



Data Visualization Best Practices

IAP Data Analytics Webinar

January 25, 2017, 3:00pm EST



Today's Speakers

- Jessie Parker, GTL and Analyst on Medicaid IAP Data Analytic Team, Data and Systems Group, CMCS
- Katherine Rowell, Co-Founder and Principal HealthDataViz





Agenda for Today's Call

- Overview of Medicaid Innovation Accelerator Program
- Presentation Overview
- Data Visualization Research and Best Practices
- Questions and Answers





Medicaid Innovation Accelerator Program (IAP)

- (Four year commitment by CMS to build state capacity and support ongoing innovation in Medicaid through targeted technical assistance
- (A Center for Medicare & Medicaid Innovation (CMMI) funded program that is led by and lives in Center for Medicaid and CHIP Services (CMCS)
- (Supports states' and HHS delivery system reform efforts
 - The end goal for IAP is to increase the number of states moving towards delivery system reform across program priorities





Medicaid Delivery System Reform

PROGRAM AREAS

Improving
Care for
Medicaid
Beneficiaries
with Complex
Care Needs
and High Costs

Promoting Community Integration Through Long-Term Services and Supports

Supporting Physical and Mental Health Integration

Reducing Substance Use Disorders

Functional Areas

- Data Analytics
- Quality Measurement
- Performance Improvement
- Value-Based Payment and Financial Simulations





IAP Data Analytics Support State Medicaid Agencies

Overarching Goal:

Assist states in using data to improve programmatic decisionmaking across a variety of analytic areas.

This Webinar:

Review techniques to improve states' data visualization capabilities.





Presentation Overview

- 1. What do we need to know to create great visual displays?
- 2. The importance of understanding your data's lineage.
- 3. Basic statistics are required.
- 4. Lessons learned from visual and cognitive research.
- 5. When to use a table.
- 6. When to use a graph.
- Dashboards defined.
- 8. How to create a great dashboard.
- 9. What's an infographic anyway?
- 10. Technology alone is not the solution.





Visual Intelligence Data Visualization Research & Best Practices





1. What do we need to know to create great visual displays?





Health, Healthcare &
Basic Statistics

Data Visualization & Visual Intelligence







Health, Healthcare & Basic Statistics





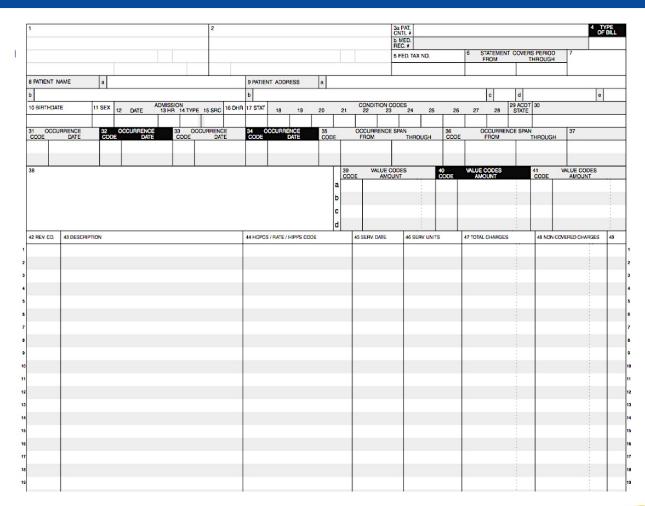


2. The importance of understanding your data's lineage.





1982 Universal Billing (Administrative Data)







Clinical Data Registries



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STS National Database

The STS National Database was established in 1989 as an initiative for quality improvement and patient safety among cardiothoracic surgeons. There are three components to the STS National Database, each focusing on a different area of cardiothoracic surgery—Adult Cardiac, General Thoracic, and Congenital Heart Surgery, with the availability of Anesthesiology participation within the Congenital Heart Surgery Database. The Database has grown exponentially over the years, both in terms of participation and stature.

Quality Improvement

The component Databases provide opportunities for quality improvement to their participants. The Society has developed quality performance measures in all three sub-specialties of surgery, and these measures have either been endorsed or are in the process of being considered for endorsement by the National Quality Forum. By collecting outcomes data for submission to the STS National Database, surgeons are committing to improving the quality of care that their cardiothoracic surgery patients receive.

Clinical Research

The Database has the corollary potential to be a powerful tool for clinical research. Since its inception, more than 100 publications have been derived from Database outcomes. These studies have been published in a variety of professional journals and textbooks and have significantly advanced knowledge in cardiothoracic surgery.

New Initiatives

The Database continues to expand with new initiatives. Launched in January 2011, STS Public Reporting Online enables Database participants to voluntarily report to the public their heart bypass surgery performance. Overall composite star ratings as well as their component ratings are listed on sts.org for more than 250 Database participants. The Adult Cardiac Surgery Database, now containing more than 4.5 million surgical records, represents an estimated 94 percent of all adult cardiac surgery centers across the U.S. With the success of participation nationally, STS launched in 2011 an initiative to accommodate Database participation worldwide by including international participants in the Adult Cardiac Surgery Database.





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Home > Medicaid > Quality of Care > Performance Measurement > Nationwide Adult CAHPS

Performance Measurement

Child Core Set

Adult Quality Grants

Adult Core Set

Nationwide Adult CAHPS

CAHPS® Home and Community Based Services Survey

Nationwide Adult Medicaid CAHPS

In the Fall of 2014, CMCS conducted a Nationwide Adult Medicaid (NAM) CAHPS survey of Medicaid enrollees to attain national and state-by-state measures of access, barriers to care, and experiences with care across delivery systems and major population subgroups. The survey interviewed a representative sample of adults ages 18 and older enrolled in Medicaid during October 2013 through December 2013. This first-of-its kind survey provides baseline information on the experiences of low-income adults prior to a state's expansion of coverage to the new adult group that took effect on January 1, 2014. These data will be used to inform CMS and state efforts to improve health care delivery for Medicaid enrollees. Additional information is available in a CMCS Informational Bulletin

Additional Resources

NORC's Medicaid CAHPS Project Page

Handout for the Nationwide Adult Medicaid CAHPS

Questions or requests for technical assistance related to the Nationwide Adult Medicaid CAHPS survey can be directed to: MedicaidCAHPS@norc.org.





Quality of Data

Importance of Understanding the Quality and Timeliness of Your Data

- Is the data well defined and documented?
- Is it timely?
- Is it complete (missingness)?
- Is it ever audited?





Understanding why and for what purpose data is being captured, along with the quality of the data is essential to understanding what insights it can and cannot deliver.





3. Basic statistics are required.





Mean or Median

Which statistic would you use to describe this group's annual income?







Mean vs. Median

Medical Patients' Average Length of Stay (ALOS)		Medical Patients' Median Length of STAY	
Α	3	С	1
В	2	В	2
С	1	1	2
D	5	Α	3
E	8	G	3
F	9	D	5
G	3	Н	5
Н	5	E	8
1	2	F	9
ALOS	4.2	Median	3.0

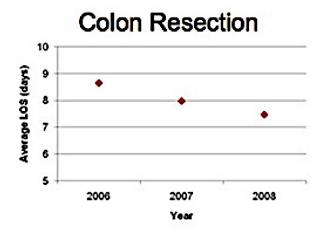


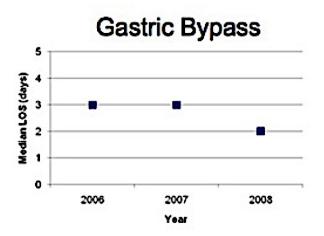




Impact on Length of Stay

NEXT





Decreased reoperative complications results in a better patient experience as well as a better use of hospital resources, as shown in the decreased length of stay for both colon resections and gastric bypass.

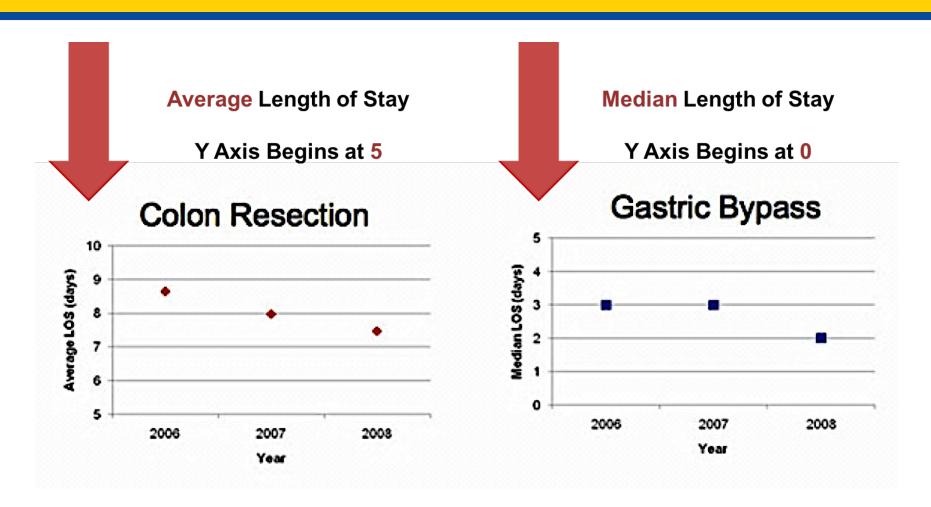
Image 4 of 6

CLOSE X





SCOAP Example - Details







Compared with what?





Values with No Comparisons

What do these values tell us?

10,000 Cancer Deaths

25,000 Surgeries

1,000 Live Births

500 Beneficiaries

200 Immunizations





Examples of Possible Comparison Values

We always need a comparison

- Budget
- Target
- Expected
- Similar Programs
- Previous Year
- Competitor
- Benchmark





If the viewers of your dashboards, reports or infographics can't answer SO WHAT you need to go back to the drawing board.





Data Visualization & Visual Intelligence







4. Lessons learned from visual and cognitive research.





I See, I Understand

70% of the way we take in all data and information is through our eyes.







