Telling the Public Health Story using InfoGraphics

Issac Evans

September 16, 2014
DATA VISUALIZATION
Data Visualization is...

- The use of graphics to communicate information clearly and more effectively
  - Aesthetic Forms and Functionality
  - Enhanced comprehension of complex data
  - Convey key-aspects in a intuitive way
The Value of Data Visualization
IMPACT OF INFOGRAPHICS
• Initially planned to give money mainly to get countries wired and full of computers

• Interest redirected to fighting disease in third world countries after reading a two-part series article back in January 1997

• Later confessed it wasn’t the 3,500 word article but the graphic that impacted him
In Third World’s Impoverished Lands, Water Is a Deadly Drink

[Photo of a woman and children by a river]

Groups That Help Those Who Fall Ill

The Struggle
Approaches Aimed At Cleaner Living

Precautions for Those Who Travel in Risky Areas

To KEFIR World
“No graphic in human history has saved so many lives in Africa and Asia” —Nicholas Kristof

A CLOSER LOOK

Death by Water

A huge range of diseases and parasites infect people because of contaminated water and food, and poor personal and domestic hygiene. Millions die, most of them children. Here are some of the deadliest water-related disorders.

<table>
<thead>
<tr>
<th>DISORDER/ESTIMATED DEATHS PER YEAR</th>
</tr>
</thead>
<tbody>
<tr>
<td>DIARRHEA</td>
</tr>
<tr>
<td>3,100,000</td>
</tr>
<tr>
<td>SCHISTOSOMIASIS</td>
</tr>
<tr>
<td>200,000</td>
</tr>
<tr>
<td>TRYPANOSOMIASIS</td>
</tr>
<tr>
<td>130,000</td>
</tr>
<tr>
<td>INTESTINAL HELMINTH INFECTION</td>
</tr>
<tr>
<td>100,000</td>
</tr>
</tbody>
</table>

Sources: World Health Organization, American Medical Association Encyclopedia of Medicine.
Why Is Data Visualization Helpful, Needed, Growing?

- People like and relate to symbology
- Helps translate complex scientific data for visual learners and low literacy audiences
  - Information graphics are suitable and most effective where design gives readers the “a ha” reaction
Why Is Data Visualization Helpful, Needed, Growing?
As of August 2011,
• IKEA stores in more than 38 countries
As of August 2011,
- IKEA stores in more than 38 countries
- Serving over 655 million people annually
As of August 2011,
- IKEA stores in more than 38 countries
- Serving over 655 million people annually
- 27 different languages
- 1 product assembly guide
GOOD USE OF INFOGRAPHICS
<table>
<thead>
<tr>
<th>Product</th>
<th>Old size</th>
<th>New size</th>
<th>Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tropicana orange juice</td>
<td>64 oz</td>
<td>59 oz</td>
<td>-7.8 percent</td>
</tr>
<tr>
<td>Ivory dish detergent</td>
<td>30 oz</td>
<td>24 oz</td>
<td>-20 percent</td>
</tr>
<tr>
<td>Kraft American cheese</td>
<td>24 slices</td>
<td>22 slices</td>
<td>-8.3 percent</td>
</tr>
<tr>
<td>Kirkland Signature (Costco) paper towels</td>
<td>96.2 sq ft</td>
<td>85 sq ft</td>
<td>-11.6 percent</td>
</tr>
<tr>
<td>Haagen Dazs ice cream</td>
<td>16 oz</td>
<td>14 oz</td>
<td>-12.5 percent</td>
</tr>
<tr>
<td>Scott toilet tissue</td>
<td>115.2 sq ft</td>
<td>104.8 sq ft</td>
<td>-9 percent</td>
</tr>
<tr>
<td>Lancane first aid spray</td>
<td>113 grams</td>
<td>99 grams</td>
<td>-12.4 percent</td>
</tr>
<tr>
<td>Chicken of the Sea salmon</td>
<td>3 oz</td>
<td>2.6 oz</td>
<td>-13.3 percent</td>
</tr>
<tr>
<td>Classico pesto</td>
<td>10 oz</td>
<td>8.1 oz</td>
<td>-19 percent</td>
</tr>
<tr>
<td>Hebrew National franks</td>
<td>12 oz</td>
<td>11 oz</td>
<td>-8.3 percent</td>
</tr>
</tbody>
</table>
Static InfoGraphic

THEN: 64oz  10oz  24 SLICES  30oz  16oz  3oz  115.2 FT  12oz

-7.8%  -19%  -8.3%  -20%  -12.5%  -13.3%  -9%  -8.3%

NOW: 59oz  8.1oz  22 SLICES  24oz  14oz  2.6 oz  104.8 FT  11oz

SOURCE: CONSUMER REPORTS  A COLLABORATION BETWEEN GOOD AND BRADLEY R. HUGHES
Figure 4. Trends in the prevalence of obesity among adults aged 20 and over, by sex: United States, 1999–2010

1Significant increasing linear trend 1999–2000 to 2009–2010 (p < 0.0001).

