

A look into the Performance of US Healthcare system

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Thinkful Capstone 1 – 9/3/2018

Questions to Ask

Performance of US
Healthcare System

- 1. How is the US Healthcare system performing by Disease category?
- 2. How is the US Healthcare system performing by State?
- 3. How satisfied are patients with the healthcare system?

About the Data

Data was pulled by
Centers for
Medicare &
Medicaid Services
(CMS)

- CMS publishes The Physician Compare website in as required by the Affordable Care Act (ACA) to help patients assess and find doctors and hospitals.
- This dataset contains the information supplied to patients via that website, including patient satisfaction surveys and performance scores across over 100 metrics.
- Data is from 2017 and includes:
 - Outcome score for 506k visits
 - Spans 183k Physicians/Groups
 - Represents all 50 States
 - Also includes 2700 Patient Satisfaction Scores

About the Data: The Source of the Data

84% of the performance data is from Claims

- QCDR - A Qualified Clinical Data Registry - an entity Fed Gov. approve that collects clinicians' clinical data for submission into Incentive Program
- REG - Clinical registries are organized systems that use observational study methods to collect uniform data to evaluate specified outcomes for a population defined by a particular disease, condition, or exposure, and that serve one or more scientific, clinical, or policy purposes.
- CLM - Claims

Reporting Mechanism	count	mean	std
QCDR	8423.0	88.133325	20.970593
CLM	424985.0	82.894641	27.859007
REG	69248.0	72.200165	33.171550
WI	3432.0	68.205128	25.138727

About the Data: How is Claims Data used to Measure Performance?

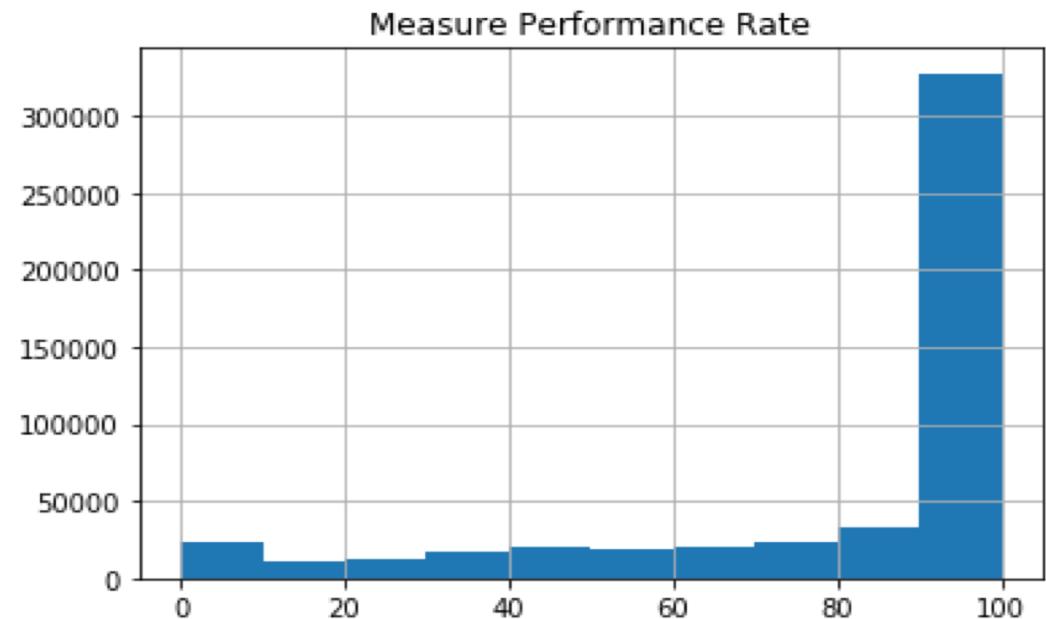
Claims are evaluated by Centers for Medicare & Medicaid Services (CMS)

- Claims are analyzed for a number of factors to create a performance score.
- The scoring evaluates if appropriate services are provided for specified groups of patients, or identifies potential over-utilization of services
- Factors are considered such as:
 - Screenings
 - Assessment/Diagnoses
 - Treatment
 - Cost
 - Follow-up test results
 - Hospital Visits / Stays

About the Data: Distribution of Performance Ratings

Performance Ratings are heavily distributed toward 100.