Gestalt Principles of Visual Perception (Pattern Seeking)

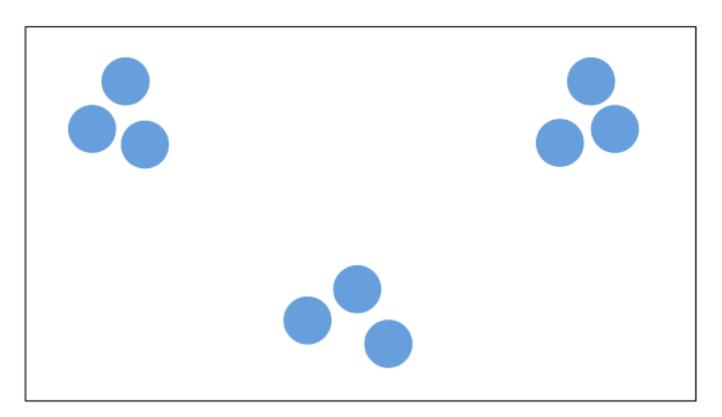
Principle	Description
Proximity	Objects that are close together are perceived as a group.
Similarity	Objects that share similar attributes are perceived as being part of a group.
Enclosure	Objects collected within a boundary-like structure are perceived as a group.
Closure	Open structures are perceived as closed, complete, and regular whenever there is a way that they can be reasonably interpreted that way.
Continuity	Objects that are aligned together or appear to be a continuation of one another are perceived as a group.
Connection	Objects that are connected are perceived as a group.





Proximity

Objects that are close together are perceived as a group.

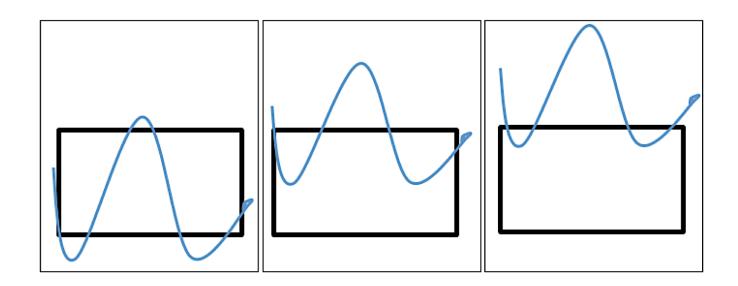






Continuity

Objects that are aligned together or appear to be a continuation of one another are perceived as a group.



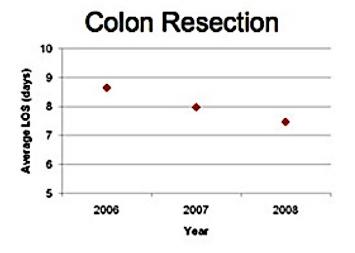


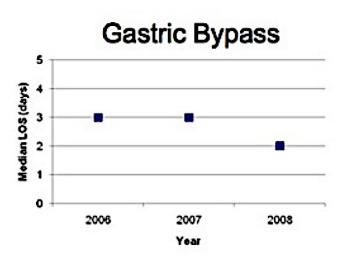




Impact on Length of Stay

NEXT





Decreased reoperative complications results in a better patient experience as well as a better use of hospital resources, as shown in the decreased length of stay for both colon resections and gastric bypass.

Image 4 of 6

CLOSE X





Pre-Attentive Processing is the ability of the low-level human visual system to rapidly identify certain basic visual properties.





Count the Fives





See the Fives





Data-Ink Ratio

Good graphics should include only data-ink. Non-data-ink is to be deleted everywhere else possible.

Above all else show the data Tufte, 1983







	I	1	CY	10	
Priority Area	A ccounta bility	Q1	Q2	Q3	Q4
Falls					
Patient Falls with Injury		0.46	0.45	0.41	
Serious Reportable Events		1	0	1	6
Medical Records					
MD Notes Composite		72%	66%	65%	67%
H&P Compliance		100%	96%	94%	95%
H&P Updated per Policy		41%	21%	80%	45%
Medication Management-Inpatient					
Medications Secured Properly		88%	83%	78%	
Expired Meds (Doses)		435	277		
Patients' Own Meds-Labelling		38%	86%	60%	
Recording/Reporting Fridge Temp		40%	70%	53%	
Patient Education on AntiCoag		80%			
Med Rec-Admission		89%	92%	89%	87%
Med Rec-Discharge		98%	98%	98%	97%
Medication Management-Outpatient		0070	0070	0070	0.70
Sites-MESAC Approval of Samples		100%	100%	100%	
Sites-Correct Use of SIMS for					
Approved Samples		86%	86%	86%	
Pain Management		0070	0070	0070	
Pain Assessment/Reassessment		NA	97%	98%	98%
Severe Pain Management		NA	84%	95%	97%
Patient Identifiers		IVA	0470	0070	01 70
Mislabeled Specimens		1058	1110	1177	1143
Blood Transfusion RN Verification	-	1036	Data		1143
Safety Reporting Proxy		0	0	0	0
Patient Rights		0		<u> </u>	
Grievance Responded (per Hospital					
policy)		NA	79%	82%	76%
Restraints		IVA	79%	82%	70%
Restraint Prevalence		ALA	NA	6.1%	3.2%
		NA NA	NA NA	NA	
MD/NP/PA Daily Assessment					33%
Ordered per Policy		NA	90%	89%	89%
Utilization Matches Order		NA	88%	80%	37%
RN Assessment & Interventions		NA	92%	82%	85%
Skin Integrity			***	0.00/	0.40/
Pressure Ulcer Prevalence		NA	NA	2.9%	2.1%
CNS Consults (>Stage 2)		NA	95%	87%	
Wound Measured Weekly		NA	86%	80%	
Serious Reportable Events		3	2	1	4
Universal Protocol					
UP Compliance (Procedural Areas)		96%	99%	94%	92%
UP Compliance (Ambulatory Areas)		71%	91%	64%	86%
Wrong Site Procedures-SRE		0	2	0	1
Other NP SGs					
Critical Value Callbacks		NA	NA	98%	98%
Norry Box					
Interventions without Orders			Data	TBD	
Infection Control			Data		
Internal Handoffs			Data		
	1				





Show the Data

_	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Group 1	1,000	1,250	1,500	1,750	2,000	2,250	2,500	2,750	3,000	3,250	3,500	3,750
Group 2	1,500	2,000	2,500	3,000	3,500	4,000	4,500	5,000	5,500	6,000	6,500	7,000
Group 3	2,000	2,250	2,500	2,750	3,000	3,250	3,500	3,750	4,000	4,250	4,500	4,750
Group 4	2,500	3,000	3,500	4,000	4,500	5,000	5,500	6,000	6,500	7,000	7,500	8,000
Group 5	3,000	2,900	2,800	2,700	2,600	2,500	2,400	2,300	2,200	2,100	2,000	1,900
Group 6	3,500	3,300	3,100	2,900	2,700	2,500	2,300	2,100	1,900	1,700	1,500	1,300
Group 7	4,000	4,200	4,400	4,600	4,800	5,000	5,200	5,400	5,600	5,800	6,000	6,200
Group 8	4,500	4,100	3,700	3,300	2,900	2,500	2,100	1,700	1,300	900	500	100
Group 9	5,000	5,500	6,000	6,500	7,000	7,500	8,000	8,500	9,000	9,500	10,000	10,500
Group 10	5,500	5,200	4,900	4,600	4,300	4,000	3,700	3,400	3,100	2,800	2,500	2,200





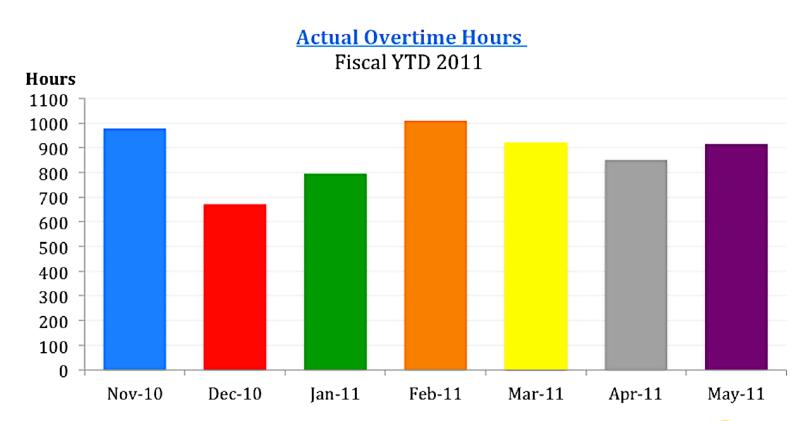
Color used well can enhance and clarify a presentation. Color used poorly will obscure, muddle, confuse.





Inappropriate Use of Color

What are the colors conveying?

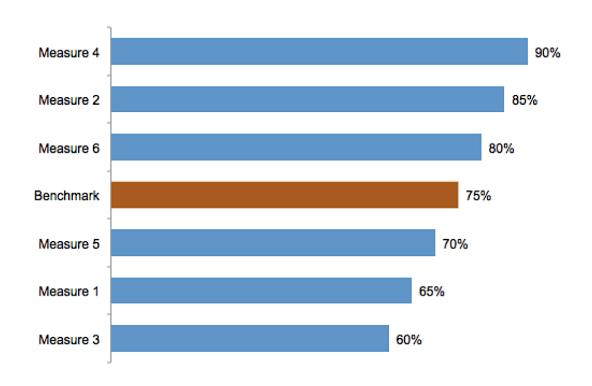






Color

Use color to show differences and highlight important information.







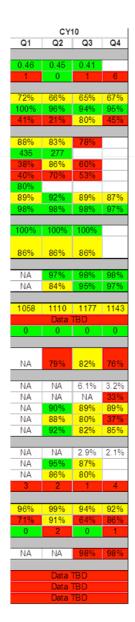
Fill in the blank: Approximately 10% of all males and 1% of all females are ______.





Color Normal





	C1	10	
Q1	Q2	Q3	Q4
0.46	0.45	0.41	
1	0	1	6
	2221	0.004	0001
72%	66%	65%	67%
100%	96%	94%	95%
41%	21%	80%	45%
000/	000/	700/	000/
88%	83%	78%	83%
38%	86%	60%	86%
40%	70%	53%	83%
80%	80%	80%	80%
89%	92%	89%	87%
98%	98%	98%	97%
100%	100%	100%	
100%	100%	100%	
000/	0.00/	0.00/	
86%	86%	86%	
NA	97%	98%	98%
NA	84%	95%	97%
IVA	04 /0	9370	31 /6
1058	1110	1177	1143
1036		TBD	1143
0	0	0	0
NA	79%	82%	76%
NA	NA	6.1%	3.2%
NA	NA	NA	33%
NA	90%	89%	89%
NA	88%	80%	37%
NA	92%	82%	85%
NA	NA	2.9%	2.1%
	14/-1	2.070	
NA	95%	87%	
NA	95%	87%	4
NA NA	95% 86%	87% 80%	4
NA NA	95% 86%	87% 80%	4 92%
NA NA 3	95% 86% 2	87% 80% 1	
NA NA 3	95% 86% 2 99% 91%	87% 80% 1	92%
NA NA 3 96% 71%	95% 86% 2 99%	87% 80% 1 94% 64%	92% 86%
NA NA 3 96% 71%	95% 86% 2 99% 91%	87% 80% 1 94% 64%	92% 86%
NA NA 3 96% 71% 0	95% 86% 2 99% 91% 2	87% 80% 1 94% 64% 0	92% 86% 1
NA NA 3 96% 71% 0	95% 86% 2 99% 91% 2 NA	87% 80% 1 94% 64% 0	92% 86% 1
NA NA 3 96% 71% 0	95% 86% 2 99% 91% 2 NA	87% 80% 1 94% 64% 0	92% 86% 1

CY10

Dichromatic







Questions so far?





