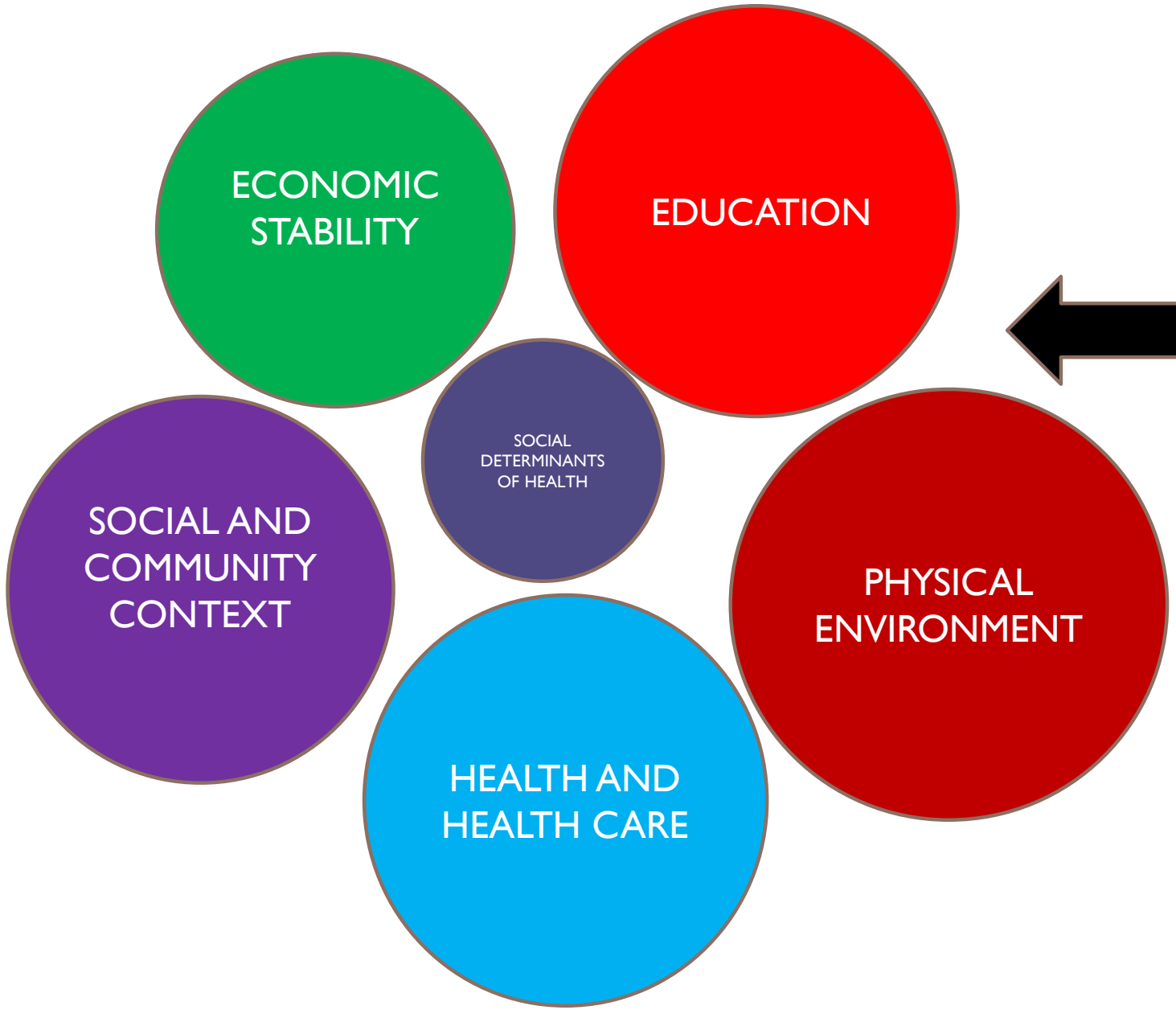
THE IMPACT OF SOCIAL DETERMINANTS OF HEALTH ON HOSPITAL READMISSION RATES FOR SELECT TN HOSPITALS

Matt Bach – Data Analytics Cohort 1

AGENDA

1) To explore the relationship between the Social Determinants of Health and Hospital Readmission Rates for 10 TN Hospitals. This will entail an exploratory analysis of several datasets to find correlations between the determinants and the 6 conditions measured by the Hospital Readmission Reduction Program.

