Medicare Data Presentation

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Is the outcome of a medical procedure related to its cost or location for Medicare patients?

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Quality and cost of medical procedures appear to vary widely between hospitals and locations.

Medicare data can be analyzed to help patients make informed decisions about the hospitals they choose.

We can identify what relationships exist (if any) between outcomes, cost, and locations. This information can be used improve quality of care or to help Medicare administrators manage their allocations.

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With so much data reported to Medicare, it can be challenging to identify where to start and what to analyze.

Four health care measures in particular have a large amount of data for comparison (over 12,000 data points across more than 4,000 hospitals). These are:
- **Heart attacks**
- **Heart failure**
- **Pneumonia**
- **Hip or knee replacements**
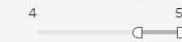
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Specifically what data are we analyzing?

- **Average cost of procedure per hospital**
- **Percentage of mortality or readmission per procedure**
- **Location of hospital**
- **Overall hospital rating**

Patient Interface to Choose a Hospital – Heart Attack Data Example

Heart Attack Occurences Search

Hospital Name	HA Score (%)	HA Avg. Cost
CEDARS-SINAI MEDICAL CENTER	8.8	$30,724
CENTINELA HOSPITAL MEDICAL CENTER	9.8	$26,286
PROVIDENCE SAINT JOHN'S HEALTH CENTER	10.5	$25,233
EL CAMINO HOSPITAL	10.6	$26,897
SAINT VINCENT MEDICAL CENTER	10.6	$24,037
JOHN MUIR MEDICAL CENTER - WALNUT CREEK CAMPUS	10.7	$24,412
SANTA BARBARA COTTAGE HOSPITAL	11.1	$26,940
SAN GABRIEL VALLEY MEDICAL CENTER	11.2	$27,029
EISENHOWER MEDICAL CENTER	11.3	$23,718
SOUTHERN CALIFORNIA HOSPITAL AT HOLLYWOOD	11.3	$26,583
UC SAN DIEGO HEALTH HILLCREST - HILLCREST MED CTR	11.3	$25,740
PROVIDENCE TARZANA MEDICAL CENTER	11.4	$27,050
ALHAMBRA HOSPITAL MEDICAL CENTER	11.6	$26,453
SCRIPPS MEMORIAL HOSPITAL - ENCINITAS	11.6	$24,098
HOAG MEMORIAL HOSPITAL PRESBYTERIAN	11.7	$25,595
MILLS-PENINSULA MEDICAL CENTER	11.7	$24,956
STANFORD HEALTH CARE	11.7	$23,819
HUNTINGTON MEMORIAL HOSPITAL	11.8	$23,709
ALTA BATES SUMMIT MEDICAL CENTER	11.9	$24,007
CHINESE HOSPITAL	12.0	$24,544
PIH HEALTH HOSPITAL-WHITTIER	12.0	$22,562
PROVIDENCE LITTLE COMPANY OF MARY MED CTR TORRANCE	12.0	$26,492
ST JUDE MEDICAL CENTER	12.0	$26,158
SUTTER ROSEVILLE MEDICAL CENTER	12.0	$23,712
JOHN MUIR MEDICAL CENTER - CONCORD CAMPUS	12.1	$27,367
GARDEN GROVE HOSPITAL & MEDICAL CENTER	12.2	$26,064
ALVARADO HOSPITAL MEDICAL CENTER	12.3	$26,101
REDLANDS COMMUNITY HOSPITAL	12.3	$24,467
SHARP CHULA VISTA MEDICAL CENTER	12.4	$26,291
COMMUNITY HOSPITAL OF THE MONTEREY PENINSULA	12.5	$25,894
GARFIELD MEDICAL CENTER	12.5	$27,816
TEMECULA VALLEY HOSPITAL	12.5	$24,499
MEMORIALCARE SADDLEBACK MEDICAL CENTER	12.6	$25,262
SANTA MONICA - UCLA MED CTR & ORTHOPAEDIC HOSPITAL	12.6	$23,940
SHARP MEMORIAL HOSPITAL	12.6	$24,392
PETALUMA VALLEY HOSPITAL	12.7	$22,816