Mean 81, Std. Dev 29
Median 98
25% fall below 72.



About the Data: Categorizing

The data did not come
categorized.

It came with a list of 200+
Measure Titles.

I placed each title into one of
21 Categories

A	B	C
1 Measure Identifier	Measure Title	Category
2 PQRS_EP_130_1	Documentation of Current Medications in the Medical Record	Preventative Care
3 PQRS_EP_226_1	Preventive Care and Screening: Tobacco Use: Screening and Cessation Intervention	Lifestyle Risks
4 PQRS_EP_128_1	Preventive Care and Screening: Body Mass Index (BMI) Screening and Follow-Up Plan	Lifestyle Risks
5 PQRS_EP_131_1	Pain Assessment and Follow-Up	Bones
6 PQRS_EP_193_1	Perioperative Temperature Management	Surgery
7 PQRS_EP_182_1	Functional Outcome Assessment	Preventative Care
8 PQRS_EP_111_1	Pneumonia Vaccination Status for Older Adults	Flu
9 PQRS_EP_110_1	Preventive Care and Screening: Influenza Immunization	Flu
10 PQRS_EP_317_1	Preventive Care and Screening: Screening for High Blood Pressure and Follow-Up Document	Blood Pressure
11 PQRS_EP_113_1	Colorectal Cancer Screening	Cancer
12 PQRS_EP_173_1	Preventive Care and Screening: Unhealthy Alcohol Use – Screening	Lifestyle Risks
13 PQRS_EP_112_1	Breast Cancer Screening	Cancer
14 PQRS_EP_145_1	Radiology: Exposure Time Reported for Procedures Using Fluoroscopy	Radiology
15 PQRS_EP_238_1	Use of High-Risk Medications in the Elderly*	Geriatrics
16 PQRS_EP_47_1	Care Plan	Preventative Care
17 PQRS_EP_195_1	Radiology: Stenosis Measurement in Carotid Imaging Reports	Radiology
18 PQRS_EP_117_1	Diabetes: Eye Exam	Diabetes
19 PQRS_EP_39_1	Screening or Therapy for Osteoporosis for Women Aged 65 Years and Older	Bones
20 PQRS_EP_146_1	Radiology: Inappropriate Use of "Probably Benign" Assessment Category in Mammography	Radiology
21 PQRS_EP_225_1	Radiology: Reminder System for Screening Mammograms	Preventative Care
22 PQRS_EP_14_1	Age-Related Macular Degeneration (AMD): Dilated Macular Examination	Eyes
23 PQRS_EP_12_1	Primary Open-Angle Glaucoma (POAG): Optic Nerve Evaluation:	Eyes
24 PQRS_EP_140_1	Age-Related Macular Degeneration (AMD): Counseling on Antioxidant Supplement	Eyes
25 PQRS_EP_76_1	Prevention of Central Venous Catheter (CVC)-Related Bloodstream Infections	Urology
26 PQRS_EP_119_1	Diabetes: Medical Attention for Nephropathy	Diabetes
27 PQRS_EP_163_1	Diabetes: Foot Exam	Diabetes
28 PQRS_EP_141_1	Primary Open-Angle Glaucoma (POAG): Reduction of Intraocular Pressure (IOP) by 15% OF Eyes	Eyes
29 PQRS_EP_154_1	Falls: Risk Assessment	Falls
30 PQRS_EP_155_1	Falls: Plan of Care	Falls
31 PQRS_EP_48_1	Urinary Incontinence: Assessment of Presence or Absence of Urinary Incontinence in Wom	Urology
32 PQRS_EP_181_1	Elder Maltreatment Screen and Follow-Up Plan	Geriatrics
33 PQRS_EP_134_1	Preventive Care and Screening: Screening for Clinical Depression and Follow-Up Plan	Mental Health
34 PQRS_EP_147_1	Nuclear Medicine: Correlation with Existing Imaging Studies for All Patients Undergoing B	Bones
35 PQRS_EP_137_1	Melanoma: Continuity of Care – Recall System	Cancer
36 PQRS_EP_224_1	Melanoma: Overutilization of Imaging Studies in Melanoma	Cancer
37 PQRS_EP_265_1	Biopsy Follow-Up	Cancer
38 PQRS_EP_10_1	Diabetic Retinopathy: Communication with the Physician Managing Ongoing Diabetes Care Diabetes	

