

Designing effective infographics, data visualisation, and visual abstracts



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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...

A

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

- 1 Viewed through the lens of a **strict weight loss approach to health**, a **dietary approach** to reduce energy intake is **more effective for weight loss** (in the short term) and is more likely to promote weight loss maintenance than an exercise alone approach. However, a **combination of diet and physical activity improves either practice in isolation**.
- 2 Evidence shows that **you can out-exercise/out-work poor nutritional choices...**
BUT most people do not since they are either unmotivated, unwilling, or cannot practically perform enough physical activity to do so.
- 3 Being **physically active and, in particular, attaining an adequate level of fitness**, is associated with many **health benefits** (including reduced risk for all-cause mortality) **that are unlikely to be achieved through diet, alone**.
- 4 **Physical Exercise & Higher Levels Of Cardiovascular Fitness Can Help...**
 - ✗ Hypertension
 - ✗ Cardiovascular Disease
 - ✗ Type 2 Diabetes
 - ✗ Common Cancers
 - ✗ All-cause Mortality

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

B



Sources: Pickering, et al. *Circulation*, 2005 and O'Brien, et al. *J Hypertens*. 2003

- 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

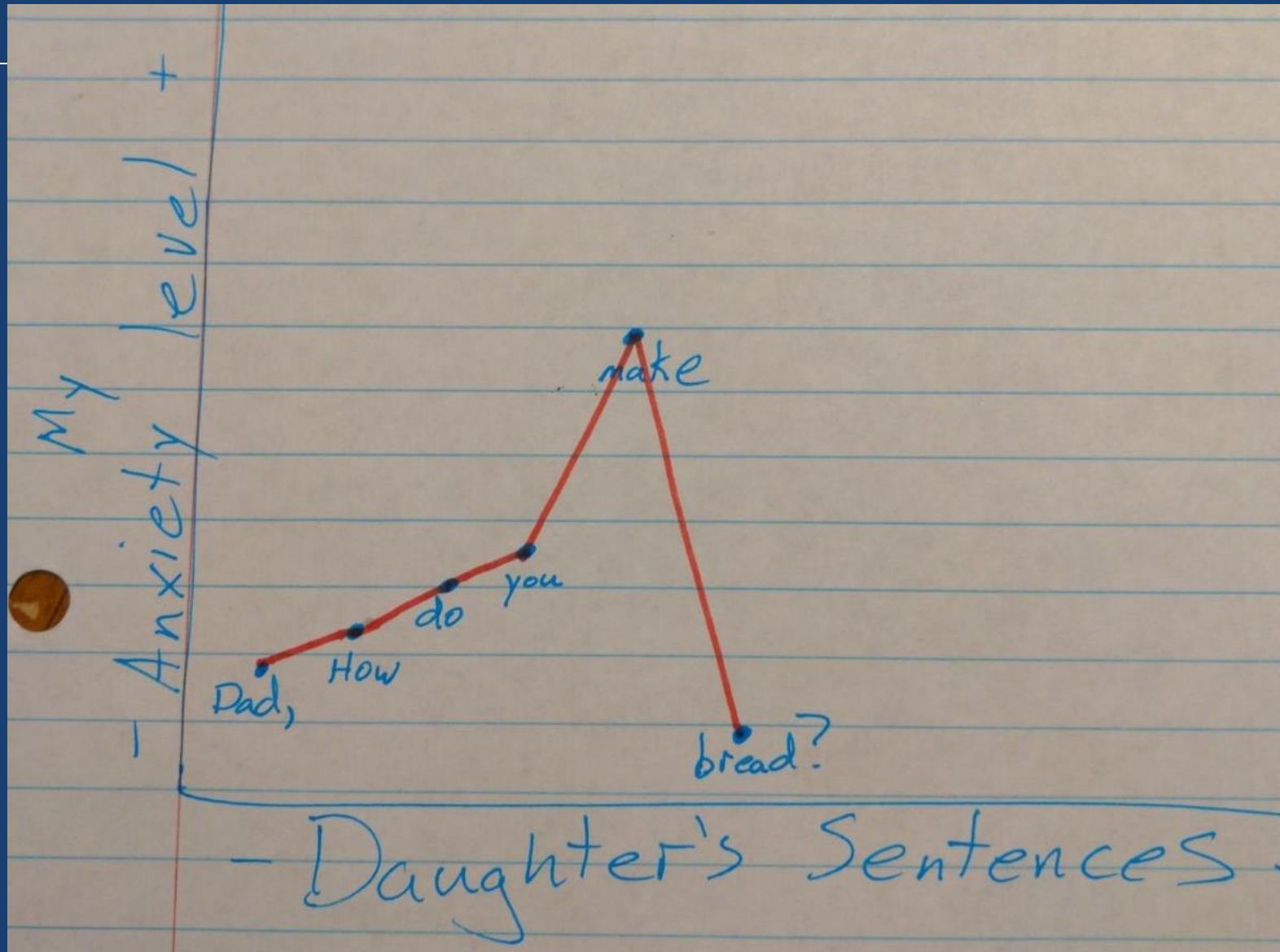


- Simplifies how information is presented



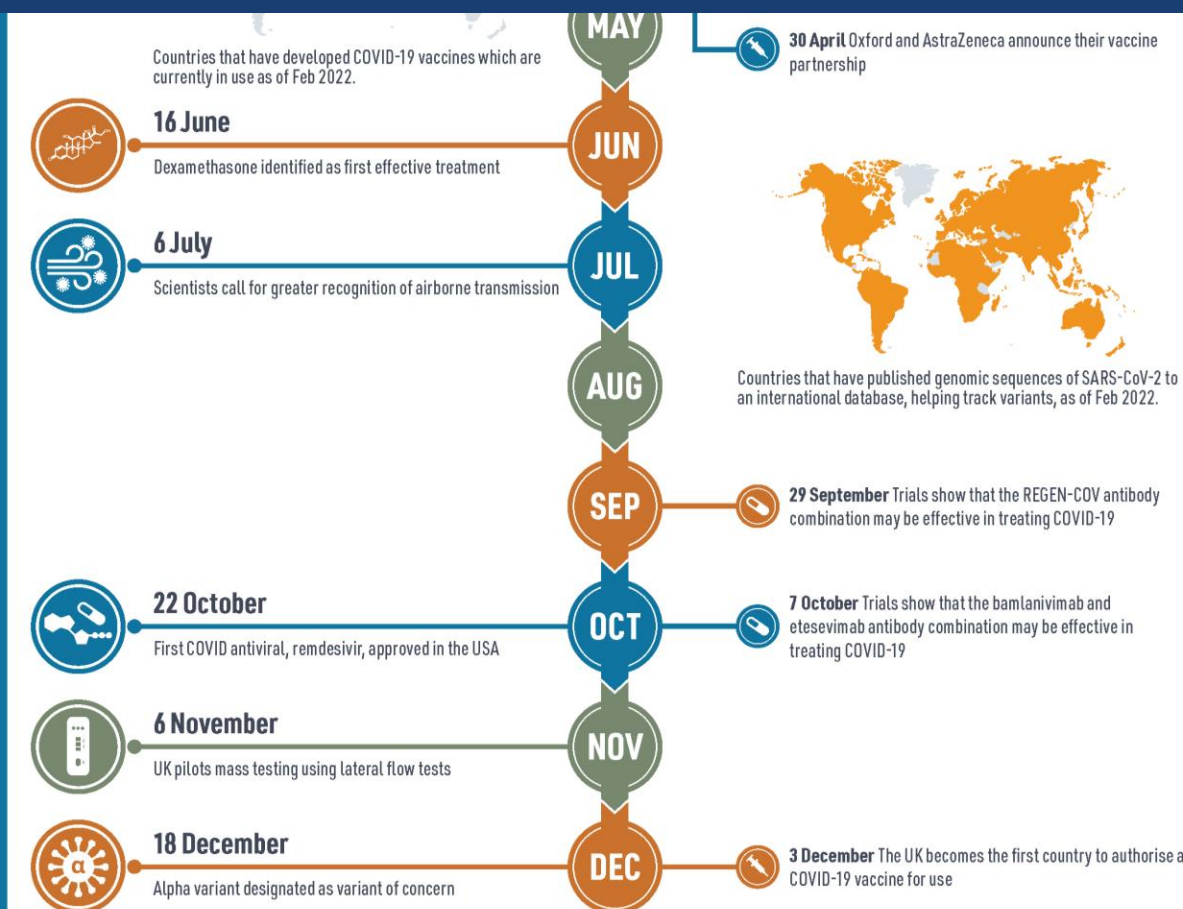
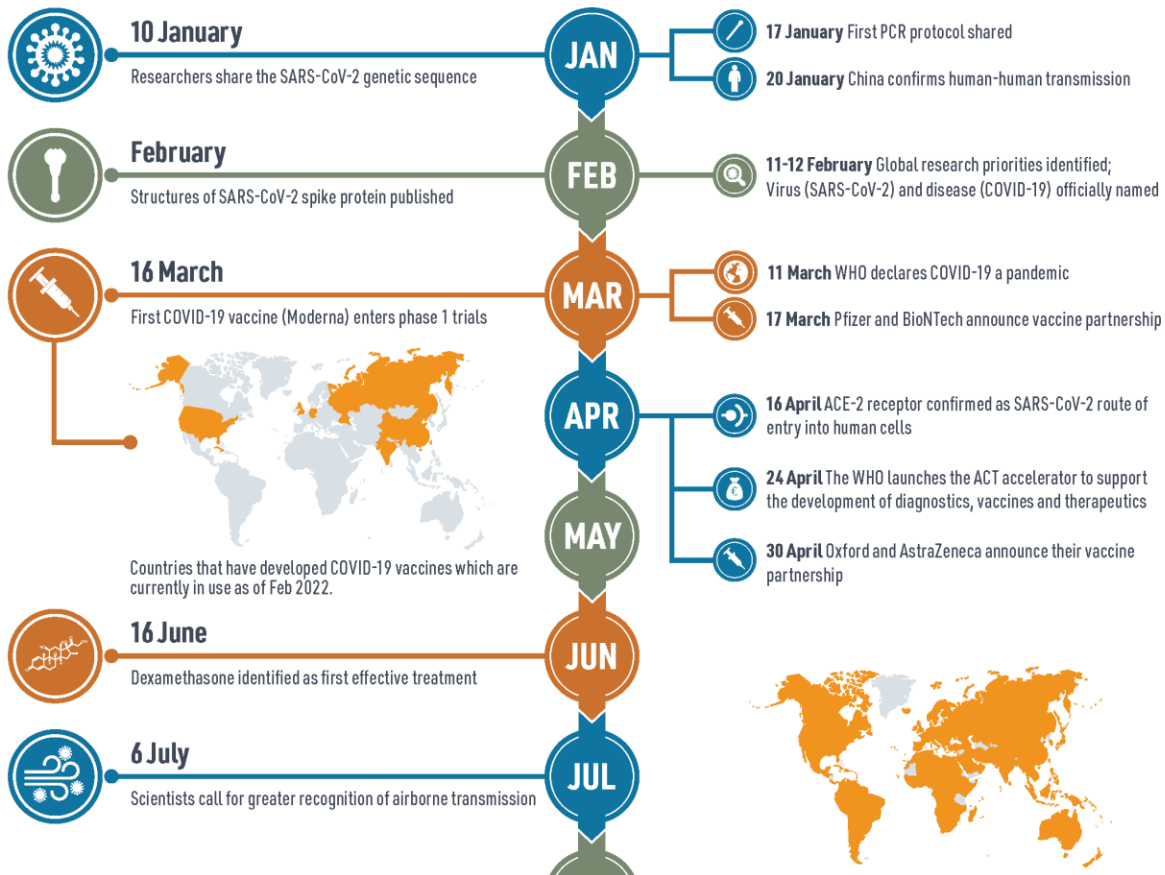
The data in an *infographic* brings insights and connections between things, sometimes surprisingly, and **THAT** is the story you're telling.

