

Map Design and Communication

GIS I: Organizing Principles

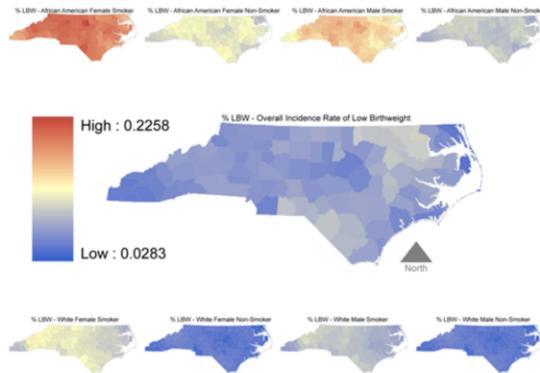


- Identify map design fundamentals
- Explore GIS as a communication tool
- Discuss examples of map design and explore choices based on specific products



- **Map objectives vary**
 - **Share information**
 - **Highlight relationships in space**
 - **Tell a visual story**

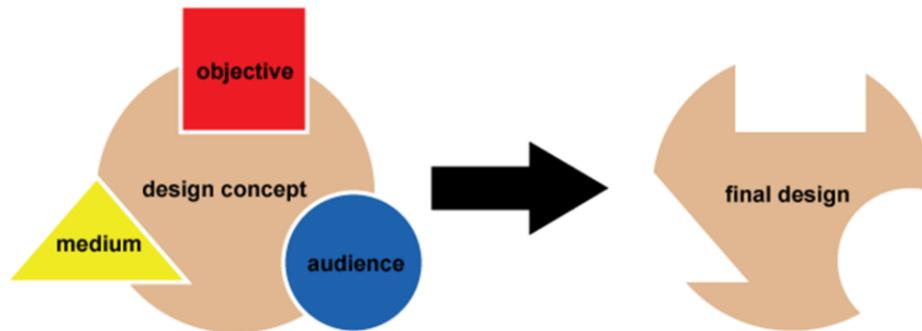
- **Design objectives provide focus**
 - **Manipulate graphic characteristics**
 - **Clearly communicate map objectives**



Map objectives: most analysis ends with the communication of results

Design objectives can be considered a means to the end: make the graphic and text elements of your map work for you;

helping the map reader make proper use of your map = meet your map objectives



Key factors that guide your design objectives:

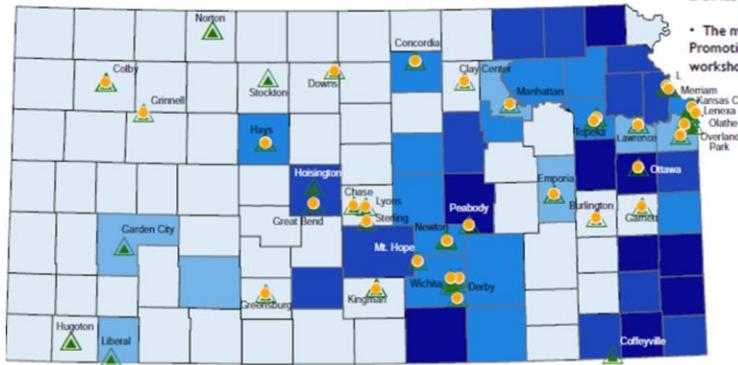
- What is the map objective?
- Who is the audience?
- How will the map be used?

Other important factors to consider:

- Balance between generalization and reality
- Scale and level of detail
- Technical limits - printing and plotting hardware limits (i.e., @ 1:1,000,000 scale a 10 meter road should appear as a line on a map 0.01 mm long; smallest line possible rendered by inkjet technology is 0.1 mm; color printing issues)

Example Map 1

Kansas Chronic Disease Self-Management Program
Workshop Sites, 2012-2014



- The Kansas Arthritis Program tries to increase healthcare access for people with arthritis and other chronic conditions so that they can improve self-management.
- One purpose of this map is to determine which areas with high prevalence of arthritis have not yet been targeted.
- The map will help the Bureau of Health Promotion strategically plan where new workshop sites will be implemented.

Arthritis Prevalence

Lightest Blue	Insufficient data
Medium-Light Blue	0.1% - 18.8%
Medium-Dark Blue	18.9% - 24.7%
Darkest Blue	24.8% - 28.6%
Darkest Blue	28.7% - 33.8%

Workshops

- Yr1 workshops n=40 (Yellow Circle)
- Yr2 workshops n=23 (Green Triangle)



Data Source: Arthritis prevalence: 2011 Behavioral Risk Factor Surveillance System, Bureau of Health Promotion, Kansas Department of Health and Environment; CDSMP workshops: 2012-2014 NCOA database



This is a choropleth map that uses shades of blue to indicate arthritis prevalence. The author used color and shape on the point symbols for the different types of workshops to help the audience easily distinguish between them.

Smoking Violations on Denver Health Campus, Jan.-Aug. 2014

- The Denver Public Health Chronic Disease Tobacco Team conducted weekly surveys of the Denver Health Campus to see if smoking violations were a serious issue on the hospital's campus.
- The areas with the largest amount of smoking violations seem to be near major roadways and parking lots.
- Smoking violations represent smokers who were hospital system employees, patients, or visitors.

"No Smoking" Signs



Smoking Violations



1



5



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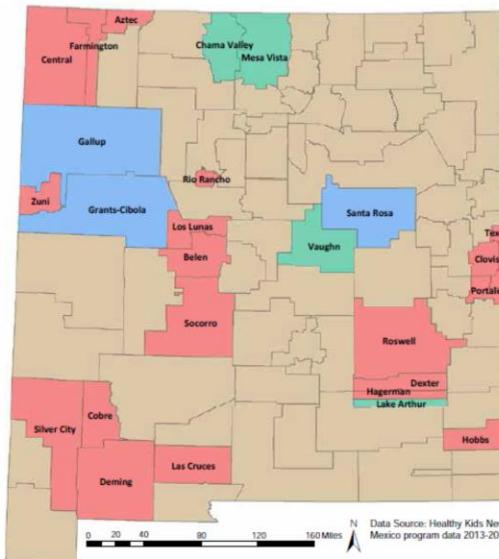


Data collected by the DPH Chronic Disease Tobacco Team during weekly campus audits.

This map uses satellite imagery to help the audience identify place. The point symbology utilizes yellow proportional dots to symbolize the magnitude of smoking violations (quantitative data), and red circles that use the standard convention for 'no' to denote the "No Smoking" sign locations (qualitative data).

Example Map 3

Status of School District Wellness Policies in New Mexico,
School Year 2013-2014



- Healthy Kids New Mexico works with public school districts to update and strengthen their wellness policies to include language supporting healthy eating, physical activity, and staff wellness.
- This map shows the progress school districts are making in updating and strengthening their wellness policies.
- This map is helpful for statewide programming, strategic planning, identifying gaps and opportunities, and building collaborative partnerships across state agencies and organizations.

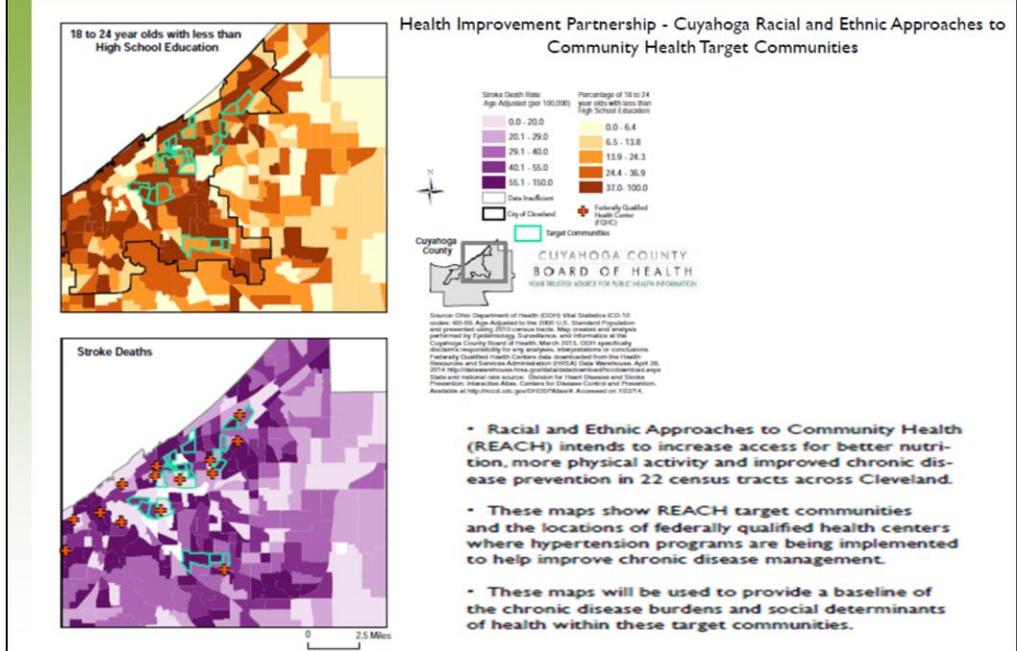
District Wellness Policy Progress

- In Process of Updating Policies
- Updated & Approved Policies
- Implemented New Policies
- No Progress



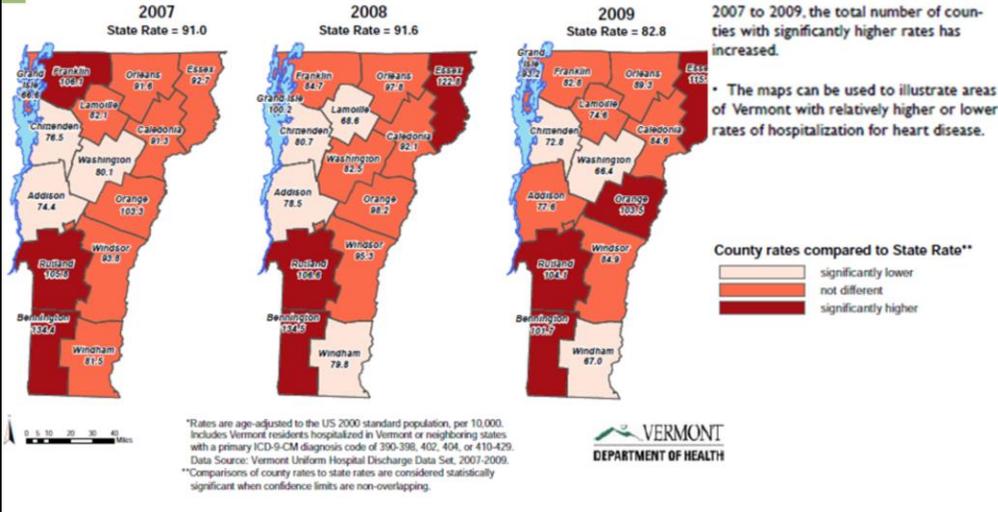
Data Source: Healthy Kids New Mexico program data 2013-2014

This map symbolizes qualitative data with an appropriate color scheme. The colors are not related to each other but they are of a consistent color value (i.e. not mixing pastels and brights) so that they form a pleasing color palette.



These maps use design to tell the audience that they are looking at the same geographic area but with different health outcomes. There are areas of interest that are consistent between the maps and these are highlighted in the same color between the maps so that it is apparent to the audience that the reference is to the same geographic locations.

Hospitalization Rates* for Diseases of the Heart by Vermont County of Residence, 2007-2009

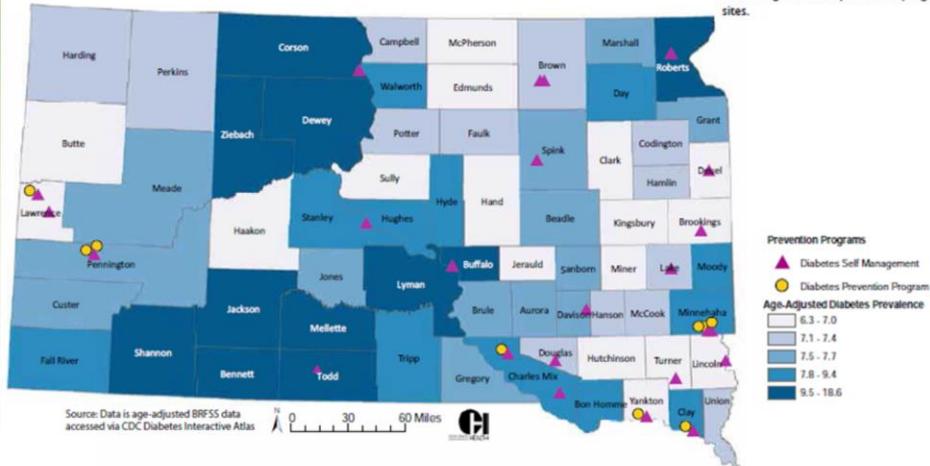


- These maps illustrate variation of hospitalization rates among individual counties and show a slight decrease of the state rate over time.
- While the state rate has declined from 2007 to 2009, the total number of counties with significantly higher rates has increased.
- The maps can be used to illustrate areas of Vermont with relatively higher or lower rates of hospitalization for heart disease.

This map uses the map design principle of 'small multiples' in order to visualize changing rates in the same geographic place but across different time spans.

Diabetes Prevalence and Prevention Programs Among South Dakota Adults, 2011

- Prevalence of diabetes within South Dakota counties ranges from 6.3%-18.6%.
- Diabetes Self-Management and Prevention Programs are proven ways to combat and control the disease.
- The purpose of this map is to determine the need for and location of future diabetes self-management and prevention program sites.



This map is another example of a good use of color and shape to let the audience easily distinguish between different types of point data.

The good cartographer is both a scientist and an artist. (S)He must have a thorough knowledge of (her) his subject and model, the Earth.... (S)He must have the ability to generalize intelligently and to make a right selection of the features to show. These are represented by means of lines or colors; and the effective use of lines or colors requires more than knowledge of the subject – it requires artistic judgment. Erwin Josephus Raisz –

author of the first cartography textbook in English: *General Cartography* (1938).



Level 1 Map review: Reviewer Map Submitter Team

Title/text:

Formatting- consistency
Grammar
Spelling
Appropriateness- does it match content?
Title structure- for example: the term 'age adjusted' belongs in the legend title, not the map title; first words describe main variable(s), years are usually at the end of the title, and general smooth flow of information in the title
Font size- is text legible at the scale for which it was intended to be distributed?
Acronyms and abbreviations- have these been defined before use?

Title/Text comments

Map elements/layout:

Size, shape, and orientation of map- are these appropriate?
Color- are the colors used for symbols and shapes appropriate?
Visual hierarchy- does this support the main feature(s) of the map?
Visual contrast- are key map features distinguishable?
Projection- does the map use the correct projection?

Map elements/ layout comments

This is an example of a map review request.