ACCESSIBLE DATA VISUALIZATION

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What is data visualization?

- Use of visual images, graphs, or charts to convey information and data

- Data visualization can:
  - Simplify information
  - Highlight key findings
  - Increase understanding

- How do you use data visualization in research and evaluation?
For example…

Percentage of adults ages 18–64 who get no aerobic physical activity, by disability type

Mobility: Serious difficulty walking or climbing stairs
Cognitive: Serious difficulty concentrating, remembering or making decisions
Vision: Serious difficulty seeing, even wearing glasses
Hearing: Serious difficulty hearing
No Disability: Does not have any of the above disability types

Accessibility

- When I say accessible, what do you think of?
What is accessible?

- Accessible is
  - Universal design
  - Access
  - Attitude
  - Inclusion

- Accessible data visualizations will help a larger audience than just those with disabilities

- When you design a visual you know it better than anyone else, but what about your audience? What constraints might they have?
Data Visualization Function - What

- What story should the data visualization tell?
  - What is the conversation or story about?
  - What is your message?
  - What should your audience remember?
Data Visualization Function - How

- How will the data viz be used? What is the goal?
  - To display relationships and patterns
  - To inform or educate
  - To describe your findings to other researchers
  - To provoke action
  - To advocate
  - To influence decision-making
Data Visualization Function - Who

- Who will engage with this data visualization?
  - Stakeholders
  - Researchers
  - General public
  - Known and unknown disabilities
  - What level of sophistication with charts and graphs will be understandable to your audience?
  - Did you consider trauma informed and universal design best practices?
  - Reading levels and abilities
Nuts and Bolts of Accessibility – Font

- Sans serif fonts are preferred for accessibility
- Sans serif means “without the decorative line” (e.g., Times vs. Arial)
- Popular sans serif fonts include:
  - Arial
  - Calibri
  - Century Gothic
  - Tahoma
  - Verdana
Nuts and Bolts of Accessibility - Color

- Choose high contrasting colors like:
  - Black and white
  - Black and yellow

- Remember to consider color blindness

- Use a color checker to check contrast between font and background
  - [https://webaim.org/resources/contrastchecker/](https://webaim.org/resources/contrastchecker/) online resource
  - [https://developer.paciellogroup.com/resources/contrastanalyser/](https://developer.paciellogroup.com/resources/contrastanalyser/) download
Color Contrast - Example

Tobacco Use, Cessation Attempt, Desire to Quit Among Adults with Disabilities - AK BRFSS

<table>
<thead>
<tr>
<th>Tobacco User</th>
<th>Cessation Attempt</th>
<th>Smokeless Desire to Quit</th>
</tr>
</thead>
<tbody>
<tr>
<td>29.3%</td>
<td>23.9%</td>
<td></td>
</tr>
<tr>
<td>63.4%</td>
<td>57.5%</td>
<td>64.8%</td>
</tr>
</tbody>
</table>

Contrast ratio: 2.4:1

Foreground colour: white

Background colour: #A0AF4F

Sample preview: example text showing contrast

WCAG 2.1 results:
- 1.4.3 Contrast (Minimum) (AA): Fail for large and regular text
- 1.4.6 Contrast (Enhanced) (AAA): Fail for large and regular text
- 1.4.11 Non-text Contrast (AA): Fail for UI components and graphical objects
Nuts and Bolts of Accessibility - Hierarchy

- Ordered heading hierarchy will allow screen readers to properly read the documents, for example:
  - Heading 1
    - Heading 2
      - Heading 3
      - Heading 4

- On a graph or chart, text size is important:
  - Title
    - Subtitle
      - Label
      - Axis Label
Displaying Data

- Choose the right chart to display your message
- Logical organization
- Proportional display – squint test
- Logical and clear message
- Avoid using only color to convey meaning
- Minimize clutter, extraneous lines, and distractions
Other Considerations for Data Display

- Label data directly
- Alternative text is added to images, charts, and tables
- Spell out acronyms or provide a glossary of terms
- Provide instruction on how to understand visualization, in text or during presentations
- And more…
Resources

  - Where to Start?
  - Accessible Data Visualization Checklist
  - Access for All Quick Reference Guide for Word, PDF, and PowerPoint
EXAMPLES

Before and After
The young read news online, the older watch news on TV

Preferred method of news consumption by age group

Those who prefer reading get their news from...

Source: Pew Research Center
After

Preferred method of news consumption by age group.
After

Those who prefer getting their news from...

<table>
<thead>
<tr>
<th>Age Group</th>
<th>Newspaper</th>
<th>Online</th>
</tr>
</thead>
<tbody>
<tr>
<td>18-29</td>
<td>10%</td>
<td>81%</td>
</tr>
<tr>
<td>30-49</td>
<td>13%</td>
<td>72%</td>
</tr>
<tr>
<td>50-64</td>
<td>40%</td>
<td>41%</td>
</tr>
<tr>
<td>65+</td>
<td>63%</td>
<td>20%</td>
</tr>
</tbody>
</table>
Handout

- Tobacco Use Among Alaskan Adults with Disabilities
- What do you see that is different between the two?
Discussion

- What strategizes can you use to make your data visualizations more meaningful and accessible?
Helpful Hints

- Plan for teaching how to read the chart and ways of interpreting data
- Be clear on the purpose of the data
- Choose chart wisely
- Field test charts that will be distributed widely
- Consider all the ways people will share, post, print, and other ways the data will be accessed
Questions
Contact Information

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