Working Group on Data Visualisation: Good and Bad Practices in Data Vis

September 26th 2017

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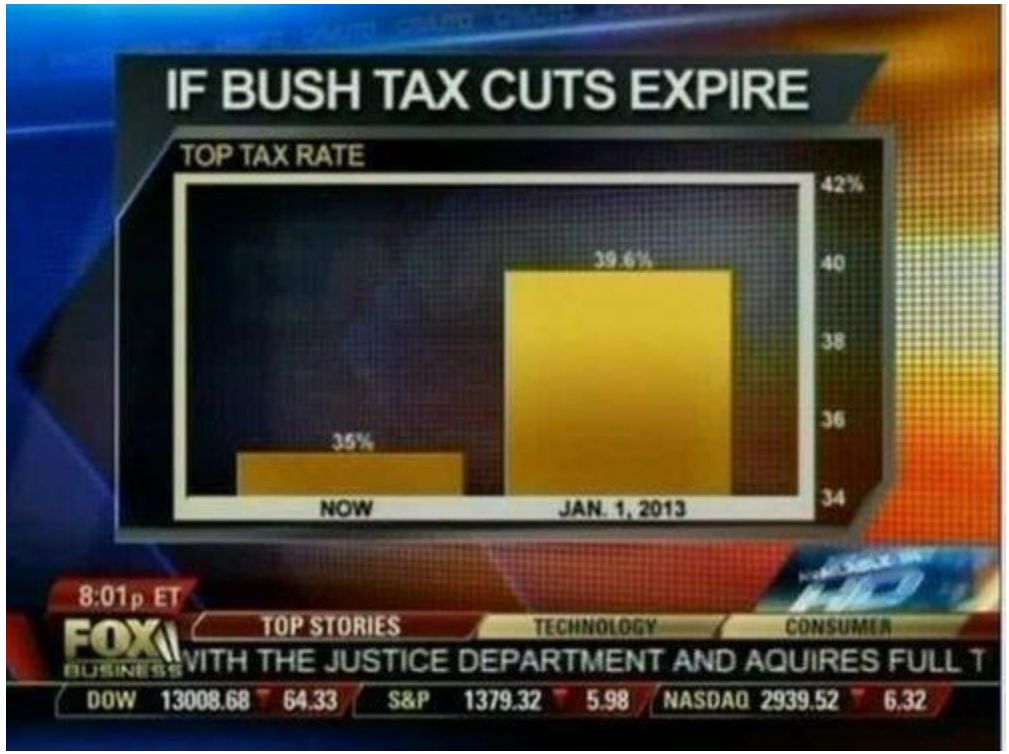
Today’s session

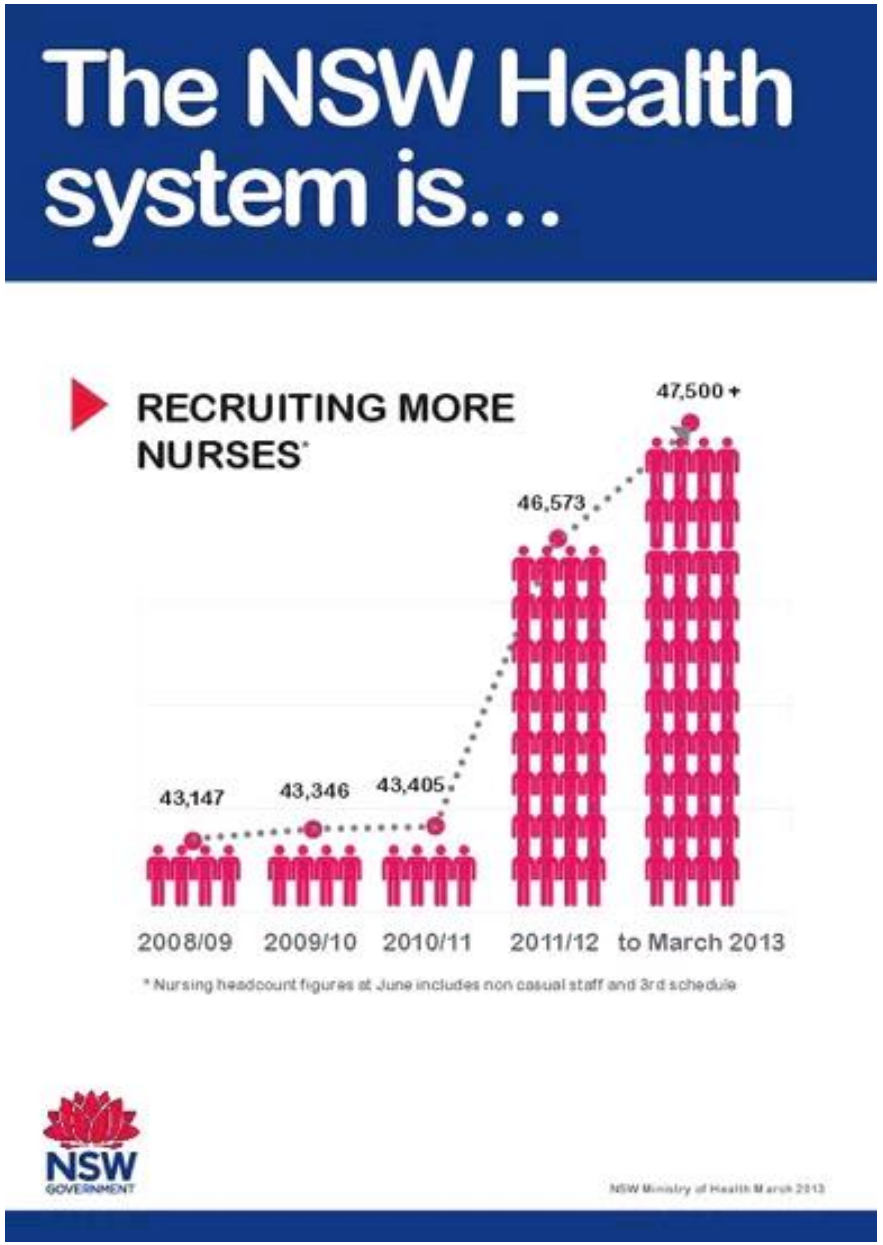
- Basic visualisation mistakes
- Good examples
- Small groups discussion
- Working group format

Basic mistakes

Truncated y-axis / unusual scales

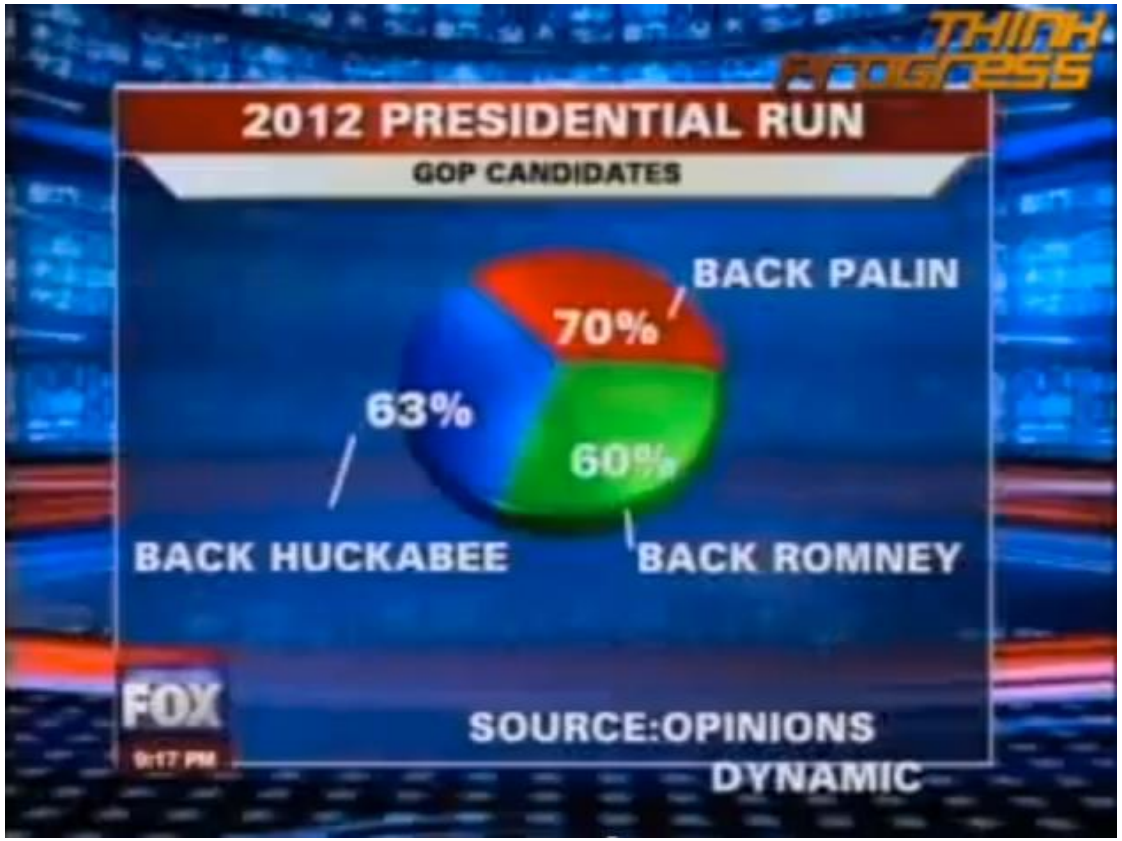


https://blog.heapanalytics.com/how-to-lie-with-data-visualization/



https://www.theguardian.com/news/datablog/gallery/2013/aug/01/16-useless-infographics