EXAMPLES



CHEM VS COVID TIMELINE

KEY MILESTONES IN THE FIGHT AGAINST THE PANDEMIC IN 2020



View the full interactive Chem vs. COVID timeline at: www.rsc.li/chemvscovid

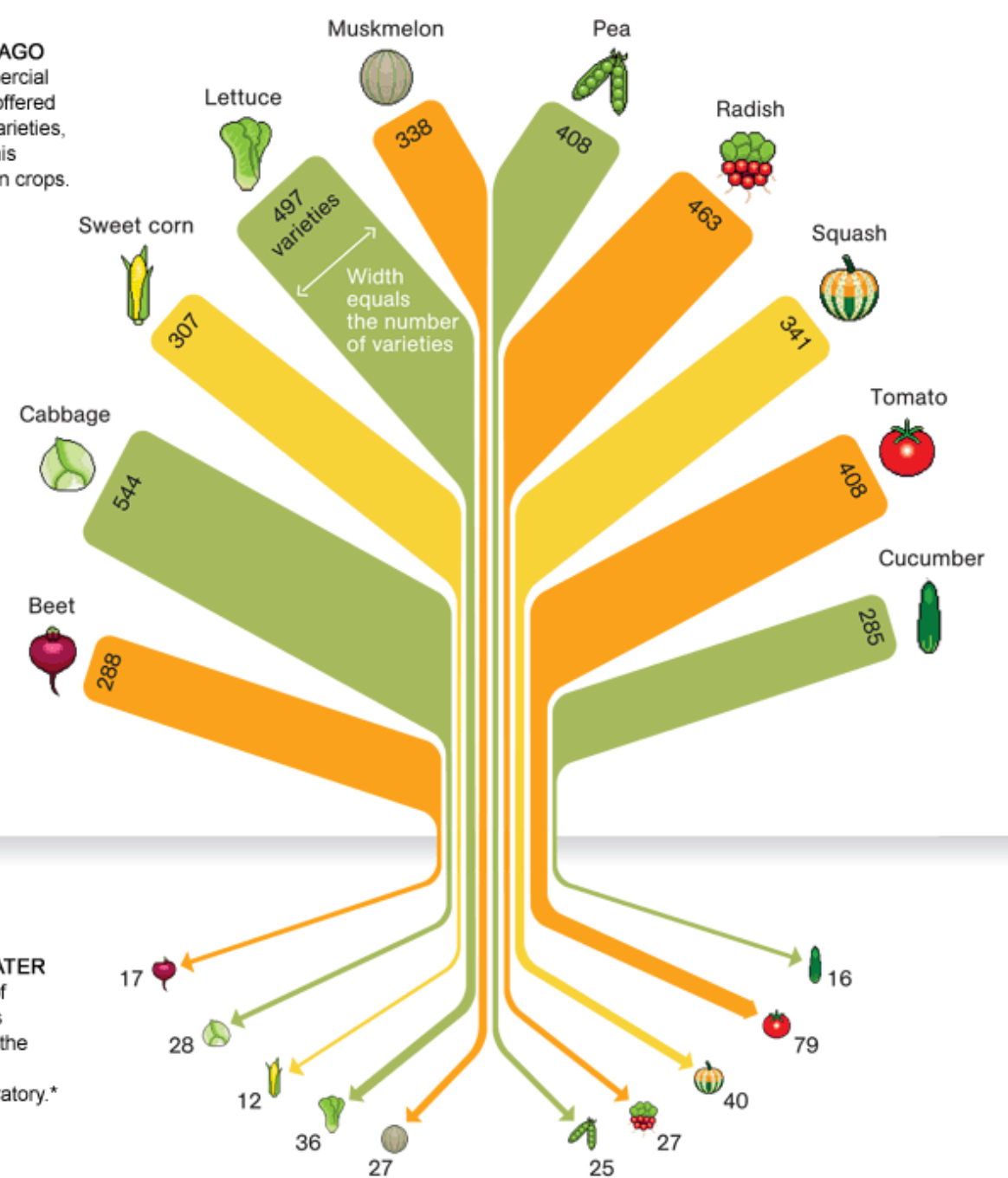


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EXAMPLES

A CENTURY AGO
In 1903 commercial seed houses offered hundreds of varieties, as shown in this sampling of ten crops.

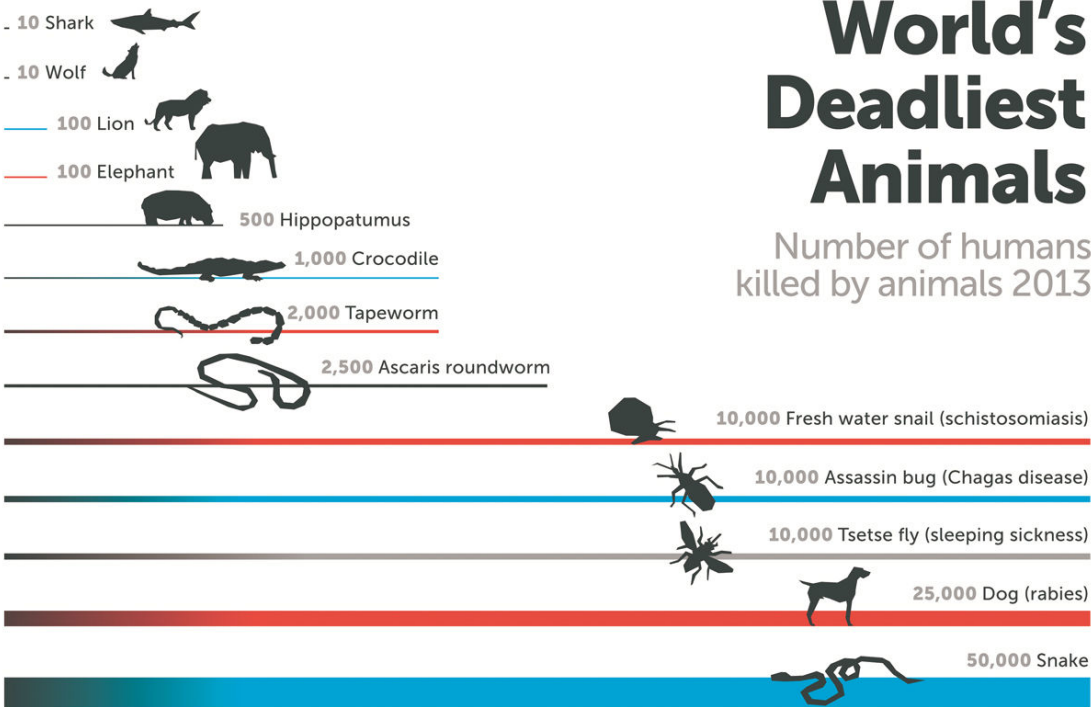


80 YEARS LATER
By 1983 few of those varieties were found in the National Seed Storage Laboratory.*

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



Number of deaths | Killer



World's Deadliest Animals

Number of humans killed by animals 2013

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



SOURCES: IHME; crocodile-attack.info; Kasturiratne et al. (doi.org/10.1371/journal.pmed.0050218); FAO (webcitation.org/6OgpS8SVO); Linnell et al. (webcitation.org/6ORL7DBUO); 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	<i>Usually</i> 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

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.

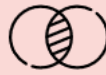


- 75% of people decline current weight loss programmes in the UK.



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

What?



- Similar preferences regardless of diabetes status.



- Preference for healthy eating over meal replacement diets.



- Favouring individual over group activities.



- Choosing programs with higher 10-15 kg weight loss goals.

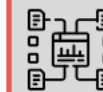


- Online content preferred to in-person interactions.



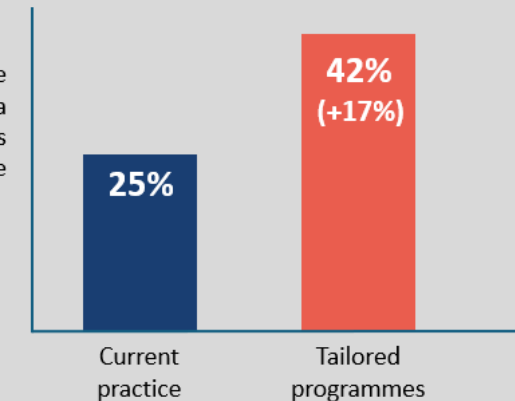
- Specific preferences noted in women and ethnic minorities.

So?



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

% of people accepting a weight loss programme



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*

For more information on [NewDawn](#) visit www.phc.ox.ac.uk/NewDawn



SUPPORTED BY

NIHR

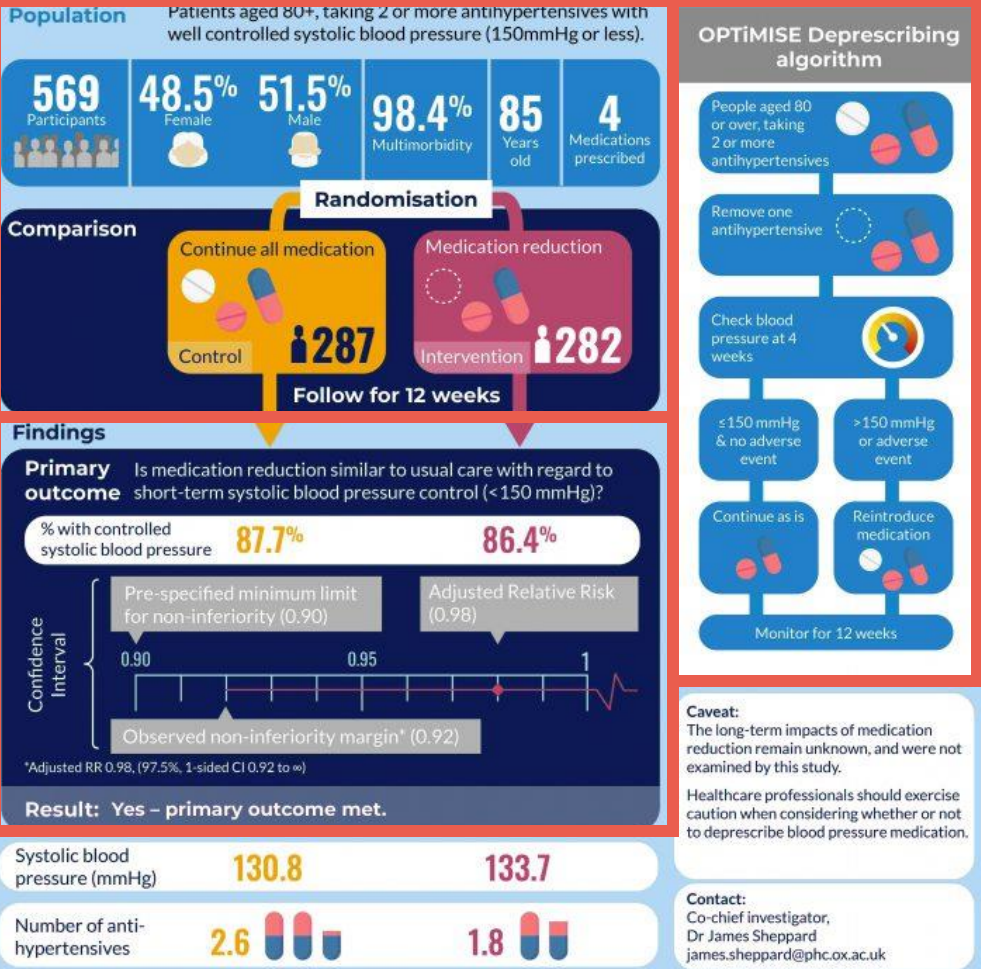
National Institute for Health and Care Research



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.



- **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 viz 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

- **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.

- **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.



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')

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.