Hospital Rating
4 — 5

HA State
- (All)
- Null
- AK
- AL
- AR
- AZ
- ☑ CA
- CO
- CT
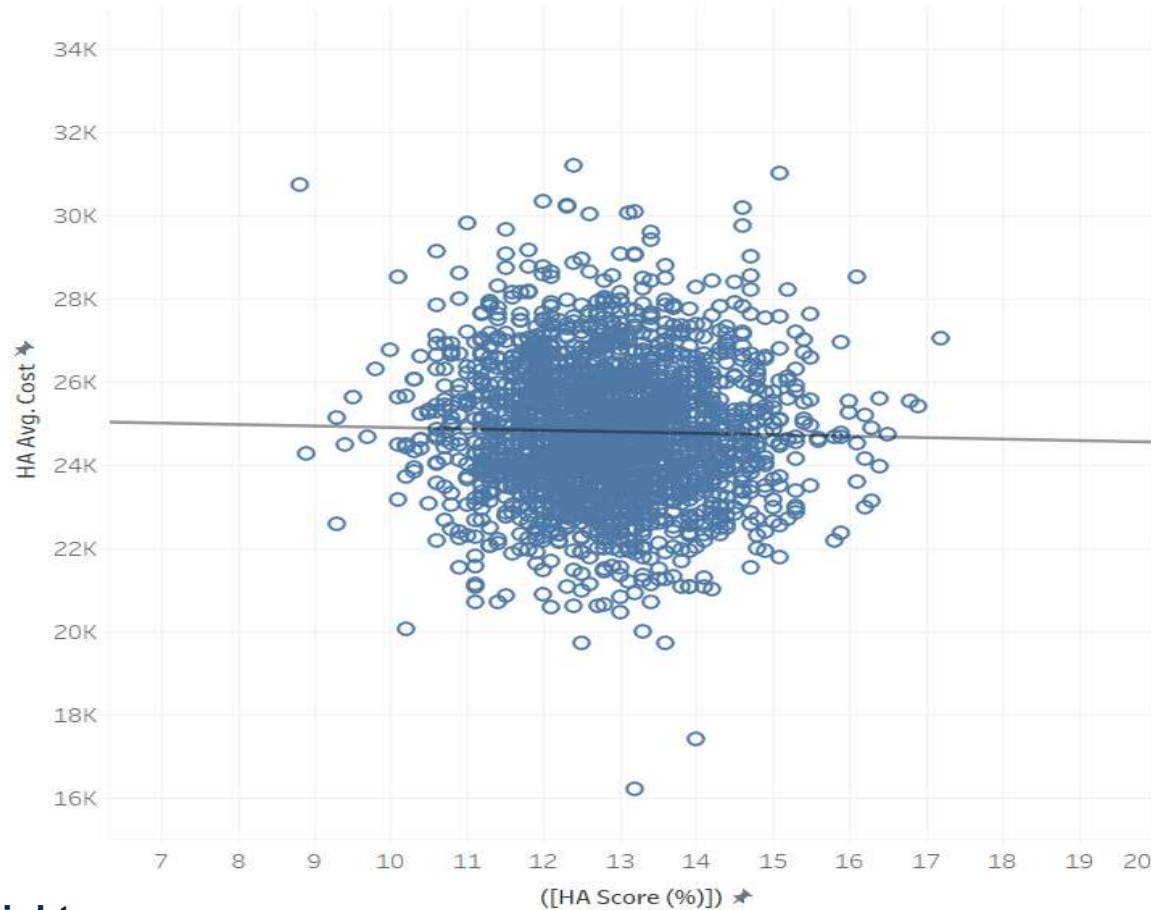- DC
- DE
- FL
- GA
- GU
- HI

County Name
- ☑ (All)
- ☑ Null
- ☑ ACCOMACK
- ☑ ADA
- ☑ ADAIR
- ☑ ADAMS
- ☑ AIKEN
- ☑ ALACHUA
- ☑ ALAMANCE
- ☑ ALAMEDA
- ☑ ALBANY
- ☑ ALBEMARLE
- ☑ ALCORN
- ☑ ALEXANDRI...
- ☑ ALLEGANY

Insights

- **A patient seeking treatment for a heart attack can lookup any Medicare hospital and find/sort information on average outcomes (mortality %) and cost, and filter by location and hospital rating.**
- **In this example, a user has searched and sorted all above average hospitals in California (4 or 5 overall rating) to find the ones with best outcomes (lowest mortality %'s in second column). The user can additionally filter by what is most local geographically by county, city, or zip code.**

