Ann & Robert H. Lurie Children's Hospital of Chicago®

Data Visualization Best Practices:

Your Guide to Great Graphs

Anne Bendelow, MPH
Ann & Robert H. Lurie
Children's Hospital of Chicago
Data Analytics & Reporting
October 23rd, 2019

BEST CHILDREN'S HOSPITALS U.S.News & WORLD REPORT HONOR ROLL 2017-18

THE LEAPFROG GROUP TOP CHILDREN'S HOSPITAL 2016

MAGNET RECOGNIZED AMERICAN NURSES CREDENTIALING CENTER

Ann K. Emery

- Information Designer
- Speaker, host of workshops and webinars, owns a design consultancy, chair of American Evaluation Association's data interest group
- Aim of equipping organizations to visualize data more effectively

Design

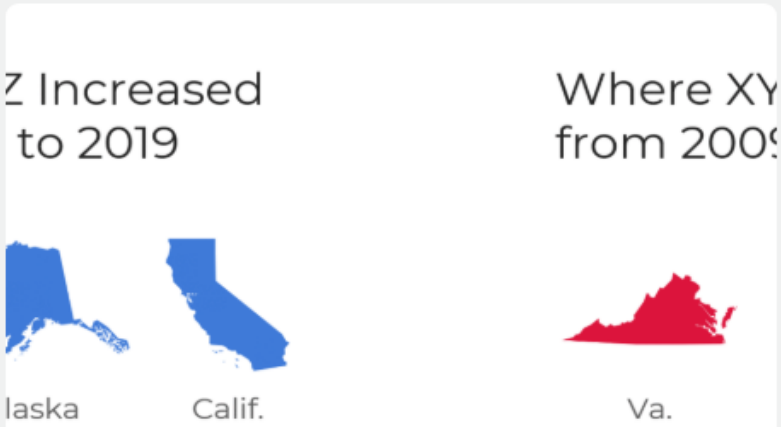
Want good DataViz, but don't have time to do it yourself? We design reports, one-pagers, dashboards, infographics, and slideshows.

GET STARTED

Most of our designs are private, client-facing documents. Once in a while, we work on public-facing reports. Here are a few public projects.

- The American Evaluation Association in 2020
- Coalition Assessment: Approaches for Measuring Capacity and Impact
- Data Placemats: A Facilitative Technique Designed to Enhance Stakeholder Understanding of Data
- Epidemiological and Statistical Basics with Ann & Robert H. Lurie Children's Hospital
- The Global Environment Facility's Scorecard

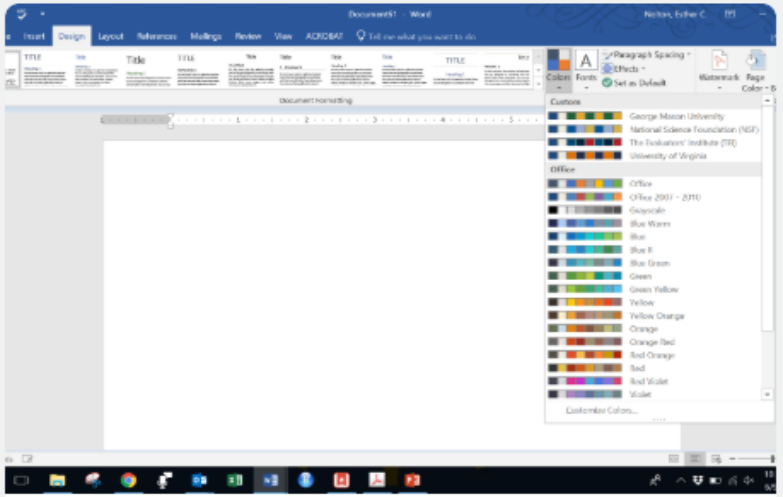
Blog



My Favorite Source for State Icons to Use in Data Visualizations

Jun 25th, 2019 / Data Visualization

Does the first draft of your report or slideshow have way too much text? Are you looking for strategies for transforming your wall of text into an effective visual? If so, I wrote this article for you! This is one of many techniques for



Work Smarter, Not Harder, When Visualizing Data [Guest Post by Esther C. Nolton]

Jun 13th, 2019 / Data Visualization

Esther C. Nolton attended one of my data visualization workshops in May 2019, and almost immediately followed up with examples ...

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Children's Hospital of Chicago®

Ann K Emery's Workshop:

Ann(e) C Bendelow 'Lite Edition!

Same Name, Shorter Content
☺

Ann & Robert H. Lurie Children's Hospital of Chicago®

Overview

- Review 4 concepts from Ann's technical advising to apply here at Lurie Children's:

  ✓**Choose the Right Chart**

  ✓**De-Clutter**

  ✓**Clarify with Color**

  ✓**Clarify with Text**

- Before & After examples, Lurie Style!

Focused on static visualizations

PIGS IN SPACE: EFFECT OF ZERO GRAVITY AND AD LIBITUM FEEDING ON WEIGHT GAIN IN CAVIA PORCELLUS

Colin B. Purrington
6673 College Avenue, Swarthmore, PA 19081 USA

ABSTRACT:

One ignored benefit of space travel is a potential elimination of obesity, a chronic problem for a growing majority in many parts of the world. In theory, when an individual is in a condition of zero gravity, weight is eliminated. Indeed, in space one could conceivably follow ad libitum feeding and never even gain an gram, and the only side effect would be the need to upgrade one's stretchy pants("exercise pants"). But because many diet schemes start as very good theories only to be found to be rather harmful, we tested our predictions with a long-term experiment in a colony of Guinea pigs (Cavia porcellus) maintained on the International Space Station. Individuals were housed separately and given unlimited amounts of high-calorie food pellets. Fresh fruits and vegetables were not available in space so were not offered. Every 30 days, each Guinea pig was weighed. After 5 years, we found that individuals, on average, weighed nothing. In addition to weighing nothing, no weight appeared to be gained over the duration of the protocol. If space continues to be gravity-free, and we believe that assumption is sound, we believe that sending the overweight — and those at risk for overweight — to space would be a lasting cure.

INTRODUCTION:

The current obesity epidemic started in the early 1960s with the invention and proliferation of elastane and related stretchy fibers, which released wearers from the rigid constraints of clothes and permitted monthly weight gain without the need to buy new outfits. Indeed, exercise today for hundreds of million people involve only the act of wearing stretchy pants in public, presumably because the constrictive pressure forces fat molecules to adopt a more compact tertiary structure (Xavier 1965).

Luckily, at the same time that fabrics became stretchy, the race to the moon between the United States and Russia yielded a useful fact: gravity in outer space is minimal to nonexistent. When gravity is zero, objects cease to have weight. Indeed, early astronauts and cosmonauts had to secure themselves to their ships with seat belts and sticky boots. The potential application to weight loss was noted immediately, but at the time travel to space was prohibitively expensive and thus the issue was not seriously pursued. Now, however, multiple companies are developing cheap extra-orbital travel options for normal consumers, and potential travelers are also creating news ways to pay for products and services that they cannot actually afford. Together, these factors open the possibility that moving to space could cure overweight syndrome quickly and permanently for a large number of humans.

We studied this potential by following weight gain in Guinea pigs, known on Earth as fond of ad libitum feeding. Guinea pigs were long envisioned to be the "Guinea pigs" of space research, too, so they seemed like the obvious choice. Studies on humans are of course desirable, but we feel this current study will be critical in acquiring the attention of granting agencies.

MATERIALS AND METHODS:

One hundred male and one hundred female Guinea pigs (Cavia porcellus) were transported to the International Space Laboratory in 2010. Each pig was housed separately and deprived of exercise wheels and fresh fruits and vegetables for 48 months. Each month, pigs were individually weighed by duct-taping them to an electronic balance sensitive to 0.0001 grams. Back on Earth, an identical cohort was similarly maintained and weighed. Data was analyzed by statistics.

RESULTS:

Mean weight of pigs in space was 0.0000 +/- 0.0002 g. Some individuals weighed less than zero, some more, but these variations were due to reaction to the duct tape, we believe, which caused them to be alarmed push briefly against the force plate in the balance. Individuals on the Earth, the control cohort, gained about 240 g/month ($p = 0.0002$). Males and females gained a similar amount of weight on Earth (no main of effect of sex), and size at any point during the study was related to starting size (which was used as a covariate in the ANCOVA). Both Earth and space pigs developed substantial dewlaps (double chins) and were lethargic at the conclusion of the study.

CONCLUSIONS:

Our view that weight and weight gain would be zero in space was confirmed. Although we have not replicated this experiment on larger animals or primates, we are confident that our result would be mirrored in other model organisms. We are currently in the process of obtaining necessary human trial permissions, and should have our planned experiment initiated within 80 years, pending expedited review by local and Federal IRBs.

ACKNOWLEDGEMENTS:

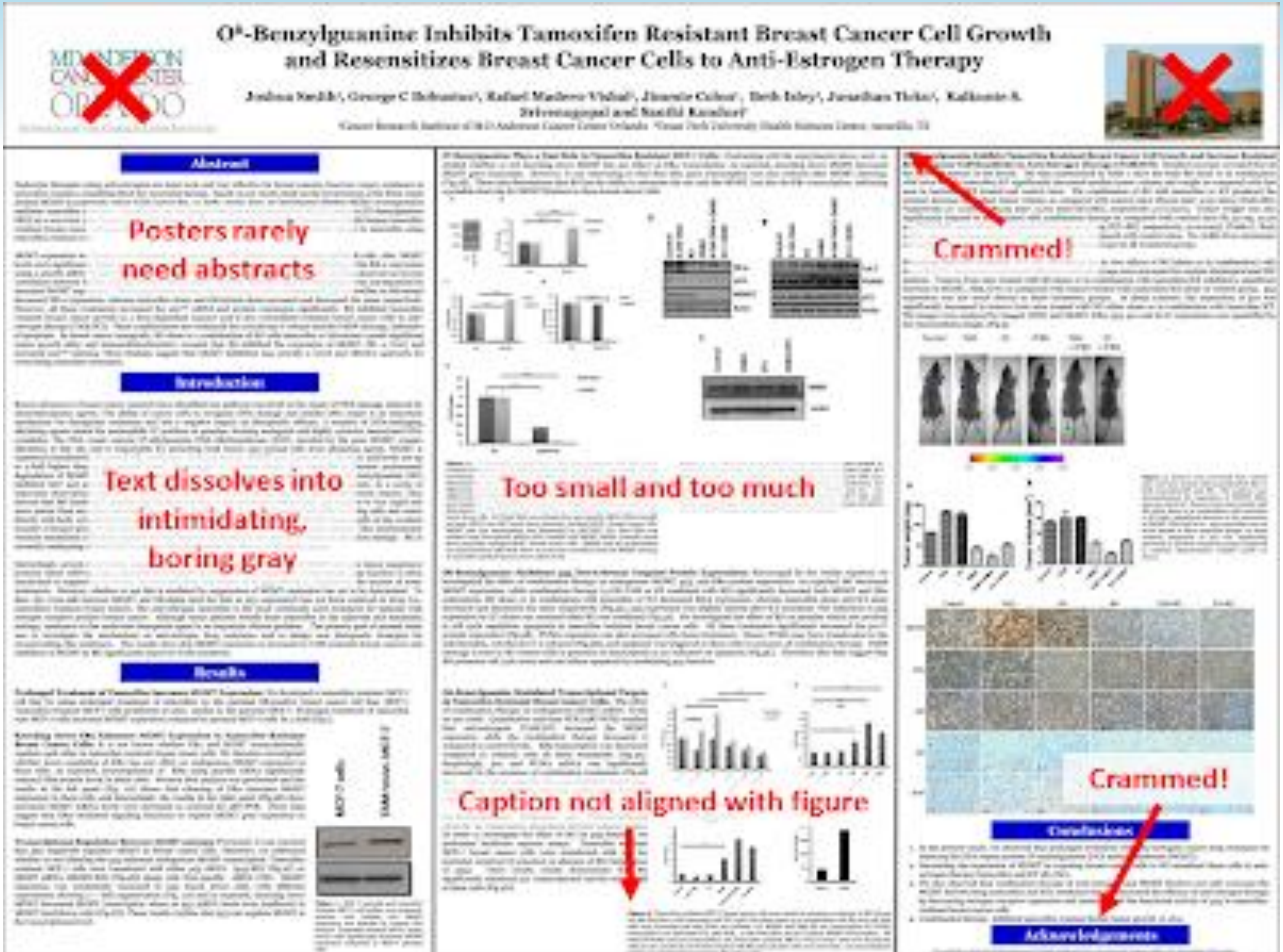
I am grateful for generous support from the National Research Foundation, Black Hole Diet Plans, and the High Fructose Sugar Association. Transport flights were funded by SPACE-EXES, the consortium of wives divorced from insanely wealthy space-flight startups. I am also grateful for comments on early drafts by Mañana Athletic Club, Corpus Christi, USA. Finally, sincere thanks to the Cuy Foundation for generously donating animal care after the conclusion of the study.

LITERATURE CITED:

NASA. 1982. Project STS-XX: Guinea Pigs. Leaked internal memo.

Sekulić, S.R., D. D. Lukač, and N. M. Naumović. 2005. The Fetus Cannot Exercise Like An Astronaut: Gravity Loading Is Necessary For The Physiological Development During Second Half Of Pregnancy. Medical Hypotheses. 64:221-228

Xavier, M. 1965. Elastane Purchases Accelerate Weight Gain In Case-control Study. Journal of Obesity. 2:23-40.


O6-Benzylguanine Inhibits Tamoxifen Resistant Breast Cancer Cell Growth
and Resensitizes Breast Cancer Cells to Anti-Estrogen Therapy
Abstract
Posters rarely need abstracts
Introduction
Text dissolves into intimidating, boring gray
Results
Too small and too much
Crammed!
Caption not aligned with figure
Crammed!
Conclusions
Acknowledgements

ACADEMIC RESEARCH POSTER TEMPLATE

Subtitle for Academic Research Poster (48x36 inches)

Your names and the names of the people who contributed to this presentation

University at Buffalo
The State University of New York

Introduction

Mauris orci mi, varius id diam id, egestas auctor enim. Praesent ut massa nibh. Duis purus neque, facilisis cursus ultrices vel, ullamcorper ac augue. Donec semper lorem vitae urna pulvinar, in congue massa tristique. Sed in risus nibh. In nisl quam, aliquet sed nibh sit amet, faucibus.

Methods

Mauris orci mi, varius id diam id, egestas auctor enim. Praesent ut massa nibh. Duis purus neque, facilisis cursus ultrices vel, ullamcorper ac augue. Donec semper lorem vitae urna pulvinar, in congue massa tristique:

MAURIS ORCI VARIUS ID DIAM

- Sed in risus nibh. In nisl quam, aliquet sed nibh sitamet, faucibus placerat dui.
- Fusce quis augue scelerisque, luctus rum sed, ut in pulvinar urna in eros posuere.

EUISMOD JUSTO VITAE PURUS

- Proin semper ipsum donec semper placerat.
- Finibus quam tempor, vitae consectetur.
- Elementum orci dignissim. Proin semper ipsum.

Mauris orci mi, varius id diam id, egestas auctor enim.

Data Analysis

Mauris orci mi, varius id diam id, egestas auctor enim. Praesent ut massa nibh. Duis purus neque, facilisis cursus ultrices vel, ullamcorper ac augue [See Figure A]. Donec semper lorem vitae urna pulvinar, in congue massa tristique:

A. Sed in risus nibh. In nisl quam, aliquet sed nibh sitamet, faucibus placerat dui.

B. Fusce quis augue scelerisque, luctus rum sed, ut dolor. pulvinar urna in eros posuere.

C. in elementum orci dignissim. Proin semper ipsum finibus quam tempor, vitae consectetur.

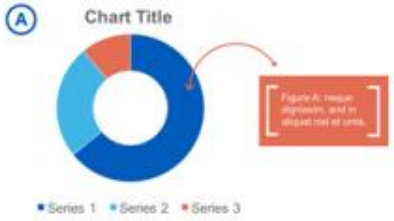
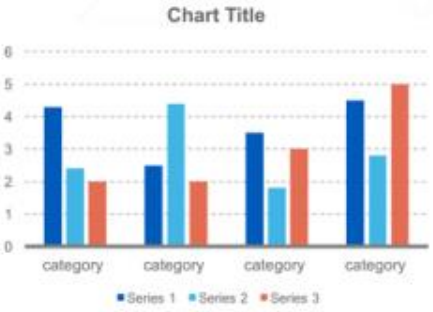


Chart Title			
8.01	7.99	5.77	6.44
4.50	3.11	9.55	1.12
6.15	8.00	6.18	5.65
8.21	2.16	3.11*	7.17
3.00	9.70	10.50	4.45

**Unamcorper efficitur sed in nulla.*



Results

Mauris orci mi, varius id diam id, egestas auctor enim. Praesent ut massa nibh. Duis purus neque, facilisis cursus ultrices vel, ullamcorper ac augue. Donec semper lorem vitae urna pulvinar, in congue massa tristique quis augue scelerisque.

Sed in risus nibh. In nisl quam, aliquet sed nibh sit amet, faucibus placerat dui. Fusce quis augue scelerisque, luctus rum sed, porta ut dolor. In pulvinar urna in eros posuere, in elementum orci dignissim.

MAURIS ORCI MI VARIUS ID DIAM

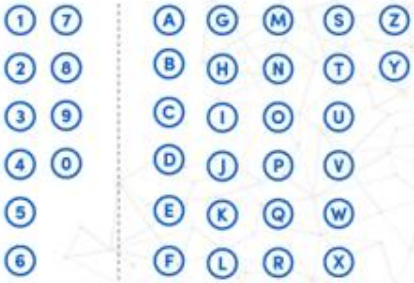
Egestas auctor enim. Praesent ut massa nibh. Duis purus neque, facilisis cursus ultrices vel, ullamcorper ac augue. Donec semper lorem.

Conclusion

Mauris orci mi, varius id diam id, egestas auctor enim. Praesent ut massa nibh. Duis purus neque, facilisis cursus ultrices vel, ullamcorper ac augue. Donec semper lorem vitae urna pulvinar, in congue massa tristique:

- **Sed Risus Nibh:** Ciln nisl quam, aliquet sed nibh sitamet, faucibus placerat dui augue scelerisque.
- **Curabitur Accumsan Nulla:** Fusce quis augue urna scelerisque, luctus rum sed, ut dolor in pulvinar in eros.
- **Elementum Orci Dignissim:** Proin semper ipsum finibus quam tempor, vitae consectetur.
- **Aenean Suscipit:** Proin semper Donec semper ipsum.
- **Rutrum Gravida:** Ullamcorper efficitur sed in nulla.

Graphic Elements



References

1. Phasellus nec lectus bibendum, posuere nibh id, lacinia magna
2. Mauris orci mi, varius id diam id, egestas auctor enim
3. Duis vitae tincidunt tortor, vitae sollicitudin magna
4. Aenean et est sem. Phasellus nec lectus bibendum, posuere
5. Lacinia magna. Mauris orci mi, varius id diam id, egestas auctor
6. Mauris orci mi, varius id diam id, egestas auctor enim

Thoughtful data visualization: Why does it matter?

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Less energy required for reading graphs

More energy reserved for making decisions based on that data

And your data deserves to be out in the world:
Utilized. Actionable. Talked about

Choose the **Right Chart**

Choose the **Right Chart**

Selecting visualizations that fit your data and tell your story

Choose the Right Chart

What information do you want your data to show?

Comparison

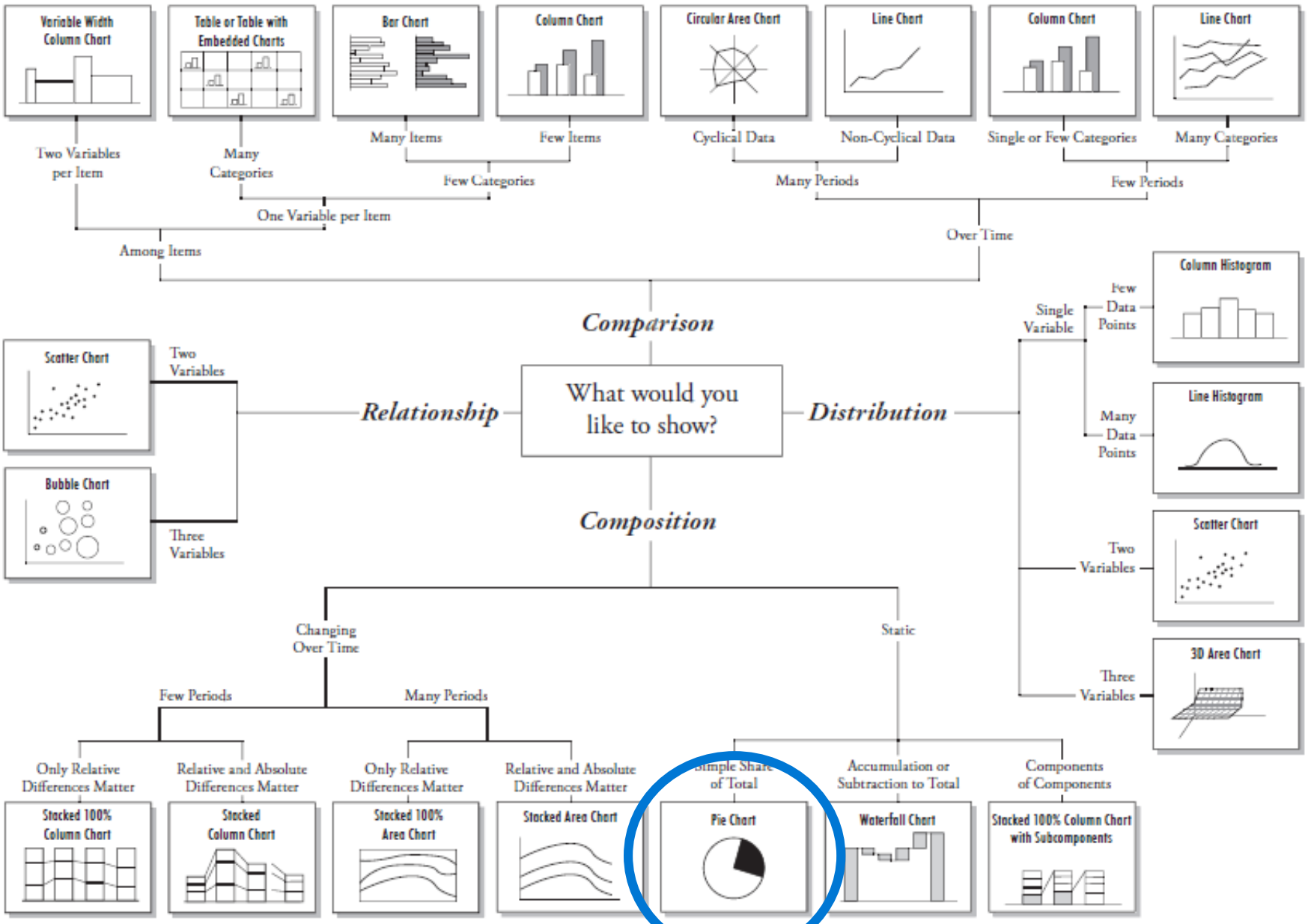
Distribution

Relationship

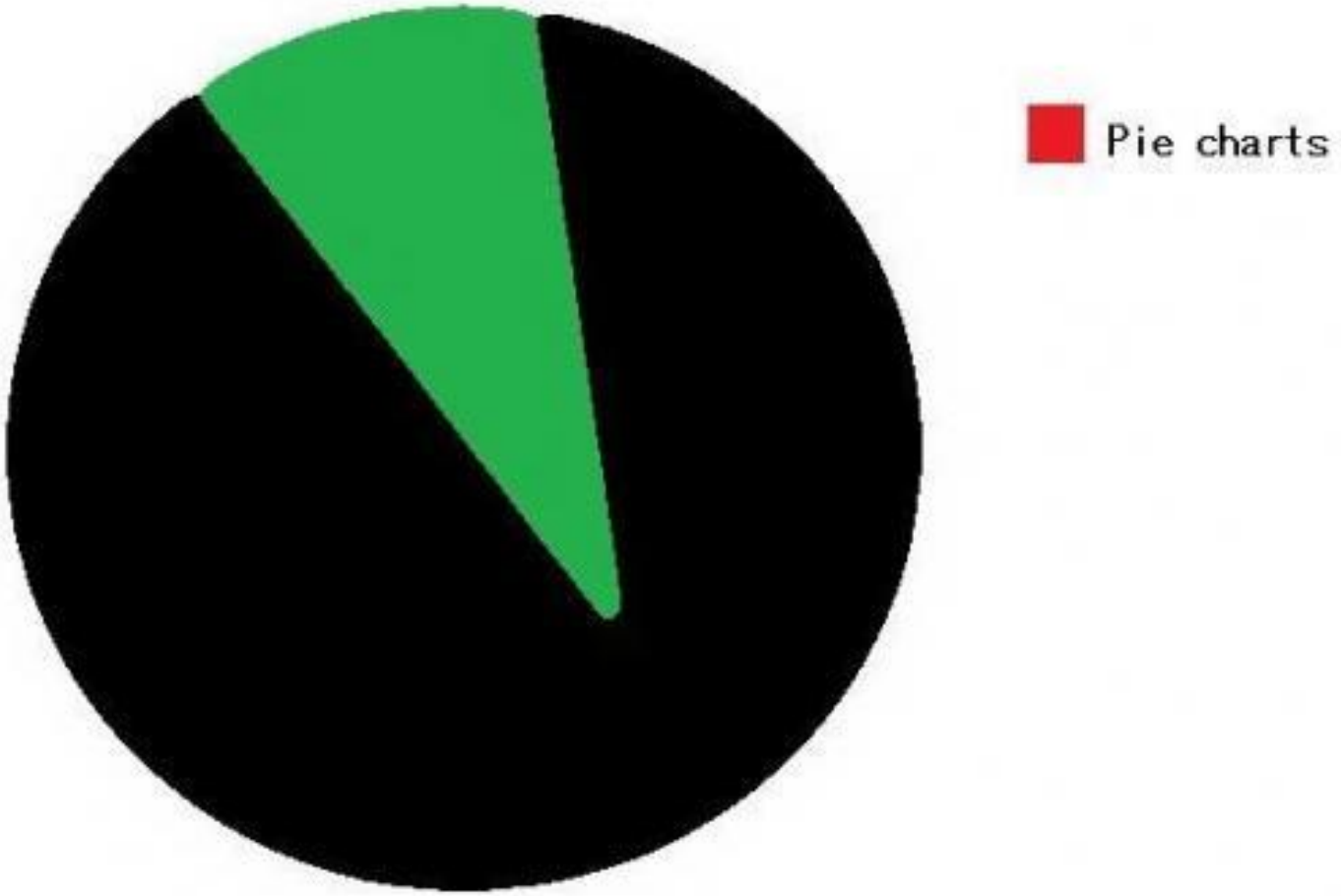
Composition

https://depictdatastudio.com/charts/

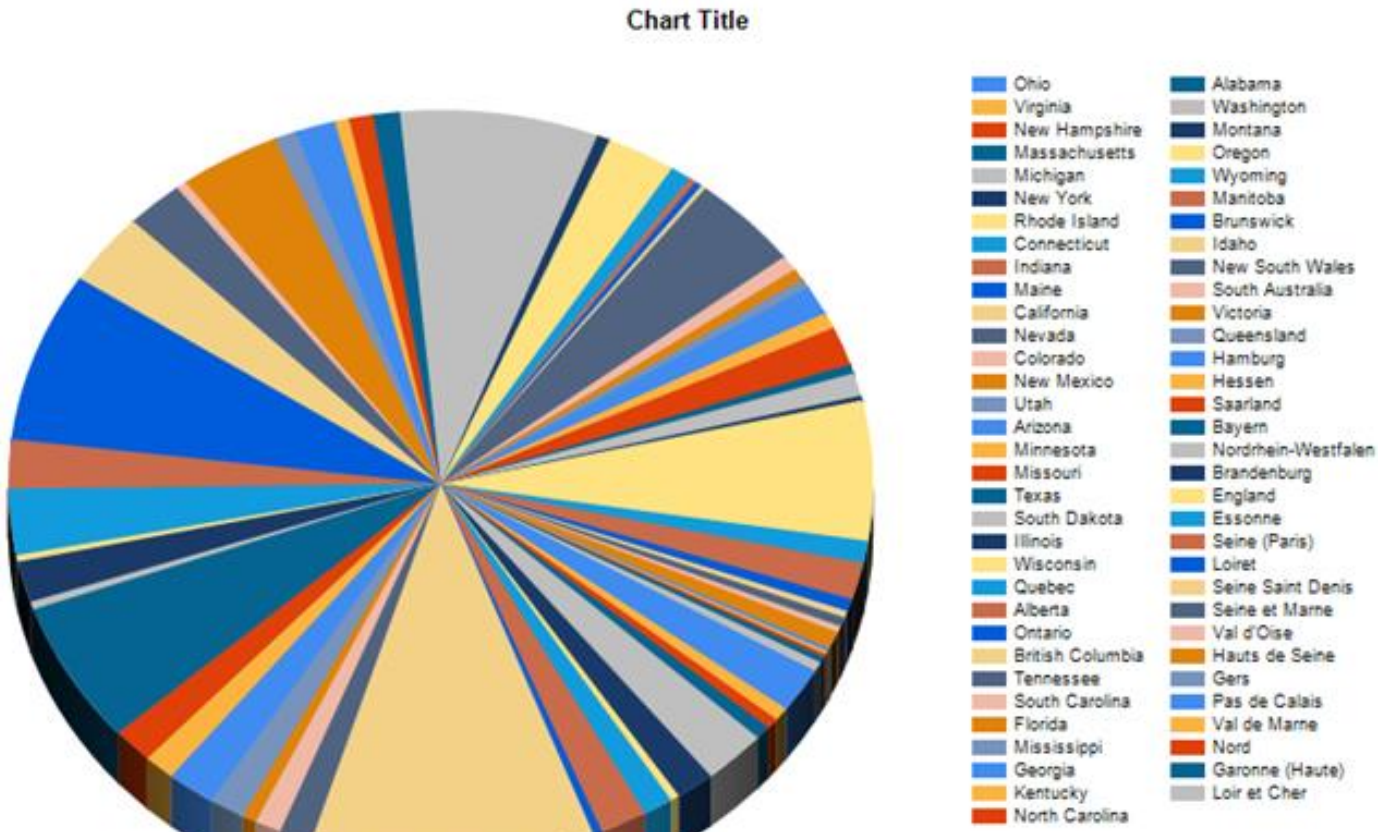
Chart Suggestions—A Thought-Starter



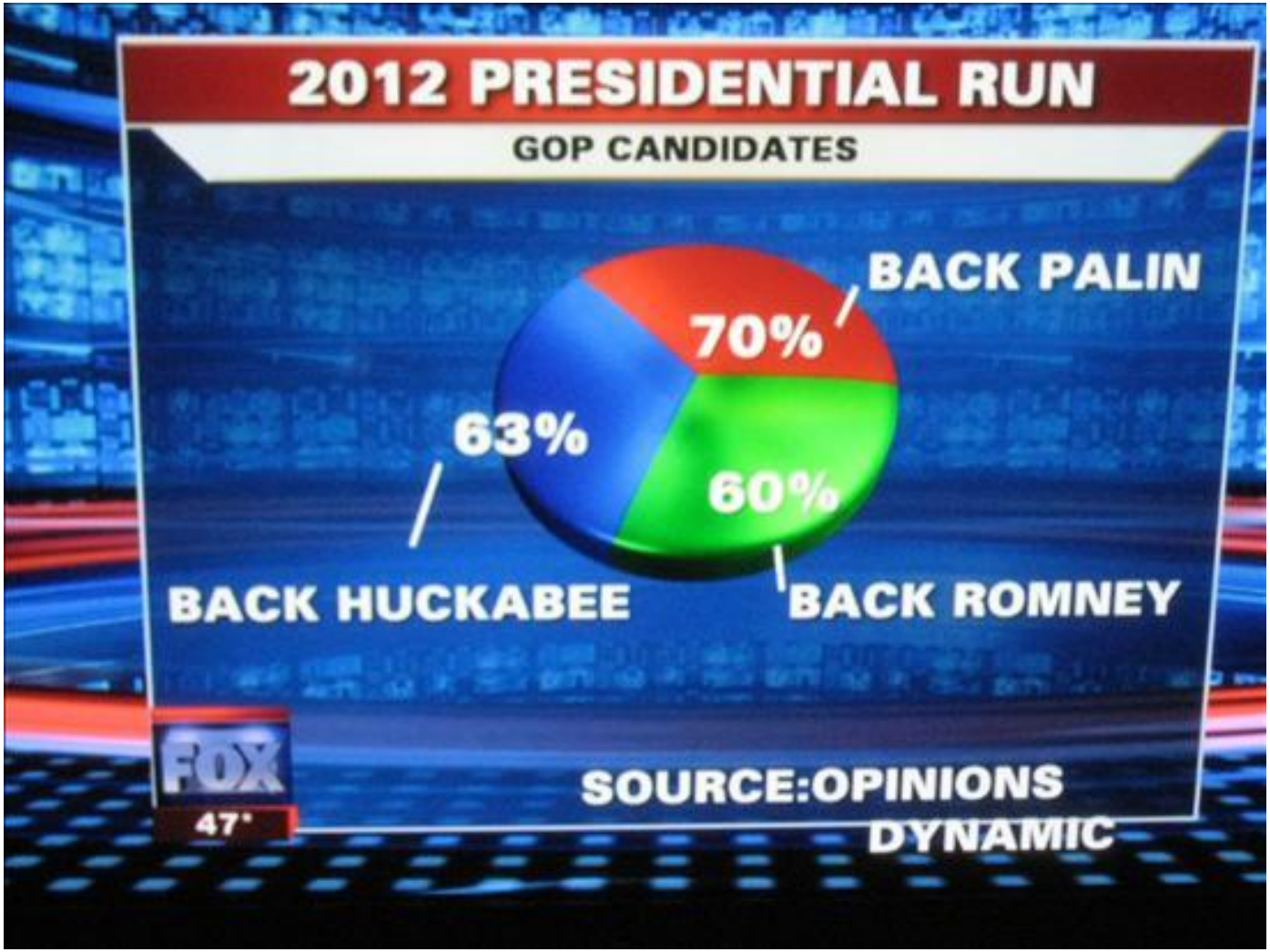
Things I don't understand



Do pie charts deserve their bad reputation?

