Presenting Outcomes Data Clearly and Effectively

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Depictions of data help us tell a story...

- What message do you want to convey?

- What do you want your audience to remember?

- What are your strengths that you want to highlight?

- Start by sketching some ideas...
Sketch some of your ideas...

"this"  led to..  "that"

Before  After
“Outcomes” and “Outputs”

- **Outcomes** show change over time for a client after experiencing some program or intervention.
  - Achieve some change in therapeutic measures.
  - Changes in personal lives (access to medical care, access to food, legal support / status).
  - Changes in quality of life (housing status, employment status).

- **Outputs** are short term achievements of the overall program or the Center.
  - Number of clients served.
  - Number of services provided.
  - Number of people trained, by profession.
  - Number of community trainings.
  - Number of hours of pro-bono services.
levels of outcomes

- What do you want to show your audience?
- Do you want to show immediate, short-term, or long-term changes and benefits?

- Four main types of outcomes:
  - Initial reactions
  - Immediate – learning outcomes
  - Intermediate – behavioral outcomes
  - Long term – situational outcomes
General principles for depictions of data...
Depictions of data help us:

- Provide a “quick view” of information.
  - We live in a visually oriented society...

- Condense information.
  - People want information quickly...

- Capture attention.
  - do not overload your audience...

- Reveal important points.
  - Draw attention to your key message.
Graphs should be:

- **Self-contained**
  - Your audience should be able to understand your graph independently of reading any of the document text.

- **Reliable**
  - The data should be reliable and consistent with other presentations of data.

- **Accurate**
  - The information conveyed by the graph should be statistically accurate.
Depictions of data should show....

- Show the Facts...
  - for example: clients “improved” in terms of a specific measure.
  - Showing “change” vs. showing “improvement”

- Show the “Power”...
  - for example: *how much* did they improve...
    - Use proper scale
    - identify units of measure
Some things to Avoid:

- Avoid 3D effects
- Avoid clutter...
- Avoid background/design effects
- Filling shapes with patterns (use sparingly)
  - Sometimes patterns are clear on your computer screen, but are not distinguishable once they are printed on a page or in a poster.
In general, avoid 3D effects...

English Proficiency at the time of intake for (n=196) Active Clients
October 1, 2010 - March 31, 2011

Proficiency level, self-reported by clients at the time of intake.
Graph formatting and examples.
Use the appropriate **scale**

- Convey message accurately.
- Be true to the integrity of the data.
In this example for the HSCL-25, the y-axis shows the full Likert Scale, from 1 to 4...

Change in Somatic symptoms
for a subset of \(n=35\) clients
active October 1, 2010 to March 31, 2011

- HSCL-anxiety
- HSCL-total-score
- HSCL-depression

Based on mean HSCL-25 scores from the 25 questions of the Hopkins
A sample Graphic to discuss **the Likert Scale**:

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>• 4 = “extremely”</td>
</tr>
<tr>
<td>3</td>
<td>• 3 = “quite a bit”</td>
</tr>
<tr>
<td>2</td>
<td>• 2 = “a little”</td>
</tr>
<tr>
<td>1</td>
<td>• 1 = “not at all”</td>
</tr>
</tbody>
</table>
Sample text to describe the Likert scale:

- For any scale, it is helpful to provide a graphic or text, separate from the graph, to explain the scale.

**Here is just one example of text:**

- HTQ-30 and HSCL-25 scores indicate severity of reported psychological and somatic symptoms, with higher values indicating more severe symptoms.
- A decrease in score indicates a reduction in the severity of reported symptoms.
- For each administered HSCL-25, a summary score was determined by summing all 25 responses (recorded on a Likert scale from 1, meaning “not at all” to 4, meaning “extremely”). A low summary score value indicates low reported somatic symptoms.
Here is the same chart, but showing only the detail of the change in scores...

Change in Somatic symptoms for a subset of \( n=35 \) clients active October 1, 2010 to March 31, 2011

- HSCL-anxiety
- HSCL-total-score
- HSCL-depression

Based on mean HSCL-25 scores from the 25 questions of the Hopkins Symptoms Checklist.
The **title** of a graph should:

- Convey the message you want
  - ...but do not try to tell the whole story.

- Not be misleading
  - intentional/ unintentional

- Convey the Units of measure
  - You can also use axis title to indicate units of measure.

