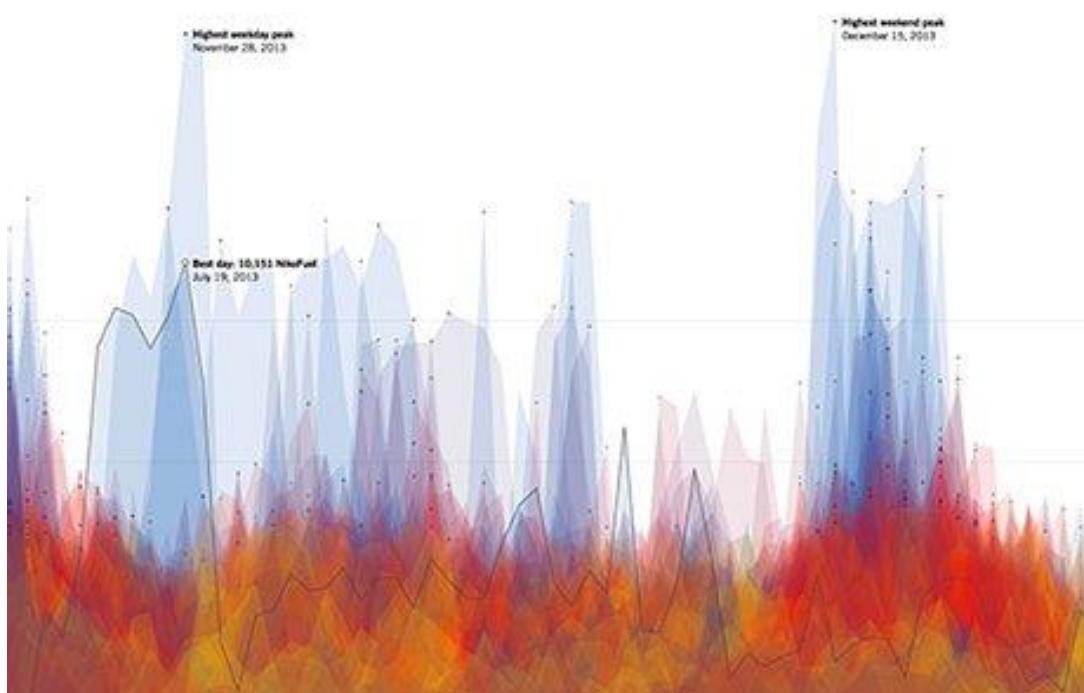


HOW TO READ INFOGRAPHICS AND DATA VISUALISATIONS?

A pedagogical guide



The media, as well as companies, institutions and NGOs increasingly use data visualisation¹. Indeed, this means of communication often allows them to present data, in particular economic data, in a more rapid and more accessible manner.

Data visualisation tools are particularly well-suited to the new forms of information consumption (key role of images and interactivity, immediacy specific to social networks, etc.). Furthermore, their recent growth has been fostered by the development of digital tools, which facilitate their production, and open data, which increases data sources.

For a long time, museums have used graphical representations and the Cité de l'économie offers, on its [website](#), a selection of economic data visualisation tools: [Easy stats](#).

Enjoyable to discover, instructive, sometimes beautiful and spectacular, infographics and other data visualisation charts can play a role in democratising access to information and knowledge.

However, like all forms of communication, they must be analysed in a critical manner. This is because they can intentionally or involuntarily be misleading. This short guide aims to contribute to enhancing our understanding of these tools.

Infographics and data visualisations present data in an elegant and sometimes even amusing way. Rather than looking at long tables of figures, with lengthy written commentaries, the public is invited to view data and play interactively with information, and absorb it.

In fact, infographics are not a new phenomenon. Cartography is a very old form of graphic representation. And, as early as 1854, the source of a cholera epidemic was discovered by showing on a map the dispersion of contamination cases.

However, in our times, data visualisation has blossomed. Infographic searches in Google increased eight-fold between 2010 and 2012, showing the keen interest of Internet users. To meet this demand, many media organisations have set up data journalism departments.