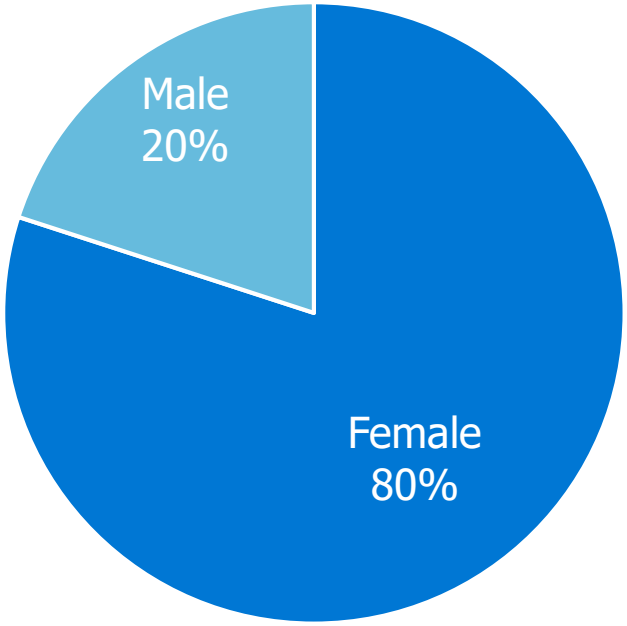


Pie-chart Fails: Ubiquitous



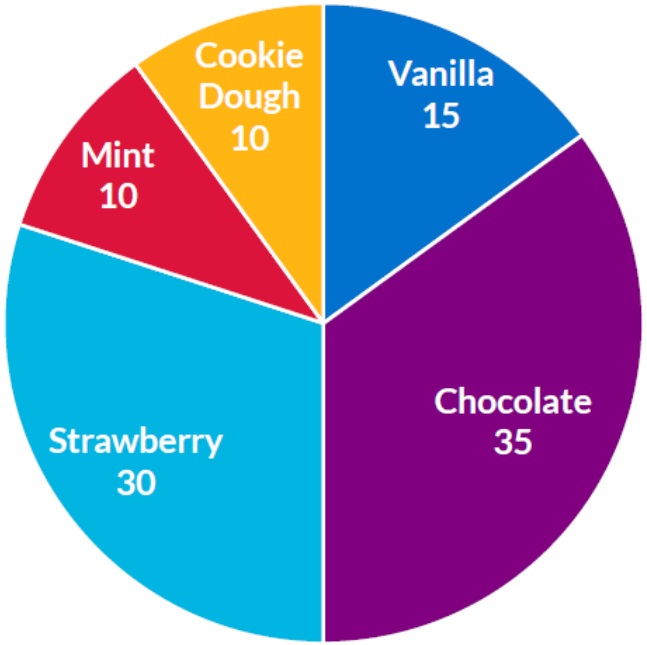
Pies and Donut Chart Rules

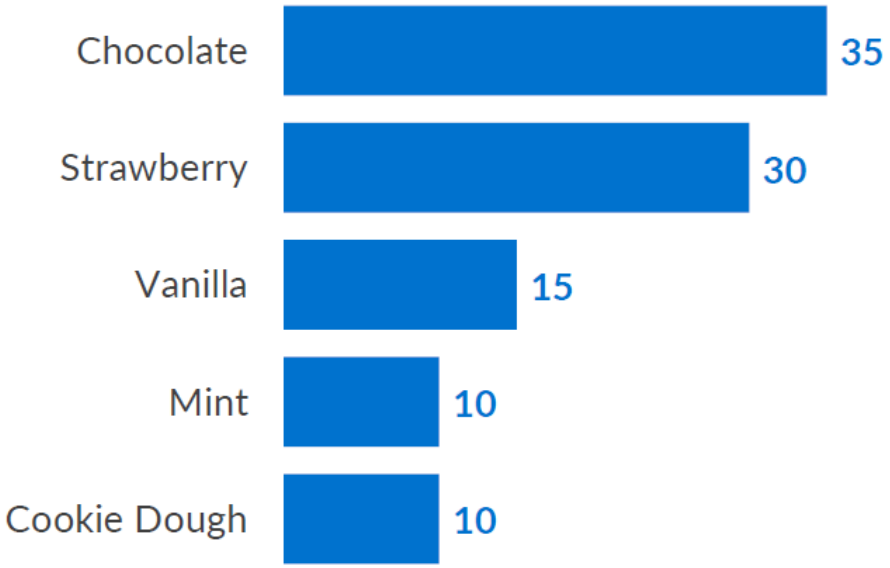
- ✓ Well-formatted
  - ✓ 2-D
  - ✓ No exploding slices
  - ✓ No leader lines or legends
- ✓ Nominal/ categorical data
- ✓ Everything adds to 100%
- ✓ No negative percentages
- ✓ Displays a single point in time
- ✓ 2-3 different slices max
- ✓ 1 pie at a time



Pie chart alternatives

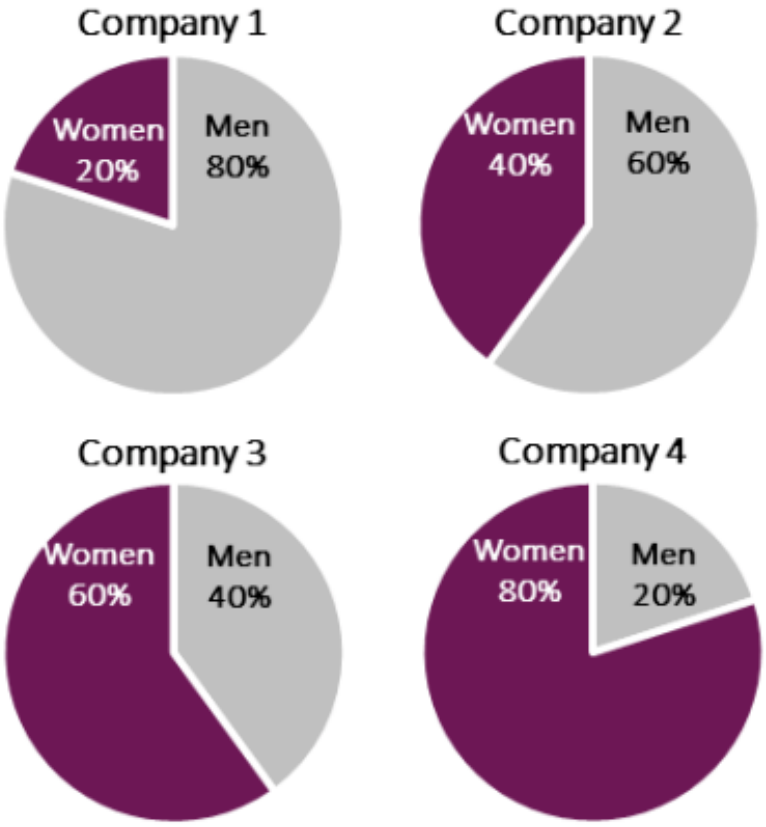
If you have more than 3 slices, swap in a bar chart and order the bars from greatest to least

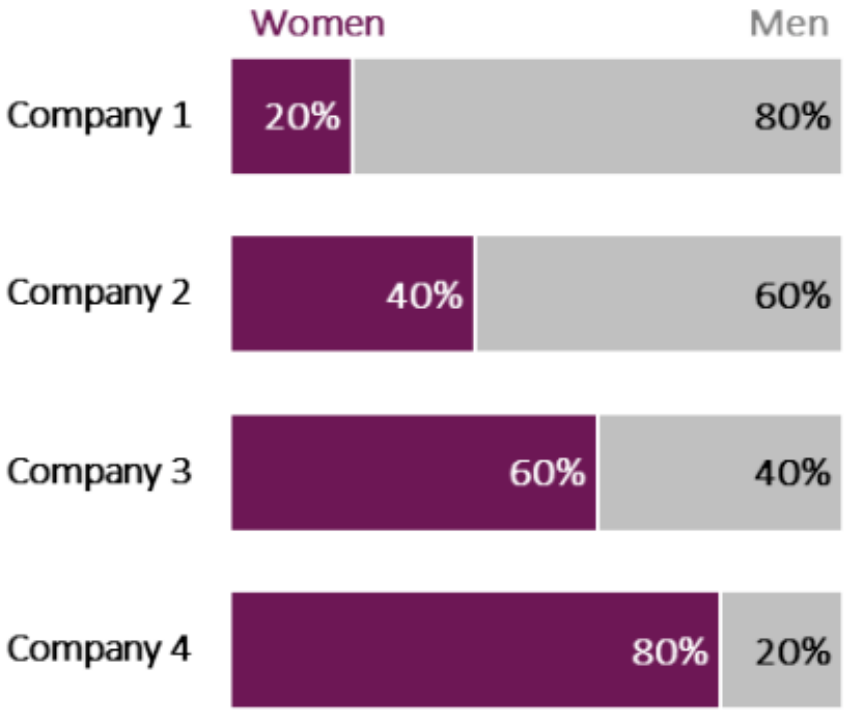




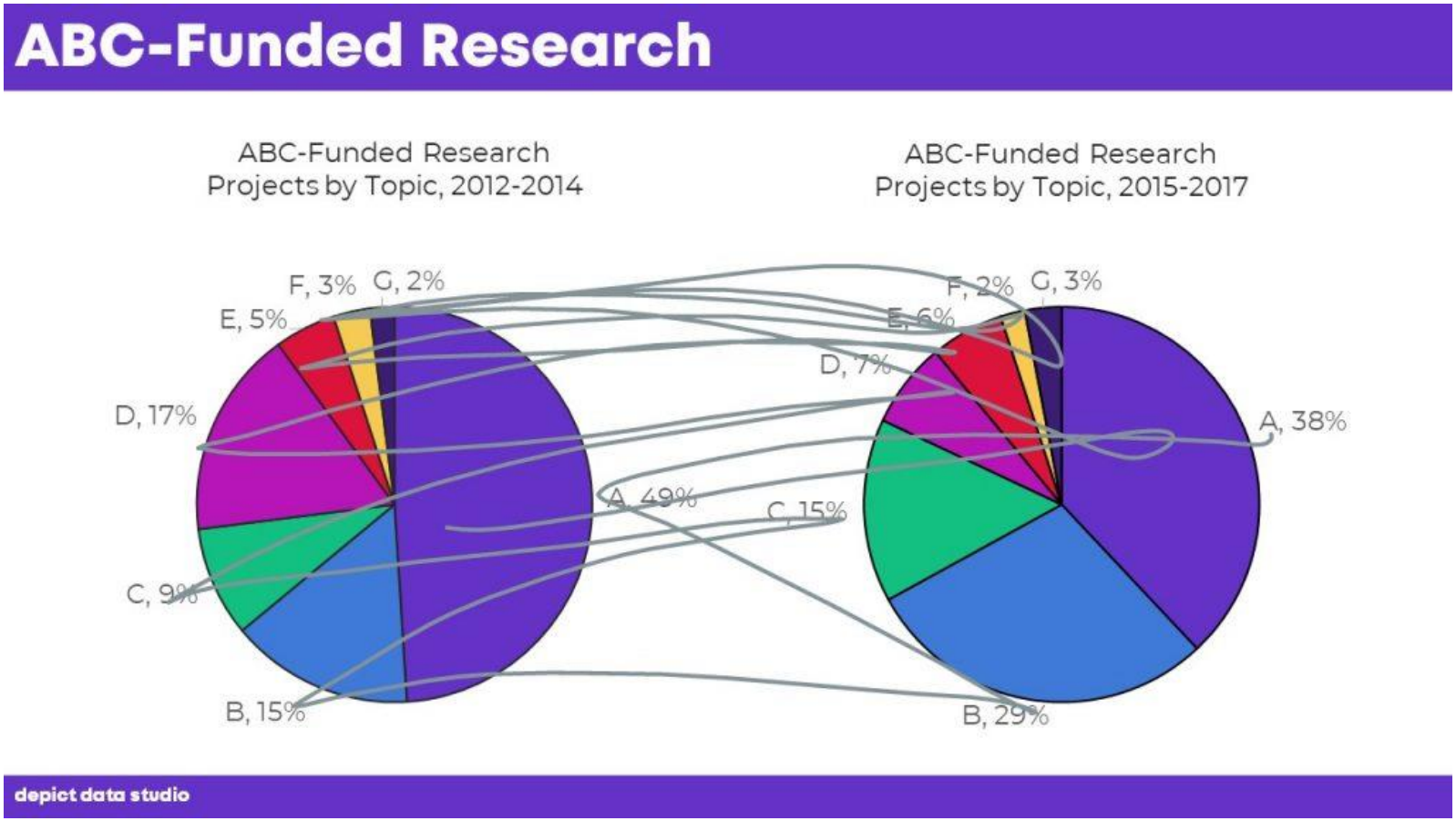
Pie chart alternatives

Use a small multiples stacked bar chart-
Much easier to read and compare.

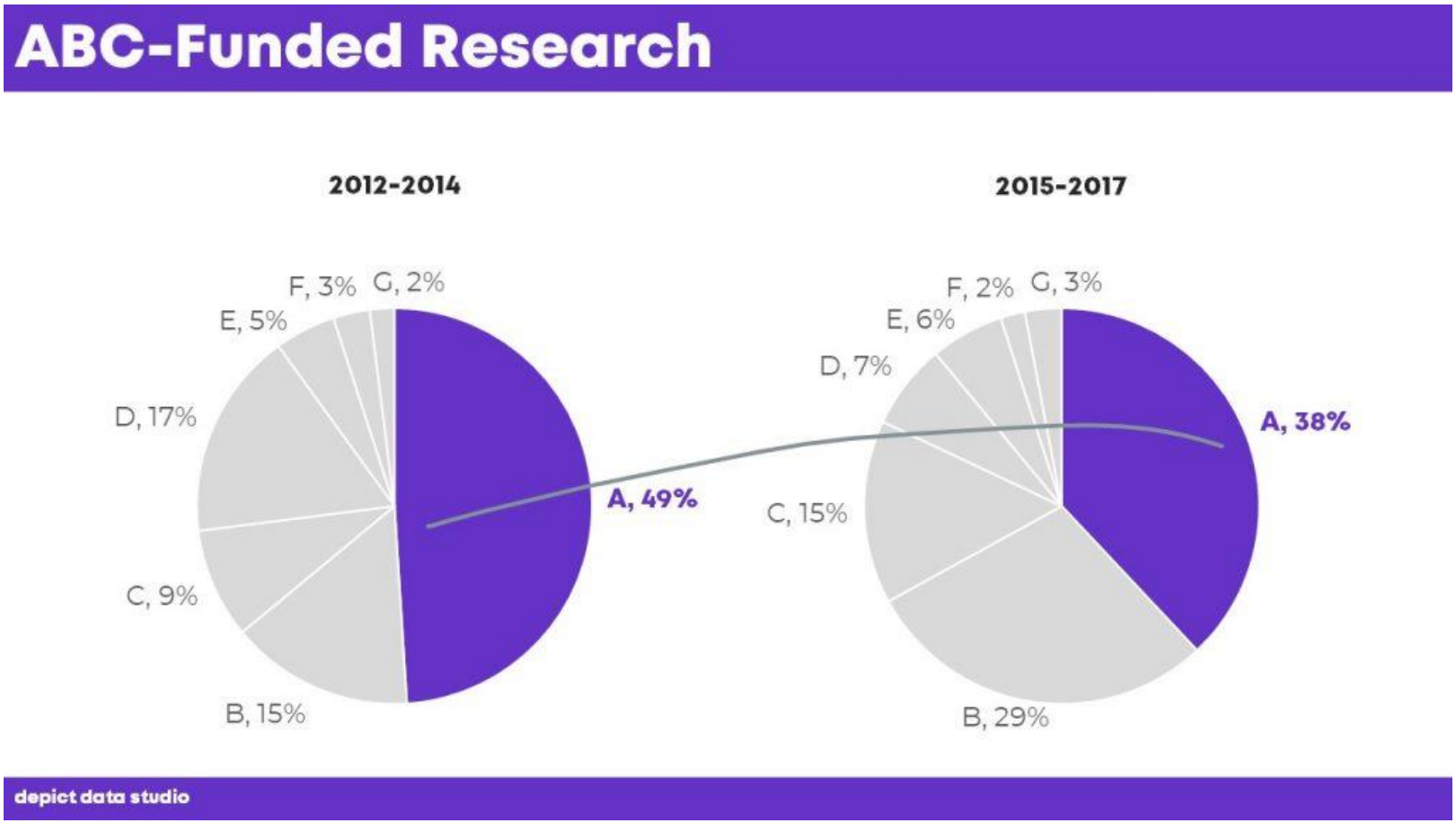




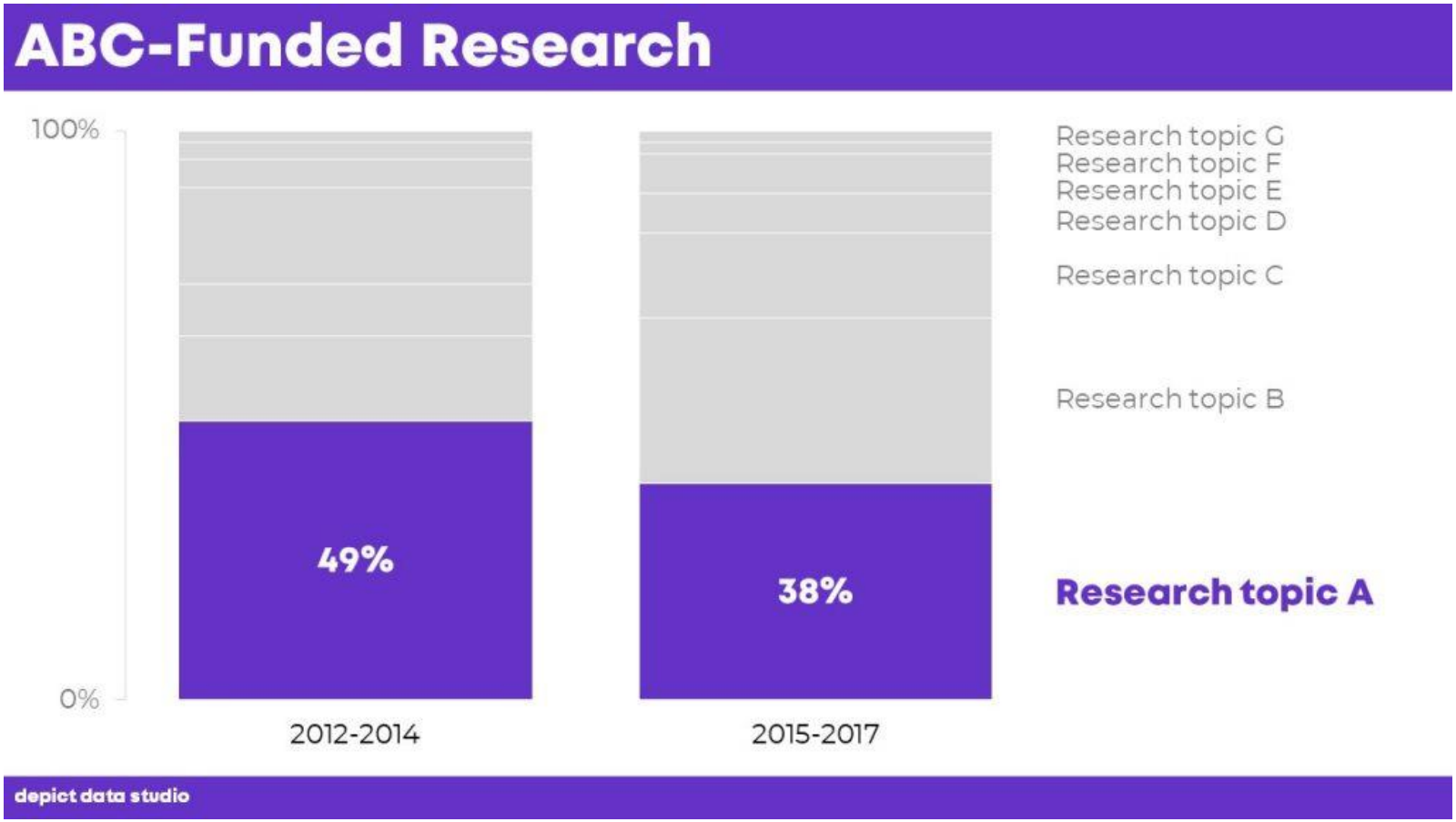
Pie chart alternatives



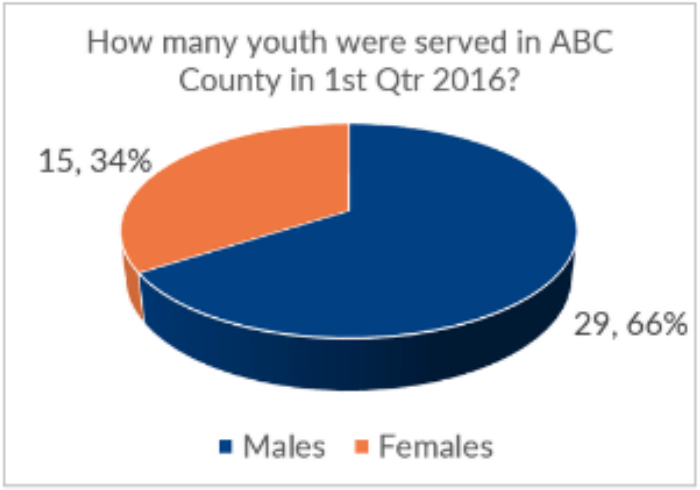
Pie chart alternatives

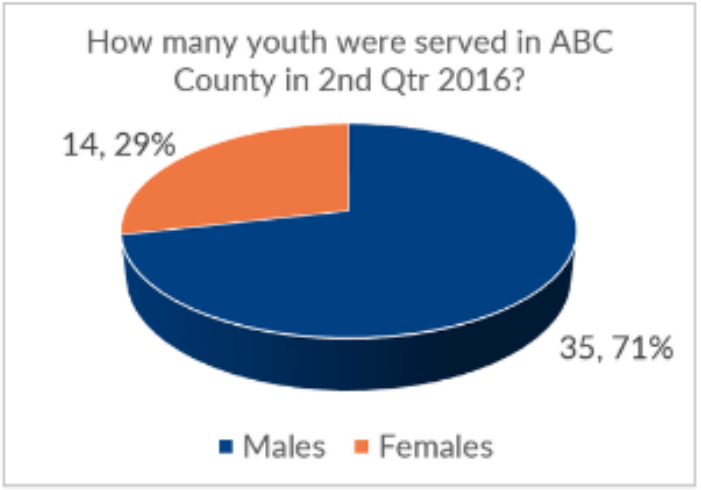


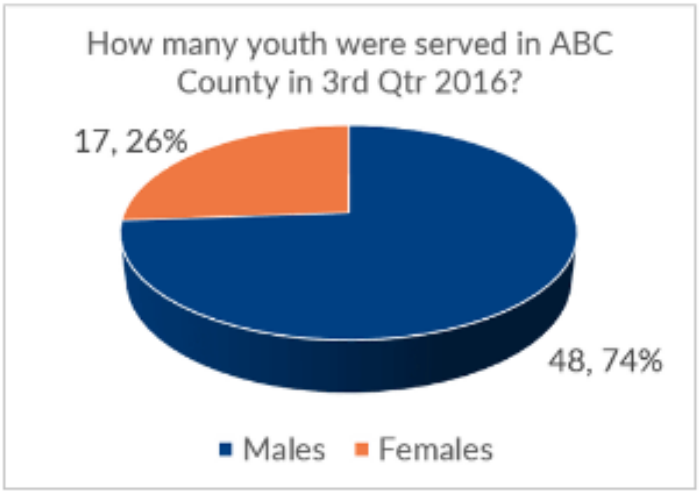
Pie chart alternatives

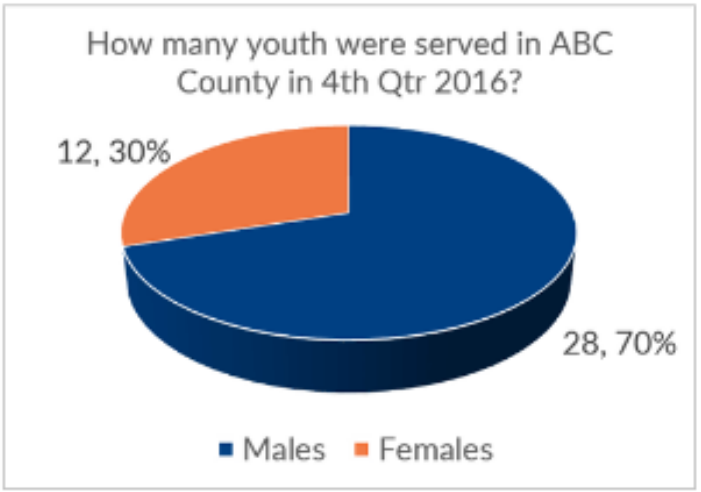


Pie chart alternatives



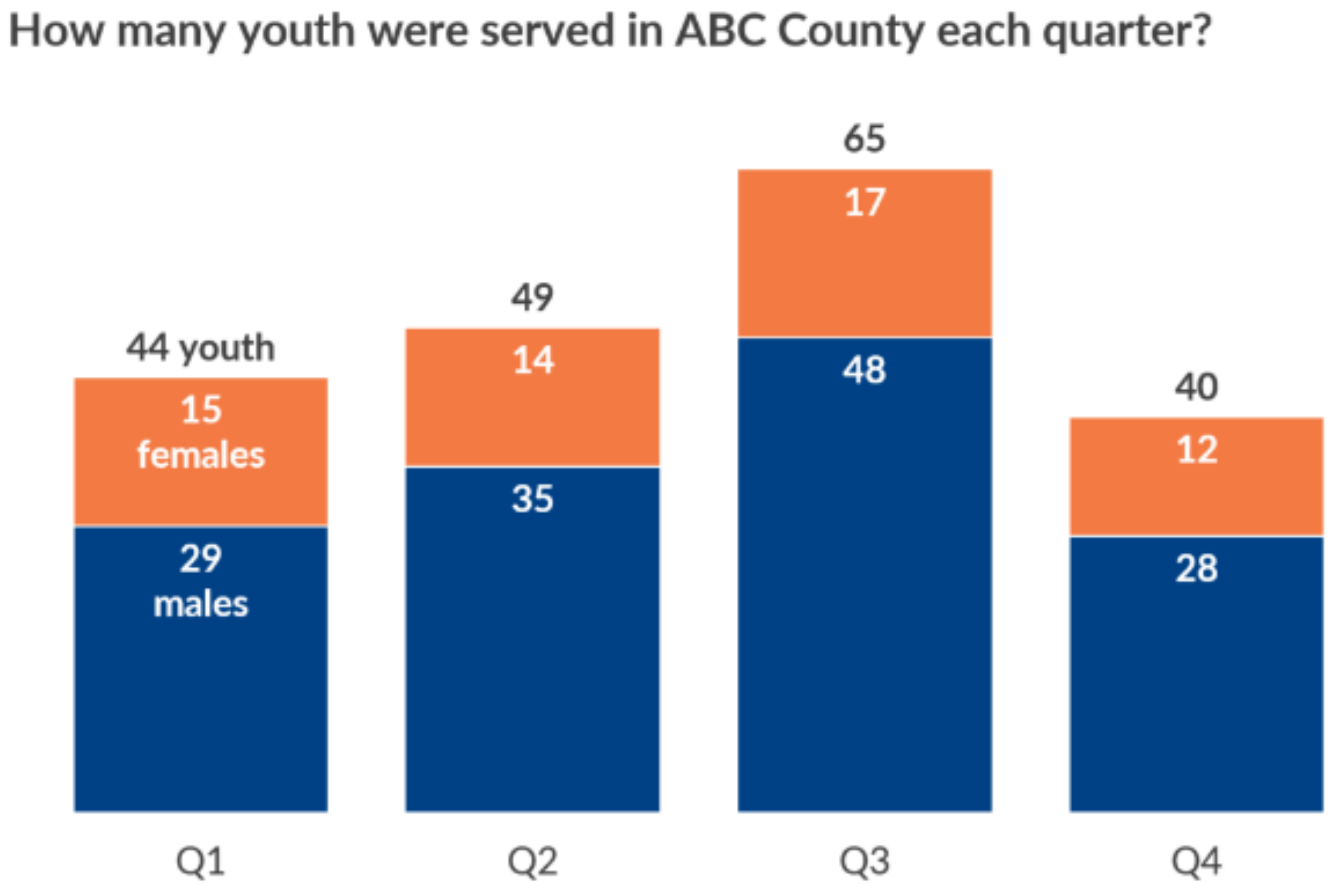






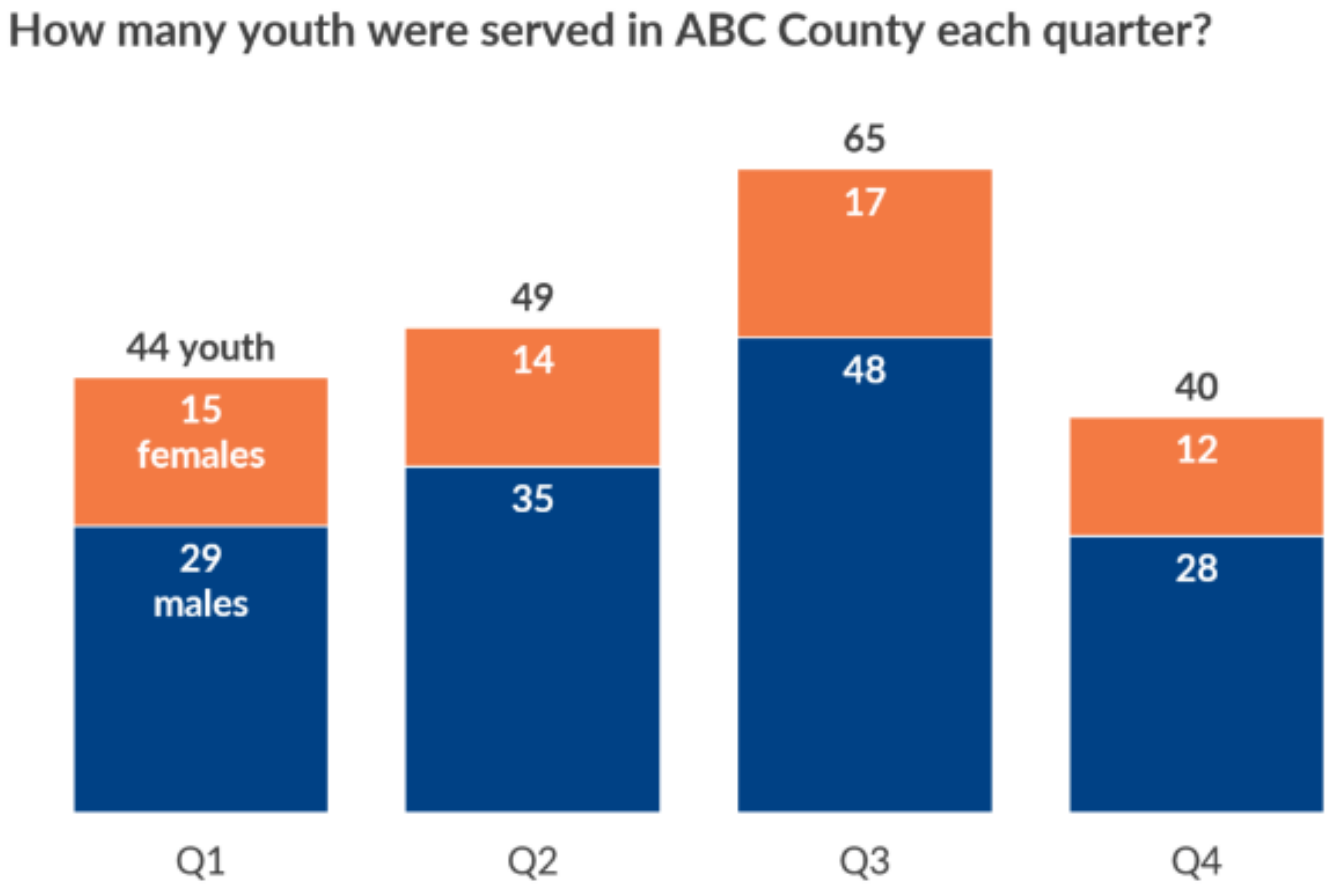
Pie chart alternatives

For displaying multiple points in time



Pie chart alternatives

For displaying multiple points in time




WHAT GROUP PROJECTS ARE SUPPOSED TO TEACH YOU
COMMUNICATION
RESPONSIBILITY
COLLABORATION
TEAMWORK


WHAT GROUP PROJECTS TAUGHT ME
COMMUNICATION
RESPONSIBILITY
COLLABORATION
TEAMWORK
TRUST NO ONE

Chose the Right Chart

- Consider your message
- Consider your audience
- Graph is not always the best option
  - Does this display my idea better than a table or words?
  - A visualization should improve your communication- not confuse
- More than 1 "correct" option to display data
  - Choosing the wrong type of chart can mislead your audience

Improving a table: How can we better tell this data's story?

Households Served in the ABC Program			
County	County 1	County 2	Total
September	107	182	289
October	109	173	282
November	135	156	291
December	148	153	301

Same data, many options: (a better) **Table**

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Households served

County	Sept	Oct	Nov	Dec
County 1	107	109	135	148
County 2	182	173	156	153
Total	289	282	291	301

Same data, many options: **Line graph**

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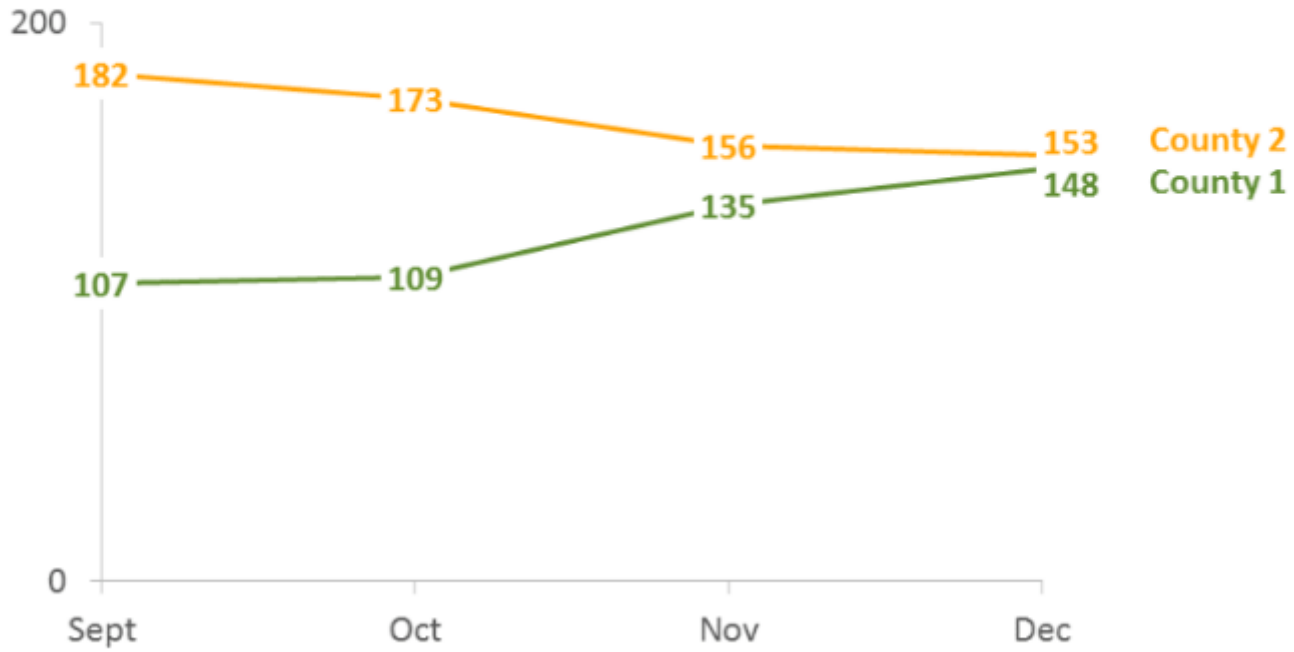
Households served

We provided services to **fewer households in County 2** (182 families in September vs. 153 by December) and **more households in County 1** (107 in September vs. 148 by December).



Same data, many options: **Clustered column**

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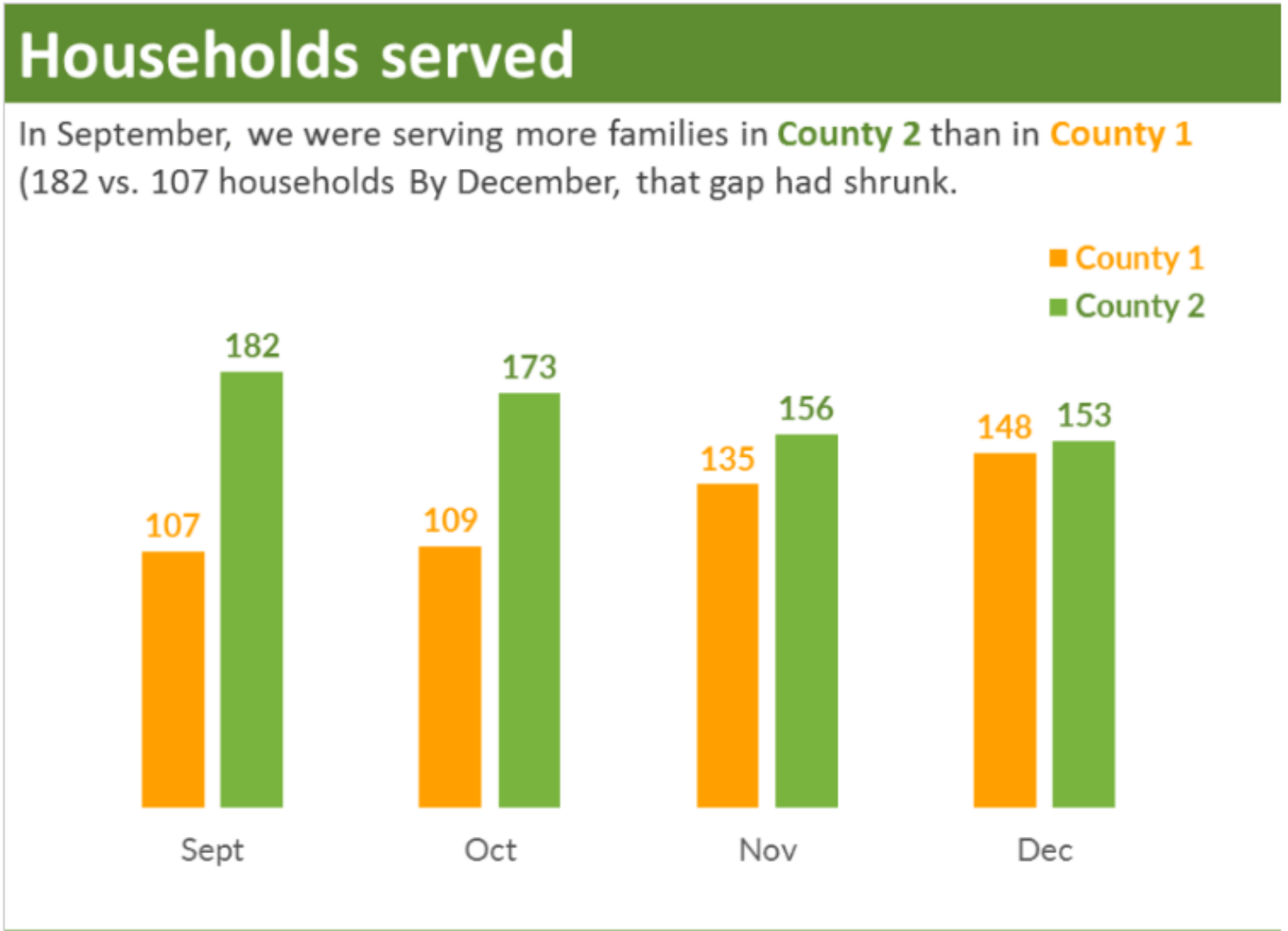

Same data, many options: **Stacked column**

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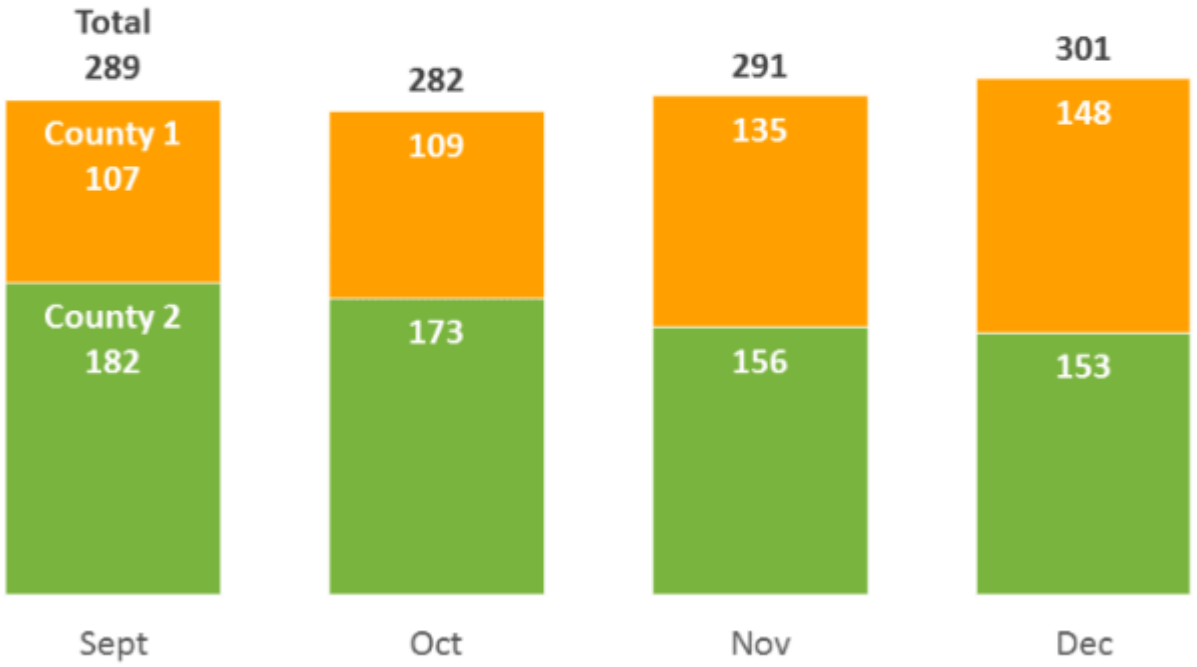
Households served

The proportion of families served in **County 1 increased** while the proportion of families served in **County 2 decreased**. The total number of households increased slightly, from 289 in September to 301 in December.



Same data, many options: **Stacked 100% column**

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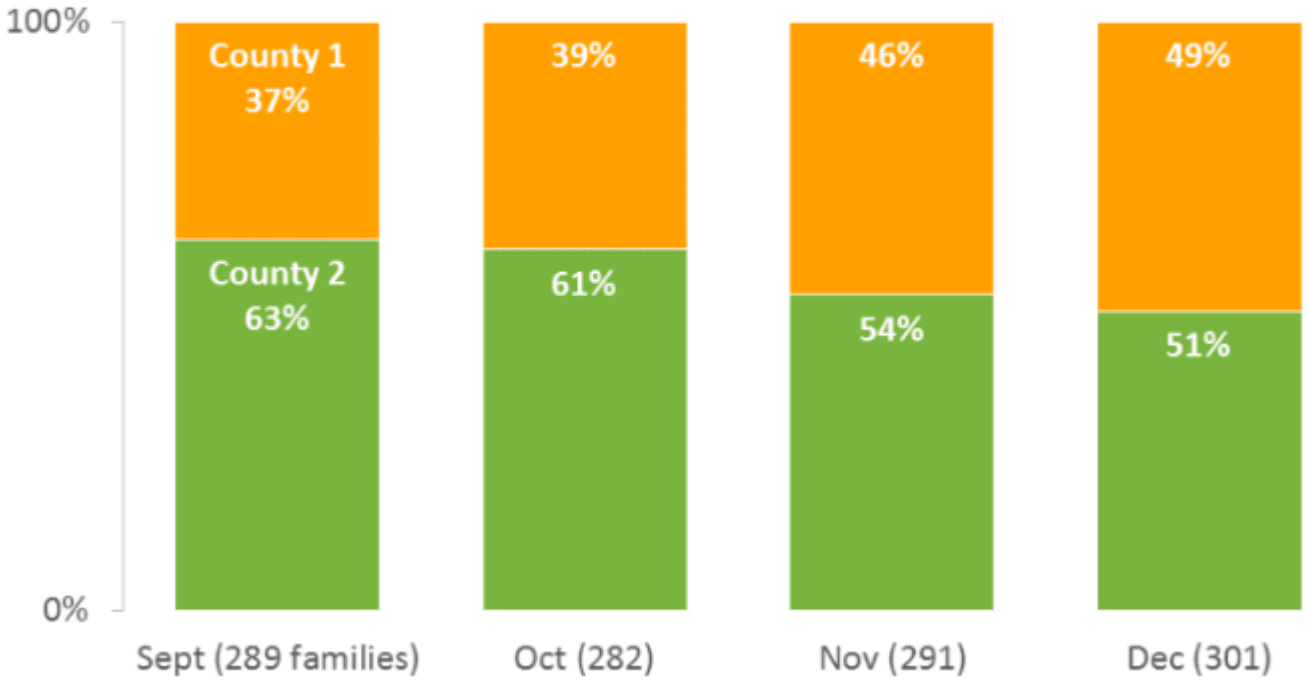
Households served

The proportion of families served in **County 1 increased** while the proportion of families served in **County 2 decreased**.



Chose the Right Chart

Resources

https://depictdatastudio.com/charts/

https://datavizcatalogue.com/search.html

De-Clutter!

De-Clutter!

Declutter your visualization so that viewers can focus on what matters- the data

Remove

to improve

(the **data-ink** ratio)

De-Clutter Checklist:

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- ✓Remove borders
- ✓Remove tick marks and leader lines
- ✓Remove 3D/ special effects
- ✓Remove background fills
- ✓Remove decorative clip-art
- ✓Consolidate Redundant Text
- ✓Label Sparingly
  - Label the axis or the individual data points- but not both
- ✓Label directly
  - Delete the legend and place labels directly beside or on top of data

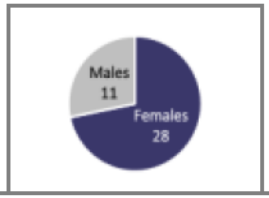
Remove Borders

Ann & Robert H. Lurie Children's Hospital of Chicago®

Client Demographics: All Were Formerly Homeless and 1/3 are Victims of Domestic Violence

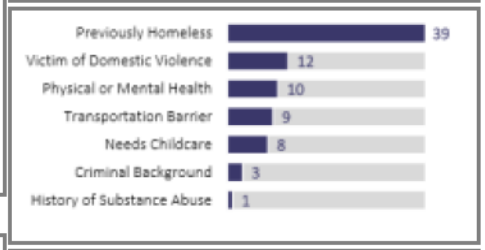
BAES collects background information on clients during screening interviews with clients, during screening interviews with case managers, and from Bridging Affordability's existing database.

Gender
BAES serves both men and women. Nearly three-quarters of the clients have been women.



Age Ranges
Clients have ranged from 22 to 62 years old; the average client is in their early-40s.

Barriers to Employment
All of the clients were previously homeless and one-third are victims of domestic violence. Some of the clients deal with physical disabilities, mental health issues, cognitive issues, past substance abuse.

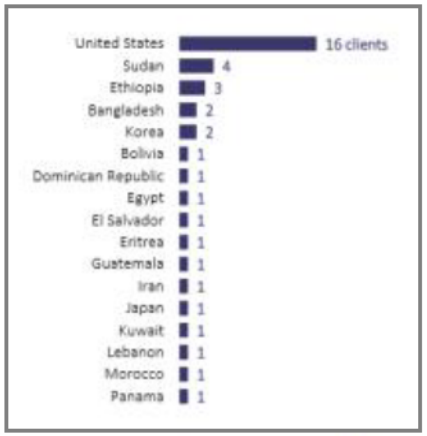


Educational Levels
Clients have a range of educational levels. Degrees come from institutions in Bangladesh, Cuba, Japan, and Sudan, as well as from Northern Virginia Community College and Strayer University, among others.

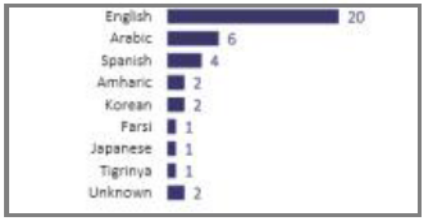
Races and Ethnicities
Of the 39 clients served during the pilot period, 16 were African American/Black, 5 were Asian, 15 were Caucasian/ White, 1 was multi-racial, and 1 identified as another race. Six of the 39 people also identified as Hispanic.

Races and Ethnicities	Hispanic	Not Hispanic	Total
African American/Black	1	15	16
Asian	-	5	5
Caucasian/White	5	10	15
Multi-racial	-	1	1
Other	1	1	2
Total	6	32	39

Countries of Birth
Clients represent 17 different countries. Sixteen of the 39 clients are US-born while the remaining 23 were born outside of the United States. Clients come from Ethiopia, Sudan, Bangladesh, Korea, Bolivia, the Dominican Republic, Egypt, El Salvador, Eritrea, Guatemala, Iran, Japan, Kuwait, Lebanon, Morocco, and Panama.



Primary Languages
English is not the primary language for half the clients. Clients' primary languages include Arabic, Spanish, Amharic, and others. BAES has helped several clients enroll in English classes to improve their reading, writing, speaking, and pronunciation skills.



Remove Borders

Ann & Robert H. Lurie Children's Hospital of Chicago®

Client Demographics: All Were Formerly Homeless and 1/3 are Victims of Domestic Violence

BAES collects background information on clients during screening interviews with clients, during screening interviews with case managers, and from Bridging Affordability's existing database.

Gender

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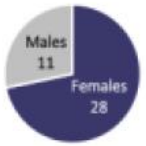

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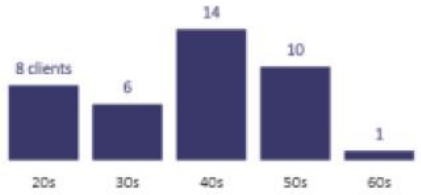

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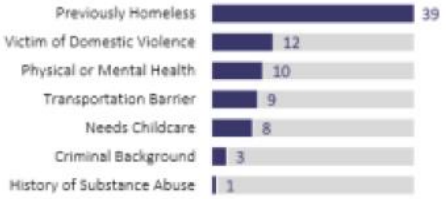

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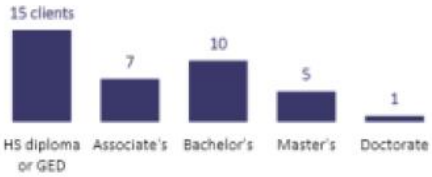

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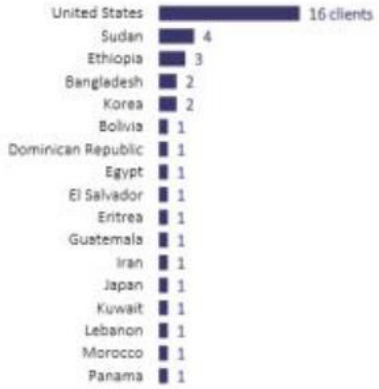

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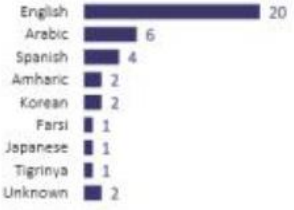
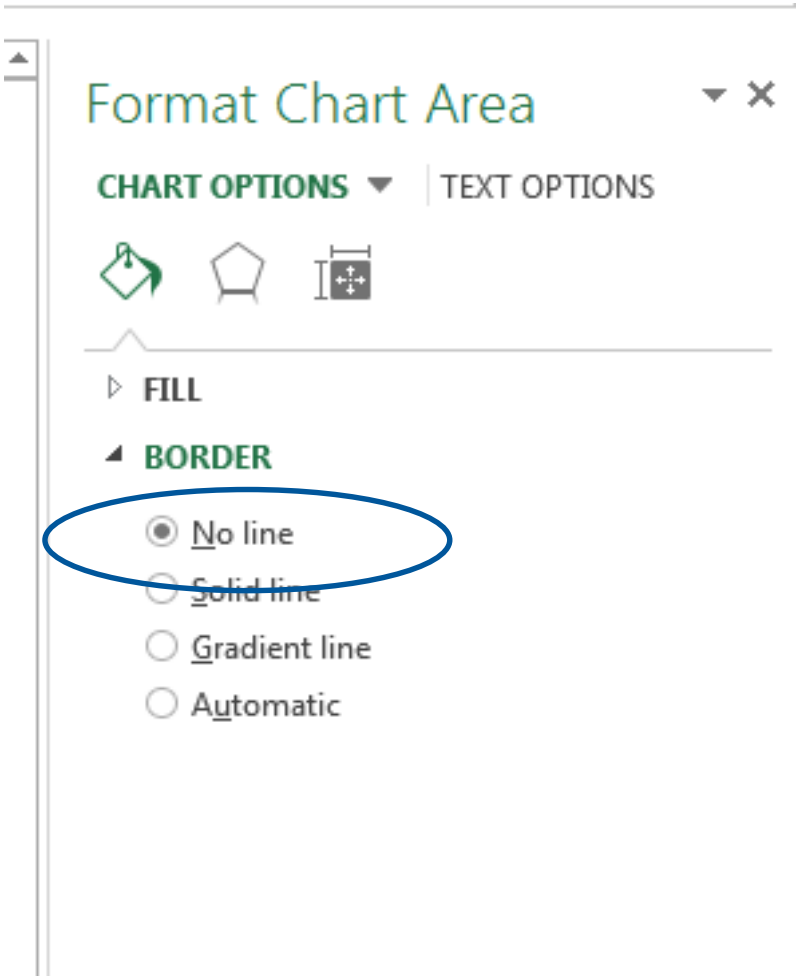


Remove Borders

- From the graph as a whole
- From the segments within the graph (e.g., stacked bar charts get outlined in white)
- From tables



Remove Borders

Decluttering also applies to tables!

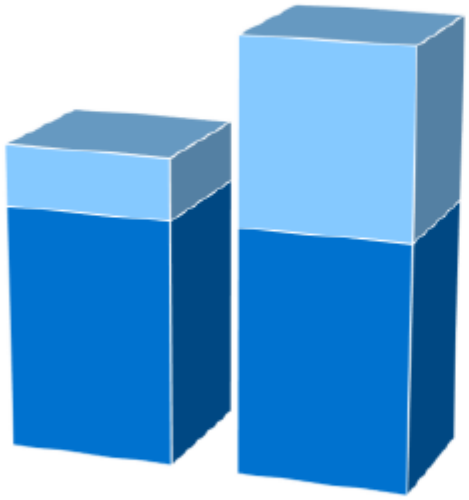
Households Served in the ABC Program			
County	County 1	County 2	Total
September	107	182	289
October	109	173	282
November	135	156	291
December	148	153	301

Remove Borders

County	September	October	November	December
County 1	107	109	135	148
County 2	182	173	156	153
Total	289	282	291	301

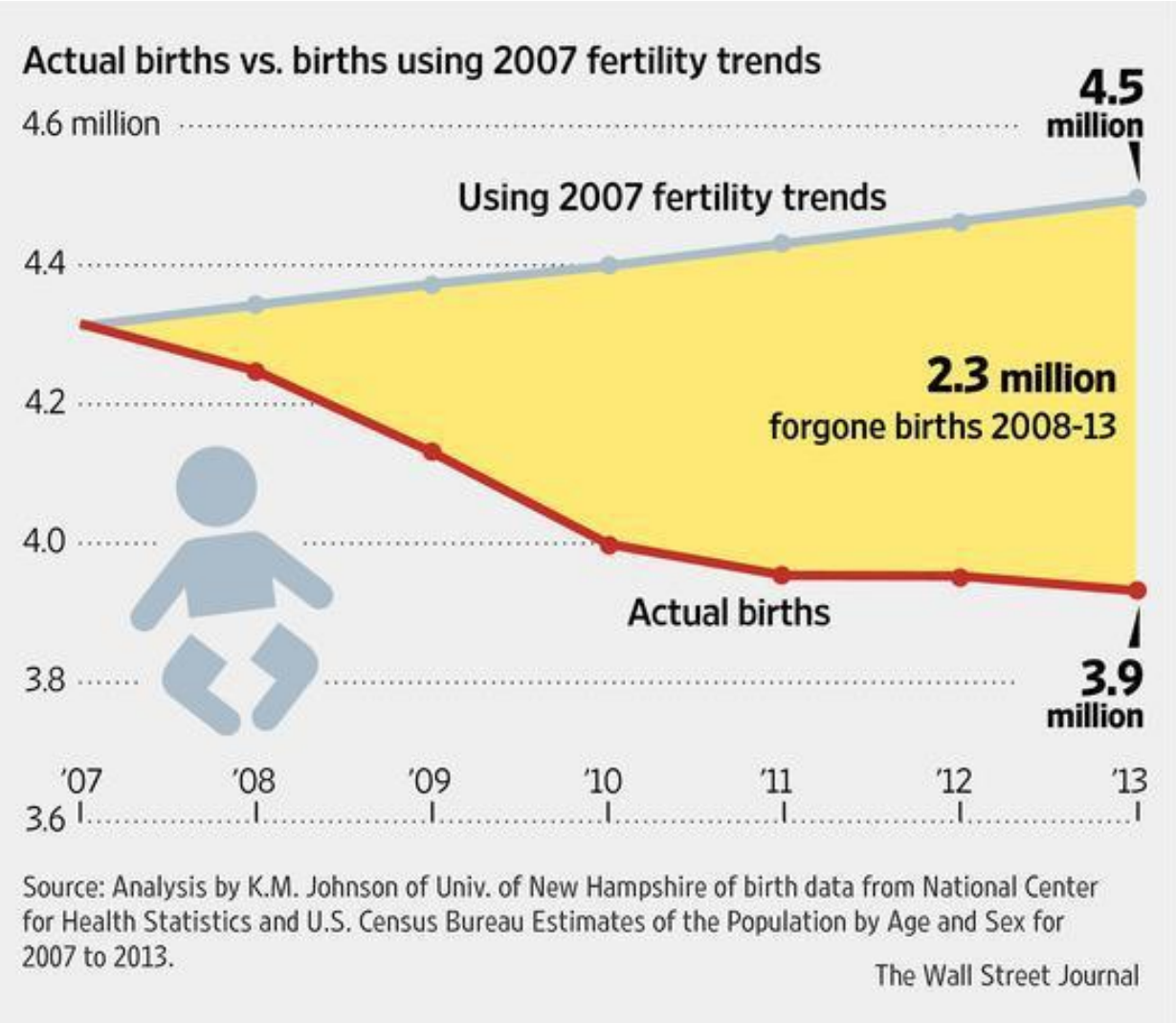
Remove Distractions

Any 3D elements or "special effects",
bolded, underline, or *italic* text



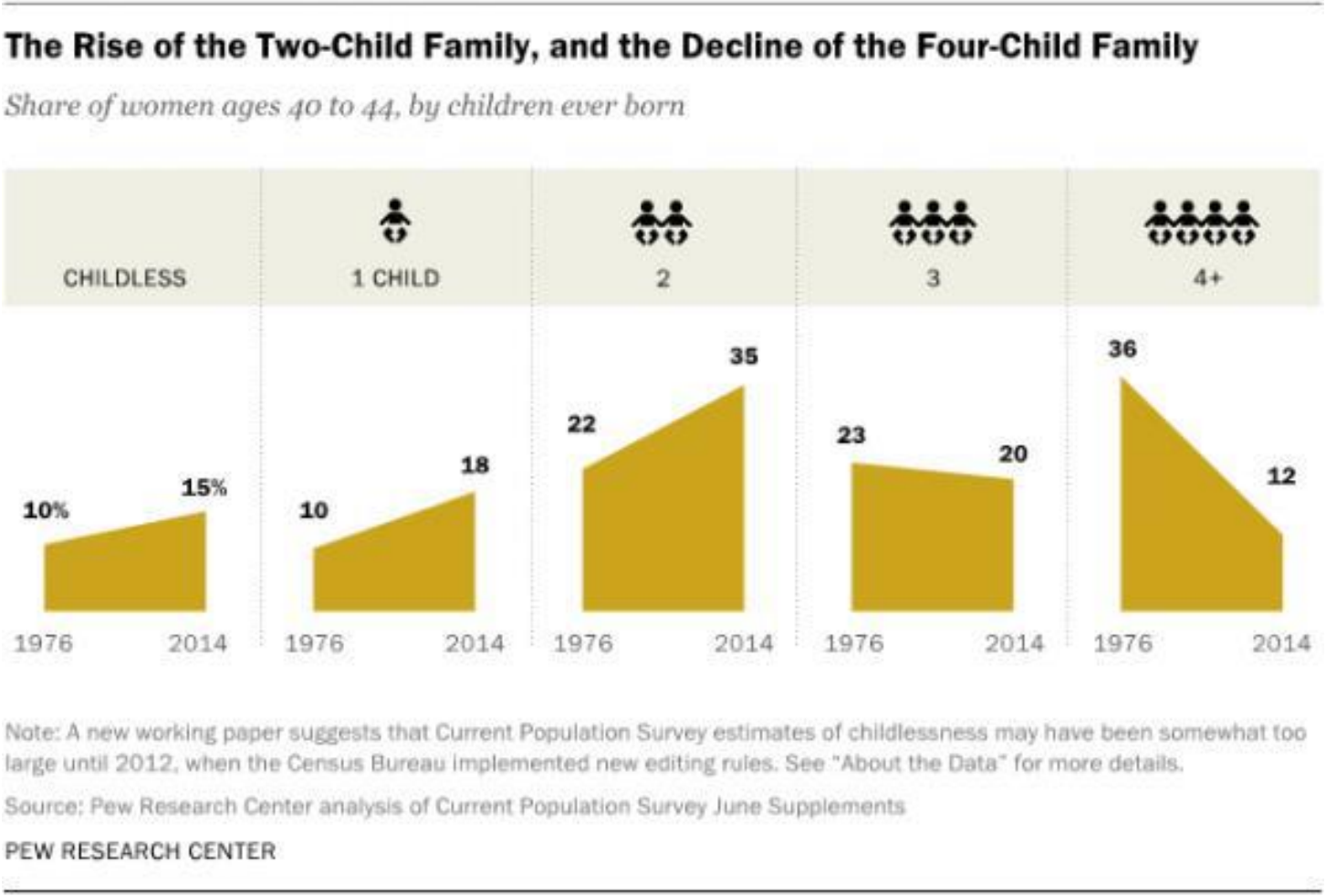
Remove Distractions

Decorative clip-art / pictures

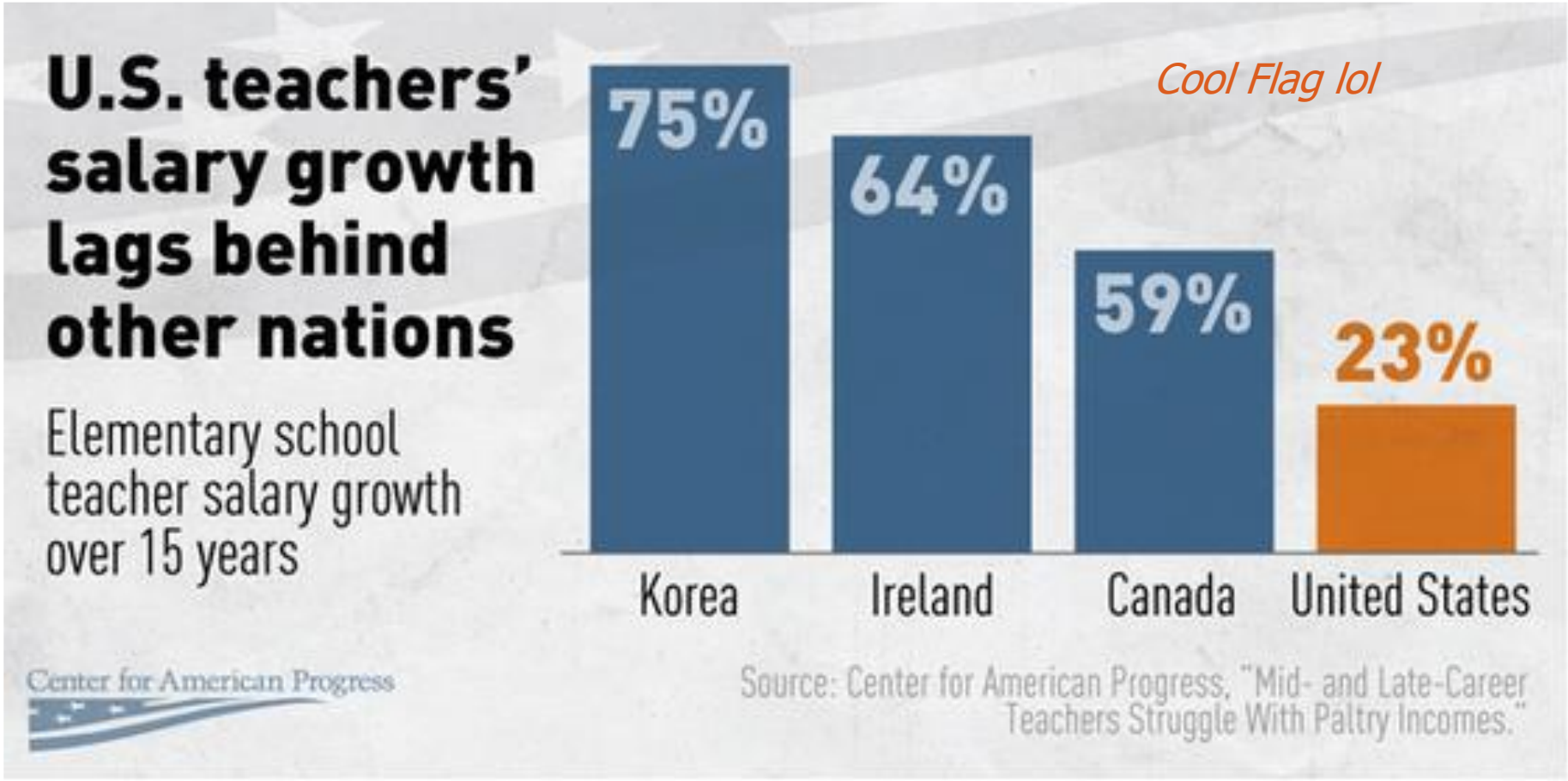


Remove Distractions

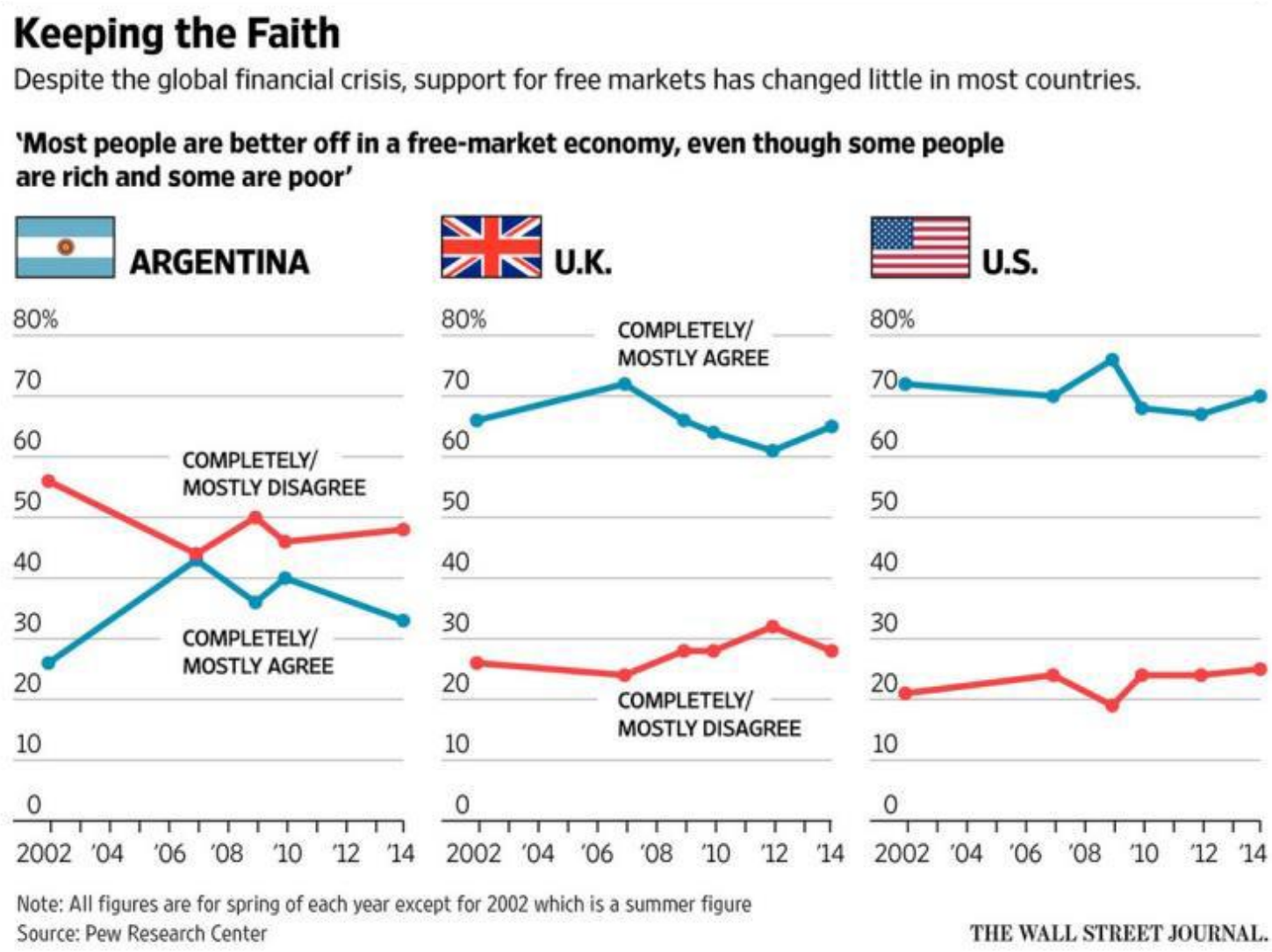
But, you may add icons that support interpretation



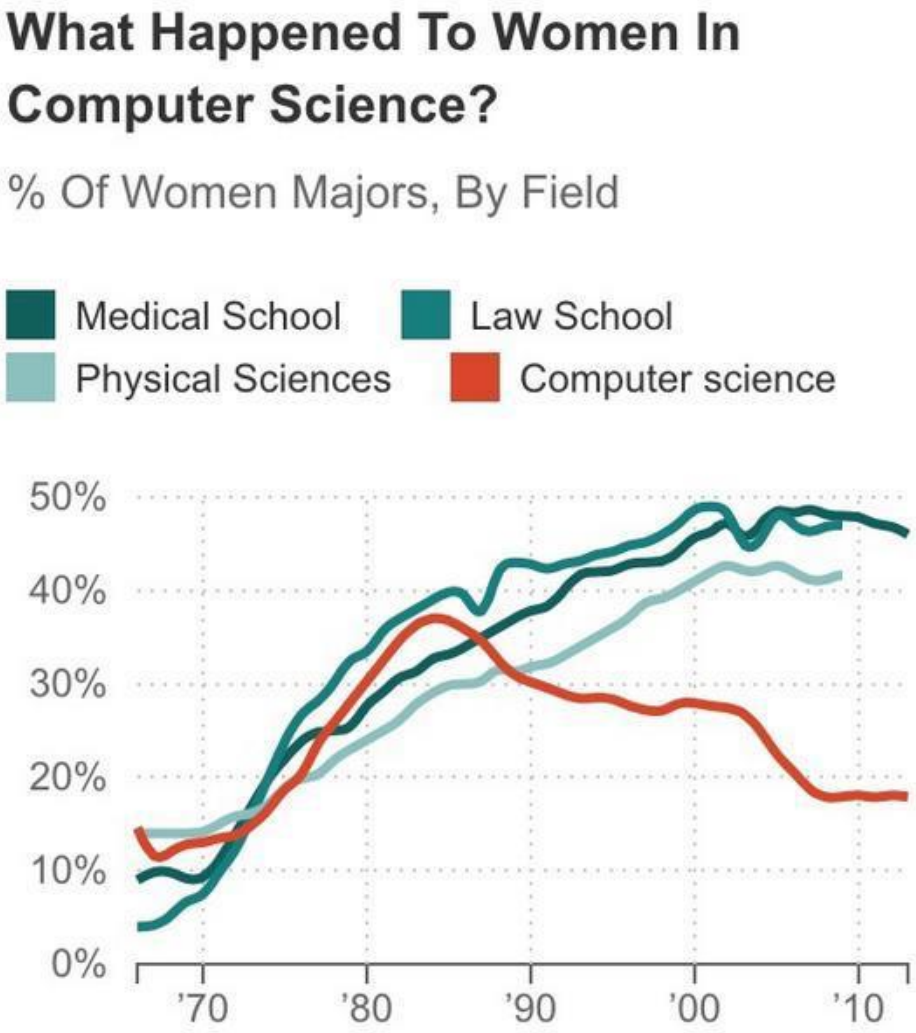
Remove Distractions



Icons that support interpretation

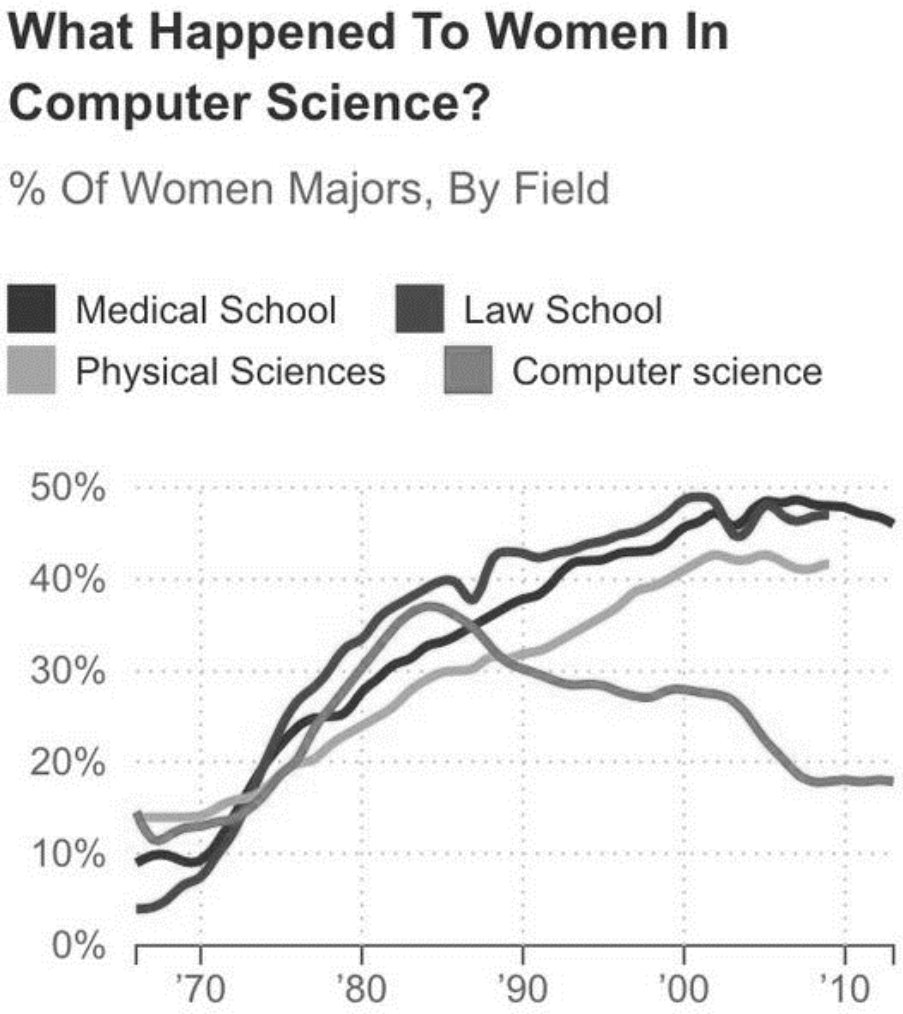


Remove Legends and Label Directly



Remove Legends and Label Directly

Legends create even more problems when printed in grayscale



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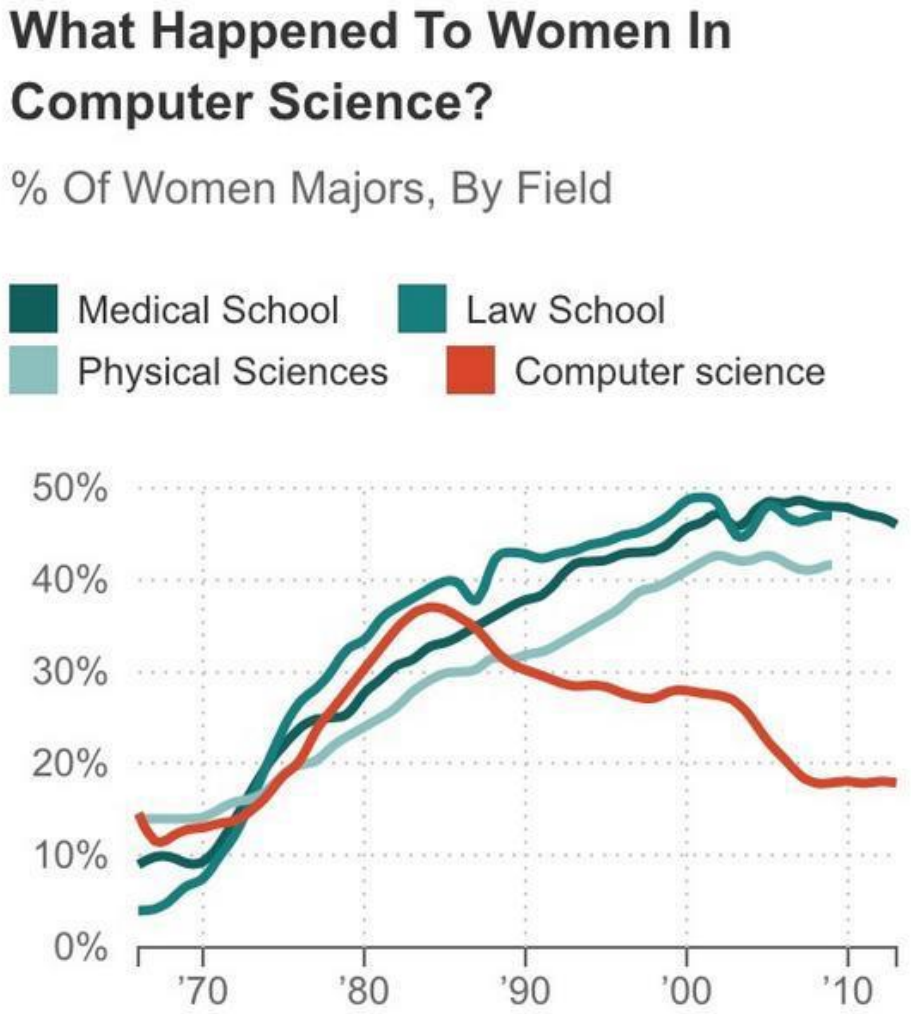

