When Less *Really* is More:

Putting Data Visualization Best Practices to Work

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Good data visualization . . .



is an accessible story-telling tool



supports good communication among stakeholders



supports better data use for decision-making



Intended Results



Reflect on your audience



Build a shared understanding of data viz best practices



Reflect on your own work and action plan



Assumptions



Data are of good quality



Data are actionable



Data viz authors had good intentions

Shout-outs



Ann Emery

http://annkemery.com/

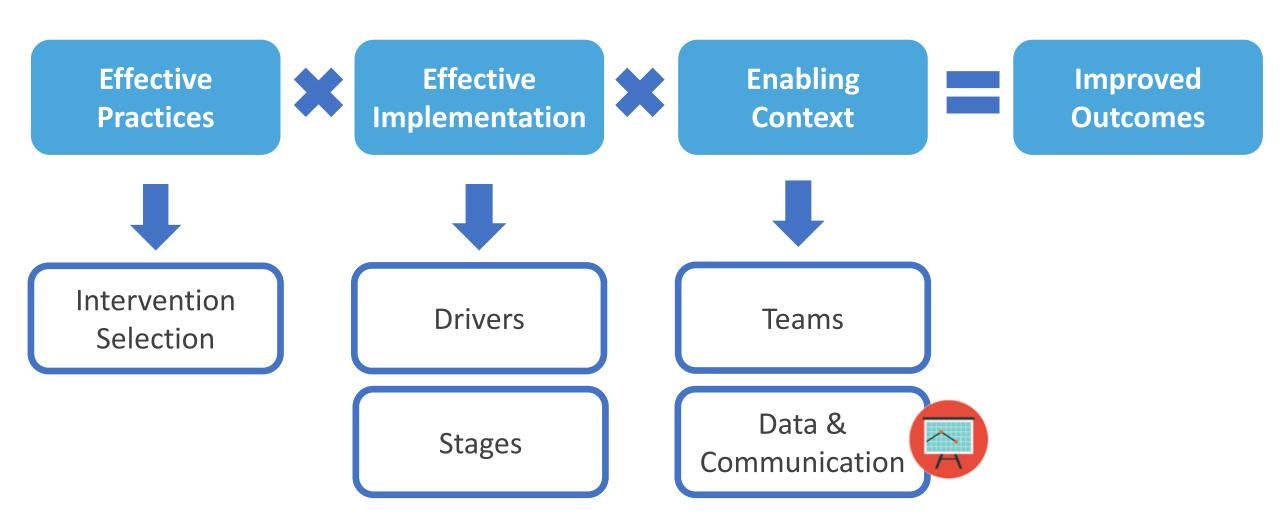


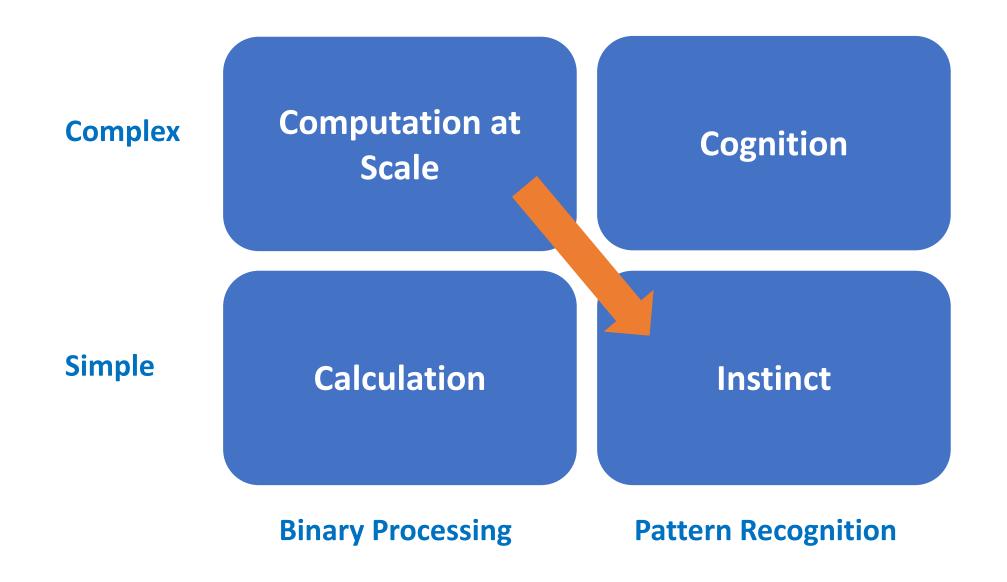
Stephanie Evergreen

http://stephanieevergreen.com/



Active Implementation



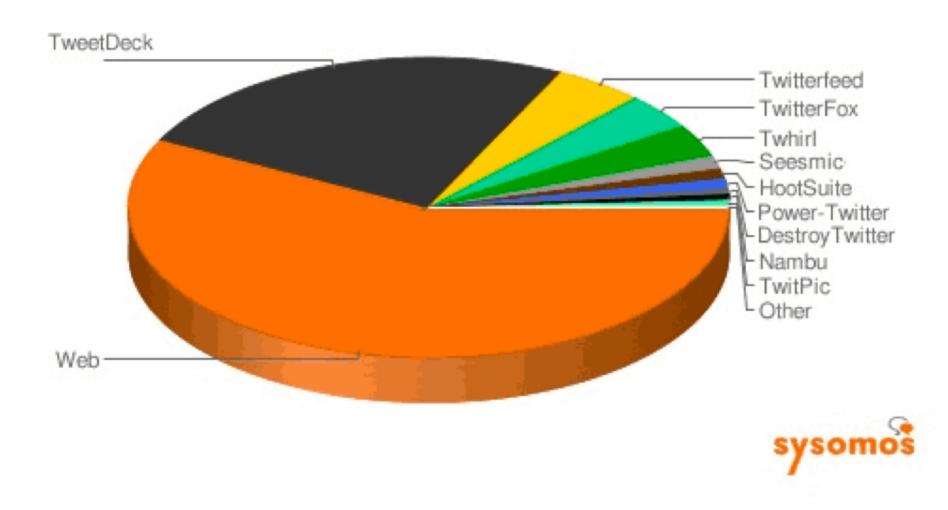


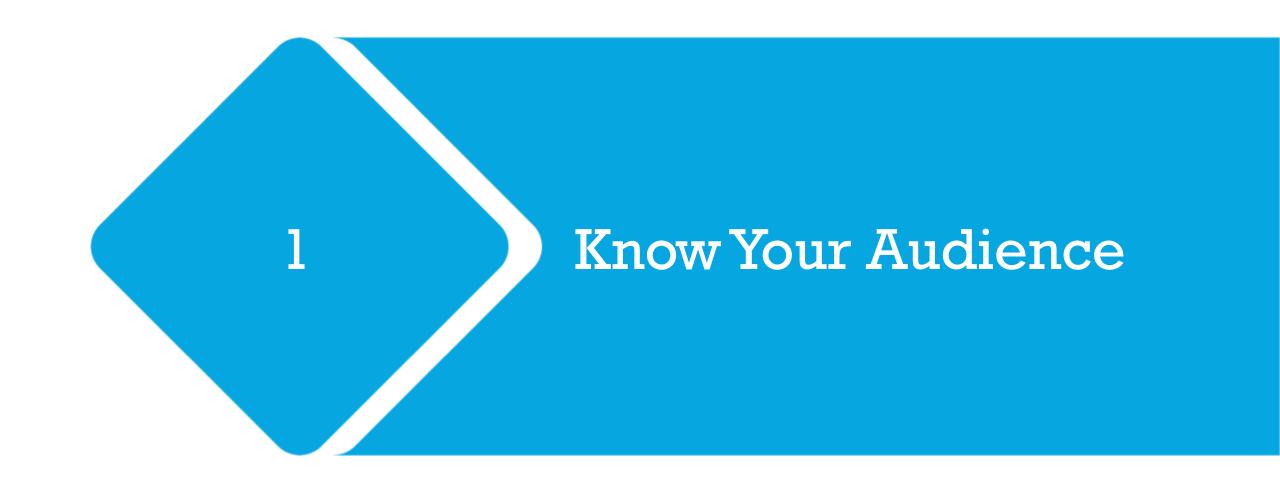






Market Share of Publishing Tools





Computation at Complex Simple Instinct Binary Processing Pattern Recognition

Think – Pair – Share



Think about your audience:

- What level of technical detail do they need?
- What do they want to do with the data?
- What do you want them to do with the data?
- What are some gaps in the way you currently communicate data?



Pair up with someone. Discuss your reflections.

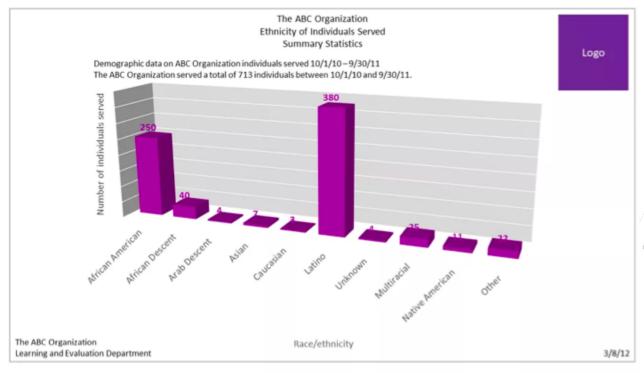


Share with the larger group – if you wish.



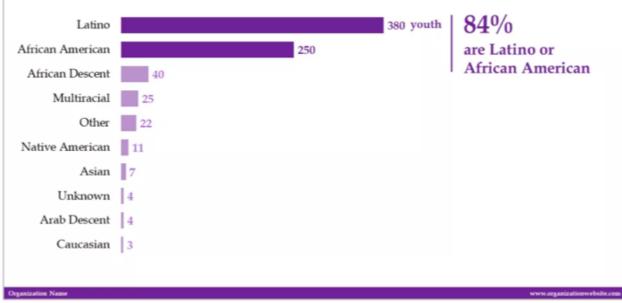
Text

- Titles are descriptive
- Subtitles/annotations provide additional information
- Text size is hierarchical
- Text is horizontal
- Data are labeled directly
- Labels are used sparingly