2) To make recommendations as to how to understand these correlations and suggest an actionable plan to address the root causes of the problems inherent in the Social Determinants of Health which lead to increased readmission rates.



THE 6 HRRP-DEFINED CONDITIONS

- COPD
- CABG
- PNEUMONIA
- HIP/KNEE REPLACEMENT
- HEART ATTACK
- HEART FAILURE

SELECTED TN HOSPITALS BY PEER GROUP/ TOP 3 ZIP CODES SERVED

PEER GROUP 1

St. Thomas West Hospital -- Nashville, TN
- 37205
- 37209
- 37221

Memorial Health System -- Chattanooga, TN
- 37343
- 37379
- 37421

PEER GROUP 2

Vanderbilt University Hospital -- Nashville, TN
- 37207
- 37013
- 37211

Baptist Memorial Hospital Memphis – Memphis, TN
- 38017
- 38111
- 38016

PEER GROUP 3

Greeneville Community Hospital East – Greeneville, TN
- 37743
- 37745
- 37641

Methodist Medical Center of Oak Ridge – Oak Ridge, TN
- 37830
- 37716
- 37840

PEER GROUP 4

St. Francis Hospital -- Memphis, TN
- 38111
- 38118
- 38115

Vanderbilt Wilson County Hospital -- Lebanon, TN
- 37087
- 37090
- 37184

PEER GROUP 5

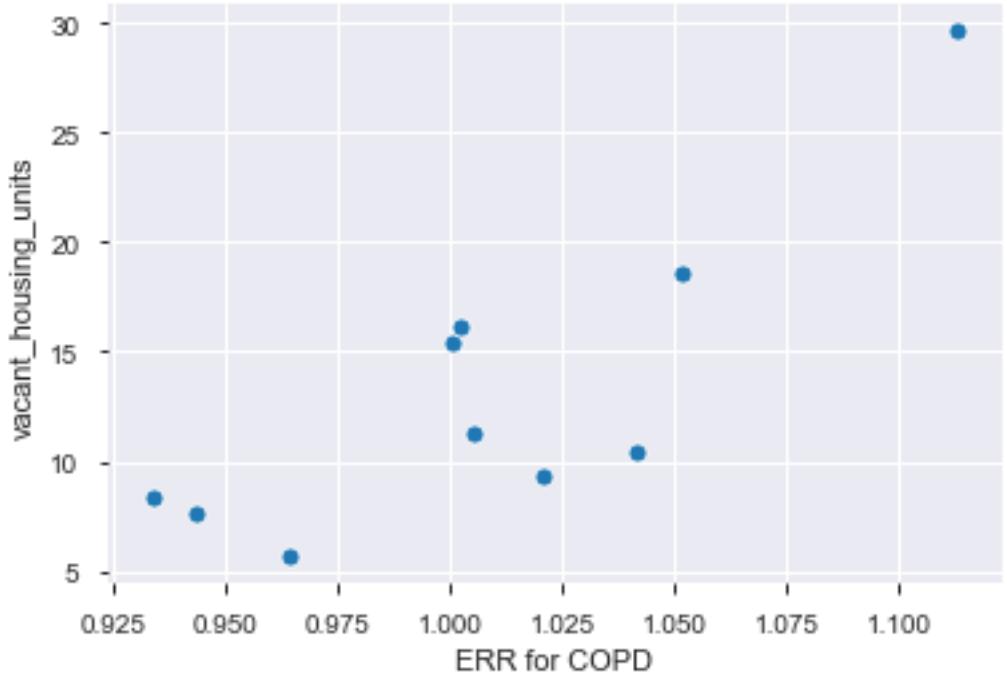
Livingston Regional Hospital -- Livingston, TN
- 38372
- 38310
- 38326

