**From Numbers to Visuals: Unleashing the Power of Data to Create Narratives for CBO Impact**
**Color for Clarity and Inclusion: Best Practices for Behavioral Health Data Visualization**

## Introduction

Color is a powerful tool in data visualization, capable of drawing attention, evoking emotions, and conveying meaning. However, when used ineffectively or insensitively, color can also mislead, confuse, or alienate viewers. For behavioral health community-based organizations (CBOs), it's crucial to employ color in a way that enhances clarity, promotes inclusion, and aligns with the organization's mission and values.

This guide outlines best practices for using color in data visualization, with a specific focus on the needs and considerations of behavioral health CBOs. By following these guidelines, CBOs can create visualizations that effectively communicate data insights while respecting the diversity of their stakeholders and communities.

1. **Ensure Accessibility**
   - Use color combinations with sufficient contrast for those with visual impairments or color vision deficiencies. Tools like **Color Oracle** can simulate how your colors appear to individuals with different types of color blindness.

   - Aim for a minimum contrast ratio of 4.5:1 between text/graph elements and the background. This means the lighter color should be at least 4.5 times as bright as the darker color. Check contrast ratios with tools like **WebAIM's Contrast Checker**.

   - Avoid using color alone to convey essential information. Always provide a redundant visual cue, such as differing patterns, shapes, or labels, to ensure your message is accessible to all.

   - Example: If using a blue color (#0070C0) for your graph line, choose a contrasting light background like white (#FFFFFF) to achieve a 5.7:1 contrast ratio, exceeding the 4.5:1 minimum.

Monthly Progress Over Time
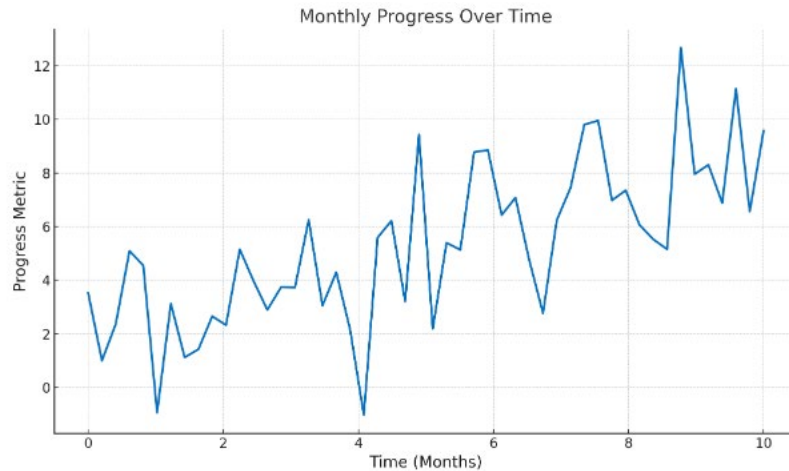
This first chart exemplifies the principle of **Ensuring Accessibility**. We have a line graph with a blue color (#0070C0) for the graph line against a white background, achieving a contrast ratio that exceeds the 4.5:1 minimum, which is accessible to those with visual impairments or color vision deficiencies.

2. **Be Mindful of Cultural Connotations**
   ● Research color meanings and symbolism across the cultures and communities your CBO serves. Colors can evoke different emotions or associations in different contexts.

   ● Avoid colors that may inadvertently promote stereotyping, stigmatization, or cultural insensitivity when depicting behavioral health issues or demographics.

   ● Example: In a visualization about mental health prevalence, avoid using red which may stigmatize certain conditions. Instead, opt for a neutral blue palette.

   ● Resource: **David McCandless' Colours in Culture**


Mental Health Condition Prevalence
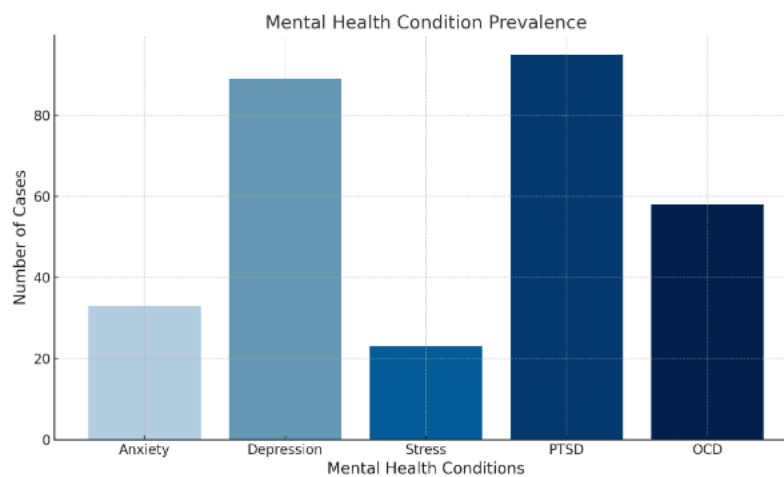
Here we have the second chart, which observes the principle of being **Mindful of Cultural Connotations**. It is a bar chart using a neutral blue color palette for different mental health conditions, avoiding any colors that could potentially stigmatize such conditions.

3. **Use Color to Highlight Key Insights**
   ● Employ the "pop-out effect" by using a highly saturated, distinctive color to draw attention to the most important data points or patterns against a more muted background palette.

   ● Reserve the brightest and boldest colors for the most critical insights to maintain their impact and avoid visual clutter.

   ● Example: In a line graph showing therapy session attendance over time, use a bright green to highlight the month with the highest attendance among gray lines for other months.

   ● Resource: **Gestalt Principles of Visual Perception**


Therapy Session Attendance Over Time
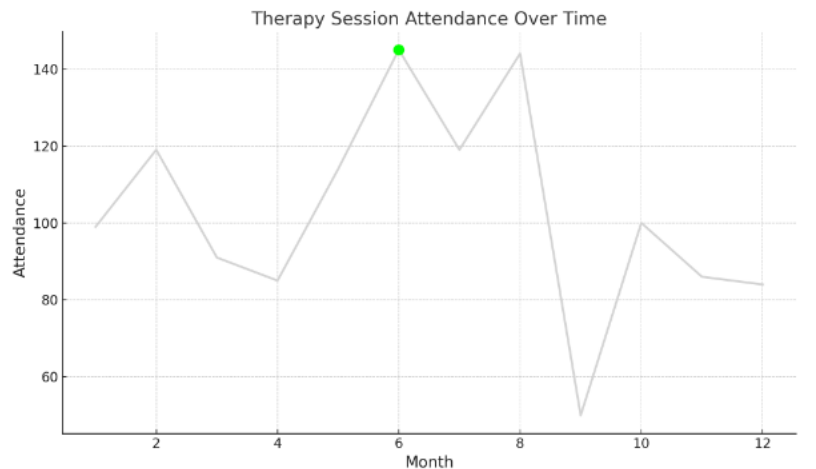
The third chart demonstrates how to **Use Color to Highlight Key Insights**. In this line graph, we've illustrated therapy session attendance over time. A bright green color is used to highlight the month with the highest attendance against the other months presented in gray, creating a "pop-out effect" for the highlighted data point.

4. **Maintain Consistency**
   ● Develop a cohesive color palette for your organization's data visualizations and apply it consistently across all your communications. This builds visual recognition and reinforces your CBO's brand.

- Within a single visualization, assign colors consistently to recurring categories or variables. This helps viewers quickly interpret and compare the data.

- Example: If using purple to represent "Counseling Services" in a bar chart of program utilization, maintain purple for counseling in other charts like pie charts or stacked bar charts.

- Resource: **Venngage's Guide to Picking Colors**

Program Utilization (Bar Chart)



Program Utilization (Pie Chart)
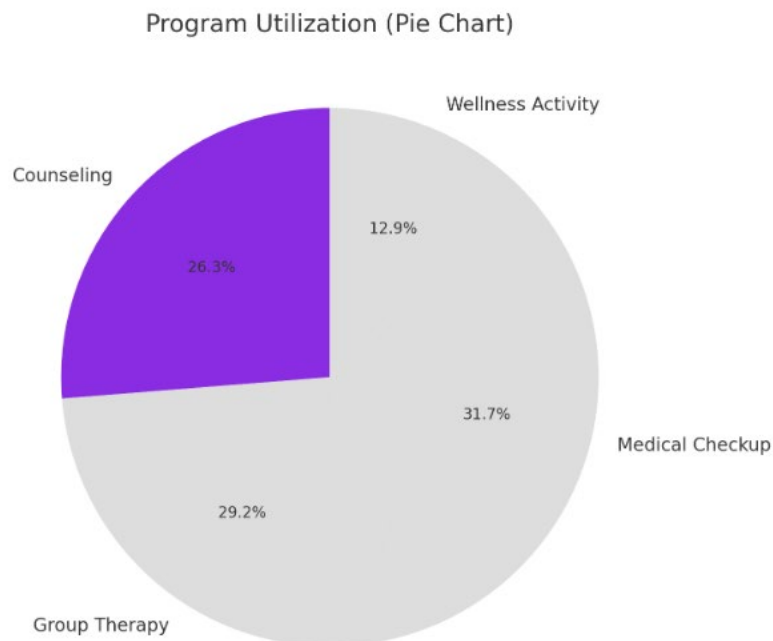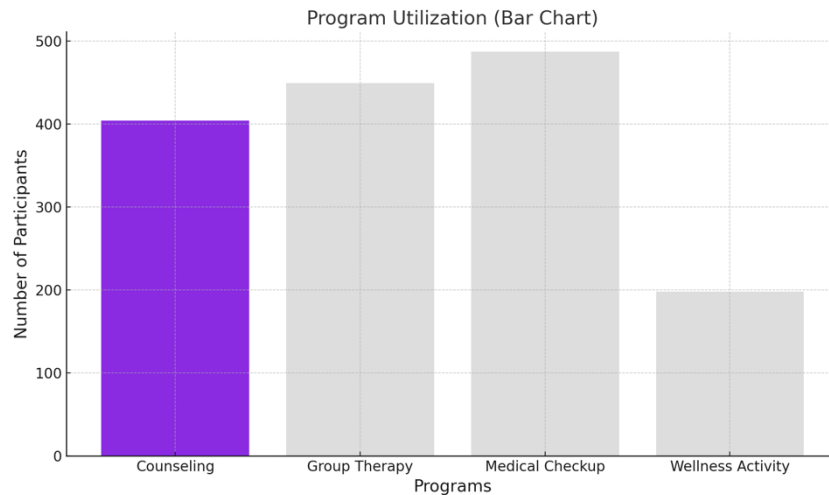


The fourth example emphasizes **Maintaining Consistency** across visualizations. Here are two charts: a bar chart and a pie chart that use a consistent purple color to represent "Counseling Services". This helps viewers quickly interpret and

compare the data across different types of visualizations.

5. **Leverage Natural Perceptual Tendencies**
   ● For sequential data that progresses from low to high, use a monochromatic light-to-dark gradient (e.g., light blue to dark blue). This intuitively communicates the value progression.

   ● For diverging data with a midpoint, choose two contrasting hues for the ends of the scale (e.g., orange to blue) with a neutral midpoint. This draws attention to the extremes and the balance point.

   ● Avoid using rainbow color schemes or red-green combinations, as these can be difficult to interpret, especially for those with color vision deficiencies.

   ● Example: For a heatmap depicting client satisfaction ratings across programs, use a light-to-dark green gradient to intuitively show low to high satisfaction.

   ● Resource: **Colorbrewer 2.0**



Client Satisfaction Ratings Across Programs (Heatmap)
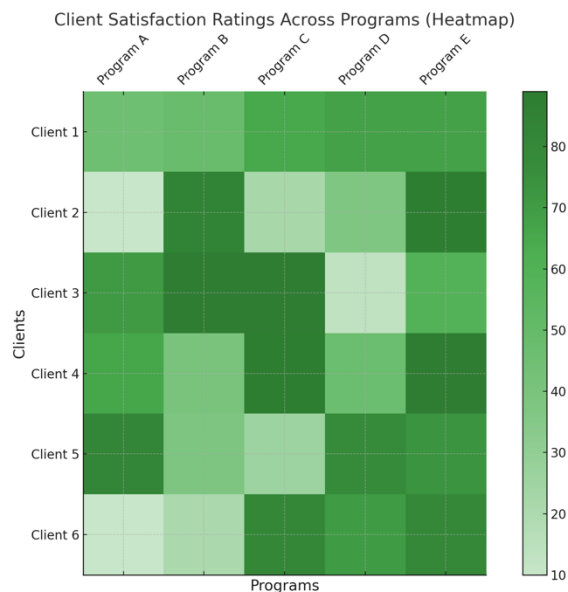
The fifth chart shows how to **Leverage Natural Perceptual Tendencies**. It is a heatmap that uses a light-to-dark green gradient to depict client satisfaction ratings across various programs, which intuitively communicates satisfaction from low (light green) to high (dark green).

6. **Gather Diverse Feedback**
    - Before finalizing and publishing your data visualizations, share your color choices with a diverse group of stakeholders, including members of underrepresented communities your CBO serves.

    - Solicit feedback on the cultural relevance, emotional impact, and accessibility of your color choices. Ask if the colors effectively convey the intended message and if anything is confusing or offensive.

    - Iterate on your color palette based on this feedback to ensure your final visualizations are inclusive, respectful, and effective for all your audiences.

    - Example: Before finalizing a visualization on program outcomes by race/ethnicity, share the color drafts with staff and community members of each race/ethnicity to gauge resonance and catch any unintended connotations.

    - Resource: **The Data Visualization Society**

For the sixth and final point about **Gathering Diverse Feedback**, we don't need to create a new visualization; however, if we were to implement this guideline, we would present this heatmap (or another visualization) to a diverse group of stakeholders, solicit their feedback regarding the color choices and other elements of the design, and make revisions as necessary.

**Additional Resources**

- **Adobe Color's Accessibility Tools**
- **The Perception of Color**
- **Viz Palette's Color Guide**
- **Storytelling with Data's Guide to Choosing Colors**

**Conclusion**

By following these best practices for using color in data visualization, behavioral health CBOs can create graphics that are accessible, inclusive, and effective at communicating key insights to diverse stakeholders. Intentional and sensitive color choices not only enhance clarity but also demonstrate an organization's commitment to equity and respect for the communities it serves.

Remember, creating meaningful and responsible data visualizations is an iterative process. As you apply these color principles, seek out diverse perspectives, listen to feedback, and be willing to adapt. With practice and care, your use of color will become a powerful tool for promoting understanding, driving action, and advancing your CBO's mission.