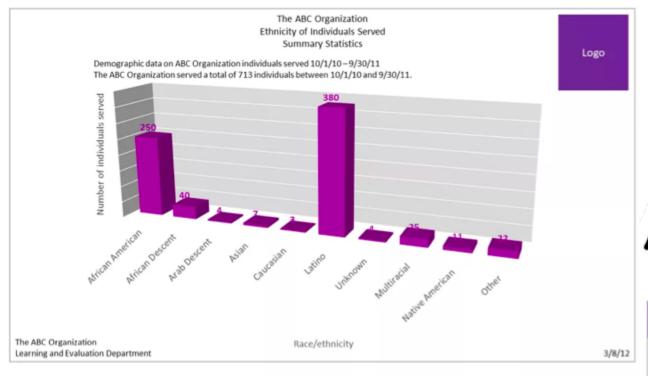






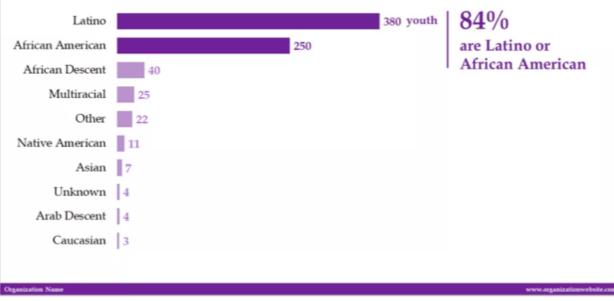


- Proportions are accurate
- Data are intentionally ordered
- Axis intervals are equidistant
- Graph is 2-dimensional
- Display is free from decoration