Heart Attack Data – No Strong Correlation between Cost, Outcome, and Geography
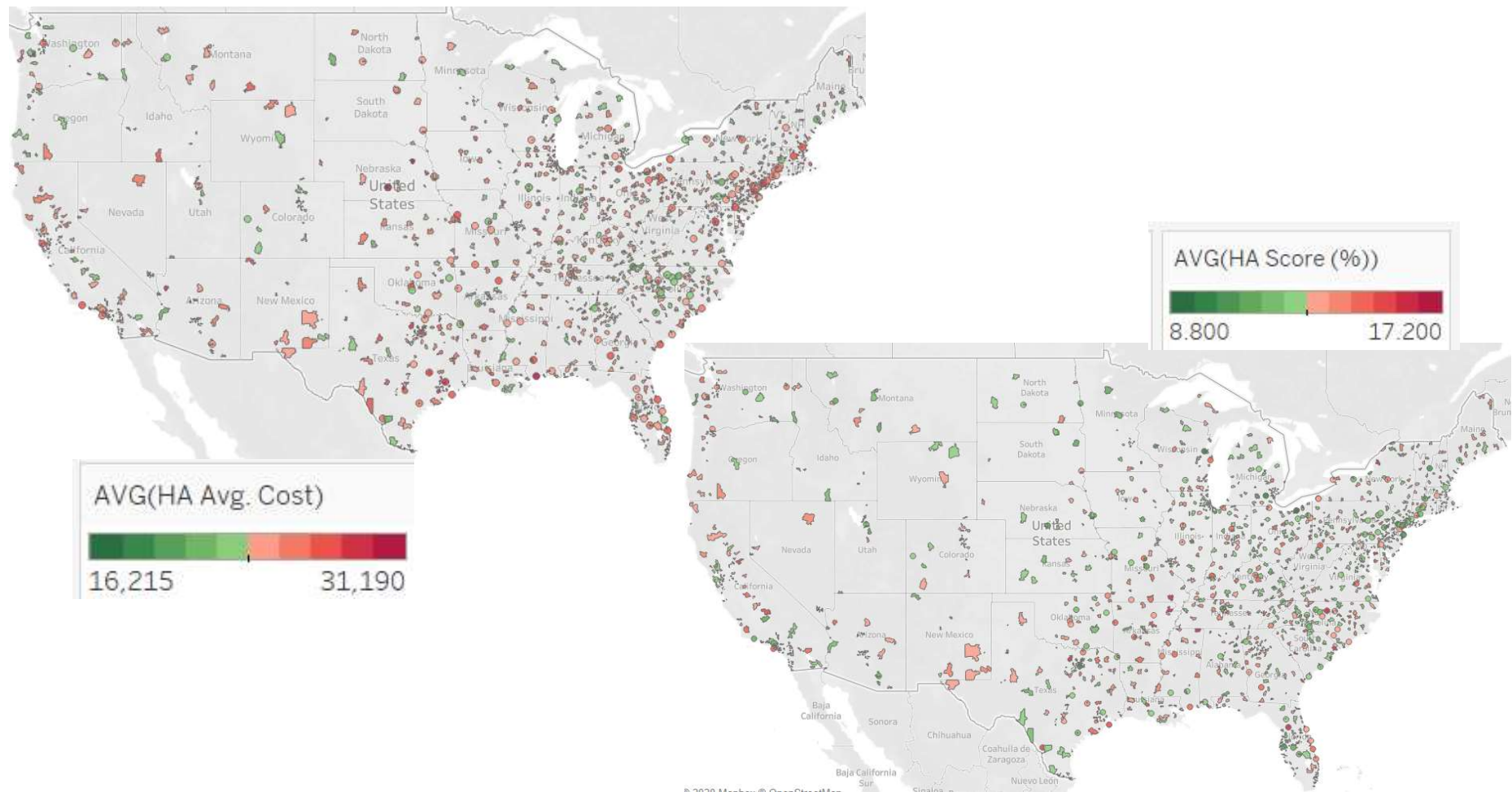

Heart Attack Occurences - Cost vs. Mortality %

Key Insights

- This scatter plot shows a slightly negative, although very weak correlation between heart attack mortality and cost. On average, for every 1% increase in the odds of mortality, there is a $34 decrease in the cost of procedure.
- R^2 is <0.01

Heart Attack Data – No Strong Correlation between Cost, Outcome, and Geography

AVG(HA Score (%))

