

# Spatial Analysis of Patient Experience Scores

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# Objectives

- Illustrate the impact that location has on hospital inpatient performance scores
  - Visualization
  - Geoanalytics
    - Drive time analysis
    - Hot spot analysis
- Discuss the significance of this impact
  - To hospitals
  - To patients
- Identify next steps

# Measuring the Patient Experience

Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS) is a national standardized survey of hospital patients.

The HCAHPS survey contains 21 patient perspectives on care and patient rating items that encompass nine key topics.

- communication with doctors,
- communication with nurses,
- responsiveness of hospital staff,
- pain management,
- communication about medicines,
- discharge information,
- cleanliness of the hospital environment,
- quietness of the hospital environment,
- transition of care. –From HCAHPS online



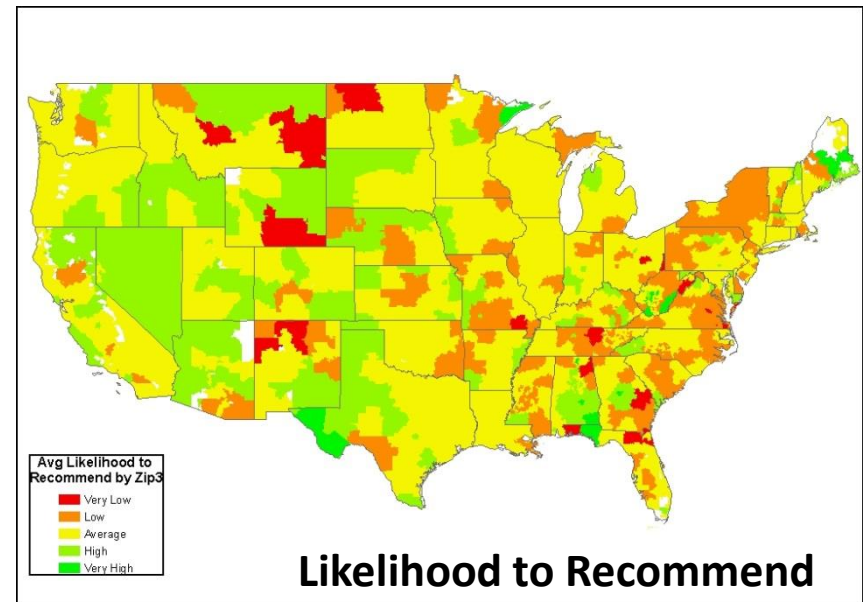
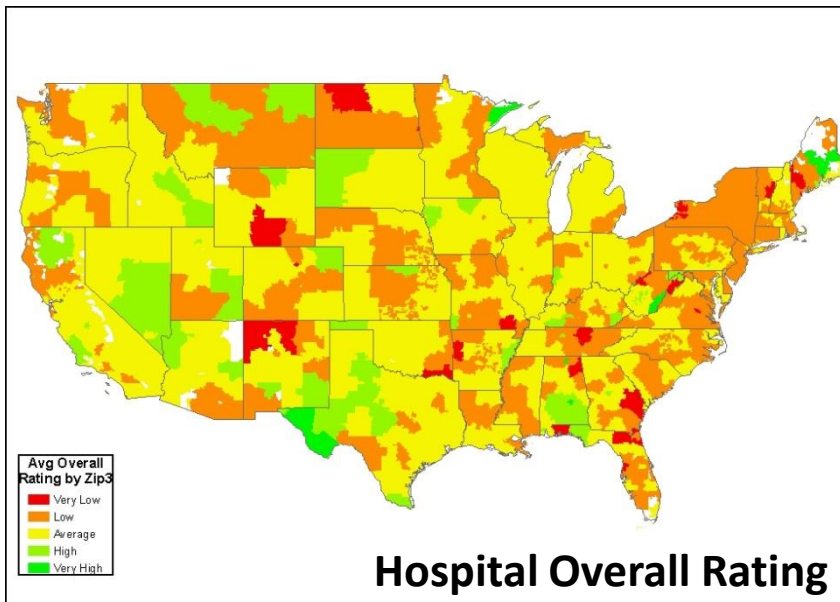
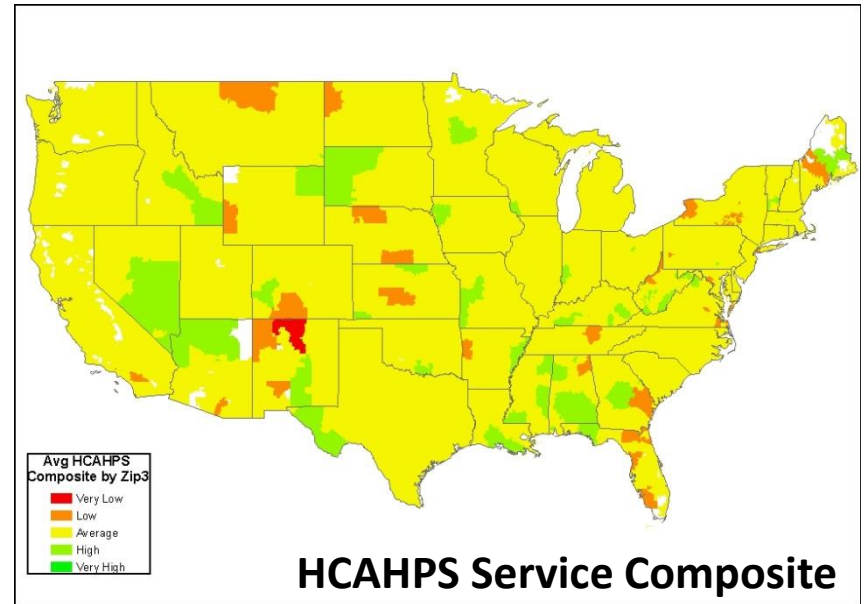
## US Hospitals struggle to maintain high Patient Experience scores as measured by HCAHPS