Hardin Medical Center – Savannah, TN
- 38570
- 38549
- 38506

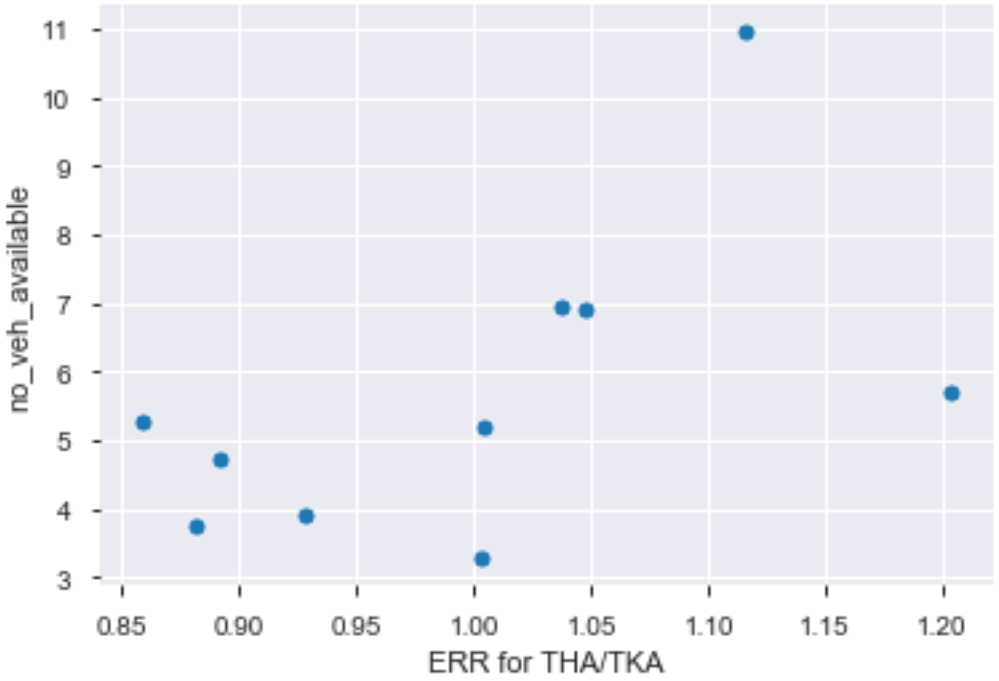
POWER BI PORTION OF PRESENTATION

A THUMBNAIL ANALYSIS OF THE RELATIONSHIP BETWEEN SELECT SDoH AND THE ERR CONDITIONS FOR ALL 10 SELECTED HOSPITALS USING THE PEARSON CORRELATION

VACANT HOUSING UNITS & ERR FOR COPD
r = .83



NO VEHICLE AVAILABLE & ERR FOR HEART FAILURE
r = .61



POVERTY RATE & ERR FOR PNEUMONIA
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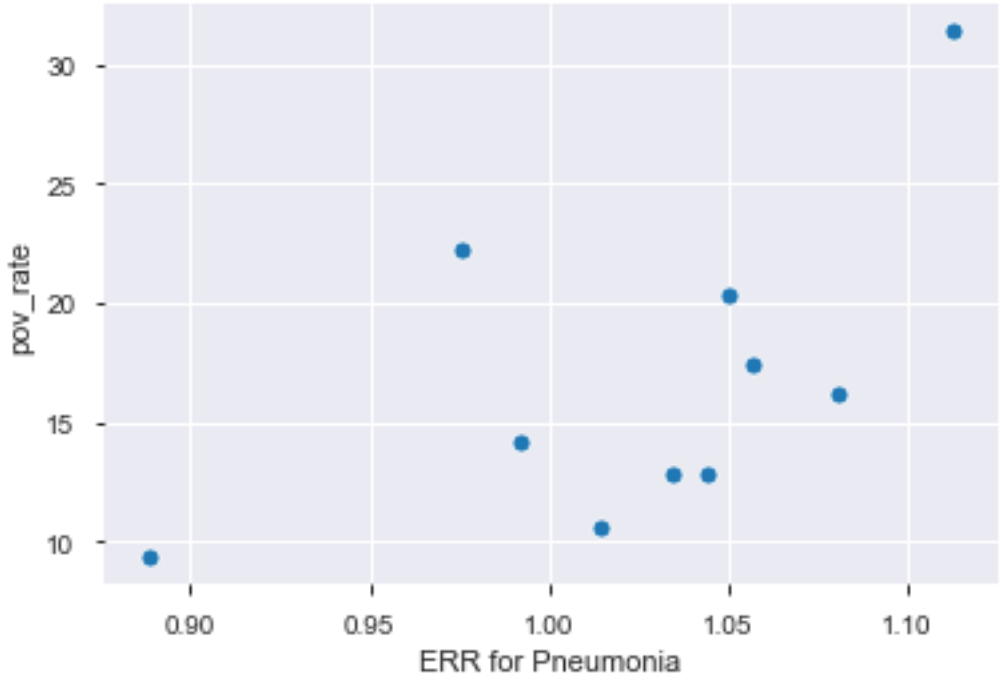
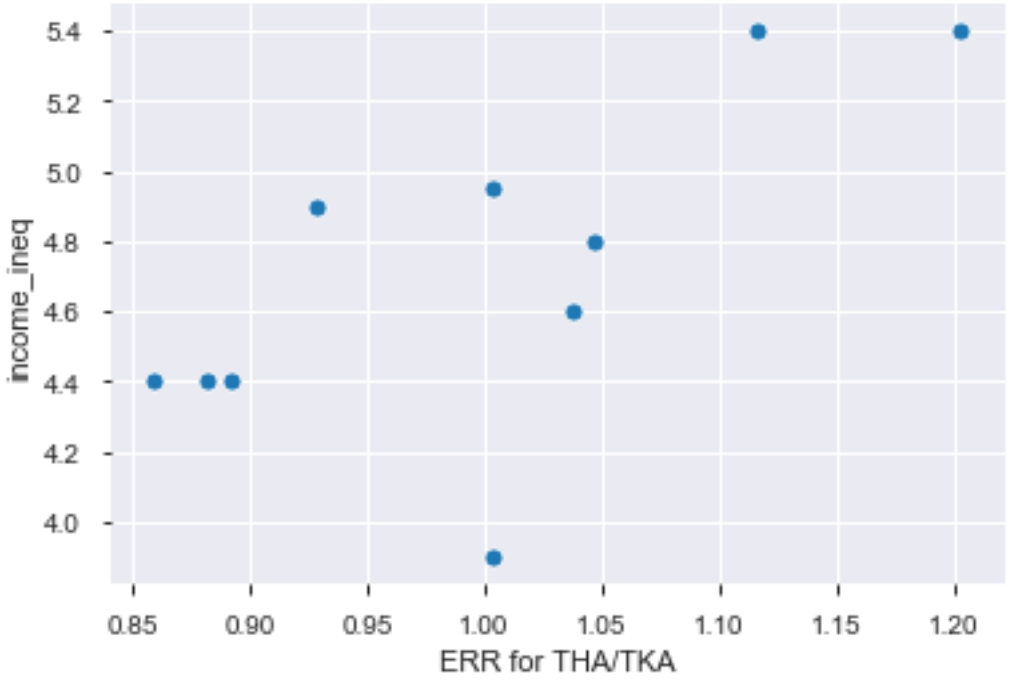
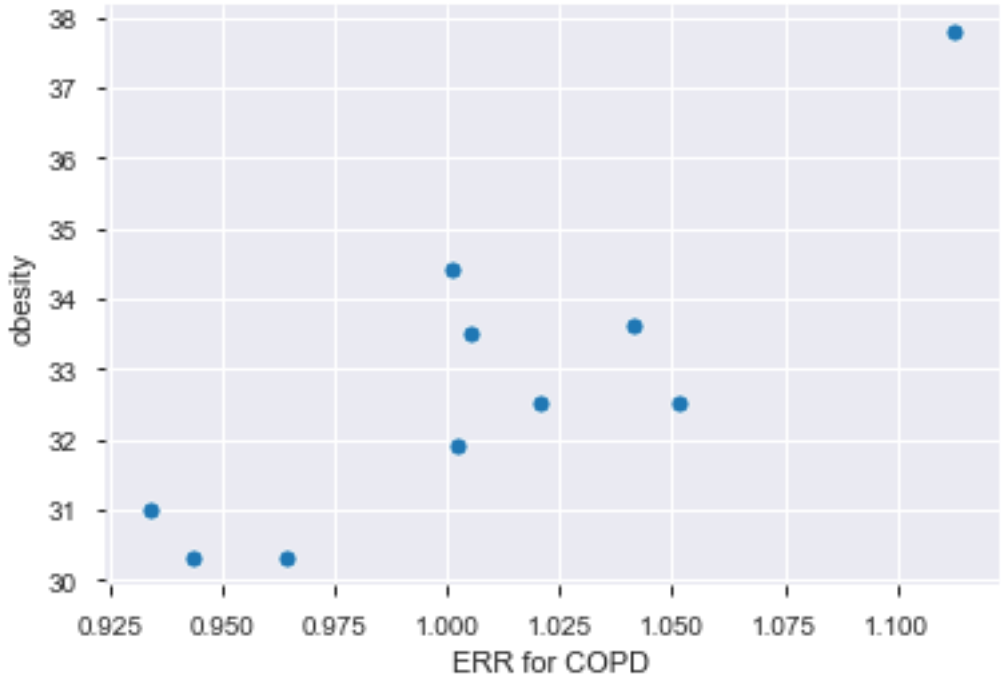


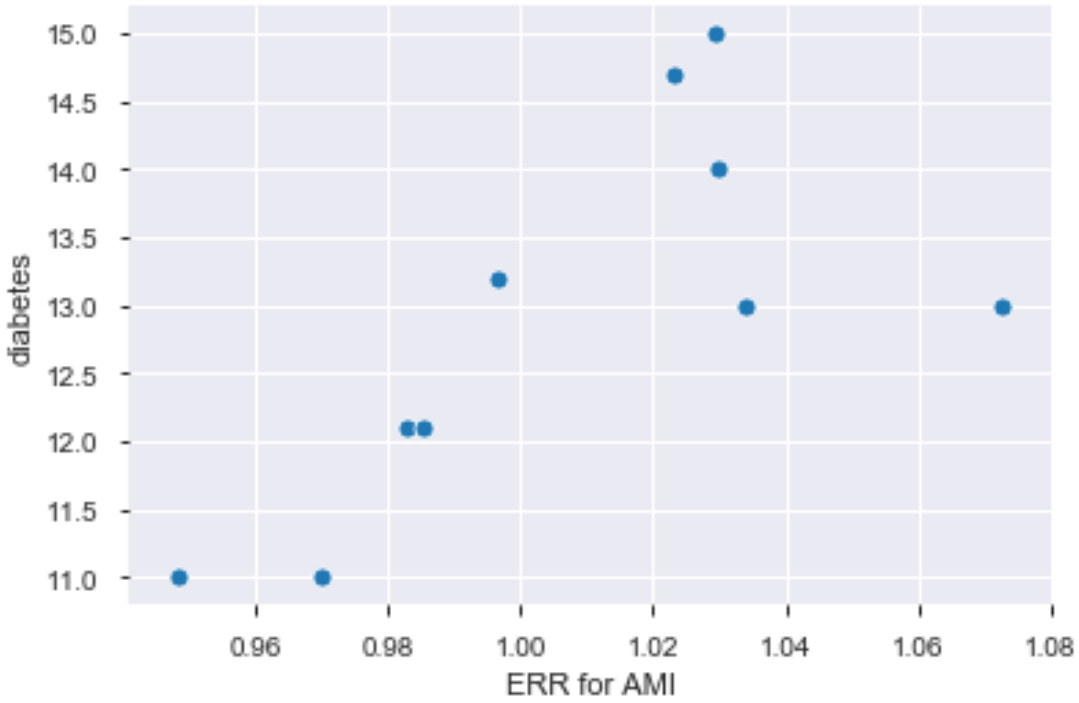
INCOME INEQUALITY & ERR FOR KNEE/HIP REPLACEMENT
r = .68



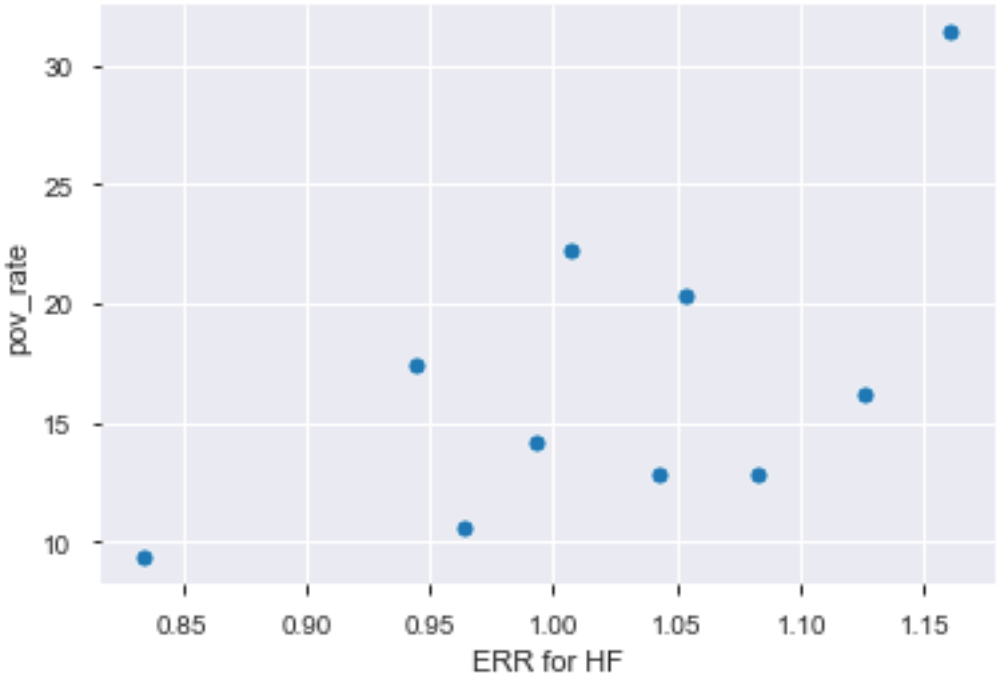
OBESITY & ERR FOR COPD
r = .86



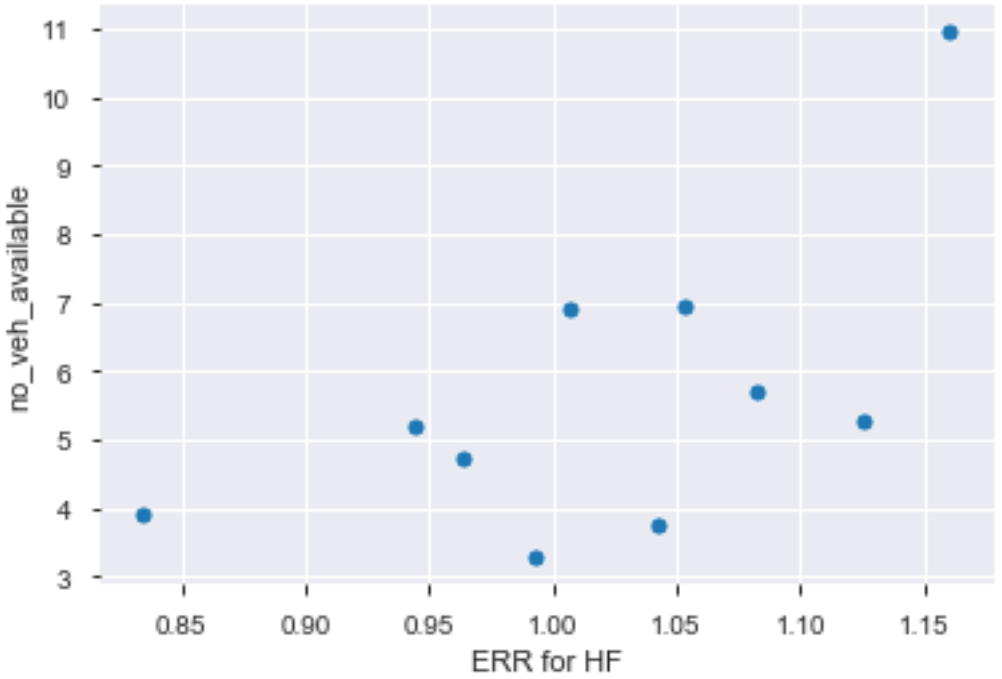
DIABETES & ERR FOR AMI
r = .63



POVERTY RATE & ERR FOR HF
r = .62



NO VEHICLE AVAILABLE & ERR FOR HF
r = .61



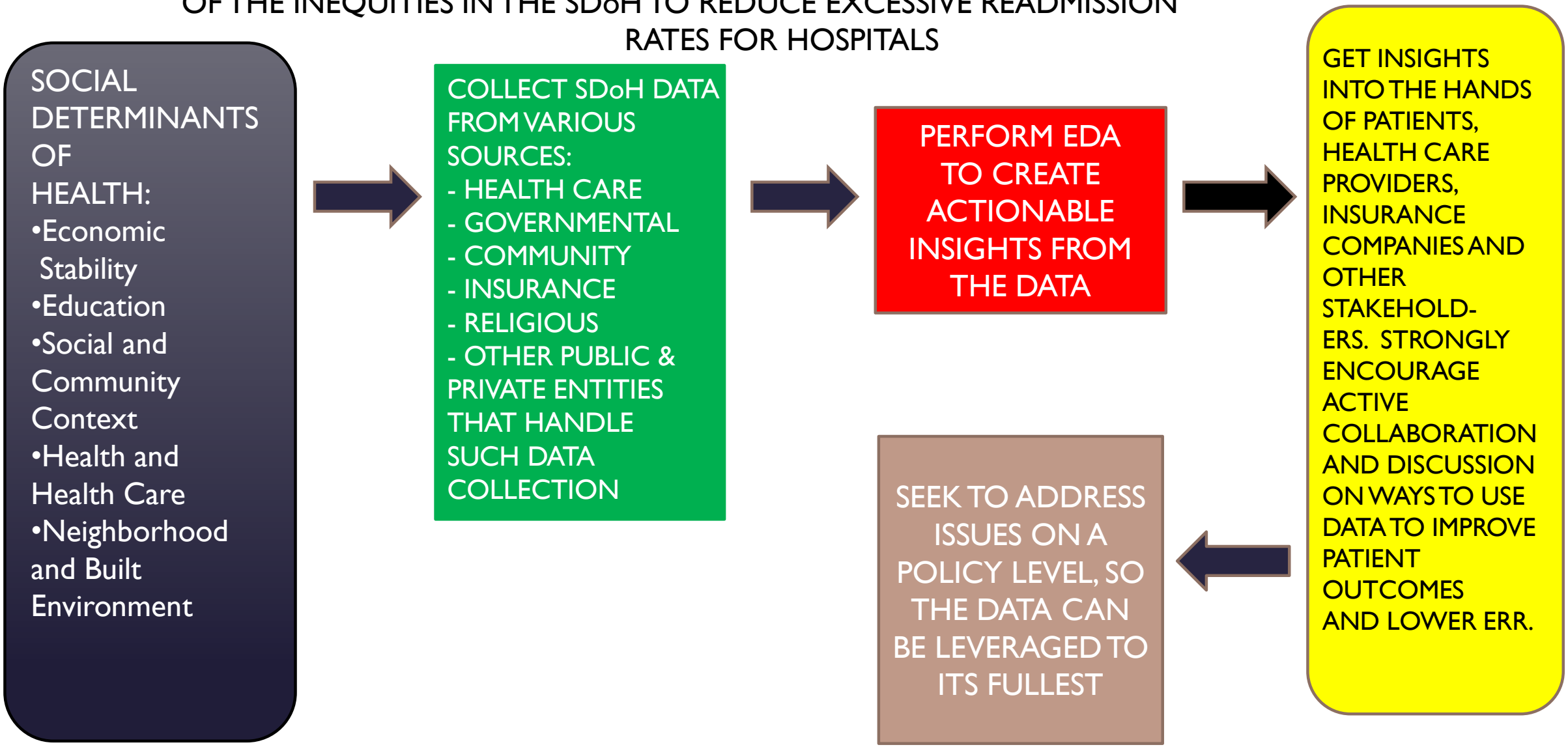
CONCLUSION:

- MY ANALYSIS SEEMS TO SUPPORT A CORRELATION BETWEEN THE SELECTED SDoH AND ERR FOR THE 6 CONDITIONS AT 10 TN HOSPITALS.

- HOW THESE RELATIONSHIPS WORK IS BOTH SIMPLE AND COMPLEX. SIMPLE IN THE SENSE THAT IT'S NOT HARD TO IMAGINE A PERSON'S SOCIOECONOMIC POSITION AFFECTING HIS/HER HEALTH OUTCOMES. THE COMPLEXITY LIES IN HOW ALL THESE FACTORS INTERRELATE. THIS IS WHERE DATA ANALYSIS BECOMES KEY IN REACHING A FULLER UNDERSTANDING.