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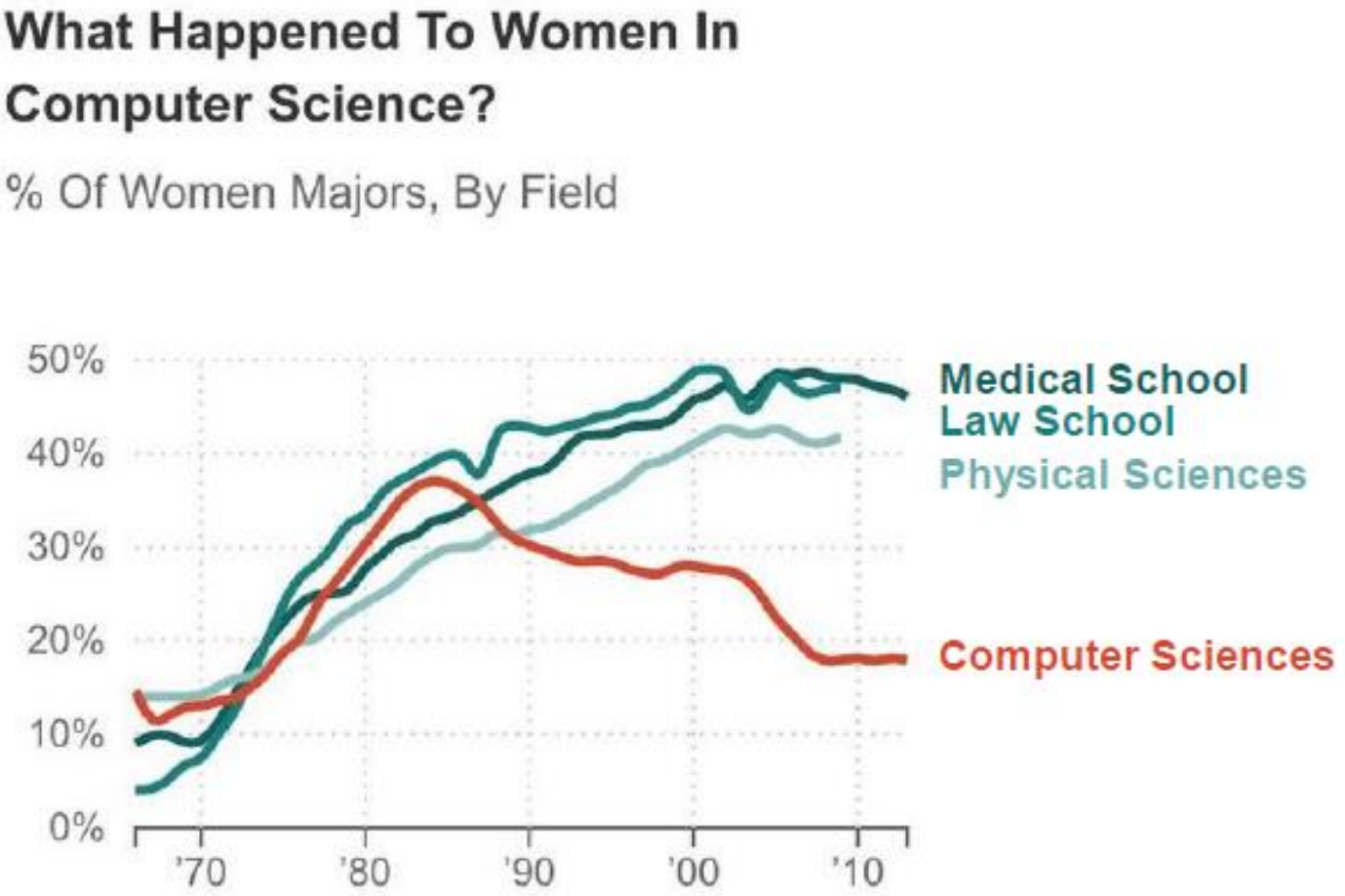

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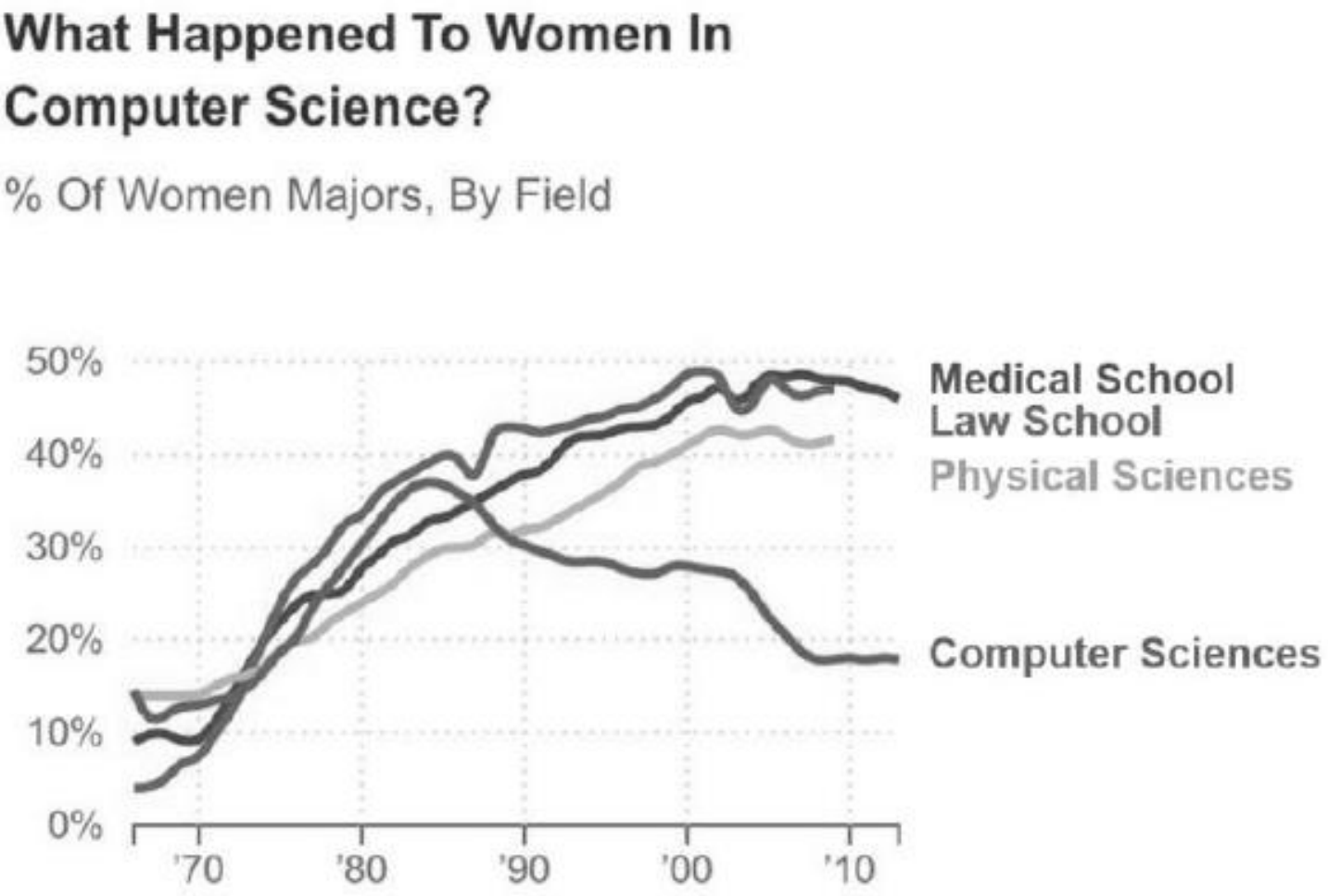
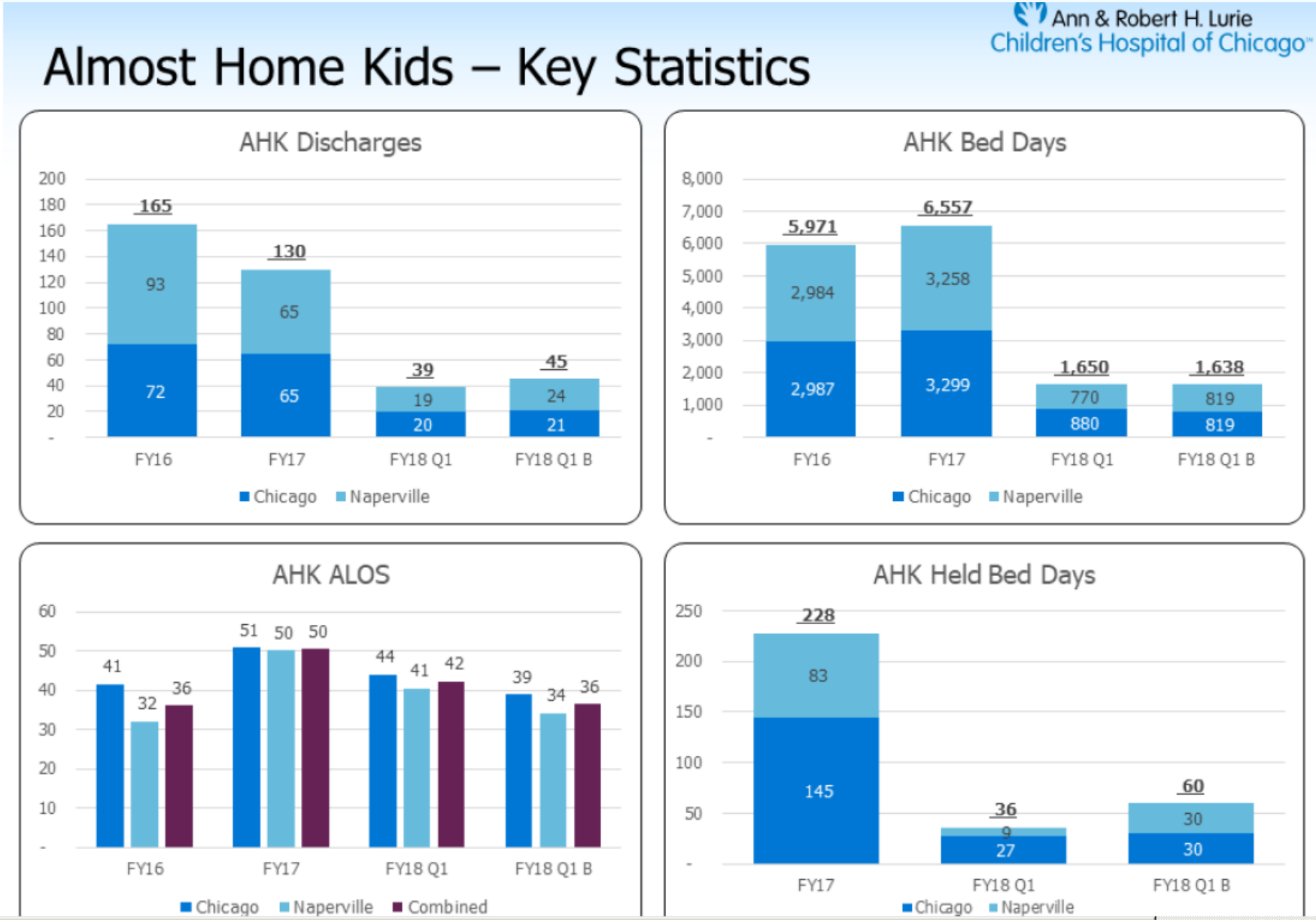


Remove Redundant Labels

Ann & Robert H. Lurie Children's Hospital of Chicago



De-Clutter Checklist:

Ann & Robert H. Lurie Children's Hospital of Chicago®

- ✓Remove borders
- ✓Remove tick marks and leader lines
- ✓Remove 3D/ special effects
- ✓Remove background fills
- ✓Remove decorative clip-art
- ✓Consolidate Redundant Text
- ✓Label Sparingly
  - Label the axis or the individual data points- **but not both**
- ✓Label directly
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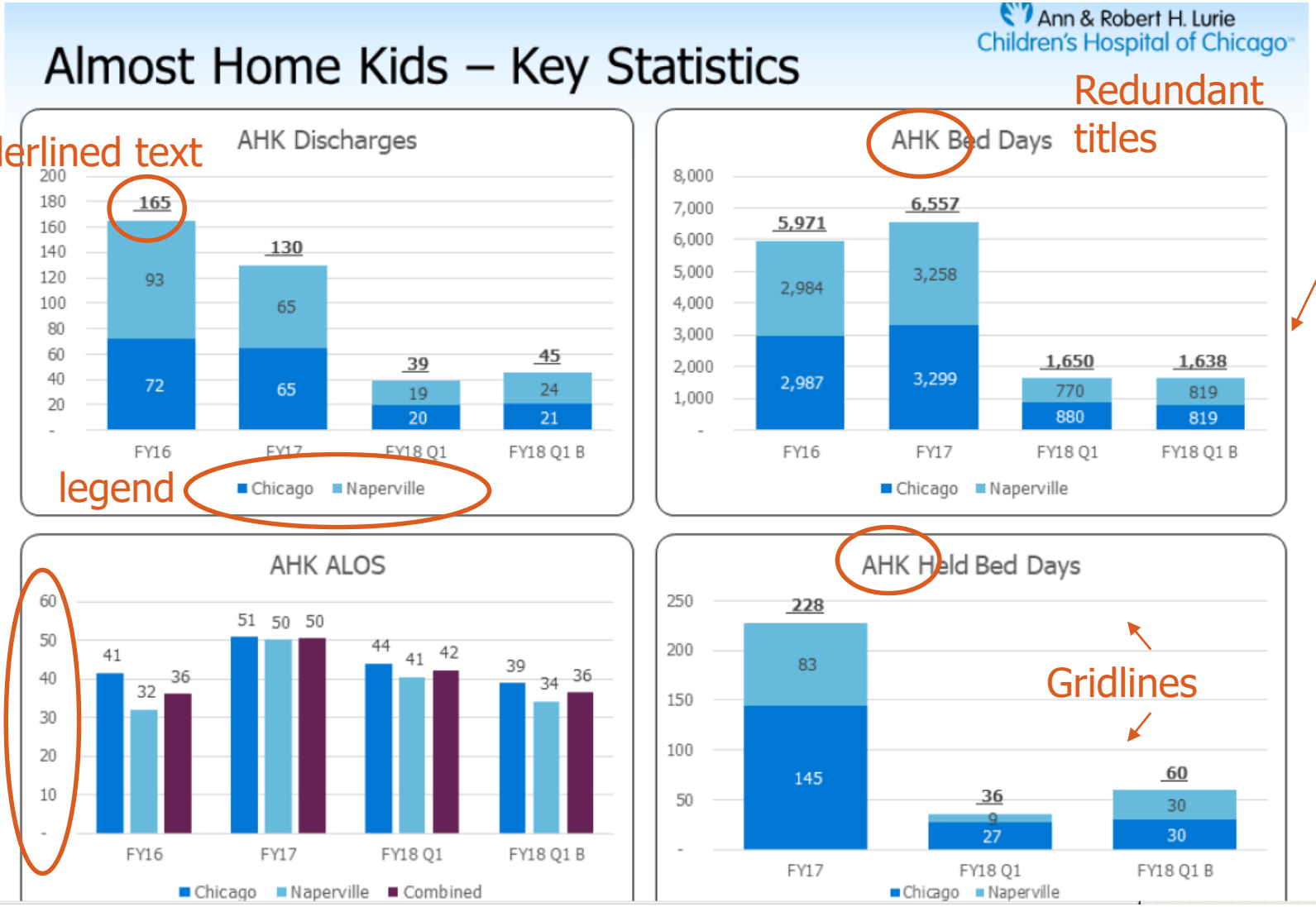
Ann & Robert H. Lurie Children's Hospital of Chicago



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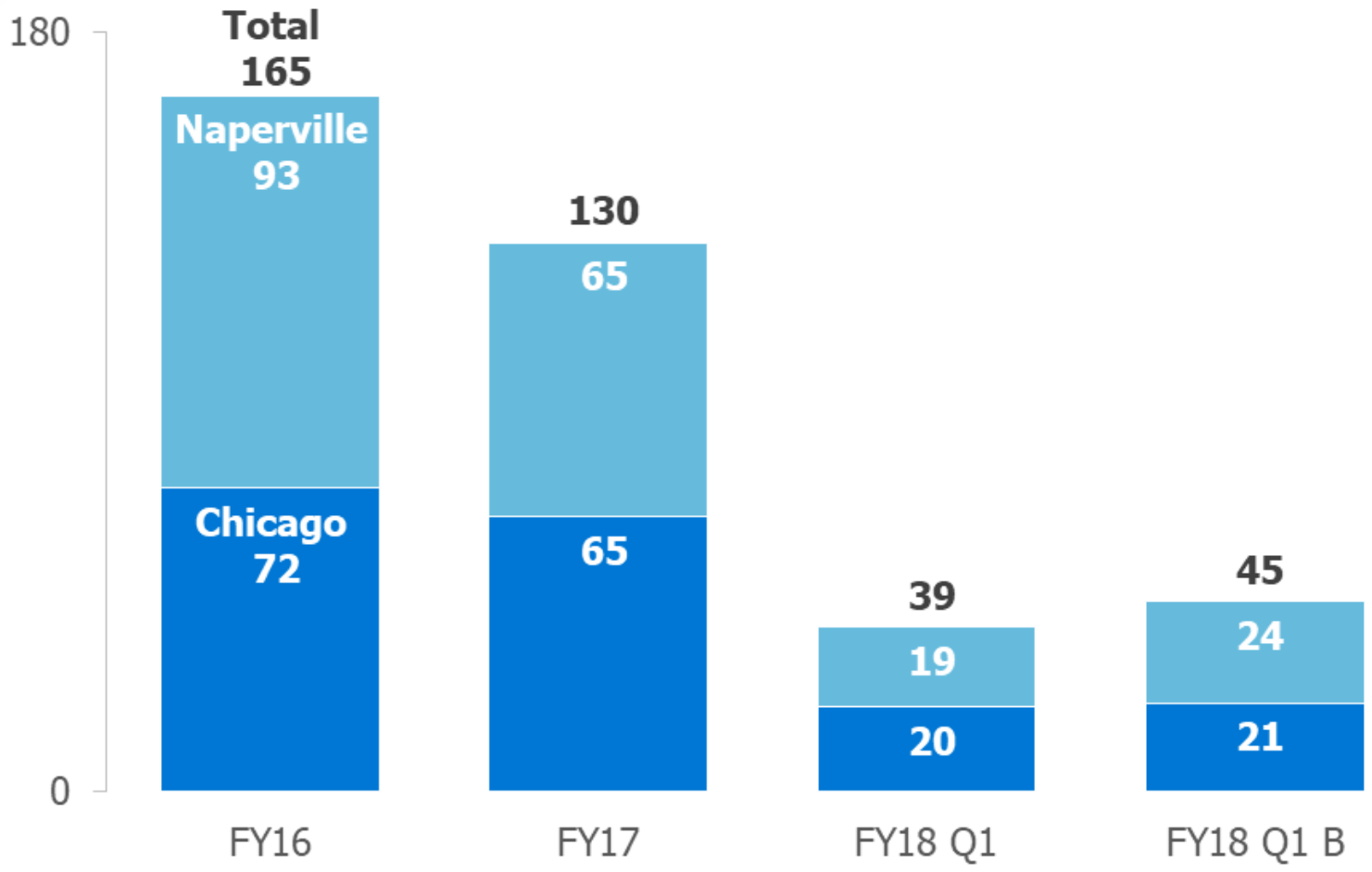
De-cluttered example

Ann & Robert H. Lurie Children's Hospital of Chicago®

Almost Home Kids: Discharges



Clarify with **Color**

Clarify with **Color**

Color can enhance branding and understanding, & to guide viewers to the most important pieces of the graph

Clarify with Color

- ✓ Brand visuals with custom colors, consistent color palettes
- ✓ Ensure legibility in grayscale- printer friendly
- ✓ Select distinguishable colors to people with color vision deficiencies (avoid red/green combinations!) Link to simulator check
- ✓ Ensure sufficient foreground/background contrast
- ✓ Color-code strategically and meaningfully

Match Colors to Branding

Ann & Robert H. Lurie
Children's Hospital of Chicago®

Find A Doctor | Request An Appointment | Locations & Directions

For Appointments: 1.800.KIDS DOC®

Donate Now

Ann & Robert H. Lurie
Children's Hospital of Chicago®

All, for your one.

Search Lurie Children's

Care & Services | Research Innovation | For Healthcare Professionals | Community | Get Involved

Top-ranked pediatric care.

All for Luke.

See Luke's Story

I would like to...

Find a Doctor

Request an Appointment

Find Locations

Match Colors to Branding

Ann & Robert H. Lurie Children's Hospital of Chicago®

Color: Categories

The Lurie Children's brand palette is divided into three categories of color. When designing a piece of communication, stick within one color category per piece.

Ensure Legibility for Color Blindness

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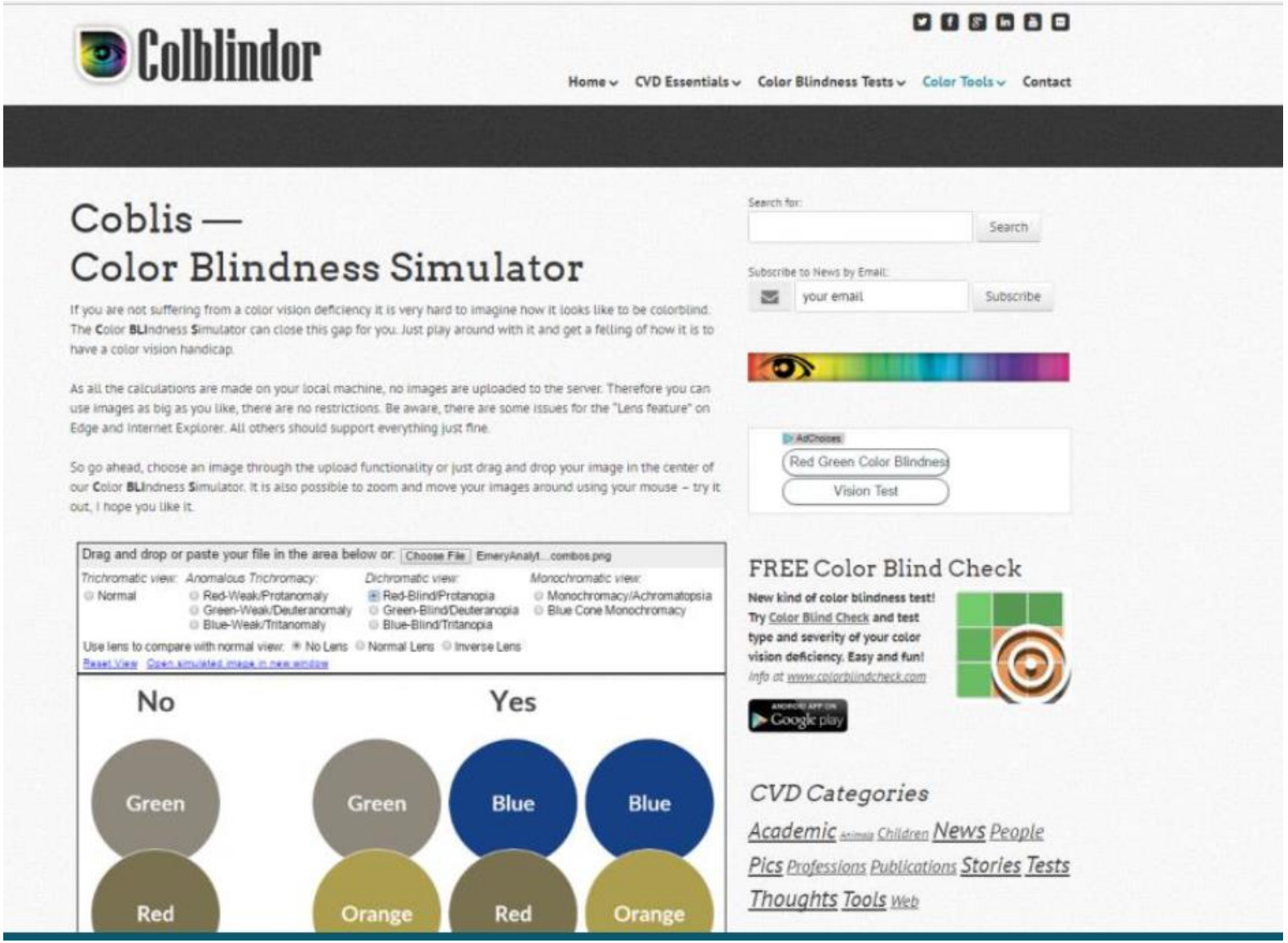

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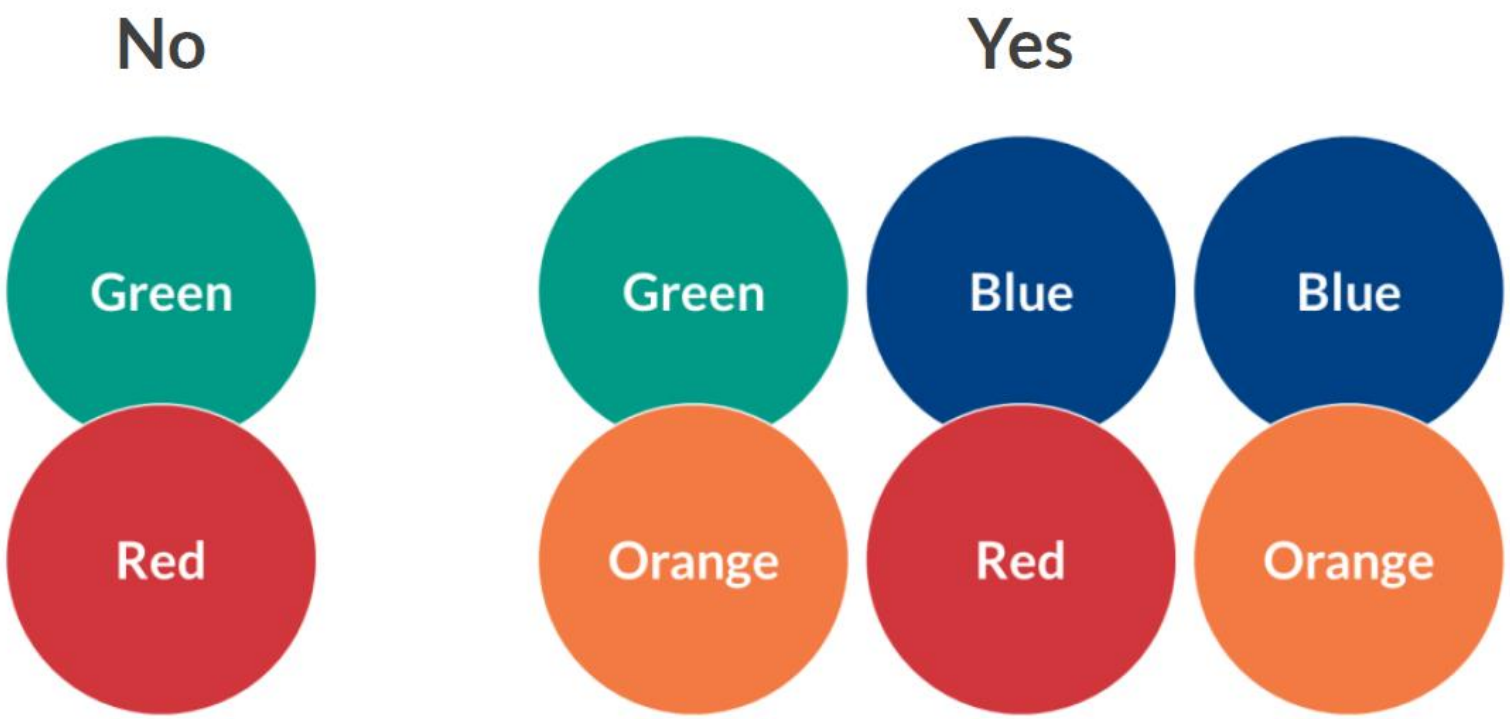
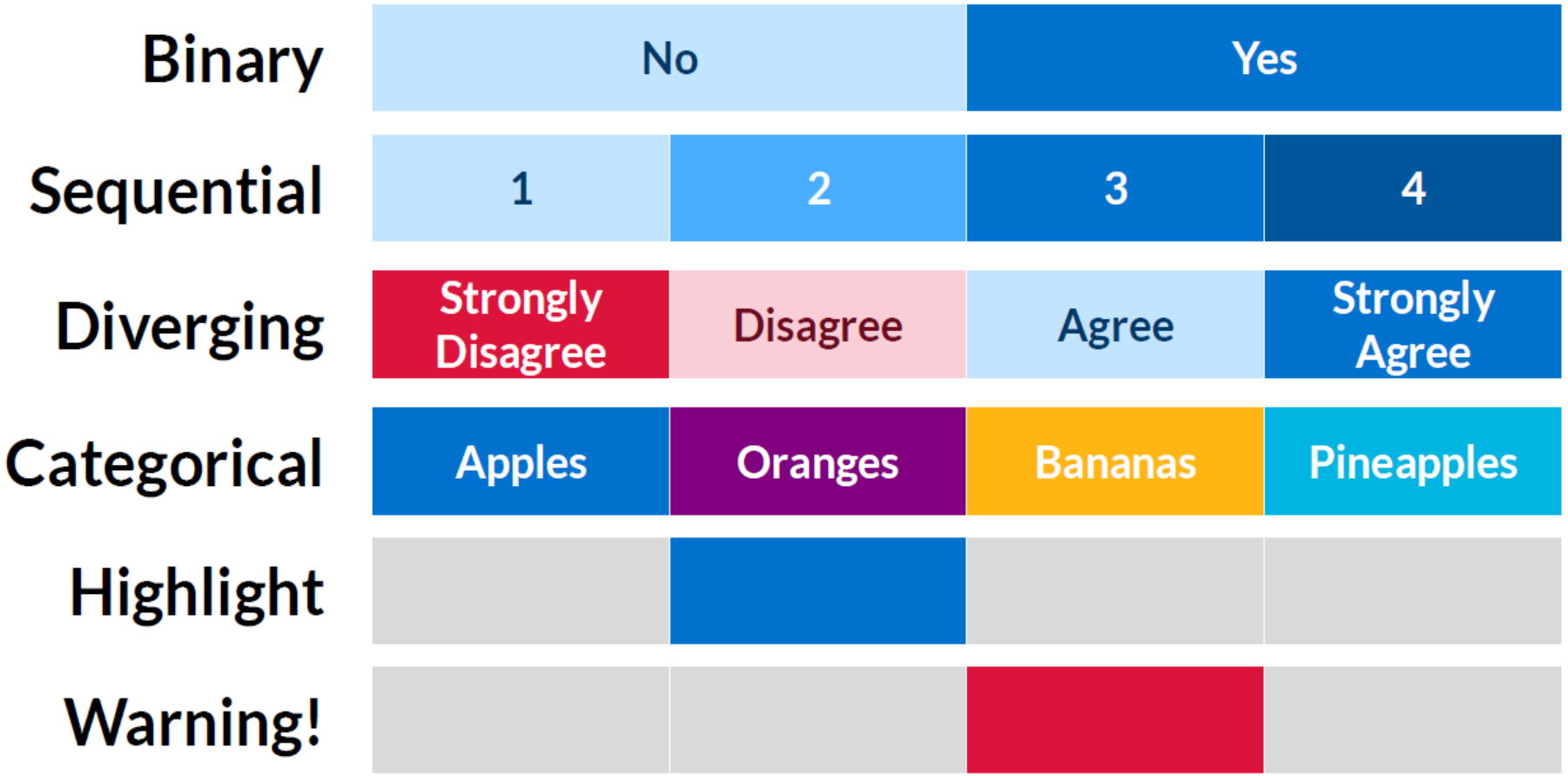


Use Color Meaningfully & Strategically

Ann & Robert H. Lurie Children's Hospital of Chicago



Use Color Meaningfully & Strategically

Ann & Robert H. Lurie Children's Hospital of Chicago

Use color to draw attention to or highlight certain findings

Stereotyping in Europe

EU nation most likely to be named ...

Views in:	Most Hardworking	Most Trustworthy	Least Hardworking	Least Trustworthy
Britain	Germany	Germany	**Greece**	France
France	Germany	Germany	Italy	**Greece**
Germany	Germany	Germany	**Greece**	**Greece**/Italy
Italy	Germany	Germany	Romania	Italy
Spain	Germany	Germany	**Greece**	Italy
Greece	**Greece**	**Greece**	Italy	Germany
Poland	Germany	Germany	**Greece**	Germany
Czech Rep.	Germany	Germany	**Greece**	**Greece**

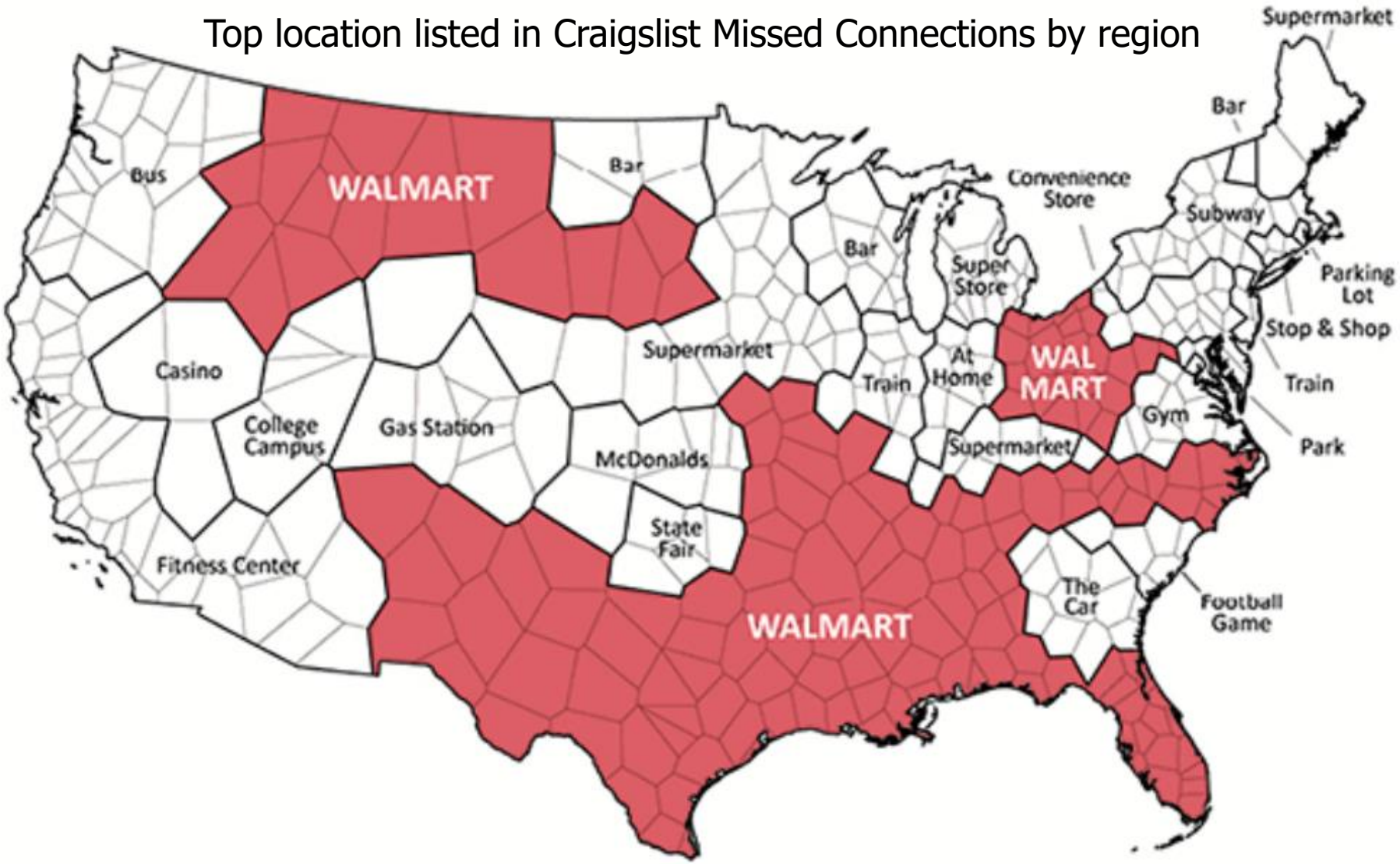
Source: Spring 2012 and Spring 2013 Global Attitudes surveys.

PEW RESEARCH CENTER

Use Color Meaningfully & Strategically

Ann & Robert H. Lurie Children's Hospital of Chicago®

Top location listed in Craigslist Missed Connections by region



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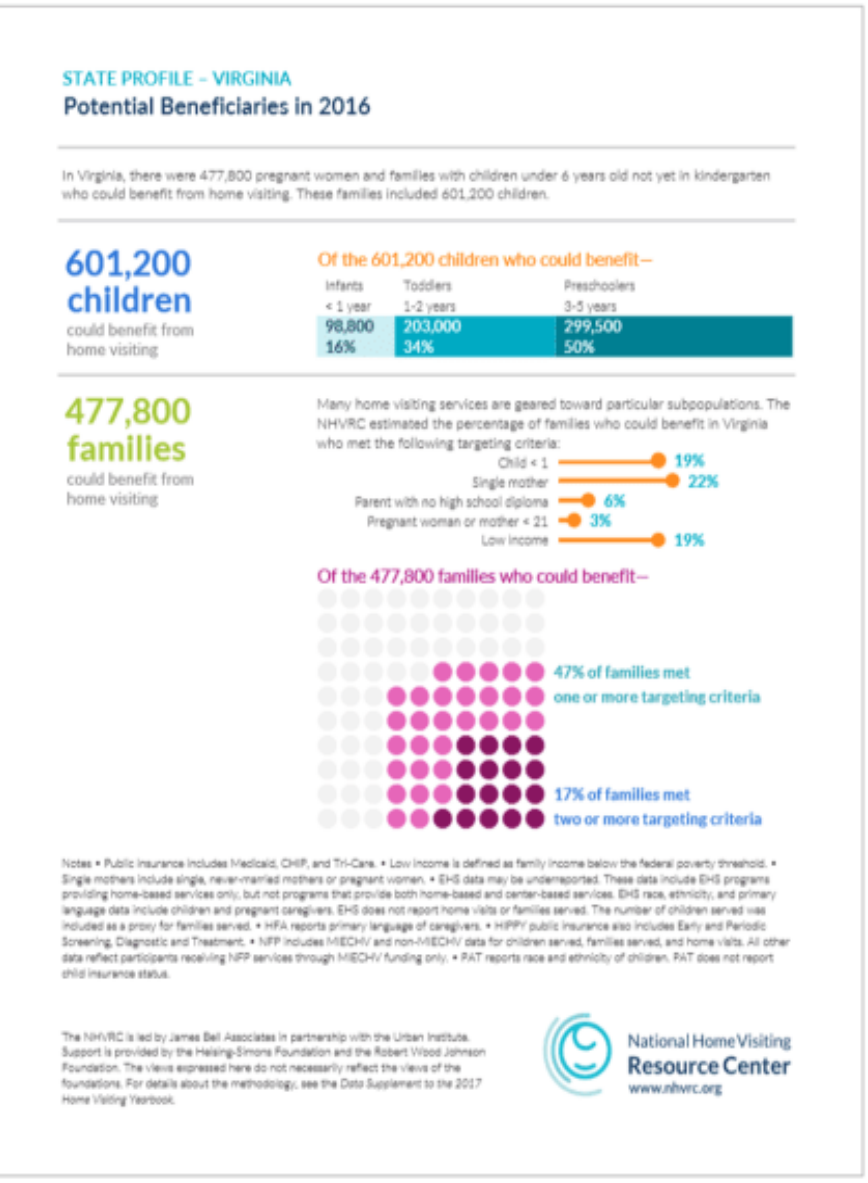

STATE PROFILE – VIRGINIA

Potential Beneficiaries in 2016

In Virginia, there were 477,800 pregnant women and families with children under 6 years old not yet in kindergarten who could benefit from home visiting. These families included 601,200 children.

601,200 children
could benefit from home visiting

Of the 601,200 children who could benefit—

Infants	Toddlers	Preschoolers
< 1 year	1-2 years	3-5 years
98,800	203,000	299,500
16%	34%	50%

477,800 families
could benefit from home visiting

Many home visiting services are geared toward particular subpopulations. The NHVRC estimated the percentage of families who could benefit in Virginia who met the following targeting criteria:

- Child < 1: 19%
- Single mother: 22%
- Parent with no high school diploma: 6%
- Pregnant woman or mother < 21: 3%
- Low income: 19%

Of the 477,800 families who could benefit—

47% of families met one or more targeting criteria

17% of families met two or more targeting criteria

Notes • Public insurance includes Medicaid, CHIP, and Tri-Care. • Low income is defined as family income below the federal poverty threshold. • Single mothers include single, never-married mothers or pregnant women. • EHS data may be underreported. These data include EHS programs providing home-based services only, but not programs that provide both home-based and center-based services. EHS race, ethnicity, and primary language data include children and pregnant caregivers. EHS does not report home visits or families served. The number of children served was included as a proxy for families served. • HFA reports primary language of caregivers. • HIPPY public insurance also includes Early and Periodic Screening, Diagnostic and Treatment. • NFP includes MIECHV and non-MIECHV data for children served, families served, and home visits. All other data reflect participants receiving NFP services through MIECHV funding only. • PAT reports race and ethnicity of children. PAT does not report child insurance status.

The NHVRC is led by James Bell Associates in partnership with the Urban Institute. Support is provided by the Heising-Simons Foundation and the Robert Wood Johnson Foundation. The views expressed here do not necessarily reflect the views of the foundations. For details about the methodology, see the *Data Supplement to the 2017 Home Visiting Yearbook*.

National Home Visiting Resource Center
www.nhvrc.org

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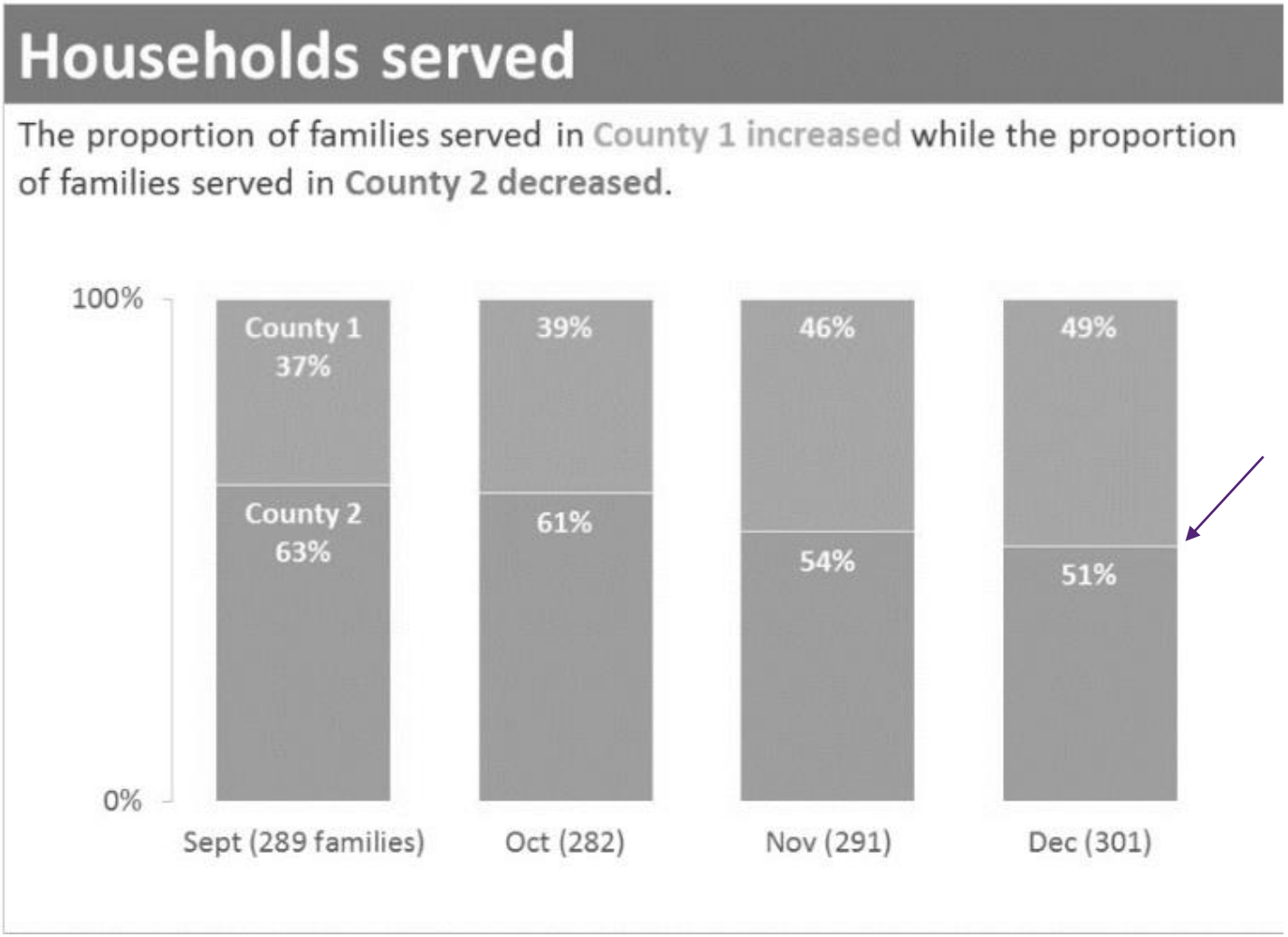
Legibility in Grayscale



White border lines

Clarify with **Text**

Clarify with **Text**

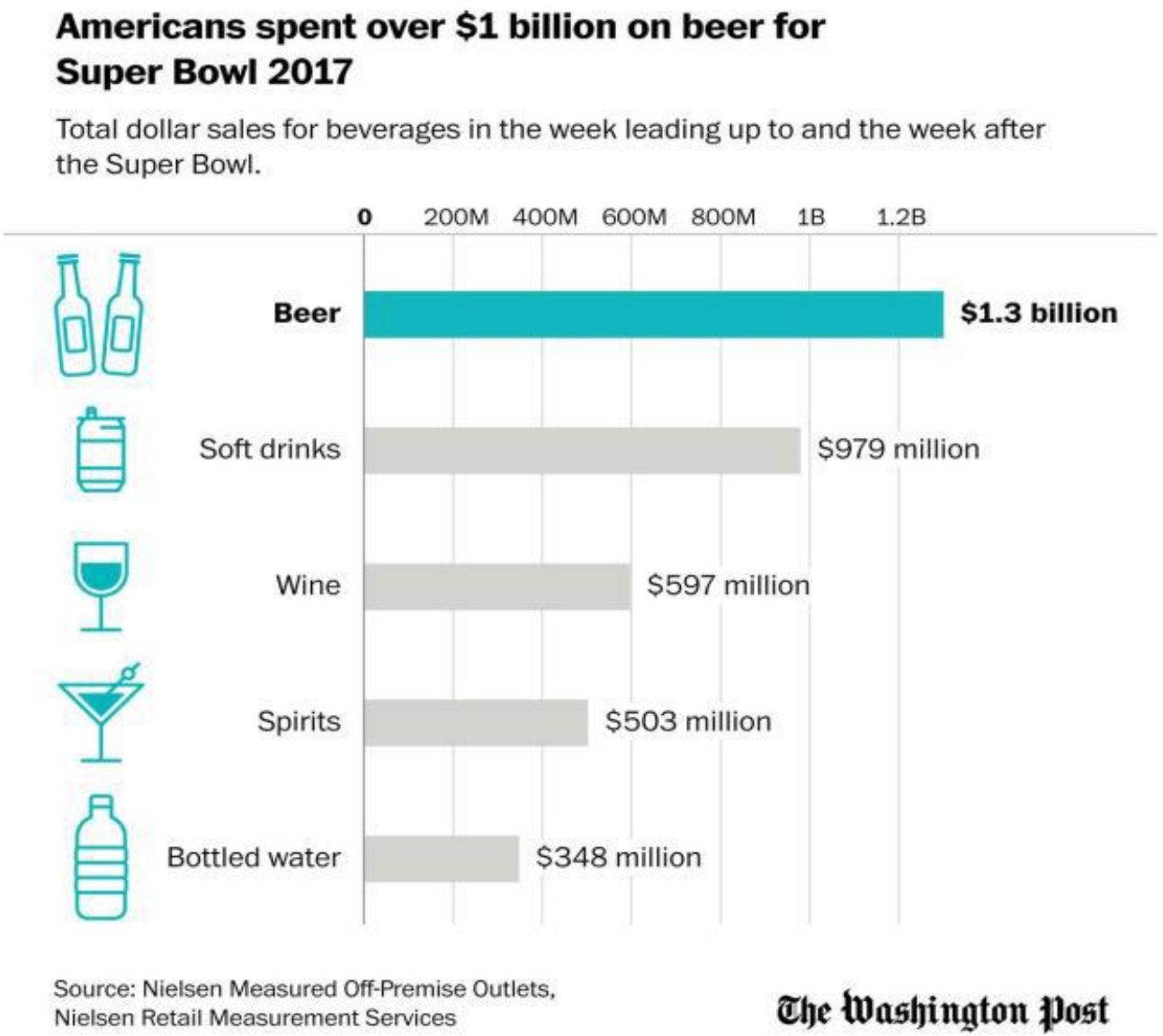
Your graph's title, subtitle, and annotations can strengthen your message

Ann & Robert H. Lurie Children's Hospital of Chicago®

Clarify with Text

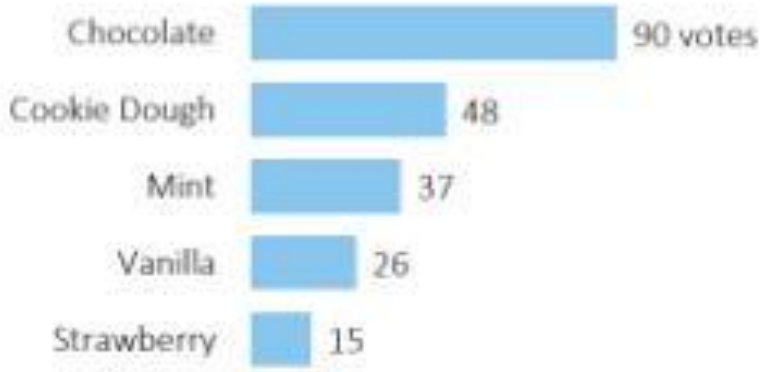
- ✓Brand visuals with custom fonts (Tahoma)
- ✓State the story in the title (6-12 words)
- ✓Annotate directly when appropriate
- ✓Establish a text hierarchy
- ✓Make sure all text is **h o r i z o n t a l**
- ✓Left-align titles and subtitles
- ✓Use ALL CAPS sparingly
- ✓Measure text readability
- ✓Round decimals to whole numbers (most of time)

State the story in the title



State the story in the title

Ice cream flavor preferences based on 2014 survey of elementary school students (n=216)

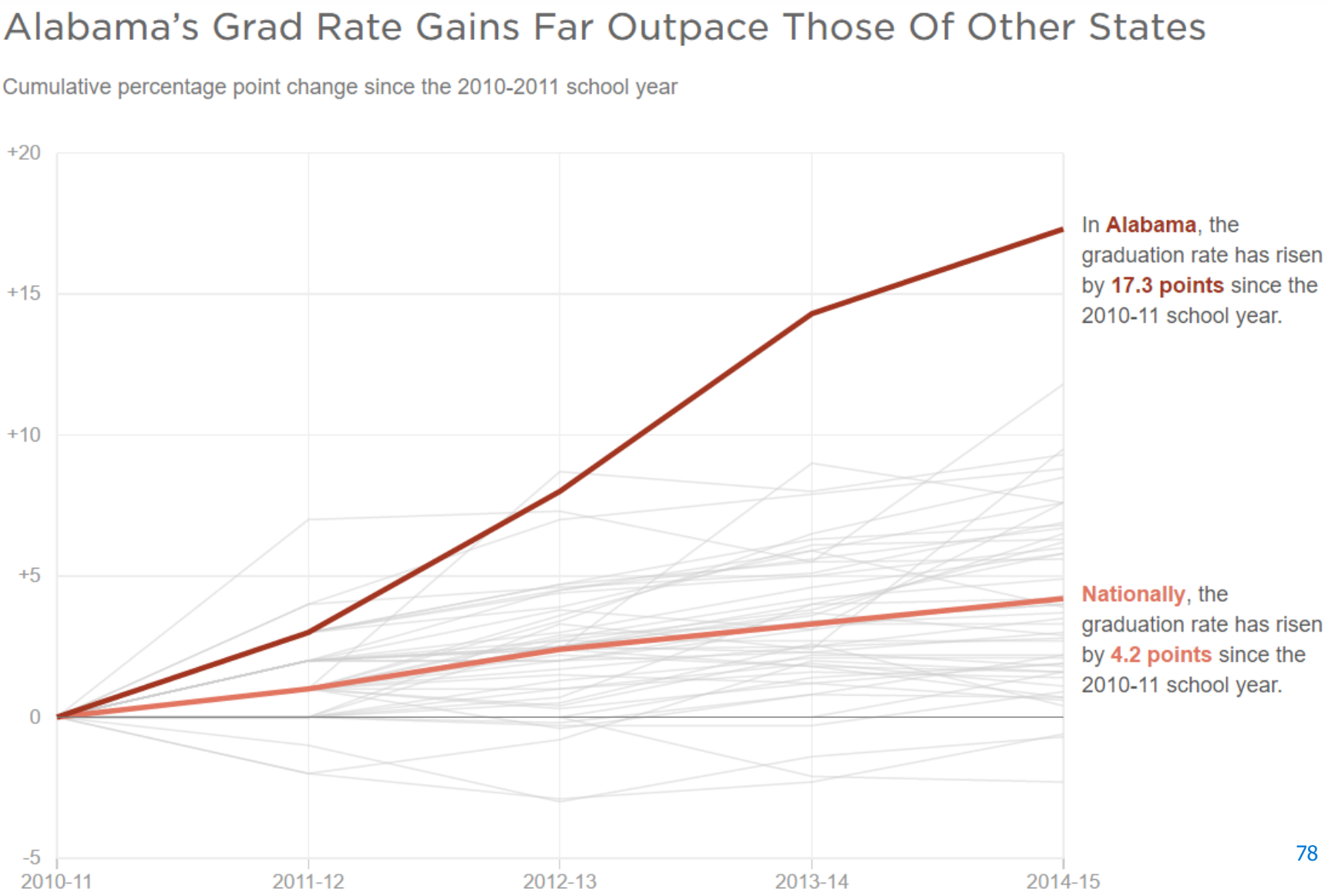


or

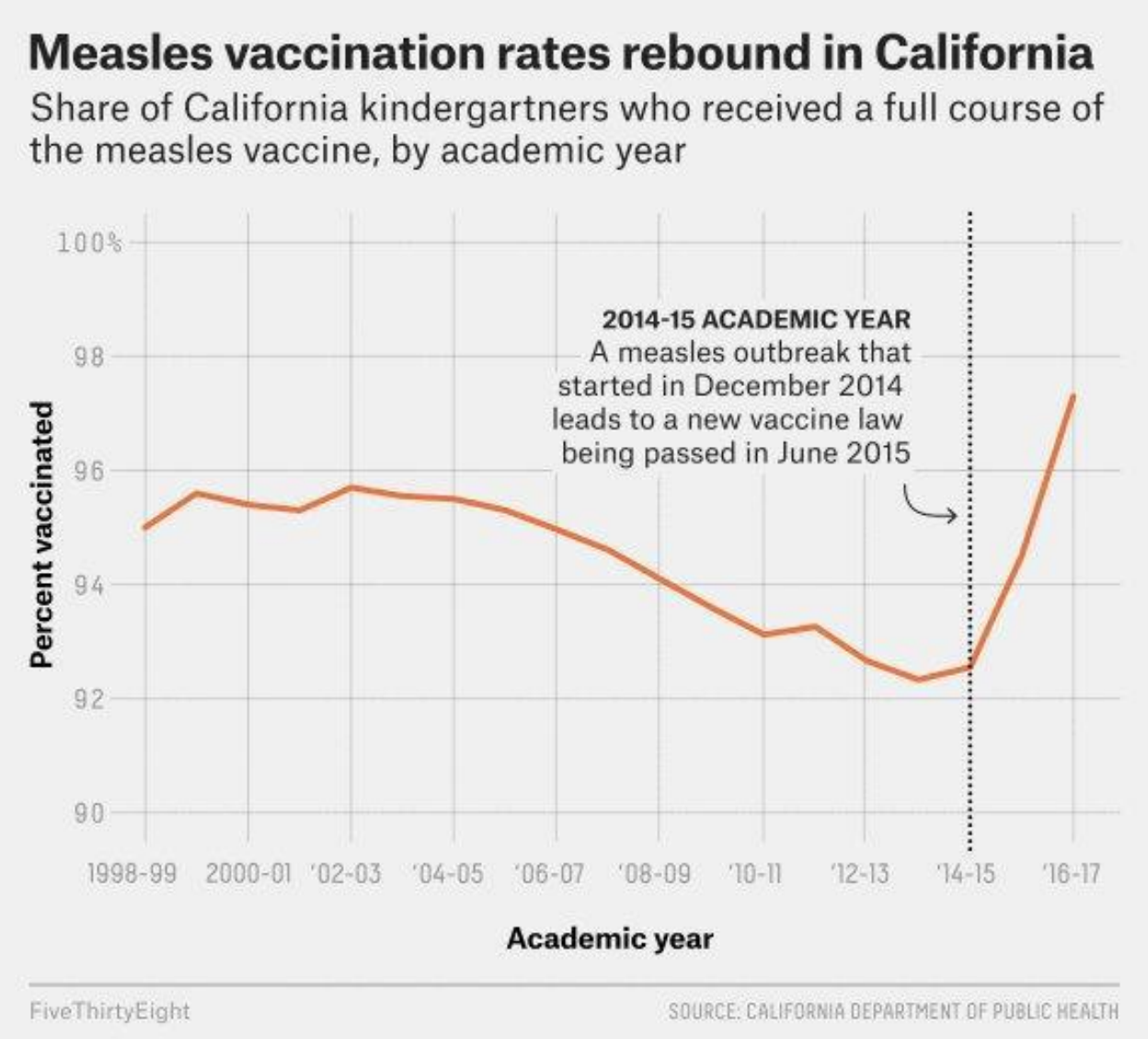
Chocolate was most popular flavor among elementary students surveyed

Source: 2014 survey of elementary school students (n=216)

Annotate


Alabama's Grad Rate Gains Far Outpace Those Of Other States
Cumulative percentage point change since the 2010-2011 school year
+20
+15
+10
+5
0
-5
2010-11
2011-12
2012-13
2013-14
2014-15
In Alabama, the graduation rate has risen by 17.3 points since the 2010-11 school year.
Nationally, the graduation rate has risen by 4.2 points since the 2010-11 school year.

Annotate


Measles vaccination rates rebound in California
Share of California kindergartners who received a full course of the measles vaccine, by academic year
100%
98
96
94
92
90
Percent vaccinated
2014-15 ACADEMIC YEAR
A measles outbreak that started in December 2014 leads to a new vaccine law being passed in June 2015
1998-99
2000-01
'02-03
'04-05
'06-07
'08-09
'10-11
'12-13
'14-15
'16-17
Academic year
FiveThirtyEight
SOURCE: CALIFORNIA DEPARTMENT OF PUBLIC HEALTH

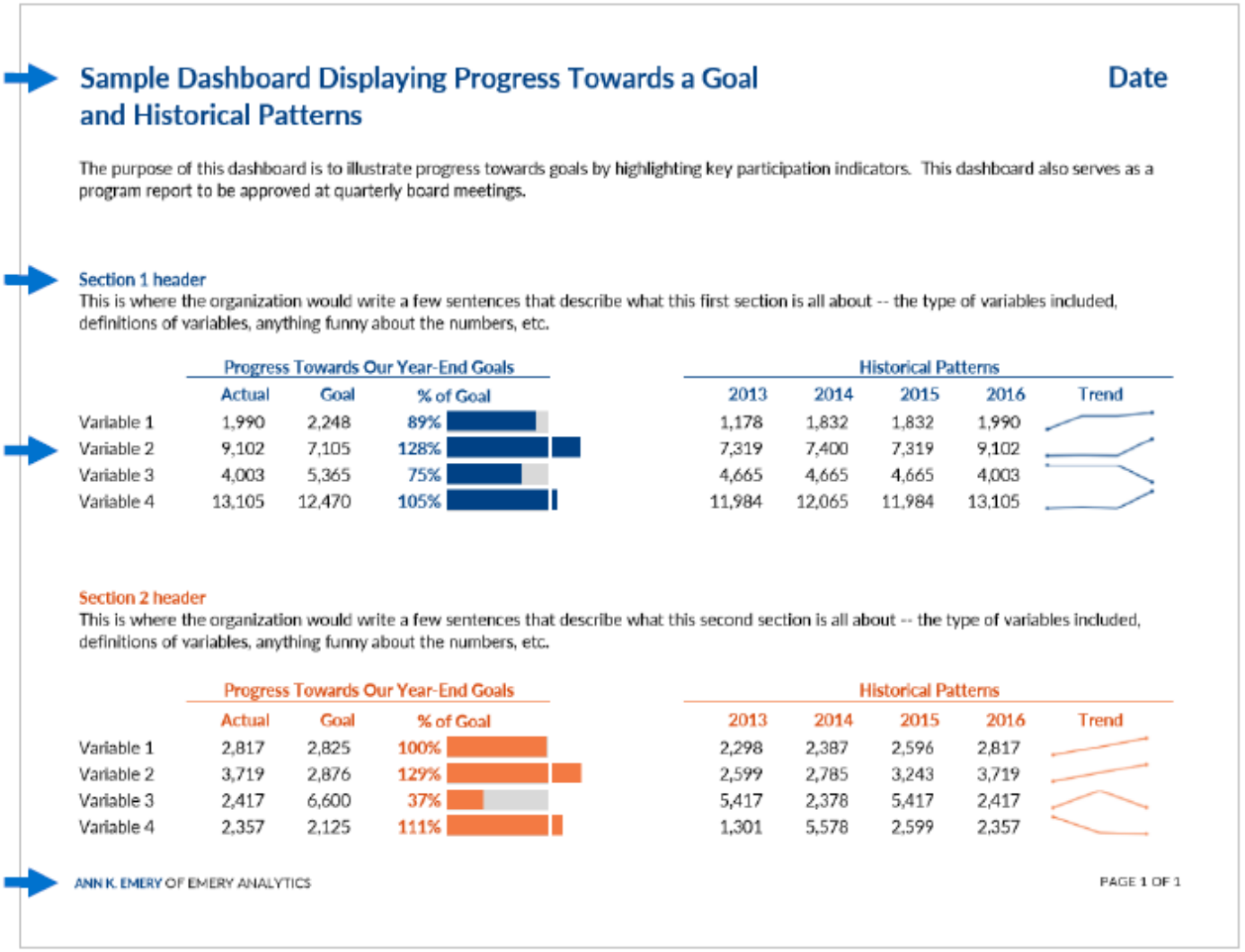
Establish a text hierarchy

Title (18)

H1 (11 bold)

Body (11 regular)

Footer (9 gray)



Sample Dashboard Displaying Progress Towards a Goal and Historical Patterns

Date

The purpose of this dashboard is to illustrate progress towards goals by highlighting key participation indicators. This dashboard also serves as a program report to be approved at quarterly board meetings.

Section 1 header

This is where the organization would write a few sentences that describe what this first section is all about -- the type of variables included, definitions of variables, anything funny about the numbers, etc.

	Progress Towards Our Year-End Goals			Historical Patterns				
	Actual	Goal	% of Goal	2013	2014	2015	2016	Trend
Variable 1	1,990	2,248	89%	1,178	1,832	1,832	1,990	
Variable 2	9,102	7,105	128%	7,319	7,400	7,319	9,102	
Variable 3	4,003	5,365	75%	4,665	4,665	4,665	4,003	
Variable 4	13,105	12,470	105%	11,984	12,065	11,984	13,105	

Section 2 header

This is where the organization would write a few sentences that describe what this second section is all about -- the type of variables included, definitions of variables, anything funny about the numbers, etc.

	Progress Towards Our Year-End Goals			Historical Patterns				
	Actual	Goal	% of Goal	2013	2014	2015	2016	Trend
Variable 1	2,817	2,825	100%	2,298	2,387	2,596	2,817	
Variable 2	3,719	2,876	129%	2,599	2,785	3,243	3,719	
Variable 3	2,417	6,600	37%	5,417	2,378	5,417	2,417	
Variable 4	2,357	2,125	111%	1,301	5,578	2,599	2,357	

ANN K. EMERY OF EMERY ANALYTICS

PAGE 1 OF 1

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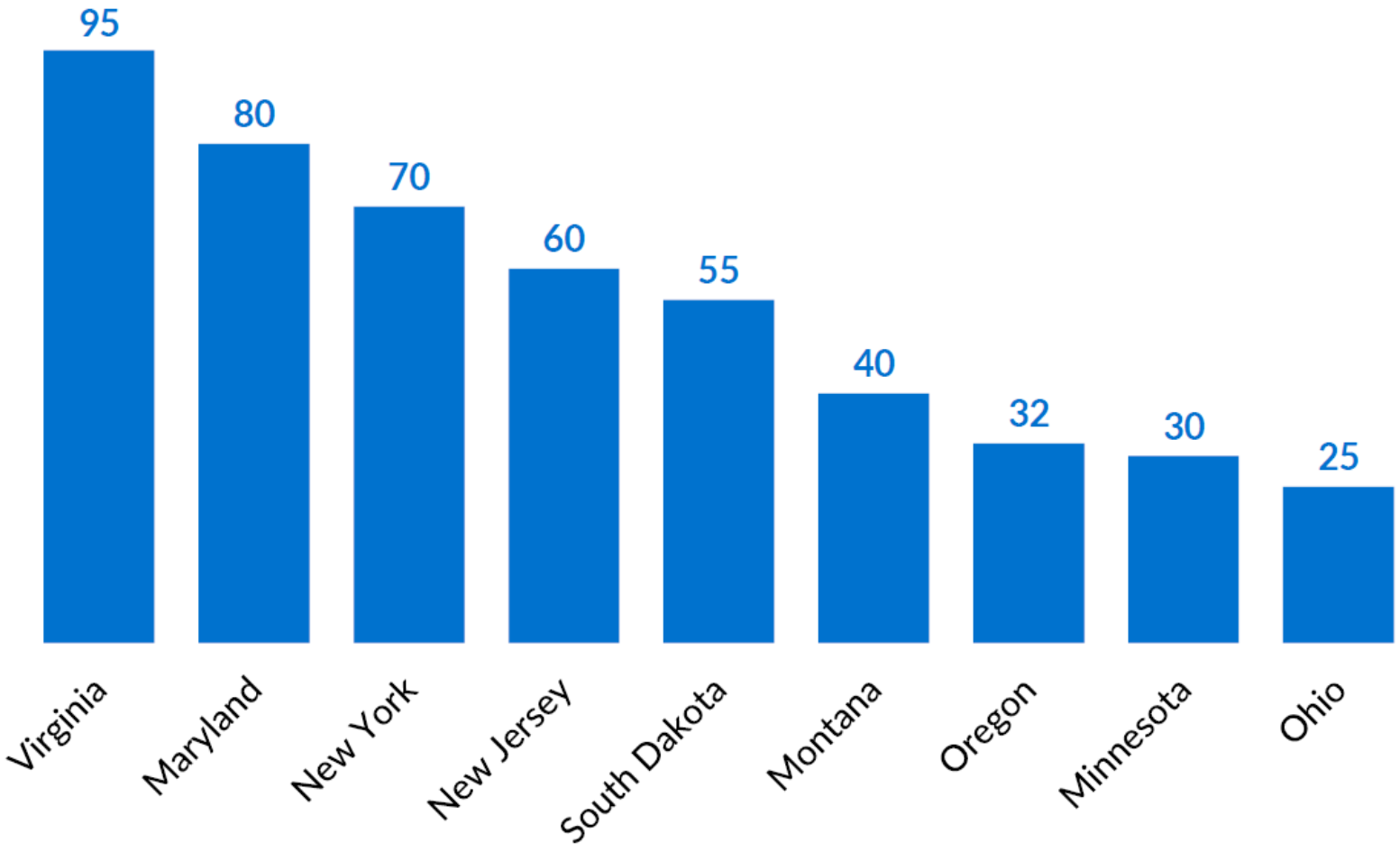

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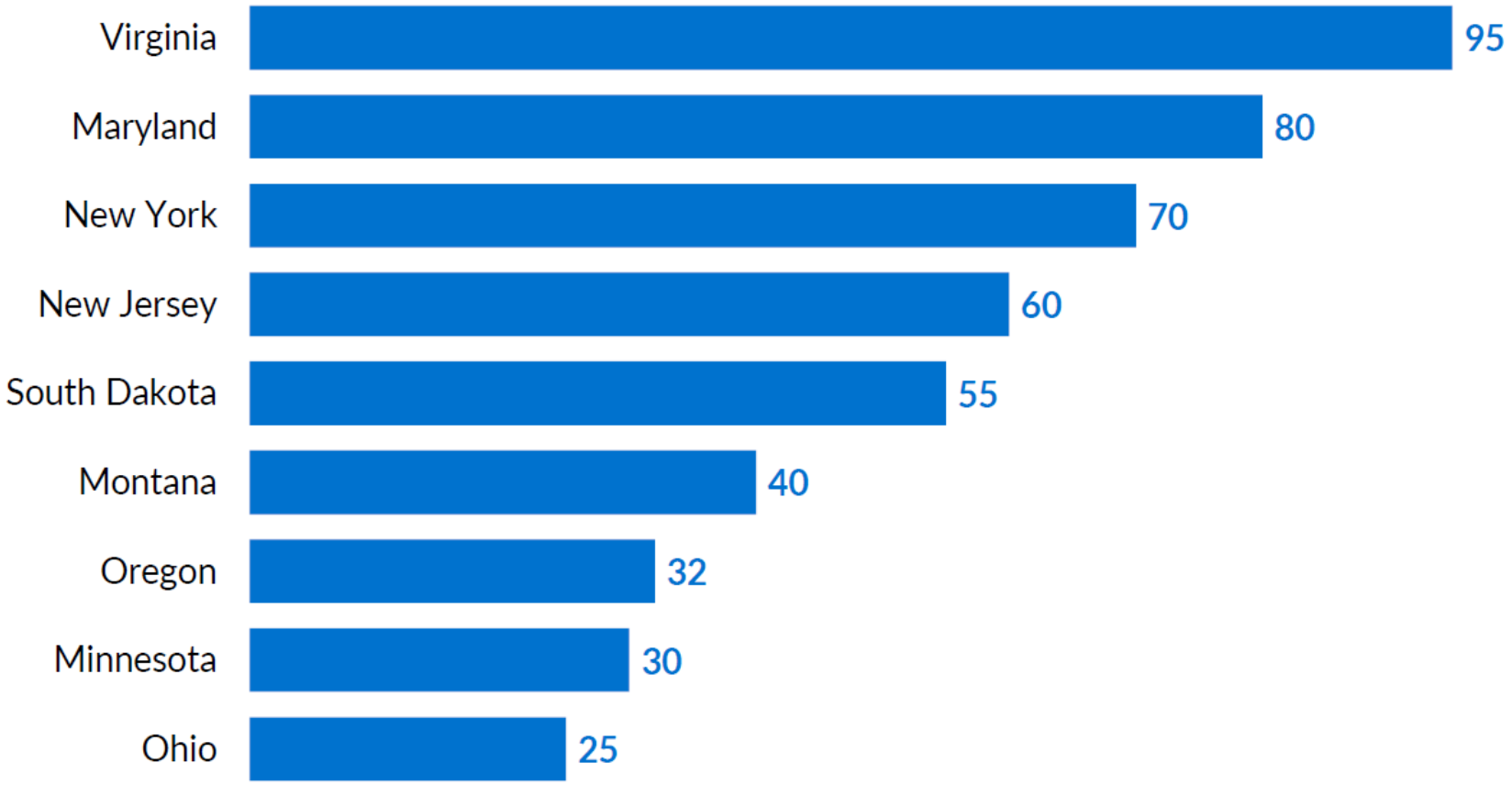