Ignoring conventions



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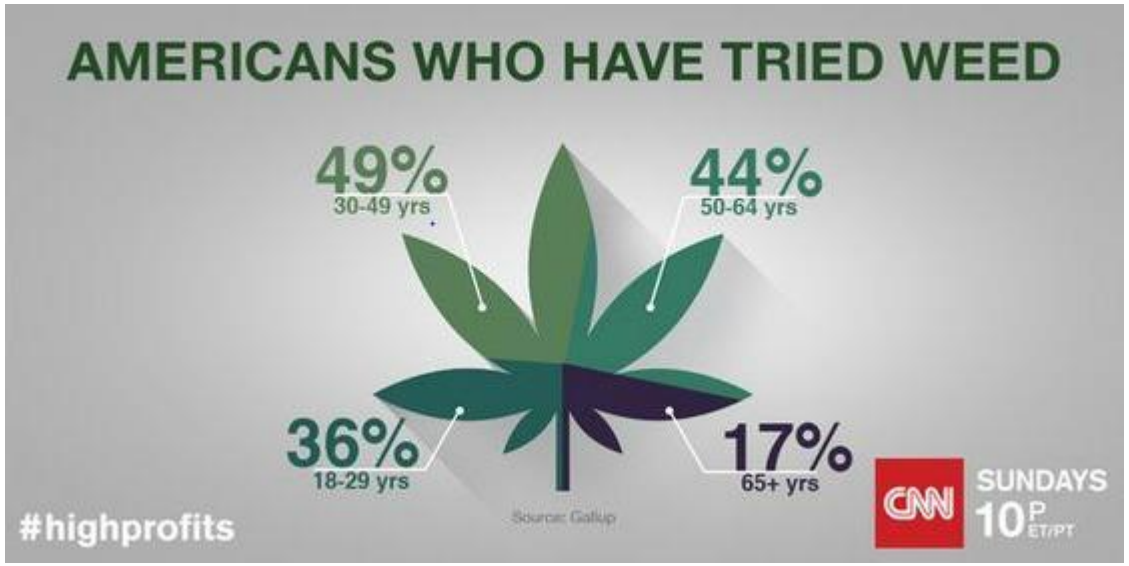
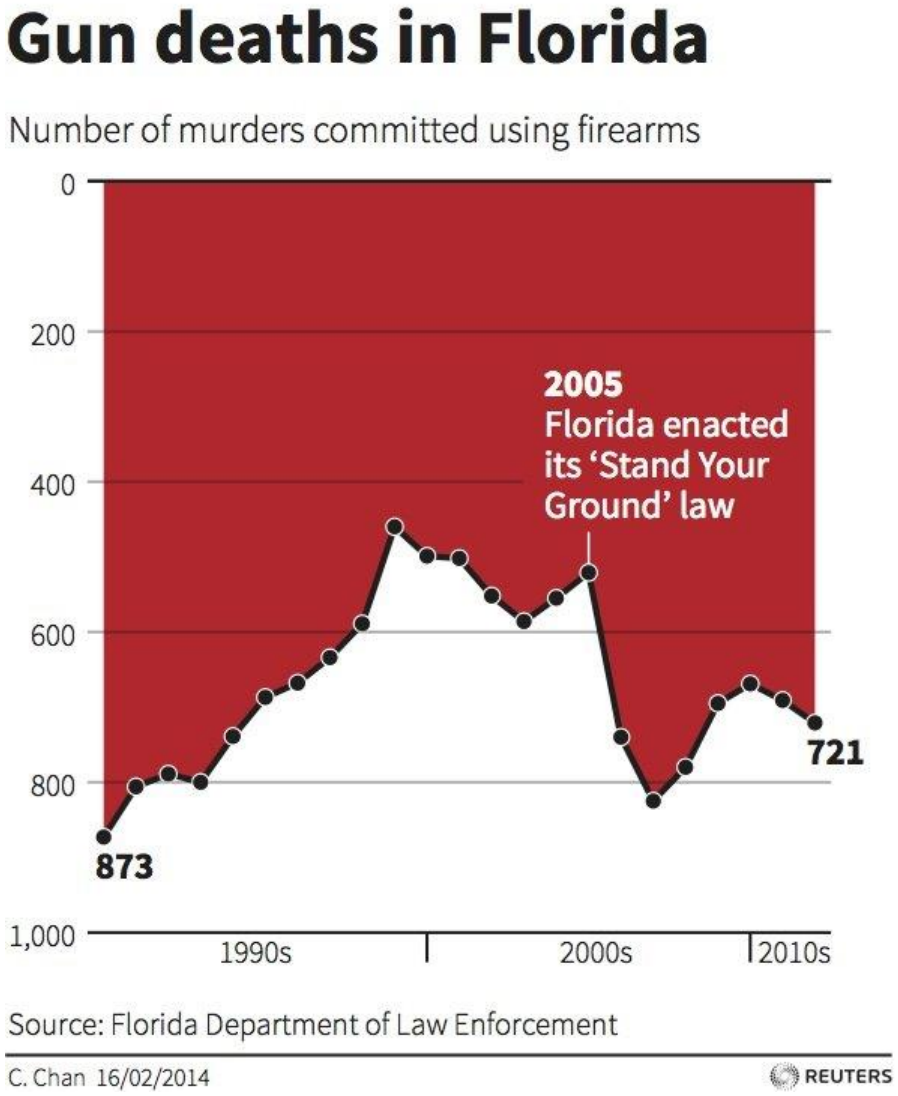
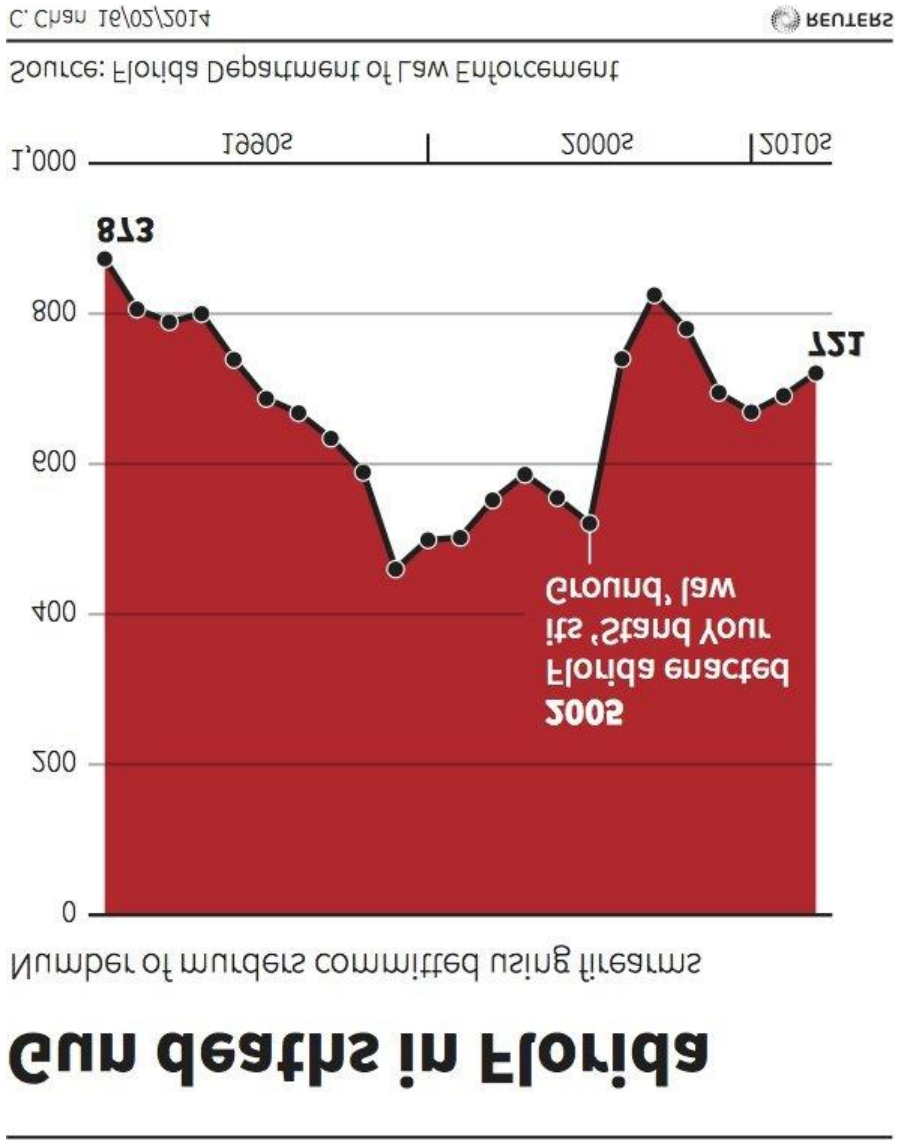


