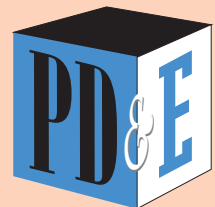
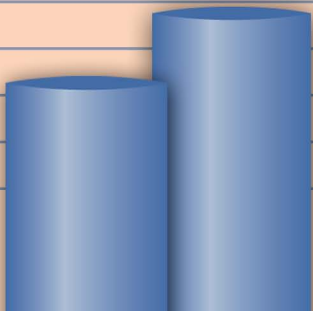
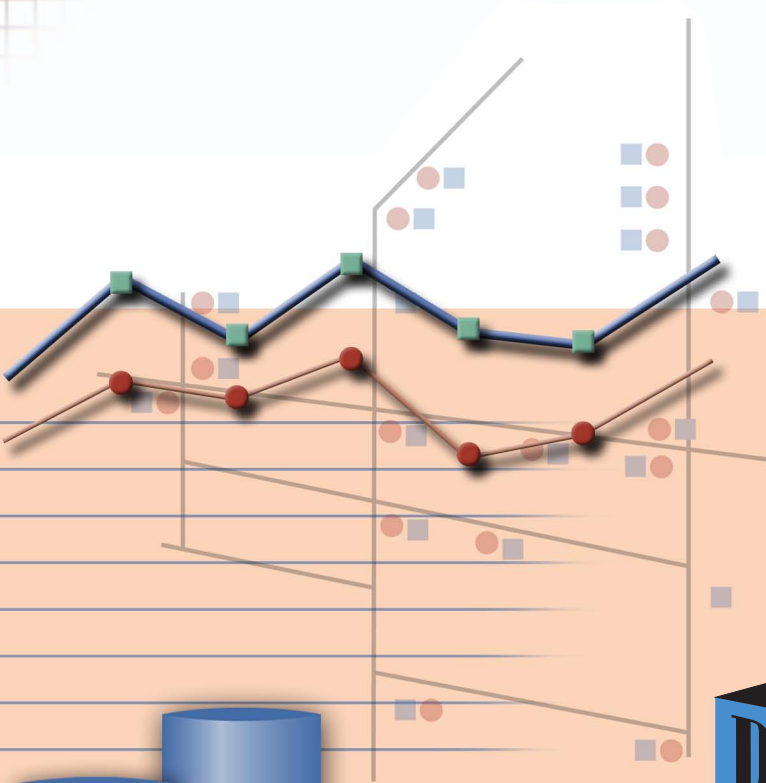


G3658-13

Using Graphics to Report Evaluation Results

Ed Minter
Mary Michaud
2003



Program Development & Evaluation
University of Wisconsin-Extension



Why use graphics to present evaluation results?

People “consume” information in different ways and presenting information graphically can help clarify evaluation results. While some find text easy to digest, others find that graphics – bar charts, pie charts, illustrations and photographs – can simplify complex information, emphasize key points and create a picture of the data.

Graphics can also tell a story, showing proportions, comparisons, trends, geographic and technical data and, in the case of photographs, putting a “human face” on a project.

This booklet gives a brief overview of how to choose among common types of graphics and ensure that they accurately represent your data.

Before choosing a graphic to illustrate evaluation results, ask the following questions:

- ▶ What is the *purpose* of this report?
- ▶ *Who will use* the information?
- ▶ What are the *key messages* for this audience?

Think about the types of graphics readers are used to seeing. For example, are members of the general public ready for a complex line graph showing trends or will a simpler graphic do a better job of helping them understand the main points? Using graphics may not always be the best approach. Ask yourself whether readers will take time to decipher complex pie charts with multiple categories or whether a simple table will do the trick.

Remember three rules of presenting data using graphics:

- ▶ Keep it simple.
- ▶ Choose a graphic that communicates the most important message.
- ▶ Don't assume people will read text that accompanies a graphic.

This booklet does not provide exhaustive rules on how to present data graphically. It does, however, offer guidelines on how to choose the most appropriate graphic to communicate data to different audiences.

Ask yourself whether the audience will take the time to decipher complex pie charts with many categories or whether a simple table will do the trick.