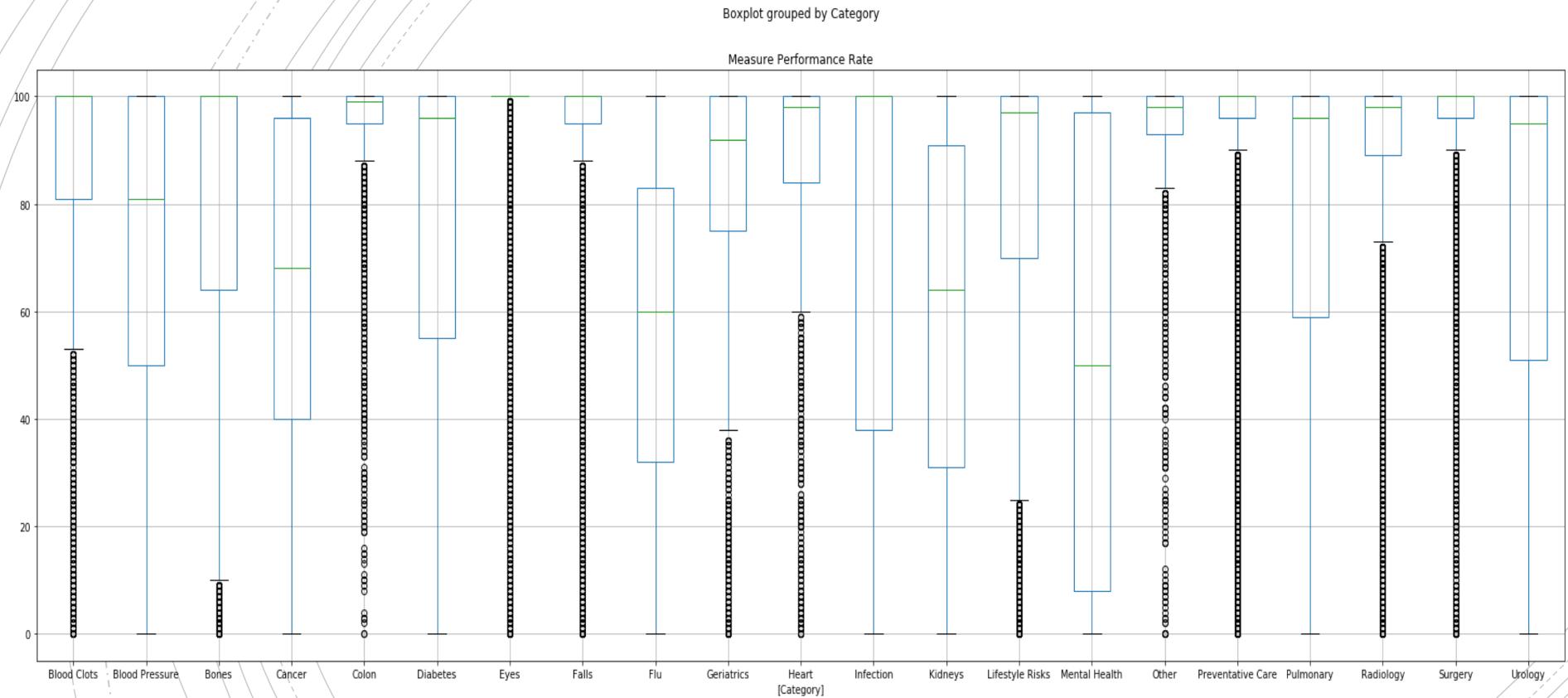
Question 1: Performance by Category

Eyes and Surgery performed the best.