- THE CONCEPT OF THE "UPSTREAM" AND "DOWNSTREAM" FACTORS IN HEALTH OUTCOMES IS USEFUL IN UNDERSTANDING HOW WE MIGHT ADDRESS THE ROOT CAUSES OF THE INEQUITIES INHERENT IN THE SDoH. THE POINT IS TO ADDRESS THE FUNDAMENTAL SOCIOECONOMIC FACTORS THAT CONTRIBUTE TO POOR HEALTH "UPSTREAM," BEFORE THE PROBLEM GOES "DOWNSTREAM" AND TURNS INTO CHRONIC ILLNESS. THIS MEANS DIRECTLY TAKING ON THE CHALLENGE OF BREAKING DOWN THE MULTITUDE OF BARRIERS MANY PEOPLE FACE WHEN TRYING TO ACCESS TRANSPORTATION, HEALTHY FOOD, EDUCATION, A SAFE, AFFORDABLE LIVING ENVIRONMENT, AND HEALTH CARE, JUST TO NAME A FEW.

ONE DATA ANALYST'S RECOMMENDATION FOR ADDRESSING THE ROOT CAUSES OF THE INEQUITIES IN THE SDoH TO REDUCE EXCESSIVE READMISSION RATES FOR HOSPITALS



APPENDIX

DATA SOURCES:

HealthyPeople.gov

- Pared down definition of Social Determinants of Health, as opposed to the WHO definition, which breaks SDoH into 12 components. The HealthyPeople.gov version paraphrases the 12 factors into a more digestible form.

CMS (Centers for Medicare and Medicaid Services)

- Hospital Readmission Reduction Program data from FY 2013-2017
- FY 2019 IPPS Proposed Rule Readmissions Supplemental Data File
- Medicare Hospital Market Service Area File/Inpatient Origin File to find top 3 zip codes served by 10 Hospitals

U.S. Census Bureau

- American Consumer Survey/American Fact Finder files to find Social Characteristics of top 3 zip codes served by each hospital
- Looked at a variety of metrics from these files to build a somewhat complete picture of socioeconomic contexts.

U.S.D.A.

- Food Environment Atlas – to identify Food Insecurity for counties in question
- Food Access Research for county-level data on obesity, diabetes, farm access, fast food access, grocery store access, and food insecurity

County Health Rankings.org in conjunction with the Robert Wood Johnson Foundation and the University of Wisconsin

- More specific county-level data from the SDoH standpoint. Used to flesh out and bolster data derived from the sources above. Really useful website for this purpose.

CDC (Centers for Disease Control & Prevention)

- Behavioral Risk Factor Surveillance System (BRFSS) – health-related telephone surveys that collect state-level data about health-related risk factors, chronic illness and the use of preventative services.

DEFINITION OF TERMS

SOCIAL DETERMINANTS OF HEALTH (SDoH):

According to *HealthyPeople.gov*, the SDoH include, but are not limited, to the following:

- Economic Stability
- Education
- Social and Community Context
- Health and Health Care
- Neighborhood and Built Environment

In short, SDoH are "conditions in the environments in which people are born, live, learn, work, play, worship, and age that affect a wide range of health, functioning, and quality-of-life outcomes and risks."

HOSPITAL READMISSION:

Centers for Medicare & Medicaid Services (CMS) defines a hospital **readmission** as "an admission to an acute care hospital within **30 days of** discharge from the same or another acute care hospital. ...The patient has enrollment information in Medicare for at least **30** days after discharge (this is necessary so that **readmissions** within **30** days can be tracked)."

HOSPITAL READMISSIONS REDUCTION PROGRAM (HRRP):

Under the Affordable Care Act, CMS began "reducing Medicare payments for Inpatient Prospective Payment System (IPPS) hospitals with excess readmissions. Excess readmissions are measured by a ratio, calculated by dividing a hospital's

number of "predicted" 30-day readmissions for heart attack (AMI), heart failure (HF), pneumonia, chronic obstructive pulmonary disease (COPD), hip/knee replacement (THA/TKA), and coronary artery bypass graft surgery (CABG) by the number that would be "expected," based on an average hospital with similar patients."

EXCESSIVE READMISSION RATIO (ERR):

"Predicted" Readmissions/"Expected" Readmissions = ERR

PEER GROUP MEDIAN ERR:

According to CMS, "the median ERR for the hospital's peer group for the measure. This is used as the threshold to assess hospital performance relative to other hospitals within the same peer group. All hospitals in the same peer group will have the same median ERR."