Observed to Expected Ratio

FY2019 Admin FTEE Model
Facility Observed to Expected (OE) Values



Choose VA

VA



U.S. Department
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Administrative Staffing Model

Using the Administrative FTE Drill Down Tool

Select Model Year and Fiscal Period (Real Time Data)

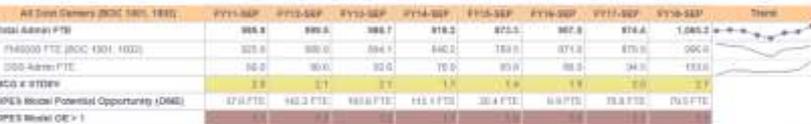


OPES Administrative Staffing Model Cost Center Detail Report FY2019

FM3638 (DOC 1001,1002) FTE, DSS Admin Mapping FTE and Unique Patients for FY2019 through JAN 13 Standard Deviations from 1a-High Complexity Peer Group Average Highlighted

(1V01) (523) Boston, MA HCS (MCG Peer Group 1a-High Complexity)

Click on Facility for Cost Center Detail Report



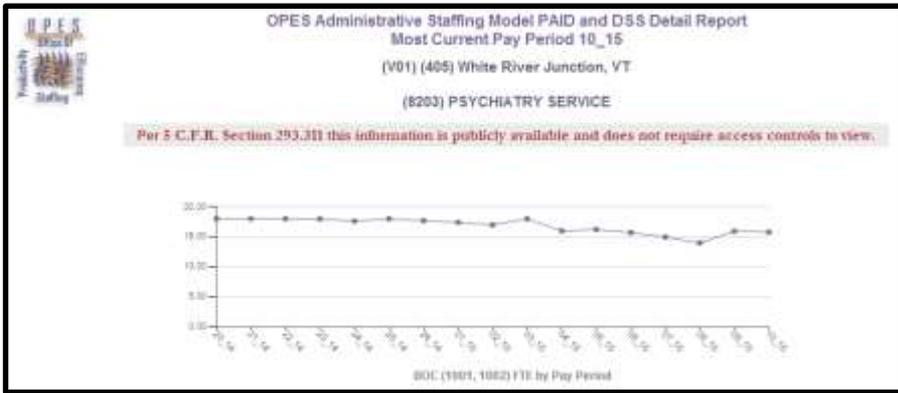
Cost Center	FY13 Unique Patients	FY14 Unique Patients	FY15 Unique Patients	FY16 Unique Patients	FY17 Unique Patients	FY18 Unique Patients	FY19 Unique Patients	Total Admin FTE (1000)	MCG Avg FTE (1000)	Std Dev	MCG Reported Standard Dev	# STDEV Above Avg	# STDEV Below Avg	OPES Model Only	OPES Model	FTE
TOTAL COST CENTERS	35,444	32,413	35,111	3,200.1	27.6	1,847.0	25.8	95.2	9.3	3.0	3.1	368.75	181.8	3.17		
PSYCHIATRY SERVICE	35,444	32,413	35,111	3,200.1	27.6	1,847.0	25.8	95.2	9.3	3.0	3.1	368.75	181.8	3.17		
PSYCHIATRY SERVICE	35,444	32,413	35,111	3,200.1	27.6	1,847.0	25.8	95.2	9.3	3.0	3.1	368.75	181.8	3.17		
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Use Hyperlinks to Drill into Facility and Cost Center Detail

- National and facility level detail uses FMS as data source

Facility	MCG Peer Group	VSSC Unique Patients	FMS E30 Admin FTE	DSS Admin FTE	Total Admin FTE	Total Admin FTE/1000 Unq	Peer Group Avg Total Admin FTE/1000 Unq	Total Variance From Peer Group
(V01) (402) Togus, ME	2-Medium Complexity	33,850	291.1	26.8	317.9	9.4	12.0	-27.3
(V01) (405) White River Junction, VT	2-Medium Complexity	20,821	271.9	19.9	291.8	14.1	12.0	42.9
(V01) (518) Bedford, MA	3-Low Complexity	14,417	284.5	29.5	314.0	20.4	13.7	97.0

- Contains name level detail for specific cost centers



Administrative FTE Model Data Validation

How to get the biggest bang for your buck when validating data:

- Look for the biggest raw numbers:
 - Cost centers with small numbers of FTEs will not impact the overall model in the same way as large ones

Cost Center <small>Click on Cost Center for PAID and DSS Detail Report</small>	VSSC Unique Patients	FMS 830 Admin FTE	DSS Admin FTE	Total Admin FTE
	FY13 thru SEP	FY13 thru SEP	FY13 thru SEP	FY13 thru SEP
(8411) BUSINESS OFFICE OPERATI	65,486	165.22	3.16	168.38
(8413) CONTRACTUAL & FEE SERVI	65,486	18.15	1.00	19.15
(8418) QUALITY & SYSTEMS IMPRO	65,486	0.00	1.00	1.00
(8419) QUALITY ASSURANCE & CAS	65,486	9.04	9.13	18.17
(8421) FINANCE	65,486	58.54	0.00	58.54
(8431) HUMAN RESOURCES MANAGEM	65,486	68.34	0.02	68.36
(8441) LOGISTICS	65,486	37.72	18.43	56.15
(8470) INFORMATION RESOURCES M	65,486	0.00	1.00	1.00
(8501) OFC OF CHIEF ENGINEERIN	65,486	14.09	0.00	14.09
(8503) FACILITY SAFETY & FIRE	65,486	19.08	1.00	20.08
(8504) PROJECT MANAGEMENT ENGI	65,486	16.41	0.00	16.41
(8521) TRANSPORTATION	65,486	13.67	0.00	13.67

VACC with over 50 FTE

What am I looking for?

- Any costs (FTE) that are not costs attributable to your site.
 - VISN costs, VACO costs, non-operational costs (research, etc.)

FY	PP	Fac Type	Duty Sta	Duty Station Name	Fund	CC	BOC	TL	Unit	Name	FTE	Duty Basis	O	Position
2014	23_13	VHA 1	523B	UNKNOWN	0152A1	8421	1001	455		Staff #1	1.00	FT	2700	00420000
2014	23_13	VHA 1	523J	WMT RIVER JCT VT	0152A1	8421	1001	452		Staff #2	1.00	FT	2555	07894A00
2014	23_13	VHA 1	523K	MANCHESTER NH	0152A1	8421	1801	452		Staff #3	1.00	FT	2555	02967900
2014	23_13	VHA 1	523L	TOGUS ME	0152A1	8421	1001	452		Staff #4	1.00	FT	2555	07895A00
2014	23_13	VHA 1	523L	TOGUS ME	0152A1	8421	1001	452		Staff #5	1.00	FT	2555	07894A00

Administrative FTE Model

Data Validation

Are costs/FTE aligned correctly?

- Remember that costing errors within your own site will not change the Admin FTE model
 - If an Admin FTE is mistakenly classified in VACC 8241 instead of 8421, the net impact on the model will be zero.
- But non-site costs in the incorrect VACC will have an impact:
 - Admin FTE classified in a operational cost center when actually a VACO employee
 - VISN FTE where FTE not cost transferred to other sites

Data Reliability:

- ✓ Data Inconsistencies
- ✓ Corroborate with independent data sets
- ✓ Data Sources

Administrative FTE Model

Finding Areas of Variance

Variance can be from peer groups,

- The Admin FTE Drill Down Report highlights cost centers where number of FTE are greater than on standard deviation above the mean of the facility complexity group.

Or a particular comparable site,

- The Facility FTE Comparison Tool allows for comparisons between selected facilities.
- This can help identify heavily staffed cost centers