5. When to use a table.





Tables

Use a TABLE to:

- Look up individual values
- Compare individual values
- Display precise values
- Communicate more than one unit of measure





Table "Before" Example

Annual Monitoring for Patients on Persistent Medications - ACE Inhibitors or ARBs	80%	84%	81%	80%
Annual Monitoring for Patients on Persistent Medications - ACE Inhibitors or ARBs	85%	84%	81%	80%
Annual Monitoring for Patients on Persistent Medications - ACE Inhibitors or ARBs	85%	84%	81%	86%
Annual Monitoring for Patients on Persistent Medications - ACE Inhibitors or ARBs	84%	84%	81%	86%
Annual Monitoring for Patients on Persistent Medications - ACE Inhibitors or ARBs	84%	84%	81%	80%
Annual Monitoring for Patients on Persistent Medications - ACE Inhibitors or ARBs	01%	84%	81%	80%
	5%			
Annual Monitoring for Patients on Persistent Medications - Anticonvulsants	73%	69%	62%	71%
Annual Monitoring for Patients on Persistent Medications - Anticonvulsants	70%	69%	62%	71%
Annual Monitoring for Patients on Persistent Medications - Anticonvulsants	70%	09%	62%	71%
Annual Monitoring for Patients on Persistent Medications - Anticonvulsants	08%	09%	62%	71%
Annual Monitoring for Patients on Persistent Medications - Anticonvulsants	08%	00%	62%	71%
Annual Monitoring for Patients on Persistent Medications - Anticonvulsants	00%	69%	62%	71%
	6%			
Annual Monitoring for Patients on Persistent Medications - Diuretios	85%	84%	80%	80%
Annual Monitoring for Patients on Persistent Medications - Diuretics	84%	84%	80%	80%
Annual Monitoring for Patients on Persistent Medications - Diuretios	84%	84%	80%	86%

Annual Monitoring for Patients on Persistent				
Medications - Diuretics	83%	84%	80%	86%
Annual Monitoring for Patients on Persistent				
Medications - Diuretics	83%	84%	80%	86%
Annual Monitoring for Patients on Persistent				
Medications - Diuretics	81%	84%	80%	86%
	4%	-		-
Annual Monitoring for Patients on Persistent	4.9			
Medications - Total rate	85%	83%	80%	859
Annual Monitoring for Patients on Persistent		83%	80%	
Medications - Total rate Annual Monitoring for Patients on Persistent	84%	83%	80%	859
Medications - Total rate	04%	82%	80%	959
Annual Monitoring for Patients on Persistent		0.5.4	10.7	
Medications - Total rate	83%	83%	80%	859
Annual Monitoring for Patients on Persistent Medications - Total rate	83%	83%	80%	859
Annual Monitoring for Patients on Persistent	83%	83%	80%	859
Medications - Total rate	01%	03%	80%	059
	4%			
Antidepressant Medication Management - Effective				
Acute Phase Treatment	71%	68%	63%	729
Antidepressant Medication Management - Effective				
Acute Phase Treatment	69%	68%	63%	729
Antidepressant Medication Management - Effective				
Antidepressant Medication Management - Effective Acute Phase Treatment	08%	68%	63%	729
		00.74		
Antidepressant Medication Management - Effective				
Acute Phase Treatment	68%	68%	63%	729
Antidepressant Medication Management - Effective			l	
Acute Phase Treatment	00%	68%	63%	729
And an arrangement of the second seco				
Antidepressant Medication Management - Effective Acute Phase Treatment	04%	68%	63%	729
	6%	00.11		
	6.5		_	
Antidepressant Medication Management - Effective			l	
Continuation Phase Treatment	54%	52%	40%	551
Antidepressant Medication Management - Effective				
Continuation Phase Treatment	54%	52%	40%	551
Antidepressant Medication Management - Effective Continuation Phase Treatment	53%	52%	40%	551
Continuation Phase Treatment	53%	52%	40%	559

Antidepressant Medication Management - Effective Continuation Phase Treatment	52%	52%	40%	55%
Antidepressant Medication Management - Effective Continuation Phase Treatment	50%	52%	40%	55%
Antidepressant Medication Management - Effective Continuation Phase Treatment	48%	52%	40%	55%
	7%			
Appropriate Testing for Children with Phanyngitis	93%	90%	77%	80%
Appropriate Testing for Children with Phanyngitis	92%	90%	77%	80%
Appropriate Testing for Children with Pharyngitis	92%	90%	77%	10%
Appropriate Testing for Children with Phanyngitis	90%	90%	77%	10%
Appropriate Testing for Children with Phanyngitis	80%	90%	77%	80%
Appropriate Testing for Children with Phanyngitis	83%	90%	77%	80%
	10%			
Appropriate Treatment for Children with Upper Respiratory Infection (URI)	97%	94%	84%	92%
Appropriate Treatment for Children with Upper Respiratory Infection (URI)	98%	94%	84%	93%
Appropriate Treatment for Children with Upper Respiratory Infection (URI)	90%	94%	84%	93%
Appropriate Treatment for Children with Upper Respiratory Infection (URI)	95%	94%	84%	93%
Appropriate Treatment for Children with Upper Respiratory Infection (URI)	93%	94%	84%	93%
Appropriate Treatment for Children with Upper Respiratory Infection (URI)	93%	94%	84%	93%
	3%			
Assidance of Antibiotic Treatment in Adults with Acute Bronchitis	30%	22%	24%	21%

Measure Name	Regional Rate	MA Rate	NCQA Nat Ave	NCQA 90th Percentile
Avoidance of Antibiotic Treatment in Adults with				
Acute Bronchitis	26%	22%	24%	31%
Avoidance of Antibiotic Treatment in Adults with Acute Bronchitis	21%	22%	24%	31%
Avoidance of Antibiotic Treatment in Adults with Acute Bronchitis	21%	22%	24%	31%
Avoidance of Antibiotic Treatment in Adults with Acute Bronchitis	21%	22%	24%	31%
Avoidance of Antibiotic Treatment in Adults with Acute Bronchitis	20%	22%	24%	31%
	10%			
Breast Canoer Screening	84%	83%	71%	80%
Breast Cancer Screening	84%	83%	71%	80%
Breast Cancer Screening	83%	83%	71%	80%
Breast Canoer Screening	82%	83%	71%	80%
Breast Cancer Screening	82%	83%	71%	80%
Breast Cancer Screening	82%	83%	71%	80%
	2%			
Cervical Cancer Screening	80%	87%	77%	83%
Cervical Cancer Screening	87%	87%	77%	83%
Cervical Cancer Screening	87%	87%	77%	83%
Cervical Cancer Screening Cervical Cancer Screening	88%	87% 87%	77% 77%	83%
Cervical Cancer Screening Cervical Cancer Screening	87%	87%	77%	83%
Cervical Cancer screening	2%	87%	77%	83%
Chlamydia Screening in Women Ages 15 to 20	05%	57%	41%	52%
Chlamydia Screening in Women Ages 15 to 20	50%	57%	4196	52%
Chlamydia Screening in Women Ages 15 to 20	50%	57%	4196	52%
Chlamydia Screening in Women Ages 15 to 20	50%	57%	4196	52%
Chlamydia Screening in Women Ages 15 to 20	53%	57%	41%	52%
Chlamydia Screening in Women Ages 15 to 20	50%	57%	4196	52%
	14%			
Chlamydia Screening in Women Ages 21 to 24	00%	62%	45%	59%
Chlamydia Screening in Women Ages 21 to 24	04%	62%	45%	59%
Chlamydia Screening in Women Ages 21 to 24	03%	62%	45%	59%
Chlamydia Screening in Women Ages 21 to 24	59%	62%	45%	59%

			45%	
Chlamydia Screening in Women Ages 21 to 24	59%	62%	40.74	59%
Chlamydia Screening in Women Ages 21 to 24	58%	62%	45%	50%
	8%			
Cholesterol Management for Patients with				
Cardiovascular Conditions-LDL-C Screening	93%	92%	88%	93%
Cholesterol Management for Patients with				
Cardiovascular Conditions-LDL-C Screening	93%	92%	88%	93%
Cholesterol Management for Patients with				
Cardiovascular Conditions-LDL-C Screening	93%	92%	88%	93%
Cholesterol Management for Patients with				
Cardiovascular Conditions-LDL-C Screening	93%	92%	88%	93%
Cholesterol Management for Patients with				
Cardiovascular Conditions-LDL-C Screening	92%	92%	88%	93%
Cholesterol Management for Patients with				
Cardiovascular Conditions-LDL-C Screening	88%	92%	88%	93%
	6%			
Colorectal Cancer Screening	82%	77%	61%	72%
Colorectal Cancer Screening	78%	77%	01%	72%
Colorectal Cancer Screening	78%	77%	61%	72%
Colorectal Canoer Screening	78%	77%	61%	72%
Colorectal Cancer Screening	75%	77%	01%	72%
Colorectal Cancer Screening	71%	77%	61%	72%
	11%			
Comprehensive Diabetes Care - HbA1c Testing	95%	94%	89%	94%
Comprehensive Diabetes Care - HbA1c Testing	94%	04%	89%	94%
Comprehensive Diabetes Care - HbA1c Testing	94%	04%	89%	94%
Comprehensive Diabetes Care - HbA1c Testing	94%	94%	89%	94%
Comprehensive Diabetes Care - HbA1c Testing	93%	04%	80%	04%
Comprehensive Diabetes Care - HbA1c Testing	93%	94%	89%	94%
	3%			
Comprehensive Diabetes Care - LDL-C Screening	92%	01%	85%	01%
and a second second	00.70		0074	01.74
Comprehensive Diabetes Care - LDL-C Screening	92%	01%	05%	91%
and the same of th	44.70	****	90.74	01.7
Comprehensive Diabetes Care - LDL-C Screening	91%	01%	85%	91%
Comprehensive Craceres Care - EDC-C Screening	91%	V176	80%	91%