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.*

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

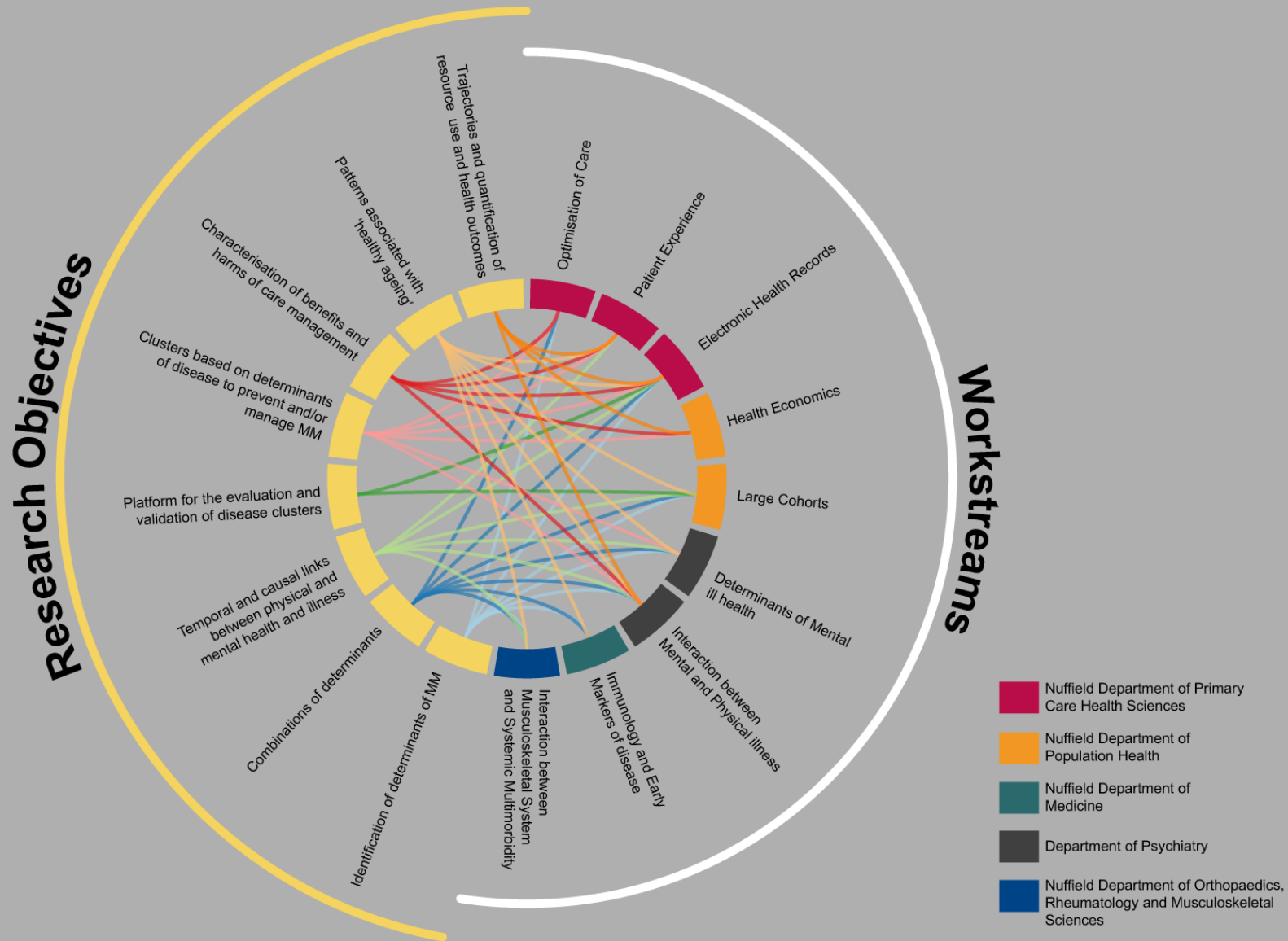
Key Factors to Consider:

- **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.

Research Objective and workstream linkages



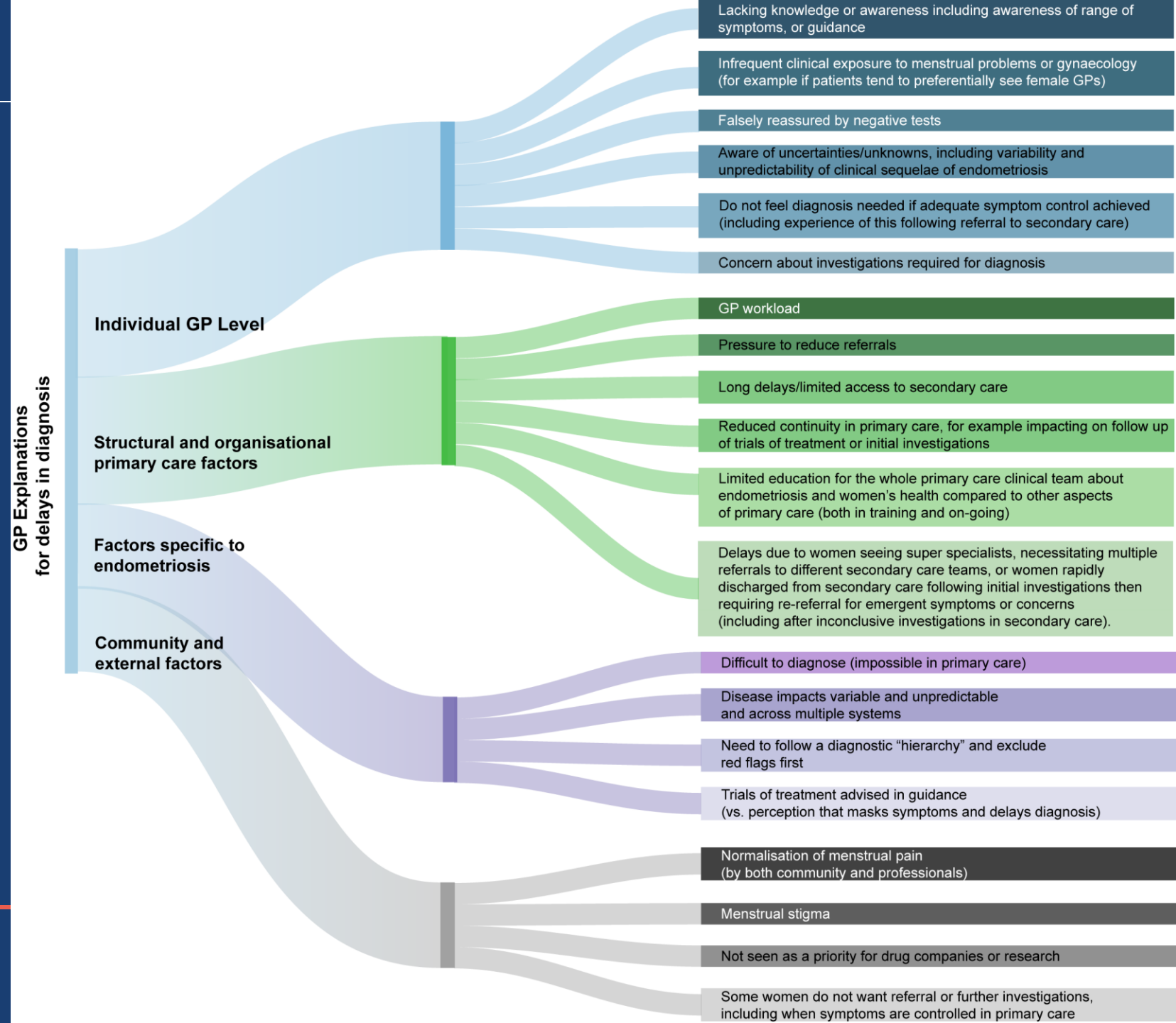
Remember:
Infographics
don't have to be
numerical data!

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

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

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

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>



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**

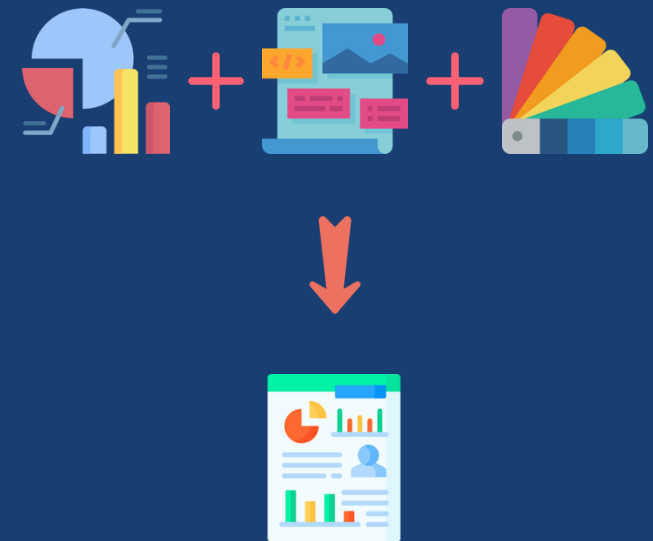
Keep it simple and make sure there's a clear path for people to navigate through it (start to finish of the story).

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.*



Visual hierarchy

And you will read this at the end

**You will read
this first**

And then you will read this

Then this one

Visual hierarchy

How eating out contributes to our diets

Findings from Nesta's analysis of individual purchase and market statistics for the out of home sector across Great Britain.

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

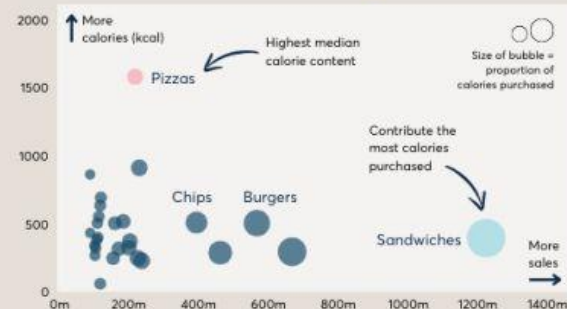
11% eat out at least once a day on average – around 7 million people.

Recommended calories per meal
600 kcal

≥ 1,300 calories

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

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



Source: Nesta's analysis of Kantar's Out of Home service data 1st April 2021 to 31st December 2021

nesta

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

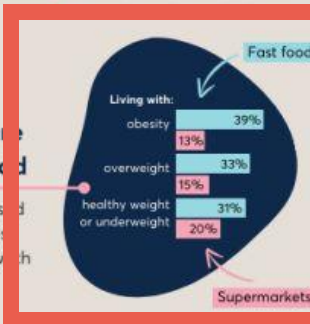
130 calories more than recommended calories per meal

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



On average, people living with excess weight purchase more calories from fast food

The share of calories purchased from major supermarkets was higher amongst those living with a healthy weight.



The out-of-home sector contributes, on average, 300 calories per person per day



Lifestyle changes to address climate change

Workshop participants required

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 group workshops.



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

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:

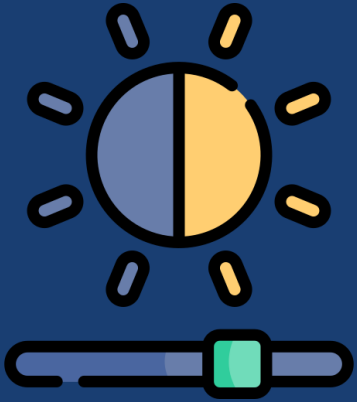
19/06 10am-1pm	Addressing Climate Change in Personal and Professional Life
02/07 2pm-4pm	Mapping the System
17/07 10am-12pm	Finding Leverage Points for Change
29/08 10am-12pm	Developing Strategies for Change

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



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

Visual hierarchy: 2



Contrast

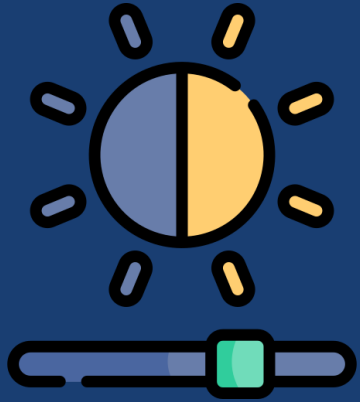
“The difference in *visual properties* that makes an object (or its representation in an image) distinguishable from other objects and the background.”

- Colour contrast

**Good
contrast**

**Bad
contrast**

Visual hierarchy: 2



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*.



Visual hierarchy: 2

Contrast can also be...

Shape



Texture



Position



Size



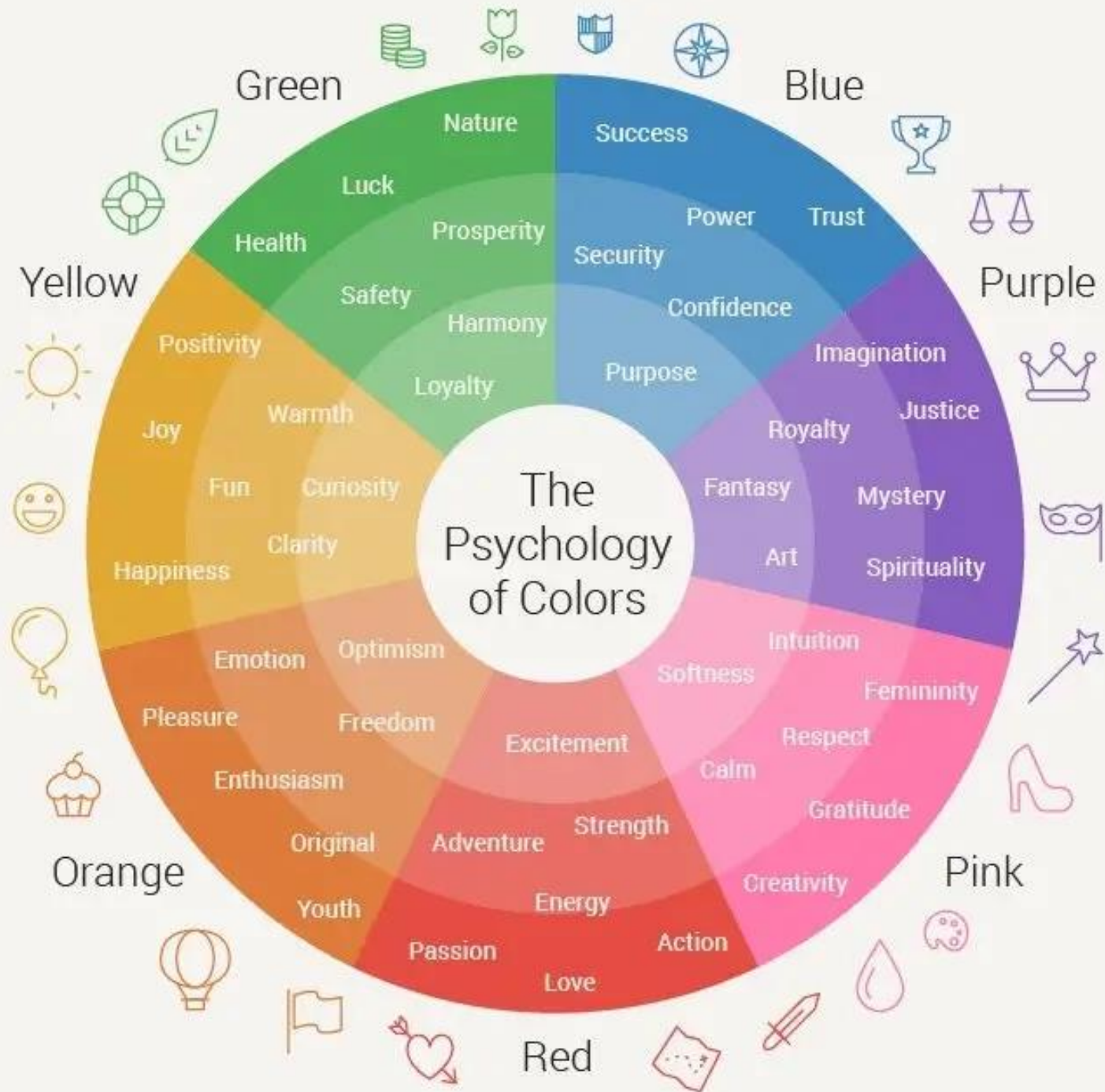
Orientation



Step Five:

Colours:

- *Keep to 3-5 colours*
- *Use colours of contrast to draw attention*
- *Colours can affect mood*
- *If colours are used to represent data, be careful with the scale*

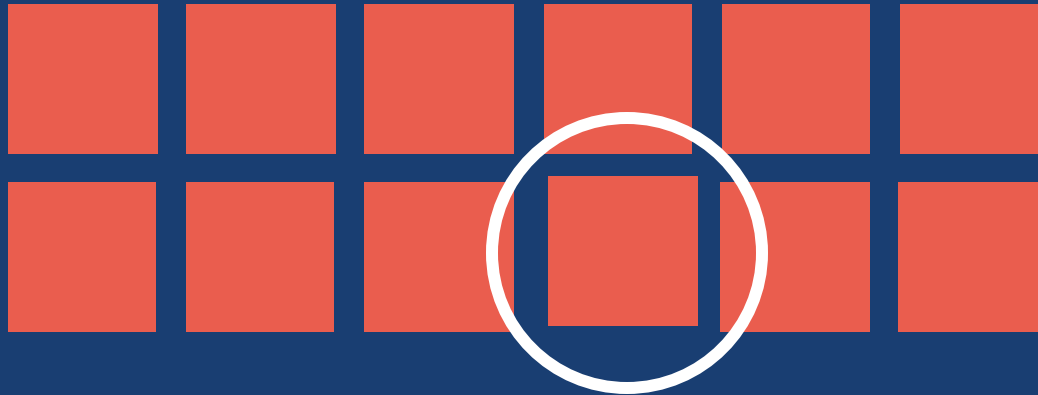
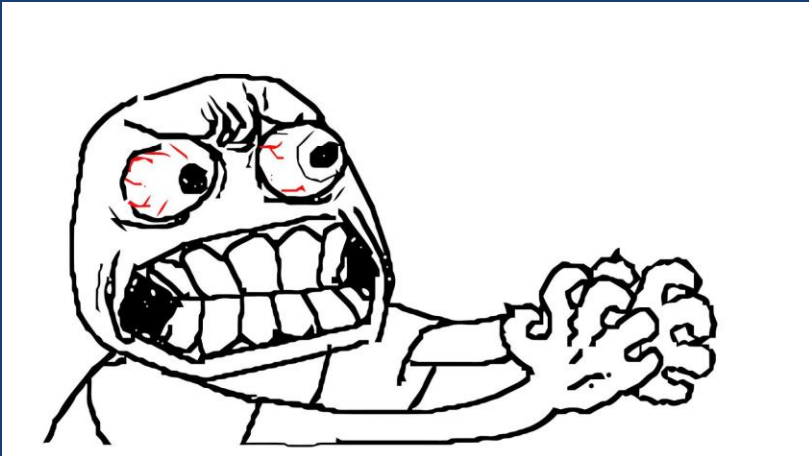
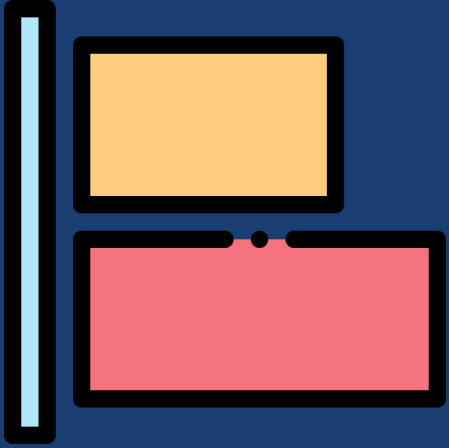


PRIMARY COLOUR	SECONDARY COLOUR PALETTE						
<div>C100 M80 Y27 K11</div> <div>Pantone 7687 C</div> <div>R25 G62 B114</div> <div>Hex #193E72</div>	<div>C1 M75 Y66 K0</div> <div>Pantone 7416 C</div> <div>R234 G93 B78</div> <div>Hex #EA5D4E</div>	<div>C1 M50 Y86 K0</div> <div>Pantone 715 C</div> <div>R242 G147 B48</div> <div>Hex #F29330</div>	<div>C0 M19 Y60 K0</div> <div>Pantone 1345 C</div> <div>R254 G212 B122</div> <div>Hex #FED47A</div>	<div>C69 M62 Y0 K0</div> <div>Pantone 7456 C</div> <div>R102 G103 B173</div> <div>Hex #6667AD</div>	<div>C73 M10 Y33 K0</div> <div>Pantone 631 C</div> <div>R46 G169 B176</div> <div>Hex #2EA9B0</div>	<div>C72 M7 Y71 K0</div> <div>Pantone 7723 C</div> <div>R70 G168 B108</div> <div>Hex #46A86C</div>	<div>C37 M19 Y20 K2</div> <div>Pantone 5517 C</div> <div>R172 G188 B195</div> <div>Hex #ACBCC3</div>
80%	80%	80%	80%	80%	80%	80%	80%
R:71 G:89 B:137	R:236 G:124 B:114	R:246 G:171 B:93	R:255 G:220 B:151	R:132 G:130 B:190	R:111 G:186 B:192	R:121 G:185 B:137	R:190 G:202 B:208
Hex #475989	Hex #EC7C72	Hex #F6AB5D	Hex #FFDC97	Hex #8482BE	Hex #6FBAC0	Hex #79B989	Hex #BECAD0
60%	60%	60%	60%	60%	60%	60%	60%
R:116 G:124 B:163	R:242 G:188 B:149	R:249 G:193 B:135	R:255 G:229 B:178	R:162 G:160 B:208	R:155 G:203 B:208	R:161 G:202 B:166	R:206 G:214 B:219
Hex #747CA3	Hex #F29E95	Hex #F9C187	Hex #FFE5B2	Hex #A2A0D0	Hex #9BCBD0	Hex #A1CAA6	Hex #CED6DB
40%	40%	40%	40%	40%	40%	40%	40%
R:162 G:164 B:193	R:244 G:189 B:184	R:252 G:214 B:176	R:255 G:238 B:205	R:193 G:191 B:225	R:193 G:221 B:224	R:196 G:221 B:197	R:223 G:227 B:231
Hex #A2A4C1	Hex #F48DB8	Hex #FCD6B0	Hex #FFEECD	Hex #C1BFE1	Hex #C1DDE0	Hex #C4DDC5	Hex #DFE3E7
20%	20%	20%	20%	20%	20%	20%	20%
R:208 G:208 B:224	R:248 G:221 B:219	R:253 G:235 B:216	R:255 G:246 B:230	R:224 G:223 B:241	R:225 G:238 B:240	R:226 G:238 B:227	R:239 G:241 B:243
Hex #D0D0E0	Hex #F8DDDB	Hex #FDEBD8	Hex #FFF6E6	Hex #E0DFF1	Hex #E1EEF0	Hex #E2EEE3	Hex #EFF1F3
NIHR Navy	NIHR Coral	NIHR Orange	NIHR Yellow	NIHR Purple	NIHR Aqua	NIHR Green	NIHR Grey

Visual hierarchy: 4

Alignment: line up visual elements

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

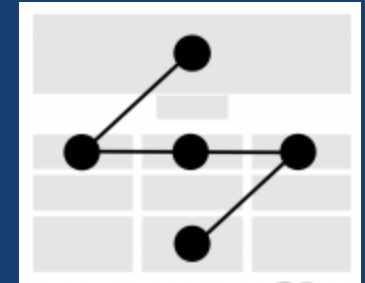


Step Five: The design (5)



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.*



Visual hierarchy: 4

Alignment: line up visual elements



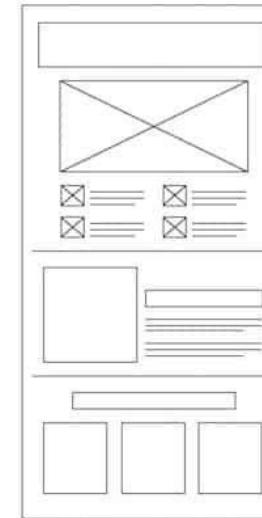
Visual hierarchy: 4

Layouts

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

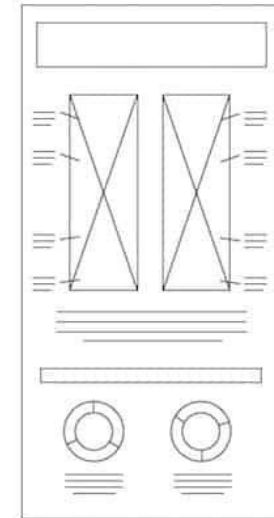
Infographic Layout Cheat Sheet

by SeeMei Chow



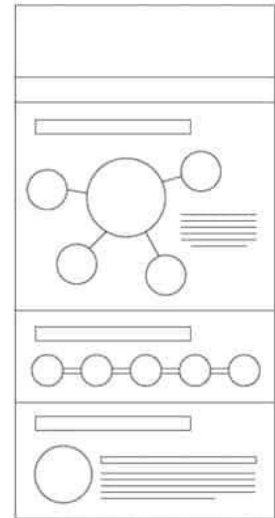
Useful Bait

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



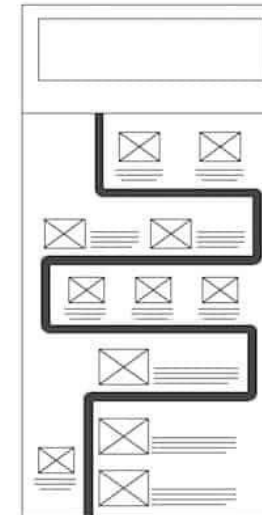
Versus/ Comparison

Works well with a lot of informations
Design(visual) is very important
Informations have to be very interesting



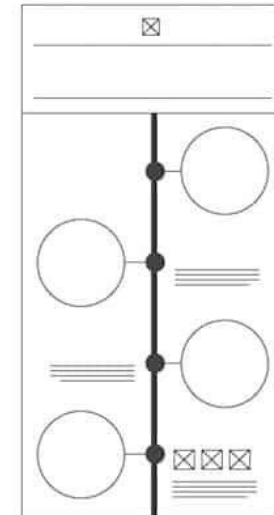
Heavy Data (numbers porn)

Works well with marketing strategy
Timeline for project
Can extend to a flowchart



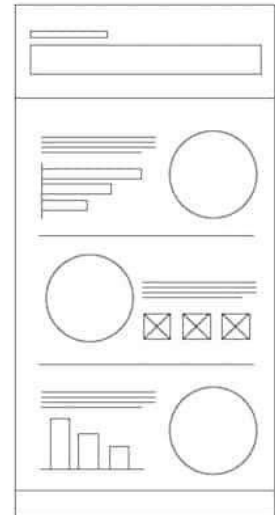
Road Map

Good for storyline/journey
Can be used as a timeline too



Timeline

Can be a comparison
Good for timeline or journey too
From simple to complex
(depends on your data)