# Spatial Visualization

# Average Performance Scores by Zip3

These maps show the distribution of the average scores for *HCAHPS Composite*, *Overall Hospital Rating* and *Likelihood to Recommend*.

Red and orange average scores are below 70% and green shades indicate average scores above 80%.



# Geoanalytics

# Spatial Analytics

HCAHPS surveys were evaluated to analyze the impact of location on the patient experience.

## DRIVE TIME

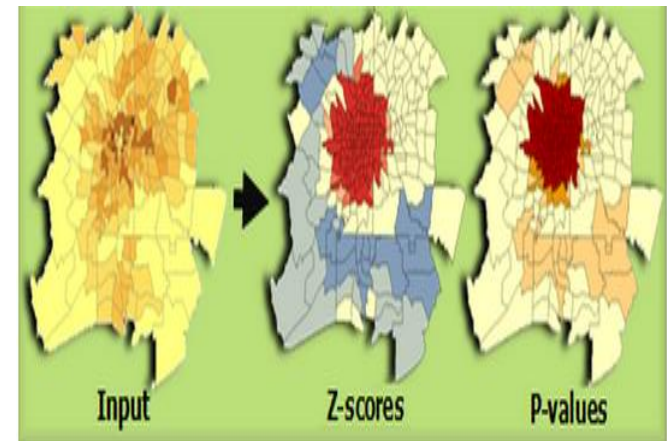
Determine drive time from response location to visited facility.



“The primary purpose of the **Calculate Drive-Time Polygons** task is to create drive-time polygons around user-specified points. A drive-time polygon is a region that encompasses all accessible streets that lie within a specified drive time from that point. Drive-time polygons can be used to evaluate the accessibility of a point with respect to some other features.”-ESRI

## HOT SPOT ANALYSIS

Identify statistically significant clusters of high and low scores.



# Selection Criteria and Definitions

- Hospital selection criteria
  - 138 hospitals across the contiguous United States
  - At least 600 beds
  - Primary service of general medical and surgical services
  - Located in major metropolitan areas with population greater than 500,000
- Drive time categories based on the measure of impact to patient's/caregivers:
  - 0 to 5 minutes = *Walking distance*
  - 5 to 10 minutes = *Bike ride / Segway*
  - 10 to 15 minutes = *Taxi or hitch a ride / transport service*
  - 15 to 30 minutes = *I'll need my car*
  - 30 to 60 minutes = *More than a lunch break*
  - 60 to 120 minutes = *A day trip*
  - 120 to 240 minutes = *Miss 2 days of work and pay for lodging*



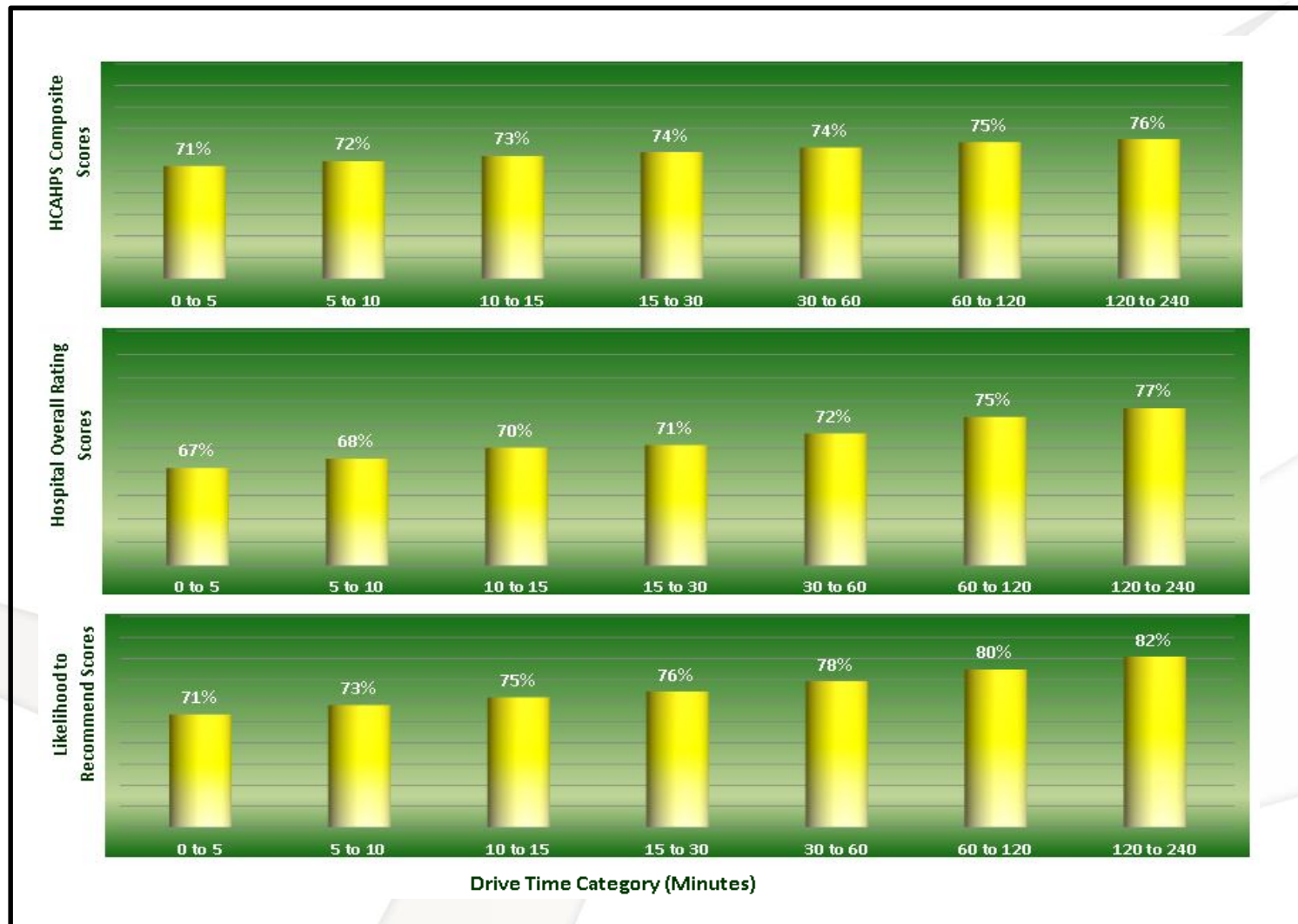
# US Hospitals and Drive Time: Does the Commute Matter?

HCAHPS Composite  
Scores

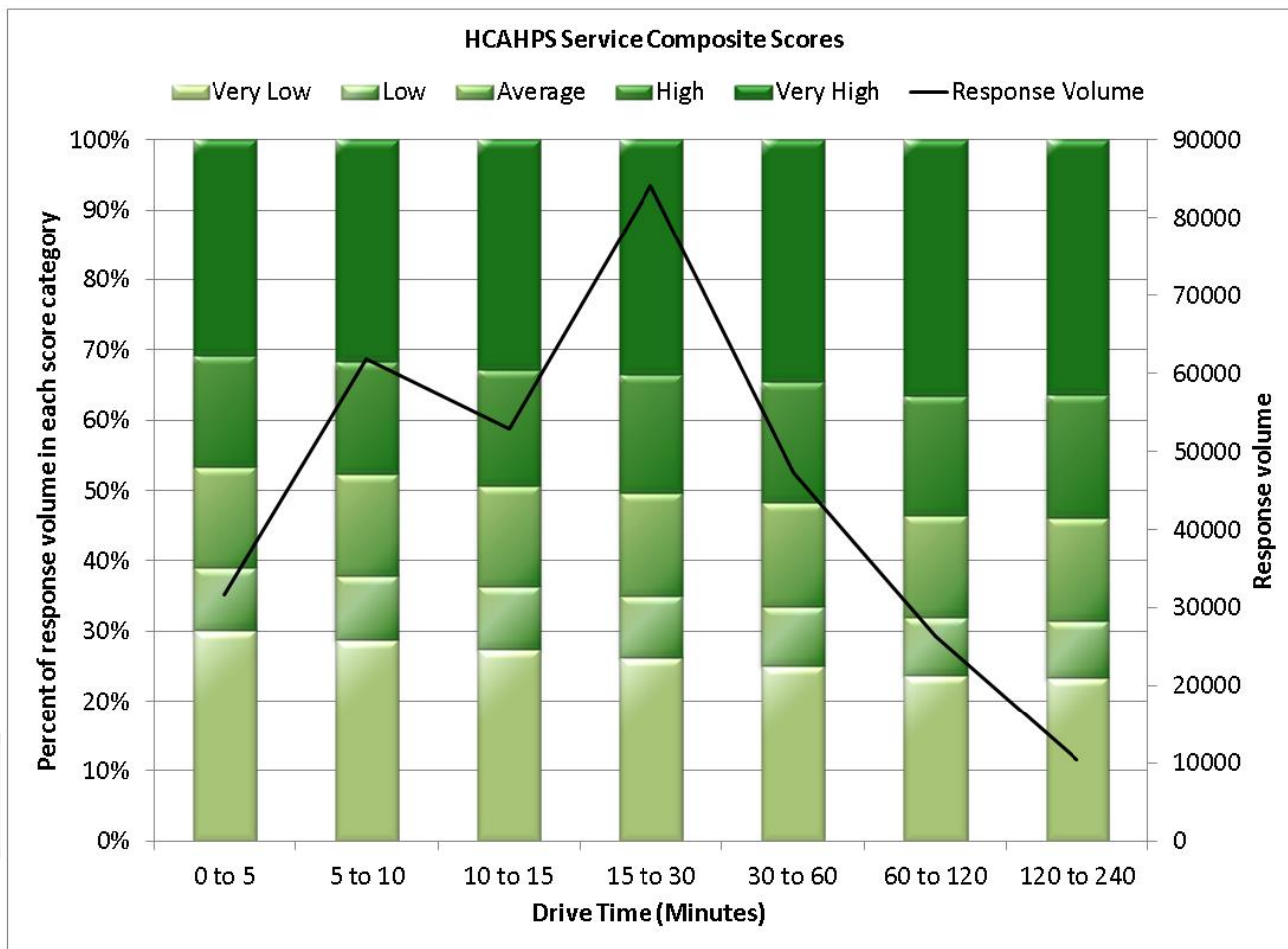


Drive Time Category (Minutes)

# Performance Scores and Drive Time



# More Very High Scores from Commuters More Very Low Scores from Neighbors

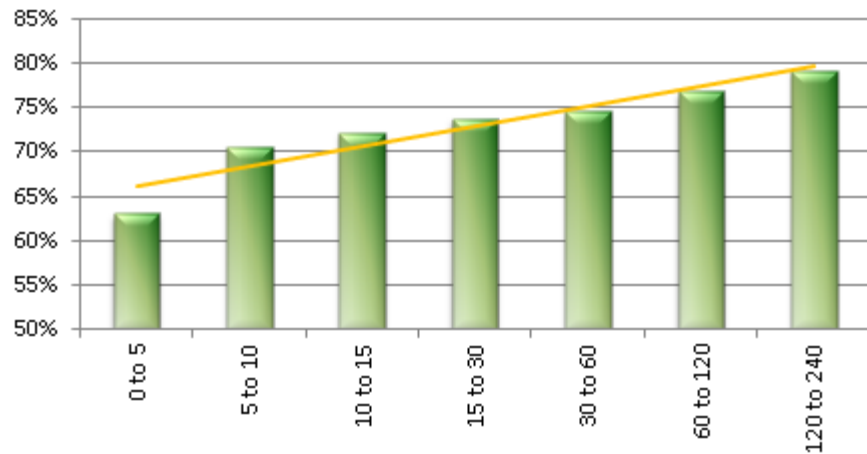


# Specific Examples from the Study Group

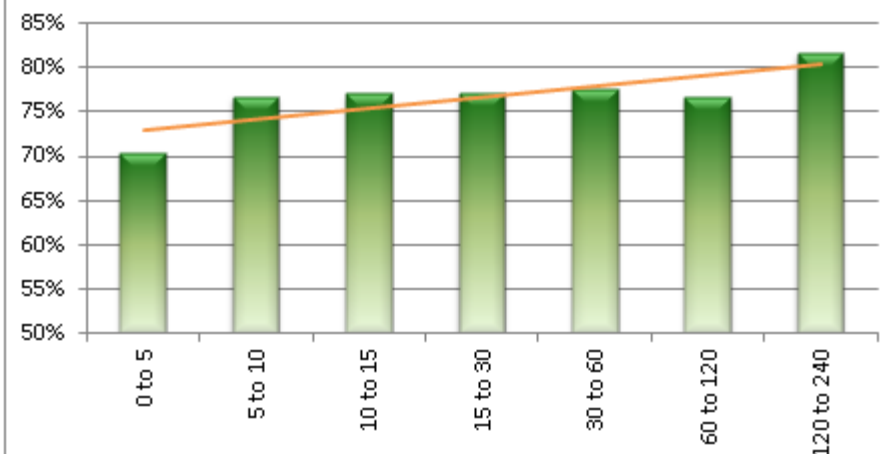
- Specific examples are shown to illustrate variation/similarities across hospitals
- Similar patterns are seen across the study group
- Additional analytics include
  - Scatter plot
  - Histogram
  - Hot Spot Analysis

# Drive Time vs HCAHPS Service Composite Scores: Examples from the study group

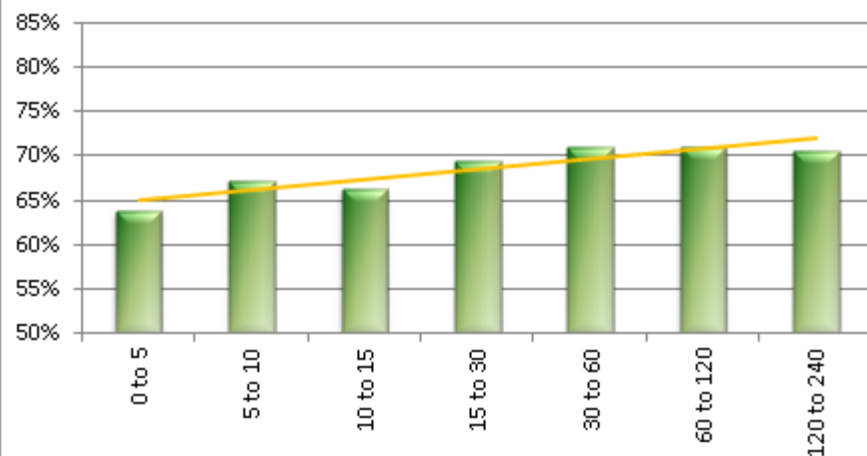
Hospital 1



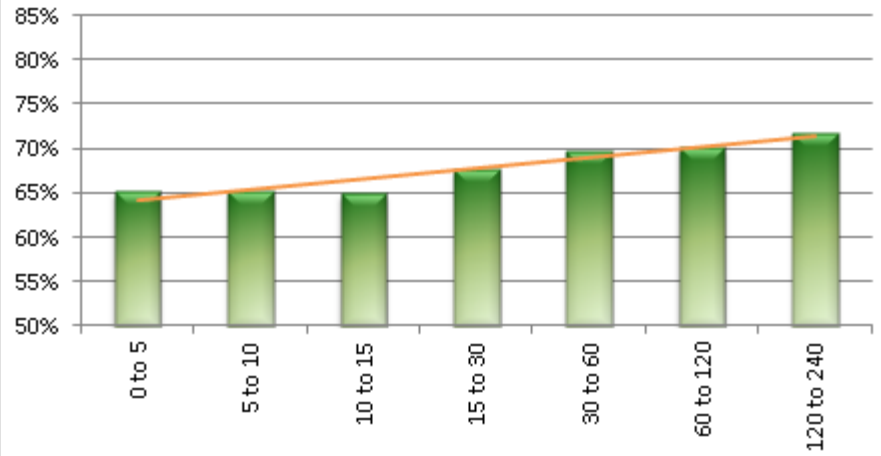
Hospital 2



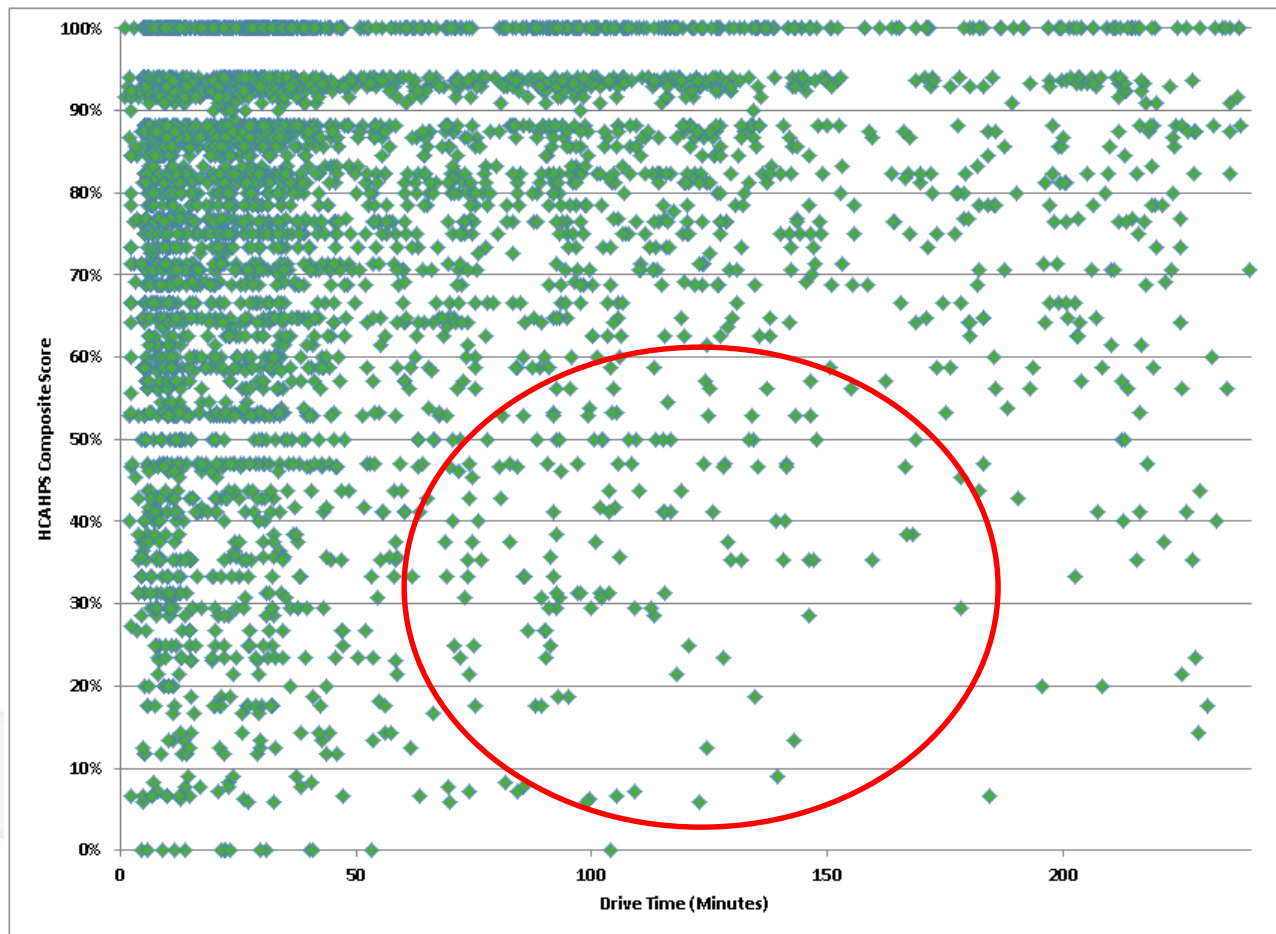
Hospital 3



Hospital 4



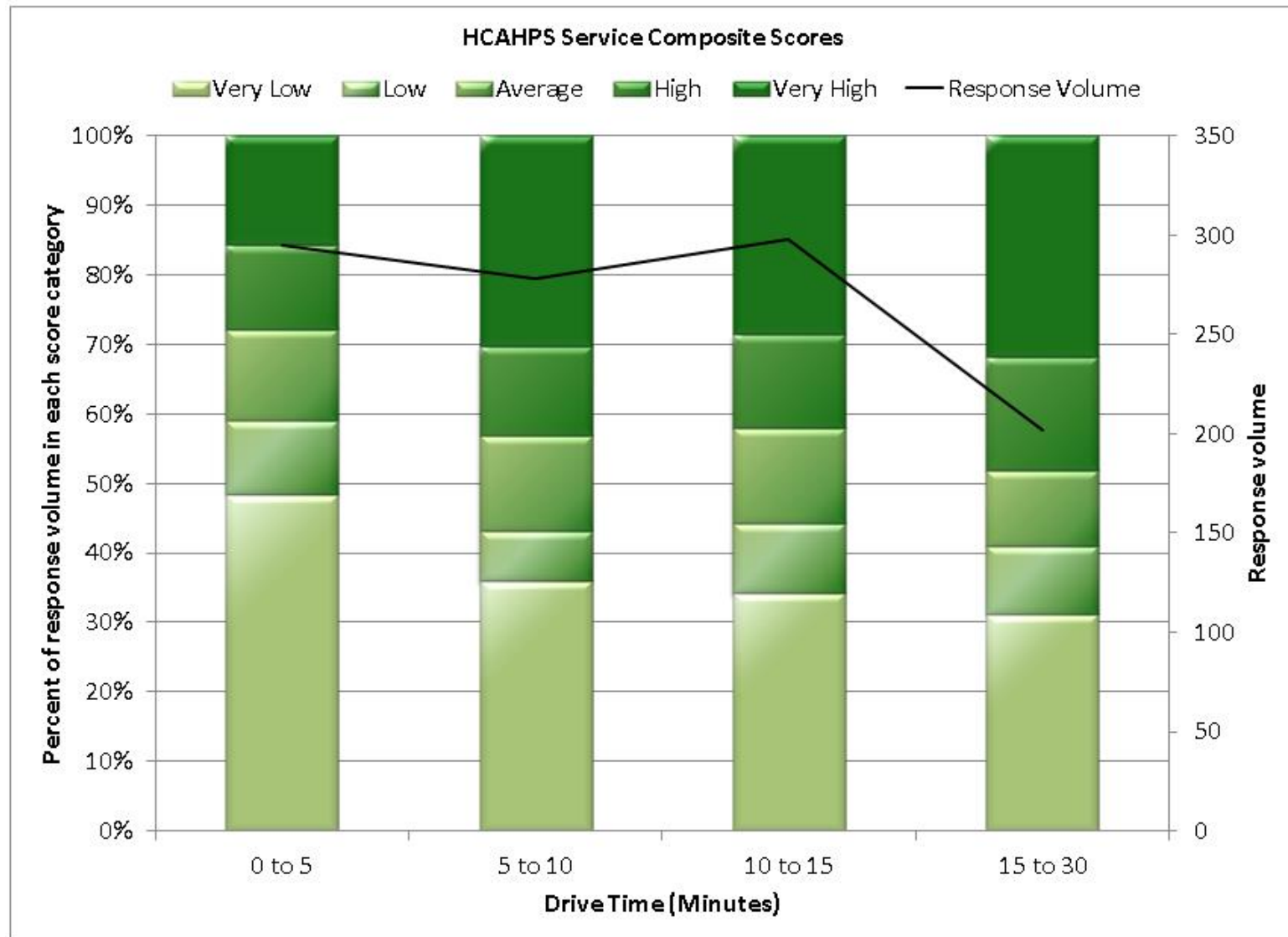
# Fewer Very Low Scores from Commuters



*The scatter plot shows data from a single hospital in the study group.*

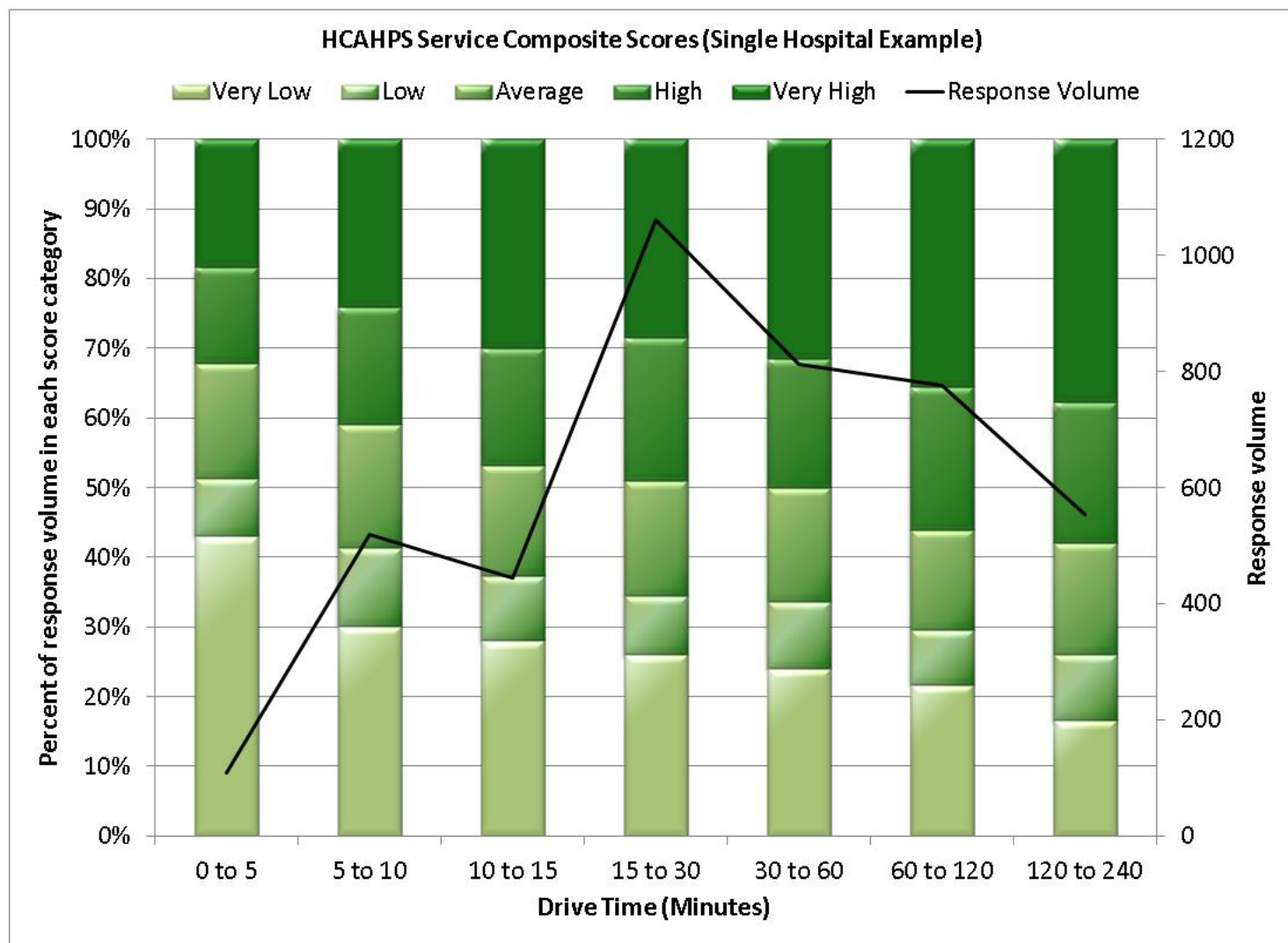
# More Very High Scores from Commuters

## More Very Low Scores from Neighbors



# More Very High Scores from Commuters

## More Very Low Scores from Neighbors

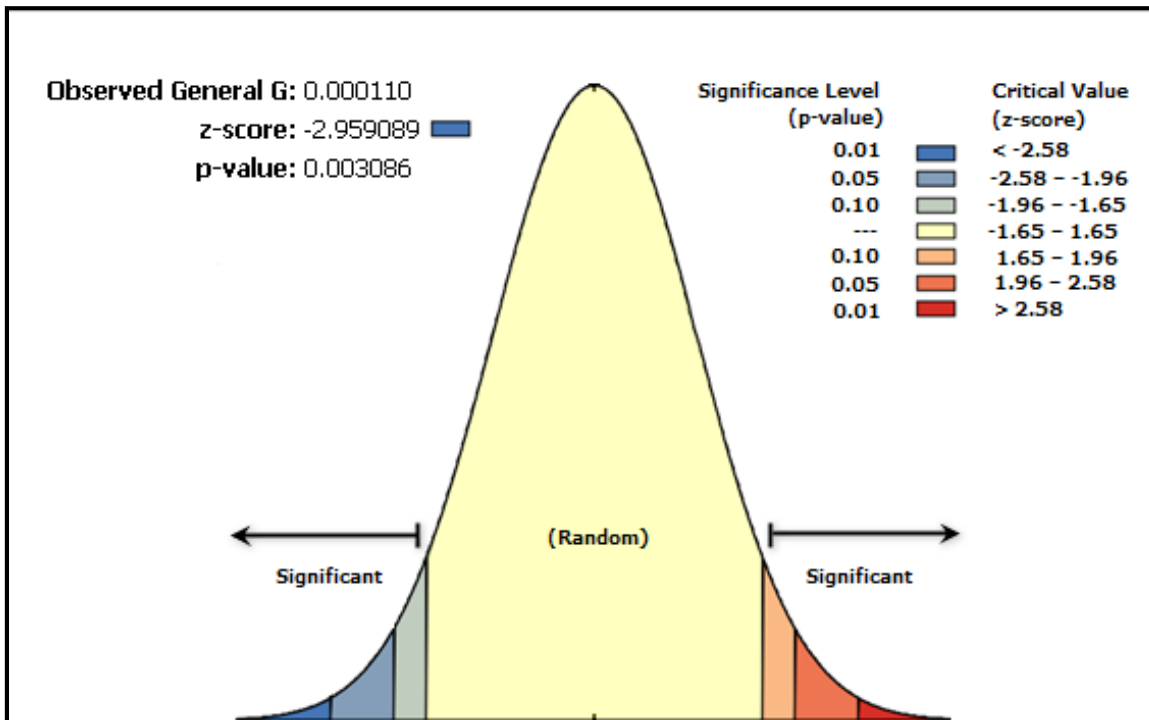
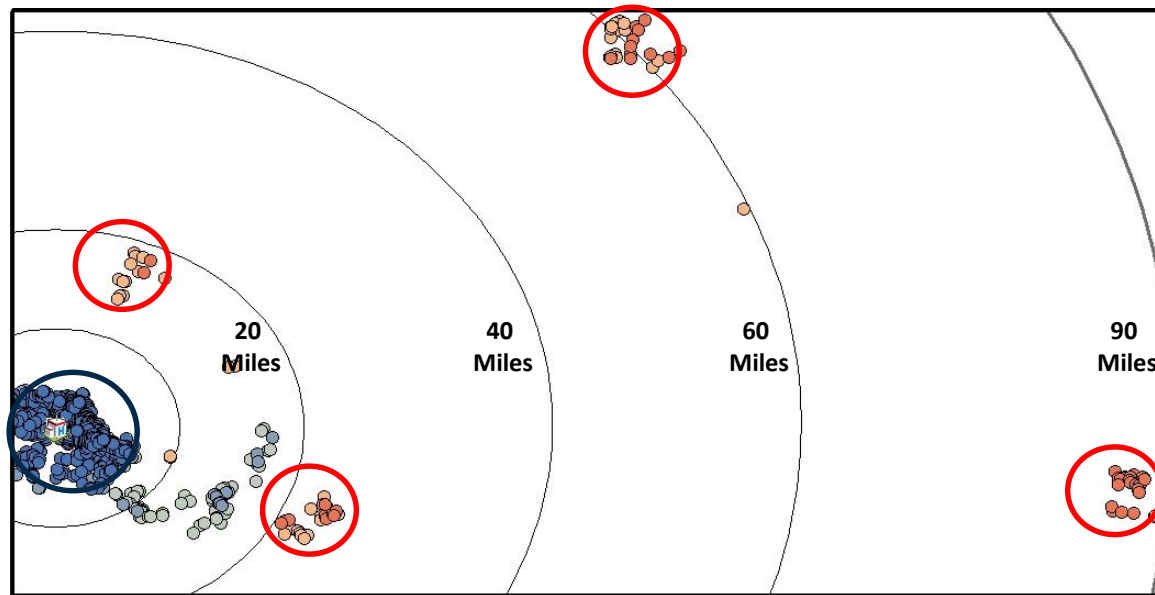


# Optimized Hot Spot Analysis

Note the high and low score clusters indicating areas where there may be spatially significant clustering of the HCAHPS Composite scores.

High score clusters are noted in areas further from the hospital, consistent with the drive time analysis.

*The hot spot analysis shows data from a single hospital in the study group.*



- Cold Spot - 99% Confidence
- Cold Spot - 95% Confidence
- Cold Spot - 90% Confidence
- Not Significant
- Hot Spot - 90% Confidence
- Hot Spot - 95% Confidence
- Hot Spot - 99% Confidence

# Conclusions

- We have illustrated a pattern of fewer very low scores from commuters
- It is worthwhile for a hospital to track commute distance
  - Increased awareness of the burden of medical travel
  - Impact to performance scores
- When building the business case for telemedicine / satellite clinics
  - Increased access to follow-up care for commuters
  - Increased market share
  - ***Potential improvement in performance scores***

# Next Steps

- Analyze population segments
  - Medical Diagnostic Code
  - Demographics
- Impact of Telemedicine / Satellite Clinics
  - Already a win-win
    - Increased convenience for commuters
    - Increased market share for top-performing hospitals

***Will an increased number of commuter survey responses boost overall performance scores?***



Questions ?