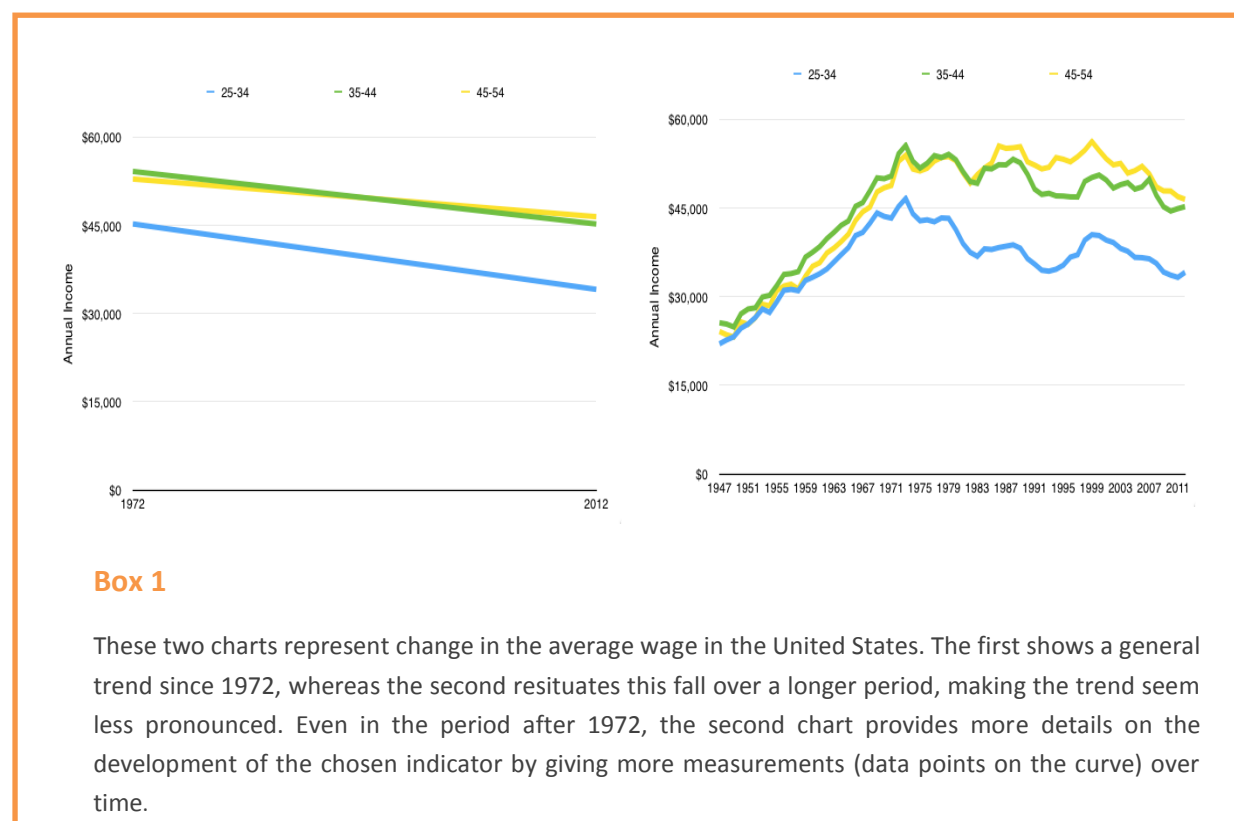
Infographics are far more effective than tables of figures in that they can simplify and arrange a large amount of data and transform them into a story. And yet, through their use of both figures and images, infographics can easily seem like telling an absolute truth. Discernment is therefore required.

Indeed, one can almost prove whatever one wants by **choosing** data that back up an argument, and by **representing** this data in **picture form**.

¹ The definition of data visualisation is not yet set in stone. Data visualisation is a way to process data and represent them in image form. It may be static (infographics per se), animated, or interactive. It may use charts, histograms, pie charts, maps, chronologies or an original combination of such tools.

1) DATA SELECTION

When infographics show how a phenomenon develops over time, the selected data may be patchy: they may focus on the period that supports the author's argument; or only use certain measurements in time, which smooths the details of a development, giving the illusion of a general trend (see Box 1 below).



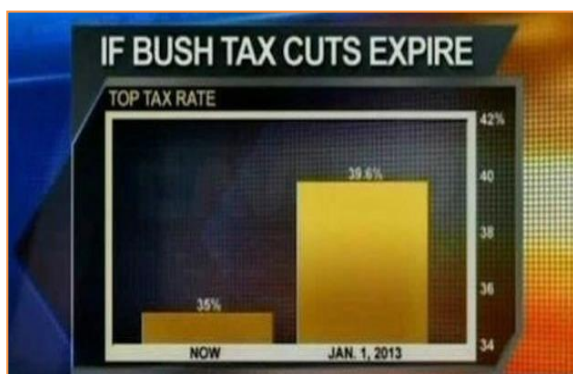
The measurement of a phenomenon is not an exact science. For example, for an infographic showing security in Nigeria, one author had estimated the annual number of abductions based on the number of newspaper articles on the subject, whereas numerous factors determine whether articles are published in newspapers.

An infographic must show the data source, exactly in the same ways as a Wikipedia article, for example, must provide its sources.

2) THE GRAPHIC REPRESENTATION OF DATA

On some charts, the axes are not identified, which makes data meaningless.

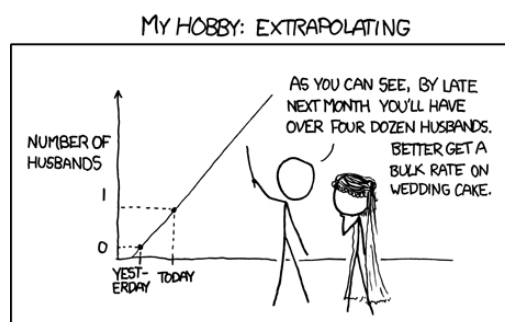
Some charts are truncated. A typical example of this consists in not starting the y-axis (vertical) at 0, which overstates the developments shown (see Box 2).



