

Designing effective infographics, data visualisation, and visual abstracts



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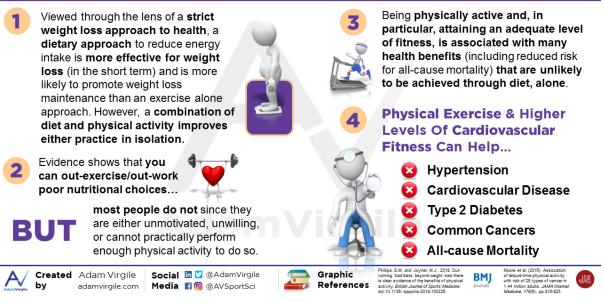
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- Trained in Medical Biochemistry (Uni of Surrey)
- Worked in clinical trials developing various types of assays for biologics
- Read and wrote about science in my spare time, occasionally got paid for it
- Somehow convinced company to pay for me to do a MSc in Science Communication (Uni of West England), even though completely unrelated to my role
- Left company (lol) to become a freelance science writer / communicator (3 years)
- Expanded out into developing graphics alongside writing, mostly out of interest and a way to add more visual appeal to the blog I ran.
- Decided freelance is too much work and a salary is nice
- Joined Uni of Ox dept Primary Care Health Sciences (2015)
- Started giving you this presentation...

Briefly me and a quick question...



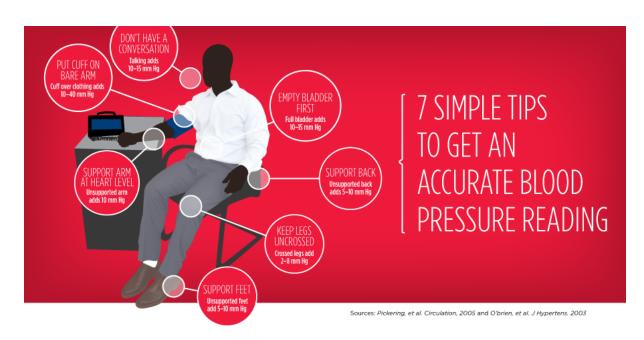
Out-running "Bad" Diets: Beyond Weight Loss There Is Clear Evidence Of The Benefits Of Physical Activity



- Words (or info) with Graphics
- Graphics do little to enhance the content
- Too much text
- Too cramped



B

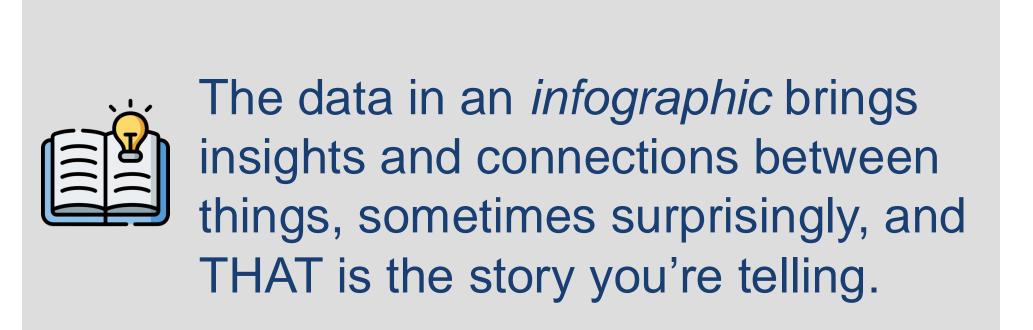


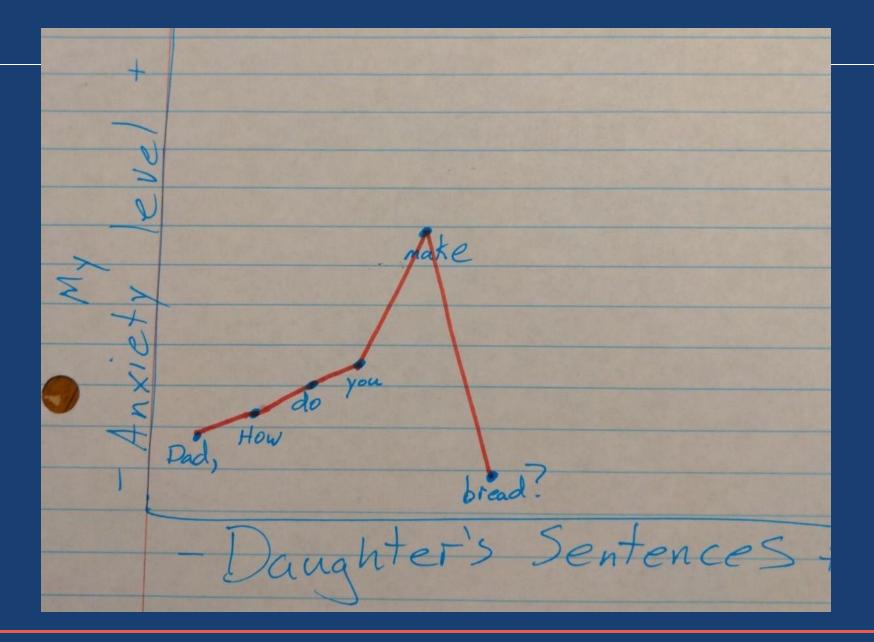
- Graphics enhance understanding of the info
- Image tells a story (in its most basic sense) on its own
- More space and easier to interpret

Uses visual cues to better communicate information

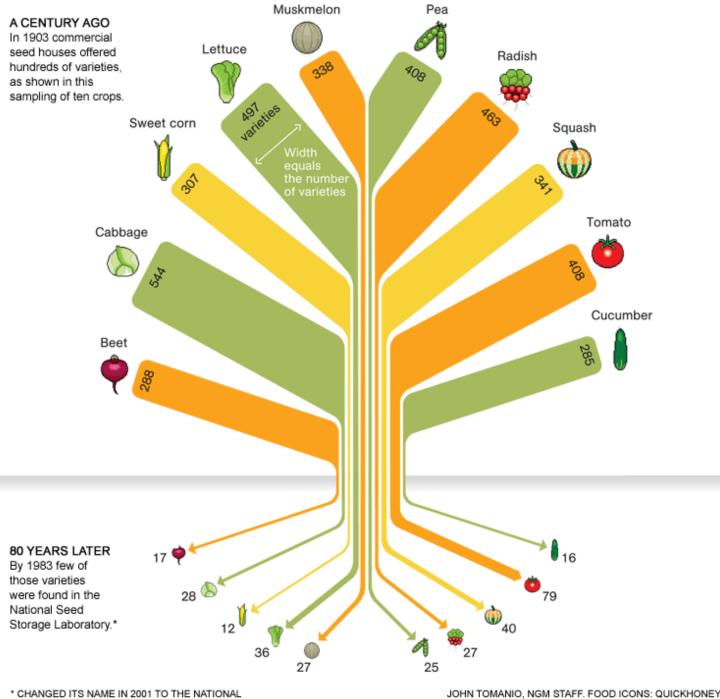


Simplifies how information is presented







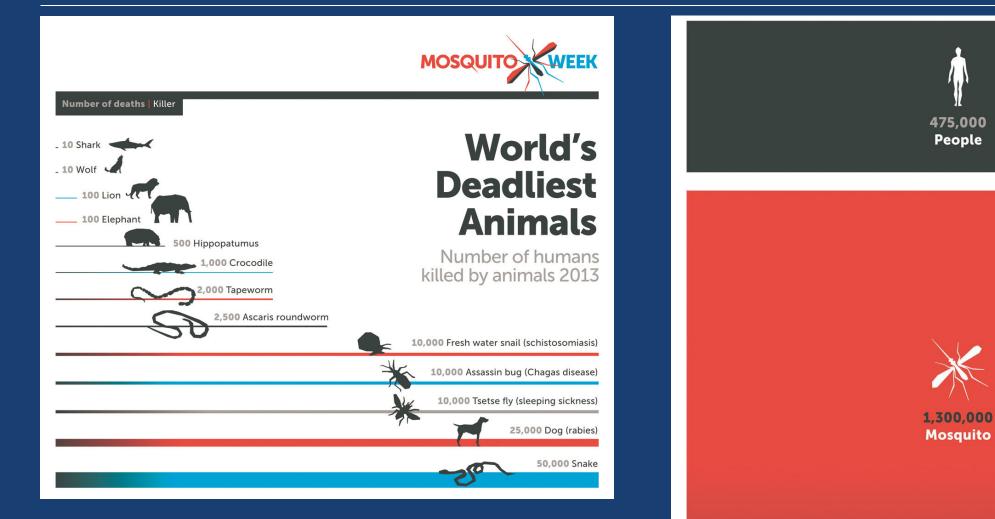


http://ngm.nationalgeographic.com/2011/07/food-ark/food-variety-graphic

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CENTER FOR GENETIC RESOURCES PRESERVATION

SOURCE: RURAL ADVANCEMENT FOUNDATION INTERNATIONAL



https://www.gatesnotes.com/health/most-lethal-animal-mosquito-week

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SOURCES: IHME; crocodile-attack.info; Kasturiratne et al. (doi.org/10.1371/journal.pmed.0050218); FAO (webcitation.org/60gpS8SVO); Linnell et al. (webcitation.org/60RL7DBUO); Packer et al. (doi.org/10.1038%2F436927a); Alessandro De Maddalena. All calculations have wide error margins.

- Infographics tell a premeditated story to guide the audience to a conclusion (subjective)
- Data visualisations let the audience draw their own conclusions (objective)

DIFFERENCE BETWEEN INFOGRAPHICS AND DATA VISUALISATIONS

	Infographics	Data viz
Complexity	Generally quite simple, targeting a layman audience	Vary in complexity depending on the type of data.
Includes narrative or story telling	Usually	No. Any narrative is usually external to the visualisation (think charts in a paper)
Design and aesthetics	Often a lot of design, thought and work goes into making it visually appealing	Usually not a lot of design, i.e. just what R, Stata or Excel can spit out with a few visual tweaks
Includes meta data (units, source, definitions)	Sometimes (but good practice include sources and units as a minimum)	As with narrative, usually external to the data visualisation itself.
Includes graphics	Generally yes, as they are what gives the visual appeal and impact	Sometimes. May depend on use and audience.
Interactive	Increasingly so online, but still plenty of 'in print' infographics.	Increasingly so online.
Time take to complete	Can take quite a while to get right.	Generally not long and can be automatically produced by software.

- Somewhere between an infographic and a data viz...
- A visual summary of the info in an abstract, meant to convey the key findings in a shorter format and /or entice someone to read on for more detail

VISUAL ABSTRACT

What do UK adults with, or at risk of, type 2 diabetes prefer in weight loss programmes?

Analysing choices of 3,960 participants living with overweight across seven characteristics of weight loss programmes

Why?



 Losing weight can reduce people's risk of developing a range of health problems.



75% of people decline current weight loss programmes in the UK.



Understanding what people like and dislike about different programmes could help us make more appealing programmes.

What?

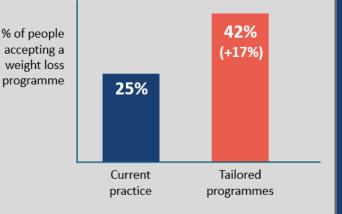
KG

- Similar preferences regardless of diabetes status.
 Preferences for healthy eating
 - Preference for healthy eating over meal replacement diets.
 - Favouring individual over group activities.
 - Choosing programs with higher 10-15 kg weight loss goals.
- Online content preferred to inperson interactions.
- Specific preferences noted in women and ethnic minorities.

So?



We modelled the data to see what
 difference incorporating such
 preferences might make.



Identifying preferred features of weight loss programmes for adults with, or at risk of, type 2 diabetes: a discrete choice experiment with 3,960 adults in the UK.

Buckell, J., Mitchell, C., Fryer, K., Newbert, C., Brennan, A., Joyce, J., Jebb, S., Aveyard, P., Guess, N., Morris, E. Diabetes Care





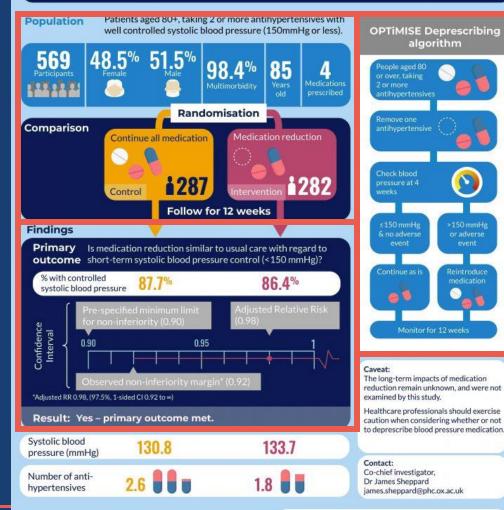
VISUAL ABSTRACT

Optimising Treatment for Mild Systolic Hypertension in the Elderly

Is it safe to deprescribe blood pressure lowering medications in older adults?

Results from the OPTIMISE trial

Summary This trial suggests that antihypertensive medication reduction can be achieved without substantial change in blood pressure control in some older, multi-morbid patients with hypertension.



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National Institute

for Health Research

Sheppard JP, Burt J, Lown M, et al. Effect of antihypertensive medication reduction vs usual care on short-term blood pressure control in patients with hypertension aged 80 years and older: the OPTIMISE randomized clinical trial. JAMA. 2020; 323(20):1-13. doi:10.1001/jama.2020.4871

Reference:

- Overall, the distinction between these things, not that important, it's about information design and use.
- BUT, important to be clear that you're communicating to people correctly when you say what you want (data vis or infographic or, if what you really want, is just some info prettied up with some design / graphics

- 1. The data
- 2. The audience
- 3. The key message
- 4. The medium
- 5. The design

FIVE STEPS TO AN INFOGRAPHIC **Step One: The Data**

- Start with quality data: Ensure your information is accurate, relevant, and timely.
- Quantity matters: Have enough data to tell a compelling story, but not so much that it overwhelms.
- **Context is key**: Understand the broader implications of your data.
- Source credibility: Always cite your sources to build trust and reliability.
- Data tells a story: Look for narratives or insights within your numbers.
- **Consider limitations**: Be aware of any gaps or biases in your data.

FIVE STEPS TO AN INFOGRAPHIC **Step Two: The audience**

• Know your target:

Understand the specific needs, interests, and background of your audience.

Consider diversity:

Account for cultural, educational, and generational differences.

Assess appropriateness:

Is an infographic the best medium for this particular audience?

• Avoid assumptions:

Don't presume prior knowledge or shared cultural references.

• Be sensitive:

Frame information appropriately, avoiding exaggeration or scare tactics.

• Evaluate effectiveness: Remember, popularity doesn't always equal comprehension.

FIVE STEPS TO AN INFOGRAPHIC **Step Two: The audience**

Key Point: The information needs of a clinician, researcher, patient, or general public member can vary drastically. Tailor your approach accordingly.

Example Audience Considerations:

- Age groups (e.g. young adults vs. seniors)
- Professional background (e.g. healthcare providers vs. patients)
- Cultural context (e.g. long-term residents vs. recent immigrants)
- Literacy levels (both general and 'health literacy')

FIVE STEPS TO AN INFOGRAPHIC **Step Three: The key message**

Defining Your Message:

- **Understand**: What's the primary takeaway for your audience?
- Feel: What emotion do you want to evoke?
- Act: What action do you want your audience to take?

Remember: A powerful visual without a clear message is just a pretty picture. Your key message is the backbone of your infographic.

FIVE STEPS TO AN INFOGRAPHIC **Step Three: The key message**

Key Considerations:

- **Clarity**: Can you articulate your message in one clear sentence?
- Relevance: Does your message resonate with your audience's needs and interests?
- **Impact**: Is your message compelling enough to inspire the desired response?
- **Balance**: Are you informing without overwhelming or understating?
- Ethics: Is your message presented responsibly, especially for health-related topics?

Tip: Consider including your key message as text within your visual to reinforce your core point.



FIVE STEPS TO AN INFOGRAPHIC **Step Four: The medium**

Primary Considerations:

- Format: Will it be a leaflet, postcard, web page, social media post, etc.?
- Viewing Context: Where and how will your audience encounter this visual?
- Device Compatibility: Will it be viewed on smartphones, desktops, or in print?

Strategic Planning:

- Multi-format Design: Plan for adaptability across different mediums
- Modular Approach: Create sections that can be easily repurposed
- Scalability: Ensure your design works at various sizes and resolutions

FIVE STEPS TO AN INFOGRAPHIC **Step Four: The medium**

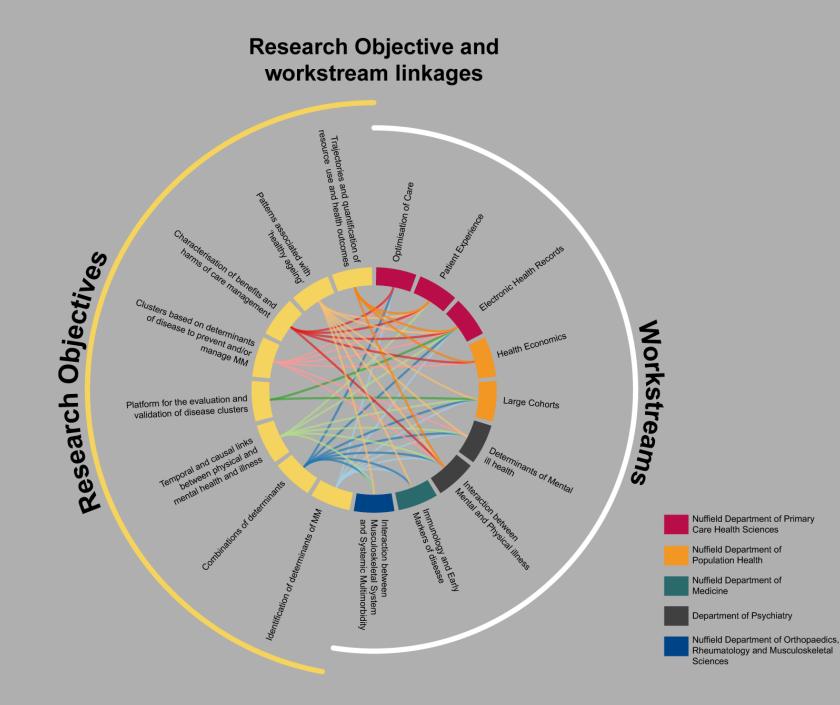
Key Factors to Consider:

- Accessibility: Is your chosen medium accessible to your target audience?
- Interactivity: Could interactive elements enhance engagement?
- **Shareability**: How easily can your visual be shared or distributed?
- Longevity: Is this for short-term impact or long-term reference?



Remember: The medium isn't just a vessel for your message – it's an integral part of how your message is received and understood.





Remember: Infographics don't have to be numerical data!

They can show more qualitative or relationship oriented information as well.

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They can show more qualitative or relationship oriented information as well.

GP Explanations for delays in diagnosis

Navigating possible endometriosis in primary care: a qualitative study of GP perspectives Sharon Dixon, Abigail McNiven, Amelia Talbot and Lisa Hinton British Journal of General Practice 2 August 2021; BJGP.2021.0030. **DOI:** https://doi.org/10.3399/BJGP.2021.0030

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Infrequent clinical exposure to menstrual problems or gynaecology (for example if patients tend to preferentially see female GPs) Falsely reassured by negative tests Aware of uncertainties/unknowns, including variability and unpredictability of clinical sequelae of endometriosis Do not feel diagnosis needed if adequate symptom control achieved (including experience of this following referral to secondary care) Concern about investigations required for diagnosis GP workload Individual GP Level Pressure to reduce referrals Long delays/limited access to secondary care Reduced continuity in primary care, for example impacting on follow up Structural and organisational of trials of treatment or initial investigations primary care factors Limited education for the whole primary care clinical team about endometriosis and women's health compared to other aspects of primary care (both in training and on-going) Factors specific to Delays due to women seeing super specialists, necessitating multiple endometriosis referrals to different secondary care teams, or women rapidly discharged from secondary care following initial investigations then requiring re-referral for emergent symptoms or concerns (including after inconclusive investigations in secondary care). **Community and** external factors Difficult to diagnose (impossible in primary care) Disease impacts variable and unpredictable and across multiple systems Need to follow a diagnostic "hierarchy" and exclude red flags first Trials of treatment advised in guidance (vs. perception that masks symptoms and delays diagnosis) Normalisation of menstrual pain

(by both community and professionals)

Menstrual stigma

Not seen as a priority for drug companies or research

Some women do not want referral or further investigations, including when symptoms are controlled in primary care

Lacking knowledge or awareness including awareness of range of

symptoms, or guidance

Step Five: The design (1)

- Clarity and accuracy are more important than aesthetics*.
- Infographics are not clip art. They are not necessarily easy to do, and they must fit your data and story.

Step Five: The design (2)

1. Get to the essence of what your data shows Try to distil it into one short sentence.

2. What is/are the insight(s)?

What is the question and the answer to this meaningful information that people didn't know about?

3. Create the narrative

What's the story behind the insights? Start connecting the dots between questions/answers and insights.

4. Create a visual analogy You're not telling your narrative, you're showing it.

5. Make a sketch

Rough it out on paper, to see how it might work. You're first ideas are likely to be obvious and boring or cliché, so try at least a few different things before committing to anything.

6. Create the layout

Keep it simple and make sure there's a clear path for people to navigate through it (start to finish of the story).

7. Make it beautiful

Clarity and accuracy are the most important, BUT, if you can, make something that **people will want** to look at it, not something that **you want them to look at**. Err on the side of minimalism.

Step Five: The design (3)

- Your first ideas will probably be pants...
- Steal from others: look around online for designs, colour schemes, font pairings etc that you like.
- Take what you like, but don't copy them wholesale. Smash together the ideas you like, see if they work.





And you will read this at the end

You will read this first

And then you will read this

Then this one

How eating out contributes to our diets

Findings from Nesta's analysis of individual purchase

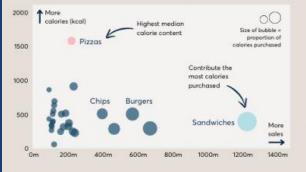
and market statistics for the out across Great Britain.

Approximately 60% of us use the out of home sector at least once a week

11% eat out at least once a day on average - around 7 million people.

Recommended colories per med 600 kcal

Pizzas have the most calories, but supermarket sandwiches are the item we buy the most



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O e in three fast food meals in Great Britain contain more than double the number of calories

On average, people living with excess weight purchase mo calories from fast for

ast food

7.7%



The out-of-home sector calories per person per day

nesta

Meal purchases from supermarkets including meal deals contain on average 730 calories

130 calories more than recommended calories per meal

Fast food

Over half of calories purchased are from fast food and food-to-go from supermarkets

Source: Nesta's analysis of Kantar's Out of Home

service data 1st April 2021 to 31st December 2021

730 kcal

Fast food supermarkets 17 7% 16 7% cafes

> Living with 339 overweight healthy weig 31% Supermarket

contributes, on average, 300

What is this about? We invite relatively well-off individuals

to participate in research on addressing sustainability and climate change in personal and professional life. Together, we will explore barriers, opportunities, and policy support in collaborative



What do I need to do?

You're invited to participate in our workshops at the University of Glasgow campus-feel free to choose and attend any or all of the 4 sessions:

- Addressing Climate Change in 19/06 Personal and Professional Life 10am-1pm Mapping the System 02/07 **2**pm-4pm Finding Leverage Points for Change **17/07** 10am-12pm
- Developing Strategies for Change 29/08 10am-12pm

You will receive a £ 30 thank-you voucher for your time invested in each workshop.

Lifestyle changes to address climate change

Workshop participants required

Who can participate?

- An individual income of £ 59,200 before tax, or a household income of £ 100.000 before tax
- Being at least 18 years of age
- Resident in Scotland
- Being proficient in English



Scan the QR code to sign up for the workshops! Please contact Dr Esther K. Papies (esther.papies@glasgow.ac.uk) for more information.

MRC/CSO Social and Public Health Sciences Unit

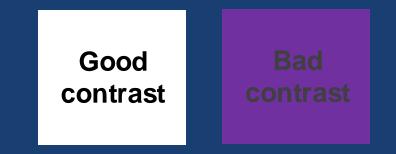


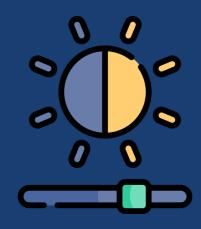


Contrast

"The difference in *visual properties* that makes an object (or its representation in an image) distinguishable from other objects and the background."

• Colour contrast





Contrast

But context (i.e. what's behind or next to) of the colours you use is also important and can change how they *look*.

Contrast can also be...



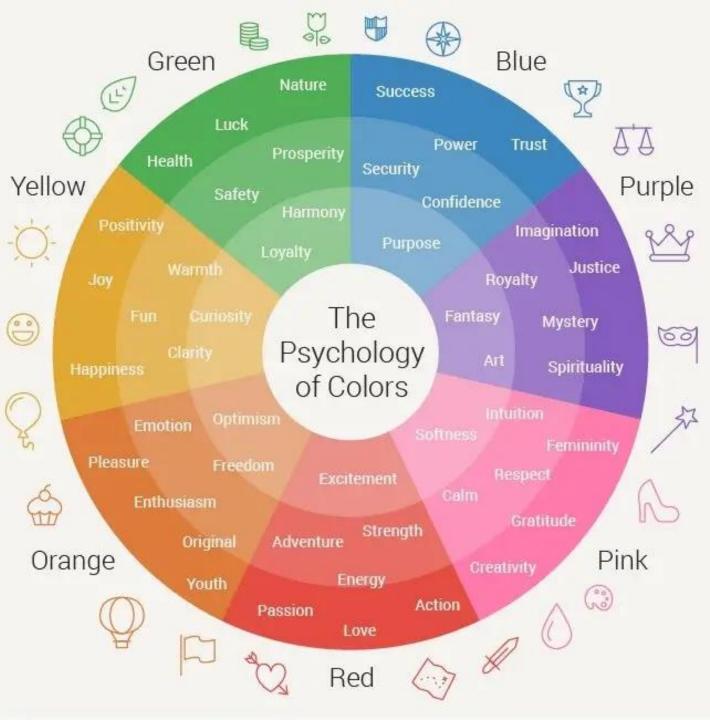
FIVE STEPS TO AN INFOGRAPHIC



Step Five:

Colours:

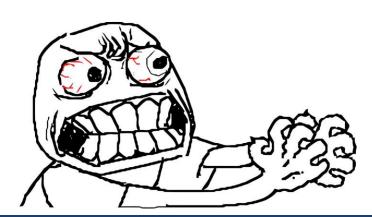
- Keep to 3-5 c
- Use colours of attention
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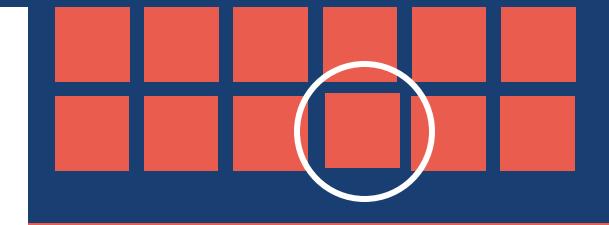


	PRIMARY SECONDARY COLOUR COLOUR PALETTE							
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	M 80	M 75	M 50	М 19	M 62	M 10	M 7	М 19
	Y 27	Y 66	Y 86	Y 60	Y 0	Y 33	Y 71	Y 20
	K 11	K 0	K 0	К 0	K 0	K 0	K 0	К 2
	Pantone	Pantone	Pantone	Рапtone	Pantone	Pantone	Pantone	Рапtone
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	R 25	R 234	R 242	R 254	R 102	R 46	R 70	R 172
	G 62	G 93	G 147	G 212	G 103	G 169	G 168	G 188
	B 114	B 78	B 48	B 122	B 173	B 176	B 108	B 195
	Hex	Hex	Hex	Hex	Hex	Hex	Hex	Hex
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	Hex	Hex	Hex	Hex	Hex	Hex	Hex	Hex
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	Hex	Hex	Hex	Hex	Hex	Hex	Hex	Hex
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y	NIHR Navy	NIHR Coral	NIHR Orange	NIHR Yellow	NIHR Purple	NIHR Aqua	NIHR Green	NIHR Grey

Alignment: line up visual elements

- Helps to create order
- Organises disparate elements into a whole
- Creates imaginary visual connections



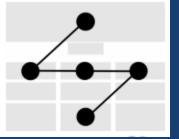


Step Five: The design (5)

Alignment and layout:

- Align the various elements of your infographic, i.e. on a grid, with similar spacing between them
- Helps to guide the reader through the infographic
- Colour breaks Good way of organising data and sectioning off information without relying entirely on headings. Also helps to break the monotony.







Source: www.drinkaware.co.uk

Visual hierarchy: 4

Alignment: line up visual elements



Navigation

Nulla neque habitant morbi

Nullam laoreet commodo

Sed vitile nisi lacus enim **Carabitur** cursus faucibus

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1234 Main 5t

123-455-7890

Springfield, IL 60528

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1234 Main St Springfield, IL 60528 123-456-7890

Navigation

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eget | turpis | metus| rutrum | commodo

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Curabitur cursus faucibus auctor mauris tincidunt quis

Cras aliquam. Aliquam ultrices

Fusce in libero id lacus auctor dig-

Visual hierarchy: 4

Layouts

Taken from: piktochart.com/blog/infographic-layout

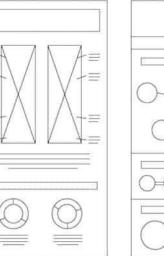
NIHR Applied Research Collaboration Oxford and Thames Valley

Infographic Layout Cheat Sheet by SeeMel Chow

Versus/ Comparison

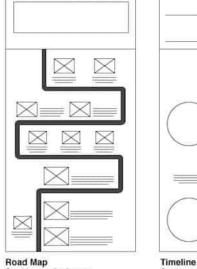
Works well with a lot of informations

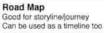


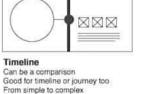


Useful Bait Works well with most of the data Easy to read and good usability

Heavy Data (numbers porn) Works well with marketing strategy Timeline for project Can extend to a flowchart

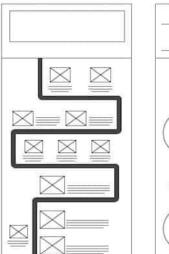


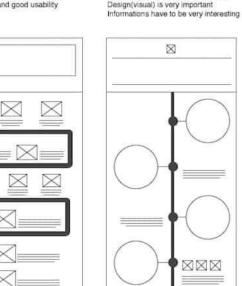




(depends on your data)

Visualized Article Needs strong title Works well with heavt content Easy to read and understand





Step Five: The design (6)

Fonts:

- Use at most 3, e.g. one for headers, body text and quotes or sub headings. Ideally 2.
- If you need more variation, use different weights (e.g. light, thin, bold, extra bold etc).
- Search for good font pairings online –inkbotdesign.com/fontcombinations/
- Download and use fonts for free from fonts.google.com.
- Generally, use sans-serif fonts, but use what works for your infographic.



Step Five: The design (7)

Add a focal point:

- a memorable image that reinforces the message
- a key statistic or information picked out in a larger font
- every good infographic has a hook or primary take-away

How much weight did they lose (after 3 months)?

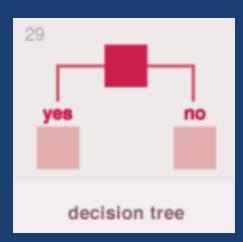


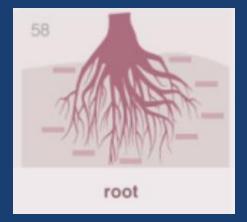
About the weight of a Yorkshire Terrier

Step Five: The design (8)

Fancy or plain?:

- If comprehension is most important (such as in a medical environment or when an immediate decision is needed to be made) then plainer infographics will be more effective.
- Fancy or embellished infographics will however have a wider appeal.





What kind of chart?

Show the individual parts that make up a whole:

- Pie chart
- Stacked bar
- Stacked column

Understand how the data is distributed:

- Scatter plot
- Line chart
- Bar chart

Analyse trends:

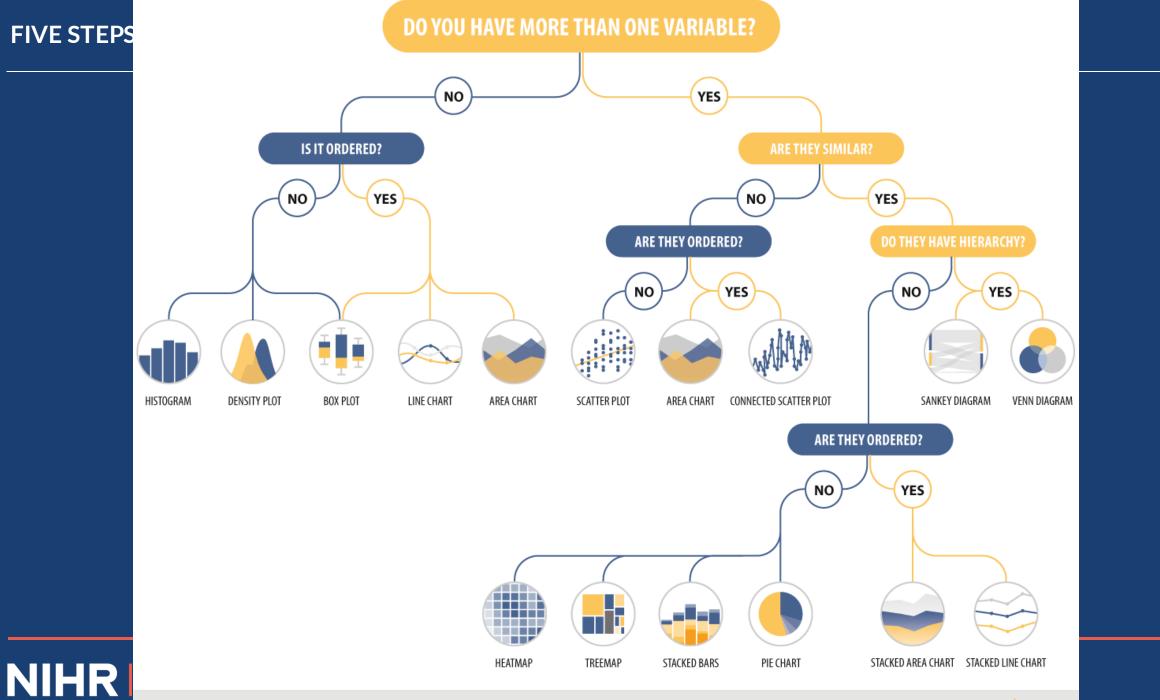
- Line chart
- Bar chart

Show/ the relationship between data sets:

- Line chart
- Scatter plot
- Bubble chart

Compare values:

- Bar chart
- Line chart



Created by ActiveWizards

Headings

- Like a headline, it needs to grab attention, be easily readable and relevant
- Generally, keep it high in contrast and large
- They play a role in how an infographic is viewed

Types of Headings

- **Subject:** "Obesity in the UK"
- Message: "1 in 10 British children are obese"
- Question: "What is the state of childhood obesity in the UK?"
- Fear: "The childhood obesity crisis"
- Hopeful: "Childhood Obesity: complex but conquerable"
- Call: "Help kids to be healthy, not heavy"

Software for making infographics

Installable Software

- Adobe Creative Cloud (£££ subscription)
- Affinity Designer

 (£ one time purchase, and actually really good...)
- PowerPoint/ Excel (Really, it can be fine! It's just more fiddley)
- inkscape.org Open source alternative to Adobe Illustrator (Free)

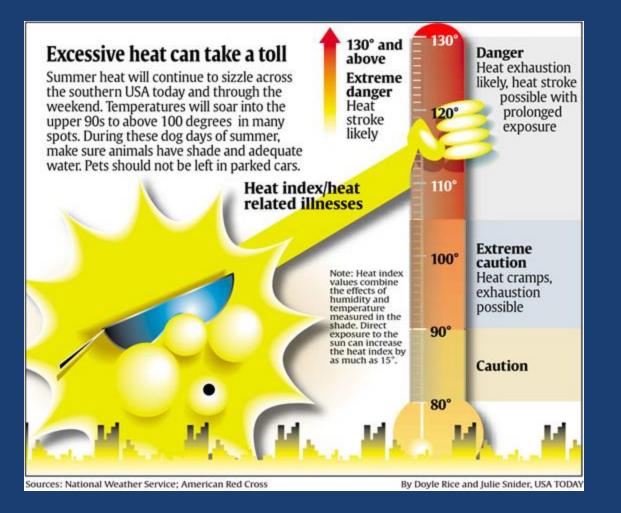
Online Options

- Adobe Spark
 (Free!)
- Piktochart.com (Free with limits, or £ subscription)
- biteable.com/infographic (Free trial and £ subscription)
- canva.com/create/infographics (Free trial and £ subscription)
- boxy-svg.com (Free, but basic)

Common errors...

Not running it past people before publishing it...

(Though I struggle to believe this wasn't deliberate...)



Common errors.

Not proof reading*:

* Hyphens are important...

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numbers, including some that featured a bucket and bells brigade or performers into buckets and trash cans with drums sticks and hammer mallets. PHOTO BY JENNIFER STULTZ

MENTORING DAY Students get first hand job experience

By Gale Rose grose@pratttribune.com

Eager students invaded onestions and got some businesses all over Pratt hands on experience with Tuesday, October 24 as they looked for fixure job opportunities on Disability Mentoring Day. The 97 students from 12 chools fanned out across Pratt and got first hand

ug Meyer

ty Commissioner

experience what it would be like to work at those 40 businesses. They asked various operations.

the Main Street Small An-

Paola Luna of Pratt High School, Gina Pat-Luna said she was inton of Kingman High terested in animal health School and America Fernandez of St. John chose and wanted to know more

for their business. Students got a tour of the facility, learned what happens in an examination, got to handle various animals and watched a snake eat a mouse.

imal Veterinarian Clinic imals. Patton likes all kinds of animals and said she learned a lot from the experience. Watching the snake eat the mouse impressed her the most.

Fernandez wants to become a veterinarian and enjoyed learning everything that veterinarians

SEE MENTORING, 6

· Hospital Pharmacist for 41 years

- + 4 years Commissioner for Pratt Planning and Zoning Board of Appeals
- 3 years Pratt City Commission
- · Graduate of Pratt High School and KU School of Pharmacy
- · Past Member and President of Civic Groups and Organizations

about caring for hurt an-

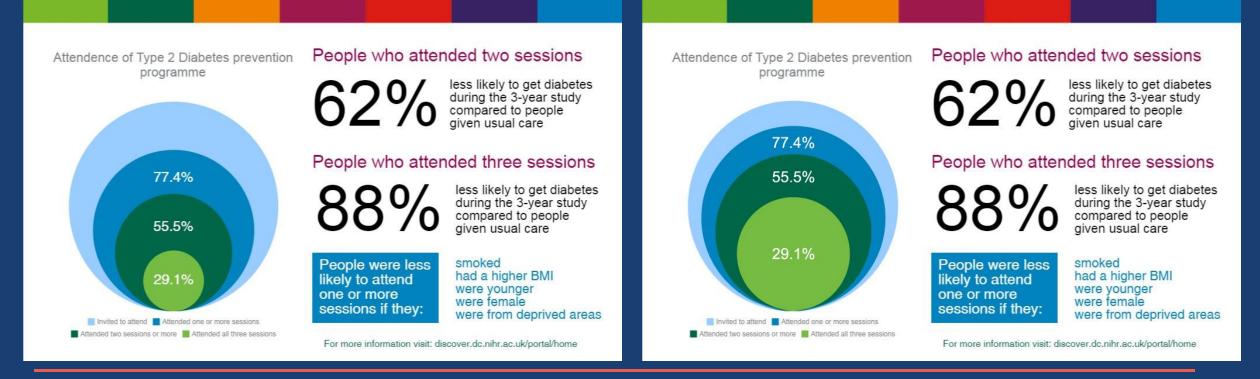
- · Experience and Knowledge of Financial Responsibility and Budgeting
- + Supports Family Values, Education, and Business Growth
- · Common Sense Approach for the Sustained Progress of Pratt

mop-enutititation www menuini the Pratt Tripuna www.prattitibunac

FIVE STEPS TO AN INFOGRAPHIC In *faux* graphics

Original

Corrected



In *faux*graphics

Something doesn't add up...