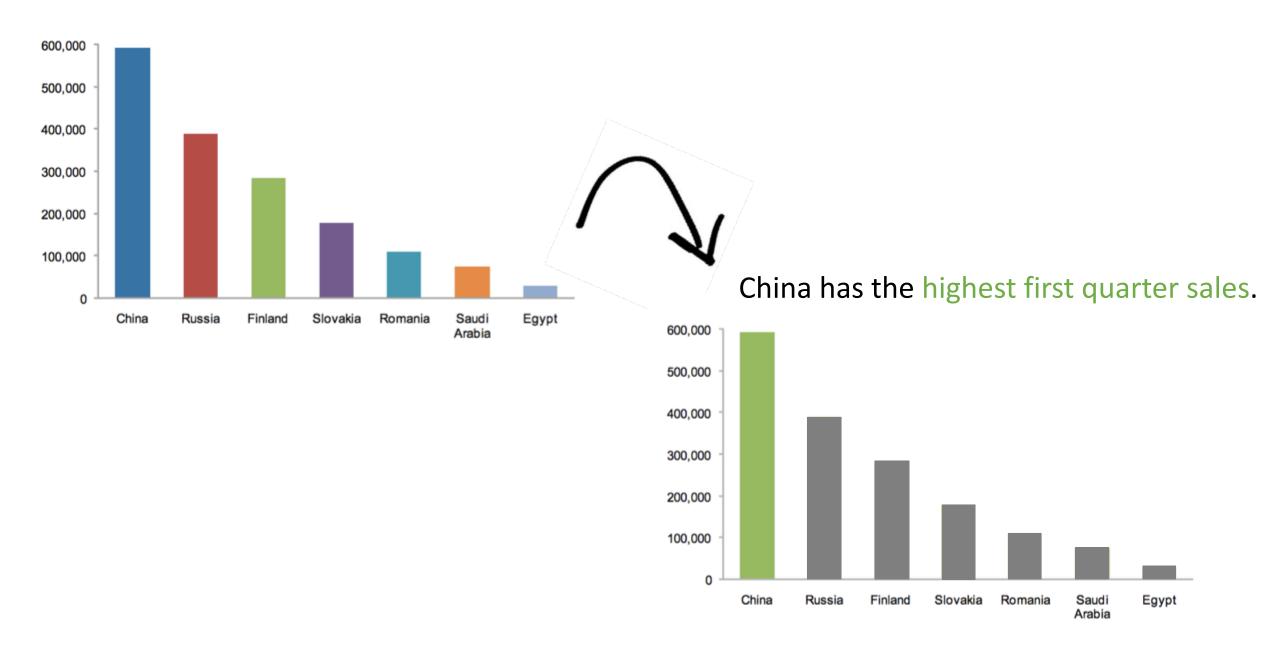




http://annkemery.com/makeovers

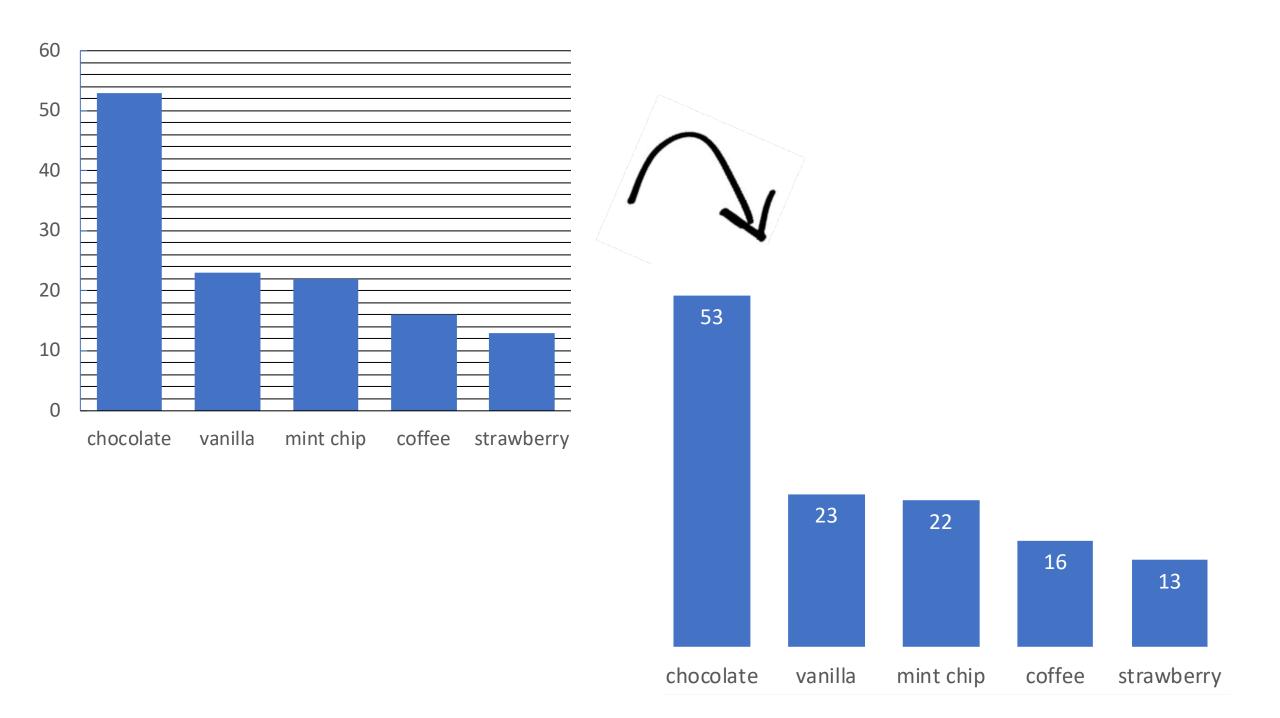


- Color scheme is intentional
- Color is used to highlight key patterns
- Color is legible when printed in black and white
- Color is legible for people with colorblindness
- Text sufficiently contrasts with background





- Gridlines, if present, are muted
- No border lines
- No tick marks, axis lines
- One horizontal, one vertical axis





- Highlight significant findings or conclusions
- Graph type is appropriate for data
- Graph has appropriate level of precision
- Chart elements work together to create meaning

"Perfection is achieved not when there is nothing more to add, but when there is nothing left to take away."

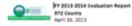
Antoine de Saint-Exupery

Remove to improve (the data-ink ratio)





Exhibit A. The Disaster



Program Profits for XYZ County

Any Department of Controllers addresses the importance of deciments, condens use with any magnificate shifts, from components underfail the surmedium goals, dreams and adolesses tressold knowledge for used on ST, NY and pregnancy prevention, bettell and additional, and oith and self-efficies." XYZ City Schools. The controllum addresses the importance of abetinence, condom use skills and

In 2013, teen programmen occurred at a rate of 31.5 per 1,000 females 15-09 in KYZ <u>Capaba, compared</u> with 33.3 per 1,000 intrinsite? In KYZ City Lahous, 528 percent of indomts reserved free and reduced faces 0.5 co.2012, compared with 50 operated of indomes the control of control of the co

th groupum year 2013-2014, 817 County served 75 students, 18 of whom received the minimum dissage

Table 1. Fortispert Demographs Semmary, Program Year 2013-2014*

| | 1 | Participants Served (N-PS) | | Fartispants Surveyed (N-DE) | |
|--------------------|-----------------|----------------------------|-------|-----------------------------|------|
| | | - | - | 4 | - |
| Service | Fernale | 45 | 10.0 | 15 | 10.5 |
| | Make | 30 | 40.3 | - 1 | 37.5 |
| Ago | 4.35 | 67 | 76.0 | 319 | 67.5 |
| | 35-17 | - 17 | 75.7 | | 12.5 |
| | 117 | _ | 1.7 | | |
| Rass)* (stecuty | Attean American | .74 | 495.0 | 10 | 43.7 |
| | American Indian | 3 | 4.0 | 1 | 4.3 |
| | Asian | 1 | 1.3 | - 1 | 4,3 |
| | Settro | | 30.7 | 0 | 0 |
| | 107101 | 29 | 37.3 | - 1 | 37.5 |
| | Other | 1.0 | 11.3 | 3 | 12.5 |

Regard of 8

Will County TV 2013-2014 Transaction Research

As detailed in the program cope of work, 6999 is expected to achieve the following extremes regarding participants' knowledge and disturbs after programming is completed:

- 1. Mi percent of displace, will demonstrate an increase in increasing that cusports the presention of gragnancy and/or \$7's (sexually transmitted infactions), including WE/MES.
- of sexual activity for the presention of programmy and/or 17%, including 616/8/25;
- 3. SI person of participants will demonstrate an increase in attitudes and beliefs that support the use after indexing for the prevention of programms and/or 95%, including 80%/Ac50.

Ests presented in this evaluation report are based on participant responses to the Team Programus Properties Survey (1975) prior to and after programming, that were processed using SAS SA, and ago, act, and applications are a survey of the participant. Our to the small cample one of the participant group, an's description statistics and he presented in this region. As EVI County was unable to recruit and serves a comparison group, comparison group findings will not be presented for evaluation

diagree and strongly diagree. When reporting findings, respondents who answered either "strongly agree" or "agree" are considered to be in agreement, libraries, respectively who arranged atter-"drong's GOLDON," or "disagree" are considered to be in disagreement. When excluding the personage of participants who demonstrated an increase in attribute and better supporting other abstraction or condom use, any nonexe in agreement along the scale (for example, a respondent answers "strongly disagree" at pro-test but "disagree" at post-test) would be counted.

An quietrant above expendence perspect, removed the same materia prior to the universe bank, cours programs were existed to ensure that post-costs be administrated a material or driven months, or 50 days, after the pro-cest. The linear time between survey administrations was 91.5 days, 41.7 profess of authorage had the minimum 90-day intercal between pre- and post-test.

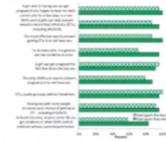
Observe J. Sexual Enowinder

The rive questions gauging assess invasively were second as a "best" with each question being worth The rive speciality graphing because of the High saven instance as it is such with a sub-field being section and graphing or an appropriate an appropriate particular and particular and particular and inspecial to assume the superior and particular and inspect and particular a

Participants also showed an increase or functional incominday reporting where to obtain both control. When along their approvable with the observed, "larger where to get both control (i.e., contains, "the pril," 1943 growth showed increased approving to a good control.