NOTE: Estimates were age adjusted by the direct method to the 2000 U.S. Census population using the age groups 20–39, 40–59, and 60 and over.

Dynamic InfoGraphic

1985

CDC

No Data  <10%  10%-14%  15%-19%  20%-24%  25%-29%  ≥30%

Map of the United States showing data distribution across different states.
THE PROCESS
InfoGraphic Process

• Background and Process Development
• Service Options
• Production Timeline
• Key Roles
• Workflow Chart
• Sample Products*
BACKGROUND & PROCESS DEVELOPMENT
Research

<table>
<thead>
<tr>
<th>EX: CREATIVE</th>
<th>TOPIC</th>
<th>FACTS</th>
<th>ISSUE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>ACTION ITEM</th>
<th>GOAL</th>
<th>BENEFITS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>END PRODUCT</th>
<th>CREATIVE BRIEF</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1. PRINT / COMMUNICATION POLICY
   - Limited distribution
   - PRO: Accessible but low awareness
   - CON: Higher distribution/global
   - TECHNICAL LIMITATIONS?

2. WEB
   - PRO: High visibility
   - CON: Highest distribution

3. SOCIAL MEDIA
   - PRO: High visibility
   - MAX DISTRIBUTION
   - TECHNICAL LIMITATIONS?
   - APPROVAL REINFORCED? (Criteria)

4. DESIGN CONSULTATION
   - CREATIVE BRIEF
   - PROJECT TIMELINE
   - INVOLVES GB/SPCB/SME
Consultation

1. CONTENT
2. DATA
3. BRAINSTORMING
4. WHATS THE POINT?

Product

5. Concept
6. Development
7. Intended Use

- Website
- Social Media
- Print

Product

- WHAT LIMITATIONS TO BE CONSIDERED

Final Production

4. Comps (drawings only)
5. Rendering
6. Pitch

- Style
- Tone
- Art Direct

Evaluation

7. Final Production
8. Revisions

- 508
- File Preparation
- D.

8. Focus Study
- Survey
- Target Audience
InfoGraphics 2-Day Training

Column Five Media
Ross Crooks

Design firm based in Newport Beach, CA renowned as the industry leads in data visualization/social strategy/infographic design.

CLIENTS:
eBay, Esquire, Facebook, General Electric, GOOD Magazine, Google, Harvard University, Microsoft, Newsweek, Nokia, Playstation, Travelocity, Yahoo, The Wall Street Journal, etc.
Creating Great InfoGraphics OnDemand Design Tutorial

Deep Local Inc
Nathan Martin
Collin Miller

Design agency out of Pittsburg, PA offering an online tutorial through MyDesignshop.com that covers step-by-step guidance to the information design process
“If you want to be creative, you need to build physical habitats that unlock your imagination.”
SERVICE OPTIONS
**INFOGRAPHIC: CHARTS, FIGURES AND MANUSCRIPTS**

The study or analysis of subject matter to create iconography or visual graphic concepts, elements, and pictographs to visually represent traditional data, statistics, charts, graphs, and maps with clarity and in a meaningful way.

- Turnaround: 10-15 working days*
- Center Approval Required
- HHS Clearance require if new data is being presented
INFOGRAPHIC: STORYTELLING WITH DATA

The structural and visual display of content and data sets in a logical order that explains a process, supports an argument, or tells a story. Visual metaphors and graphic elements are strategically used throughout the product to assist with comprehension and ease of navigation throughout the narrative.

- Center Approval Required
- HHS Clearance required
- Delivery date TBD
KEY ROLES
InfoGraphic Process: Key Roles

• Technical Advisors
• Graphics Support
  – Design Staff
  – Quality Assurance/Control Manager
• Writer/Editor Support
• Subject Matter Experts
  • Health Communication Specialist
  • Public Affairs Officer
  • Epidemiologist
Technical Advisors

Laura Northen
OD and NCEZID

Brittney Spilker
NCBDDD, NCCDPHP and NCEH/ATSDR

Belinda Ware
CGH, NCHHSTP, NCIPC and NCIRD
PRODUCTION TIMELINE
InfoGraphics Production Timeline

CIO REQUEST
- SME
  - CONTENT:
    - story
    - data & stats

CONSULTATION
- TA & SME
  - CRITERIA:
    ✓ enhance meaning
    ✓ of public interest
    ✓ eye-opening factor
    ✓ empowering
  - KEY MESSAGE
  - CREATIVE BRIEF
  - WEB/SM APPROVAL