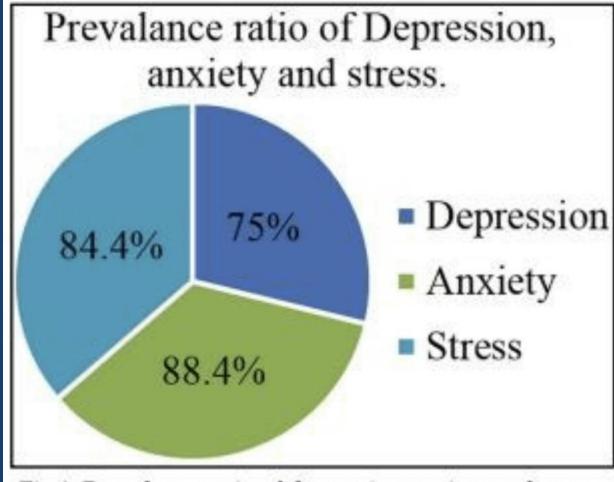


Fig.1: Prevalence ratio of depression anxiety and stress.

Just being wrong...

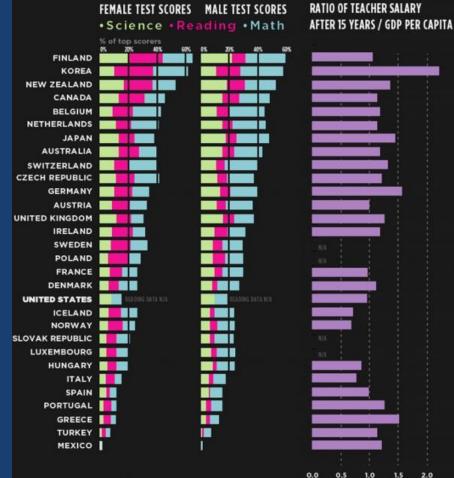
London?_





FIVE STEPS TO AN INFOGRAPHIC In *faux* graphics

DO BETTER PAID TEACHERS MAKE SMARTER STUDENTS?



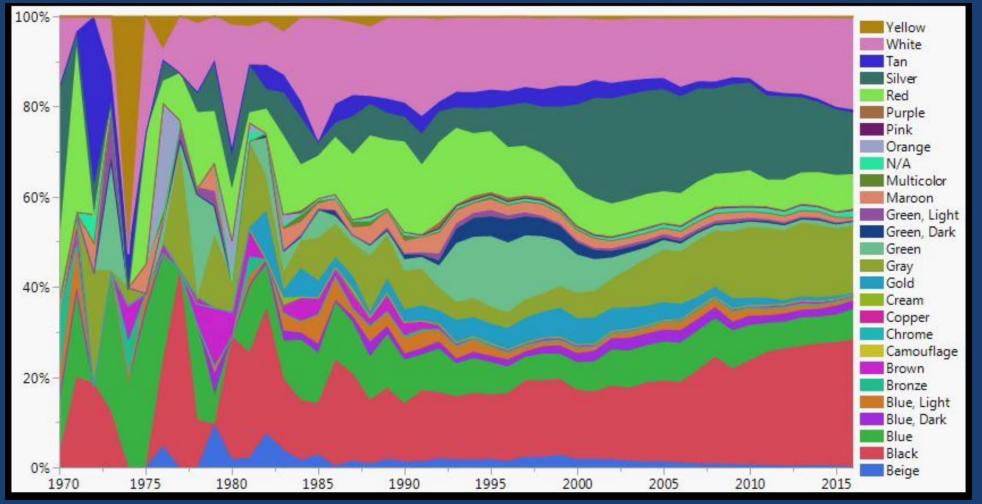
I don't...I don't know...?



Source: Education at a Glance 2009: OECD Indicators



Car Sales, by colour, each year



NIHR Applied Research Collaboration Oxford and Thames Valley

https://community.jmp.com/t5/JMP-Blog/Exploring-30-years-of-car-colors/ba-p/30746

In *faux*graphics STATE OF THE ECONOMY Just plain not caring about you AVG. HOURLY WAGES 51 NE GROCERY PRICES job anymore.. Ho a b Or being 3.8% 21% Fox News, who VICE PRESIDENTIAL DEBATE BEGINS SINCE LAST SEPT. SINCE JAN. '21 apparently 00:13:17 SOURCE BUREAU OF LABOR STATISTICS ECONOMY AMONG TOP CONCERNS FOR VOTERS hate y-axis DE * * * @CBS NEWS AMERICA DECIDES * VICE PRESIDENTIAL DEBATE * * * * NEWS LIVE labels IN SECO **Applied Researc Oxford and Thar** The pr .COM

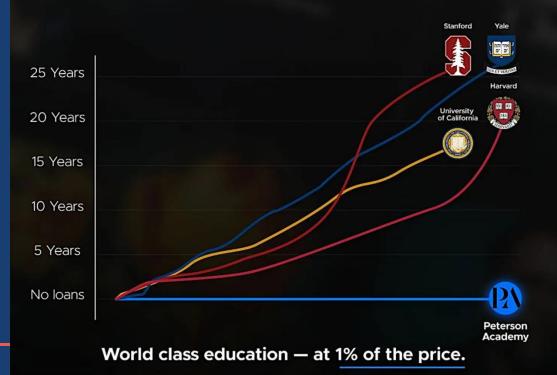
For the love of all you may hold holy, *please* label your axis!



Dr Jordan B Peterson 🤡 Sponsored · 🎯

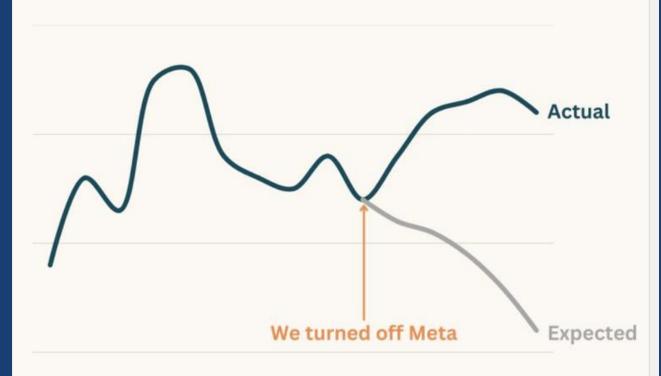
Enroll now for access on September 9th for the public launch at **petersonacademy.com.** 18 beautiful courses, 3 new courses monthly, optional AI... See more

The average time to pay-back student loans



Hell, why even bother with axis?

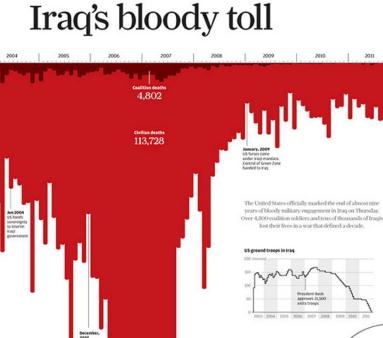
How Uber saved \$35M in ads



NIHR Applied Research Collaboration Oxford and Thames Valley experimental.beehiiv.com

FIVE STEPS TO AN INFOGRAPHIC In *faux* graphics

Or just put the graph upside down...