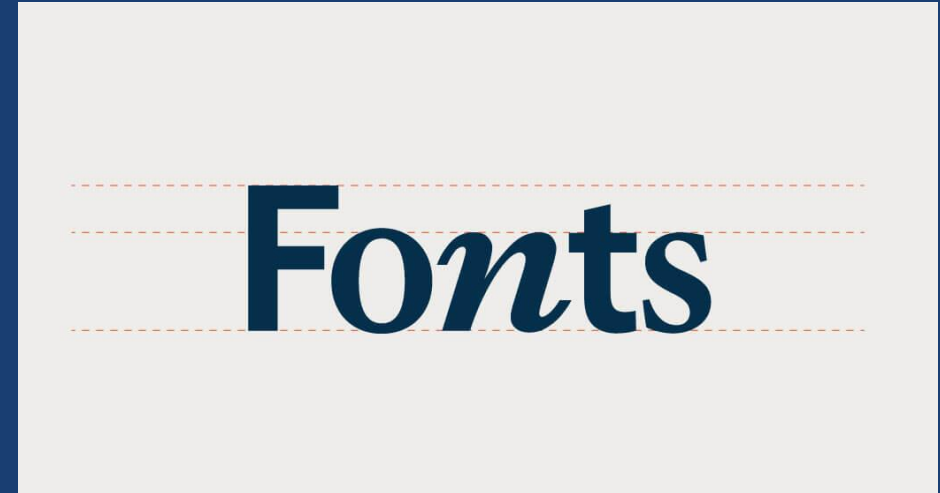
Visualized Article

Needs strong title
Works well with heavy 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/font-combinations/*
- *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:

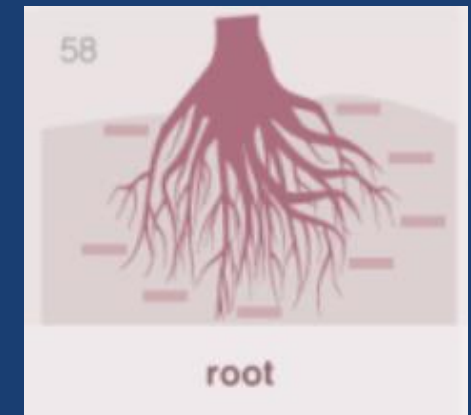
- *a memorable image that reinforces the message*
- *a key statistic or information picked out in a larger font*
- *every good infographic has a hook or primary take-away*



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:

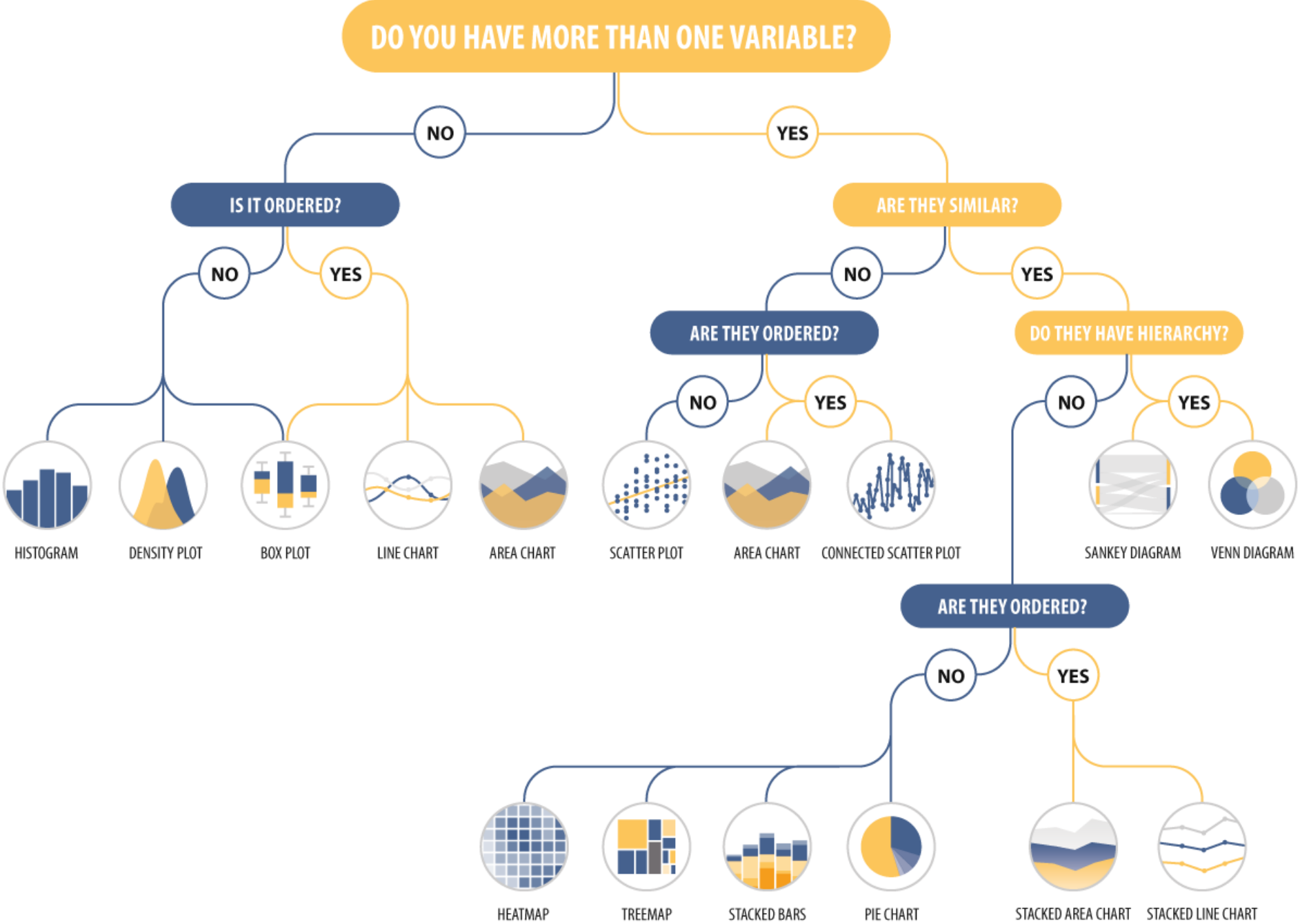
- Line chart
- Bar chart

Show/ the relationship between data sets:

- Line chart
- Scatter plot
- Bubble chart

Compare values:

- Bar chart
- Line chart



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)

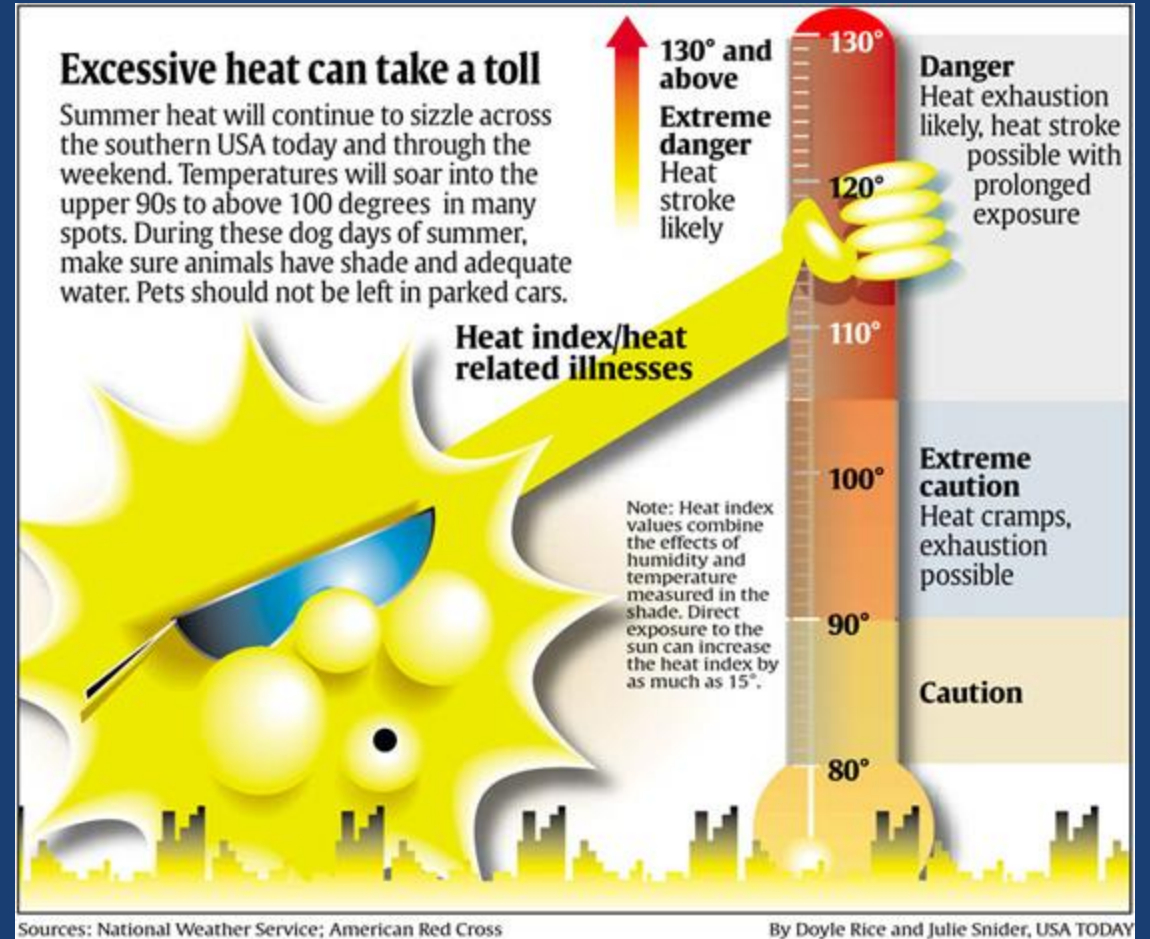
Online Options

- **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...)



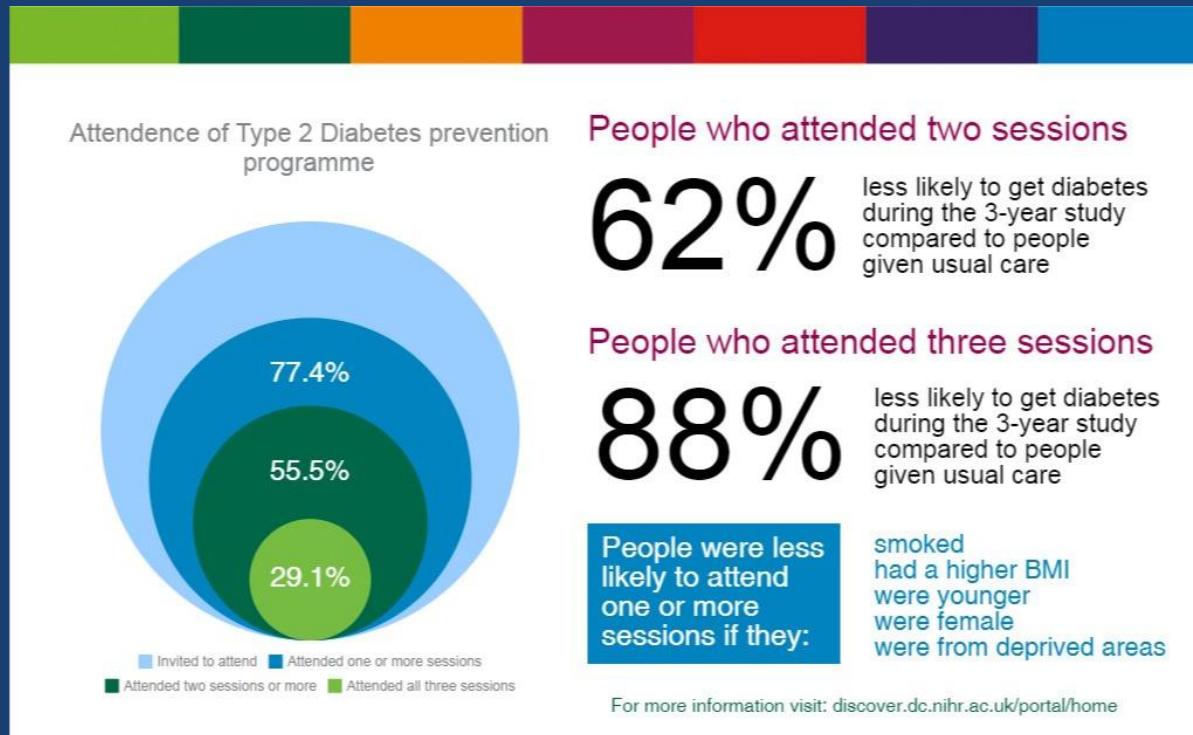
Common errors...