Will County IV 2010-2014 Conjugate Pages Property and a

Rigure 1. Retriet of Regardents Wife Correctly Answered Questions on



Objective 2. Delay of Sessel Activity

Of the participants currents, 762 persons (n=15) reported being abstract at both pile- and pask test. Married regarders per point to you that agreement with recent, they may bet have engaged in constitution that is the property of the period of the property of the period of the p present or encouraged them to about.

Table 2. Abstinant Repartment Agreement That Programs and ST: Processor Michigan, Prom

Present Lind St.

| the orbital and the | Participant (~17) | | |
|--|-------------------|--------|--|
| The second second | PHIS | Part 2 | |
| I do not want to get un STI. | 94.7 | 14.2 | |
| with the half and the sale trained before | 70.0 | 88.5 | |
| Figit project or packagant or program, it would not up to fold or place. | 81.5 | 81 | |

Objective 2. the of Conducts

more reclaimed to decrease changes after programming. Table 3 contractors respondent agreement with claimance addressing administrative contractors respondent agreement with claimance addressing administrative contractors privacy. After programming, This process of participants demonstrated an increase in agreement towards administrative and letters assessing the use of contract.

Table 5. Foreign of Participants Who Agreed with Statements Addressing Condoms

| Artifudes Regarding Condums | | Partitions | |
|---|------|------------|--|
| | | Per I's | |
| Condons break easily. | 79.2 | 62.5 | |
| they parties the rest want to see a conduct, I would be able to reduce | 87.5 | 110 | |
| Late confident Localificaci a condom connectly. | 50-0 | 95.8 | |
| Bits too embanseing to buy condition it a stars. | 54.2 | 30.3 | |
| Wasted correctly overly first, conducts are affective of precenting programmy. | 70.6 | 110 | |
| Placed correctly every time, condumy are effective at presenting most STs, techning INVASE. | 54.2 | 100 | |

When extent about their important to use a forth operand method in the next year, 10.7 persent of persent indicated they planned to use some method, including abotherors, at both pre- and pentison. Figure 2 symmetries which methods respondents indicated that they intend to use in the next year \$ Participants

Figure 2. Respondents' Intended Sinth Control Method Use in the Next Year



^{*}Based on an aggregation of the responses to guestions 14, 15, 11, 17, 20 and 21, which are losed in faster 6. Questions 1.6 and 1.7 are reserve upsted. Anter: Recognition has not with valued to allow "all that apply," therefore counts gag, second 100%.

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Affection behaviors are not contrated per try APRF cultures abportune, Festings regarding behavior charge are discussed in this report as an indicator of the program's societies to positively impacting additional and bettern, Season between reported by responsively is customeroad in "other, it which full into acts of other comparises seemals action as foot your and positively, orbital one during the momentum. between pre- and post-less, or abstracts at pre- and post-less.

| Reported Sengel Behavior | Participant (N-34) | |
|--|--------------------|------|
| representation and according | | - 6 |
| Sexually action at both pre-and post-tool | | |
| Introduct same activity between pre- and post-root | | |
| Authorit at both pro- and post-test | 10 | 79.2 |

indicate that participants have an improved foundation of broadings from which to make responsible decisions along their search health, and may the soops of work objective that 50 percent of students will demonstrate on increase in prowings that ecoports the presenter of pregnancy and/or STs, including

Participants also reported increased support for electronic after programming of the participants who did not already provide agree with all of the electronic underworks in Table 2, 17.5 persons movement. thair agreement thai prognancy ancior ST presention motivated them to abotto. Those findings are encouraging, and may the stope of some opposites than 15 persons of perincipants and deministration mortales in distributes and behind the data specified in a comparation for the presention of prognance and/or ST is, including HIVS&DE.

program ning, 79.7 percent of participants increased their agreement with statements suggesting the use of candidn fail for presented of ingregating while ITE. Clean those foolings, the grappes authorities as sugge of work objective that 55 percent of participants will deformable an increase in attitudes and below that support the use of condoms for the presention of programs; and/or This, including INVINCE.

Despite these promising findings, there are some locust of concern reporting implementation of allyting Proof Cholors, particularly is some of disage. Doly 24.5 percent of participants received the minimum

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person of the participants completed a pro- and processes coming. This small complet size thay had country, represent the larger price of perforance, Additional factorized auditorize will be provided to

Execution Consultant to discuss these findings. "North you for your continued consecutated to been

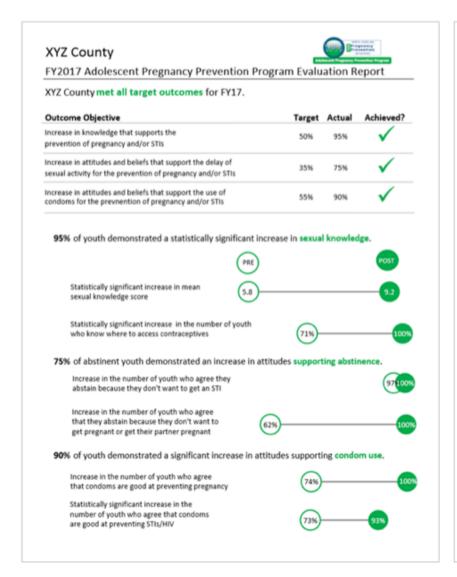
NCSRIS, Storage of Public Health

The Reboot Agenda

- 1. Don't bury the lead.
- 2. Limit to one page (front and back).
- 3. No blocks of narrative text!