8.800   17.200

AVG(HA Avg. Cost)
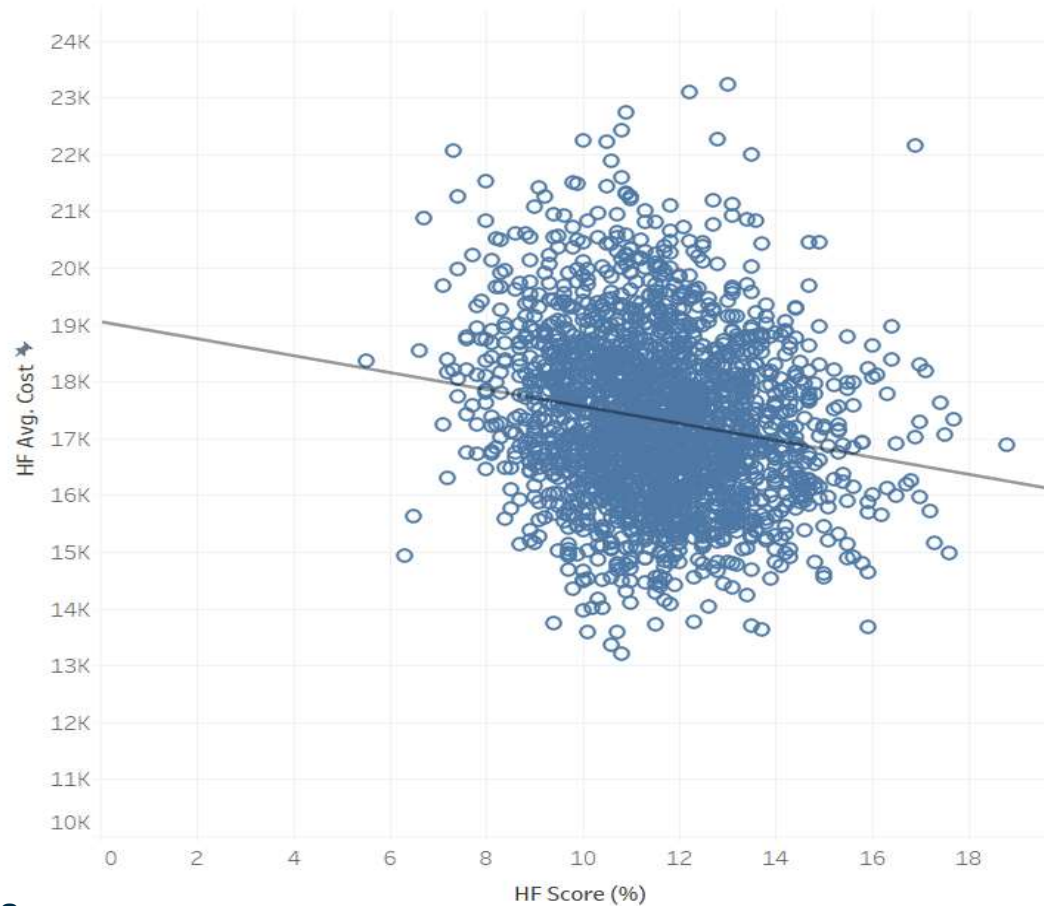
16,215   31,190

Key Insights

- **Northeast – cluster of low mortality, high cost**

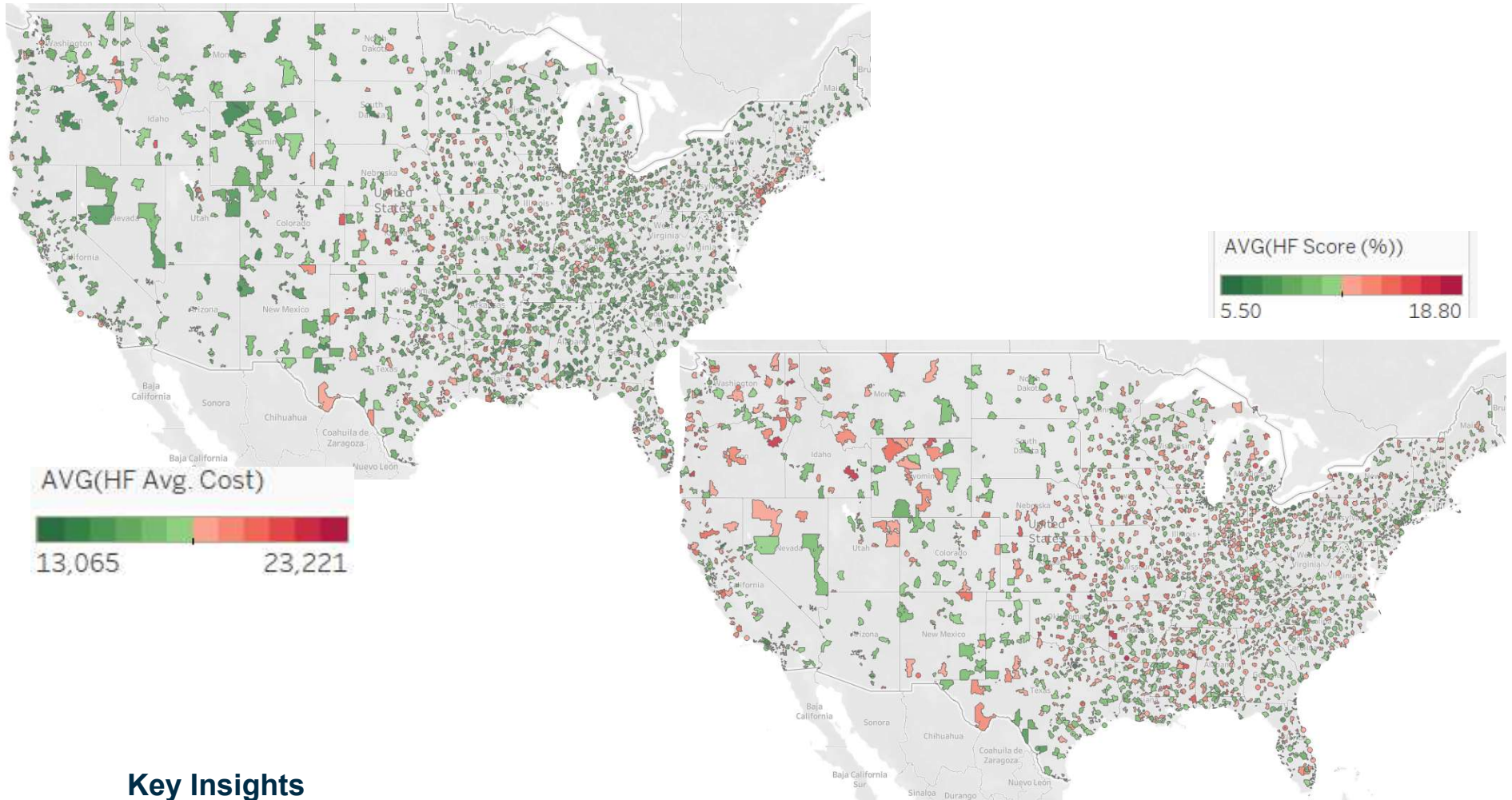# Heart Failure Data – Weak Correlation between Cost, Outcome, and Geography

Heart Failure Occurences - Cost vs. Mortality %

Key Insights

