

## APPROACH: W205-5 Exercise 1

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### Introduction:

This exercise references three types of data from the Centers for Medicare and Medicaid Services (CMS) Hospital Compare project:

1. measures around timely and effective care for common, serious medical conditions
2. measures for 30-day readmissions and deaths
3. survey data from patients on hospital quality

These data represent different ways to measure high-quality care, and analyses of care using these sources can conflict with each other. All three will be used in the following analysis.

### Assumptions:

A number of assumptions have been made in aggregating and analyzing the CMS data.

1. Excluded data: Measures that represent volume, such as Emergency Services (measure ID ED\_1b), will be excluded from aggregations of measures, as they are not comparable with other scores
2. Minimum thresholds: Hospitals must have a minimum of complete score information to be considered in 'best' rankings. As a threshold, we use 2/3 of the total possible measures in each category.
3. Comparison metric: Hospitals passing the threshold for a minimum number of score values will be compared based upon standard deviations from the mean for each measure.
4. Combining measures: Higher score values for timely and effective care represent higher quality care, while low score values for mortality and readmissions are preferred. In addition, there are fewer mortality and readmission measures (14) than those for care (38). There is no guarantee that

manipulating death and readmission scores at the pre-aggregated state (by subtracting the values from 100, for example), would result in an aggregation of equal measures. As such, hospital quality will be ranked as follows:

1. Highest scoring hospitals on care measures
2. Lowest scoring hospitals on death and readmission measures
3. Highest scoring hospitals on care measures, filtering on hospitals which also have low scores on deaths and readmissions.

## Results:

### I. High Quality Hospitals:

#### A. Care Measures:

Hospital ID	HOSP_NM	BASE_SCORE	CONST_SCORE	CARE_AVG_SCORE	CARE_AVG_SD_SCORE
10087	UNIVERSITY OF SOUTH ALABAMA MEDICAL CENTER	27	20	93.56	0.78
50739	CENTINELA HOSPITAL MEDICAL CENTER	9	14	88.63	0.71
100030	HEALTH CENTRAL	15	14	93.2	0.65
50426	WEST ANAHEIM MEDICAL CENTER	3	10	93.48	0.6
260032	BARNES JEWISH HOSPITAL	37	18	89.16	0.59
390115	ARIA HEALTH	9	13	92.44	0.59
50488	EDEN MEDICAL CENTER	13	13	89.95	0.56
130013	SAINT ALPHONSUS MEDICAL CENTER – NAMPA	9	15	86.4	0.55
450024	UNIVERSITY MEDICAL CENTER OF EL PASO	23	19	90.75	0.55
460003	SALT LAKE REGIONAL MEDICAL CENTER	30	18	90.78	0.54

## B. Death and Readmission Measures

Hospital ID	HOSP_NM	BASE_S CORE	CONST_S CORE	DAR_AVG_S CORE	DAR_AVG_SD _SCORE
160029	MERCY HOSPITAL	32	19	11.74	-1.35
50625	CEDARS-SINAI MEDICAL CENTER	22	18	11.61	-1.33
150115	MEMORIAL HOSPITAL AND HEALTH CARE CENTER	54	20	12.65	-1.27
390057	GRAND VIEW HOSPITAL	21	16	12.59	-1.21
50573	EISENHOWER MEDICAL CENTER	9	18	12.01	-1.21
330182	ST FRANCIS HOSPITAL, ROSLYN	42	19	11.97	-1.19
260179	ST LUKES HOSPITAL	46	20	11.83	-1.19
130006	ST LUKE'S REGIONAL MEDICAL CENTER	38	20	12.04	-1.17
30103	MAYO CLINIC HOSPITAL	65	20	11.97	-1.15
220077	BAYSTATE MEDICAL CENTER	12	14	12.05	-1.13

### C. Care Measures Filtered on Low Death and Readmissions

PROVR_ID	HOSP_NM	BASE_SCORE	CONST_SCORE	CARE_SUM_SCORE	CARE_AVG_SCORE	CARE_AVG_SD_SCORE	MORT_SUM_SCORE	MORT_AVG_SCORE	MORT_AVG_SD_SCORE
110078	EMORY UNIVERSITY HOSPITAL MIDTOWN	20	18	3156.0	90.17	0.5	173.5	12.39	-0.79
50024	PARADISE VALLEY HOSPITAL	12	13	3097.0	88.49	0.49	147.5	13.41	-1.1
220077	BAYSTATE MEDICAL CENTER	12	14	3456.0	88.62	0.43	168.7	12.05	-1.13
50424	SCRIPPS GREEN HOSPITAL	39	20	2980.0	96.13	0.43	170.7	12.19	-1.03
50625	CEDARS-SINAI MEDICAL CENTER	22	18	3194.0	88.72	0.39	162.5	11.61	-1.33
420023	ST FRANCIS-DOWNTOWN	34	20	3221.0	87.05	0.37	175.7	12.55	-0.83
100070	VENICE REGIONAL MEDICAL CENTER – BAYFRONT HEALTH	0	8	3150.0	90.0	0.37	172.5	12.32	-0.94
50145	COMMUNITY HOSPITAL OF THE MONTEREY PENINSULA	26	19	3168.0	90.51	0.37	171.6	12.26	-0.96
50503	SCRIPPS MEMORIAL HOSPITAL – ENCINITAS	12	16	3336.0	85.54	0.35	159.4	13.28	-0.71
220002	MOUNT AUBURN HOSPITAL	44	20	3256.0	88.0	0.35	171.6	12.26	-0.89

## II. High quality states

HOSP_ST_CD	STATE_BASE_SCORE	STATE_CONST_SCORE	STATE_AVG_SCORE	STATE_AVG_SD_SCORE
ID	9.0	15.0	86.4	0.55
UT	30.0	18.0	90.78	0.54
AL	32.44	19.89	87.55	0.45
IN	22.0	17.5	87.13	0.43
PA	15.0	13.0	89.81	0.42
MO	34.75	18.75	87.99	0.42
IL	25.83	17.83	88.17	0.42
CA	19.32	15.43	90.49	0.41
SC	30.2	19.8	87.58	0.41
GA	25.8	17.9	88.77	0.41

### III. Procedure score variability (excluding volume measures)

#### A. 10 Highest

MEDL_MEAS_ID	MEDL_MEAS_DESC	STD_DEV
OP_3b	Median Time to Transfer to Another Facility for Acute Coronary Intervention- Reporting Rate	29.48
STK_4	Thrombolytic Therapy	21.95
OP_23	Head CT Scan Results for Acute Ischemic Stroke or Hemorrhagic Stroke Patients who Received Head CT or MRI Scan Interpretation Within 45 Minutes of ED Arrival	21.84
AMI_7a	Fibrinolytic Therapy Received within 30 Minutes of Hospital Arrival	18.78
OP_2	Fibrinolytic Therapy Received Within 30 Minutes of ED Arrival	18.05
OP_21	Median Time to Pain Management for Long Bone Fracture	17.72
OP_20	Median Time from ED Arrival to Provider Contact for ED patients	16.88
VTE_5	Venous Thromboembolism Warfarin Therapy Discharge Instructions	16.3
VTE_1	Venous Thromboembolism Prophylaxis	15.26
STK_8	Stroke Education	14.01

## B. Ten Lowest

MEDL_MEAS_ID	MEDL_MEAS_DESC	STD_DEV
READM_30_COPD	Chronic Obstructive Pulmonary Disease (COPD) 30-Day Readmission Rate	1.27
MORT_30_AMI	Acute Myocardial Infarction (AMI) 30-Day Mortality Rate	1.25
READM_30_PN	Pneumonia 30-Day Readmission Rate	1.12
READM_30_STK	Stroke (STK) 30-Day Readmission Rate	1.12
READM_30_AMI	Acute Myocardial Infarction (AMI) 30-Day Readmission Rate	1.08
MORT_30_COPD	Chronic Obstructive Pulmonary Disease (COPD) 30-Day Mortality Rate	1.03
READM_30_HOSP_WIDE	30-Day Hospital-Wide All-Cause Unplanned Readmission Rate	0.85
MORT_30_CABG	30-Day All-Cause Mortality Following Coronary Artery Bypass Graft (CABG) Surgery	0.81
READM_30_HIP_KNEE	30-Day Readmission Rate Following Elective Primary Total Hip Arthroplasty (THA) and/or Total Knee Arthroplasty (TKA)	0.63
CAC_1	Relievers for Inpatient Asthma	0.14

#### IV. Procedural quality vs Survey quality

Revisit the quality scores above to find survey measures (base scores) for highest ranked hospitals using care or readmissions and deaths. Surprisingly, some of the highest rated hospitals, on care measures, have very low patient survey scores.

Here are the top ranked hospitals, based on patient surveys:

PROVR_ID	HOSP_NM	BASE_SCORE	CONST_SCORE
360352	SURGICAL HOSPITAL AT SOUTHWOODS	80.0	20
10045	FAYETTE MEDICAL CENTER	80.0	20
390316	SURGICAL INSTITUTE OF READING	80.0	20
190241	PHYSICIANS MEDICAL CENTER	80.0	20
390323	ADVANCED SURGICAL HOSPITAL	80.0	20
390324	PHYSICIAN'S CARE SURGICAL HOSPITAL	80.0	20
110200	NORTHSIDE MEDICAL CENTER	80.0	20
190259	LAFAYETTE SURGICAL SPECIALTY HOSPITAL	80.0	20
430091	BLACK HILLS SURGICAL HOSPITAL LLP	80.0	20
40152	PHYSICIANS' SPECIALTY HOSPITAL	80.0	20



There are very few hospitals that scored well on all measures - in fact, of the top 200 ranked hospitals in each category, none are included in all three lists for care, deaths and readmissions, and patient surveys. Here are the only hospitals that made both care and survey lists:

Hospital ID	HOSP_NM	BASE_SCORE	CONST_SCORE	CARE_AVG_SCORE	CARE_AVG_SD_SCORE
180044	PIKEVILLE MEDICAL CENTER	70	20	87.74	0.38
40134	ARKANSAS HEART HOSPITAL, LLC	68	20	92.43	0.38
340115	FIRSTHEALTH MOORE REGIONAL HOSPITAL	68	20	87.1	0.38
190004	THIBODAUX REGIONAL MEDICAL CENTER	59	20	87.0	0.37
250009	MAGNOLIA REGIONAL HEALTH CENTER	66	20	90.06	0.36

## Summary

This disparity in measures and scores makes recommending and choosing a good hospital very difficult. In my own county, I found the following hospitals scores:

050007 MILLS-PENINSULA MEDICAL CENTER 32  
050113 SAN MATEO MEDICAL CENTER 2  
050197 SEQUOIA HOSPITAL 4  
050541 KAISER FOUNDATION HOSPITAL – REDWOOD CITY 24

Mills-Peninsula has Yelp score of 2. Of these hospitals, only Kaiser has a high care score, while Mills and Sequoia are on the low mortality and readmissions list.

**Recommendations:**

1. Standardize measurements. There is no way to confidently combine care measures with mortality and readmissions.
2. Combine patient experience of care with expert analysis of care. Use auditors to record all measures, consistently and expertly.
3. Combine scores into a single measure and rank hospitals clearly. Allow hospitals to see clearly how they can improve scores the following year.