Data Visualization and Infographics

Data visualization translates complex ideas and concepts into a simple visual context. Patterns, trends, and relationships that might go undetected in text are conveyed at a glance in effective data visualization.

Mathematica is a leader in using effective data visualization and infographics to communicate research and policy findings. Our expanded and varied visual presentation of information is providing new insights and changing the way researchers, media outlets, and policy-makers interact with data. Data visualization can be used at every stage of the research process: defining the context of a study, helping to collect and provide quality review, conducting data analysis, and communicating findings.

The following examples show the breadth and depth of our recent work.

INFографICS

Infographics make a large amount of data more consumable, especially if the audience is new to the presented subject. Conceptually, they can describe relationships, make comparisons, or illustrate concepts related to time and lend themselves to telling a story through data and images.
Mortality measures
1. Diagnosis
2. Transferred (with matching diagnosis)
3. Assignment of Patient’s outcome

Readmission measures
1. Readmission diagnosis
2. Transferred
3. Readmission outcome attributed

Theory of Action for Data-Driven Decision Making in Education

Teen birth rates drop, but disparities continue

Birth Rate per 1,000 Females Ages 15–19, 1990–2012

1990
- Hispanic: 46.3
- Black, non-Hispanic: 43.9
- American Indian/Alaska Native: 34.9
- White, non-Hispanic: 20.5
- Asian/Pacific Islander: 9.7

2012
- Hispanic: 29.4
- Black, non-Hispanic: 29.4
- American Indian/Alaska Native: 21.0
- White, non-Hispanic: 9.7
- Asian/Pacific Islander: 7.7

Source: NCHS Data Brief, No. 136, December 2013

What Works for Disadvantaged Adults
Reverse the decline in funding for the WIA Adult Program and other similar programs
Invest more per person
Invest in sectoral programs for in-demand occupations

What Works for Disadvantaged Youth
Intensive and comprehensive programs
Residential programs
Focusing on more mature youth

What to Try for Dislocated Workers
- Programs with open entry
- On-line programs that allow work while training
- Sectoral programs
- Targeting those with a positive return on the investment in training
- Modular programs that allow workers to customize training
Like a road map, a logic model shows the route traveled (or steps taken) to reach a destination, i.e., it presents a picture of how an effort or initiative is supposed to work. However, it does not need to be linear. A good model shows at a glance how each activity will lead to desired changes, or sketches out the chosen routes and how far you will go.

“Visualizing information can give us...clarity, or the answer to a simple question, very quickly.”
David McCandless, TED talk on The Beauty of Data Visualization
DATA VISUALIZATION: BEFORE AND AFTERS

Data visualizations are conducive to exploration and help the viewer create a story on their own. The narrative may provide context, but the visualization (whether static or interactive) does not. It is a more objective presentation than an infographic and used when the audience is familiar with the data to place the data in context and provide clarity. Here are some before and after examples of our work.

BEFORE

The example above provides an easy visual snapshot of over 45 measures to show whether rates are significantly higher or lower by hospital size.

AFTER

The example above translates Excel data into a national picture.