- This scatter plot shows a negative, moderately weak correlation between heart failure mortality and cost. On average, for every 1% increase in the odds of mortality, there is a $149 decrease in the cost of procedure.
- R^2 = 0.03

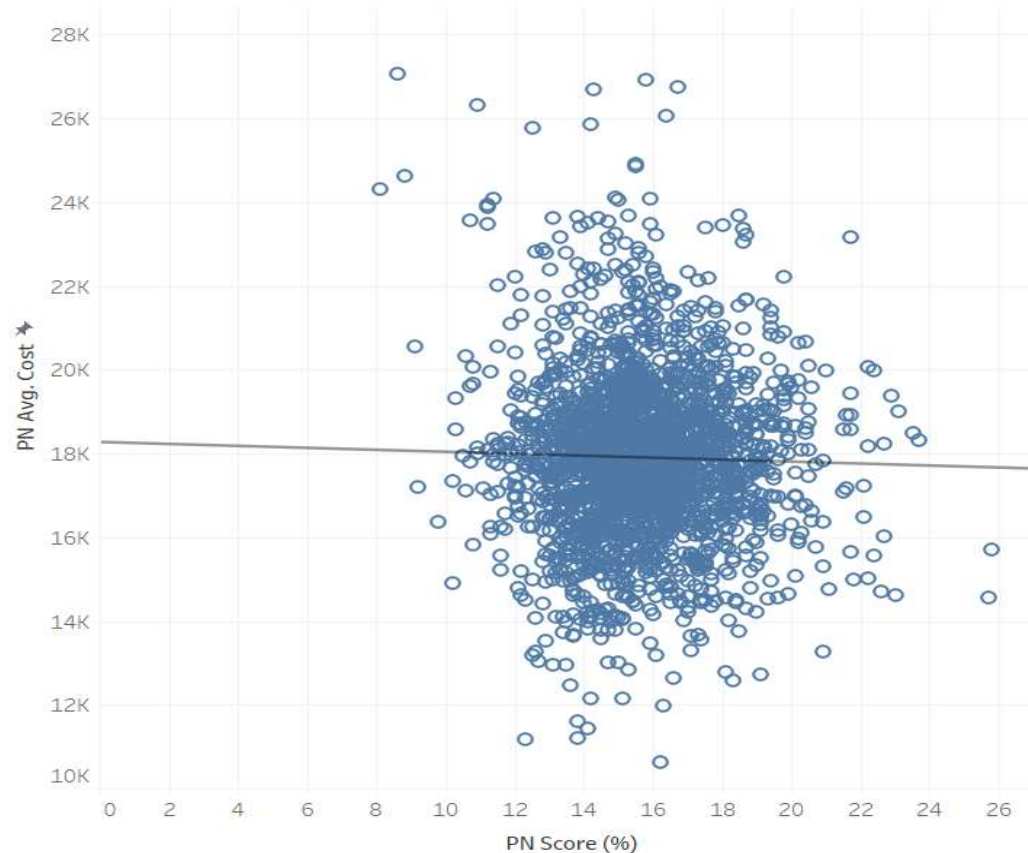# Heart Failure Data – Weak Correlation between Cost, Outcome, and Geography

AVG(HF Score (%))

5.50   18.80

AVG(HF Avg. Cost)

13,065   23,221

Key Insights

- **Higher costs, lower mortality present in northeast metros**
- **Lower than average costs prevalent throughout the western U.S.**

Pneumonia Data – Weak Correlation between Cost, Outcome, and Geography
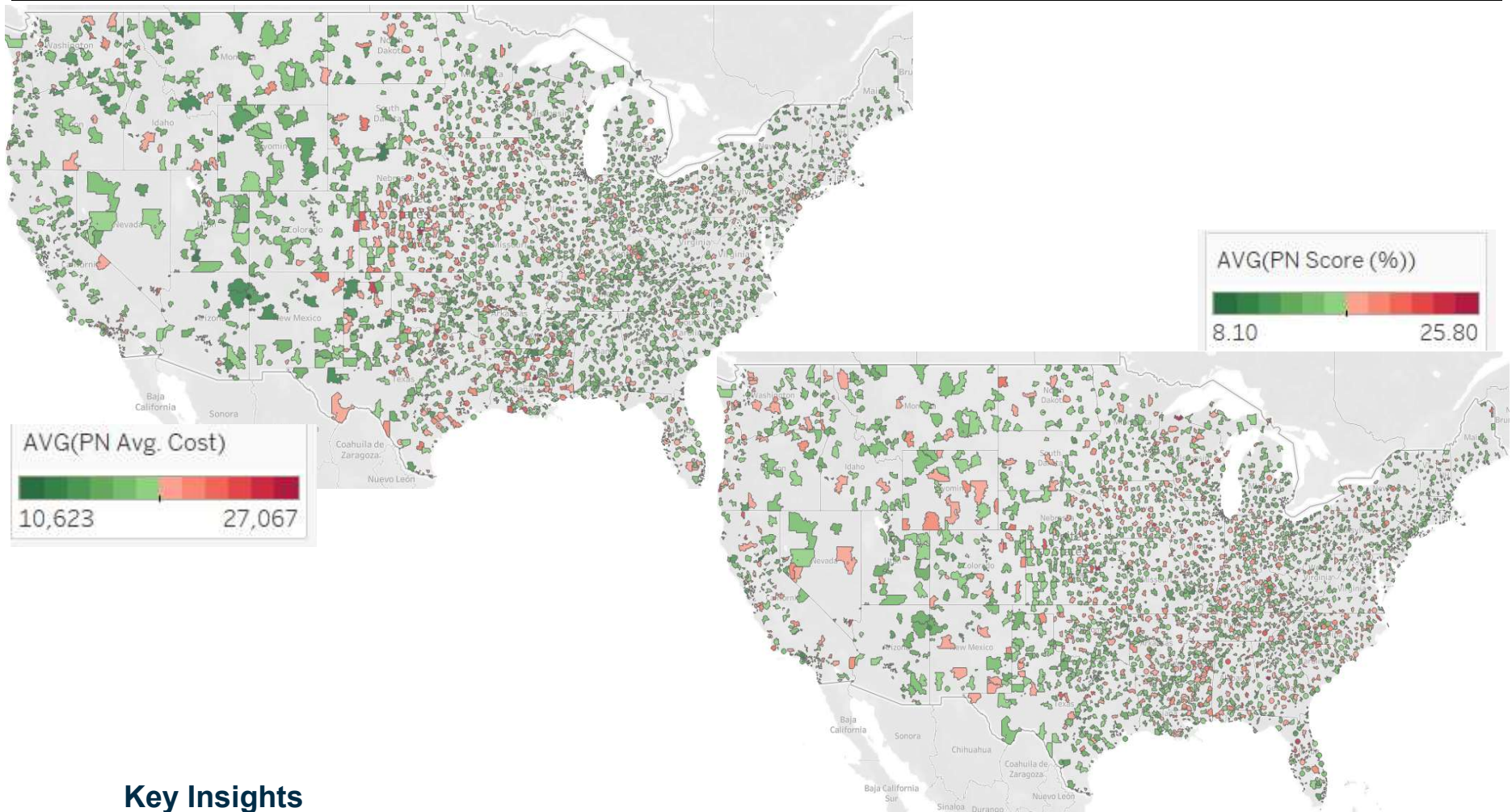

