Quality Improvement: Data Analysis and Data Display Methods

Topics

• Conducting data analysis
• Displaying your data: charts, graphs and tables
Data Analysis

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

• Mean: average of all numbers
• Median: middle value (50% of data is above and 50% is below the median)
• Mode: value that occurs most frequently
• Range: difference between highest and lowest value (Max−Min=Range)

Displaying Your Data: Graphs, Charts, and Tables
Displaying Data: Graphs, Charts, and Tables

- Choose how you will display data with the end in mind
- Decide whether to summarize or display all collected data
- Forms of data (number, percent, precision)
- Determine the audience
- Method that best tells your story or is most appropriate for your type of data

Graphs, Charts, and Tables

Graphs & Charts
- Show comparisons between variables
- Show patterns, trends or relationships
- Convey complex data relationships in a quick manner

Tables
- Organize large amounts of data
- Show specific quantitative values
Graphs, Charts and Tables cont.

Parts of a Whole
• Pie Chart

Comparison & Trend
• Bar Chart
• Line Graph
• Run Chart
• Data Tables

Relationship
• Scatter

Distribution
• Histogram
• Scatter Plot

Different Displays of the Same Data
Tables

<table>
<thead>
<tr>
<th>Ethnic Group</th>
<th>Percent of Patients</th>
<th>Percent Diagnosed with HTN w/in group</th>
<th>Total Patients Diagnosed w/ HTN</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chinese</td>
<td>3</td>
<td>31</td>
<td>60</td>
</tr>
<tr>
<td>Asian-all other</td>
<td>5</td>
<td>30</td>
<td>100</td>
</tr>
<tr>
<td>Native American</td>
<td>6</td>
<td>37</td>
<td>120</td>
</tr>
<tr>
<td>Hmong</td>
<td>10</td>
<td>29</td>
<td>200</td>
</tr>
<tr>
<td>East African</td>
<td>16</td>
<td>25</td>
<td>320</td>
</tr>
<tr>
<td>Caucasian</td>
<td>18</td>
<td>28</td>
<td>360</td>
</tr>
<tr>
<td>Hispanic</td>
<td>20</td>
<td>29</td>
<td>400</td>
</tr>
<tr>
<td>African-American</td>
<td>22</td>
<td>35</td>
<td>440</td>
</tr>
<tr>
<td>Totals</td>
<td>100</td>
<td></td>
<td>2000</td>
</tr>
</tbody>
</table>

Histograms

- Location, spread and distribution
- Display continuous data
- Columns present data in a category format
Bar Charts

- Data displayed in categories
- Comparisons can be made across categories
- Displays distribution with a set of data

Line Graphs

- Analyze trends, patterns, and exceptions over time
- Can display multiple sets of data
- Trends can be used for predictions
Pie Charts
- Helpful in comparing parts or portions to a ‘whole’
- Only use when you have a limited number of parts to compare (about 8 is the maximum - fewer is better)
- Not helpful for comparison when any part is under 5%

Scatter Plots
- Each dot represents a pair of measures
- Test for possible cause and effect
- Does not prove cause & effect relationship
Using Data Summary

• Tell the “visual” story
• Use only as much data as needed
• Keep it simple

Stratis Health is a nonprofit organization that leads collaboration and innovation in health care quality and safety, and serves as a trusted expert in facilitating improvement for people and communities.

This project is supported by the Health Resources and Services Administration (HRSA) of the U.S. Department of Health and Human Services (HHS) as part of an award totaling $625,000 with 0% financed with non-governmental sources. The contents are those of the author(s) and do not necessarily represent the official view of, nor an endorsement, by HRSA, HHS or the U.S. Government. (December/2018)