Quality Improvement Basics

Data Analysis

StratisHealth

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Objectives

After completing this module, participants will be able to

- Explain the key basic steps in data analysis
- Describe the purpose of descriptive and diagnostic data analysis
- Discuss what data stratification is and why it can be helpful
- Define mean, median, mode, and range in analyzing data

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Data Analysis

- View the data you have collected
- Consider and look at it from different perspectives
- Consider which analytic tools to use

Data Analysis Process Steps

- Step 1: Define data goals and objectives
- Step 2: Collect the data
- Step 3: Clean the data
- Step 4: Analyze the data
- Step 5: Interpret and share insights

Methods of Data Analysis

- Descriptive
  - Summarizes the data to highlight anomalies, trends, and underlying issues
  - Answers the question: “What happened?”
- Diagnostic
  - Identification of potential root causes
  - Answers the question: “Why did this happen?”
- Inferential and Predictive
  - Makes estimates and tests hypothesis to draw conclusions about causation
  - Addresses the questions: “How did this happen?” and “How can we impact this data to meet our goals?”

correlation ≠ causation

Describing Your Data

Summary Statistics

Example Data Points:
3, 5, 8, 10, and 50

- Mean: average of all numbers (15.2)
- Median: middle value (50% of data is above and 50% is below the median) (8)
- Mode: value that occurs most frequently (none)
- Range: difference between highest and lowest value (Max-Min=Range) (47)

Diagnostic Analysis

Identifying Trends and Anomalies

- Making comparisons across groups, categories, or benchmarks
- Evaluating how data changes over time

Stratification

- Arranging or classifying data into smaller groups, or “strata” to identify interactions and relationships within the data

Identify and Examine KPIs and Relationships

- Examine relationships between factors, seek out possible patterns and correlations that point to potential causes
- Identify variables that could be essential in driving the performance of your data goals (key performance indicators - KPIs)
- If you already have established KPIs, examine their relationship to different factors and their interaction with desired outcomes

Stratification

- Enables you to look at:
  - Time of day
  - Day of week
  - Site of care
  - Care providers
  - Procedures
  - Patient characteristics

When to Stratify

When you suspect that whatever you are measuring may differ based on some characteristic of the data

- Wait times differing by age
- Types of admissions vary by zip code
- Adherence to standard practice protocols differ by day of the week or time of day

In Summary

- Data analysis includes defining what we are trying to understand or achieve with the data, collecting, cleaning, analyzing the data to provide useful information to guide decision making.
- Descriptive data analysis summarizes the data and helps answer: “What happened?” This can include the mean, median, mode, and range of a data set.
- Diagnostic data analysis identifies potential causes and helps answer: “Why did this happen?” This can be accomplished by looking for trends or anomalies, stratifying the data, or identifying relationships in the data.
- Stratification is sorting into distinct groups so that patterns can be seen.

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