CONCEPT DEVELOPMENT
- TA, GD & SME
  - STORYTELLING
  - MESSAGE THEME
  - ART DIRECTION
  - TIMELINE
  - SIGN-OFF

PRODUCTION
- GD
  - RESEARCH
  - COMPS
  - SIGN-OFF
  - RENDERING
  - PRESENTATION

EVALUATION
- TA
  - FOCUS GROUP
  - SURVEYS
  - REPORT FINDINGS
InfoGraphic  Creative Brief

- Fillable PDF
- Available on CIT when submitting requests
- Shared document used during the concept development phase
Evaluating Infographic Requests

- Staff Capacity
- Redundancy
- SME Commitment
- Turnaround
  - Scheduling
  - Clearance

Evaluating Infographic Requests in Create-IT

DCS is now offering infographics as a graphics services option within Create-IT as of July 1st. Because this is a new service that requires extensive planning and collaboration, we are limiting support to 12 infographics for the initial year. This will provide adequate time to make any adjustments to our work procedures so we may continue to offer the highest quality product and client experience. The estimated turnaround for each infographic project will take approximately 1 month to complete (infographic production timeline). Below is a checklist for evaluating/prioritizing infographics requests and thereby determining our capacity for support.

<table>
<thead>
<tr>
<th></th>
<th>YES/NO</th>
<th>CICD</th>
<th>MONTH ASSIGNED</th>
</tr>
</thead>
<tbody>
<tr>
<td>ADCS Approval</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Content (Story + Data)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HHS 615 Redundancy</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Infographics Criterion Met</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CIO SME Available</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Winnable Battle</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

ADCS Approval
All requests must receive ADCS approval prior to starting – no exceptions!

Content (Story + Data)
It is the clients responsibility to provide content before submitting requests. Requests w/o content will not be supported.

HHS 615 Clearance Redundancy: Question #9
Justification must include:
1. Evidence that the publication is not duplicative of another public or private sector communication effort. Justification for any degree of duplication must be provided for consideration. [http://internet.hhs.gov/electronicforms/hhs_forms/hhs_615.pdf](http://internet.hhs.gov/electronicforms/hhs_forms/hhs_615.pdf)

Infographics Criterion
Each request will be assessed against the following criterion before support.
A. Will the sum of verbal and visual language enhance the overall understanding of the message being conveyed?
B. Is the topic of interest to the public?
C. Does the combination of the information, data, and design create an “eye opening” or “ah ha” narrative for the target audience?
D. Will this product empower users to take action for change?

CIO SME Available
DCS respectfully request that all projects include the programs SME throughout production. Requests without such commitment may be denied or placed on hold until the SME is available.

Winnable Battle
Is this project related to a winnable battle? Please note, all winnable battle requests will take priority over other requests in the system.
Preparing for the Consultation

- Have your information and data
- Keep it simple
  - What is the baseline knowledge of your target audience
- Think about the story you want to tell
  - Will creating an infographic enhance the meaning?
  - Is it of public interest? Eye-opening? Empowering?
- Fill out the Creative Brief!
- Use metaphors and analogies
  - Connect unfamiliar pairs
- Be an active part of the consultation
WORKFLOW
Stages of the Process

- **Consultation**
  - What is your story?
  - Storytelling (define topic, issue, facts, benefit, goal)

- **Concept Development**
  - Define the problem, incubate ideas, implement solutions

- **Production**
  - Design: research, comps, rendering, presentation

- **Evaluation**
  - Focus study
**InfoGraphic Work Flow Chart**

**DCS Infographic Work Flow**

Strong, visual design elements, when working in harmony, instantly direct your attention and supplement your ideas. It is also true that confusing visuals, or worse, none at all, can route even your best written work to the nearest trash bin. The Division of Communications Services (DCS) can help bring your ideas to life with clear, visually appealing infographics that are not only scientifically accurate, but also concise, memorable, and easy to understand. By working collaboratively with DCS artists, health communication specialists, and subject-matter experts (SMEs), you can further crystallize your message via strong visual design. Infographics will make your ideas stand out and make your audience far more likely to take your message to heart, change their behavior, and improve their health. Follow the flow chart to see how the process can work for you.

**CONSULTATION**

**Formatting**

The first step to creating strong information graphics is to know your content (information and supporting data). Your content will dictate your design elements, yielding what we call the “creative brief,” which provides a framework for your storytelling.

**Do you have CONTENT?**

\[
\text{INFORMATION} + \text{DATA} = \text{CREATIVE BRIEF}
\]

- **TOPIC**
- **ISSUE**
- **FACTS**
- **GOAL**
- **BENEFIT**
Storytelling

Next, use the creative brief to ensure the flow of information is logical in telling the story. Some questions to consider during this process: What is your health topic? Who is affected by the issue? What are the facts? Why is this important? What can be done?