Not proof reading*:

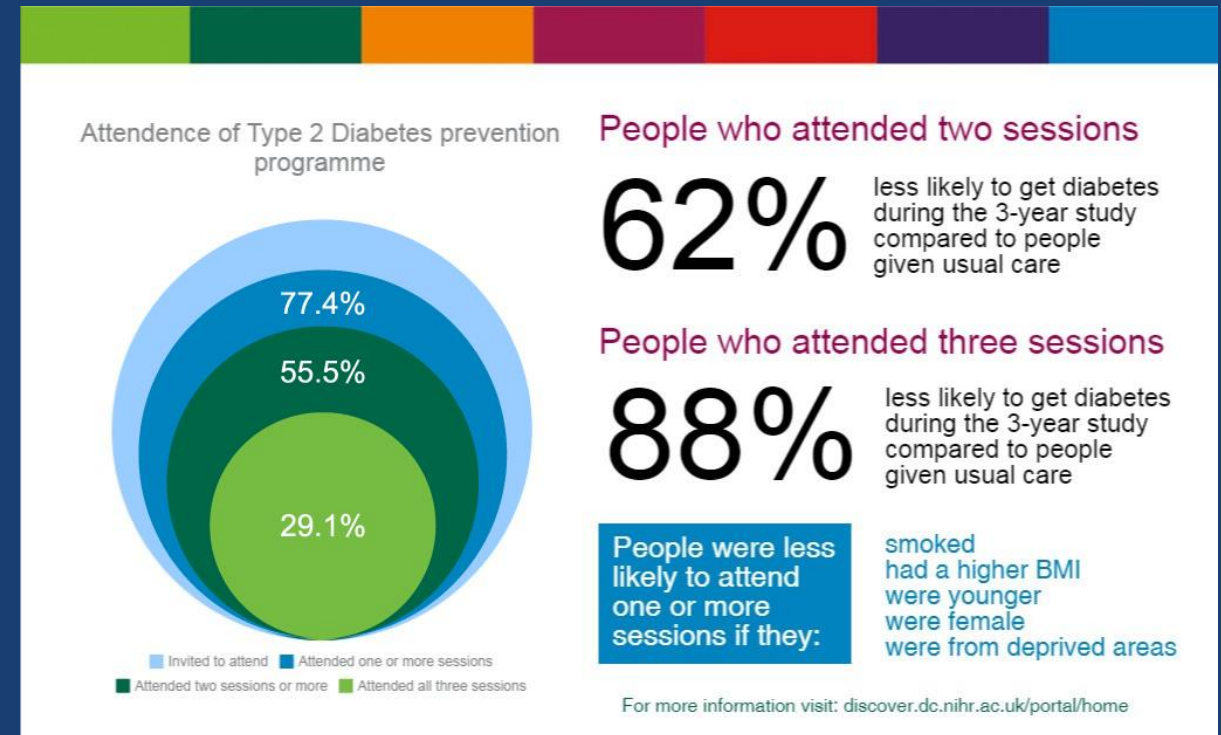
* Hyphens are important...



Original



Corrected



In *faux*graphics

Something doesn't add up...

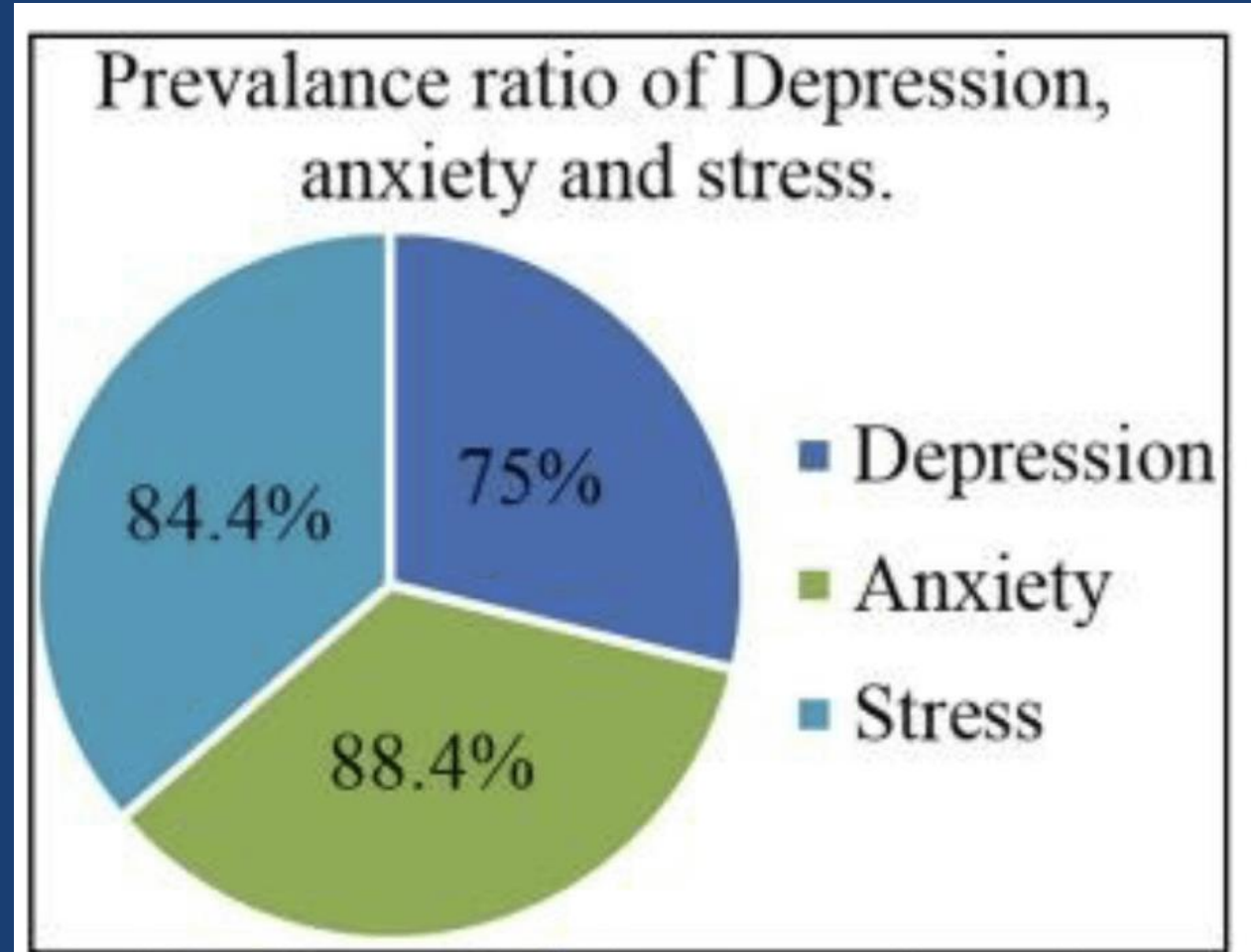


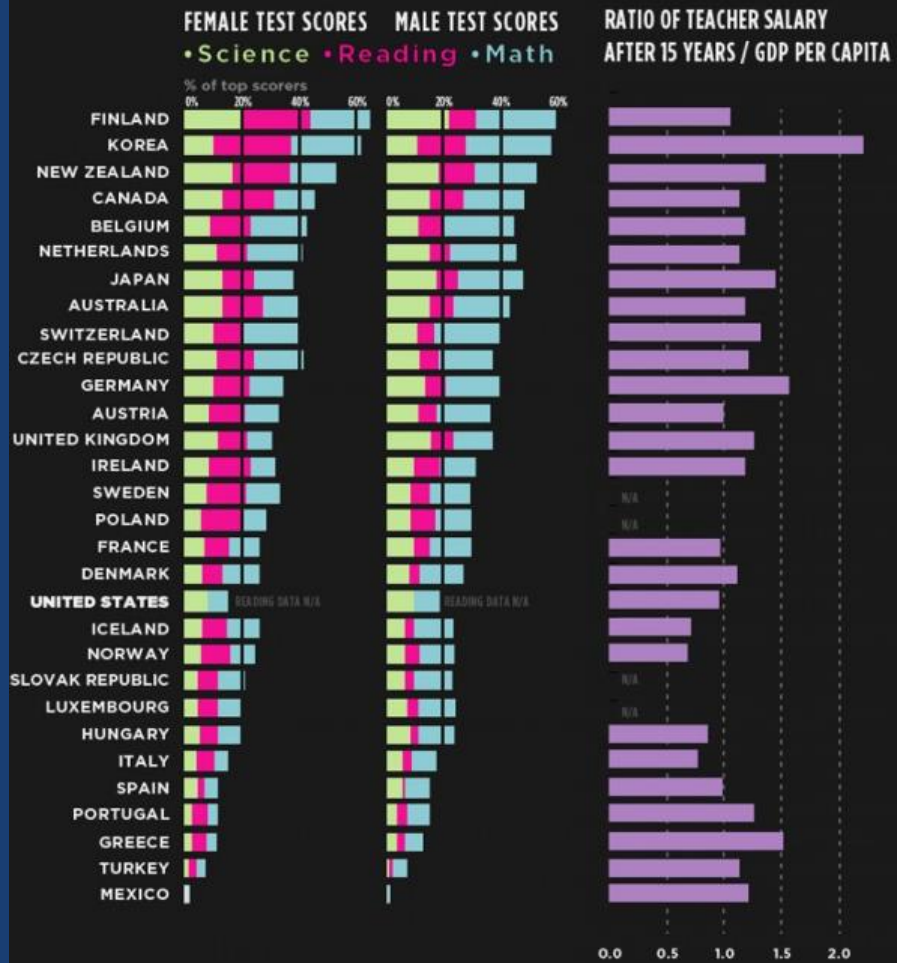
Fig.1: Prevalence ratio of depression anxiety and stress.

Just being wrong...

London?



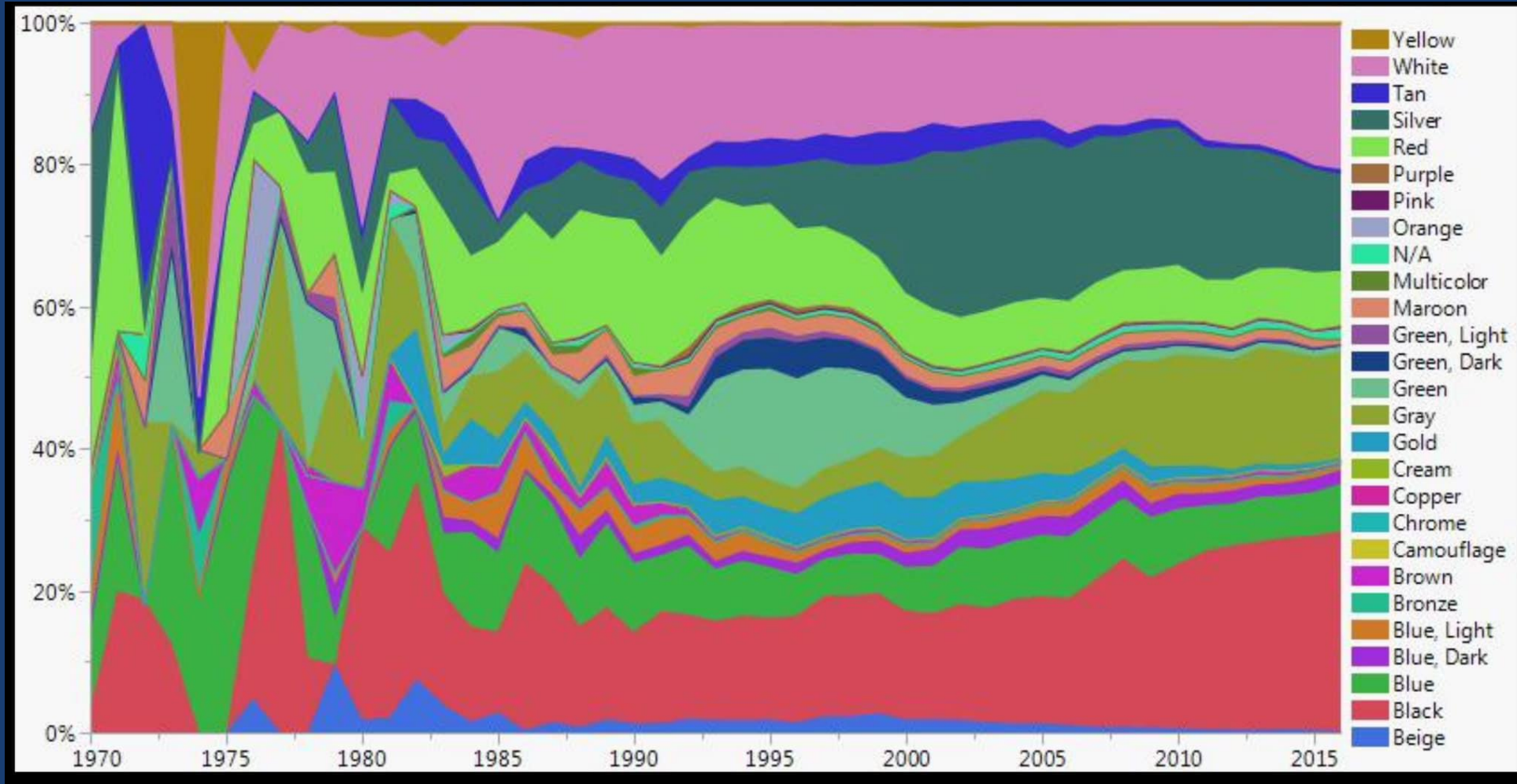
DO BETTER PAID TEACHERS MAKE SMARTER STUDENTS?