Comprehensive Diabetes Care - LDL-C Screening	90%	91%	85%	91%
Comprehensive Diabetes Care - LDL-C Screening	80%	01%	85%	91%
Comprehensive Diabetes Care - LUL-C Screening	80%	V1%	80%	V1%
Comprehensive Diabetes Care - LDL-C Screening	87%	91%	85%	91%
	5%			
Comprehensive Diabetes Care - Medical Attention for Nephropathy	91%	80%	83%	90%
Comprehensive Diabetes Care - Medical Attention for Nephropathy	90%	80%	83%	90%
Comprehensive Diabetes Care - Medical Attention for Nephropathy	90%	80%	83%	90%
Comprehensive Diabetes Care - Medical Attention for Nephropathy	89%	89%	83%	90%
Comprehensive Diabetes Care - Medical Attention for Nephropathy	89%	89%	83%	90%
Comprehensive Diabetes Care - Medical Attention for Nephropathy	80%	89%	83%	90%
	5%			
Follow-up of Care of Children Prescribed ADHD Medications - Initiation Phase	50%	45%	37%	45%
Follow-up of Care of Children Prescribed ADHD Medications - Initiation Phase	49%	45%	37%	45%
Follow-up of Care of Children Prescribed ADHD Medications - Initiation Phase	48%	45%	37%	45%
Follow-up of Care of Children Prescribed ADHD Medications - Initiation Phase	40%	45%	37%	45%
Follow-up of Care of Children Prescribed ADHD Medications - Initiation Phase	4176	40%	37%	45%
Follow-up of Care of Children Prescribed ADHD Medications - Initiation Phase	40%	45%	37%	45%
	9%			
Use of Appropriate Medications for People with Asthma: Children Ages 5 to 11	90%	97%	97%	90%





Table "After"

NCQA National Process Measures Example State Compliance Rates vs. National Compliance Rates @ 90th Percentile

Avoidance of Antibiotic Treatment in Adult with Acute Bronchitis 22% 31% 99% -6% Avoidance of Antibiotic Treatment in Adult with Acute Bronchitis 22% 31% 99% -6% Antidepressant Medication Management: Effective Continuation Phase Treatment 52% 55% -3% -3% Chlamydia Screening in Women: Ages 15 to 20 57% 72% -15% Antidepressant Medication Management: Effective Acute Phase Treatment 68% 72% -4% Annual Monitoring for Patients on Persistent Medications: Anticonvulsants 69% 71% -2% Annual Monitoring for Patients on Persistent Medications: Atliconvulsants 69% 71% -2% Annual Monitoring for Patients on Persistent Medications: ACE Inhibitors or ARBs 84% 86% -2% Annual Monitoring for Patients on Persistent Medications: ACE Inhibitors or ARBs 84% 86% -2% Annual Monitoring for Patients on Persistent Medications: Diuretics 84% 86% -2% Comprehensive Diabetes Care: Medical Attention for Nephropathy 89% 90% -1% 90% 95% -5% 90% 95% -5% 90% 95% -5% 90% 95% -5% 90% 95% 95% -5% 90% 95% -5% 90% 95% 95% -5% 90% 95% 95% 95% 95% 95% 95% 95% 95% 95% 95				
Rate	Areas for Improvement			
Use of Spirometry Testing in the Assessment and Diagnosis of COPD	Process Measures			Variance
Antidepressant Medication Management: Effective Continuation Phase Treatment 52% 55% -3% Chlamydia Screening in Women: Ages 15 to 20 57% 72% -15% Antidepressant Medication Management: Effective Acute Phase Treatment 68% 72% -4% Annual Monitoring for Patients on Persistent Medications: Anticonvulsants 69% 71% -2% Annual Monitoring for Patients on Persistent Medications: Total Rate 83% 85% -2% Annual Monitoring for Patients on Persistent Medications: Total Rate 83% 86% -2% Annual Monitoring for Patients on Persistent Medications: ACE Inhibitors or ARBs 84% 86% -2% Annual Monitoring for Patients on Persistent Medications: Diuretics 84% 86% -2% Comprehensive Diabetes Care: Medical Attention for Nephropathy 89% 90% -1% Use of Appropriate Medications for People with Asthma: People Ages 12 to 50 90% 95% 95% -5% Use of Appropriate Medications for People with Asthma: Children Ages 5 to 11 97% 99% 99% -2% Weets or Exceeds 90th Percentile of National Comprehensive Diabetes Care: HbA1c Testing 94% 94% 9% 9% 9% 9% 9% 9% 9% 9% 9% 9% 9% 9% 9%	Avoidance of Antibiotic Treatment in Adult with Acute Bronchitis	22%	31%	-9%
Chlamydia Screening in Women: Ages 15 to 20 57% 72% -15% Antidepressant Medication Management: Effective Acute Phase Treatment 68% 72% -4% Annual Monitoring for Patients on Persistent Medications: Anticonvulsants 69% 71% -2% Annual Monitoring for Patients on Persistent Medications: Total Rate 83% 85% -2% Annual Monitoring for Patients on Persistent Medications: ACE Inhibitors or ARBs 84% 86% -2% Annual Monitoring for Patients on Persistent Medications: Diuretics 84% 86% -2% Comprehensive Diabetes Care: Medical Attention for Nephropathy 89% 90% -1% Use of Appropriate Medications for People with Asthma: People Ages 12 to 50 90% 95% -5% Use of Appropriate Medications for People with Asthma: Children Ages 5 to 11 97% 99% -2% Meets or Exceeds 90th Percentile of National 87% 87% 6% Well Child Visits: First 15 Months of Life 93% 87% 6% Well Child Visits: Ages 3 to 6 92% 85% 7% Comprehensive Diabetes Care: LDL-C-Screening 91% 91%	Use of Spirometry Testing in the Assessment and Diagnosis of COPD	44%	50%	-6%
Antidepressant Medication Management: Effective Acute Phase Treatment 68% 72% -4% Annual Monitoring for Patients on Persistent Medications: Anticonvulsants 69% 71% -2% Annual Monitoring for Patients on Persistent Medications: Total Rate 83% 85% -2% Annual Monitoring for Patients on Persistent Medications: ACE Inhibitors or ARBs 84% 86% -2% Annual Monitoring for Patients on Persistent Medications: Diuretics 84% 86% -2% Annual Monitoring for Patients on Persistent Medications: Diuretics 84% 86% -2% Comprehensive Diabetes Care: Medical Attention for Nephropathy 89% 90% -1% Use of Appropriate Medications for People with Asthma: People Ages 12 to 50 90% 95% -5% Use of Appropriate Medications for People with Asthma: Children Ages 5 to 11 97% 99% -2% Welets or Exceeds 90th Percentile of National Comprehensive Diabetes Care: HbA1c Testing 94% 94% 94% 96% Well Child Visits: First 15 Months of Life 93% 87% 6% Well Child Visits: First 15 Months of Life 93% 87% 6% Comprehensive Diabetes Care: LDL-C-Screening 91% 91% 91% 9% 98 98 99 99 99 99 99 99 99	Antidepressant Medication Management: Effective Continuation Phase Treatment	52%	55%	-3%
Annual Monitoring for Patients on Persistent Medications: Anticonvulsants 69% 71% -2% Annutal Monitoring for Patients on Persistent Medications: Total Rate 83% 85% -2% Annual Monitoring for Patients on Persistent Medications: ACE Inhibitors or ARBs 84% 86% -2% Annual Monitoring for Patients on Persistent Medications: Diuretics 84% 86% -2% Annual Monitoring for Patients on Persistent Medications: Diuretics 84% 86% -2% Comprehensive Diabetes Care: Medical Attention for Nephropathy 89% 90% -1% Use of Appropriate Medications for People with Asthma: People Ages 12 to 50 90% 95% -5% Use of Appropriate Medications for People with Asthma: Children Ages 5 to 11 97% 99% -2% Welets or Exceeds 90th Percentile of National Comprehensive Diabetes Care: HbA1c Testing 94% 94% 94% 0% Well Child Visits: First 15 Months of Life 93% 87% 6% Well Child Visits: Ages 3 to 6 92% 85% 7% Comprehensive Diabetes Care: LDL-C-Screening 91% 91% 91% 0% Use of Imaging Studies for Low Back Pain 89% 81% 88% Cervical Cancer Screening 87% 83% 4% Breast Cancer Screening 87% 83% 4% 80% 3% Colorectal Cancer Screening 77% 72% 5% Well Child Visits: for Adolescents Ages 12 to 21 74% 61% 13% Chlamydia Screening in Women: Ages 21 to 24 62% 59% 3%	Chlamydia Screening in Women: Ages 15 to 20	57%	72%	-15%
Annutal Monitoring for Patients on Persistent Medications: Total Rate 83% 85% -2% Annual Monitoring for Patients on Persistent Medications: ACE Inhibitors or ARBS 84% 86% -2% Annual Monitoring for Patients on Persistent Medications: Diuretics 84% 86% -2% Comprehensive Diabetes Care: Medical Attention for Nephropathy 89% 90% -1% Use of Appropriate Medications for People with Asthma: People Ages 12 to 50 90% 95% -5% Use of Appropriate Medications for People with Asthma: Children Ages 5 to 11 97% 99% -2% Meets or Exceeds 90th Percentile of National Comprehensive Diabetes Care: HbA1c Testing 94% 94% 9% 9% 9% 9% 9% 9% 9% 9% 9% 9% 9% 9% 9%	Antidepressant Medication Management: Effective Acute Phase Treatment	68%	72%	-4%
Annual Monitoring for Patients on Persistent Medications: ACE Inhibitors or ARBs 84% 86% -2% Annual Monitoring for Patients on Persistent Medications: Diuretics 84% 86% -2% Comprehensive Diabetes Care: Medical Attention for Nephropathy 89% 90% -1% Use of Appropriate Medications for People with Asthma: People Ages 12 to 50 90% 95% -5% Use of Appropriate Medications for People with Asthma: Children Ages 5 to 11 97% 99% -2% Meets or Exceeds 90th Percentile of National Comprehensive Diabetes Care: HbA1c Testing 94% 94% 94% 94% 96% Well Child Visits: First 15 Months of Life 93% 87% 6% Well Child Visits: Ages 3 to 6 Comprehensive Diabetes Care: LDL-C-Screening 91% 91% 91% 91% 91% 91% 91% 98% 88% 98% 98% 98% 98% 98% 98% 98% 98	Annual Monitoring for Patients on Persistent Medications: Anticonvulsants	69%	71%	-2%
Annual Monitoring for Patients on Persistent Medications: Diuretics 84% 86% -2% Comprehensive Diabetes Care: Medical Attention for Nephropathy 89% 90% -1% Use of Appropriate Medications for People with Asthma: People Ages 12 to 50 90% 95% -5% Use of Appropriate Medications for People with Asthma: Children Ages 5 to 11 97% 99% -2% Weets or Exceeds 90th Percentile of National Comprehensive Diabetes Care: HbA1c Testing 94% 94% 0% 87% 6% Well Child Visits: First 15 Months of Life 93% 87% 6% Comprehensive Diabetes Care: LDL-C-Screening 91% 91% 91% 0% Use of Imaging Studies for Low Back Pain 89% 81% 8% 8% 4% 86% 88% 80% 3%	Annutal Monitoring for Patients on Persistent Medications: Total Rate	83%	85%	-2%
Comprehensive Diabetes Care: Medical Attention for Nephropathy 89% 90% -1% Use of Appropriate Medications for People with Asthma: People Ages 12 to 50 90% 95% -5% Use of Appropriate Medications for People with Asthma: Children Ages 5 to 11 97% 99% -2% Meets or Exceeds 90th Percentile of National Comprehensive Diabetes Care: HbA1c Testing 94% 94% 0% Well Child Visits: First 15 Months of Life 93% 87% 6% Well Child Visits: Ages 3 to 6 92% 85% 7% Comprehensive Diabetes Care: LDL-C-Screening 91% 91% 91% Use of Imaging Studies for Low Back Pain 89% 81% 8% Cervical Cancer Screening 87% 83% 4% Breast Cancer Screening 87% 83% 4% Colorectal Cancer Screening 77% 72% 5% Well Child Visits: for Adolescents Ages 12 to 21 74% 61% 13% Chlamydia Screening in Women: Ages 21 to 24 62% 59% 3%	Annual Monitoring for Patients on Persistent Medications: ACE Inhibitors or ARBs	84%	86%	-2%
Use of Appropriate Medications for People with Asthma: People Ages 12 to 50 90% 95% -5% Use of Appropriate Medications for People with Asthma: Children Ages 5 to 11 97% 99% -2% Meets or Exceeds 90th Percentile of National Comprehensive Diabetes Care: HbA1c Testing 94% 94% 0% Well Child Visits: First 15 Months of Life 93% 87% 6% Well Child Visits: Ages 3 to 6 92% 85% 7% Comprehensive Diabetes Care: LDL-C-Screening 91% 91% 91% 0% Use of Imaging Studies for Low Back Pain 89% 81% 8% Cervical Cancer Screening 87% 83% 4% Breast Cancer Screening 83% 80% 3% Colorectal Cancer Screening 77% 72% 5% Well Child Visits: for Adolescents Ages 12 to 21 74% 61% 13% Chlamydia Screening in Women: Ages 21 to 24 62% 59% 3%	Annual Monitoring for Patients on Persistent Medications: Diuretics	84%	86%	-2%
Use of Appropriate Medications for People with Asthma: Children Ages 5 to 11 97% 99% -2% Meets or Exceeds 90th Percentile of National Comprehensive Diabetes Care: HbA1c Testing 94% 94% 0% Well Child Visits: First 15 Months of Life 93% 87% 6% Well Child Visits: Ages 3 to 6 92% 85% 7% Comprehensive Diabetes Care: LDL-C-Screening 91% 91% 91% Use of Imaging Studies for Low Back Pain 89% 81% 8% Cervical Cancer Screening 87% 83% 4% Breast Cancer Screening 83% 80% 3% Colorectal Cancer Screening 77% 72% 5% Well Child Visits: for Adolescents Ages 12 to 21 74% 61% 13% Chlamydia Screening in Women: Ages 21 to 24 62% 59% 3%	Comprehensive Diabetes Care: Medical Attention for Nephropathy	89%	90%	-1%
Meets or Exceeds 90th Percentile of National Comprehensive Diabetes Care: HbA1c Testing 94% 94% 0% Well Child Visits: First 15 Months of Life 93% 87% 6% Well Child Visits: Ages 3 to 6 92% 85% 7% Comprehensive Diabetes Care: LDL-C-Screening 91% 91% 91% Use of Imaging Studies for Low Back Pain 89% 81% 8% Cervical Cancer Screening 87% 83% 4% Breast Cancer Screening 83% 80% 3% Colorectal Cancer Screening 77% 72% 5% Well Child Visits: for Adolescents Ages 12 to 21 74% 61% 13% Chlamydia Screening in Women: Ages 21 to 24 62% 59% 3%	Use of Appropriate Medications for People with Asthma: People Ages 12 to 50	90%	95%	-5%
Comprehensive Diabetes Care: HbA1c Testing 94% 94% 0% Well Child Visits: First 15 Months of Life 93% 87% 6% Well Child Visits: Ages 3 to 6 92% 85% 7% Comprehensive Diabetes Care: LDL-C-Screening 91% 91% 0% Use of Imaging Studies for Low Back Pain 89% 81% 8% Cervical Cancer Screening 87% 83% 4% Breast Cancer Screening 83% 80% 3% Colorectal Cancer Screening 77% 72% 5% Well Child Visits: for Adolescents Ages 12 to 21 74% 61% 13% Chlamydia Screening in Women: Ages 21 to 24 62% 59% 3%	Use of Appropriate Medications for People with Asthma: Children Ages 5 to 11	97%	99%	-2%
Well Child Visits: First 15 Months of Life 93% 87% 6% Well Child Visits: Ages 3 to 6 92% 85% 7% Comprehensive Diabetes Care: LDL-C-Screening 91% 91% 0% Use of Imaging Studies for Low Back Pain 89% 81% 8% Cervical Cancer Screening 87% 83% 4% Breast Cancer Screening 83% 80% 3% Colorectal Cancer Screening 77% 72% 5% Well Child Visits: for Adolescents Ages 12 to 21 74% 61% 13% Chlamydia Screening in Women: Ages 21 to 24 62% 59% 3%	Meets or Exceeds 90th Percentile of National			
Well Child Visits: Ages 3 to 6 92% 85% 7% Comprehensive Diabetes Care: LDL-C-Screening 91% 91% 0% Use of Imaging Studies for Low Back Pain 89% 81% 8% Cervical Cancer Screening 87% 83% 4% Breast Cancer Screening 83% 80% 3% Colorectal Cancer Screening 77% 72% 5% Well Child Visits: for Adolescents Ages 12 to 21 74% 61% 13% Chlamydia Screening in Women: Ages 21 to 24 62% 59% 3%	Comprehensive Diabetes Care: HbA1c Testing	94%	94%	0%
Comprehensive Diabetes Care: LDL-C-Screening 91% 91% 0% Use of Imaging Studies for Low Back Pain 89% 81% 8% Cervical Cancer Screening 87% 83% 4% Breast Cancer Screening 83% 80% 3% Colorectal Cancer Screening 77% 72% 5% Well Child Visits: for Adolescents Ages 12 to 21 74% 61% 13% Chlamydia Screening in Women: Ages 21 to 24 62% 59% 3%	Well Child Visits: First 15 Months of Life	93%	87%	6%
Use of Imaging Studies for Low Back Pain 89% 81% 8% Cervical Cancer Screening 87% 83% 4% Breast Cancer Screening 83% 80% 3% Colorectal Cancer Screening 77% 72% 5% Well Child Visits: for Adolescents Ages 12 to 21 74% 61% 13% Chlamydia Screening in Women: Ages 21 to 24 62% 59% 3%	Well Child Visits: Ages 3 to 6	92%	85%	7%
Cervical Cancer Screening 87% 83% 4% Breast Cancer Screening 83% 80% 3% Colorectal Cancer Screening 77% 72% 5% Well Child Visits: for Adolescents Ages 12 to 21 74% 61% 13% Chlamydia Screening in Women: Ages 21 to 24 62% 59% 3%	Comprehensive Diabetes Care: LDL-C-Screening	91%	91%	0%
Breast Cancer Screening 83% 80% 3% Colorectal Cancer Screening 77% 72% 5% Well Child Visits: for Adolescents Ages 12 to 21 74% 61% 13% Chlamydia Screening in Women: Ages 21 to 24 62% 59% 3%	Use of Imaging Studies for Low Back Pain	89%	81%	8%
Colorectal Cancer Screening 77% 72% 5% Well Child Visits: for Adolescents Ages 12 to 21 74% 61% 13% Chlamydia Screening in Women: Ages 21 to 24 62% 59% 3%	Cervical Cancer Screening	87%	83%	4%
Well Child Visits: for Adolescents Ages 12 to 21 74% 61% 13% Chlamydia Screening in Women: Ages 21 to 24 62% 59% 3%	Breast Cancer Screening	83%	80%	3%
Chlamydia Screening in Women: Ages 21 to 24 62% 59% 3%	Colorectal Cancer Screening	77%	72%	5%
,	Well Child Visits: for Adolescents Ages 12 to 21	74%	61%	13%
Follow-up of Care of Children Prescribed ADHD Medications: Initiation Phase 45% 45% 0%	Chlamydia Screening in Women: Ages 21 to 24	62%	59%	3%
	Follow-up of Care of Children Prescribed ADHD Medications: Initiation Phase	45%	45%	0%





Table "After" Version 2

NCQA National Process Measures Example State Compliance Rates vs. National Compliance Rates @ 90th Percentile By Region

Region	Measure	Example State Rate	National Rate @ 90th Percentile	Variance
East	Appropriate Testing for Children with Pharyngitis	83%	90%	-7%
	Well Child Visits: Adolescents Ages 12 to 21	68%	74%	-6%
	Antidepressant Medication Mgmt: Acute Phase	64%	68%	-4%
	Antidepressant Medication Mgmt: Continuation Phase	48%	52%	-4%
	Followup Children Prescribed ADHD Medication: Initiation Phase	41%	45%	-4%
	Comprehensive Diabetes Care: Medical Neuropathy	86%	89%	-3%
West	Cholesterol Screening of Patients with Cardiovascular LDL	88%	92%	-4%
	Comprehensive Diabetes Care: LD Screening	87%	91%	-4%
	Cervical Cancer Screening	83%	87%	-4%
	Monitoring Patients on ACE or ARB	81%	84%	-3%
	Monitoring Patients on Diuretics	81%	84%	-3%
South	Chlamydia Screening Women: Ages 21 to 24	59%	62%	-3%
	Followup Children Prescribed ADHD Medication: Initiation Phase	40%	45%	-5%
Metro	Chlamydia Screening Women: Ages 21 to 24	58%	62%	-4%
	Monitoring Patients on Anticonvulsants	66%	69%	-3%
North	Chlamydia Screening Women: Ages 21 to 24	58%	62%	-4%
	Well-Child Visits: Adolescents Ages 12 to 21	66%	69%	-3%





Table Arrangement – Consider how you might arrange and organize data in a table to make it easy for the viewer to understand any important information you wish to convey.