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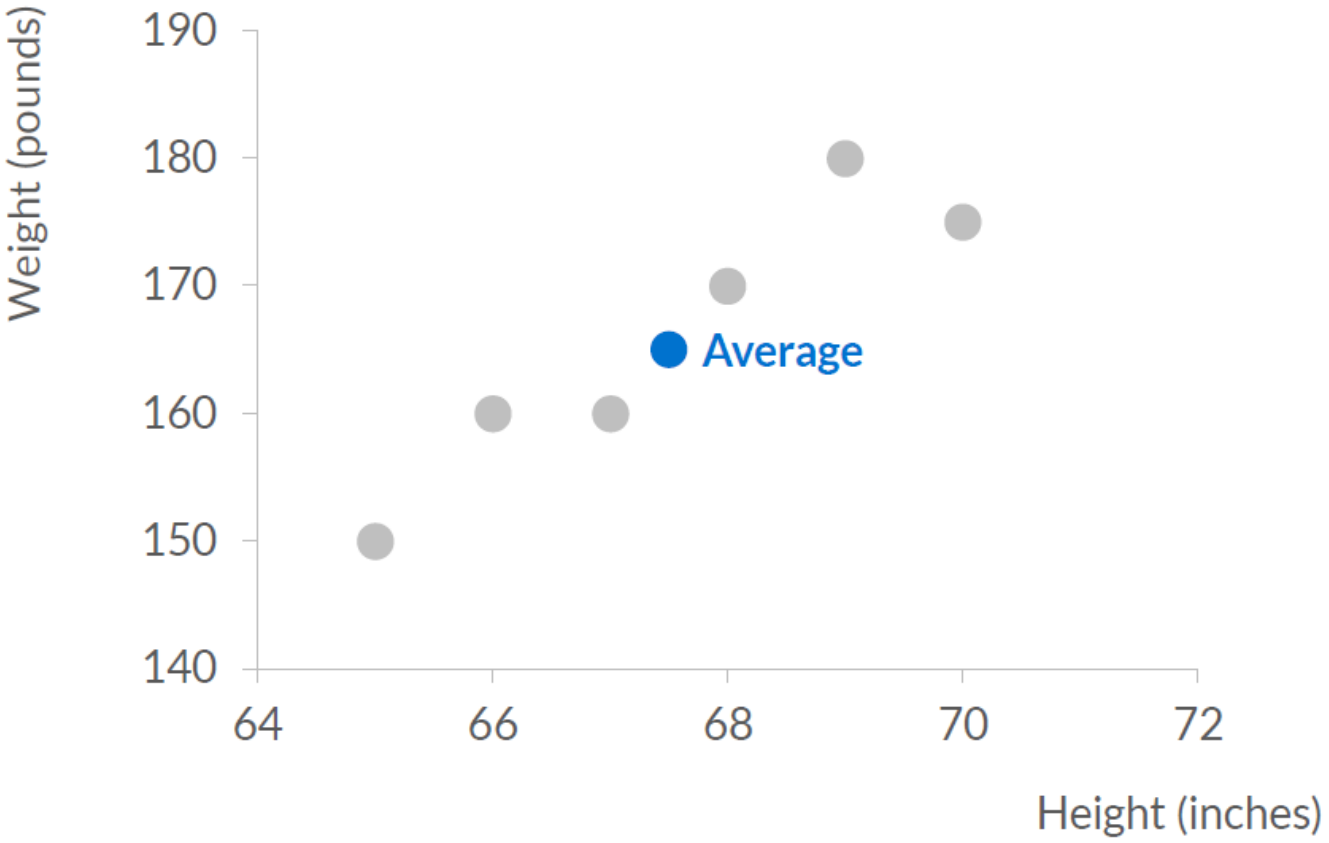
Don't forget about
Axis unit labels



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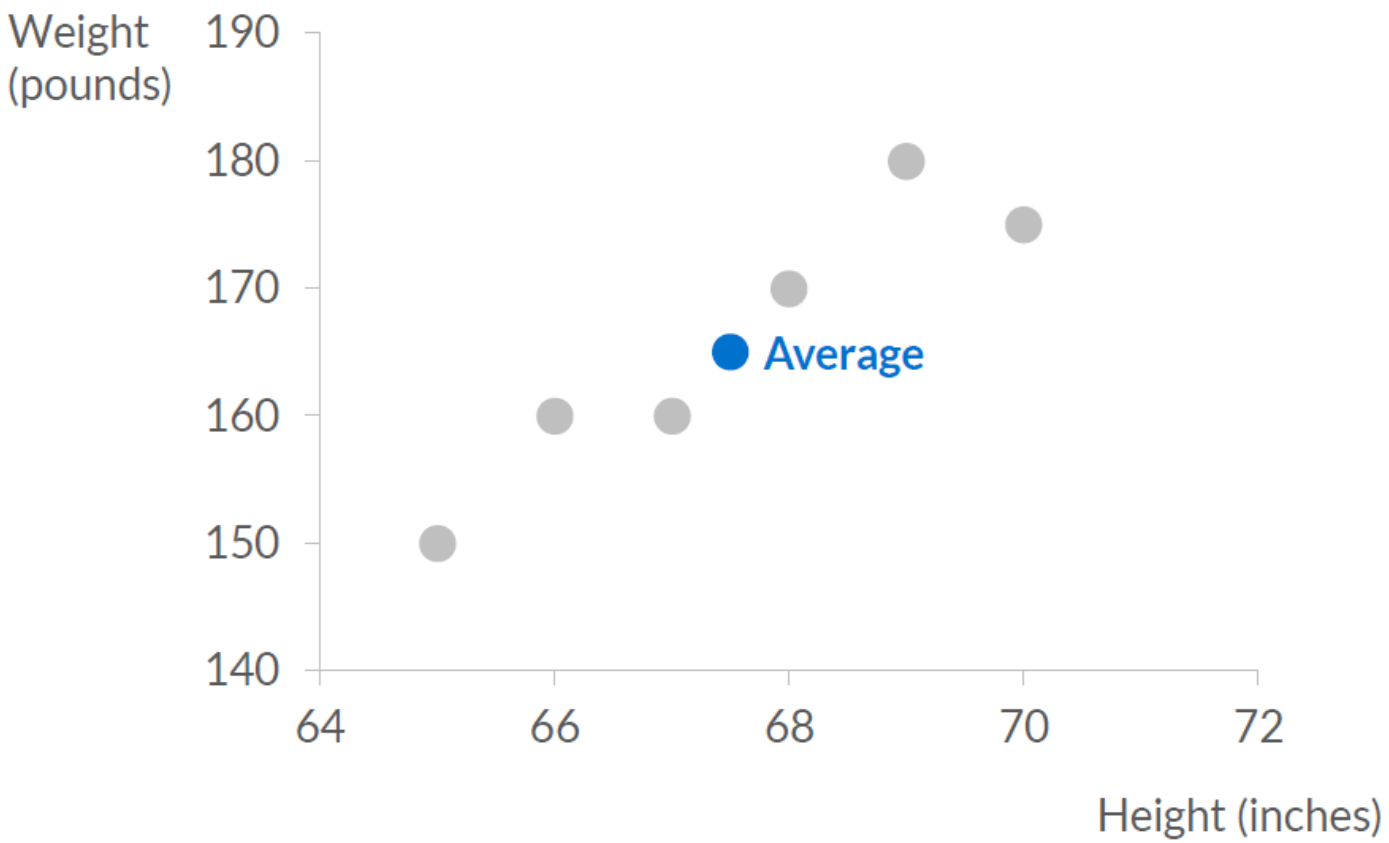
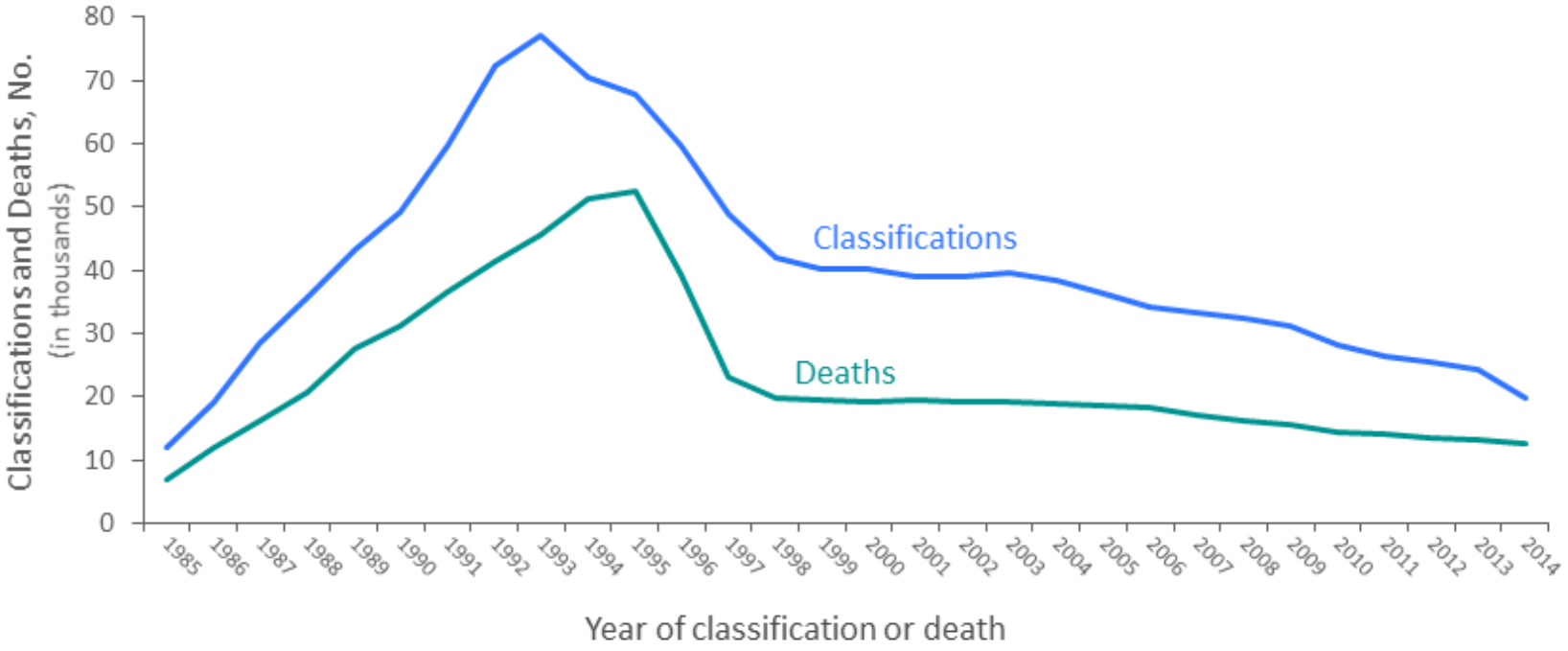


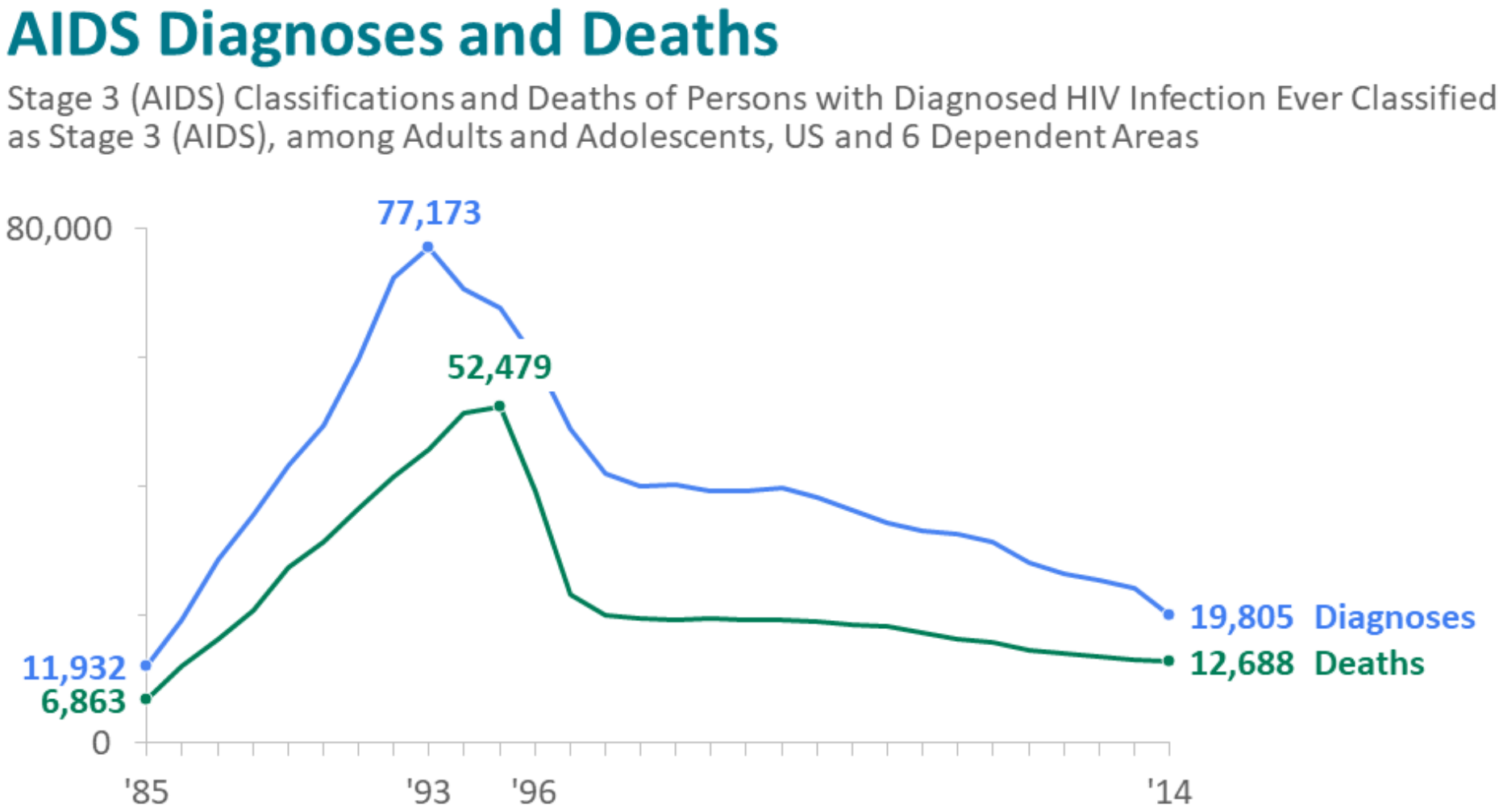
Measure text readability

Stage 3 (AIDS) Classifications and Deaths of Persons with Diagnosed HIV Infection Ever Classified as Stage 3 (AIDS), among Adults and Adolescents, 1985–2014 US and 6 Dependent Areas



Note. Deaths of persons with HIV infection, stage 3 (AIDS) may be due to any cause.

Measure text readability



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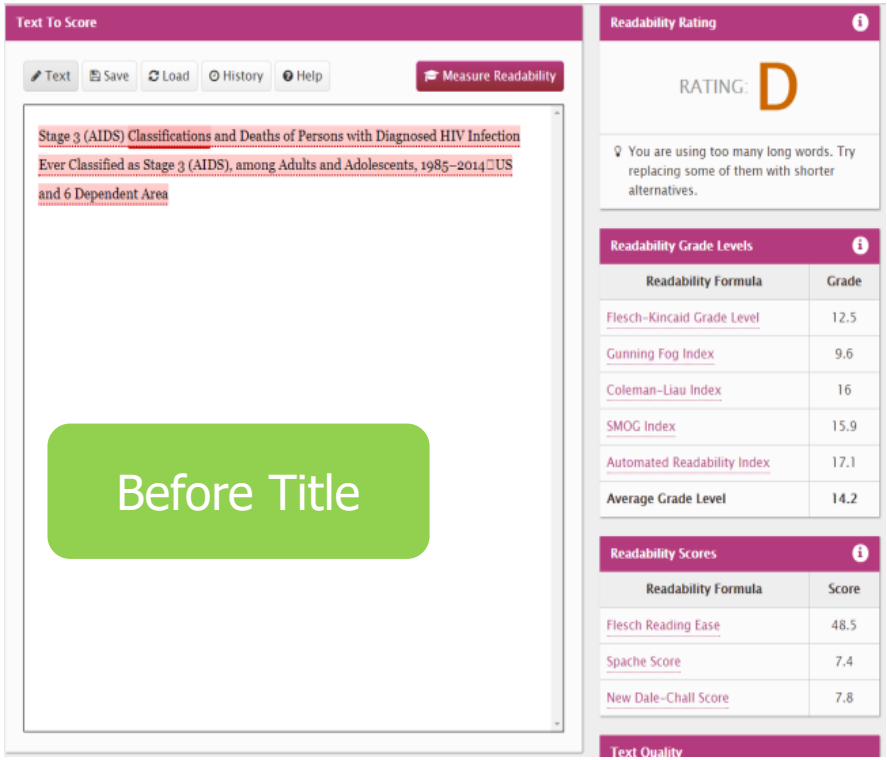
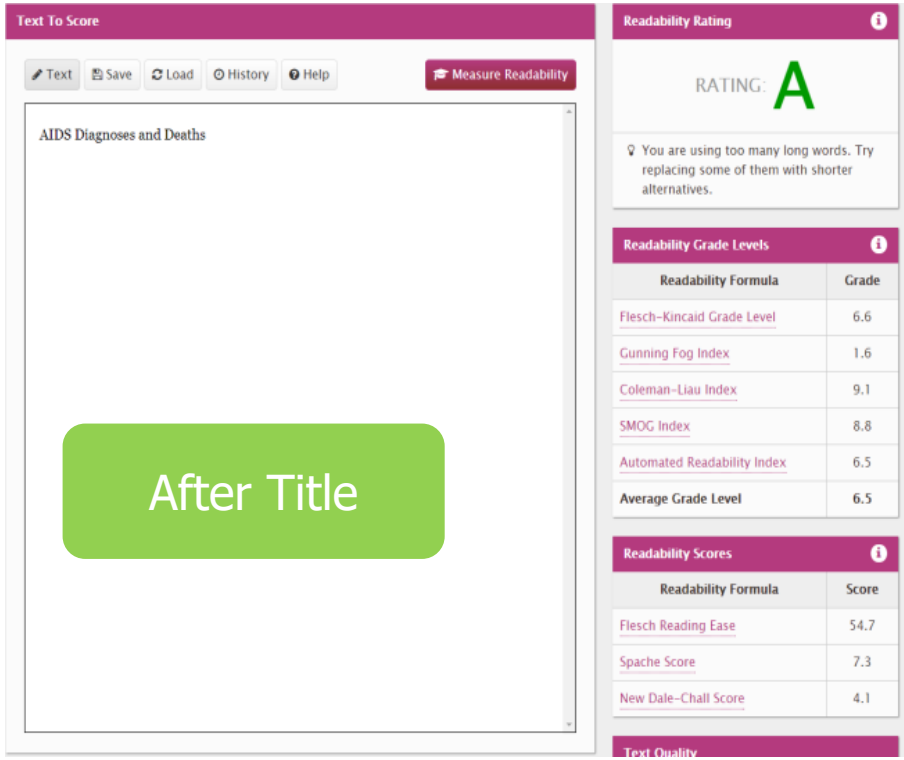
Measure text readability

Readable.io





Timings	
Reading Time	0:06
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Timings	
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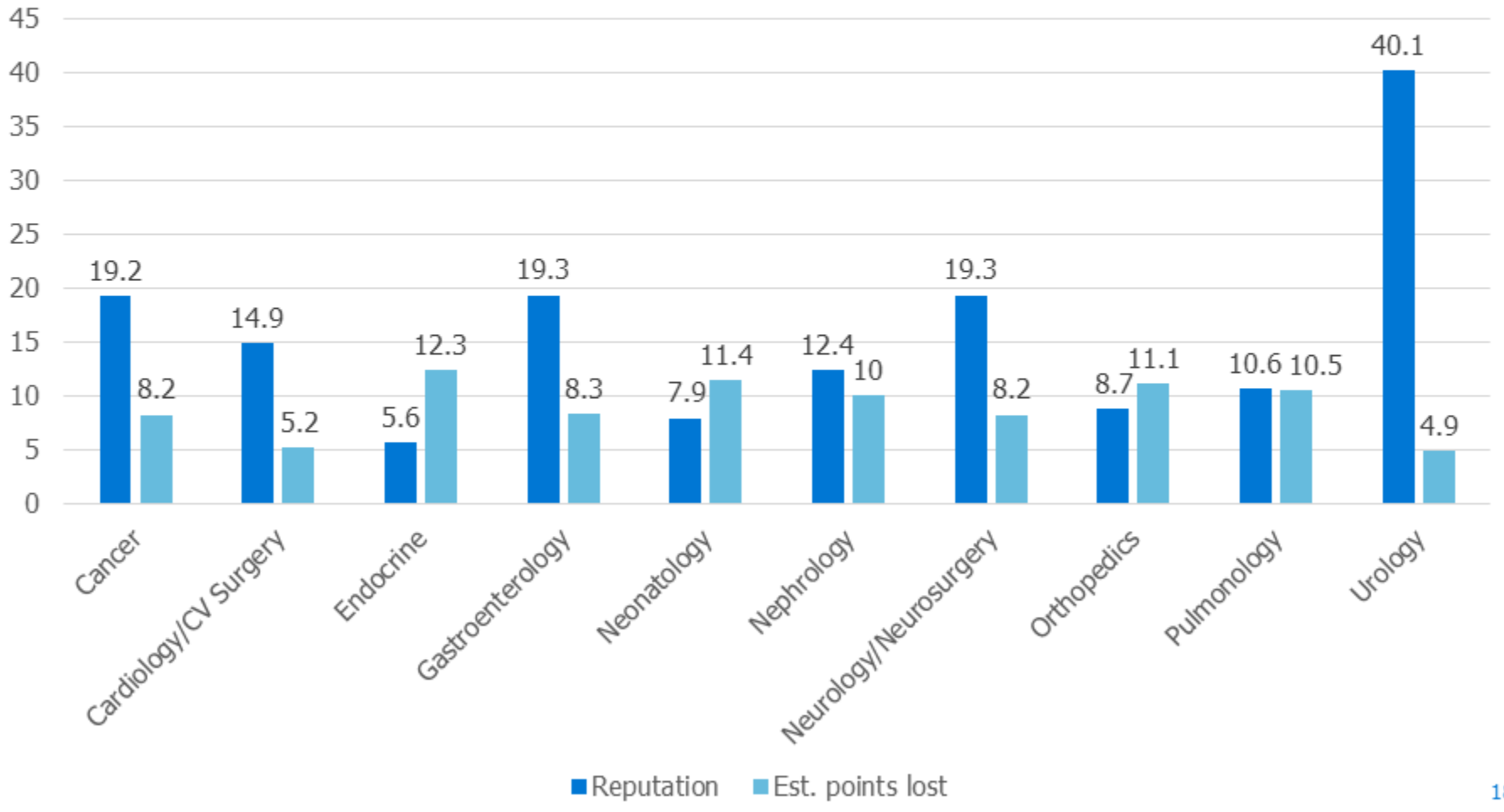
Ann & Robert H. Lurie Children's Hospital of Chicago™

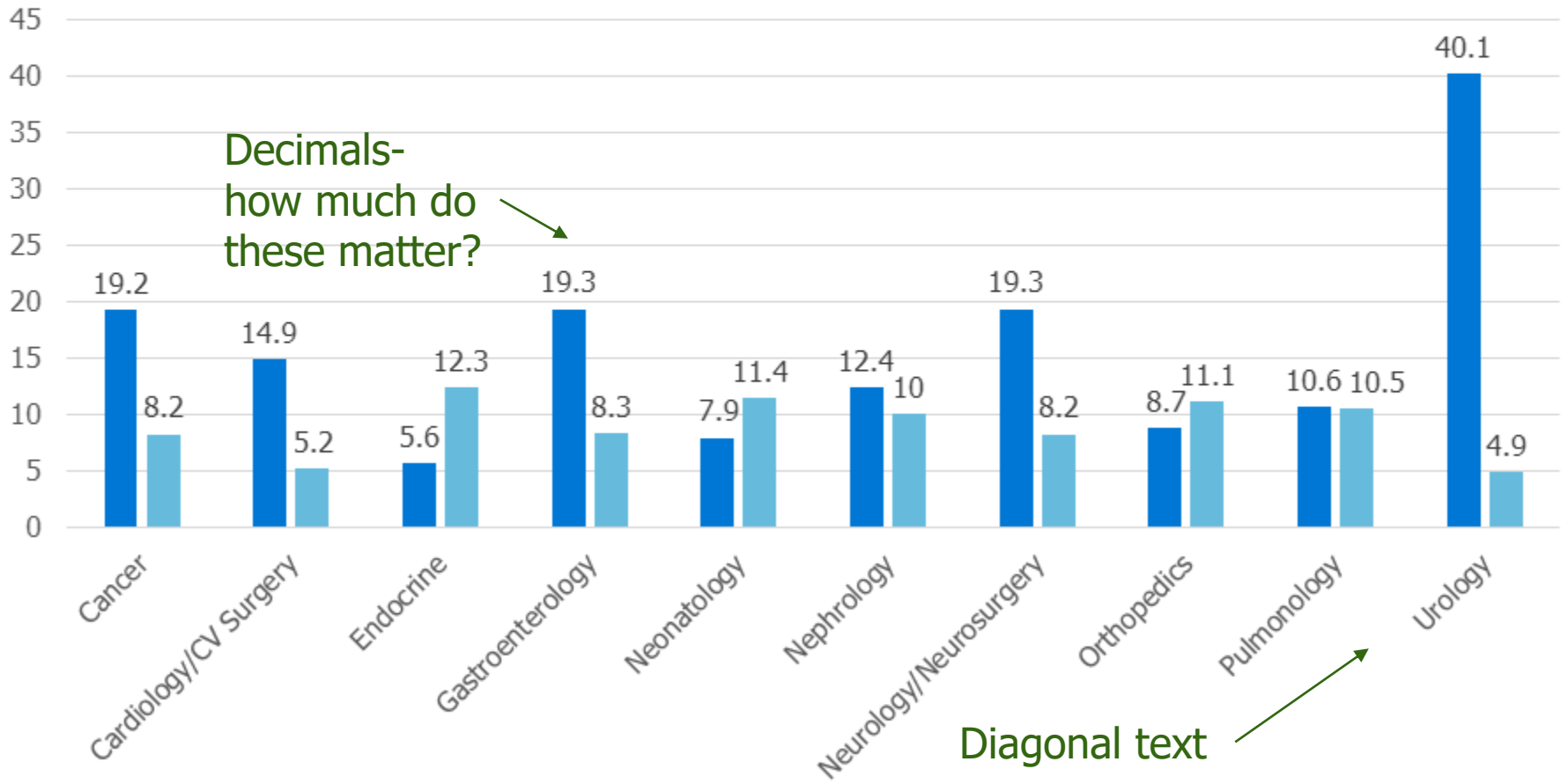
Reputation (% of specialists) and estimated points lost from reputation (weighted % of total score)



Ann & Robert H. Lurie Children's Hospital of Chicago

Reputation (% of specialists) and estimated points lost from reputation (weighted % of total score)

Long/complex title



Your Turn!

Your Turn!

Applying what we learned to improve real-life Lurie Children's examples

Stanley Manne
Children's Research Institute™

STATE AND COMMUNITY REPORTS ON INJURY
PREVALENCE AND TARGETED SOLUTIONS (SCRIPTS)
ISSUE 11, JULY 2014

Injuries to Illinois and Chicago Youth:

Alcohol and Illicit Drugs in Newborns

Screening for noxious influences affecting fetuses or newborns via placenta or breast milk occurs in newborns when the newborn appears sick and/or there are suspicions that the mother used substances. In this Child Health Data Lab Data Brief, we investigate the rates in which Illinois newborns, i.e., newborns who were Illinois residents at the time of birth and born in an Illinois hospital, test positive for alcohol, narcotics, hallucinogenic agents and cocaine during the years 2008-12 using ICD-9 codes from hospital discharge data (Table 1). Positive test results are not mutually exclusive; more than one substance was detected in 8.6% of newborns (Figure 1). Of those newborns in which more than one substance was detected, 95% had two substances detected and 5% and three substances detected.

Rates of testing positive for alcohol in newborns lower than other drugs

The rate of cocaine detected in newborns is over eight times higher than the rate of alcohol detected in newborns. It must be noted, however, that alcohol will cause a positive toxicology screen for a few hours, while cocaine and narcotics will cause positive toxicology screens for several days to a week.

It must also be noted that testing for substances occurs when an obstetrician, pediatrician or other medical professional suspects for any reason that the baby might test positive for one or more substances. Therefore, rates are assumed to be underestimates, especially for alcohol.

THE BOTTOM LINE

- The rate at which newborns test positive for alcohol is lower than for illicit drugs; this is likely due to the fact that alcohol is metabolized much more quickly than illicit drugs, and thus is assumed to be underestimated.
- The rate at which newborns test positive for cocaine has decreased significantly over time.
- The rates at which newborns test positive for narcotics and cocaine vary significantly by race.
- The rates at which newborns test positive for alcohol, hallucinogenics, narcotics and cocaine vary by region.

Figure 1. Percentage of substance type in Illinois newborns with positive toxicology, 2008-12

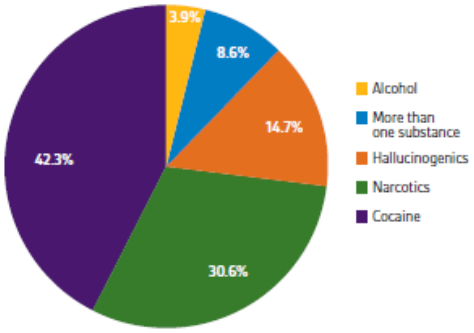


Table 1. ICD-9 codes and rates of substances

ICD-9 Code	Substance	Rate per 100,000 live hospital births in Illinois, 2008-12
760.71	Alcohol	17.7
760.72	Narcotics	108.3
760.73	Hallucinogenic agents	48.8
760.75	Cocaine	148.6

Ann & Robert H. Lurie
Children's Hospital of Chicago®

Racial and ethnic differences in substance detection in newborns

Hispanic newborns have lower rates of substance detection for all four of the investigated substances, while black newborns have the highest rates for all substances. (Table 2)

Proportionately, the differences between black babies and both white and Hispanic babies are greatest for alcohol and hallucinogenics. For both of these substances, black babies test positive over six times more than white babies, and nearly 16 times more than Hispanic babies.

The gap between the racial/ethnic groups narrows with narcotics and cocaine, with black babies testing positive eight and five times more than Hispanic babies, respectively.

Figure 2 shows the rate at which Illinois newborns tested positive for cocaine over time, by race/ethnicity. Both white and black newborns showed significant decreases over time, although the difference between black newborns and both white and Hispanic newborns was marked.

Figure 3 shows the rate at which Illinois newborns tested positive for narcotics over time, by race/ethnicity. White newborns showed slight but statistically significant increases over time. Again, the difference between black newborns and both white and Hispanic newborns was pronounced.

Rate of testing positive for cocaine in newborns declining over time

Figure 4 shows the rates of positive results by substance over time. Rates of alcohol, narcotics and hallucinogens did not increase or decrease steadily over time. Rates of cocaine did decrease over time; this decrease was statistically significant. In 2011 and 2012 rates of cocaine and narcotics converged, and in both years, narcotics were slightly higher.

Figure 4. Rate of Illinois newborns with positive toxicology findings by substance and year, 2008-12

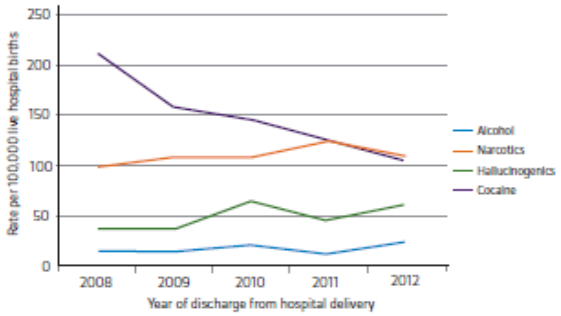


Table 2. Rate of substance detection by race/ethnicity, 2008-12

	Rate per 100,000 live hospital births		
Substance	White	Black	Hispanic
Alcohol	11.2	69.2	4.4
Narcotics	90.8	311.6	37.2
Hallucinogenic agents	32.4	197.2	12.4
Cocaine	112.6	435.9	82.4

Figure 2. Rate of Illinois newborns testing positive for cocaine by race/ethnicity and year, 2008-12

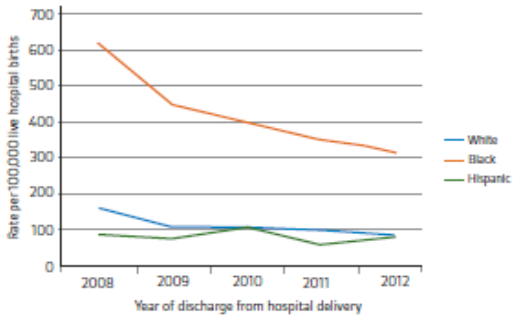
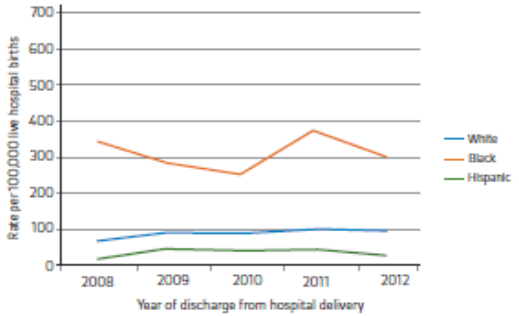


Figure 3. Rate of Illinois newborns testing positive for narcotics by race/ethnicity and year, 2008-12



Declutter this table

Declutter these borders

Stanley Manne
Children's Research Institute™

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PREVALENCE AND TARGETED SOLUTIONS (SCRIPTS)
ISSUE 11, JULY 2014

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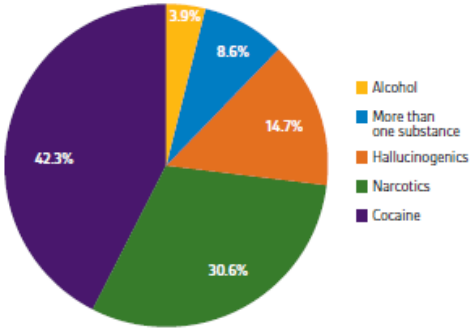

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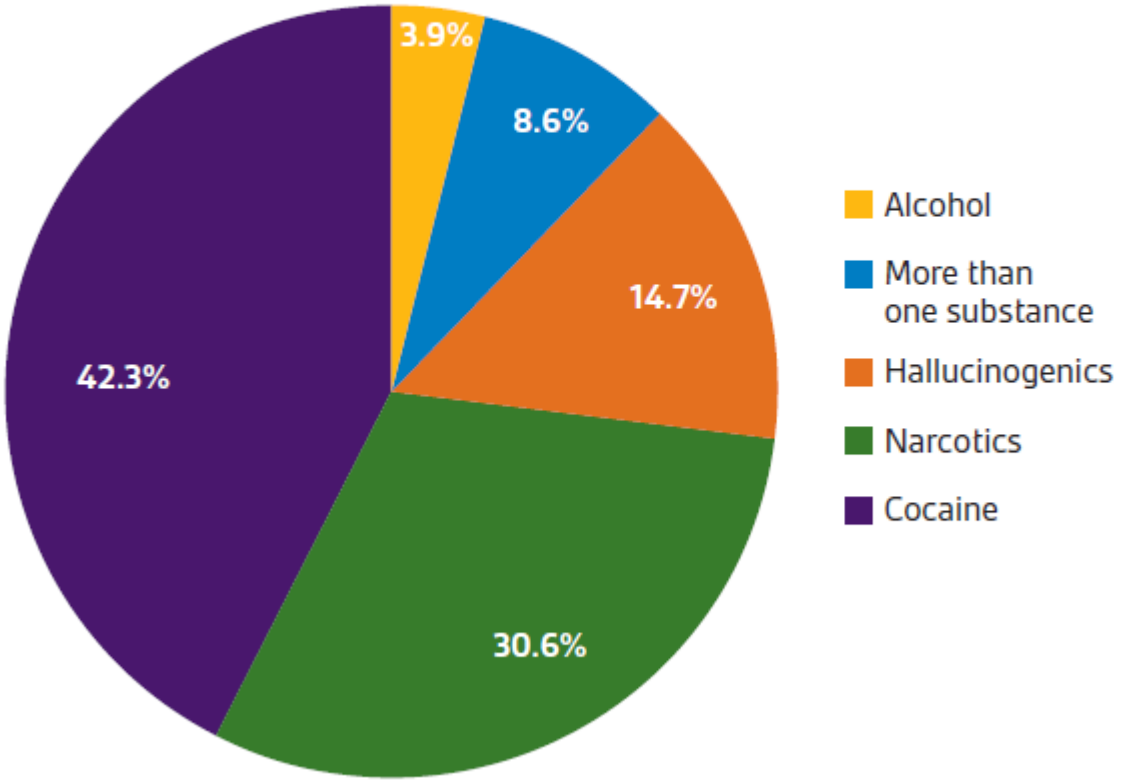
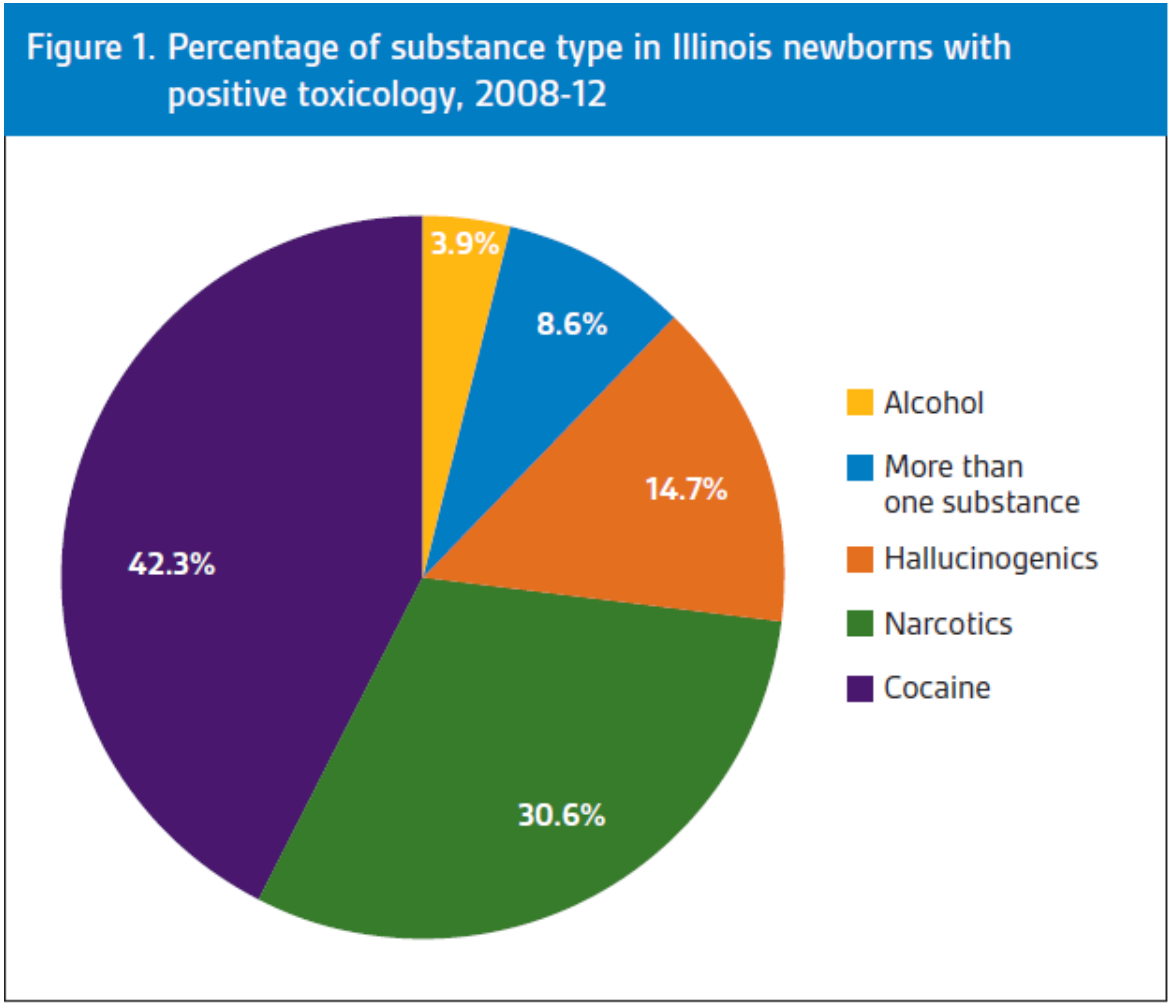
Ann & Robert H. Lurie
Children's Hospital of Chicago®

What could we improve?