▶ purpose
▶ audience
▶ message

Characteristics of an effective graphic

Graphics that use data will benefit from several key elements, illustrated in the sample bar chart below. In this example, the title clearly states the units of analysis (Williams County and Wisconsin worksites), the statistic used to describe the data (percentage) and the dates data were collected (2001). The asterisks draw attention to information sources, listed below the graph.

Include these elements in each graphic:

Title

Clear units of measure

Date(s) data collected

**Simple, straightforward
design** without clutter

Font size 10 point or larger

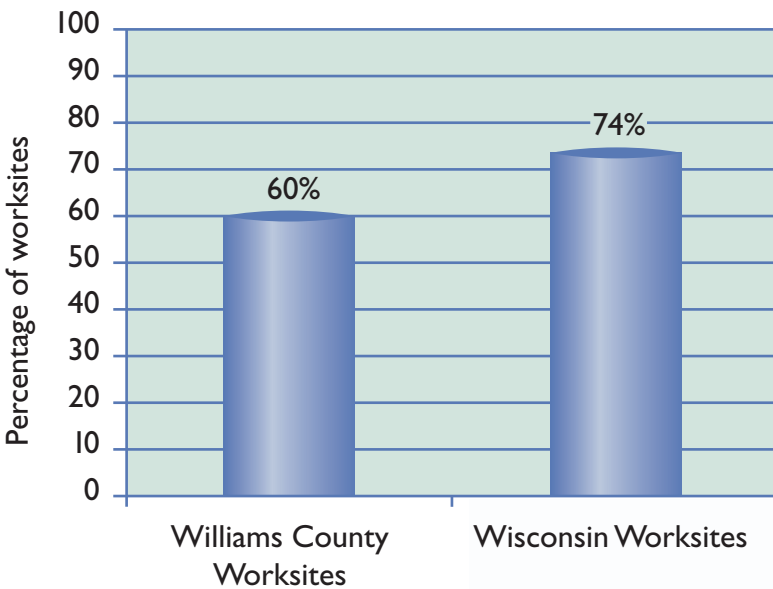
Data source(s)

Sample size

Be prepared to answer any questions about sampling and analysis methods, and include a description of the methods in written reports.

In this example, we left out sample size and level of confidence in results (see www.uwex.edu/tobaccoeval for additional resources on sampling). Audiences who do not regularly consume technical information may find that these details clutter the graphic. However, be prepared to answer questions about sampling and analysis methods, and include a description of the methods in written reports.

Percentage of Williams County and Wisconsin worksites* that ban smoking indoors, 2001**



* Worksites for both surveys are defined as those with more than five employees.

** Source: University of Wisconsin Monitoring and Evaluation Program. *Results of 2001 Wisconsin Worksite Smoking Policy Survey*. March 2002. Williams County Tobacco-Free Coalition.

When to use common graphics

	When to use	Tradeoffs
Bar chart	Versatile and good for comparisons. Relatively easy to construct.	Units on Y axis (vertical axis) can sometimes be too small to show meaningful differences.
Line graph	Useful for showing trends and differences between groups.	Too many data lines can confuse.
Pie chart	Shows proportions (percentages) of a whole.	Too many categories can mislead. Not ideal for showing trends.
Illustration <i>Examples: Diagrams, maps, drawings</i>	Conveys lots of information in a small space. Shows technical and geographic data.	May take up a lot of space. Complex illustrations may not photocopy well.
Photograph	Adds a “human face” to data. Captures before-and-after pictures of a program or intervention.	May be costly. Sometimes difficult to take high-quality photos. Can take up a lot of space in a report. May not photocopy well.

Tips

- Label the horizontal (x) and vertical (y) axes.
- Use as few bars or lines as possible (max. 6 bars or 3 lines).
- Emphasize one aspect of the data by changing a bar's color or texture.
- To clarify values, add value labels at the top of the bar.
- Label lines on line graphs and, if possible, use different colors.
- Use gridlines, horizontal lines across the chart, beginning at each interval on the vertical axis.

- Use six or fewer slices.
- Use contrasting colors, shades of gray or simple patterns to increase readability.
- Label the slices.
- Emphasize a certain piece of data by moving its slice out from the circle.