Pneumonia Occurences - Cost vs. Mortality %

Key Insights

- This scatter plot shows a slightly negative, although very weak correlation between pneumonia mortality and cost. On average, for every 1% increase in the odds of mortality, there is a $23 decrease in the cost of procedure.
- $R^2 < 0.01$

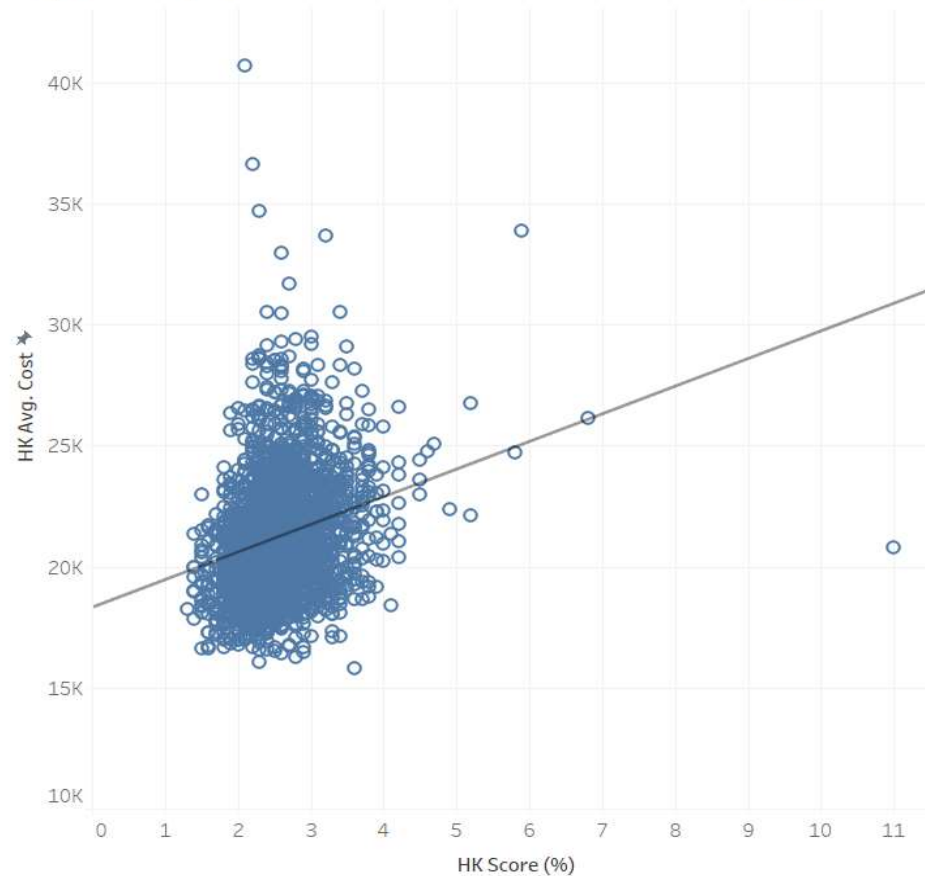# Pneumonia Data – Weak Correlation between Cost, Outcome, and Geography

AVG(PN Score (%))

8.10 — 25.80

AVG(PN Avg. Cost)

10,623 — 27,067

Key Insights

- **Lower than average costs appear prevalent throughout the western U.S. Otherwise, no discernable pattern emerges.**