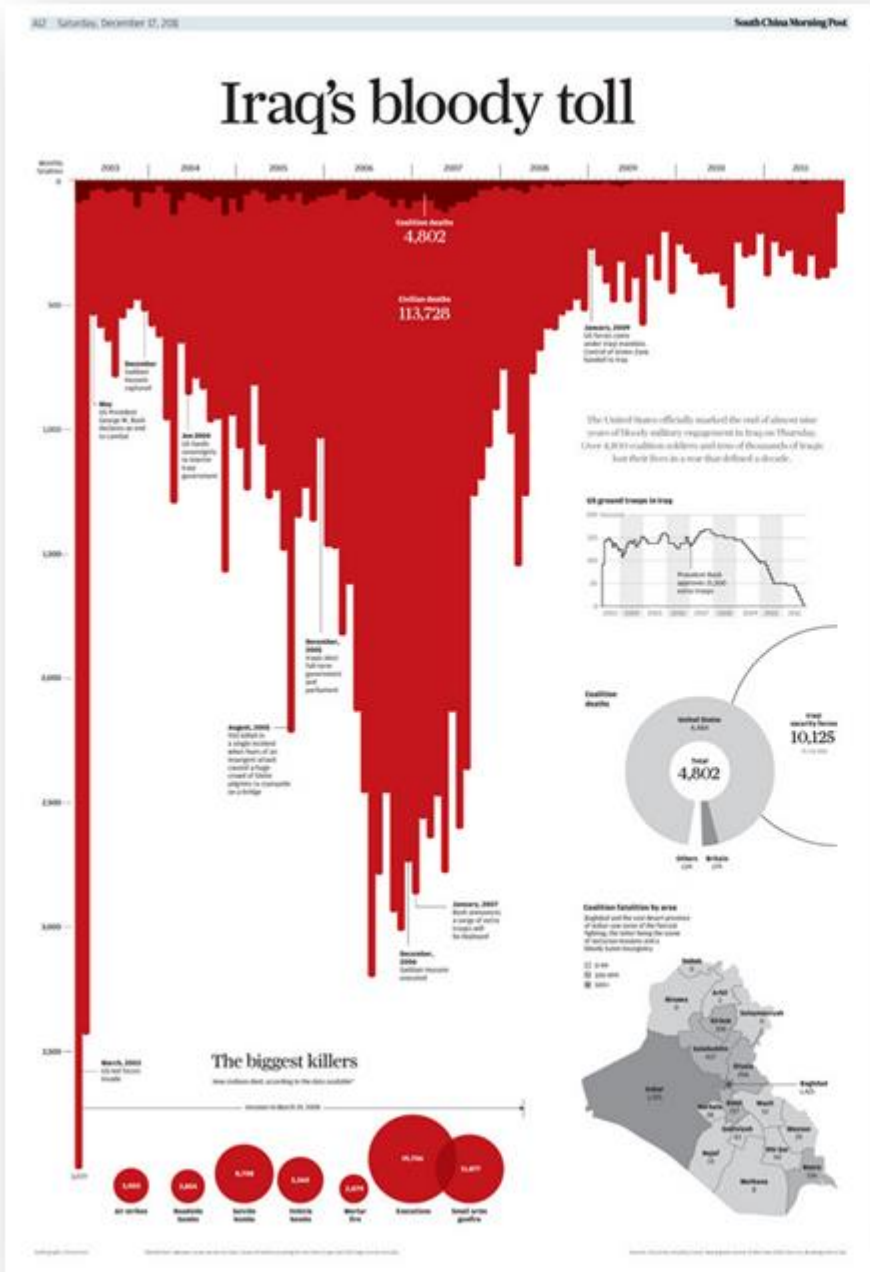
http://skepchick.org/2015/06/bad-chart-thursday-cnn-pot-pie/