- Position the title above the illustration.
- Keep illustrations simple. If the illustration needs a lot of explanation, it is probably too complicated for an illustration.
- Provide ample white space around and within the illustration

- Get written permission to take the picture as well as permission to use the photo in a publication.
- Figure out ahead of time what you want to photograph and how pictures will be used.
- Use several photographers to capture multiple perspectives.

Bar charts

Bar charts show comparisons and are relatively easy to construct. Take a moment to study the bar chart below. What does it show you? What do you conclude? What questions does the chart prompt?

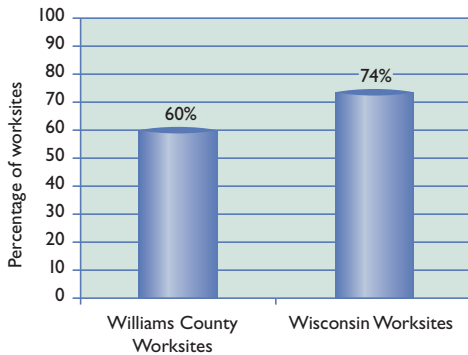
Depending on the audience, this bar chart may require more information about methods used, such as the sampling process, to collect data.

Note that the footnote says worksites are defined the same way in these two studies, making findings comparable.

However, if this was a chart on smoking prevalence among youth, the findings would not be

comparable. That's because the Williams County survey defines youth as between 11 and 18, while the statewide survey defines youth as younger than 21.

Percentage of Williams County and Wisconsin worksites* that ban smoking indoors, 2001**



*Worksites for both surveys are defined as those with more than five employees.

** Source: University of Wisconsin Monitoring and Evaluation Program. *Results of 2001 Wisconsin Worksite Smoking Policy Survey*. March 2002. Williams County Tobacco-Free Coalition.

A few simple steps make the chart less cluttered:

- ▶ Value labels (percentages listed above the bars) add precision.
- ▶ The title also uses precise language; “worksites that ban smoking indoors” is less ambiguous than “worksites that have smoking policies.”
- ▶ Gridlines add depth and dimension, helping readers see the difference between each bar of data.
- ▶ Although the y-axis data label may seem redundant, it ensures that readers know what the values mean.

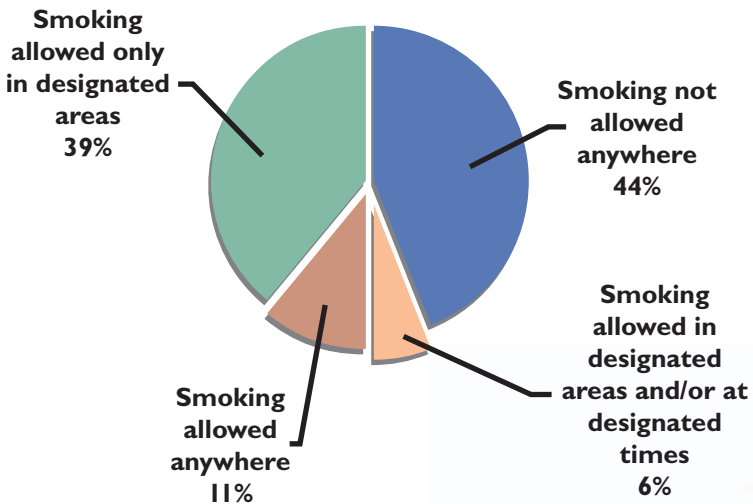
Pie charts

Pie charts show proportions of a whole. The pie chart below gives a breakdown of restaurant smoking policies in Ozaukee County.

With only the information in the graphic, readers may wonder whether this survey represents all restaurants in the county, only restaurants that responded to the survey, or restaurants that include bars. To avoid confusion, supplement the graphic with information about sampling methods, response rates and limitations of results.

Smoking Policies in Ozaukee County Restaurants, 2001

(57 restaurants surveyed)



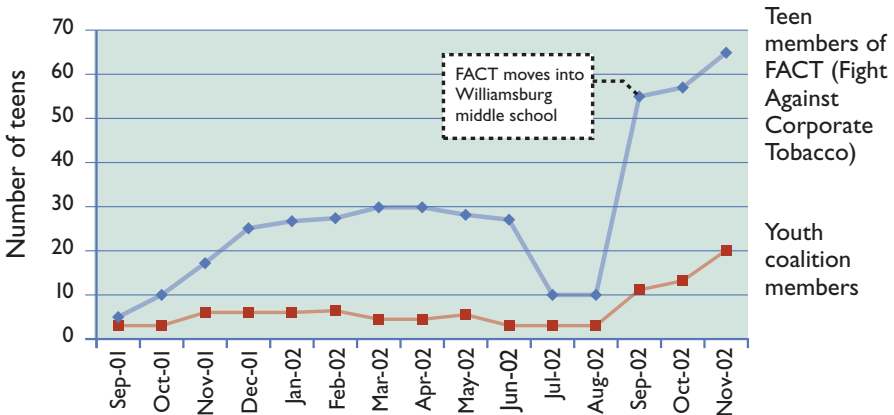
Source: Ozaukee Tobacco-Free Coalition.
2001 Ozaukee County Restaurant Survey

Line graphs

Line graphs show trends over time. They also show the ways groups differ over time. For example, lines on the graph may show that behavior patterns between two or more groups converge, diverge or stay the same.

The graph below shows that between September 2001 and November 2002, teen involvement in the Williamsburg FACT group increased. Not surprisingly, the graph tells us that fewer teens were involved over the summer and that membership increased significantly when the school year began.

Youth Involvement in Williams County Tobacco-Free Coalition, 2001-2002



Source: Williams County Tobacco-Free Coalition, 2002

Testimonials from teens involved in the program from the beginning might help tell the story of what they gained from their participation. Combining quantitative and qualitative data can tell a powerful story about community change and the forces behind it.

FACT really took off when we started mentoring the middle school students. Then I really got excited about what we could do.

—Chelsea Brinkman, sophomore
Williamsburg High

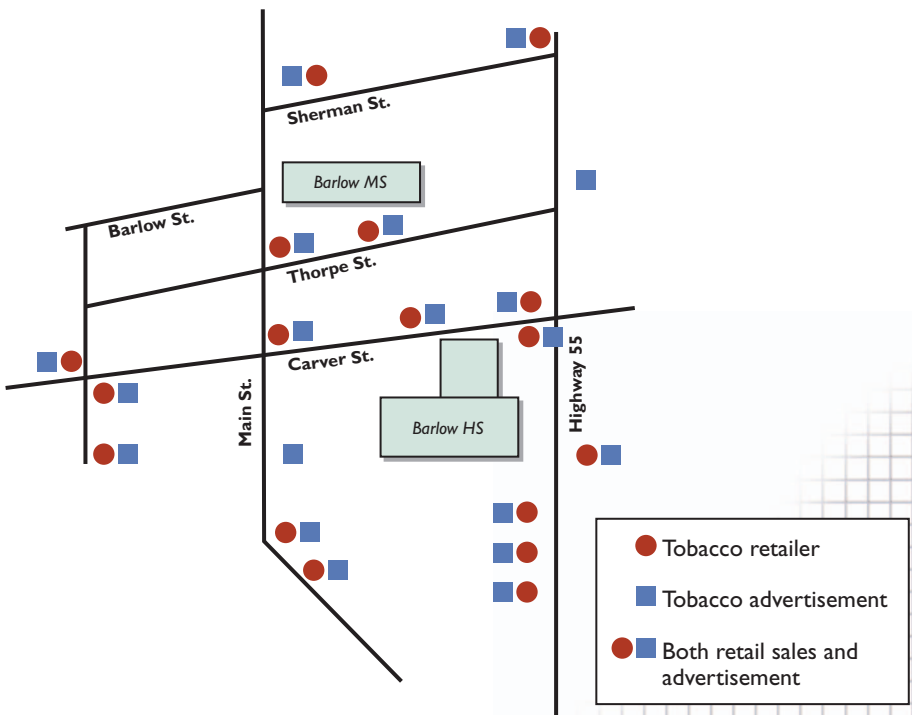
Illustrations

Illustrations can convey lots of information in a small amount of space. They can also convey technical information and geographic references. The example below, created using the “Drawing” toolbar in Microsoft Word, shows a map of tobacco retailers and advertisements within a mile of a high school and middle school. For parents and administrators, this illustration tells a compelling story about the presence of the tobacco industry in their children’s daily environment.

Text or oral explanations accompanying this illustration might explain how “Ad Watch” was conducted and how “tobacco retailer” and “tobacco advertisement” were defined. Another map a year or two later might show a decrease in the number of locations that advertise tobacco by crossing out the square:



Tobacco retailers and advertisements within one mile of Barlow High School and Middle School, 2001



Source: Williamsburg FACT group, Community Ad Watch, 2001

Photographs

Photographs often convey information better than text. They can show what happens before and after a program intervention, such as the number of tobacco ads in front of a store before and after an Ad Watch campaign. The example below combines text with a picture showing how and where tobacco products are placed in retail spaces. Text without a photograph would not convey such a powerful message.



**OPERATION
STOREFRONT**

Where are Products Located?

- **In open displays**
- **Within children's reach**
- **Near the door to invite shoplifting**



Source: Omaha Tobacco-Free Coalition, Operation Storefront, 2000

Use photography to:

- ▶ Capture before-and-after information.
- ▶ Help the audience understand participants' experiences.
- ▶ Show unexpected or secondary effects of a program.
- ▶ Document how a program was implemented.
- ▶ Compare, count, measure, qualify or track changes in the environment, such as signage in a school district or advertising in a community.

Checklist

The following questions will help ensure your graphic conveys an accurate message appropriate for your intended audience.

Before you start the graphic, ask:

- ▶ What audience are you trying to reach?
- ▶ What type of graphic is the audience used to seeing?
- ▶ What is the purpose of the graphic? What is the main message you want to convey?
- ▶ Is the type of graphic the most appropriate one to use for this message?
- ▶ Will more than one graphic deliver the message more effectively?
- ▶ Will text or oral explanation clarify the message, or is the graphic clear enough to stand on its own?

After you create the graphic, ask:

- ▶ Is the graphic easy to understand?
- ▶ Is the graphic presentation easy to interpret for someone not familiar with the material?
- ▶ Does the graphic accurately reflect the data?
- ▶ Is the graphic close to the relevant text?



References

Chin, Maggie. 2002. Caledonia/Mt. Pleasant/North Bay Restaurant Survey Findings, July 2002.

Haaland, Jan-Aage, Ulf Jorner, Rolf Persson, Anders Wallgren, Britt Wallgren. 1996. Graphing Statistics & Data, Creating Better Charts. California: SAGE Publications, Inc. (Chapters 1, 11, 14)

Piontek, Mary E., Hallie S Preskill, Rosalie T. Torres. 1996. Evaluating Strategies for Communicating & Reporting, Enhancing Learning in Organizations. California: SAGE Publications, Inc. (Chapters 4, 5)

Marten, Sue. 2001. Smoke Free Restaurants in Ozaukee County.

Ozaukee County Tobacco Free Coalition 2001 Smoke Free Restaurant Survey Presented at the Ozaukee County Tobacco Free Coalition Meeting, Grafton, WI November 2001.



Using Graphics to Report Evaluation Results

Program Development and Evaluation

www.uwex.edu/ces/pdande

© 2003 by the Board of Regents of the University of Wisconsin System. All rights reserved.

Authors: Ed Minter, Regional Evaluation Specialist, and Mary Michaud, State Coordinator for Local Program Evaluation, University of Wisconsin-Cooperative Extension

This booklet was developed by UW-Extension staff as part of the Monitoring and Evaluation Program—Local Program Evaluation with funding from the Wisconsin Tobacco Control Board,
www.uwex.edu/ces/tobaccoeval

Design/production: Jeffrey Strobel, UW-Extension Environmental Resources Center

University of Wisconsin-Extension, U.S. Department of Agriculture and Wisconsin counties cooperating. UW-Extension provides equal opportunities in employment and programming, including Title IX and ADA.

Copies of this publication and others in this series are available at <http://cecommerce.uwex.edu> or call toll-free: 877-WIS-PUBS (947-7827).

Using Graphics to Report Evaluation Results (G3658-13)

May 2003