IS President leorge W. Bu leclares an e

August, 2005 — 950 killed in a single incident when fears of an insurgent attack caused a hugo crowd of Shite piggins to stampede on a bridae

1.000

1.500

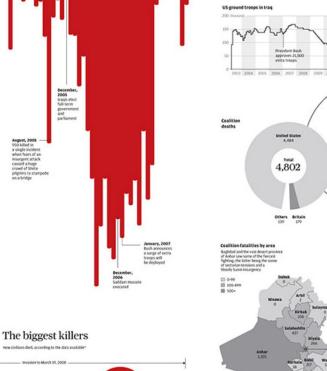
2.000

2,500

3.000

3.500 -

March, 2003 US-led forces



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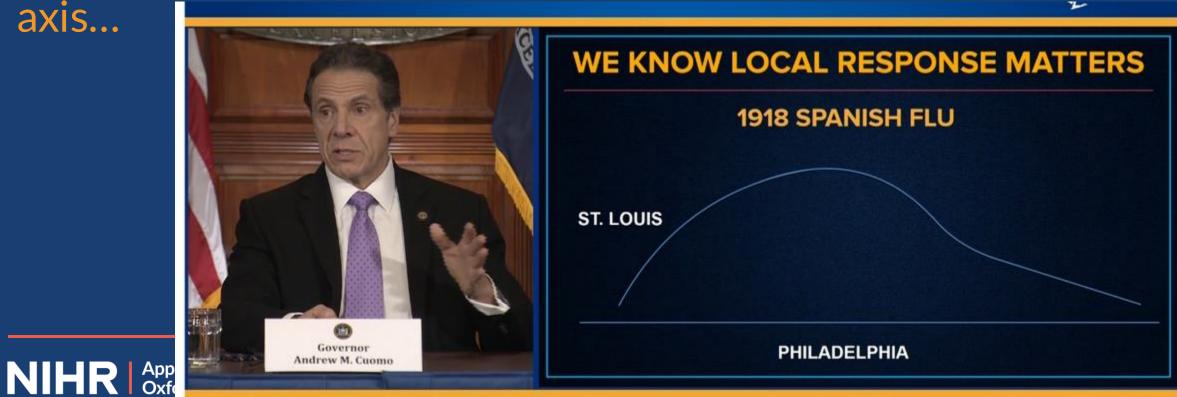
https://comm

security forces 10,125



And while we're on the subject of

axis...



FIVE STEPS TO AN INFOGRAPHIC In faux graphic

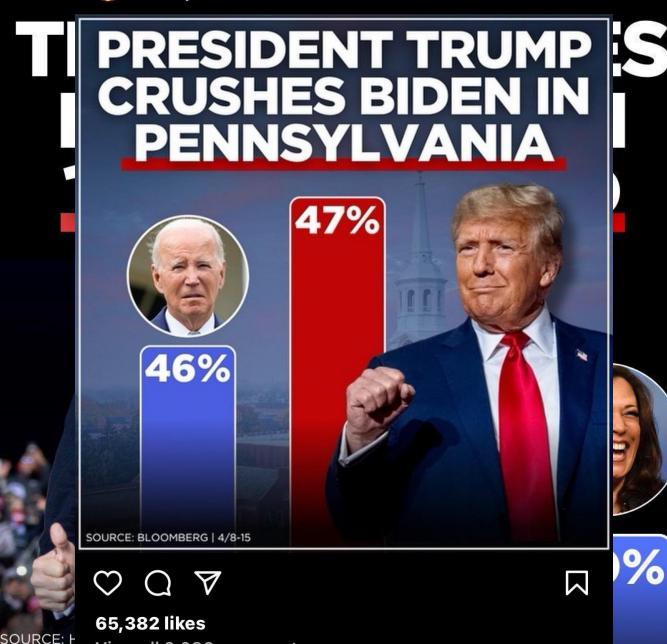


realdonaldtrump 🤗 Pennsylvania

View all 2,086 comments

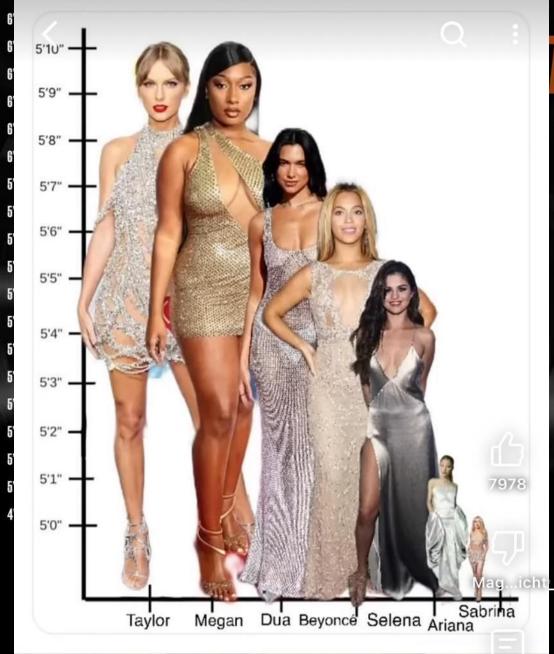
So...

- four stick people stand in feature about 43,000 nurses?
- But then 28 stick people stand in for an additional 3,000 nurses.
- This makes a 7% increase look like a 7000 % increase



Here's some more playing with non-zero axis nonsense.

Height of female popstars:



Want another example of a government infographic, perhaps... exaggerating things?

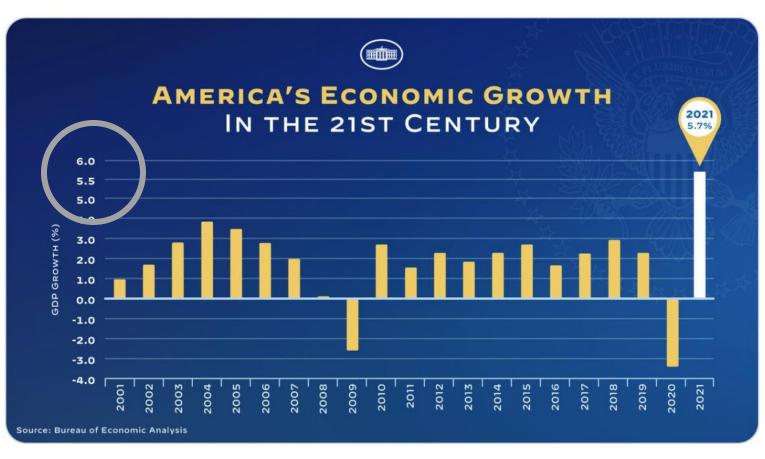
Anyone see what the problem is?





The White House @WhiteHouse

We just learned that President Biden's first year in office was the strongest year for economic growth since 1984.



9:35 AM · Jan 27, 2022 · The White House

Thanks!

Contact:

gavin.hubbard@phc.ox.ac.uk

www.arc-oxtv.nihr.ac.uk

www.phc.ox.ac.uk

Gimme Feedback!

(We'll email you a form, and it would be super helpful for me!)

https://forms.gle/Ki3jRaj3YVjnwxc9A