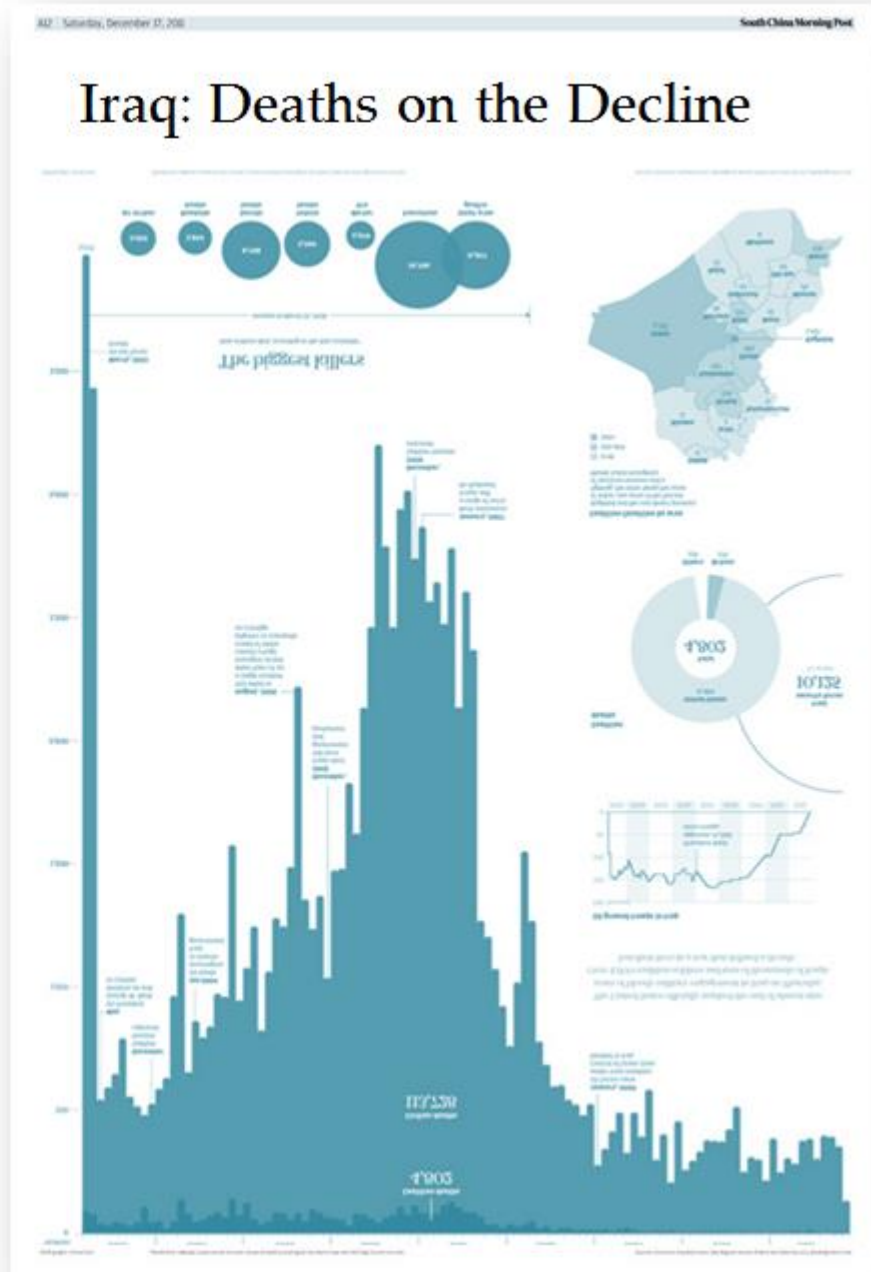
Ignoring conventions

https://blog.heapanalytics.com/how-to-lie-with-data-visualization/









http://gravyanecdote.com/tag/iraqs-bloody-toll/

Mind the defaults

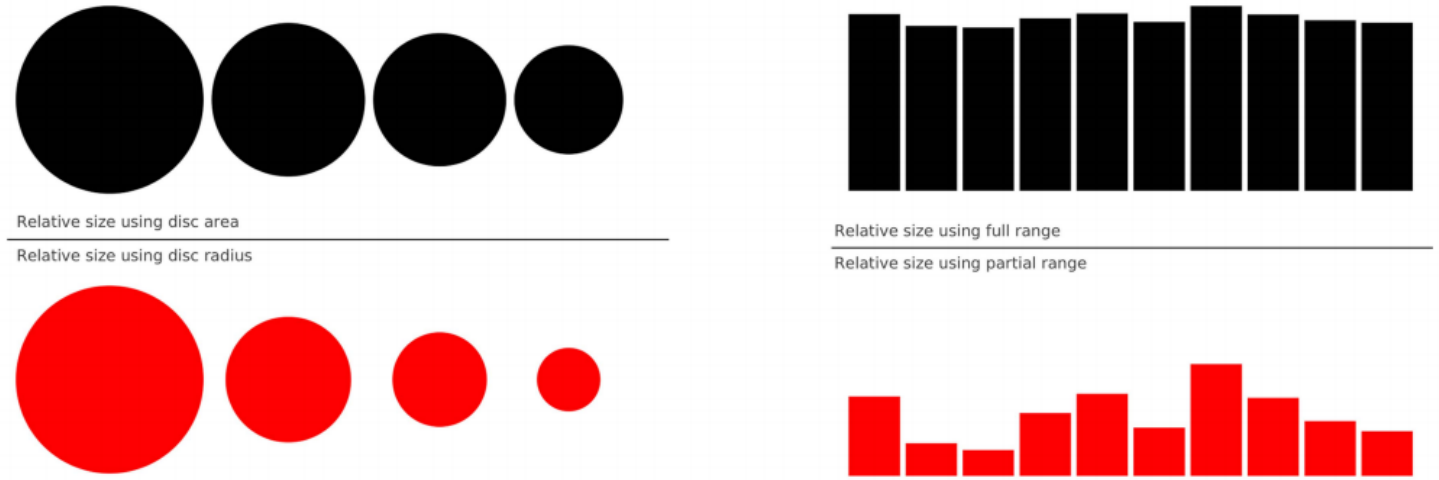
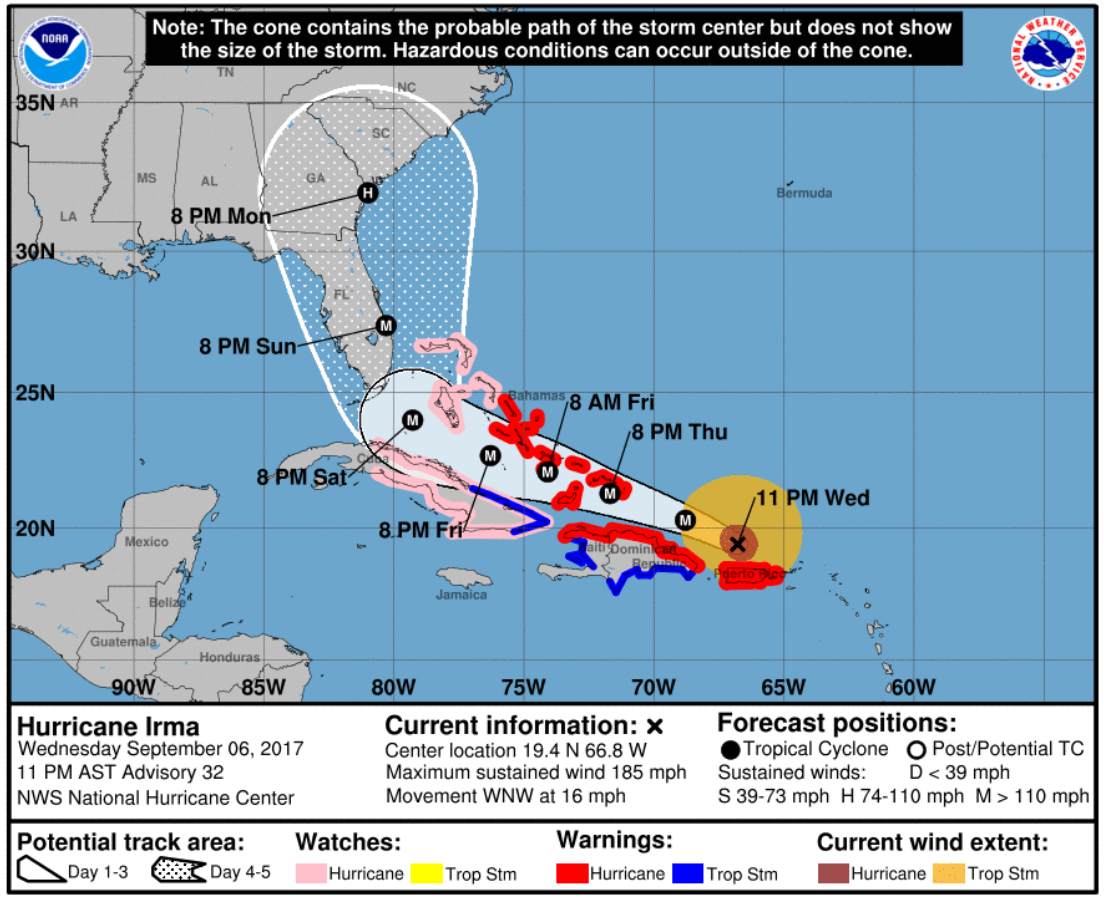
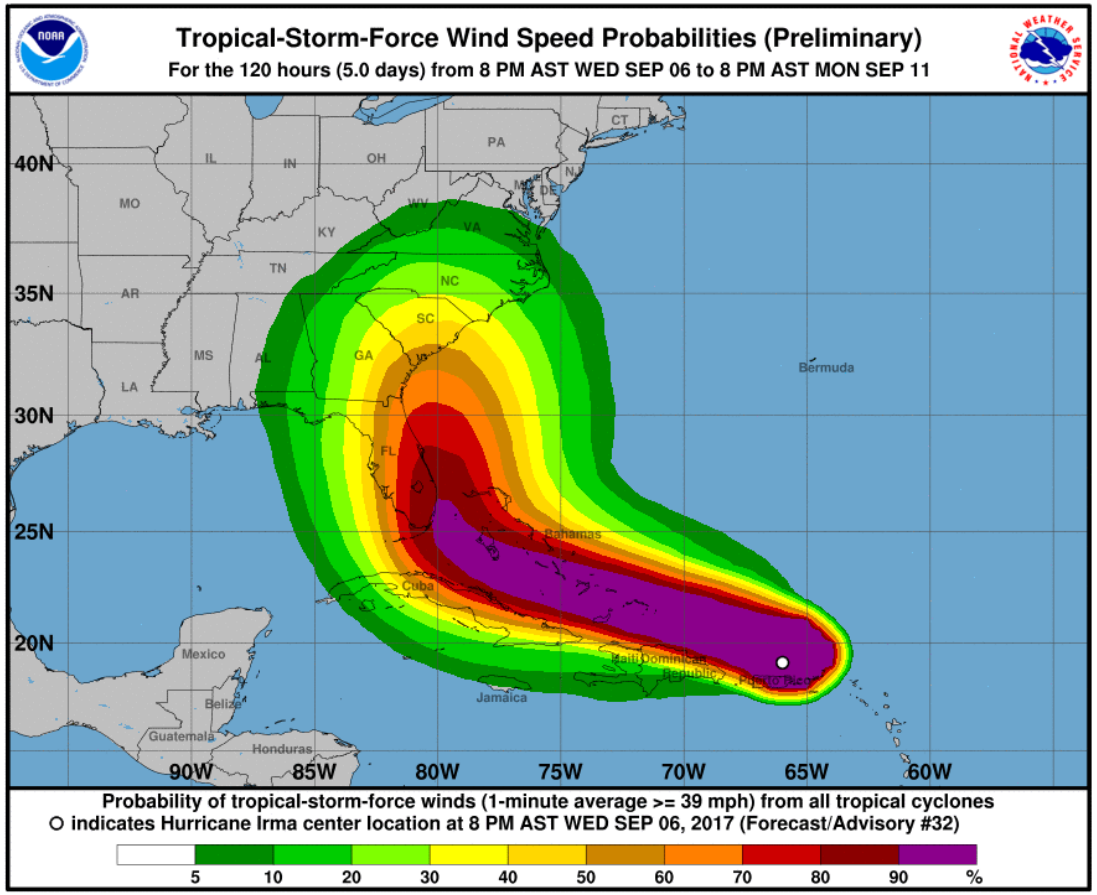


Figure 6. Do not mislead the reader. On the left part of the figure, we represented a series of four values: 30, 20, 15, 10. On the upper left part, we used the disc area to represent the value, while in the bottom part we used the disc radius. Results are visually very different. In the latter case (red circles), the last value (10) appears very small compared to the first one (30), while the ratio between the two values is only 3:1. This situation is actually very frequent in the literature because the command (or interface) used to produce circles or scatter plots (with varying point sizes) offers to use the radius as default to specify the disc size. It thus appears logical to use the value for the radius, but this is misleading. On the right part of the figure, we display a series of ten values using the full range for values on the top part (y axis goes from 0 to 100) or a partial range in the bottom part (y axis goes from 80 to 100), and we explicitly did not label the y-axis to enhance the confusion. The visual perception of the two series is totally different. In the top part (black series), we tend to interpret the values as very similar, while in the bottom part, we tend to believe there are significant differences. Even if we had used labels to indicate the actual range, the effect would persist because the bars are the most salient information on these figures.
doi:10.1371/journal.pcbi.1003833.g006

Ambiguity



Accurate but confusing



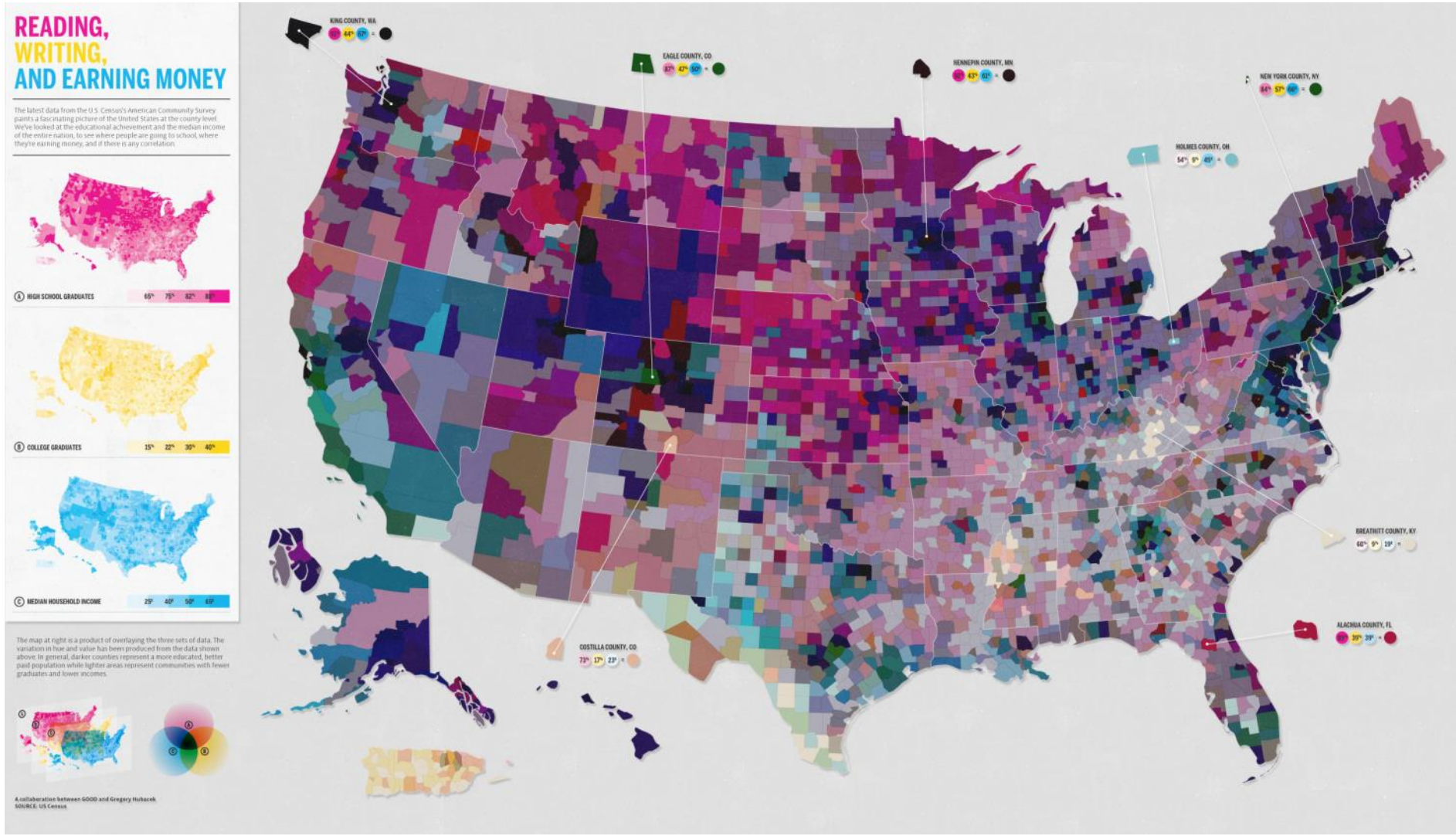
Better?

Bad big data visualisations

https://maxcooper.net/chromos-ep

Bad big data visualisations

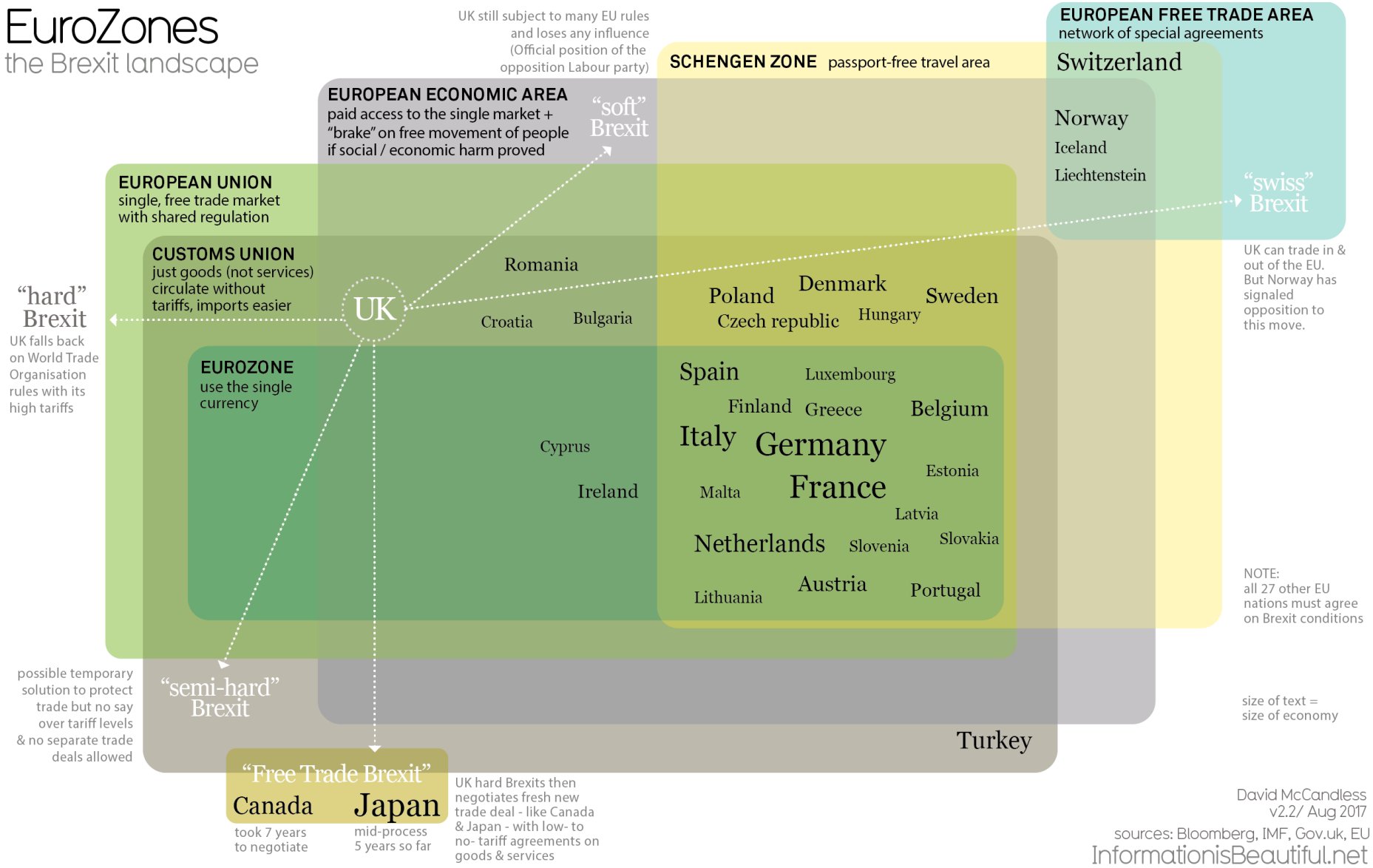
The latest data from the U.S. Census's American Community Survey paints a fascinating picture of the United States at the county level. We've looked at the educational achievement and the median income of the entire nation, to see where people are going to school, where they're earning money, and if there is any correlation.



GOOD/Gregory Hubacek

Good examples

Information is Beautiful - David McCandless



Information is Beautiful - David McCandless

Ted talk

https://www.ted.com/talks/david_mccandless_the_beauty_of_data_visualization

Information is Beautiful Awards

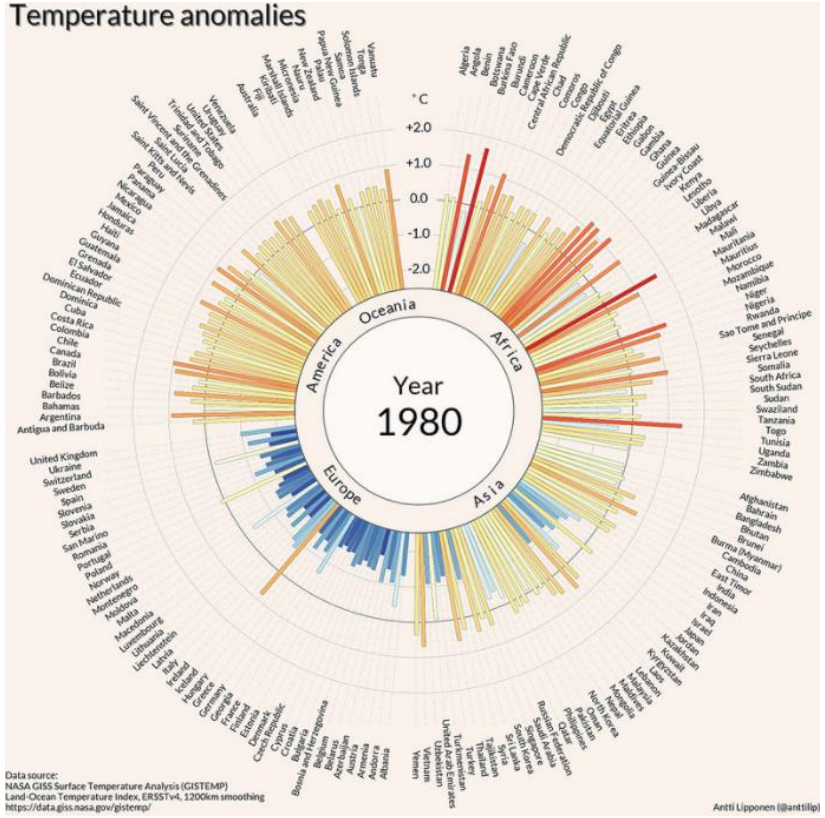
http://www.informationisbeautiful.net/2017/the-kantar-information-is-beautiful-awards-2017-is-now-open/#more-4727

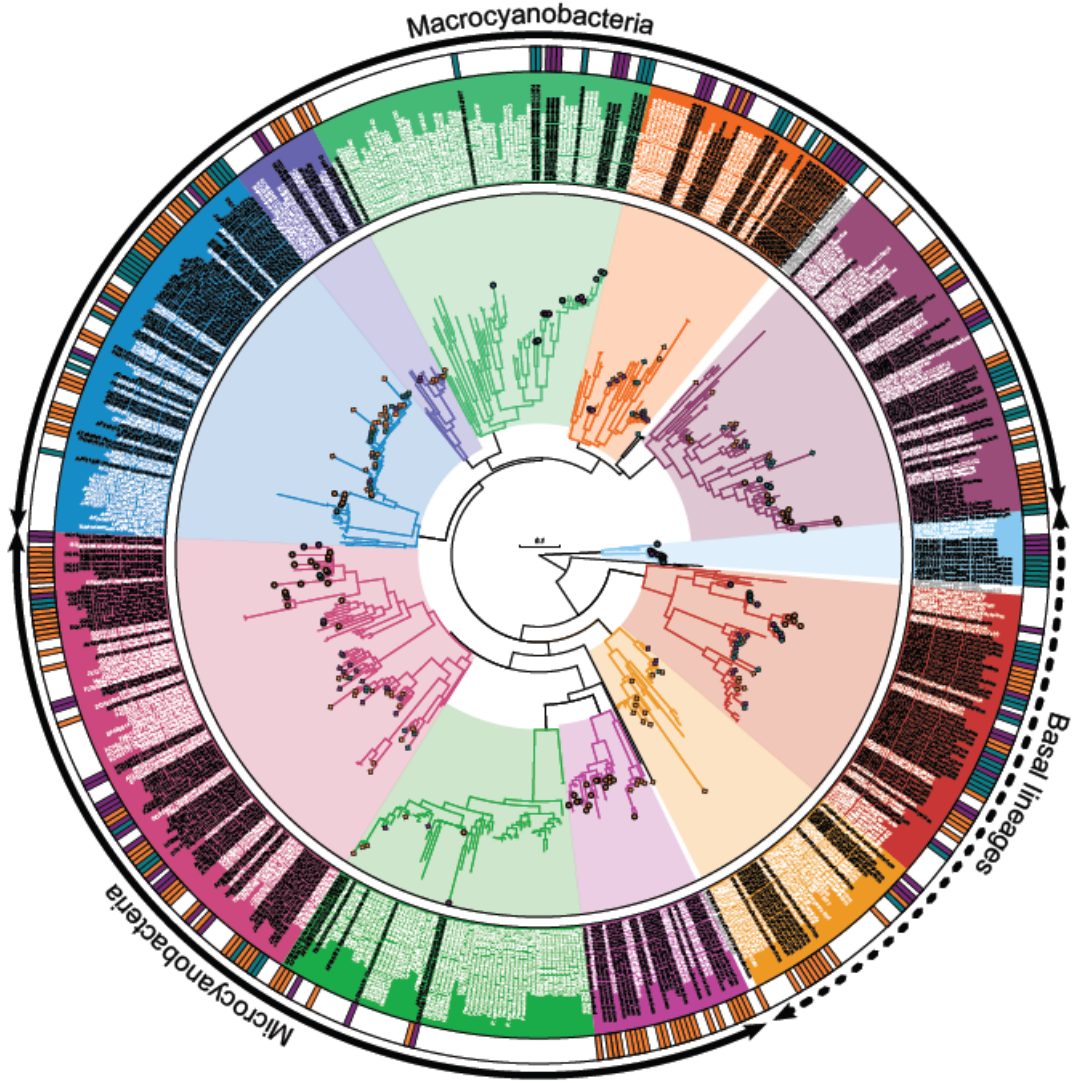
Spatial image - Facebook

https://dabrownstein.files.wordpress.com/2014/02/paul-butlers-map-of-friendships.jpg

The power of animation

Temperature anomalies:
https://www.flickr.com/photos/150411108@N06/35471910724/





Key to sub-clades:

- *Gloeocapsa**
- *Pseudanabaena*†
- *Acaryochloris, Aphanocapsa, Thermosynechococcus**
- *Leptolyngbya* (Group I)†
- *Synechococcus, Prochlorococcus, Cyanobium**
- *Leptolyngbya* (Group II), *Phormidesmis, Chamaesiphon*†
- *Trichodesmium, Phormidium, Arthrospira, Microcoleus*†
- *Wilmottia*†
- *Microcystis, Cyanothece, Pleurocapsa, Snowella* etc.*
- *Gloeocapsa, Chroococcidiopsis**
- *Calothrix, Anabaena, Nodularia, Nostoc* etc.†

* = unicellular and colonial lineages
† = filamentous lineages

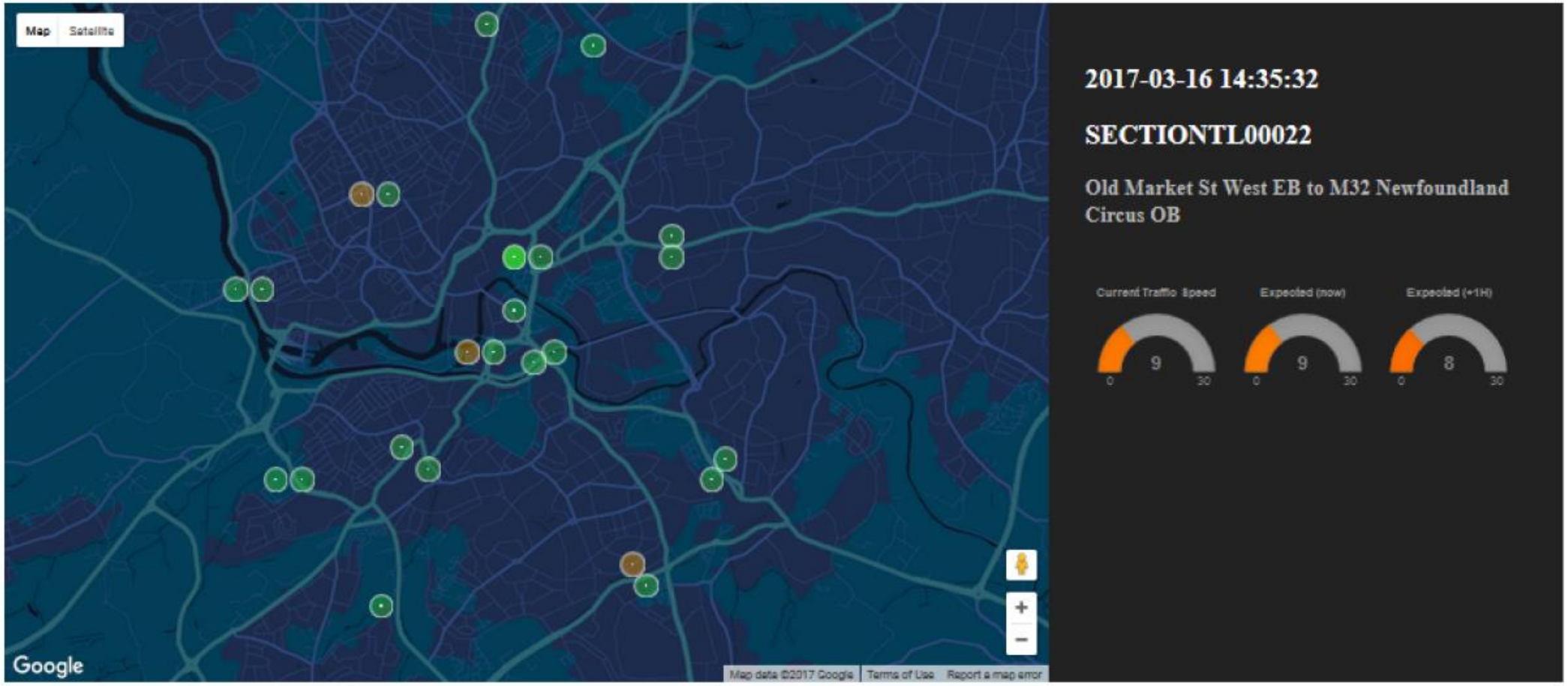
Key to locations:

- High Arctic, Northern high latitude
- Alpine, high altitude
- Antarctica, Southern high latitude

Key to major groups:

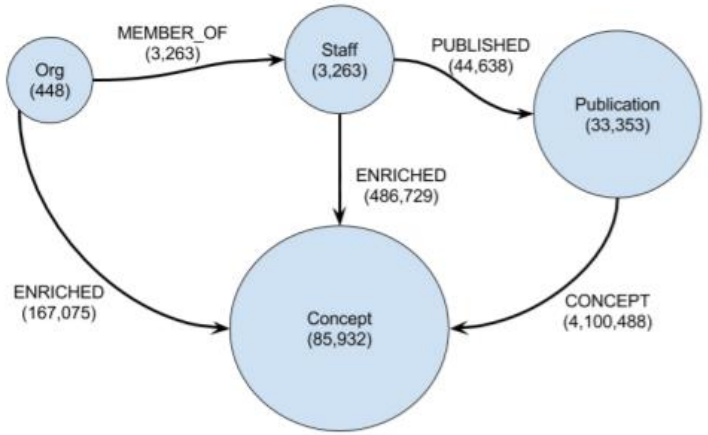
- Monophyletic
- Paraphyletic

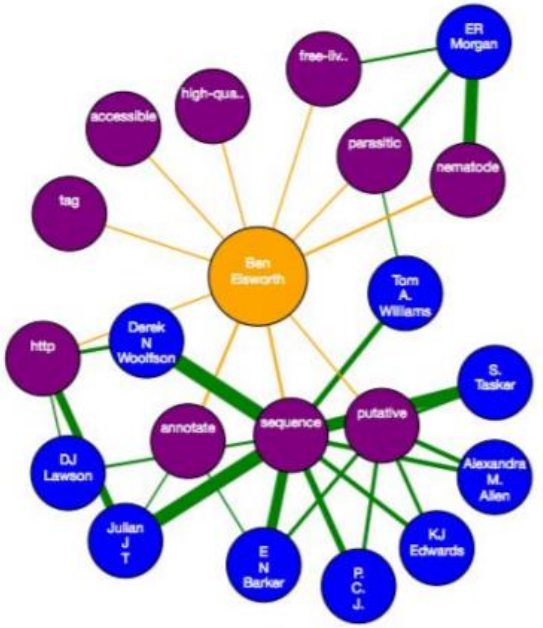
Nathan Chrismas

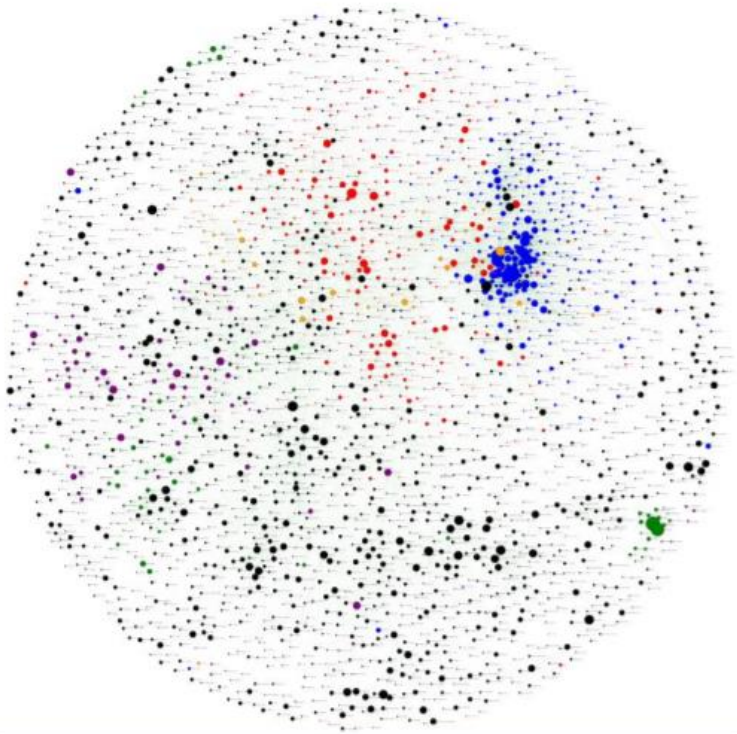


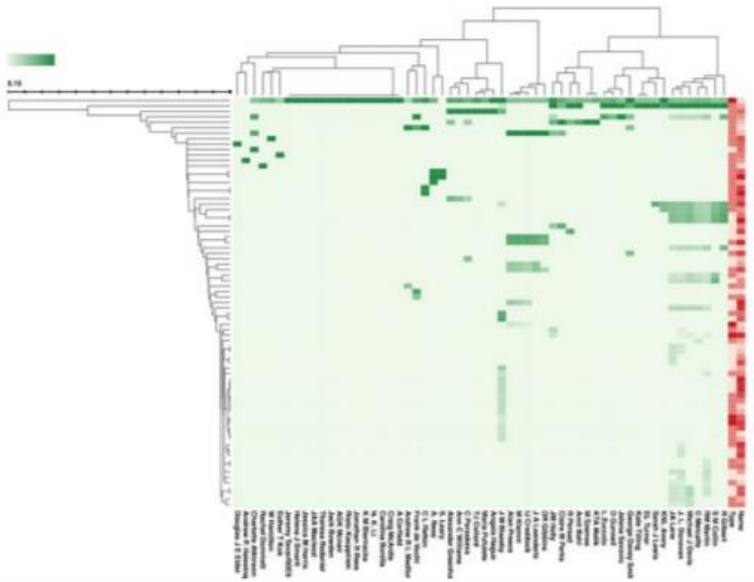
Tom Bland & Kathryn Leeming

Networks and graphs - **Ben Elsworth -** MRC Integrative Epidemiology Unit, SSCM









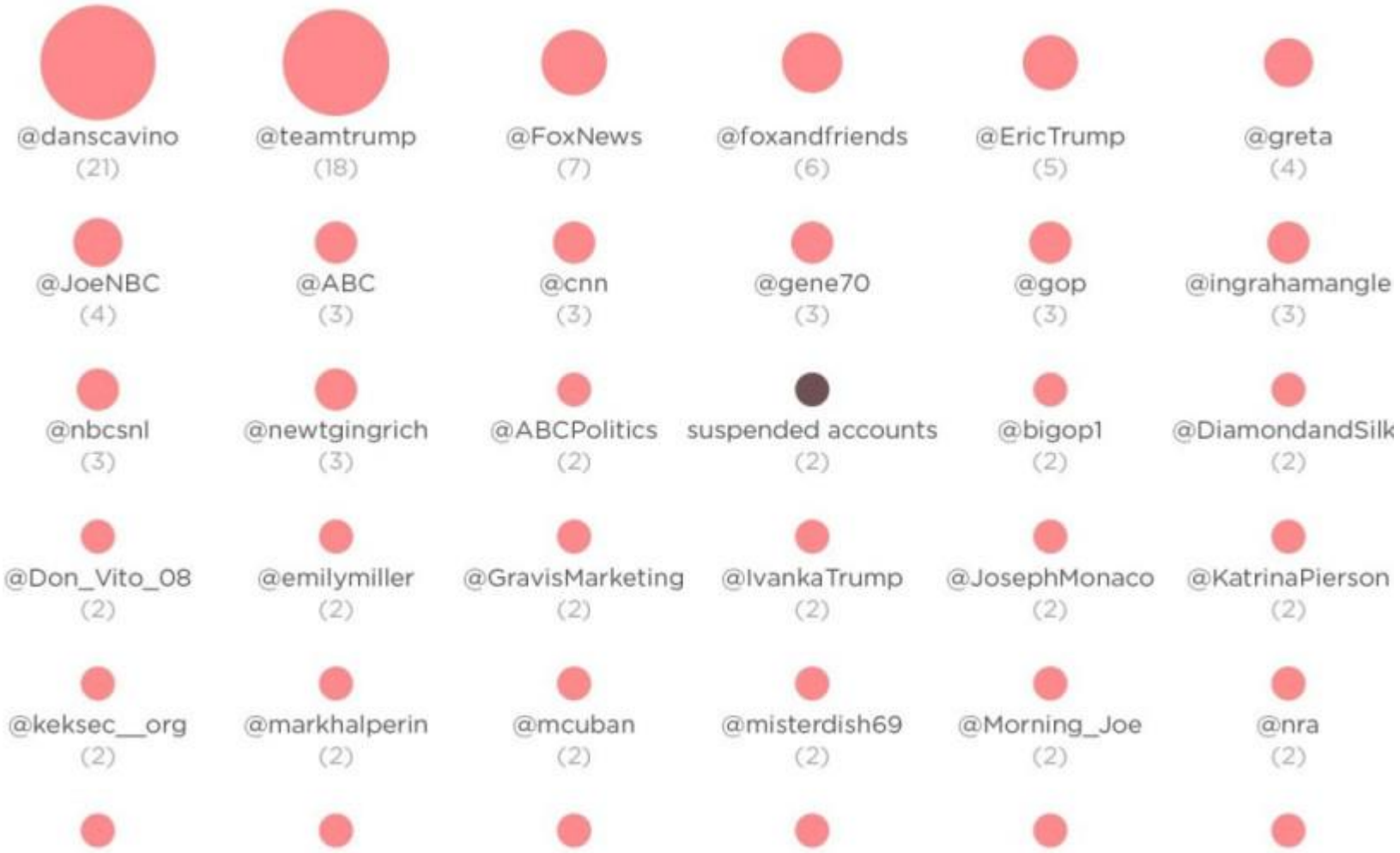
Small groups discussion

Makeover Monday

“Each week we post a link to a chart, and its data, and then you rework the chart.”