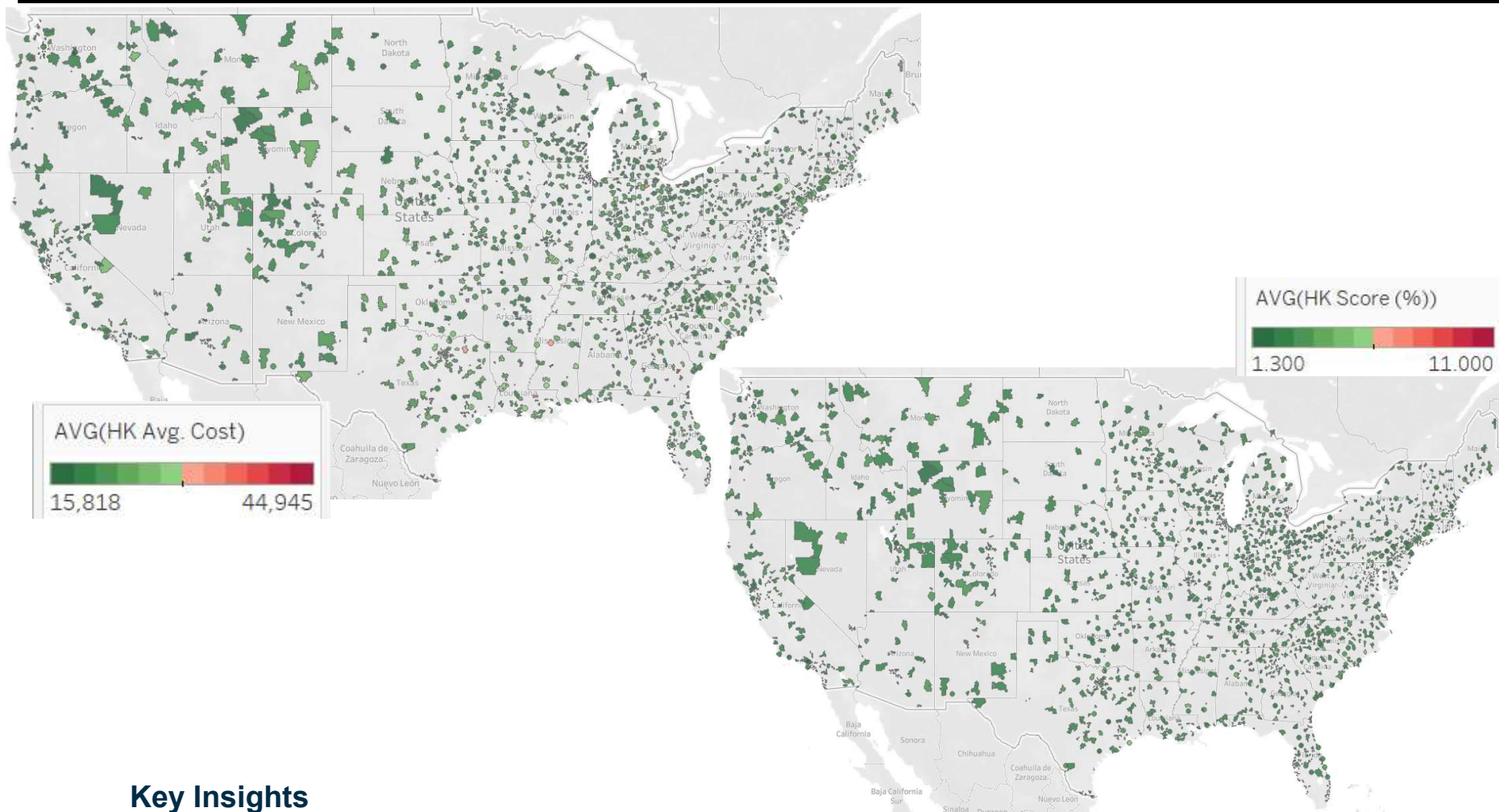# Hip/Knee Replacement Data – Weak Correlation between Cost, Outcome, and Geography

Hip/Knee Replacements Occurences - Cost vs. Readmission %

Key Insights

- **This scatter plot shows a positive, somewhat weak correlation between readmission for hip/knee replacement and cost. On average, for every 1% increase in the odds of readmission, there is a $1,141 increase in the cost of procedure.**
- **$R^2 = 0.06$**

Hip/Knee Replacement Data – Weak Correlation between Cost, Outcome, and Geography

Key Insights

- **A handful of outliers (both on the high end of the cost and % maps above) have visually skewed the color gradients. Otherwise, no discernable pattern emerges.**