Flu and Mental Health performed the worst.

Category		count	mean	std	min	25%	50%	75%
Eyes		21660.0	95.145152	15.976612	0.0	100.0	100.0	100.0
Surgery		34581.0	95.024753	11.999818	0.0	96.0	100.0	100.0
Colon		4895.0	93.943207	12.676576	0.0	95.0	99.0	100.0
Other		2249.0	92.453535	16.067797	0.0	93.0	98.0	100.0
Preventative Care		111214.0	90.605185	23.066667	0.0	96.0	100.0	100.0
Falls		6790.0	88.452135	25.888848	0.0	95.0	100.0	100.0
Radiology		29220.0	88.335113	22.169969	0.0	89.0	98.0	100.0
Heart		3014.0	86.628401	23.308561	0.0	84.0	98.0	100.0
Blood Clots		2673.0	84.026188	27.548366	0.0	81.0	100.0	100.0
Lifestyle Risks		94508.0	82.317084	26.089311	0.0	70.0	97.0	100.0
Bones		50186.0	78.994082	33.088060	0.0	64.0	100.0	100.0
Pulmonary		1125.0	77.201778	30.882327	0.0	59.0	96.0	100.0
Geriatrics		14571.0	76.059845	34.858279	0.0	75.0	92.0	100.0
Diabetes		21662.0	75.352276	33.145850	0.0	55.0	96.0	100.0
Urology		8020.0	74.905362	33.216411	0.0	51.0	95.0	100.0
Infection		1211.0	73.757225	38.806392	0.0	38.0	100.0	100.0
Blood Pressure		18597.0	72.340485	28.138784	0.0	50.0	81.0	100.0
Cancer		38874.0	64.250347	31.260876	0.0	40.0	68.0	96.0
Kidneys		525.0	59.500952	33.246169	0.0	31.0	64.0	91.0
Flu		37097.0	57.580721	29.709420	0.0	32.0	60.0	83.0
Mental Health		3416.0	51.131440	39.420480	0.0	8.0	50.0	97.0

Visualization: Performance by Category

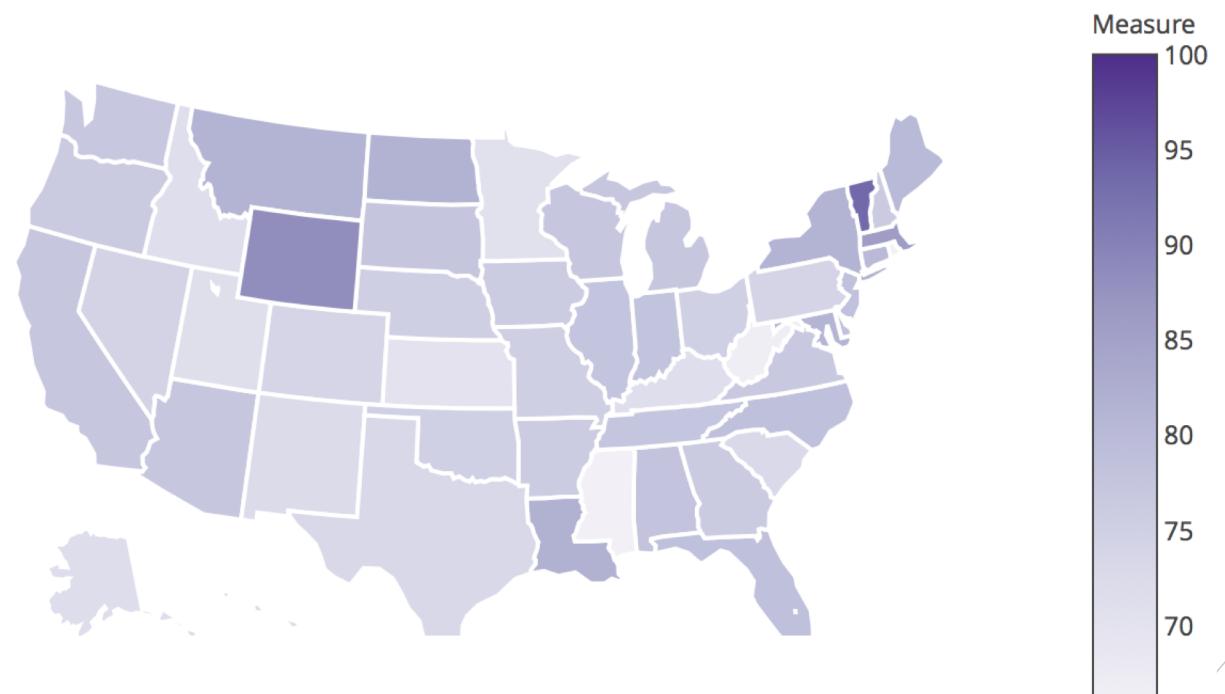


Question 2: Performance by State

Vermont and Wyoming performed the best.

West Virginia and Mississippi performed the worst.

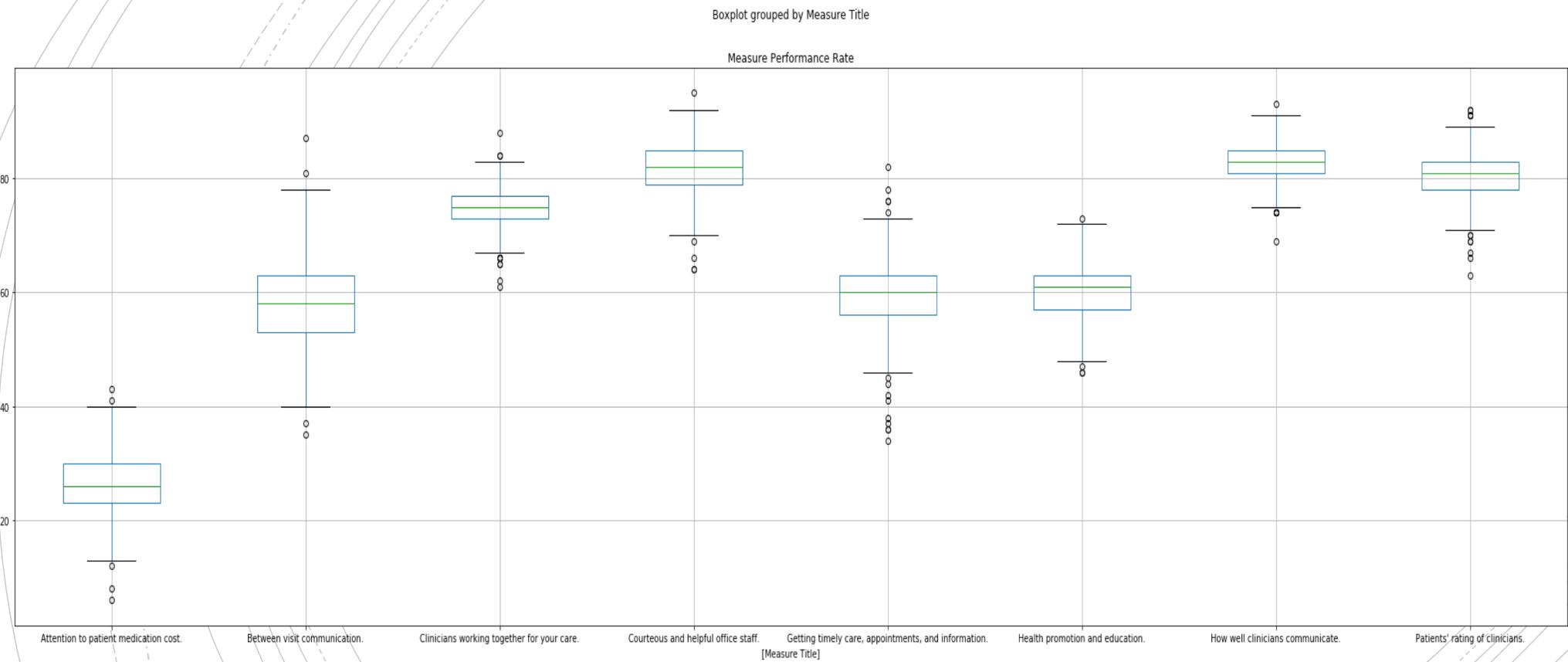
Performance does not appear to be skewed by region