http://www.makeovermonday.co.uk/

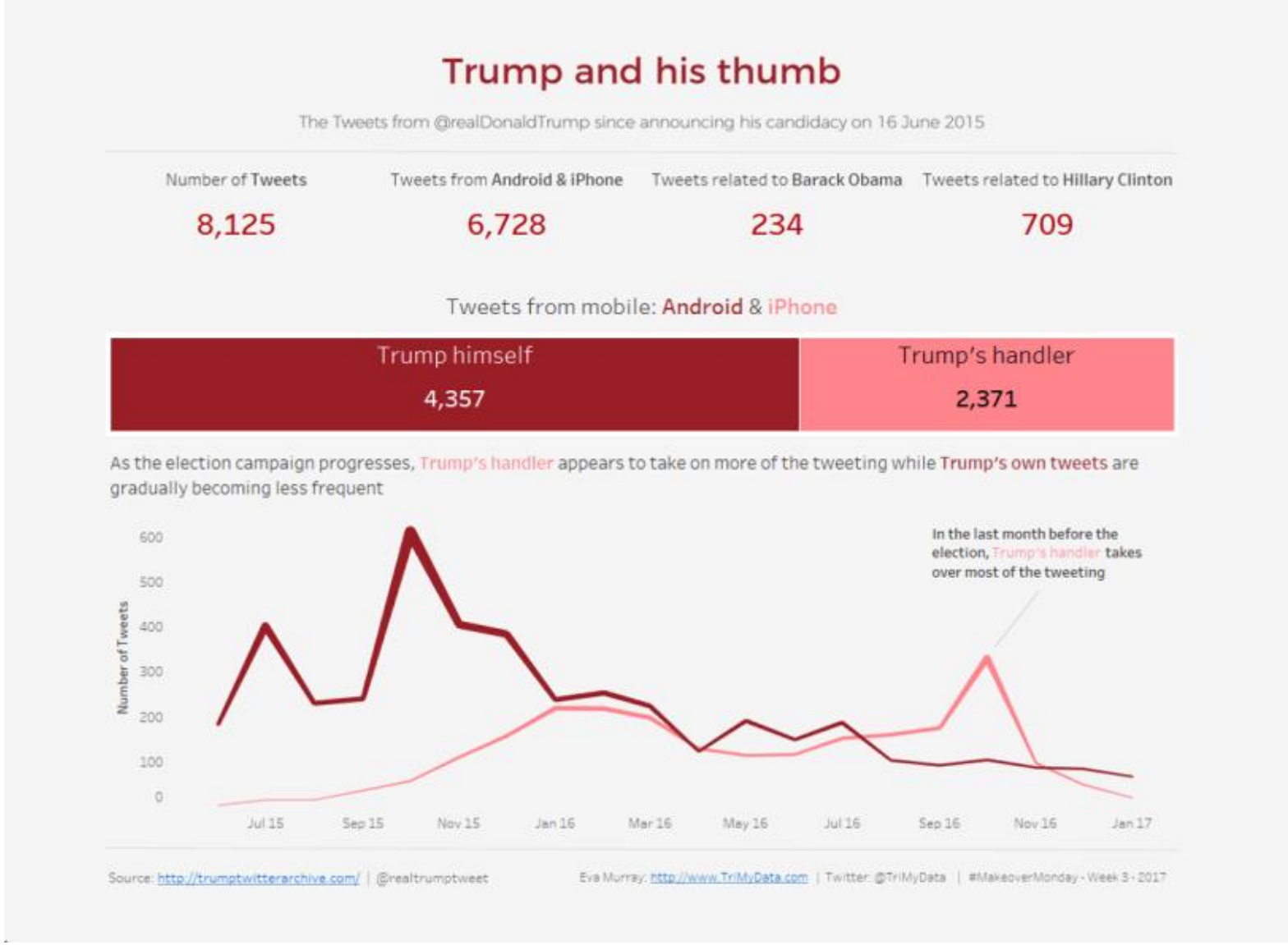
Makeover Monday – Trump's tweets



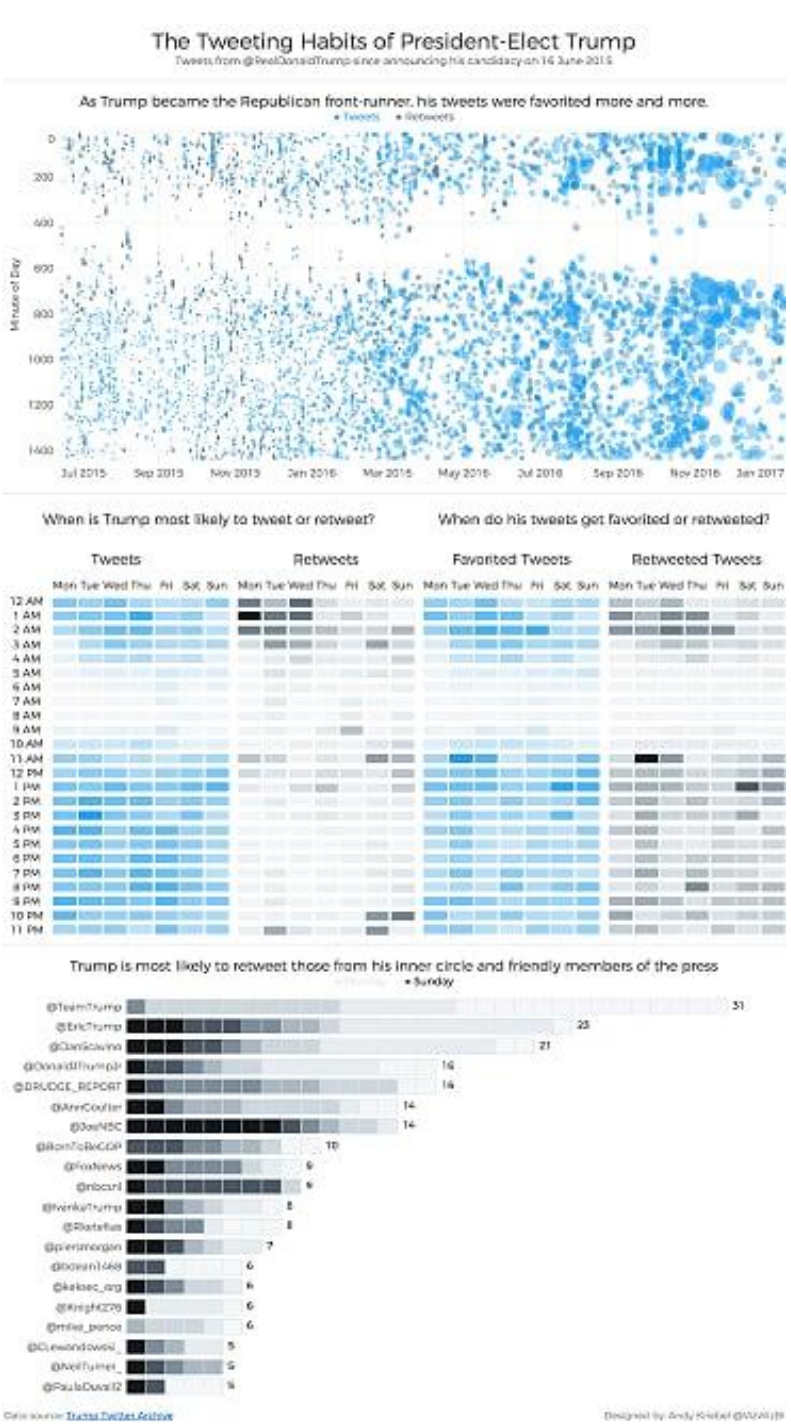
Week 3 – January 16th 2017

https://www.buzzfeed.com/charliewarzel/here-are-the-294-accounts-donald-trump-retweeted-during-the?utm_term=.ijAgeyPd7l#.ch0GJX2MOV

Makeover Monday – Trump's tweets



Interactive version: https://public.tableau.com/profile/eva.murray#!/vizhome/MakeoverMondayWeek3-Trumpandhisthumb/Trumpandhisthumb

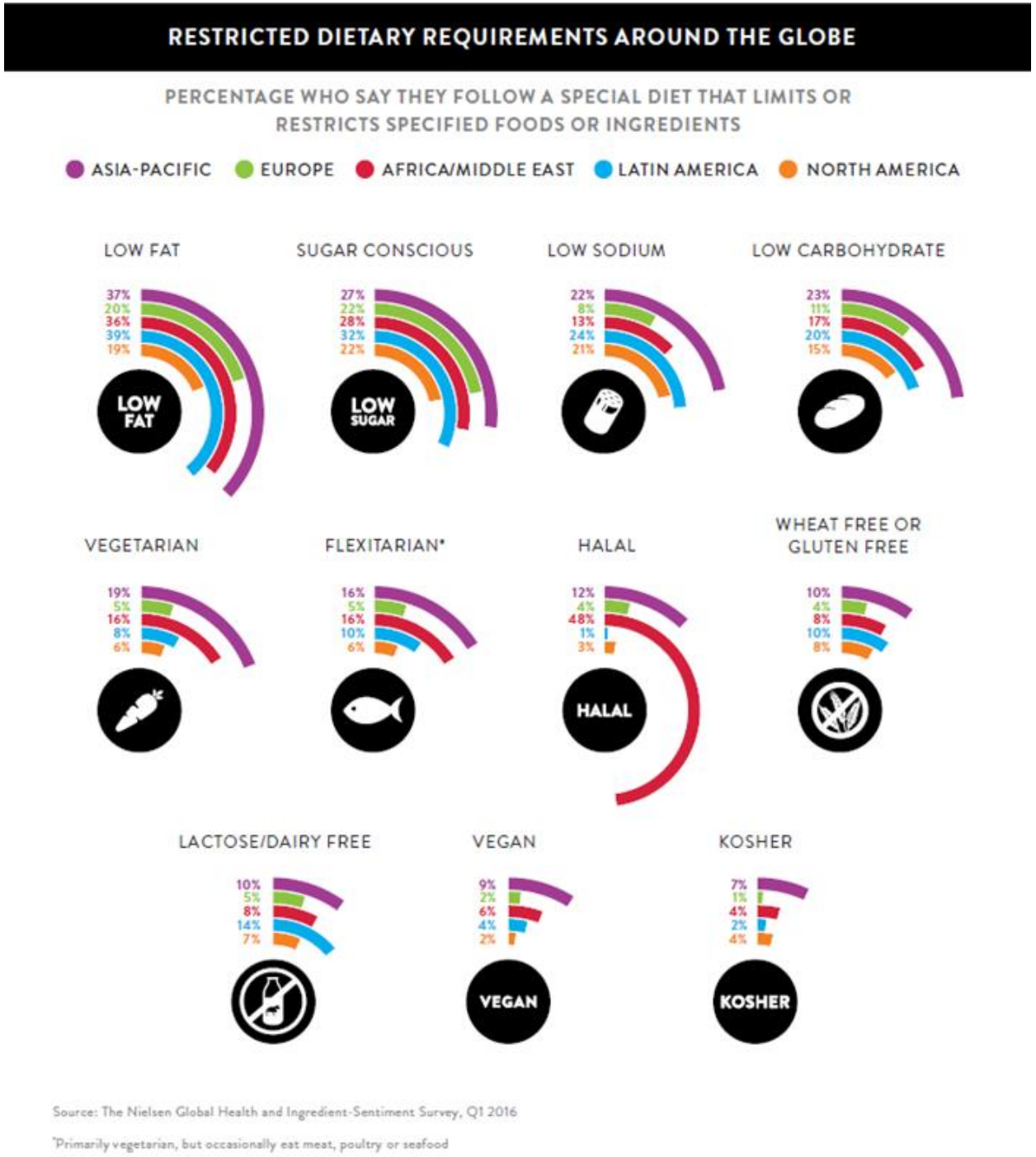


Makeover Monday – Trump's tweets

Interactive version:
http://www.vizwiz.com/2017/01/makeover-monday-tweeting-habits-of.html

Makeover Monday – this week

- Group work – discuss chart and suggest new version
- http://www.makeovermonday.co.uk/data/
- "What's in our food and on our mind – ingredient and dining out trends around the world" (Nielson report)



Working Group format

Questions

- Monthly or bimonthly?
- Format?
- Mailing list or Yammer group?

Topics people suggested they could lead

Topics:

- Graph databases – networks etc
- 3D printing for data visualisation
- Bristol is Open
- Icons and infographics
- 3D plots
- Design and interaction design
- User experience (Psychological principles)

Specific projects:

- Developing visuals for an eBooks project
- Visualisations of text

Specific Tools:

- d3
- R
- Python (inc pandas and seaborn libraries)
- Adobe Illustrator
- SAP Lumira
- Virtual reality and interactive visualisation

Topics people suggested they would like

Topics:

- Spatial data
- Whole genome sequence and metagenomics data
- Multi-dimensional data
- High-dimensional data
- Improving UX for web applications
- Infographics
- Visualising processes - e.g. a work flow
- Visualising time series data
- Visualisations for model checking and model development
- Interactive/animated visualisations for large data
- Reducing “big” data in a meaningful way in order to visualise, while retaining insight
- Communicating uncertainty
- Bristol Data Dome
- Patient data

Specific Tools:

- Javascript – particularly d3
- R
- Python
- Tableau
- Virtual Reality
- Adobe illustrator

Discussion:

- What do people mean by data visualisation?
- What do people need to help develop their data visualisations?
- Funding strategies for data visualisation projects
- Data visualisation for the social sciences
- Design: how to make stylish, intuitive and informative visuals
- Critical approaches to data visualisation

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www.bristol.ac.uk/golding