4. Use color for emphasis.





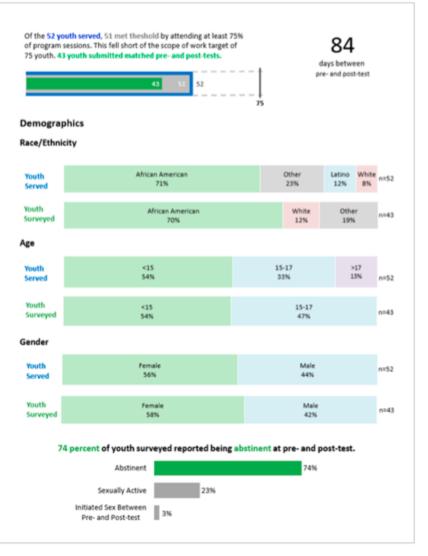
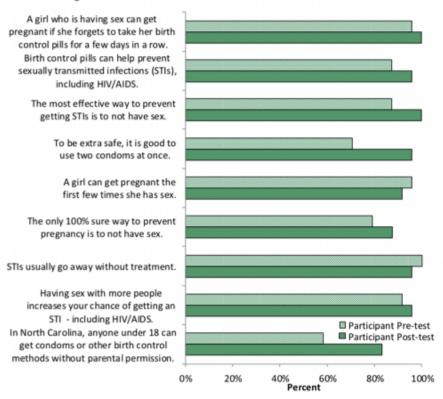
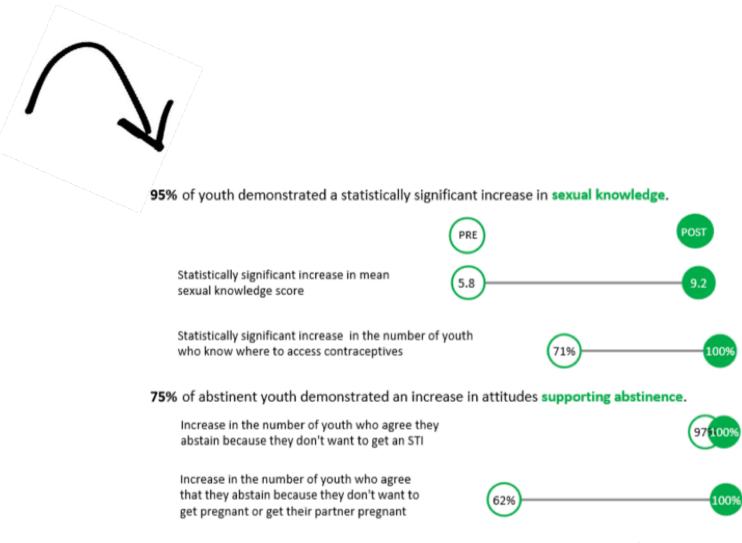
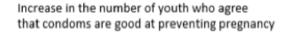


Figure 1. Percent of Respondents Who Correctly Answered Questions on Sexual Knowledge











Statistically significant increase in the number of youth who agree that condoms are good at preventing STIs/HIV



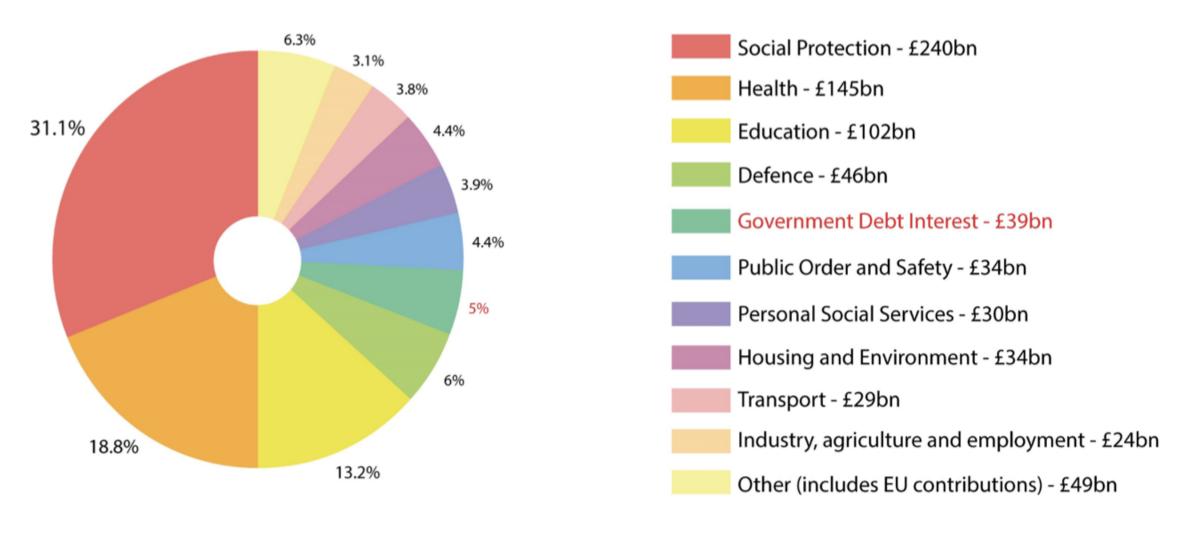
Data Gallery



Visit each data visualization flipchart. Using the Data Viz Checklist note:

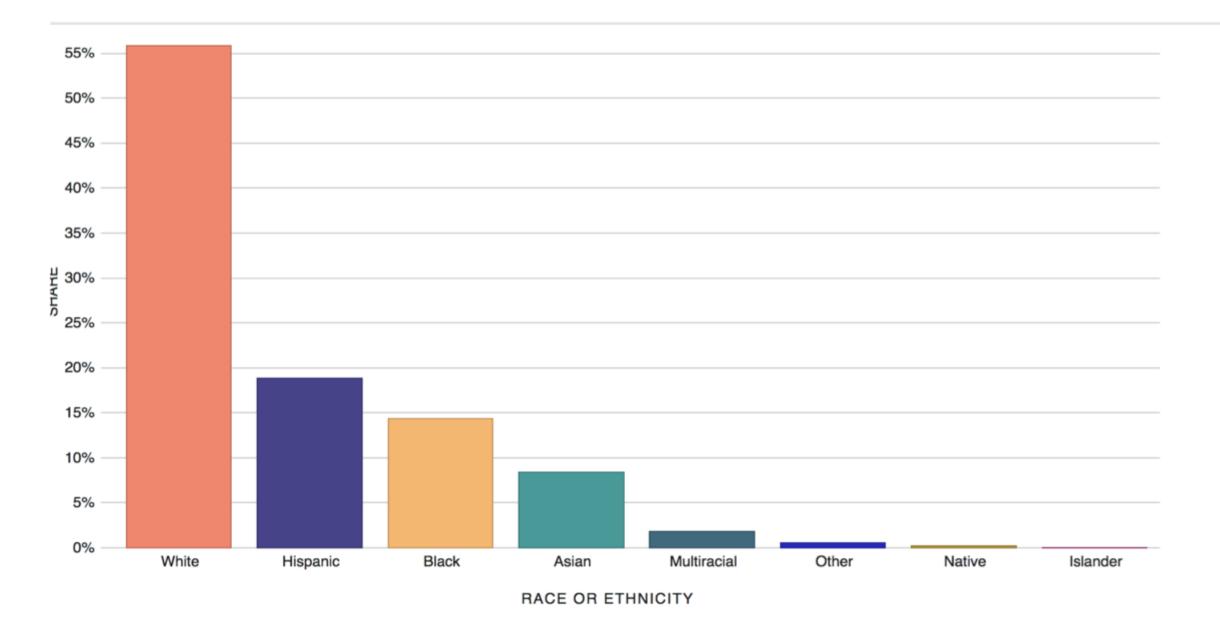
- Strengths
- Opportunities for improvement
- Questions you may have

United Kingdom 2016-17 Government Expenditure



Expenditure figures taken from page 5, Budget 2016. 16 March 2016, HM Govt

Total 2016-17 Government Expenditure: £772 billion



Anatomy of a Winning TED Talk



1%

Sophisticated Visual Aids

We're not sure who puts the D in TED-most of the best presentations favor tepid PowerPoint slide shows (sorry, Brené Brown), Pictionary-quality drawings (really, Simon Sinek?), or no props at all.



5%

Opening Joke

Remember the one about the shoe salesmen who went to Africa in the 1900s? That's how Benjamin Zander opened his talk-which turned out to be about classical music.



5%

Spontaneous Moment

Don't overprepare. Tease the guy in the front row ("You could light up a village with this guy's eyes"). Commend the stagehand who handles the human brain you brought.



5%

Statement of Utter Certainty

People come for answers-give 'em what they want, as Shawn Achor did: "By training your brain ... we can reverse the formula for happiness and success."



12%

Snappy Refrain

The TED equivalent of "I have a dream." Example: "People don't buy what you do; they buy why you do it." Repeat 7x.



23%

Personal Failure

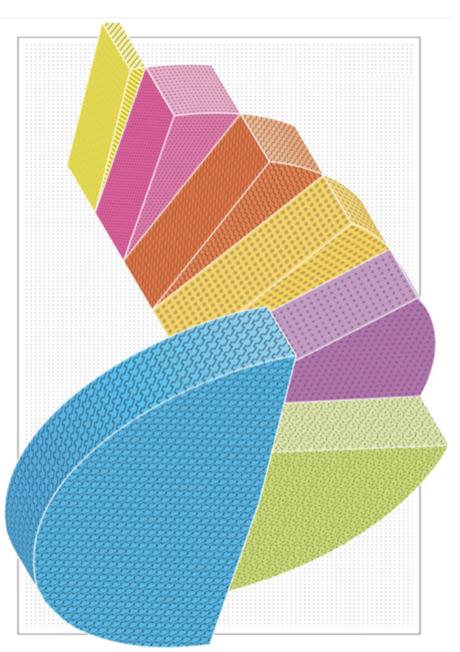
Be relatable. We want to know about that nervous breakdown. Or at least the time you didn't fit in at summer camp.



49%

Contrarian Thesis

Wait a sec-we should be playing more videogames? The more choices we have, the worse off we are? TED is where conventional wisdom goes to die.



LANGUAGES



This chart shows you the primary languages of your community, useful when deciding which language to Tweet in.

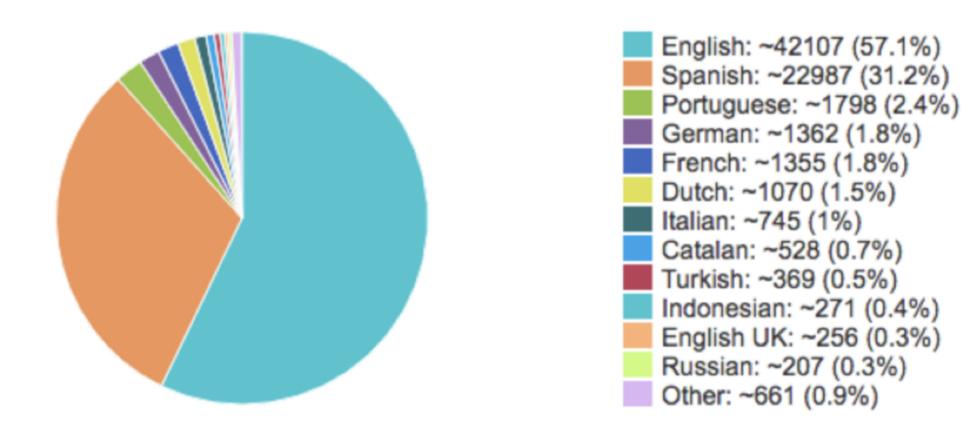
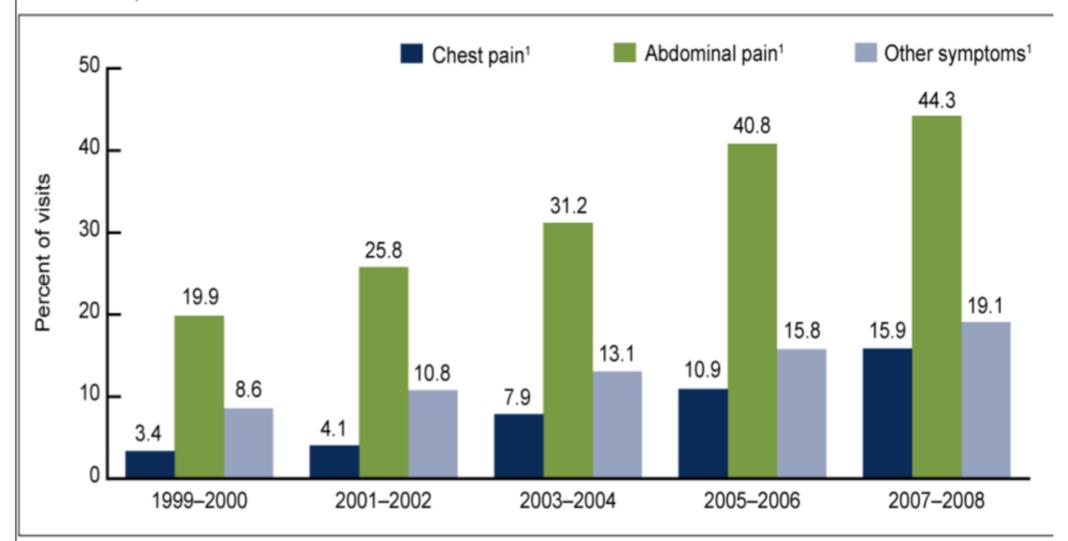


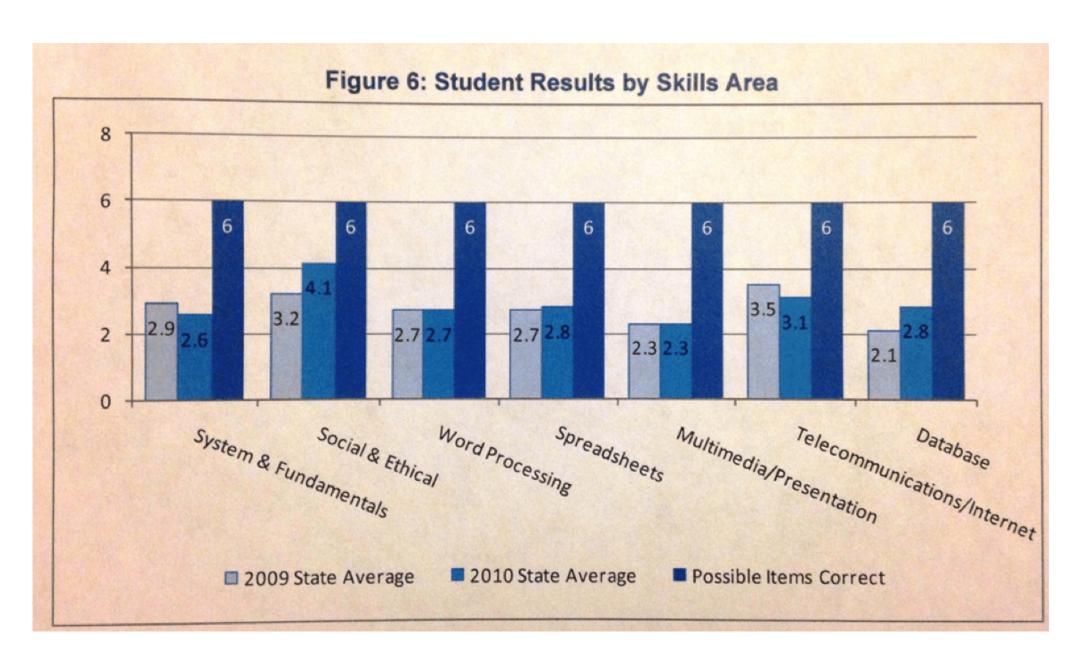
Figure 4. Advanced medical imaging among noninjury emergency department visits for persons aged 18 years and over: United States, 1999–2008



¹Trend is significant (p < 0.05).

NOTE: Figures are based on 2-year averages.

SOURCE: CDC/NCHS, National Hospital Ambulatory Medical Care Survey, 1999-2008.



Action Planning



What is your 15 percent?

Where do you have discretion and freedom to act?

What can you do without more resources or authority?