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



Car Sales, by colour, each year



In *faux* graphics

Just plain not caring about your job anymore..

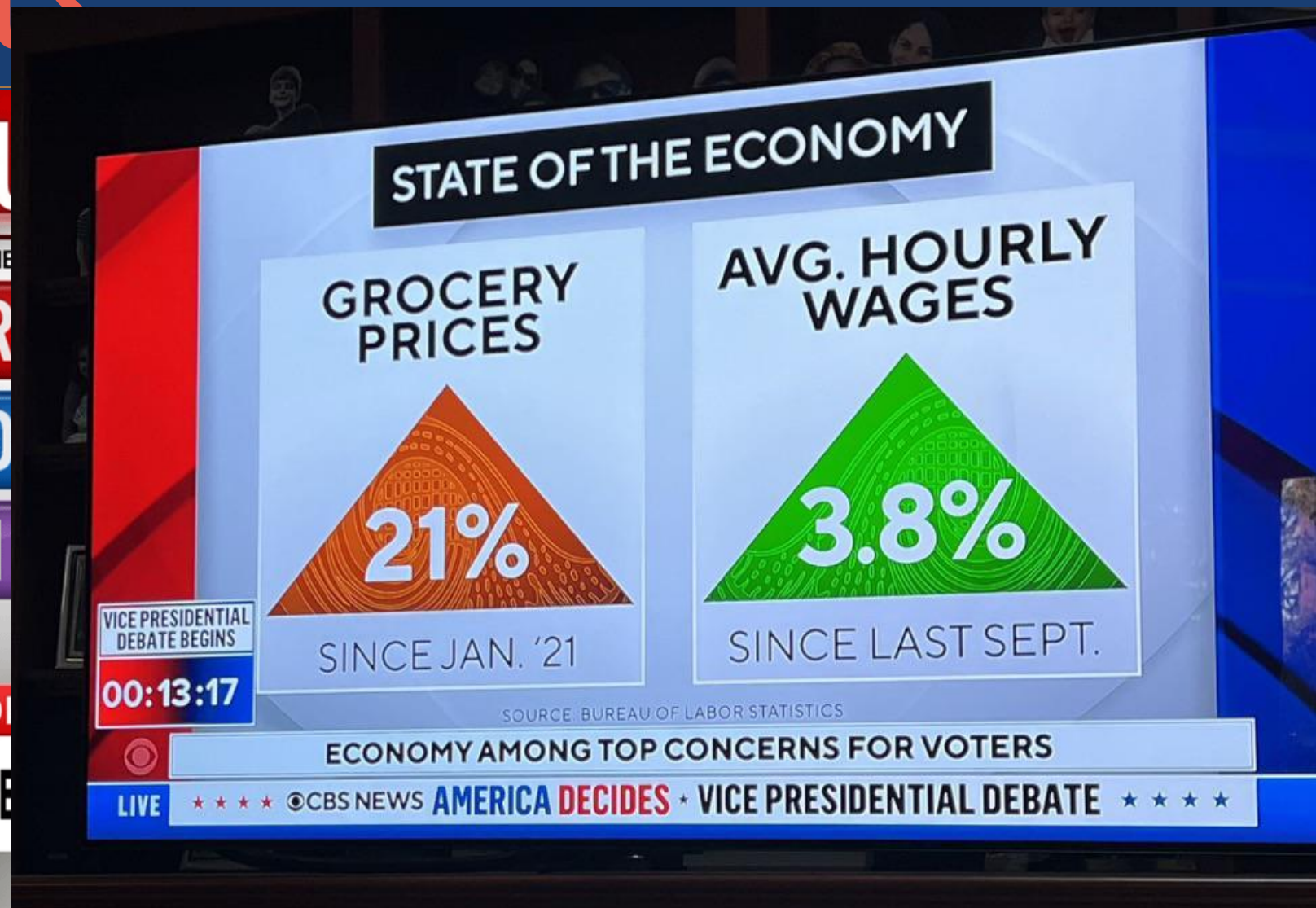
How
a b

Or being Fox News, who apparently hate y-axis labels...

NIHR

Applied Research
Oxford and Thar

The pr



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

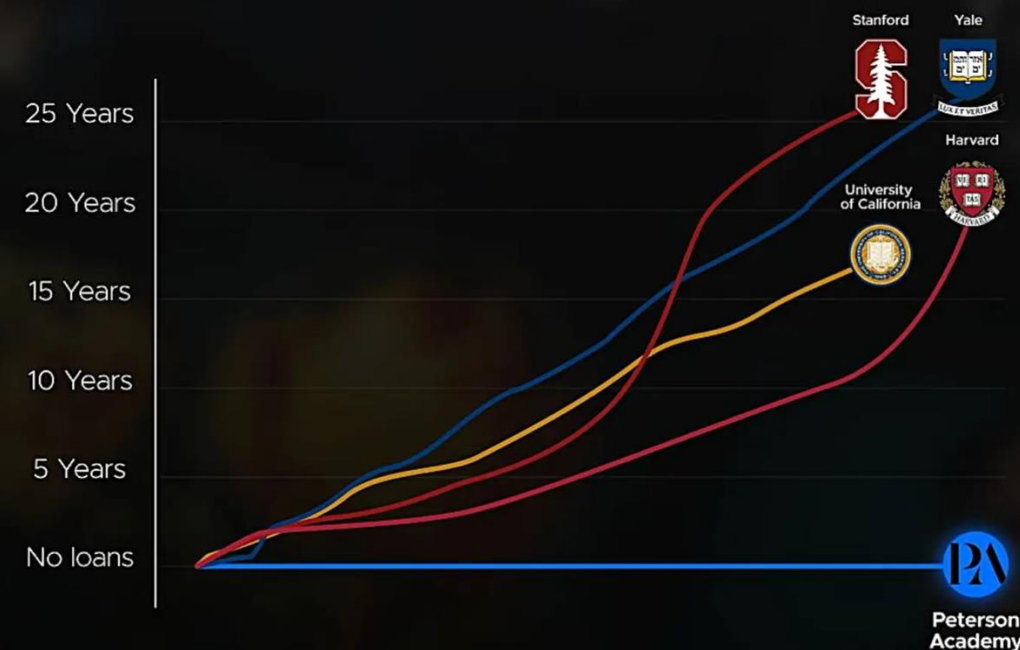


Dr Jordan B Peterson ✓

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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

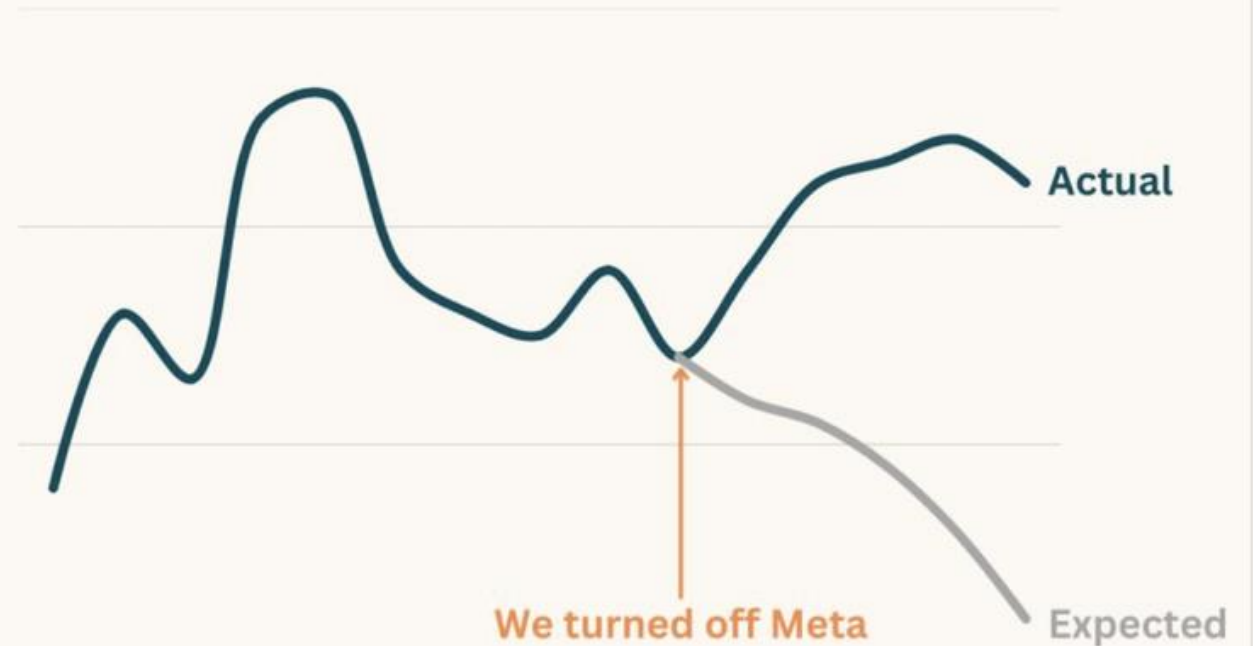


World class education — at 1% of the price.



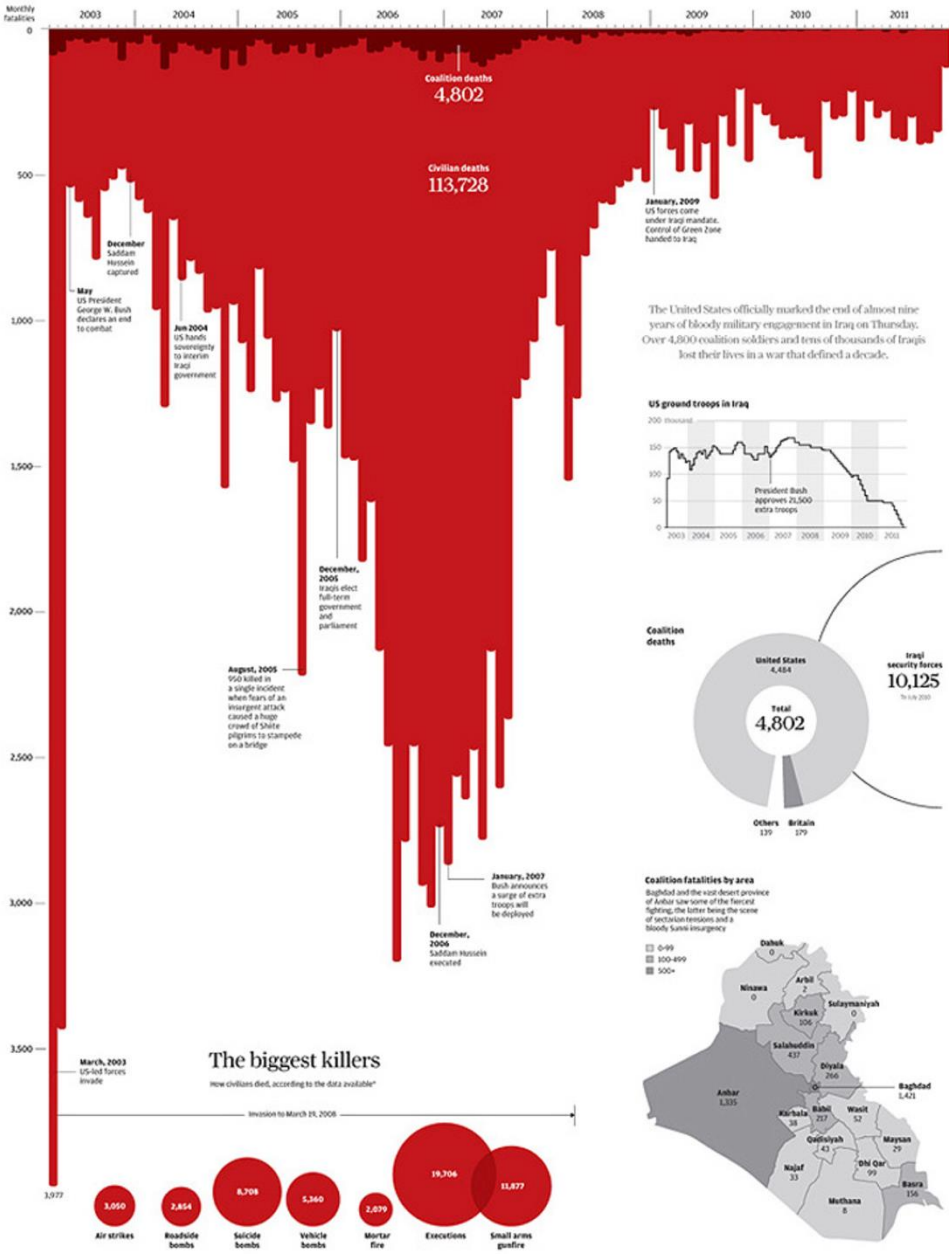
Hell, why even bother with axis?