Figure 1. Percentage of substance type in Illinois newborns with positive toxicology, 2008-12



Applying our concepts



Rule Breakers

- More than 2/3 slices

Rule Breakers

- Legend instead of directly labeled
- Border outline

Rule Breakers

- Title text readability
- Decimals

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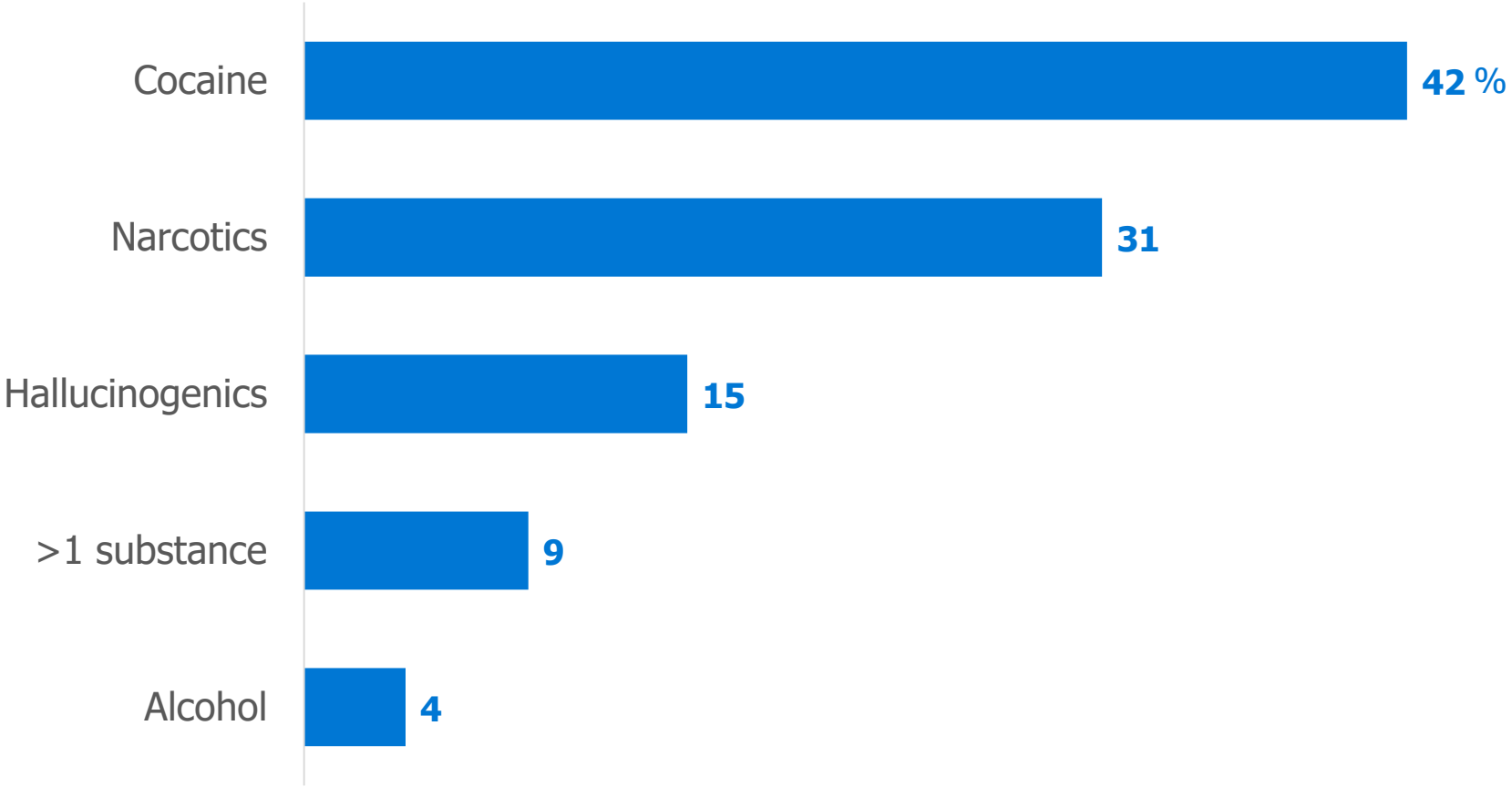
Example 1:

More Illinois newborns screen positive for illicit drugs than alcohol.

Percent of substance type in IL newborns with positive toxicology, 2008-12



Example 2: Retaining part to whole relationship

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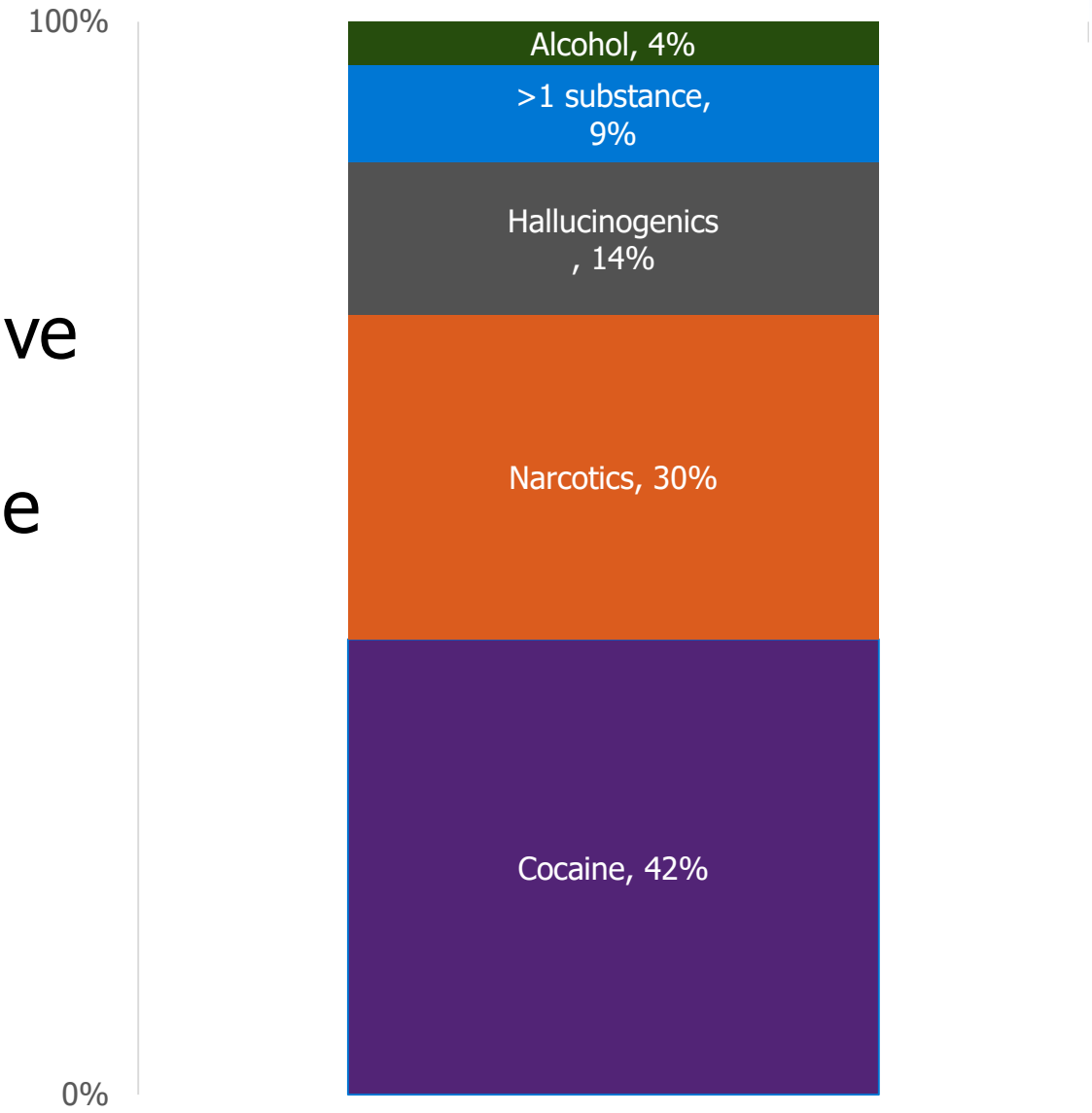
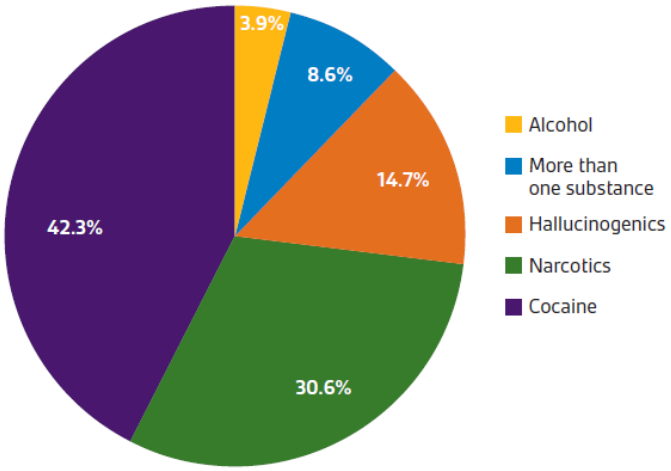
Majority of IL newborn positive toxicology screens are due to Illicit Drugs

Percentage of substance type among IL newborns with positive drug screenings, 08-12



Before

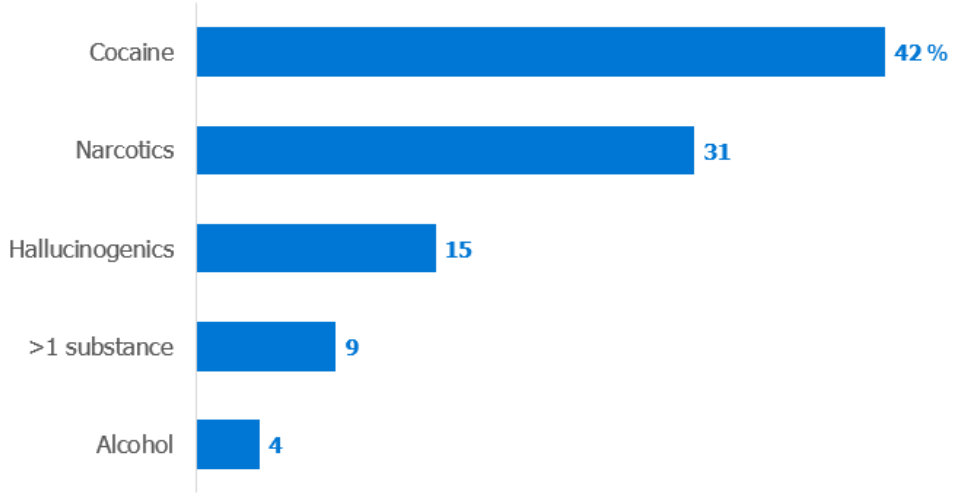
Figure 1. Percentage of substance type in Illinois newborns with positive toxicology, 2008-12



After

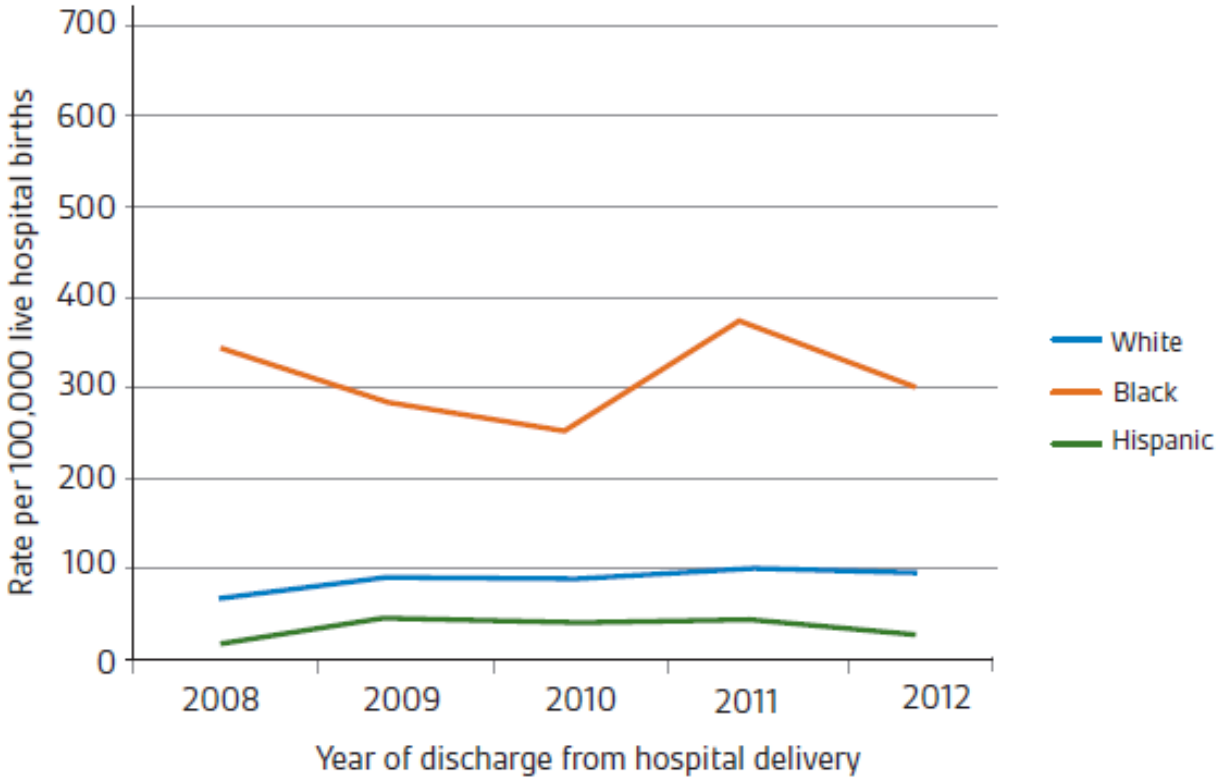
More Illinois newborns screen positive for illicit drugs than alcohol.

Percent of substance type in IL newborns with positive toxicology, 2008-12



What could we improve?

Figure 3. Rate of Illinois newborns testing positive for narcotics by race/ethnicity and year, 2008-12



Applying our concepts

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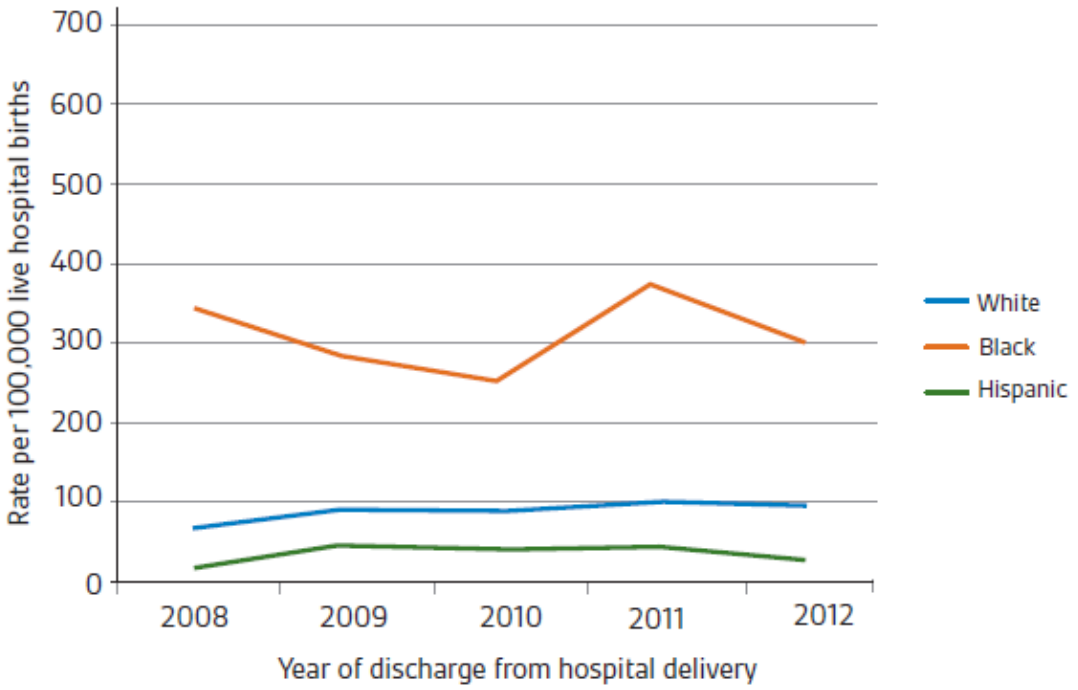


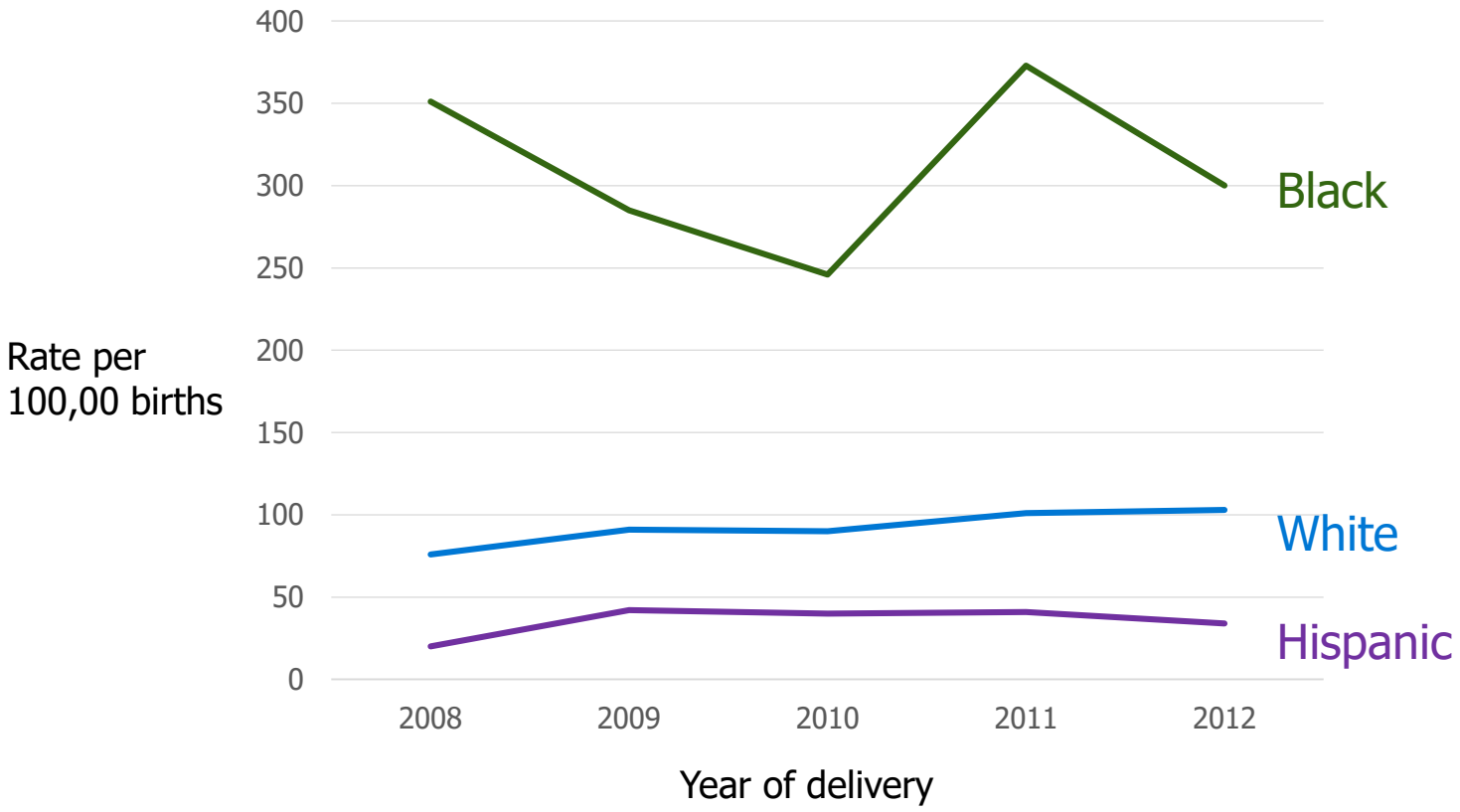
Rule Breakers

- Legend instead of directly labeled
- Border outline
- Dark gridlines

Rule Breakers

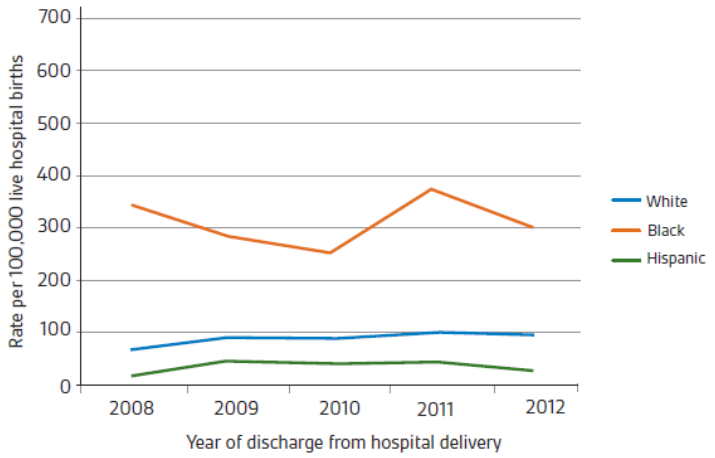
- Vertical text
- Title text readability/redundancy

The rate Illinois newborns test positive for Narcotics varies by race



Before

Figure 3. Rate of Illinois newborns testing positive for narcotics by race/ethnicity and year, 2008-12



After

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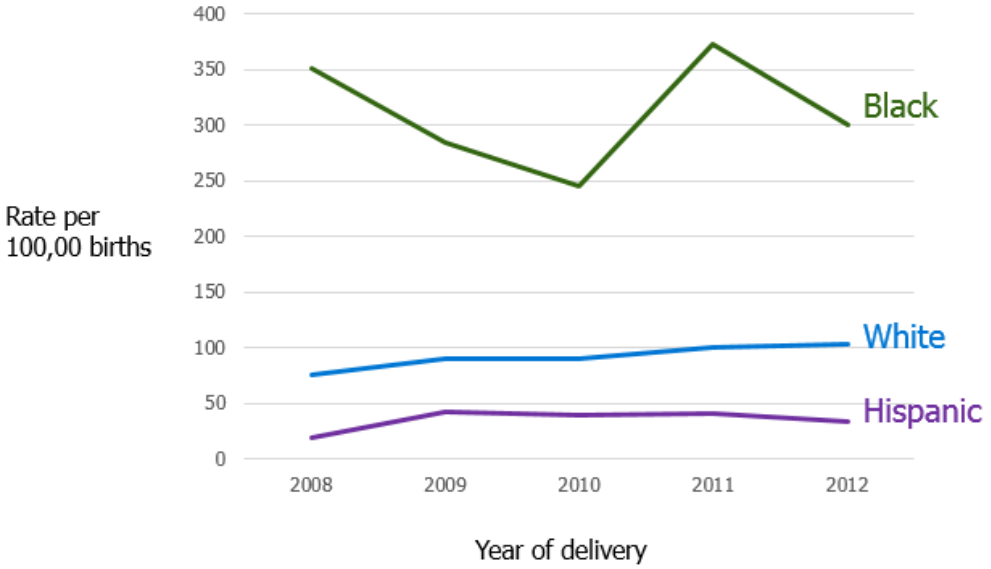
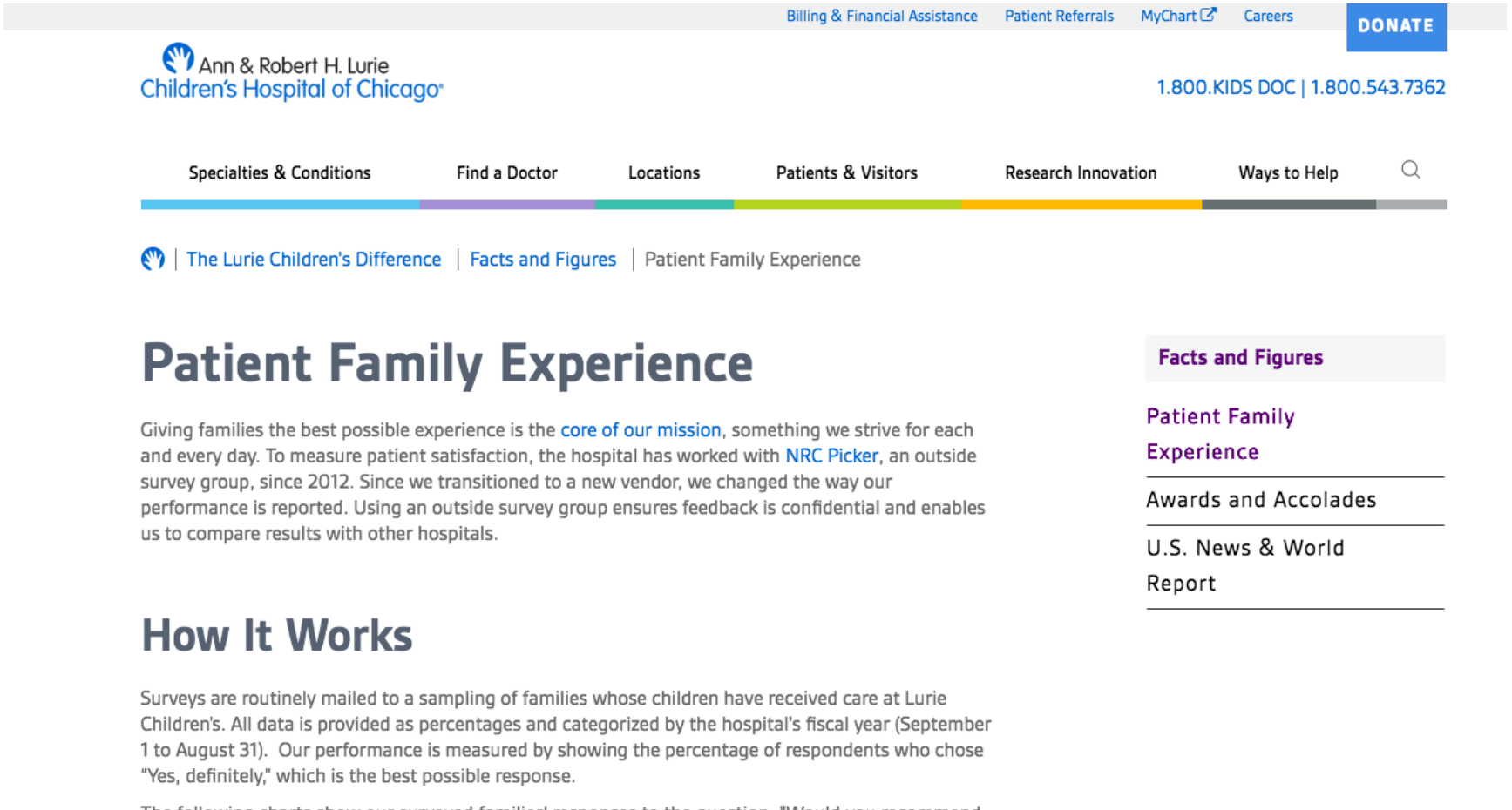


What could we improve?



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Specialties & Conditions | Find a Doctor | Locations | Patients & Visitors | Research Innovation | Ways to Help

The Lurie Children's Difference | Facts and Figures | Patient Family Experience

Patient Family Experience

Giving families the best possible experience is the core of our mission, something we strive for each and every day. To measure patient satisfaction, the hospital has worked with NRC Picker, an outside survey group, since 2012. Since we transitioned to a new vendor, we changed the way our performance is reported. Using an outside survey group ensures feedback is confidential and enables us to compare results with other hospitals.

How It Works

Surveys are routinely mailed to a sampling of families whose children have received care at Lurie Children's. All data is provided as percentages and categorized by the hospital's fiscal year (September 1 to August 31). Our performance is measured by showing the percentage of respondents who chose "Yes, definitely," which is the best possible response.

The following charts show our surveyed families' responses to the question, "Would you recommend this hospital to your family/friends?" in each of our four main services: inpatient, emergency, surgical and outpatient.

Facts and Figures

Patient Family Experience

Awards and Accolades

U.S. News & World Report

What could we improve?

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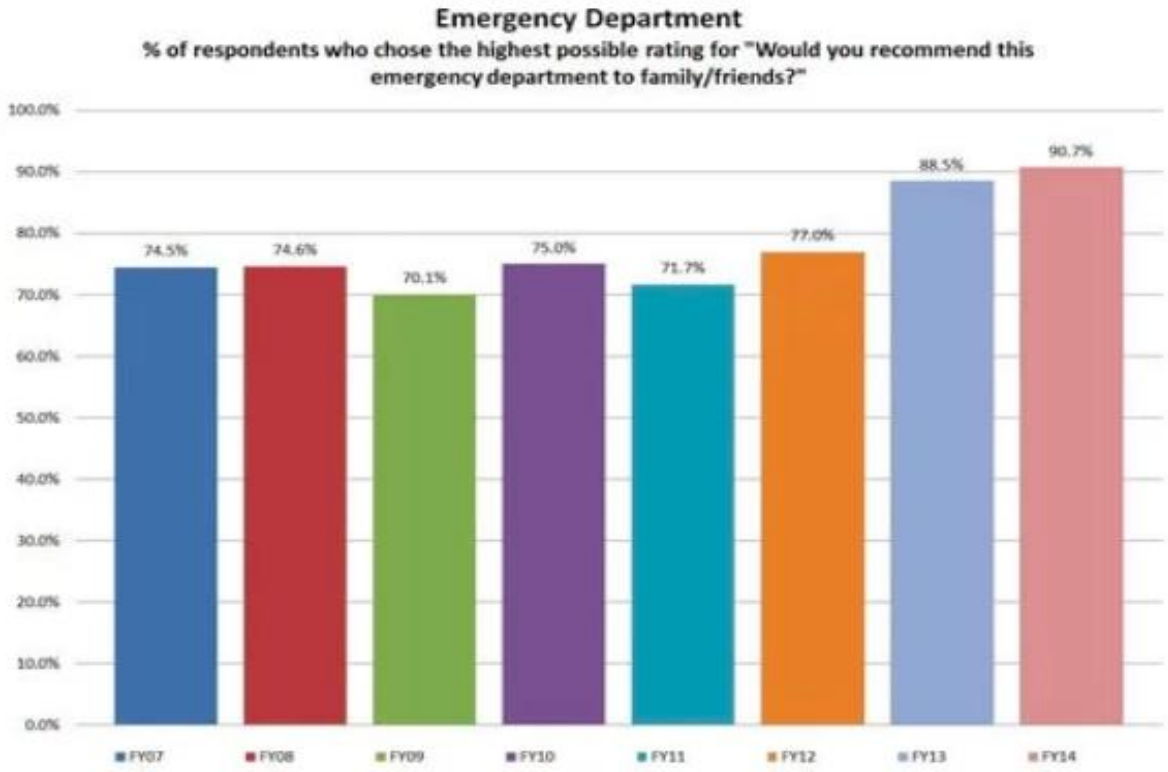
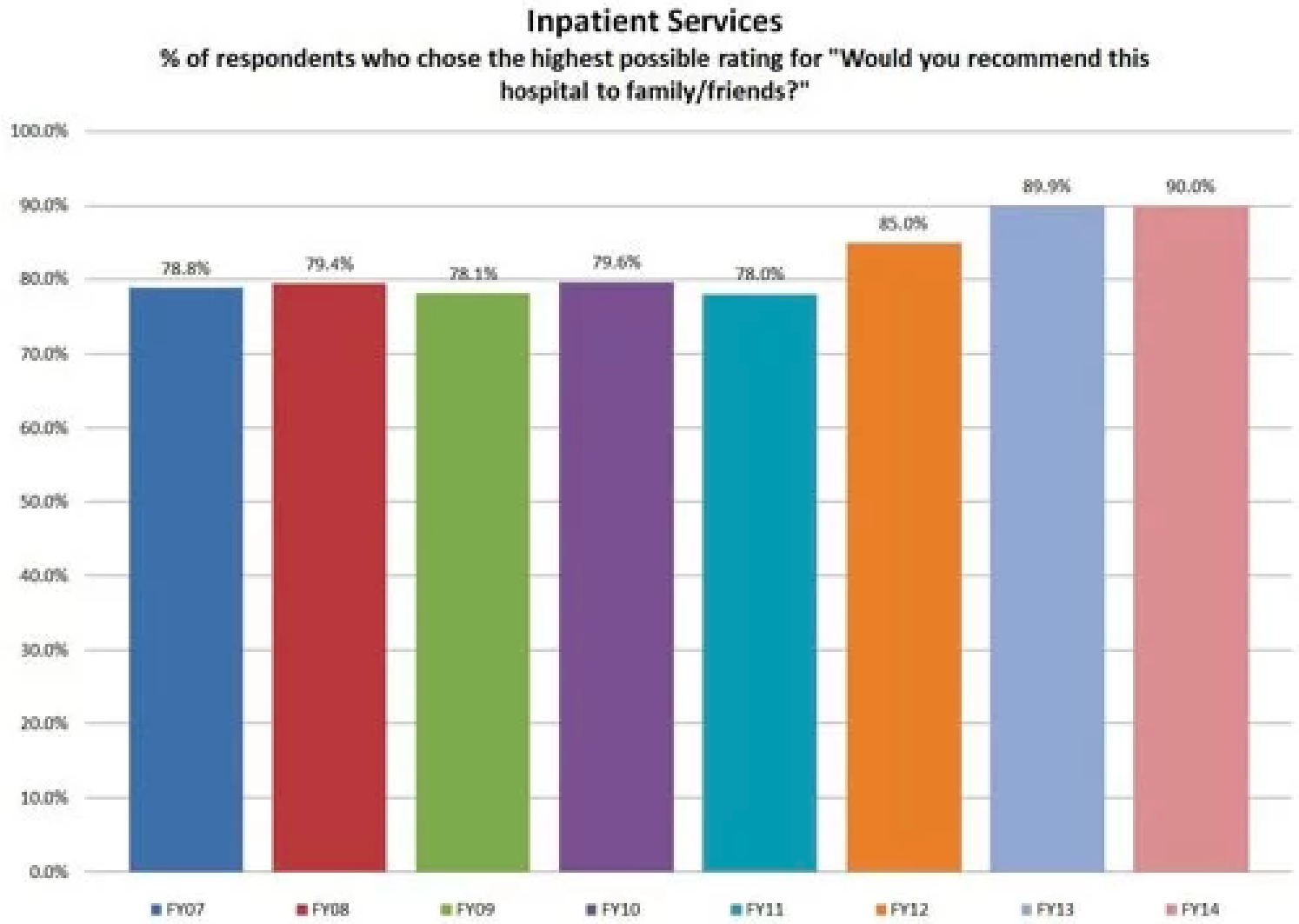


Ann & Robert H. Lurie Children's Hospital of Chicago®

What could we improve?