Cost Center <small>Click on Cost Center for PAID and DSS Detail Report</small>	Y3SC Unique Patients	FMS 038 Admin FTE	DSS Admin FTE	Total Admin FTE	Total Admin FTE/1000 UMG	Peer Group Avg FTE/1000 UMG	Variance	STDEV	# STDEV	Total FTE Variance From Peer Group Avg
	FY13 Nov SEP	FY13 Nov SEP	FY13 Nov SEP	FY13 Nov SEP						Not Modelled
00411 BUSINESS OFFICE OPERAT	85,486	185.22	3.16	188.38	2.6	1.2	1.4	0.5	3.8	92.00
00413 CONTRACTUAL & FTE SERV	85,486	18.15	1.88	19.15	0.2	0.3	0.2	0.1	-0.2	(2.10)
00418 QUALITY & SYSTEMS MGMT	85,486	0.00	1.00	1.00	0.0	0.1	(0.1)	0.1	-1.0	(5.80)
00419 QUALITY ASSURANCE & CAS	85,486	9.04	8.13	18.17	0.2	0.3	0.0	0.1	0.2	(0.30)
00421 FINANCE	85,486	58.54	0.00	58.54	0.9	0.5	0.4	0.1	3.4	27.69
00421 HUMAN RESOURCES MANAGER	85,486	69.34	0.62	69.96	1.8	0.7	0.4	0.2	2.4	25.58
00441 LOGISTICS	85,486	37.72	18.43	56.15	0.8	0.8	0.3	0.2	1.4	17.00
00470 INFORMATION RESOURCES M	85,486	0.00	1.00	1.00	0.0	0.0	0.0	0.0	-0.2	(0.30)
00521 OPG. OF CHIEF ENGINEER	85,486	14.09	0.00	14.09	0.2	0.2	0.1	0.1	0.6	3.00
00523 FACILITY SAFETY & PRT	85,486	19.00	1.00	20.00	0.2	0.1	0.2	0.1	3.0	13.40
00541 PROJECT MANAGEMENT ENGI	85,486	16.41	0.00	16.41	0.2	0.1	0.1	0.1	1.8	8.80
00521 TRANSPORTATION	85,486	13.87	0.00	13.87	0.2	0.0	0.2	0.1	3.3	11.10

Cost Center	Total Admin FTE	Total Admin FTE	Difference	% Difference
Click on Cost Center for Pay Period Details for Facility 1	(V01) (022) VA Boston HCS, MA	(V03) (038) New York Harbor HCS, NY	Total Admin FTE	Total Admin FTE
			Per +5 FTE DT	Green +5 FTE DT
00411 BUSINESS OFFICE OPERATIONS	188.38	113.48	64.82	32.0%
00413 CONTRACTUAL & FTE SERVICES	19.15	0.84	43.31	88.0%
00418 QUALITY & SYSTEMS MGMT	1.00	1.00	0.00	0.0%
00419 QUALITY ASSURANCE & CAS M	18.17	27.70	(9.53)	-52.4%
00421 FINANCE	58.54	33.90	24.64	42.1%
00421 HUMAN RESOURCES MANAGEMENT	69.96	39.63	30.33	43.0%
00423 COMPLIANCE PROGRAM OFFICE		7.98	(7.98)	
00441 LOGISTICS	56.15	37.48	18.67	33.3%

<http://1.usa.gov/1Gx3fqG>

Administrative FTE Model

Finding Areas of Variance

Or variance in type of Admin FTE,

Facility	MCG Peer Group	VSSC Unique Patients	FMS 830 Admin FTE	DSS Admin FTE
Click on Facility for Cost Center Detail Report				
(V01) (523) VA Boston HCS, MA	1a-High Complexity	65,486	903.0	92.6
(V01) (650) Providence, RI	2-Medium Complexity	34,419	311.8	22.8
(V01) (689) VA Connecticut HCS, CT	1a-High Complexity	59,023	537.6	44.3
(V04) (646) Pittsburgh, PA	1a-High Complexity	67,653	718.2	32.0
(V06) (558) Durham, NC	1a-High Complexity	63,250	632.0	31.7

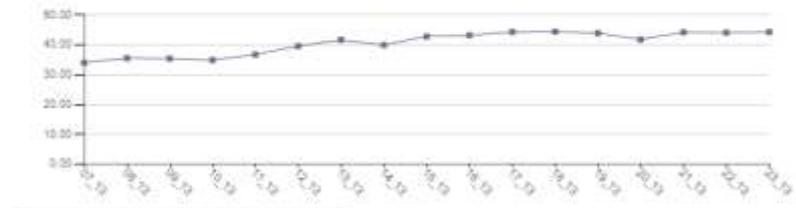
- DSS (Title 38) FTE are higher cost
 - Is this a normal distribution of Title 38 employees to Title 5?

Or simply variance in year over year trends.

All Cost Centers (BOC 1001, 1002)	FY10-SEP	FY11-SEP	FY12-SEP	FY13-SEP	Trend
Total Admin FTE	865.2	955.8	982.5	995.6	
FMS830 FTE (BOC 1001, 1002)	809.0	900.3	894.8	903.0	
DSS Admin FTE	56.2	55.5	87.7	92.6	
Peer Grp # STDEV	1.5	1.9	1.9	2.0	
OPES Model Potential Opportunity (OME)	37.6 FTE	142.2 FTE	165.6 FTE		
OPES Model OE > 1	1.1	1.2	1.2		

- Overall admin FTE trends

OPES Administrative Staffing Model PAID and DSS Detail Report
Most Current Pay Period 23_13
(V01) (523) VA Boston HCS, MA
(8201) MEDICAL SERVICE



- Or trends within cost centers



OPES Administrative Staffing Model PAID and DSS Detail Report
Most Current Pay Period 23_13
(V01) (523) VA Boston HCS, MA
(8441) LOGISTICS

Current Month FY13	ALBacctCC	Budget Object Code (BOC) - Clinical Staff	FY13 Hours Mapped	Calculated FTE	Total DSS Admin Hours Mapped	Calculated FTE
	(V01) (523) VA Boston HCS, MA					
FY13-SEP	(441) LOGISTICS	1031 OTHER HEALTH TECHS & AIDES	38,472	18.43	38,472	18.43
		Total DSS Admin	38,472	18.43	38,472	18.43

Administrative FTE Model

Develop Action Plan

- Action plan for administrative FTE
 - Fix invalid data identified from data validation
 - Involve your HR and Finance offices to ensure accurate cost accounting
 - Ensure DSS labor mapping is correct to ensure correct capture of Title 38 administrative staff
 - Probe areas of variance from peer facilities and peer groups
 - What departments are heavily staffed compared to our peer groups?
 - What departments are heavily staffed compared to our selected peer sites?
 - Are Title 38 FTE being appropriately and effectively deployed in administrative roles?
 - Is there a reason for our overall trend in administrative FTE?
 - Is there a reason for the trend of administrative FTE within given departments?
 - Identify specific areas of concern and take action
 - Allocation of new resources
 - Re-allocation of existing resources
 - Systems redesign to encourage efficiency
 - Other resource decision-making



Administrative FTE Model

Develop Action Plan

Use the Admin FTE tool to make resource decisions

- Identify departments that are heavily staffed (or drastically understaffed)
 - Evaluate the overall efficiency of the department (are the staff being used effectively?)
 - Implement micro-systems analysis to increase efficiencies in heavily staffed departments
- Resource boards
 - Use the Admin FTE tool to identify possible over use of Title 38 FTE
 - Identify departments in greatest need of resources

Remember that the Admin FTE drill down tool goes to the name level:

- Use the name level to identify potential separations and retirements
- Identify areas where enhanced workforce planning is required

Fund	CC	BOC	TL Unit	Name	FTE	Duty Basis	O r	Position
					35.76			
0152A1 A4	8401	1001	401	Staff #1	1.00	FT	2500	00028A00
0152A1 A4	8401	1002	401	Staff #2	1.00	FT	2500	02228000
0152A1 A4	8401	1001	401	Staff #3	1.00	FT	2500	00140A00
0152A1 A4	8401	1001	401	Staff #4	0.47	PT	2500	00223T00
0152A1 A4	8401	1001	401	Staff #5	1.00	FT	2500	00208000
0152A1 A4	8401	1001	401	Staff #6	1.00	FT	2500	00620000
0152A1 A4	8401	1001	401	Staff #7	1.00	FT	2500	00019000
0152A1 A4	8401	1001	818	Staff #8	0.25	PT	2000	00209T00

Summary

- Staffing Models
 - Facility Characteristics
 - Patient Characteristics
- Productivity Measurement

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VHA ADMINISTRATIVE STAFFING MODEL					
Analysis of Variance					
Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	7	31.34931	4.47847	365.95	<.0001
Error	132	1.61541	0.01224		
Corrected Total	139	32.96472			
Root MSE	0.11063	R-Square	0.9510		
Dependent Mean	6.22364	Adj R-Sq	0.9484		
Coeff Var	1.7775				
Parameter Estimates					
Variable	DF	Parameter Estimate	Standard Error	t Value	Pr > t
Intercept	1	-2.6132	0.37488	-6.97	<.0001
ARC PRP	1	0.77069	0.031	24.86	<.0001
CPM RISK	1	0.76273	0.19873	3.84	0.0002
LTC ADC	1	0.08201	0.016	5.12	<.0001
RURAL CORE PATIENTS	1	-0.03437	0.01422	-2.42	0.017
PTS FRM OTH FACILITIES	1	0.55662	0.14838	3.75	0.0003
MULTIPLE ED OR UCC	1	0.15892	0.03547	4.48	<.0001
RESIDENTS	1	0.02165	0.00995	2.18	0.0313

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