Box 2

This infographic shows the rise in the highest tax bracket on 1 January 2013 if the Bush government tax cuts had not been maintained by the Obama administration. By rising from 35 to 39.6%, the highest bracket jumps by 4.6 percentage points. Yet, this rise is represented as an explosion, thanks to the fact that the origin of the y-axis is not shown (only starts at 34%), and through the use of very broad histograms.

Creators of infographics may be tempted to estimate the development of a phenomenon by continuing the trend into the future, whereas a break in the trend cannot be ruled out: this extrapolation risk is highlighted by the cartoon in Box 3.

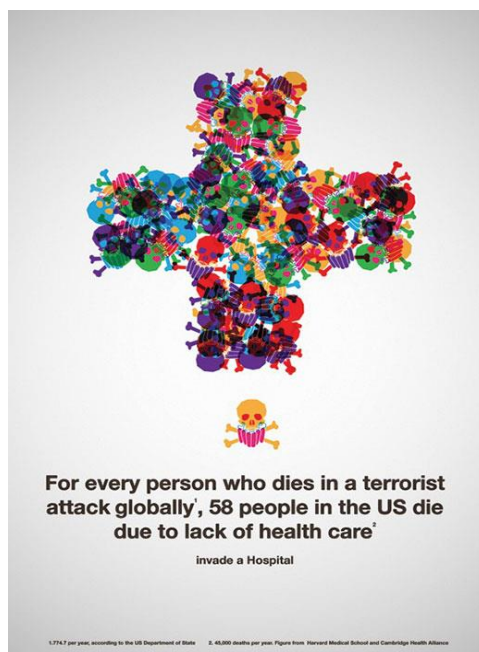


Box 3

In this cartoon, entitled "My hobby: extrapolating", a chart shows the number of husbands of the wife, increased (recently) from 0 (yesterday) to 1 (today) and many more (in the future).

Some infographics do not observe the traditional formatting conventions. For example, the sum of the different parts of a whole do not add up to 100%; or else data may be shown from right to left or from top to bottom, contrary to our visual culture.

More generally, the overall formatting of data (colour codes, layout, typography, pictograms etc.) may suggest a specific interpretation of the illustrated phenomenon (see Boxes 4 and 5 below).



Box 4

American campaign using a data visualization: *“For every person who dies in a terrorist attack globally, 58 people in the US die due to lack of health care”*. This infographic uses different methods to defend its message: the figures are based on averages from specific years that increase the ratio (1/58); the graphic representation of 58 skulls (deaths due to the lack of health care) evoke mass killings, terrifying compared to the single skull linked to terrorism.



Box 5

In these visualisations from an infographic on abortion, the ratio of people in the pictogram suggests that around 2/5 of abortions worldwide are carried out in the United States, whereas the figures given below show a ratio of 1/30, visually magnifying their importance in this country. More generally, abortion is represented by babies being thrown in a bin by women who appear fully responsible for this act, with no mention of any social or economic context.

4) COMING TO TERMS WITH INFOGRAPHICS BY LEARNING TO ANALYSE THEM

There's no such thing as objectivity. Any representation of information simplifies the reality. Data visualisations are no exception. In order for them to remain a useful means of displaying information, they must allow analysis, checking, and they must be called into question.

An infographic should neither be considered nor presented as an absolute truth, but rather should be an object that can be debated and criticised. In addition to merely providing references to its sources, ideally it should give its "recipe": how was it constructed, why did the author choose these data, this period, or this angle?

5) TOOLS MADE AVAILABLE TO YOU BY THE CITÉ DE L'ÉCONOMIE

As mentioned, the website of the Cité de l'économie has a section [Easy stats](#) that displays interesting economic data visualisations. Other examples are indicated, on a daily basis depending on current events, via the [Twitter feed](#) of the Cité de l'économie.

But the Cité has also created data visualisations, and we hope that they will respect the caveats given in this guide! : for instance, [See the world differently](#) and, directly in line with the subject of this guide, [Get data to talk](#). With the second interactive tool, you become acquainted with how to avoid the pitfalls of data correlations and learn how to distinguish between correlation and causality (see [here](#) the pedagogical guide -in French- for Getting data to talk).

6) AND WHY NOT CREATE YOUR INFOGRAPHICS?

Some data visualisations in our Easy Stats section not only present data but also allow you to create your own representative chart: this is the case for example of [Global-Economic-Dynamics-GEDVIZ](#).

In addition to these possibilities, you can use a number of free software tools to create infographics, including: [Datawrapper](#), [Piktochart](#), [Infographics](#), [Tableau public](#).

SOURCES

The examples in the boxes of this pedagogical guide were from the following sites: [Medium.com](#) (Box 1), [Gizmodo.com](#) (Box 2), [XKCD](#) (Box 3), [Visualisingadvocacy.org](#) (Boxes 4 and 5).