Define the Problem

“AE PROBLEM WELL STATED IS HALF-SOLVED”
- Charles F. Kettering
American Inventor and Social Philosopher

INTERVIEWING
- Moderator
- SME
- Listen, Observe, and Journal
- Reiterate for Confirmation
Incubate Ideas

Next, use the problem to determine the best solution. It's critical to stay involved during this process and welcome “fish-out-of-water” creative ideas. Below are a few techniques for generating ideas.

BRAINSTORMING
MIND MAPPING
VISUAL THESAURUS

Implement Solutions

At this stage, it's time to conjure, assess, rank, delete, and mold the best concepts into strategic messages to not only fix the problem, but also target your goal. Use the key message to determine the appropriate art direction (style, tone, and approach) to determine which aspects of the story to convey in verbal or visual context.

Planning

Finally, we bring the creative chaos to order by annotating clear expectations and deliverables against a production timeline to manage the project.

SIGN-OFF × John Doe, Sr.

PRODUCTION

Design
Focus Study

The final step involves using both quantitative and qualitative methods to evaluate the response of the product before publishing. The objective is to not only produce a product people will enjoy, but one that also influences change in behavior and attitudes.

- EMAIL INVITATION
- PRODUCT REVIEW
- SURVEY
REFERENCE MATERIALS
InfoGraphic Standards Guide

Infographics at CDC

A Standards Guide for creating successful infographics

A well designed infographic adds visual interest and reinforces your message.

Visit the learning site at http://www.ce.ebc.edu/ce/learning/
InfoGraphic Standards Guide

STEP 2: Laying the Foundation by Plotting the Data

Once you determine the best method to display your data, create your graph or chart using Excel, PowerPoint, or Illustrator. These programs can link data to the graphic.

Plot your data before adding any pictographs or custom illustrations to ensure your data will be accurate, not skewed.

Always begin your y-axis at zero. If you begin with something other than zero, the message could be misleading or misrepresented. And always consider scalability and proportion when displaying data.

This example demonstrates how incorrect scaling could misrepresent the data.

When you size the circles by area, circle A is half the size of circle B.

However, when you size the circles by diameter, circle A is actually only one-fourth the size of circle B.

The "Li Factor" is a value that describes the relationship between the size-of-effect shown in a graphic and the size-of-effect shown in the data. Edward Tufte defines the Li Factor in his book The Visual Display of Quantitative Information as "The representation of numbers, as physically measured on the surface of the graphic itself, should be directly proportional to the quantities represented."

STEP 3: Making Your Data, Easy to Understand for the Public

In the first two steps, you determined the best way to present your data and plotted the data, now you are ready to transform your data into an infographic.

The degree to which you customize an infographic should correlate with the complexity of the plotted data. Here is a chart to help simplify and explain this approach.

<table>
<thead>
<tr>
<th>Data Complexity</th>
<th>Simple</th>
<th>Intermediate</th>
<th>Complex</th>
</tr>
</thead>
<tbody>
<tr>
<td>Graphics/scale</td>
<td>High</td>
<td>Moderate</td>
<td>Minimum</td>
</tr>
</tbody>
</table>

High Customization: simple data set, 1 comparison. Axis optional, use of pictographs and illustrations along with or in place of charting elements.

Moderate Customization: data set with 2 comparisons. Axes required; may use pictographs or accompanying graphics to help tell the story; accompanying graphic would also work well.

Minimum Customization: complex, 3+ comparisons. Axes required; maintain complete chart and only use a graphic outside data set to complement, if desired.

A. If you have a simple comparison, consider eliminating the y-axis altogether once you are certain all pertinent information is included within the graphic. This step will simplify the graphic and make for a straightforward graphic design.

B. Pie charts may be effectively simplified as well. Consider modifying into a visual with the relevant text or icon information incorporated in the center. The shape could also be altered from the circle format as shown in this example.

C. Consider incorporating shapes and icons that relate to the data being depicted in your chart. You could also use a horizontal bar chart instead of a vertical one to provide a clear, less-conventional approach. Using grids that contain highlighted objects can quickly present data related to ratios and percentages.

Visit the branding site at http://brandidentitystandards.cdc.gov
DCS SAMPLE PRODUCTS
NEXT STEPS
Next Steps for DCS

- **Interactive Infographic Services**
  - Research and Development
    - Responsive Designs
    - Animated GIFs
    - Interactivity
    - Compliancing
  - SOPs and Work Process Defined

- **APIs**
  - Extend the life of interactive infographics

- **Communication Resource Center**
  - Populate infographics for sharing with state and locals
Thank You.

Issac Evans – hyp1@cdc.gov

For more information please contact Centers for Disease Control and Prevention

1600 Clifton Road NE, Atlanta, GA 30333
Telephone: 1-800-CDC-INFO (232-4636)/TTY: 1-888-232-6348
E-mail: cdcinfo@cdc.gov  Web: http://www.cdc.gov

The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention.