

Data visualisation – back to basics

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Published in the newsletter of the British Urban and Regional Information Systems Association, BURISA 188 June 2011

My involvement with data goes back a long way. I remember:

1. trekking across London to a computer bureau with a stack of punch cards containing program and data for our borough's small area population projections to be run overnight and returned by mail the next day
2. wrestling with triple-sized printout of 1971 census 10% small area stats, trying to make sense of migration and SEG data where most cross-tabs had no cases in most variables and all data had been barnardised
3. explaining in Newfoundland how we forecast population in North East Scotland's oil-driven economy, my *pièce de résistance* an overhead acetate with three coloured overlays showing births, deaths and migration. It took our technician two days to produce.

It seems like another era now with:

- free web based visualisation software
- open data – www.data.gov.uk alone includes 6,900+ data sets
- creative graphic designers who previously showed little interest in this work and didn't have the tools to realise their creativity
- proliferation of new media
- full colour printing as cheap as black and white.

I pondered these changes and past comments in the BURISA newsletter (for example, Data Visualisation – What is it?

by Sarah Hardwick of the South West Observatory, BURISA 187) and wondered what to add that was new and helpful.

I decided to go back to basics because some things have changed beyond recognition while others have remained constant. The danger is that the ease with which data can be accessed, manipulated and displayed becomes separate from understanding the data itself.

My ideal visualiser of data would be a – topic expert; statistician; graphic designer; artist; software developer; webmaster; and writer of plain English. Without these skills old sins will continue and new ones be added.

Take two simple recent examples.

The old fallacies

This graph of unemployment in Scotland was used by the Scottish National Party in a party political broadcast on 26 March 2011 (the poor quality image comes from [YouTube](#))



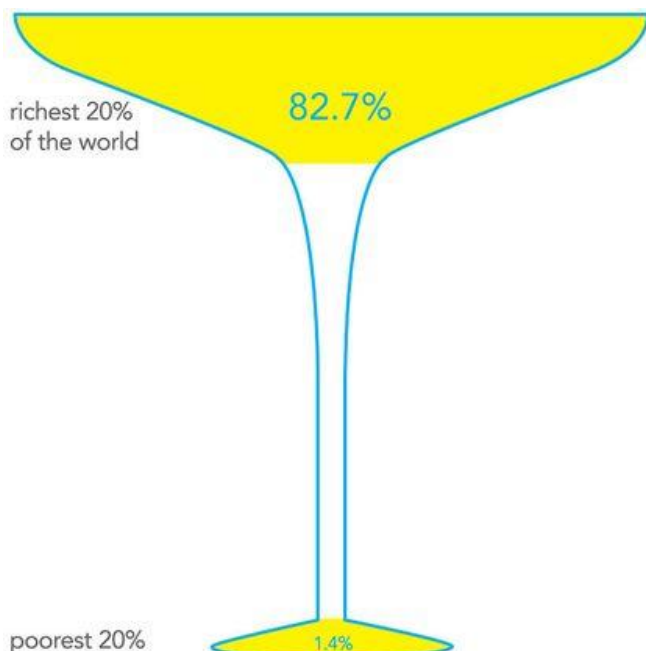
- The y-axis doesn't start at zero. That is unstated so the graph exaggerates changes
- Changes are shown for six months although the SNP had been in government at the time for four years

- An apparently arbitrary off-centre data point is included for an unnamed month
- Data points are joined with a downward curve suggesting the fall in unemployment is accelerating
- No source is given.

This is basic stuff. It happens all the time and shows that even simple visualisations can easily give a wrong impression.

The new graphics

By way of contrast, here is a graphic from the much-praised *Information is Beautiful* by David McCandless



In his book this is titled “Bottoms Up”, captioned “% of world’s wealth owned by” and says “Source: UN”. Many McCandless visualisations are stunning and tell a story difficult to summarise in words or numbers alone. This is different.

- Many readers don’t understand percentages. Including percentages of people and wealth in one diagram can confuse especially when one is rounded to a whole number, another to one decimal point

- As a metaphor the champagne/ cocktail glass is ambiguous. With the title “Bottoms Up” it could just as well imply this is to do with alcohol not wealth
- There is no definition of “wealth” and the source of the data is so broad as to be useless
- What happened to the middle 60% of people in the world who own 15.9% of the wealth? By implication they’re in the unshaded stem of the glass but invisible
- Most diagrams like this relate the percentage of a total population to the same percentage of their area. This doesn’t. It exaggerates the wealth owned by the poorest 10%, the opposite of what McCandless is trying to show.

This too-clever visualisation does both data and subject a dis-service. There is an imbalance in the skills it uses – high on artistic creativity, low on subject expertise and statistical understanding.

This is a simple example. With “mash ups” of large data sets available from innumerable sources through a computer with web access, the dangers of much bigger misunderstandings multiply.

So neither traditional nor newer exciting ways to visualise data eliminate the need for a balanced range of skills to understand, distil and present information. Readers might want to check their own understanding against the excellent [A guide to...Presenting Data](#) by the Local Government Data Unit – Wales. And then pass a copy to their graphic designers!

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