How Uber saved \$35M in ads



Or just put the graph upside down...

Iraq's bloody toll



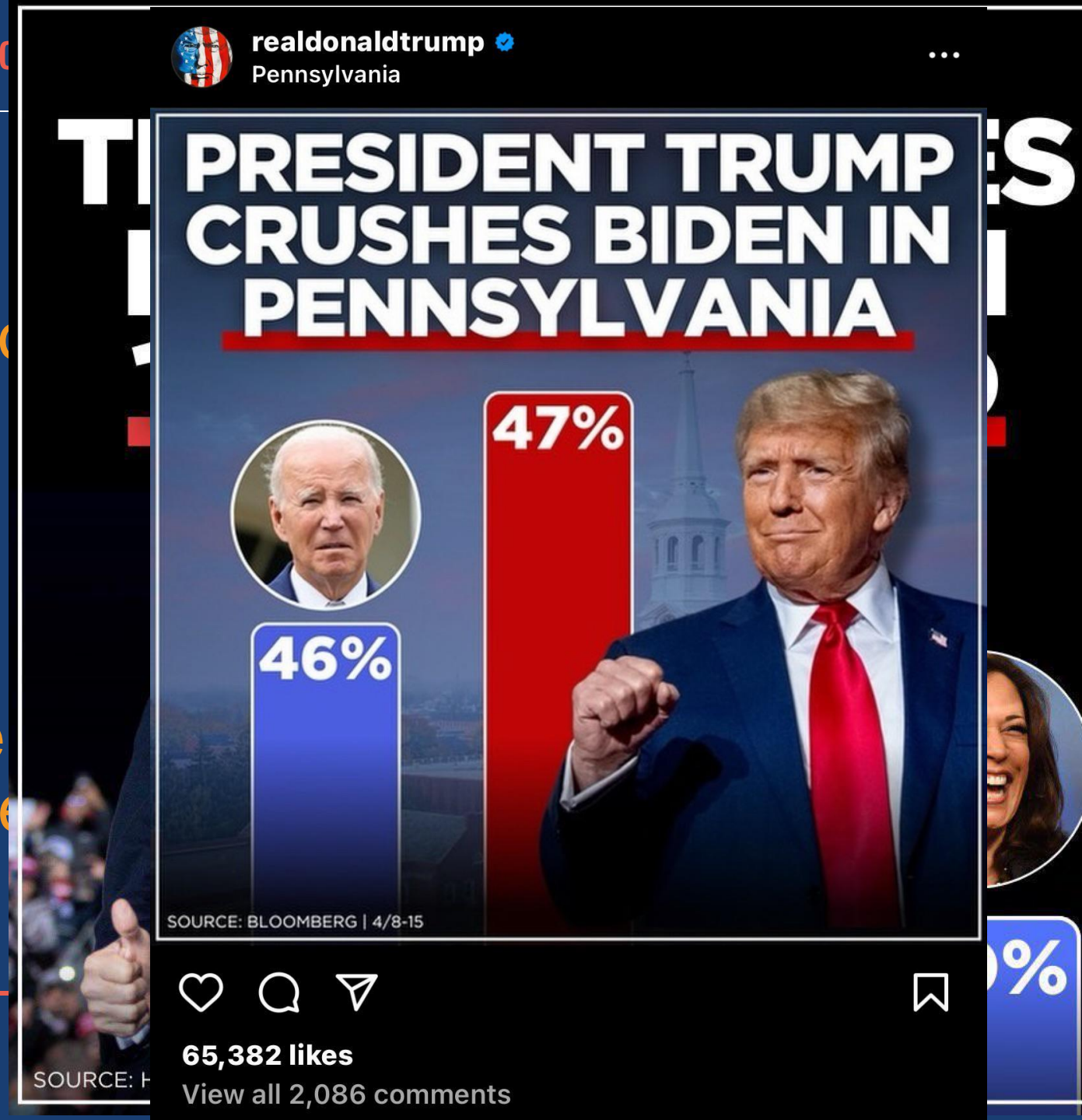
In *faux*graphics

And while we're
on the subject of
axis...

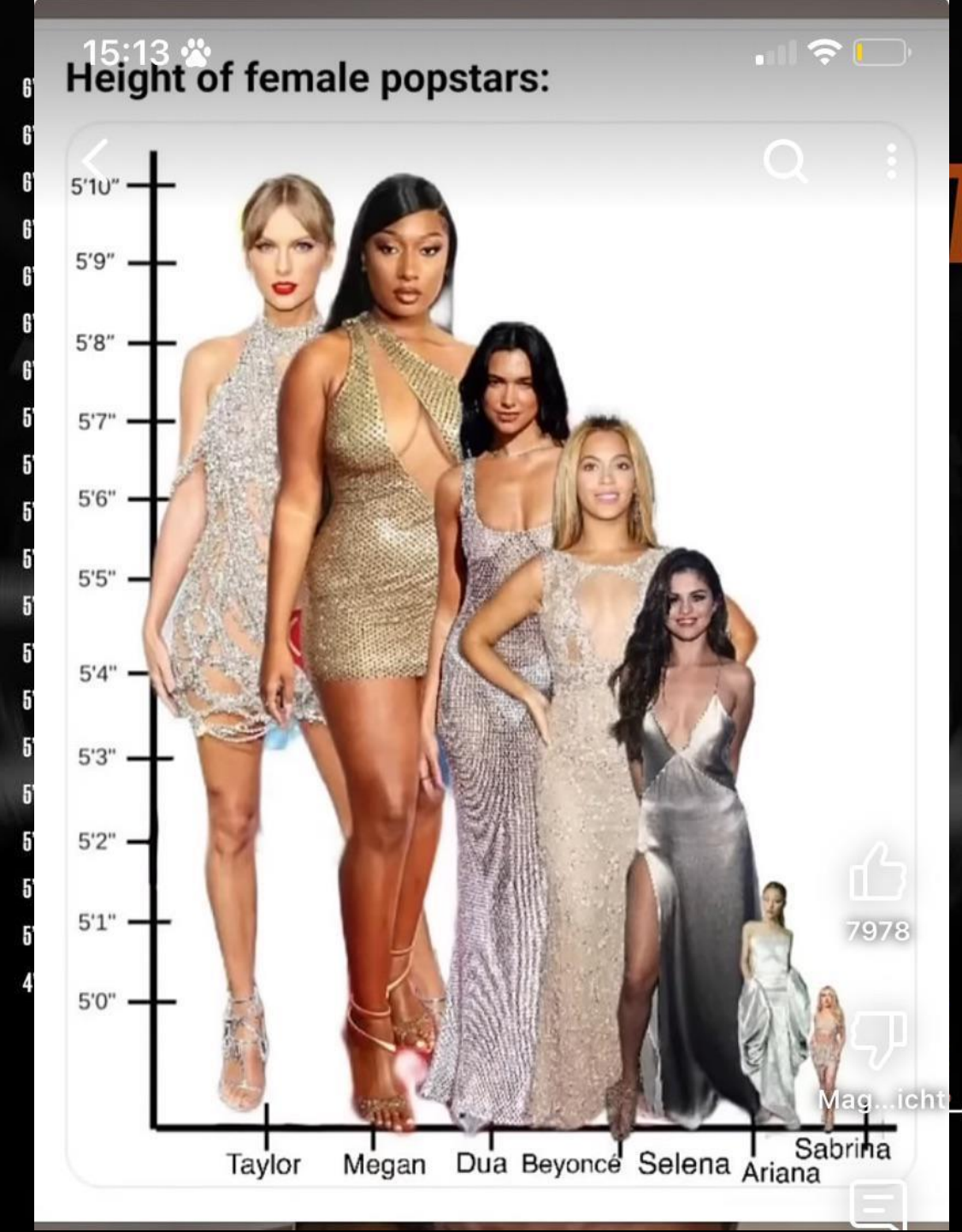


So...

- four stick people stand in for 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.



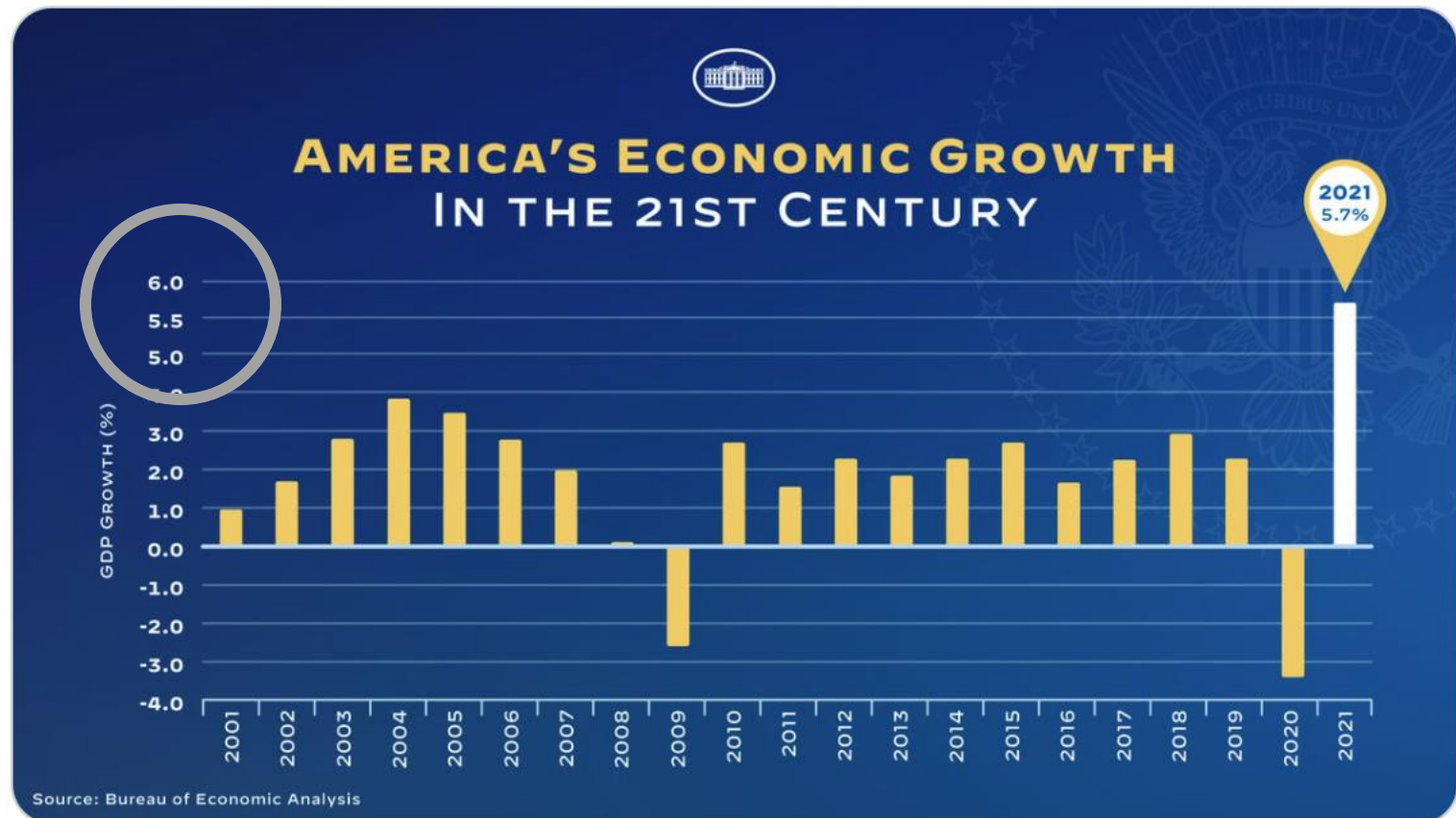
Want another example of a government infographic, perhaps... exaggerating things?

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.



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*](https://forms.gle/Ki3jRaj3YVjnwxc9A)