



BY FARHANA HOSSAIN

A Brief Guide to Effective Data Visualization Practices

Data visualizations provide an accessible and efficient way to see and understand trends, relationships, and patterns in qualitative and quantitative information. They can help nonprofits and other social sector organizations engage staff, beneficiaries, funders and policymakers in driving towards outcomes. This brief guide synthesizes a few principles and best practices for designing effective data visualizations.

Uses of Data Visualization

Effective data visualizations can help leaders and practitioners at social sector organizations:

- **Foster an organizational culture of data-driven learning and decision-making** by helping staff at all levels engage with data and extract lessons that inform their individual work, including frontline staff, and by encouraging regular data collection and use. Since data literacy can vary across roles, it is critical to ensure that visualizations can be easily interpreted and understood by staff.
- **Manage and measure performance and outcomes** by helping them track progress to goals and by identifying strengths and weaknesses in patterns of activities, engagement, and outcomes.
- **Engage and empower beneficiaries and target populations** by making it easier to engage with programs at various stages (for example, visualizing important information in outreach and recruitment materials) and by helping beneficiaries understand their progress (for example, visualizing progress towards program milestones or against their own goals).
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- **Drive continuous improvement and evidence generation** by helping to explore large data sets and identifying relationships and patterns to drive program design, implementation, and evaluation decisions.
- **Communicate compelling narratives to funders, policymakers and other stakeholders** by using impactful representations of data to craft distinct, targeted messages and allowing them to extract lessons that are relevant for their work.

Key Guiding Principles

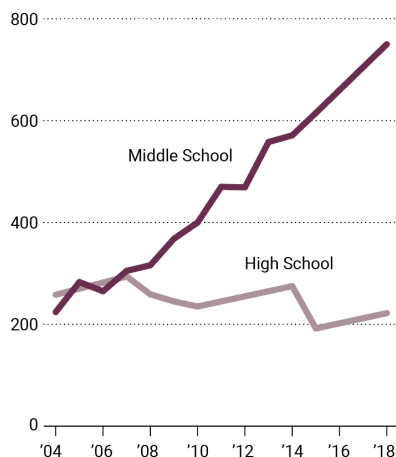
1. Choose a visual form that aligns with communication goal and data type

The first step in creating any visual — a table, chart, or diagram — should be to determine its purpose and communication goals. The most common data-communication goals are to:

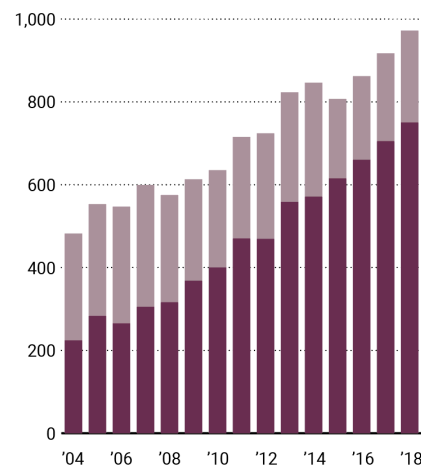
- Compare values of different categories (e.g. bar charts)
- Compare parts of a whole (e.g. pies or stacked bars)
- Show how values change over time (e.g. time series line)
- Show the distribution of values (e.g. histograms)
- Show relationship among data (e.g. scatter plots)

There are many ways to present and visualize the same set of data. The choice ultimately depends on the intended message: what are you trying to communicate? For example, the charts below visualize the same data set – the number of middle school and high school students who attend an afterschool program, but each chart makes a different point.

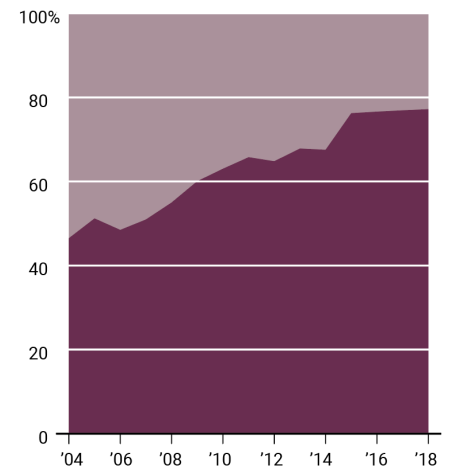
Trend for each group



Trend for whole program



Share of whole



Much has been written about how to choose the right visualization, and the following resources can help organizations choose the appropriate forms for their data and communication goals:

- Perceptual Edge [Graph Selection Matrix](#)
- Tableau [Which chart or graph is right for you?](#)
- Evergreen Data [Qualitative Chart Chooser](#)

2. Make user-focused design decisions to aid interpretation

Visualizations should be customized for target audiences and communication medium. In other words, who will use the visualizations and how? For example, will the users receive a printout report, or will they access a dashboard on their computers or tablets? What level of background knowledge and data literacy do the users have? Anticipating user needs can help create visualizations that are complete and clear – with all of the information necessary to make sure that the readers understand the information as intended (for example, appropriate annotations, labels, keys, etc.).

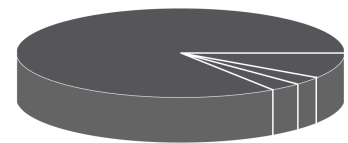
Strategic use color, type, space, and other design elements can help audiences effectively interact with visualizations and draw attention to the most important points:

- Make sure the type is legible – i.e. not too small – in print and on screen.
- Use color with purpose, and not just to decorate. Use soft, neutral colors to display most information and bright or dark colors to highlight information that require greater attention or warrant emphasis.
- Use icons and illustrations sparingly and with purpose. Icons are most effective when they are universally understood (an envelope for mail, for example) and can quickly reinforce the message being communicated. Consider gender and racial inclusion when using icons that depict people.
- Remove “chart junk” by editing default chart formats to remove elements that are redundant or add clutter.¹ For example:
 - Remove tick marks from bar charts;
 - Remove axes lines in horizontal bar charts where precise values are labeled next to the bars; and
 - Position data labels directly next to charts instead of using a legend, when possible.

3. Don’t use visualizations that distort the data.

Use of truncated axis (where the Y-axis does not start at zero), dual axes and added dimensions (e.g. a three-dimensional pie chart) can misrepresent what the data is actually saying.

A detailed discussion of such elements [can be found here](#).

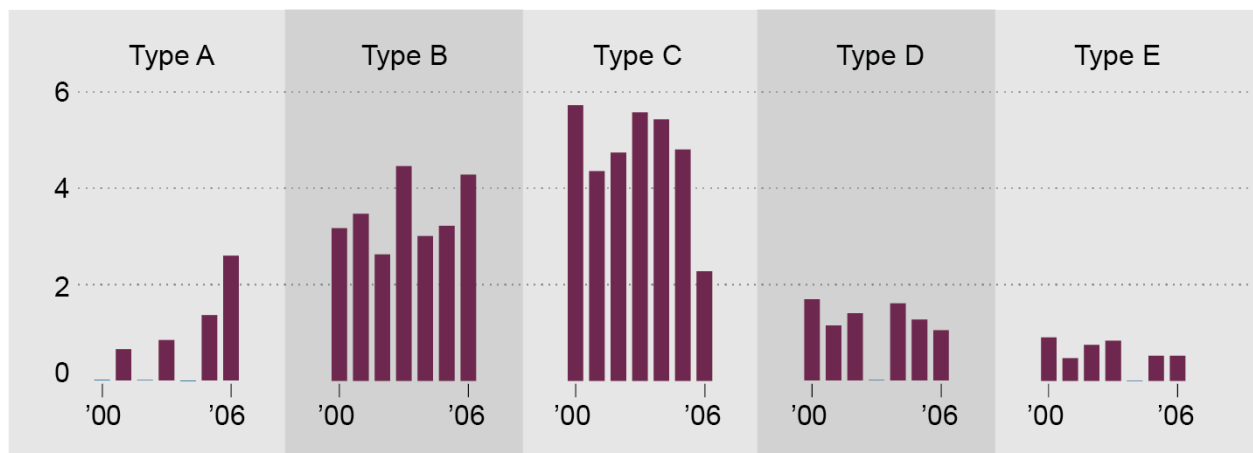
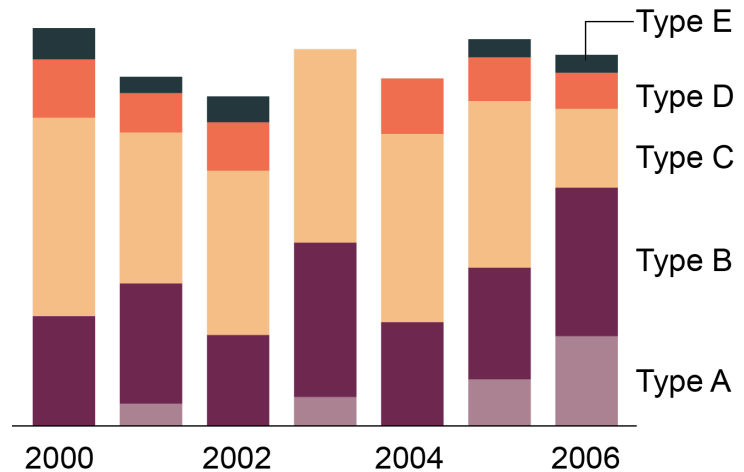


¹ “Chart junk” is a term coined by Edward R. Tufte and refers to extraneous elements in graphics that are not necessary to understand the information presented and that distract the audience from the message being conveyed.

4. Don't try to show too much in one visual.

Displaying too much information in a single chart or a map makes it difficult for readers to process the information visually, and relying on color to differentiate between many categories of information is often ineffective. Creating a panel of smaller charts – often referred to as “small multiples” – can be more effective and help audiences discern trends more quickly.

For example, the chart to the right shows the parts that make up the whole for each year, but it is nearly impossible to compare values across categories. Plotting each category separately as bars or lines in panel of charts can allow a better comparison in change over time. Plotting each category separately as bars or lines in a panel of charts, as shown below, allows a better comparison in change over time.



About the author

Farhana Hossain is an independent consultant and a Senior Evidence Advisor at Project Evident. Previously, she was a Research Associate at MDRC, where she led studies of program implementation for evaluations of youth and workforce programs. Prior to MDRC, Farhana was a data journalist for The Washington Post and The New York Times for more than a decade and oversaw the development of data visualization to inform politics and policy coverage.