Chartjunk is a term coined by Edward Tufte.

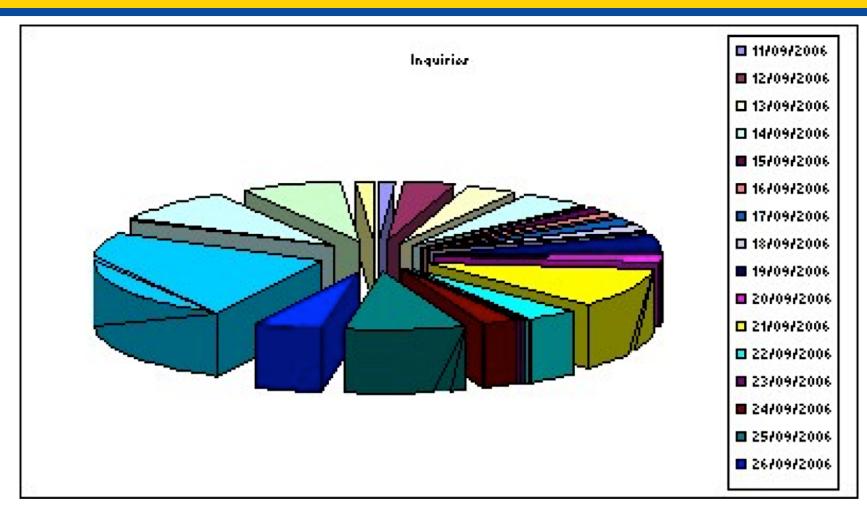
Chartjunk does not achieve the goals of its propagators.
The overwhelming fact of data graphics is that they stand or fall on their content, gracefully displayed.

Tufte The Visual Display of Quantitative Data





Chartjunk Perfected







6. When to use a graph.





Graphs

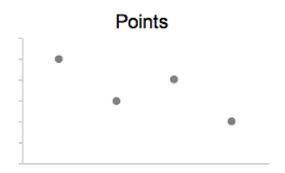
Use a GRAPH to:

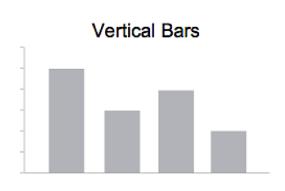
- Show Patterns
- Show Trends
- Show Exceptions
- Reveal relationships between multiple values

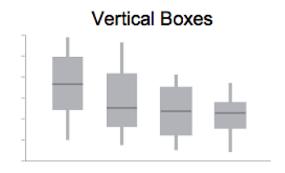


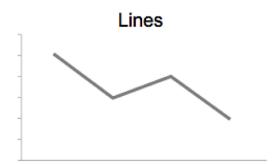


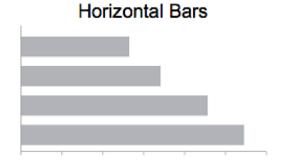
Methods of Encoding Data on a Graph

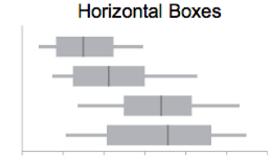










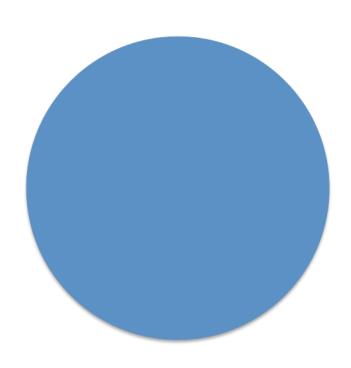






Shape and Color







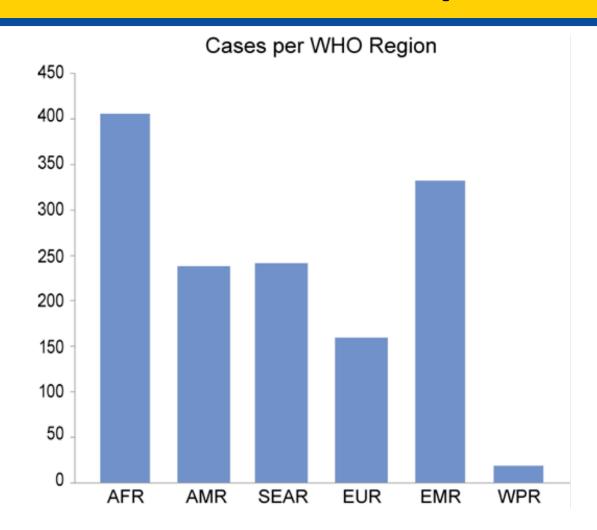


Graph Examples and Summary Best Practices





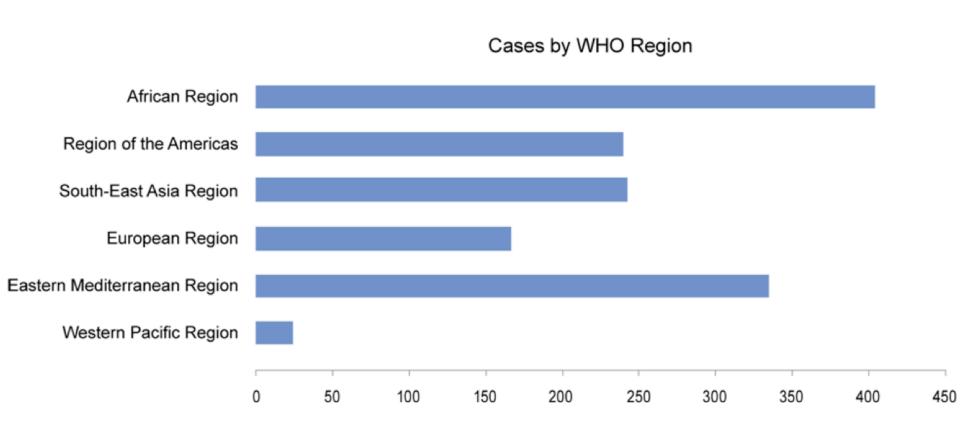
World Health Organization (WHO) Bar Chart Example







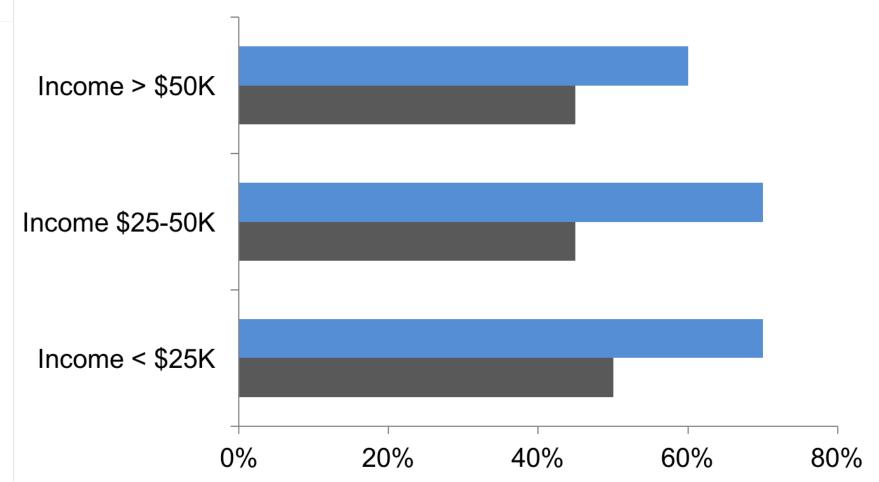
World Health Organization (WHO) Example 2







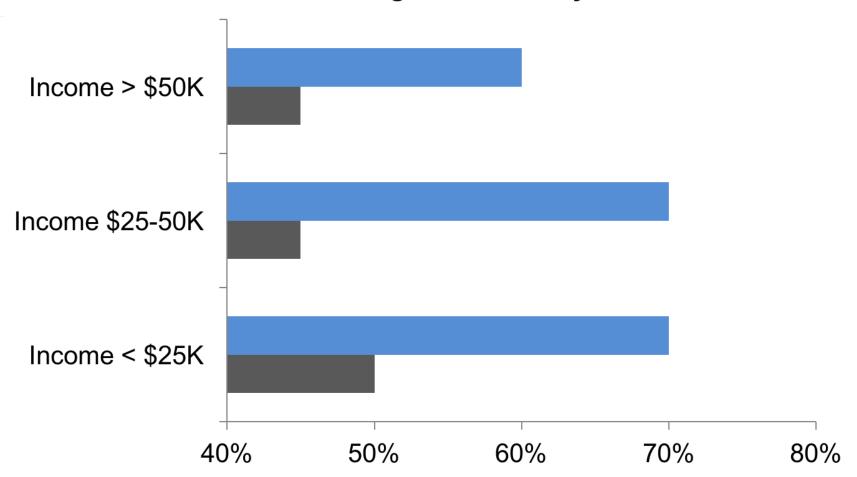
Black and White Boston Residents Who are Overweight or Obese by Income







Black and White Boston Residents Who are Overweight or Obese by Income







Bar graphs always start at 0 because they are displaying the size of the underlying values.

The exception is when you're working with a dataset with a wide range of values, then you can use a broken axis (as one option) to display the data.



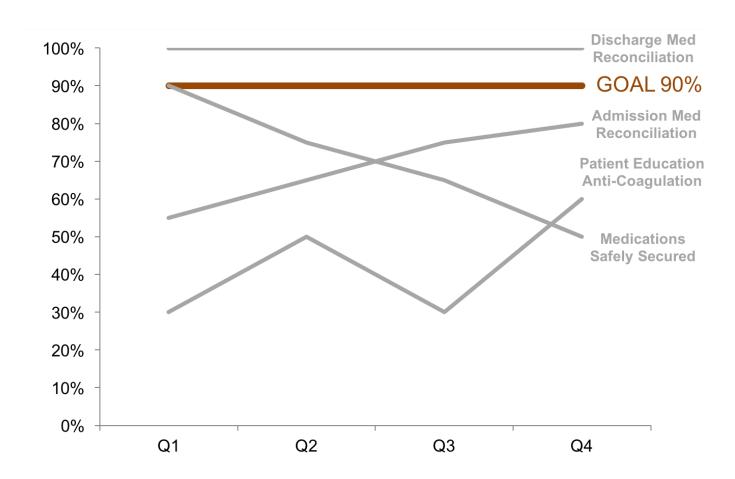


			CY	10	
Priority Area	Accounta bility	Q1	Q2	Q3	Q4
Falls					
Patient Falls with Injury		0.46	0.45	0.41	
Serious Reportable Events		1	0	1	6
Medical Records					
MD Notes Composite		72%	66%	65%	67%
H&P Compliance		100%	96%	94%	95%
H&P Updated per Policy		41%	21%	80%	45%
Medication Management-Inpatient					
Medications Secured Properly		88%	83%	78%	
Expired Meds (Doses)		435	277		
Patients' Own Meds-Labelling		38%	86%	60%	
Recording/Reporting Fridge Temp		40%	70%	53%	
Patient Education on AntiCoag		80%			
Med Rec-Admission		89%	92%	89%	87%
Med Rec-Discharge		98%	98%	98%	97%
Medication Management-Outpatient					
Sites-MESAC Approval of Samples		100%	100%	100%	
Sites-Correct Use of SIMS for					
Approved Samples		86%	86%	86%	
Pain Management					
Pain Assessment/Reassessment		NA	97%	98%	98%
Severe Pain Management		NA	84%	95%	97%
Patient Identifiers			,		
Mislabeled Specimens		1058	1110	1177	1143
Blood Transfusion RN Verification			Data	TBD	
Safety Reporting Proxy		0	0	0	0
Patient Rights				<u> </u>	
Grievance Responded (per Hospital					
policy)		NA	79%	82%	76%
Re stra ints					
Restraint Prevalence		NA	NA	6.1%	3.2%
MD/NP/PA Daily Assessment		NA	NA	NA	33%
Ordered per Policy		NA	90%	89%	89%
Utilization Matches Order		NA	88%	80%	37%
RN Assessment & Interventions		NA	92%	82%	85%
Skin Integrity		7.11			
Pressure Ulcer Prevalence		NA	NA	2.9%	2.1%
CNS Consults (>Stage 2)		NA	95%	87%	2.170
Wound Measured Weekly		NA	86%	80%	
Serious Reportable Events		3	2	1	4
Universal Protocol			_		
UP Compliance (Procedural Areas)		96%	99%	94%	92%
UP Compliance (Ambulatory Areas)		71%	91%	64%	86%
Wrong Site Procedures-SRE		0	2	0	4
Other NP SGs		-		<u> </u>	
Critical Value Callbacks		NA	NA	98%	98%
		IVA	IVA	9070	90%
Worry Box			D-4	TOD	
Interventions without Orders			Data		
Infection Control			Data		
Internal Handoffs			Data	IRD	





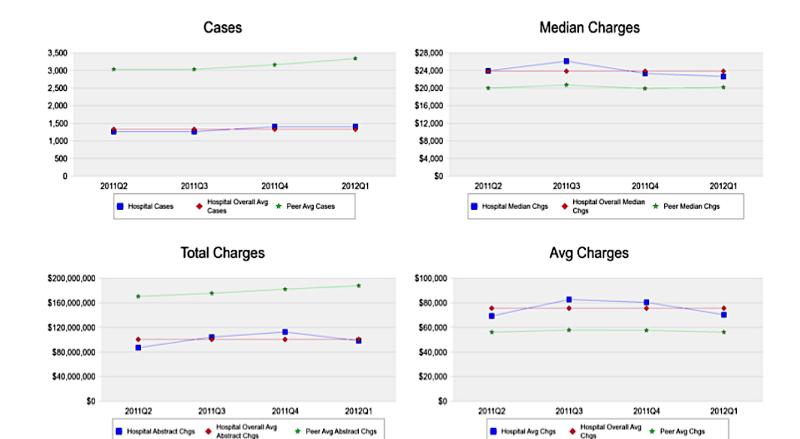
Medication Management







Scale and Arrangement - 1

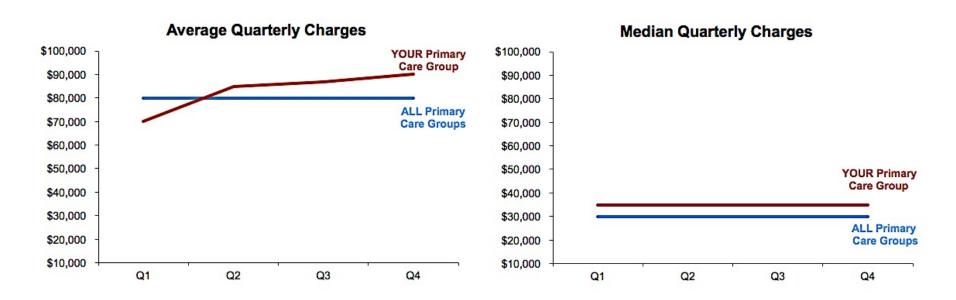






Scale and Arrangement - 2

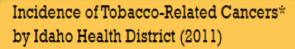
Pay close attention to scale and arrangement (and remember the Gestalt Principles).













Cancer	PHD 1	PHD 2	PHD 3	PHD 4	PHD 5	PHD 6	PHD 7	All of Idaho
Acute Myeloid Leukemia	5	2	7	23	5	6	11	59
Bladder	60	37	53	103	44	25	28	350
Cervix	8	2	14	13	6	6	4	53
Colorectal	118	51	105	138	83	74	70	639
Corpus Uteri	45	13	39	53	19	21	21	211
Esophagus	12	2	14	19	6	7	9	69
Kidney & Renal Pelvis	44	17	48	78	22	23	26	258
Larynx	6	6	5	13	4	1	3	38
Lung & Bronchus	168	82	154	205	92	76	61	838
Oral Cavity & Pharynx	39	16	26	65	33	16	15	210
Ovary	14	8	13	27	5	11	13	91
Pancreas	32	10	37	42	17	27	21	186
Stomach	21	5	8	22	3	8	8	75
Total by HD	572	251	523	801	339	301	290	3077

^{*}Population attributable fractions for tobacco vary by cancer site





Small Multiples

Incidence of Tobacco-Related Cancer Rates by 7 Idaho Public Health District (2011)

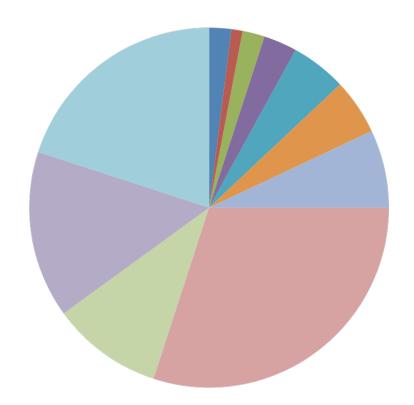
PHD	Population 2011	Lung & Bronchus	Colorectal	Bladder	All other cancers
PHD1	214,625				
PHD2	106,217				
PHD3	256,653				
PHD4	443,851				
PHD5	187,012				
PHD6	170,147				
PHD7	206,480				
		0.05% 0.10% New Incidence Rate			





Pie Charts

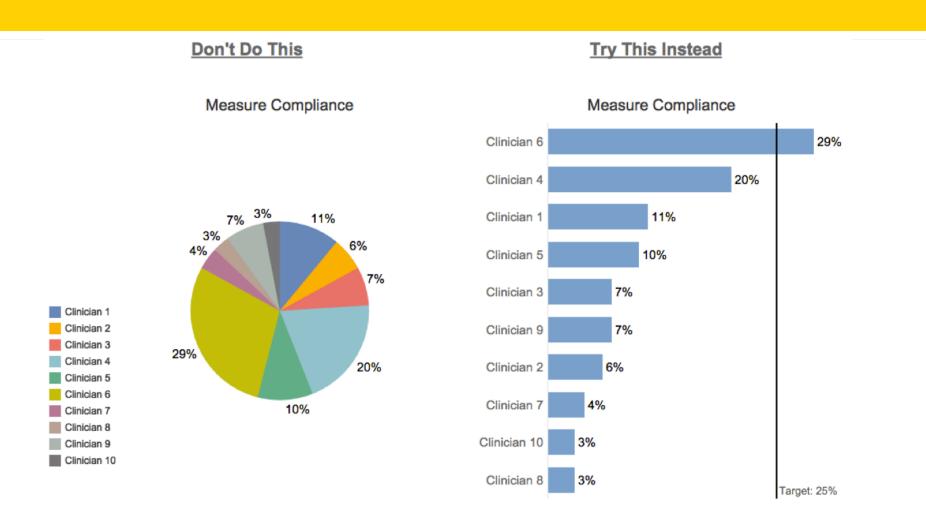
Quantify the size of the slices.







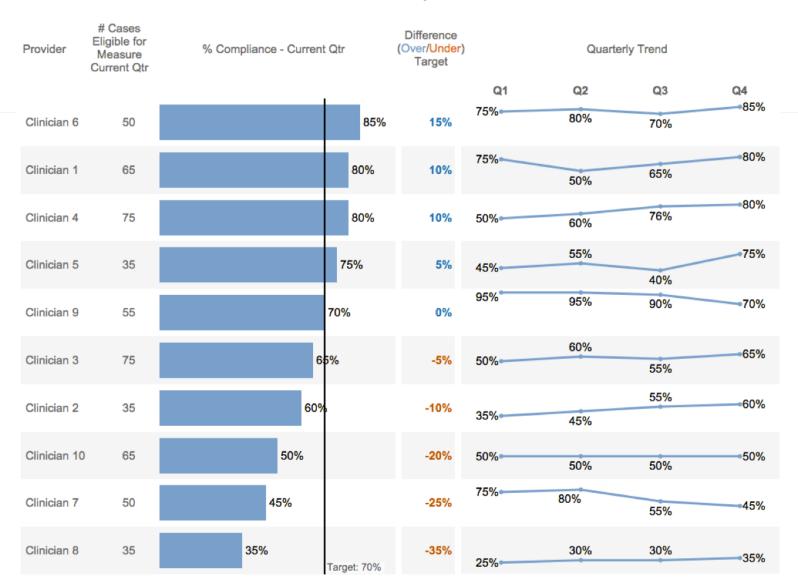
The Pie vs. The Bar







Measure Compliance







Bar charts are always superior to pie charts (and donut graphs and bubble charts).