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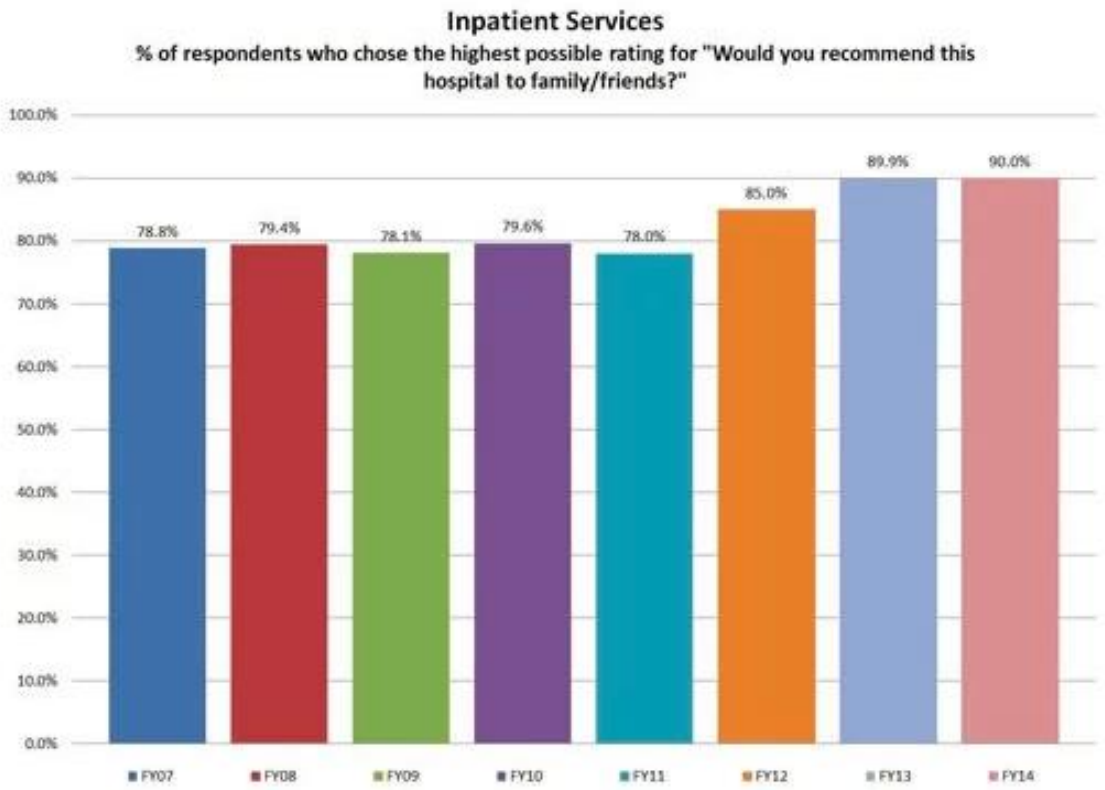

Rule Breakers

- Legend axis
- Redundant axis/data labels
- Gridlines

Rule Breakers

- Color isn't meaningful

Rule Breakers

- Decimals
- No story in the title

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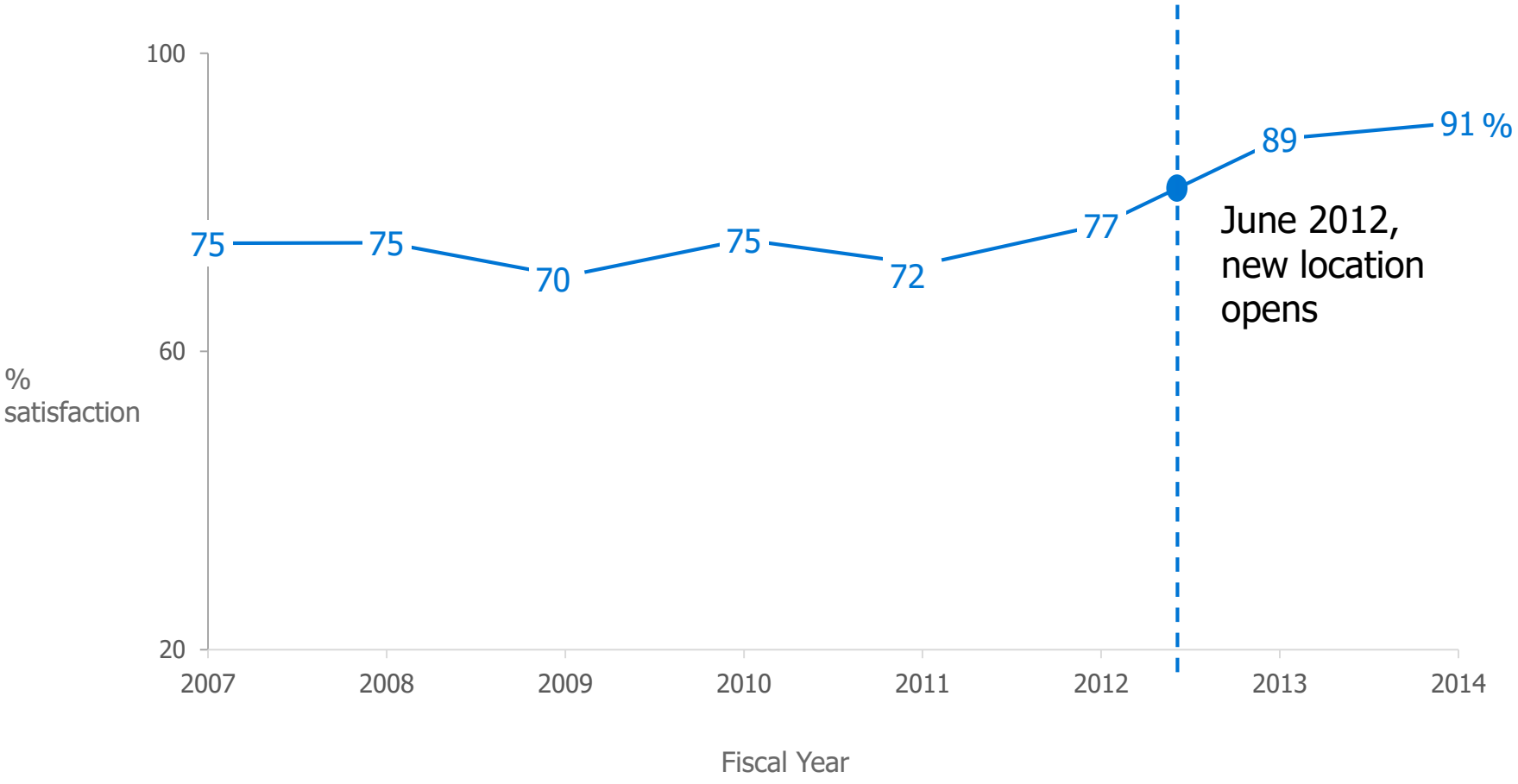
Improved patient experience in the new hospital: In a 5 year span, our Emergency Department patients' satisfaction scores increased over 20 points



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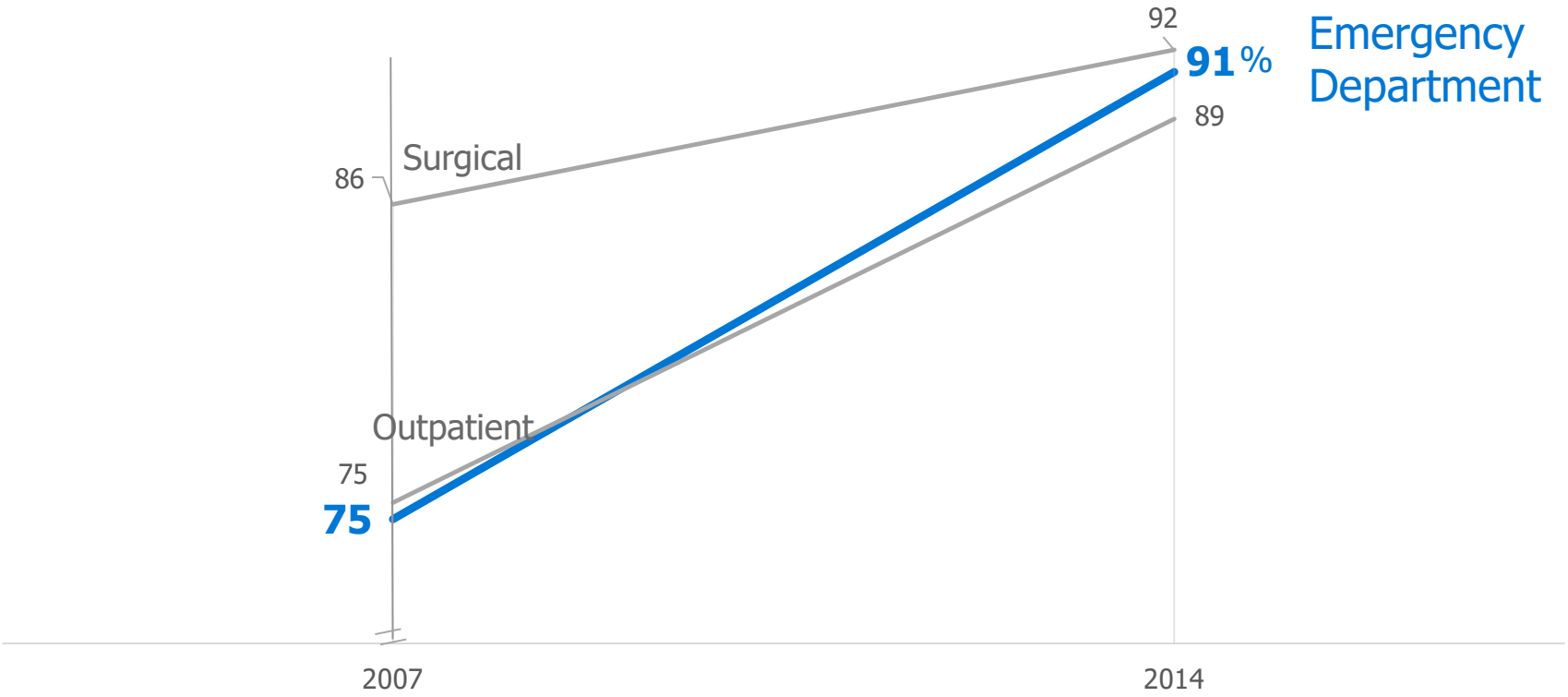
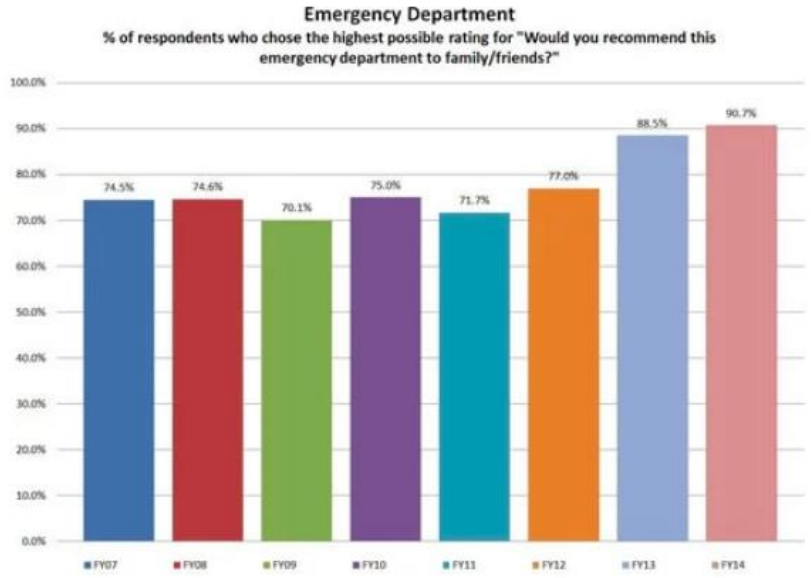
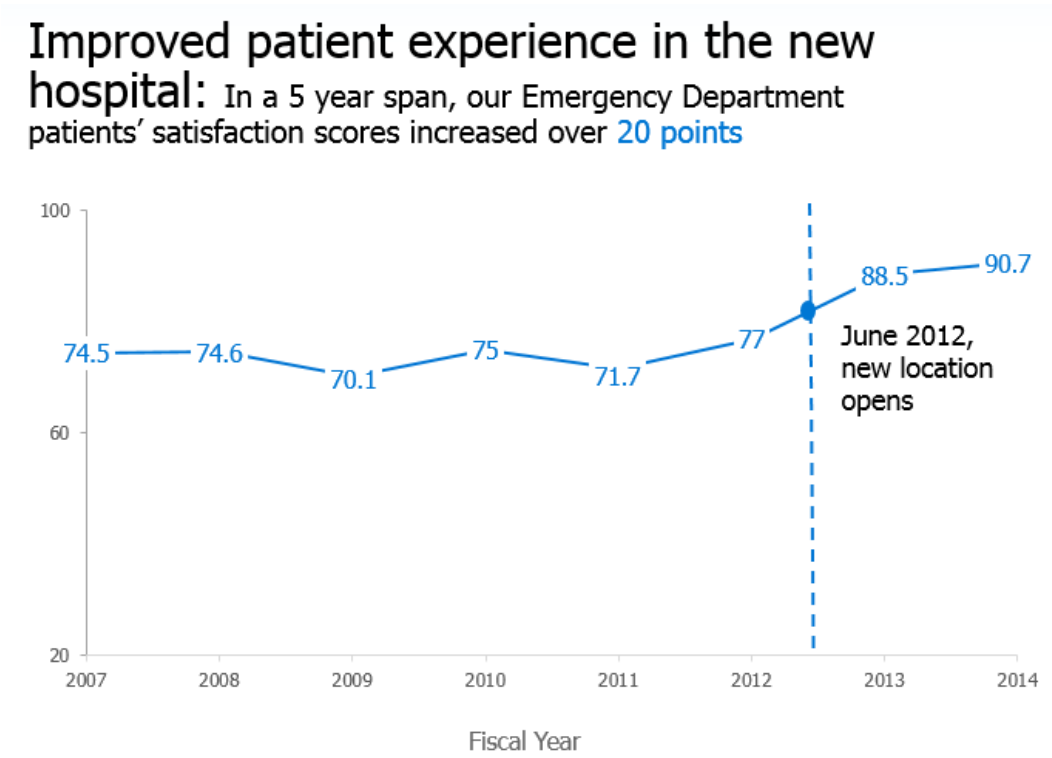
The Emergency Department improved the most: From FY07- '14, every division's patient satisfaction scores improved, with the ED displaying the greatest increase of over 15 points



Before



After



Ann & Robert H. Lurie Children's Hospital of Chicago

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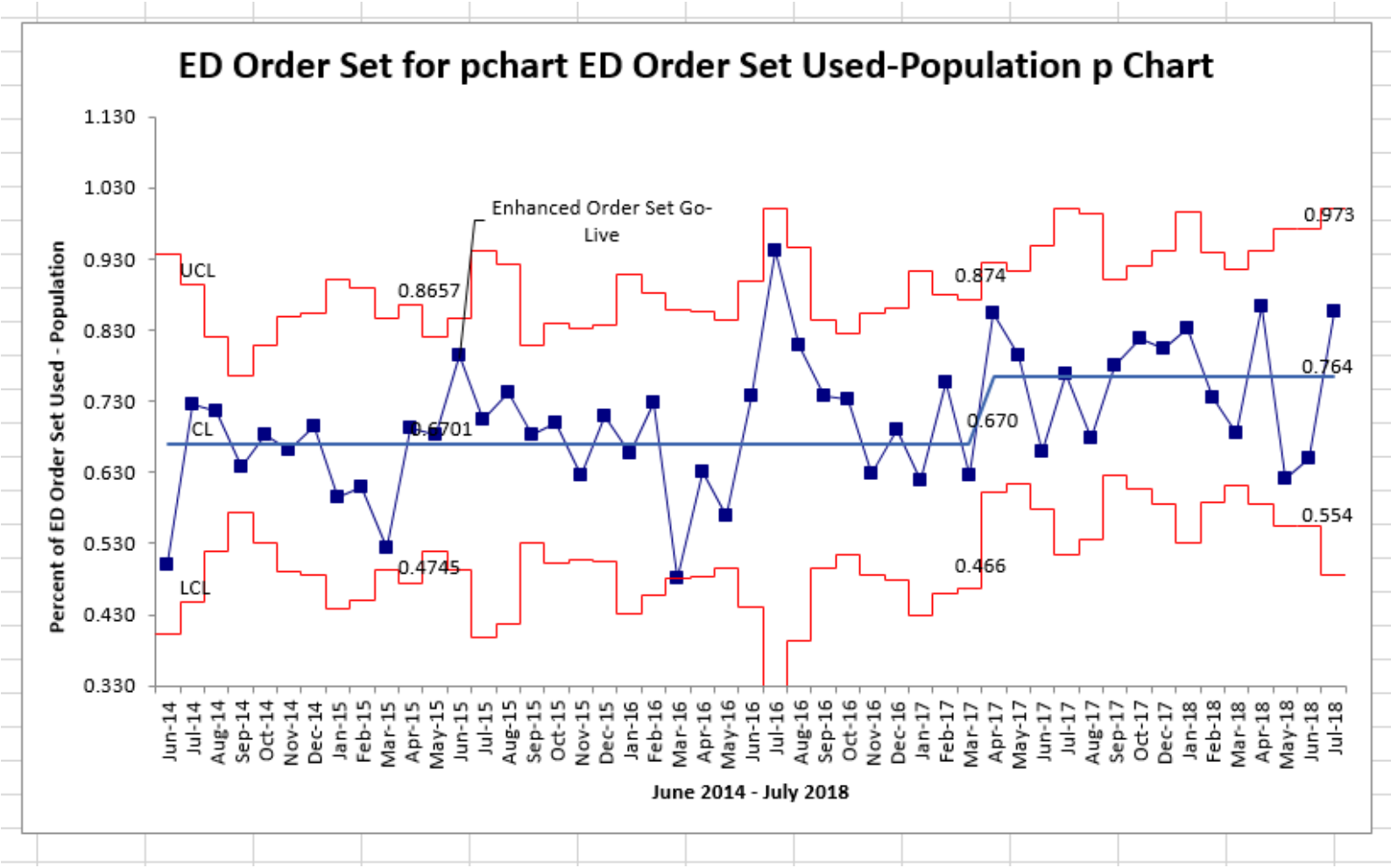

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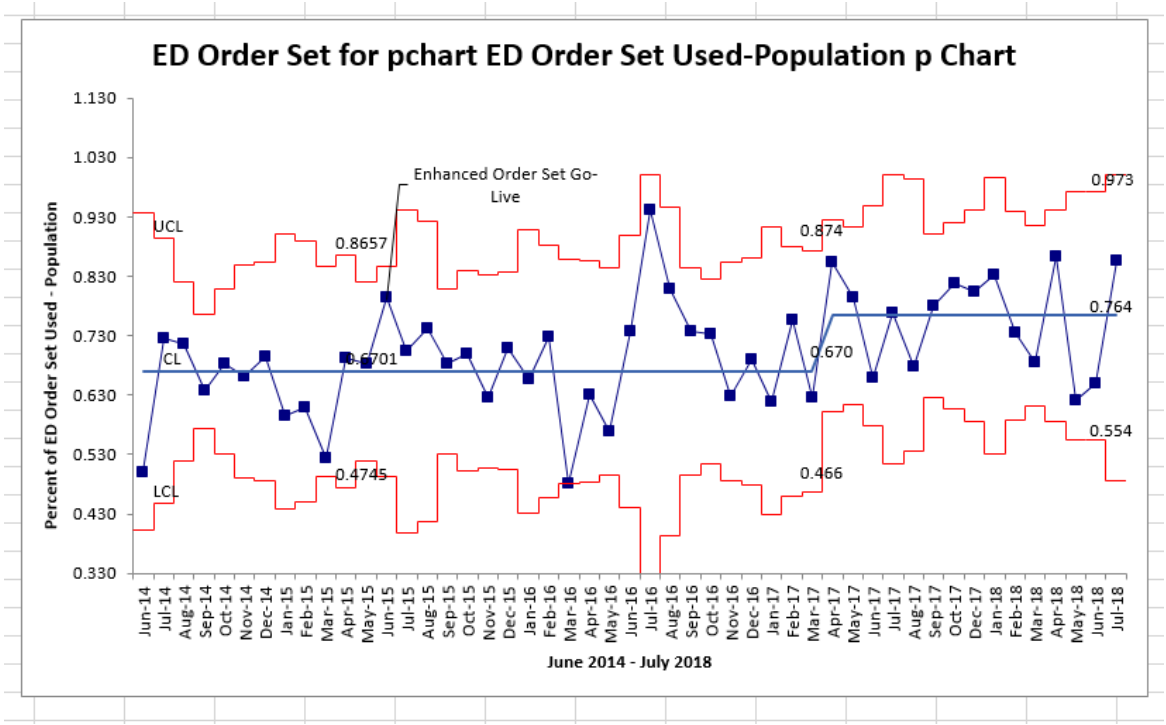
Applying our concepts



Rule Breakers

- Axis clutter
- Redundant axis/data labels
- Border

Rule Breakers

- Color meaning

Rule Breakers

- Vertical text
- Title length

After: Control chart/p chart

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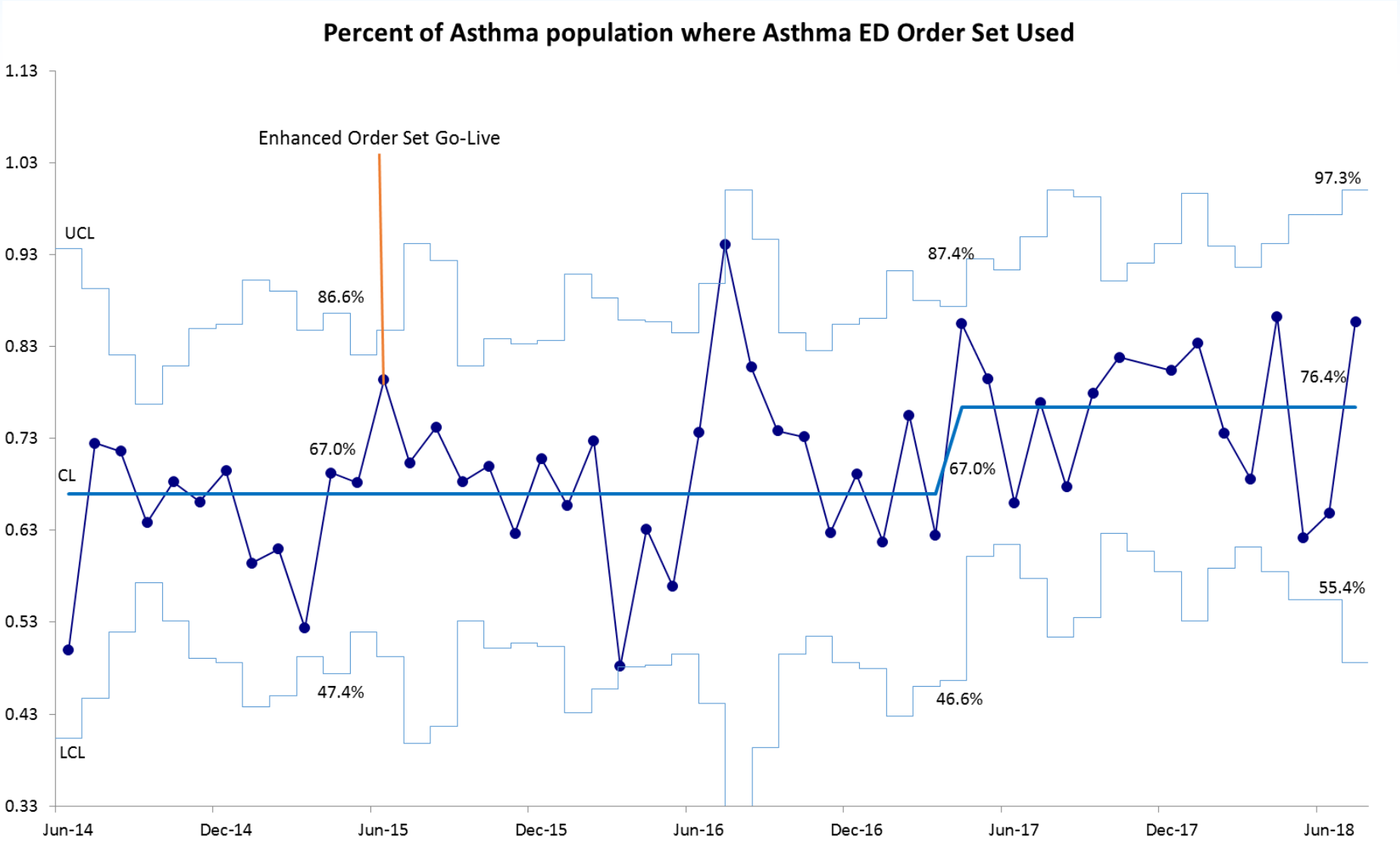

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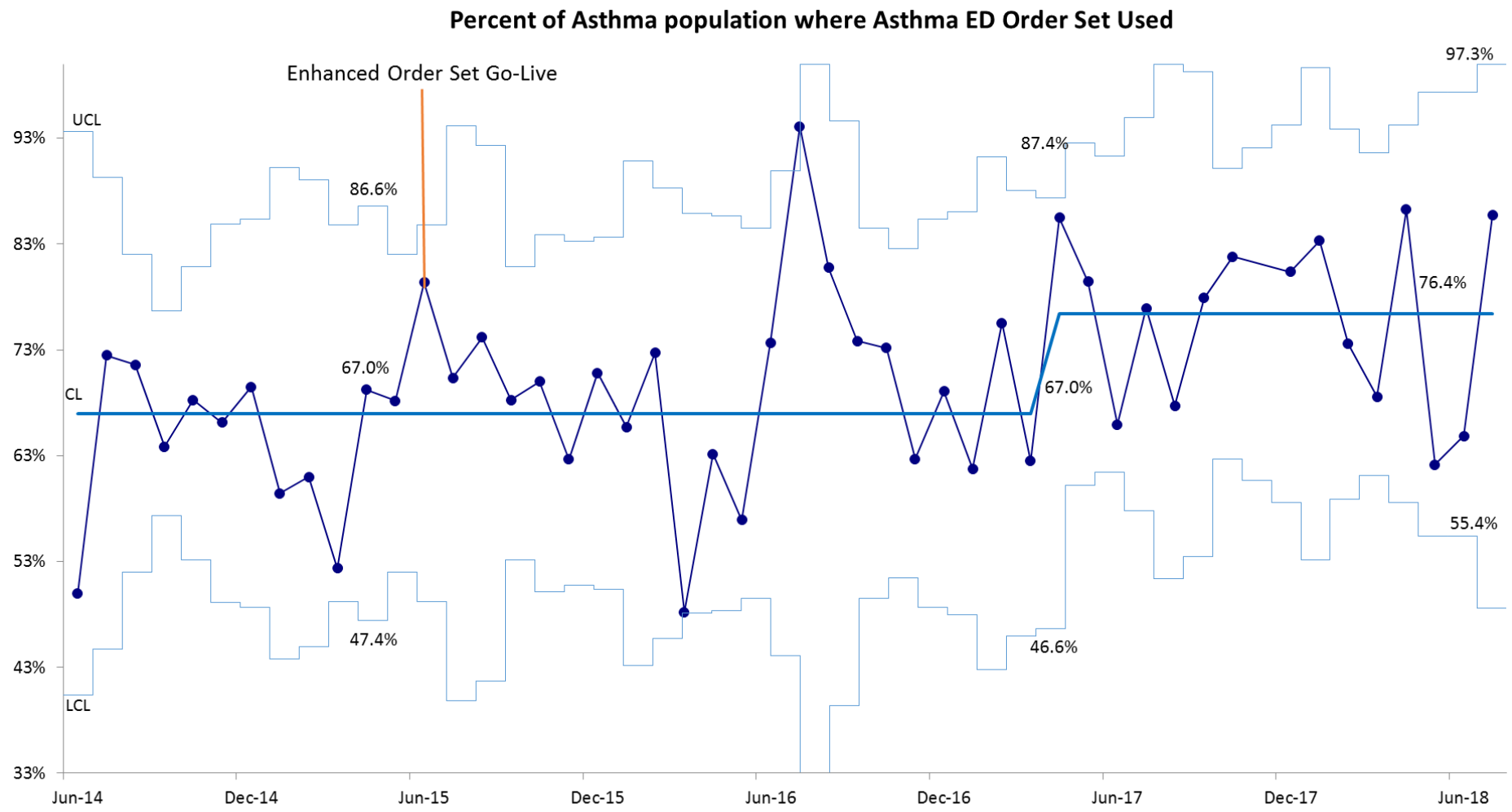
After: Control chart/p chart



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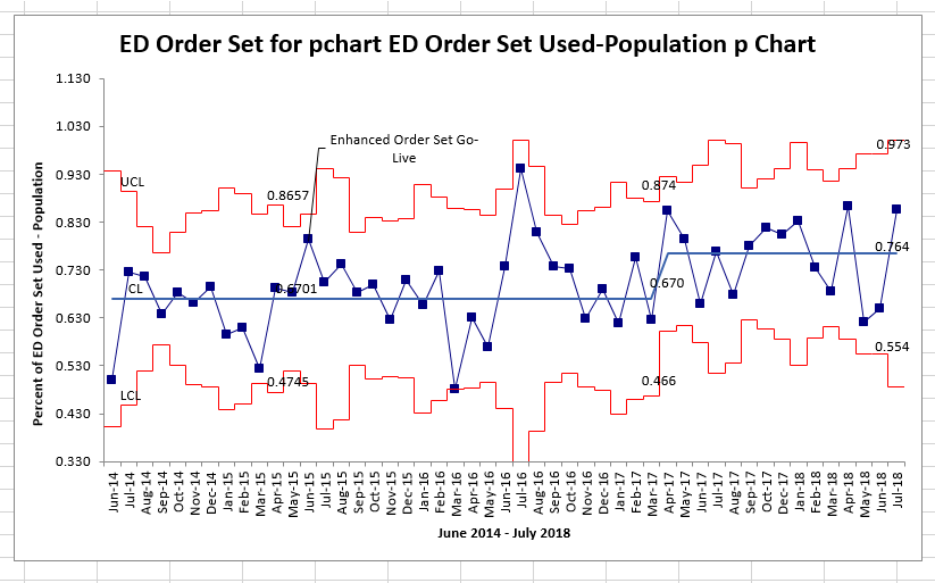
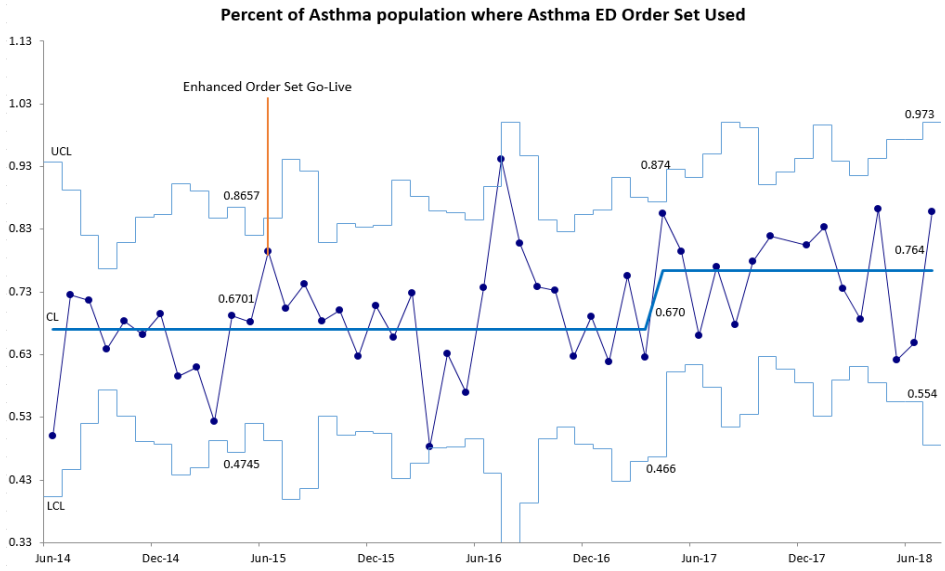
Before



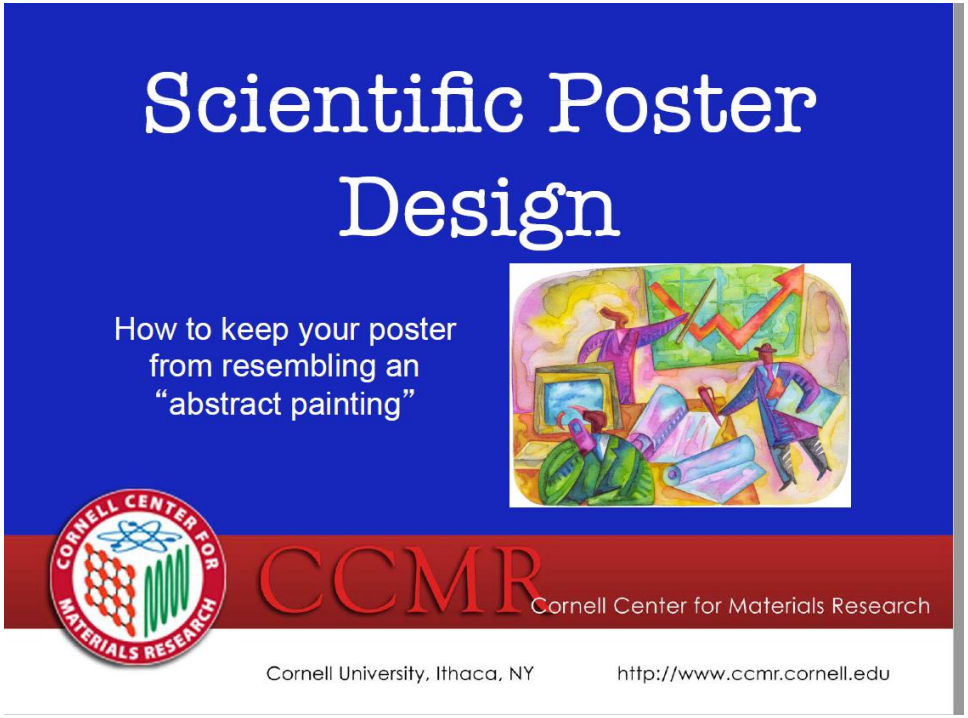
After



Remember to

- ✓**Choose the Right Chart**
- ✓**De-Clutter**
- ✓**Clarify with Color**
- ✓**Clarity with Text**

Poster Design Presentation



Thank you!!

Questions?

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