

Data Quality and Medical Record Abstraction in the Veterans Health Administration's External Peer Review Program

(Practice-oriented paper)

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Executive Summary

Under the Veterans Health Administration's External Peer Review Program, the West Virginia Medical Institute (WVMI) conducts monthly medical record abstractions in over 150 VA Medical Centers throughout the United States and Puerto Rico. The abstractions are performed by approximately 90 highly trained abstractors and are used to assess VHA clinical performance for: in-patient and out-patient encounters, JCAHO ORYX measures, and ad hoc studies on topics such as management of low back pain, spinal chord injury, and diabetic foot care. To help improve the validity and reliability of the abstracted medical data, WVMI has implemented a multi-method approach to monitoring abstracted data quality. The approach includes five major components:

- Bi-weekly computer-aided screening to detect anomalous performance (e.g., leading and terminal digit distributions of continuous variables);
- On-site interrater reliability assessments and calculation of prevalence adjusted Kappa agreement between abstractors and supervising Network Coordinators;
- Random and special assignment audits by one or more trained auditors;
- Analyses using SAS Enterprise Miner (including runs and randomness testing, hierarchal modeling (decision tree and cluster analysis) and neural network programming for assessing performance;
- Statistical process control for tracking and trending performance of abstractors, VAMCs, and items over time.

In addition, WVMI has created web-enabled feedback capabilities so that key administrators can rapidly access and report on performance impacting data quality. This paper will outline the data quality techniques and results that have enhanced the use of medical record data for assessing clinical performance throughout the VHA system.

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West Virginia Medical Institute

- WVMI is one of 37 designated Peer Review Organizations serving Medicare and Medicaid beneficiaries
- Staffed by 200 employees located in six offices in WV, VA, DE, & MD
- WVMI conducts medical record review for the Veterans Health Administration and the Department of Defense



Veterans Health Administration External Peer Review Program

- “EPRP” began in 1992; WVMI has been prime contractor for both of the 5 year cycles
- EPRP assesses clinical guideline performance using third party medical record abstraction
- EPRP is used for comparing performance among VHA hospitals, clinics, and across the 22 administrative regions



Medical Record Review

- WVMI has a Nation-wide network of 95 certified medical record abstractors
- Records are abstracted throughout the year at 170 hospitals
- In FY 2001 over 350,000 records were abstracted in hospitals, out-patient clinics, and other care delivery settings
- Records are transmitted electronically to Charleston, WV and compiled and analyzed for quarterly reports



Objectives for Abstractor Monitoring and Data Quality Assessment

- Measure abstractor performance and detect anomalous behavior
- Use “real-time” surveillance & analytical techniques to more quickly identify and correct substandard abstractor performance
- Rule out abstractor “error” and focus on other sources of variation
- Use surveillance for quality control *and* quality improvement



Techniques used to Build the Monitoring and Assessment Model

- Data Entry Error Detection
- Leading & Terminal Digit Analysis
- Pattern Analysis
- Cluster Analysis
- AI-aided Profiling

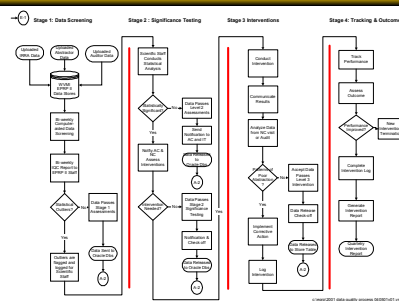


Steps in Monitoring and Improving Abstractor Performance

- Screen up-loaded medical records
- Identify abstractors (and records) with unexpected results
- Analyze results to determine source and extent of the anomalous performance
- Conduct interventions and field audit where needed
- Use results for quality improvement training



Abstractor Monitoring and Data Quality Assessment Flow Diagram

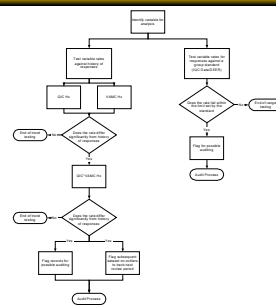


Stage 1 "Real-time" Screening Techniques

- Data Entry Error Rates
- Leading & Terminal digit analysis
- Disease discrepancy rates
- Diabetic abnormal foot rates
- % Dates filled
- Do not review rates



IQC Data Screening Process

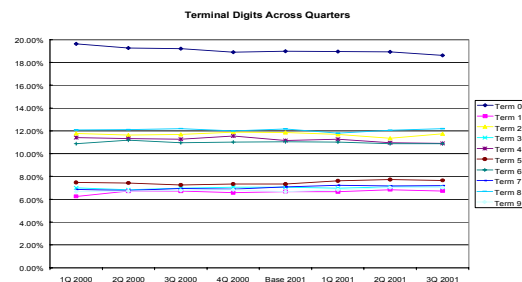


Examples of Data Entry Error Reduction

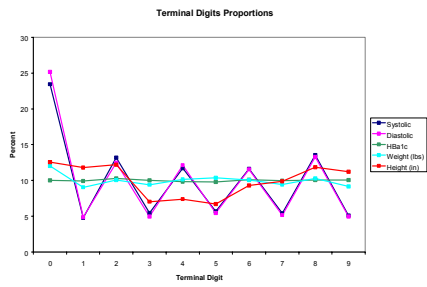
	4Q98	3Q00
HT		
Max	762	82
Min	-70	49
WT		
Max	2,891	515
Min	-15	47
BPs		
Max	662	253
Min	70	54
BPd		
Max	150	126
Min	1	32
HbA1c		
Max	98.7	18.4
Min	0	3.5



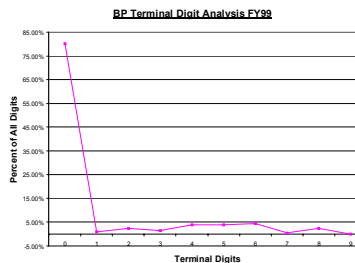
Terminal Digit Analysis: Continuous Variables



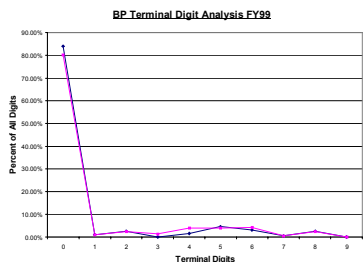
Terminal Digit Analysis: Continuous Variable Digit Distributions



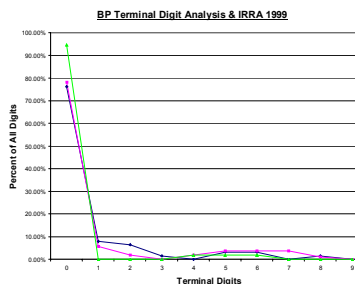
Blood Pressure TDA: Fabricated Data?



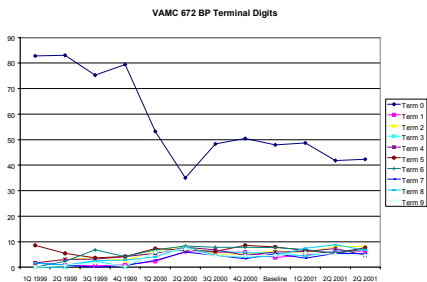
Blood Pressure TDA: Abstractor #2--Same VAMC/Similar Results



Interrater Reliability Assessment Blood Pressure Terminal Digit



Terminal Digit Analysis: BP Terminal Digit Distribution for VAMC 672



Data Screening Abstractor Anomaly Report

3rd Quarter 2001 - Anomaly Report

Number of Anomalies	5
QIC	Area
120	Abnormal Foot Exams: Pnumovac Contraindicated: HTN Discrepancy: DM Discrepancy: COPD
Number of Anomalies	3
QIC	Area
204	Abnormal Foot Exams: Hospice/Terminal: Pnumovac Contraindicated:
185	Pnumovac Contraindicated: HTN Discrepancy: COPD Discrepancy:
138	Terminal Digit 0: Pnumovac Contraindicated: Do not review:
128	Pnumovac Contraindicated: Do not review: COPD Discrepancy:
102	Terminal Digit 0: Pnumovac Contraindicated: HTN Discrepancy:



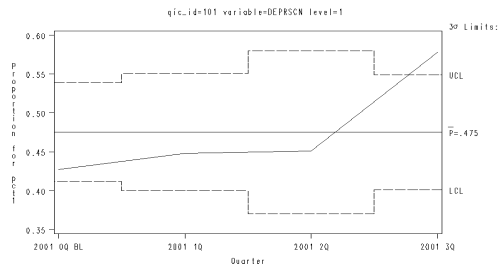
Abstractor Outlier Report

2001 3rd Quarter - QIC Outlier Report: Key Performance Indicators for QIC 199

variable	level	description	Chg from history	Chg from previous	2001 3Q	2001 2Q	2001 1Q	2001 0Q BL
HMOGVD	1	Yes	extreme increase	significant increase	20%	17%	0.6%	4.3%
	2	No	extreme decrease	significant decrease	74%	83%	100%	96%
TOBSTATUS	1	Current user	increased	increased	19%	19%	18%	18%
	2	Former user	increased	increased	23%	21%	17%	16%
	3	Decline current user not further info.	decreased	decreased	20%	22%	20%	20%
	4	No use in past 7 years	increased	increased	20%	31%	28%	28%
	5	No documentation	extreme decrease	significant decrease	0.2%	0.2%	0.8%	10%



SPC Analysis of Increase in Depression Screening



Techniques used to Assess Data Reliability

- Interrater Reliability Assessment
- Intrarater Reliability Assessment
- False Negative & False Positive Rates
- Service/Clinical Indicator Date Variance
- Item Reliability Assessment



Interrater Reliability Assessments

- "IRRAs" occur between abstractors and either their field supervisor or an auditor
- Attempt to interrater between 20 and 25 records
- Calculation of agreement using weighted percent agreement and Kappa "beyond chance" agreement
- Abstractors (and items) yielding low Kappa agreement (< .85) are identified for QI training



Problems with Kappa in Contexts of High Goal Attainment

- *Prevalence of an observed trait:*
100% Agreement that a service was provided = No Kappa Score

Example:

	Yes	No
Yes	20	0
No	0	0

% agreement = 100
Kappa can not be calculated



One disagreement can yield a Kappa Score of Zero

- 95%+ Agreement that a service was/was not provided can yield a **zero or negative** Kappa Score

Example:

	Yes	No
Yes	19	1
No	0	0

% agreement = 95
Kappa = 0




High agreement yielding a negative Kappa

- 90%+ Agreement that a service was/was not provided can yield a **zero or negative** Kappa Score
- Example 5:

	Yes	No
Yes	18	1
No	1	0

% agreement = 90
Kappa = -.05


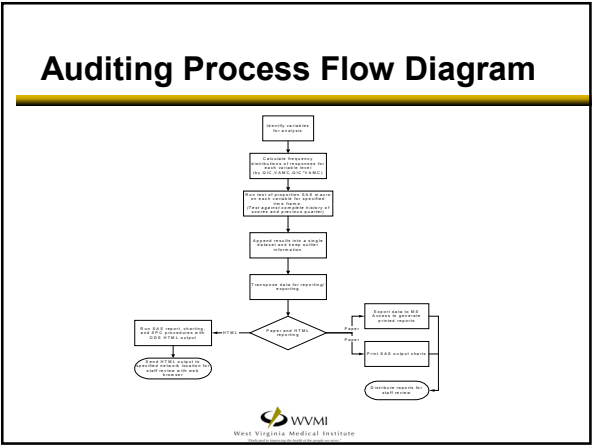
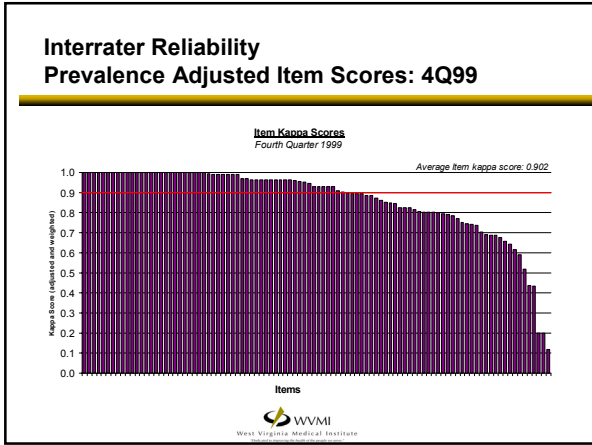


High agreement yielding an “unacceptable” Kappa Score

- 95% Agreement that a service was/was not provided can yield a low Kappa Score
- Example:


	Yes	No
Yes	18	0
No	1	1


% agreement = 95
Kappa = .64

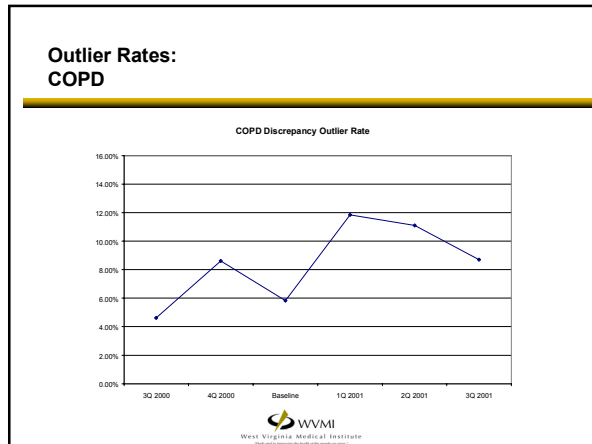
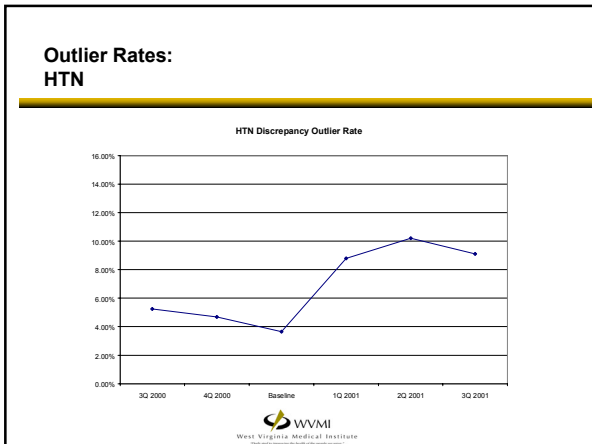
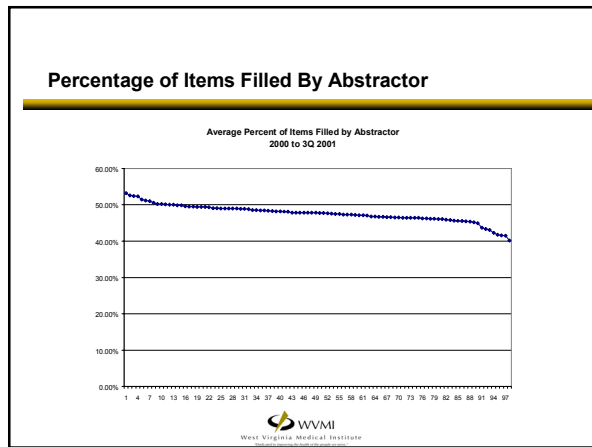
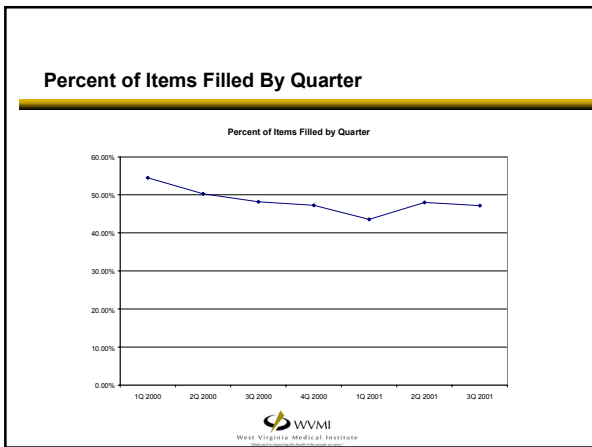
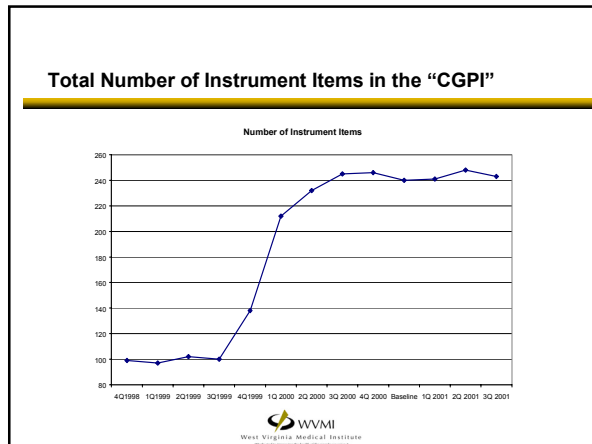
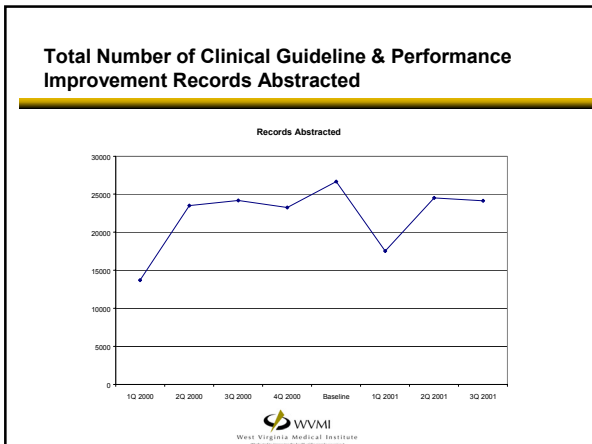



3Q01 Abstractor Assessment & Audit Kappas

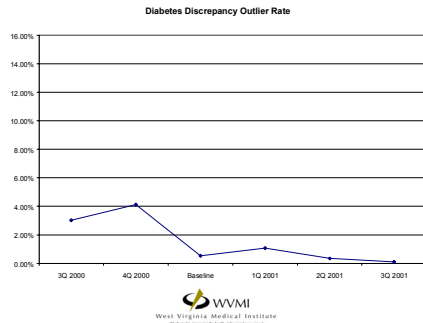
Abstractor Assessment		Audit	
Kappas	#Records	Kappas	#Records
0.83	32	0.87	24
0.88	16	0.84	23
0.94	15	0.88	19
0.85	12	0.89	24
0.96	13	0.87	17
Overall: 0.892		0.92	24
		0.84	21
		0.84	22
		0.86	28
		0.87	25
		Overall: 0.868	



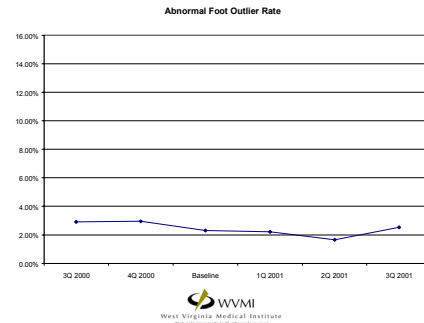
- ### Abstractor Performance with Increases in Record Volume
- Over an 18 month period, the number of required abstractions nearly tripled
 - WVMI increased the number of abstractors from 35 to 95
 - How has performance been impacted with increases in record volume?
 - How has adding items to the instrument impacted medical record abstraction?
- 



Outlier Rates: Diabetes



Outlier Rates: Abnormal Foot



Current Status of the Assessment and Data Quality Model

- Demonstrated ability to detect negligent or fabricated data
- Rate of agreement among abstractors is approximately 90%
- Agreement rates are impacted by quality in, and types of, record keeping (paper, electronic, and both together) and, the item needing abstraction