Always.





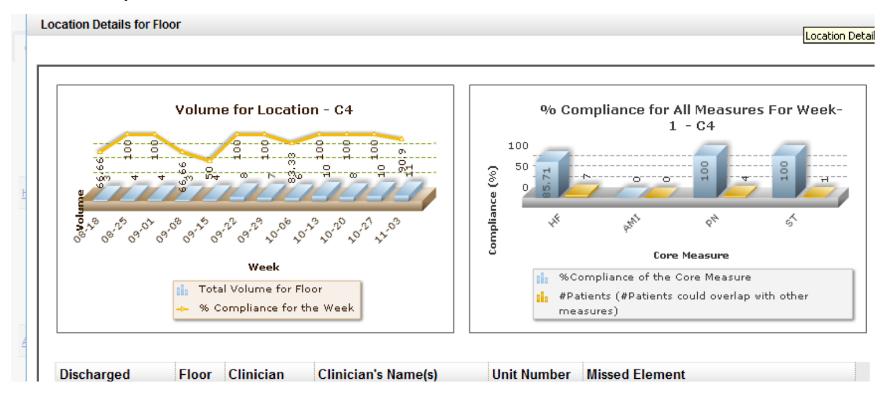






Using 3-D

3-D or Not 3-D – that is the question (and we have the answer).







3-D and Bad Data

Studies suggest that people use 3-D graphics to obfuscate bad data.







7. Dashboards defined.





Data Dashboards Defined

Visually identify and monitor at a glance

on a

single computer screen or report page

the

most important information

needed to

think and reason

and make informed decisions.





8. How to create a great dashboard.





Data Dashboards

Data dashboards are NOT comprehensive. Rather, like a car dashboard they only provide summary information and warnings.







If a warning light comes on

there is a manual to look up more information about the warning.

CHECK HOUSE

And sometimes additional In-depth analysis is required.







We can use this same construct when we consider the creation of our dashboards and supporting reports, detail lists and analytic tools.





Summary Overview Dashboard



Focused Reports



Detailed Lists

Analytic Tools





But how do we determine what viewers need to have displayed on each of these?





Books vs. E-reader

Think about how you read a book and how that was translated to the Kindle.







Mental Model

Mental Model – how do the viewers of the dashboards and reports you will create think about and use data in the context of their:

- → Scope extent of the viewer's responsibility, e.g. Organization, Department, Project
- → Role the function or part the viewer plays, e.g. Director, Manager, Support Staff
- → Decisions/Need and based on scope and role what decisions do the viewers have to make or what do they need to have?



Features of Great Dashboard Design

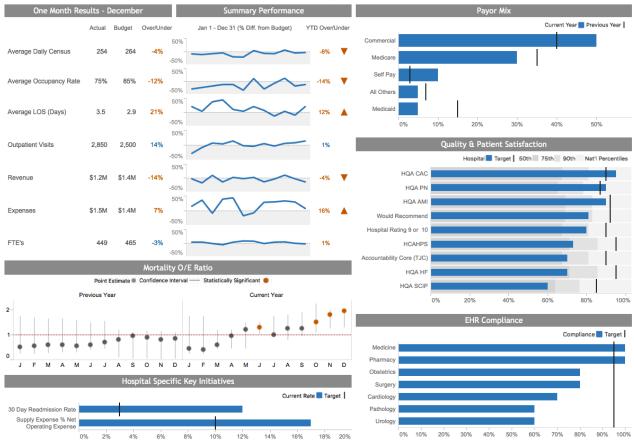
- Well organized
- Details rolled up into summaries
- Exceptions and unfavorable trends are highlighted
- Concise and clear displays
- Context, context, context





Example CEO Dashboard

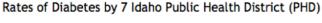


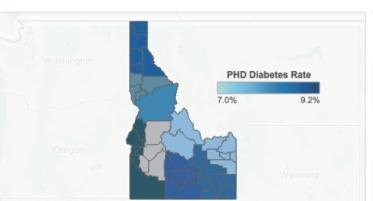






Prototype State Public Dashboard





Public Health Districts

Population	3,268,928	
Diabetes Rate	8.11%	
Unisured Rate	18.8%	
Primary Care Physician per 100,000 Residents	63	

Rates of Diabetes Ranked by County

Clark County

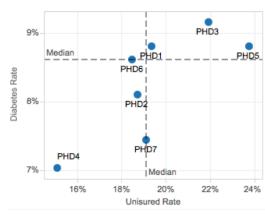
Adams County PHD3

12.8%

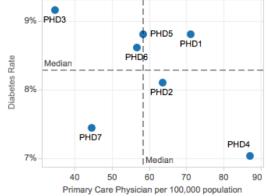
11.6%

3	Camas County	PHD5	11.5%
4	Washington	PHD3	11.4%
5	Lemhi County	PHD7	11.3%
6	Owyhee Cou	PHD3	11.2%
7	Lewis County	PHD2	11.0%
8	Boise County	PHD4	10.6%
9	Power County	PHD6	10.5%
10	Benewah Co	PHD1	10.4%
11	Custer County	PHD7	10.3%
12	Gooding Cou	PHD5	10.3%
13	Boundary Co	PHD1	10.2%
14	Shoshone Co	PHD1	10.2%
15	Gem County	PHD3	10.1%
16	Idaho County	PHD2	10.0%
17	Clearwater C	PHD2	9.9%
18	Minidoka Cou	PHD5	9.9%
19	Butte County	PHD6	9.8%
20	Lincoln County	PHD5	9.6%
21	Bonner County	PHD1	9.5%
22	Oneida County	PHD6	9.4%
23	Payette Coun	PHD3	9.2%
24	Bear Lake Co	PHD6	9.0%

Diabetes Rate and Unisured Rate by PHD



Diabetes Rate and Number of Primary Care Physicians per 100K Residents by PHD



Bingham Cou.. 28 Cassia County PHD5 29 Canvon Coun... 30 Fremont Cou.. 31 Jerome County PHD5 32 Bannock Cou.. 33 Blaine County 34 Caribou Coun.. 35 Kootenai Cou... PHD1 36 Twin Falls Co.. 37 Franklin Coun.. PHD6 38 Idaho PHD2 39 Elmore County PHD4 Bonneville Co., PHD7 Jefferson Cou., PHD7 42 Ada County 43 Teton County

Nez Perce Co.. PHD2

PHD4

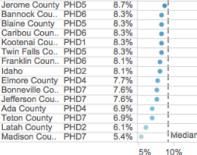
PHD6

Valley County

26

27

45



9.0%

9.0%

8.9%

8.9%

8.8%

8.7%





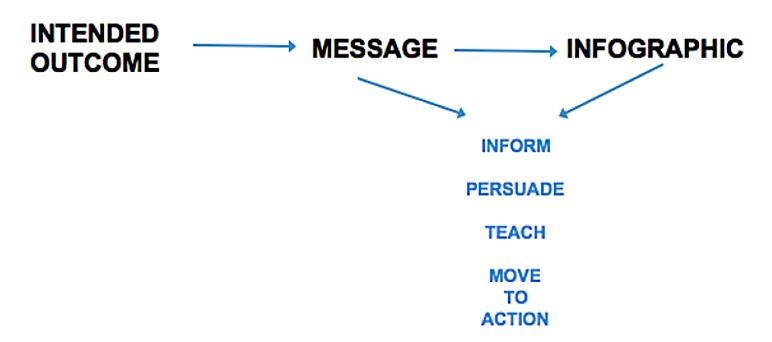


9. What's an infographic anyway?





An Infographic (information graphic) is a tool for rational understanding, an instrument to discuss relevant ideas and phenomena



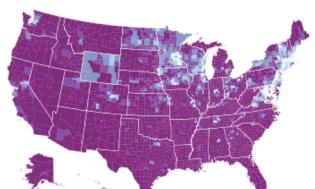




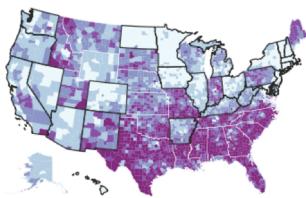
Uninsured Infographic

Percentage Uninsured, by County, 2013 to 2015

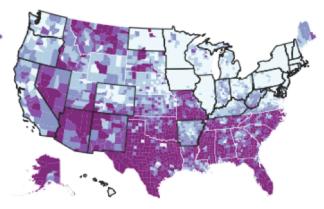




In **2013**, there were only 10 states where the percentage of residents who lacked health insurance was lower than 9 percent.



In **2014**, the Affordable Care Act was rolled out, reducing the number of Americans without health insurance. States that expanded Medicaid, outlined in black, saw the biggest changes.



In **2015**, Pennsylvania and Indiana also expanded their Medicaid programs. Now states with the highest rates of uninsured residents are in the South and Southwest.

Created by: **By QUOCTRUNG BUI and MARGOT SANGER-KATZ** OCT. 30, 2015





10. Technology alone is NOT the solution.





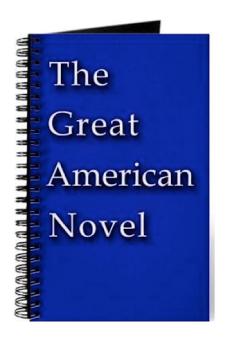
It is NOT About the Tool

Software Applications Do Not On Their Own Result in Great Results

Just because you have this:

Doesn't mean you'll write this:









Health, Healthcare &
Basic Statistics

Data Visualization & Visual Intelligence







For more information & resources please contact: MedicaidIAP@cms.hhs.gov





Additional Information

Thank you for joining today's webinar!

A summary of best practices and a resource library of links to data visualization educational topics will be posted on the <u>IAP Data Analytics website</u>.

You will receive an email with the link when these educational materials are posted.





Questions or Comments?