- Include a number for easy reference
  - (if the graph is part of an article or text)
  - All images (photos, diagrams, tables) should be in the same numbering series.
Here is the same HSCL-25 chart, with less text in the title and legend, but more in the axis title.

Decrease in Somatic symptoms for a subset of clients (during the past 6 months)

Anxiety and Depression scores based on the Hopkins Symptoms Checklist

- HSCL-anxiety
- HSCL-total-score
- HSCL-depression
**Axis Titles**

- The axis titles can help explain the data, but should not try to convey too much information.

- The x-axis is generally used:
  - to indicate change over time.
  - To list categories

- The y-axis generally shows:
  - The extent or degree of the measure
This example shows change in HTQ30 scores during six months...

Change in Psychological symptoms for a subset of \( n=35 \) clients active October 1, 2010 to March 31, 2011

- HTQ-PTSD
- HTQ-total-score

Based on mean HTQ-30 scores from the 30 questions of the Harvard Trauma Questionnaire.
Here is the same chart, with less text in the title, but more text in the axis titles...

Clients reported fewer symptoms of PTSD (based on 35 clients) October 2010 to March 2011

HTQ30 scores for PTSD symptoms

- HTQ-PTSD
- HTQ-total-score

1st-admin
2nd-admin
first measure at time of intake; second measure after six months in program.
Baseline measures and change over time

Showing the baseline measure (before showing the change) can help clarify the message.
This sample shows Employment status measures at the time of intake...

Employment/ Income Status at Intake for a subset (n=138) of Active Clients
October 1, 2010 - March 31, 2011

- 87 clients with work authorization and consistent employment
- 16 clients with no work authorization, stable full-time/part-time employment
- 12 clients with no work authorization, inconsistent, minimal employment
- 23 clients with no employment or work authorization

Number of Clients
This example shows the Employment status at intake and 6 months later...

Employment/Income Status at time of Intake and after 6 months for a subset (n=138) of Clients active in 2011

- **No Employment or Work Authorization**: 87 at-intake, 72 after-6months
- **No Work Auth., inconsistent, minimal employment**: 16 at-intake, 27 after-6months
- **No Work Auth., stable FT/PT employment**: 12 at-intake, 14 after-6months
- **Has Work Auth and consistent employment**: 23 at-intake, 25 after-6months
Another example - showing the baseline measures for Housing Status at time of intake...

Housing Status at time of Intake for a subset ($n=138$) of Active Clients
October 1, 2010 - March 31, 2011

<table>
<thead>
<tr>
<th>Housing Status</th>
<th>Number of Clients</th>
</tr>
</thead>
<tbody>
<tr>
<td>Homeless/ Resides in Shelter</td>
<td>6</td>
</tr>
<tr>
<td>Rotates -homes of family/ friends</td>
<td>26</td>
</tr>
<tr>
<td>Stable Housing but Overcrowded</td>
<td>56</td>
</tr>
<tr>
<td>Stable and Appropriate Housing</td>
<td>50</td>
</tr>
</tbody>
</table>
Here the title indicates that this is the change in housing status during the first six months of care...

Change in Housing Status
from time of Intake to 6-months
for a subset (n=138) of Active Clients, 2011
To show “progress” or improvement, a horizontal bar chart may be more effective.

- The horizontal depictions highlight whether something increased or decreased.
Here is the same graph, combining categories, and emphasizing the change in Housing Status over time.

**Change in Housing Status**
from time of Intake to 6-months
for a subset *(n=138)* of Active Clients, 2011

- **Stable housing (included overcrowded)**
  - At time of intake: 106
  - After 6 months: 112
- **Unstable housing (shelter or temporary)**
  - 26
  - 32

**Number of Clients**
Different types of data...

- If you are working with distinct categories of data, a bar chart displays the information clearly, with the categories listed along the x-axis.

- A line chart can be used to show progression, or change over time.

- A pie chart shows proportions, and generally is not useful for outcomes data.
Here, a line graph is not appropriate, because these are distinct categories and not meant to show change over time...

Change in Housing Status from time of Intake to 6-months for a subset (n=138) of Active Clients, 2011
Displaying outputs...

- A pie chart shows proportions, and generally is not useful for outcomes data.

- A pie chart might be useful to show the proportion of outputs, such as the number of services provided, or the number of referrals.
Sample showing number of referrals (outputs) in bar chart form...

Number of Referrals for a subset of $n=45$ Clients
October 1, 2010 - March 31, 2011

- Mental health referral: 37
- Medical care referral: 31
- Social work referral: 34
- Legal counsel referral: 3
- Other referrals: 25
the same information as a pie chart - shows that the proportion of different services provided was fairly even.
Order of information in a Bar chart...

- The order of the categories does not need to be arranged alphabetically or numerically; instead, it should show convey some logical order or information.

- Data labels are generally discouraged; most textbooks assert that data labels confuse the audience. In some cases, however, they can help clarify the data.

- The legend should have minimal text, and in the same logical order as the data.
In this example of Client Goals, the categories are ordered numerically..

Goal-Setting by a subset of n=100 Clients
October 1, 2010 to March 31, 2011

Number of goal Set by clients
during meetings with Case Managers

<table>
<thead>
<tr>
<th>Number of Goals Met</th>
<th>0</th>
<th>5</th>
<th>10</th>
<th>15</th>
<th>20</th>
<th>25</th>
<th>30</th>
<th>35</th>
</tr>
</thead>
<tbody>
<tr>
<td>set 1 to 3 goals</td>
<td>29</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>set 4 to 6 goals</td>
<td>32</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>set 7 to 10 goals</td>
<td>20</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>set &gt;10 goals</td>
<td>19</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Can your audience understand a graph showing the comparison of two means...

**Goals accomplished during six months:**
Average Number of Goals Set and Met
October 1, 2010 to March 31, 2011
(for a subset of $n=100$ clients)

![Bar graph showing the comparison of average goals set (7.81) and average goals met (6.74) for a subset of 100 clients.]](image)
Here, categories are in chronological order, (to show progression to higher levels of education).

**Highest Education Level Attained (self-reported)**
for all Active Clients \((n=196)\)
**Reported at time of Intake**
October 1, 2010 - March 31, 2011

<table>
<thead>
<tr>
<th>Category</th>
<th>Number of Clients</th>
</tr>
</thead>
<tbody>
<tr>
<td>None/Not recorded</td>
<td>35</td>
</tr>
<tr>
<td>Elementary School</td>
<td>9</td>
</tr>
<tr>
<td>High School - Coursework</td>
<td>27</td>
</tr>
<tr>
<td>High School</td>
<td>68</td>
</tr>
<tr>
<td>College/Vocational - Coursework</td>
<td>44</td>
</tr>
<tr>
<td>College/Vocational - Degree</td>
<td>71</td>
</tr>
<tr>
<td>Graduate/Professional Training</td>
<td>49</td>
</tr>
</tbody>
</table>
Here is the same chart, drawing attention to the education levels most frequently attained...

**Highest Education Level Attained (self-reported) for all Active Clients \(n=196\)**

Reported at time of Intake

October 1, 2010 - March 31, 2011

<table>
<thead>
<tr>
<th>Education Level</th>
<th>Number of Clients</th>
</tr>
</thead>
<tbody>
<tr>
<td>Elementary School</td>
<td>9</td>
</tr>
<tr>
<td>High School - Coursework</td>
<td>27</td>
</tr>
<tr>
<td>None/Not recorded</td>
<td>35</td>
</tr>
<tr>
<td>College/Vocational - Coursework</td>
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<td>Graduate/Professional Training</td>
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<td>High School</td>
<td>68</td>
</tr>
<tr>
<td>College/Vocational Degree</td>
<td>71</td>
</tr>
</tbody>
</table>
This sample is listed in order to highlight which services were most needed...

**Services started after intake at ASTT**
(for subset of *n=45 Clients*)
October 1, 2010 - March 31, 2011

- School Started: 4
- Legal Counsel started: 7
- Employment started: 8
- ESL classes started: 11
- Medical Treatment: 23
- Case Mgmt (at ASTT): 37
- Mental Health (at ASTT): 39

Number of Clients receiving services
Clarifying your chart...

- Ask others to give you feedback on your chart: what is clear to you may not be clear to others. This will require several iterations.

- Try skimming your poster or document “backwards” – if someone begins by looking at graphics near the middle or end, will they be able to understand the message.

- Keep the message simple. More detail can always be provided in your document.
Some References:


Contact info:

- Please contact me if you would like to discuss these topics or if you would like additional examples.

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