Question 3: Patient Satisfaction

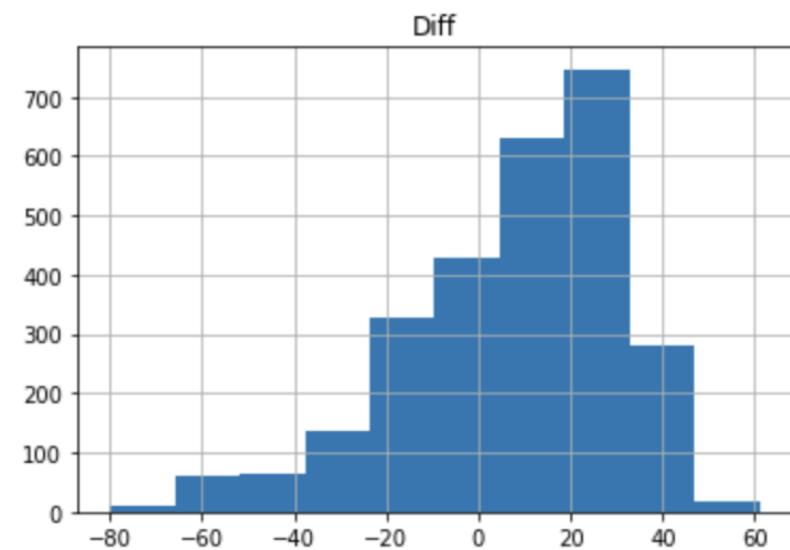
Measure Title	count	mean	std	min	25%	50%	75%	max
How well clinicians communicate.	363.0	82.815427	3.272451	69.0	81.0	83.0	85.0	93.0
Courteous and helpful office staff.	395.0	81.602532	4.403678	64.0	79.0	82.0	85.0	95.0
Patients' rating of clinicians.	379.0	80.527704	4.326753	63.0	78.0	81.0	83.0	92.0
Clinicians working together for your care.	395.0	75.205063	3.488338	61.0	73.0	75.0	77.0	88.0
Health promotion and education.	408.0	60.083333	4.703798	46.0	57.0	61.0	63.0	73.0
Getting timely care, appointments, and information.	390.0	59.346154	6.482381	34.0	56.0	60.0	63.0	82.0
Between visit communication.	395.0	58.007595	7.420471	35.0	53.0	58.0	63.0	87.0
Attention to patient medication cost.	396.0	26.378788	5.250963	6.0	23.0	26.0	30.0	43.0

Visualization of Patient Satisfaction



Patient Satisfaction is lower than Measured Performance

	Measure Performance Rate	Patient Satisfaction	Diff
count	2705.000000	2705.000000	2705.000000
mean	72.686137	64.985900	7.700236
std	23.046523	5.019115	23.538388
min	0.000000	39.000000	-80.000000
25%	59.000000	63.625000	-6.000000
50%	77.000000	65.750000	11.875000
75%	91.000000	67.375000	25.750000
max	100.000000	88.200000	61.000000



Proposing Further Research

Performance of US
Healthcare System

- 1. Determine why Mental Health, Flu, Cancer, and Kidneys have the poorest performance Ratings.
 - Dive into the ratings of each of these categories to determine if a particular sub-measures within each of these categories contribute to the low scores.
- 2. Better understand why patients are not satisfied with Doctor's attention to patients' medical costs.
 - Find data sets or create surveys