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What is data visualisation?

Let's start with a quick game. Grab a timer and look at the following sets of numbers. How many seconds does it take you to count all the 5's in Figure A?

37 32 92 91 44 8 78 66 25 77 86 33 39 83 93 24
43 12 5 61 23 38 33 91 46 49 71 3 85 17 27 42 98
40 10 76 16 68 20 81 06 21 36 74 22 97 67 60 50
82 14 63 38 18 1 7 62 29 70 87 35 31 64 19 19 26
69 72 47 80 99 11 87 28 54 96 41 4 2 45 48 100
13 89 79 88 95 30 65 90 9 84 34 25 16 75 62 14 5

Figure A

How many seconds does it take you in Figure B?

37 32 92 91 44 8 78 66 25 77 86 33 39 83 93 24
43 12 5 61 23 38 33 91 46 49 71 3 85 17 27 42 98
40 10 76 16 68 20 81 06 21 36 74 22 97 67 60 50
82 14 63 38 18 1 7 62 29 70 87 35 31 64 19 19 26
69 72 47 80 99 11 87 28 54 96 41 4 2 45 48 100
13 89 79 88 95 30 65 90 9 84 34 25 16 75 62 14 5

Figure B

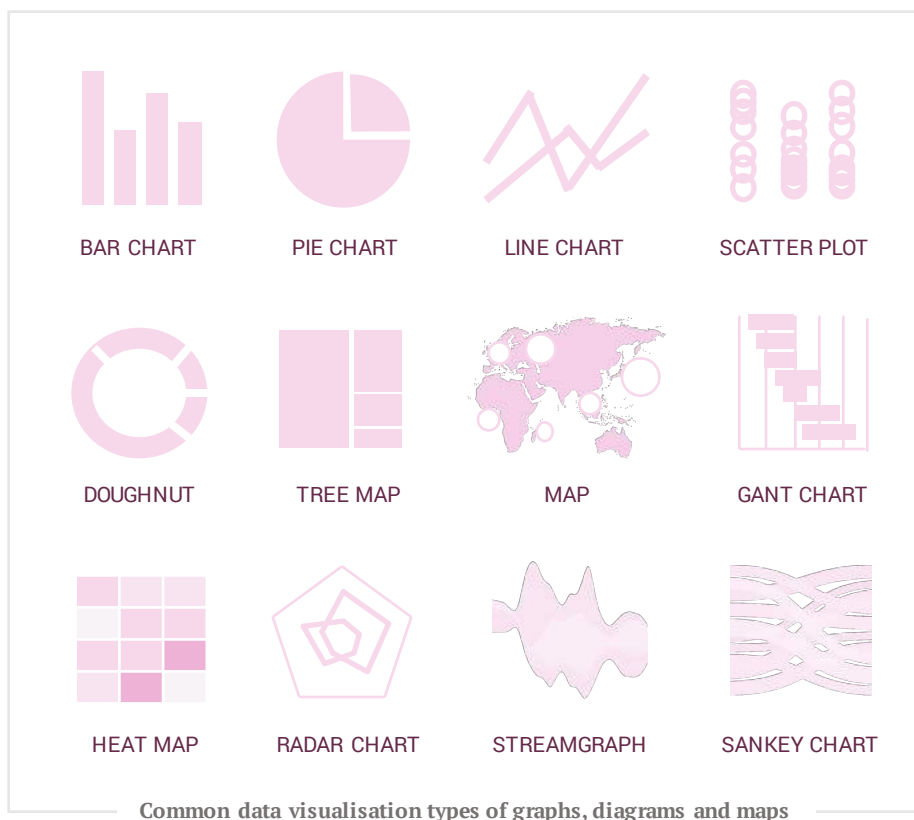
The easy and immediate perception in Figure B was possible thanks to the fact that the 5's were encoded with what we call a "pre-attentive visual attribute": a difference in line size, shape, orientation and/or colour (hue) that can be processed by your brain without significant effort. Visual tips are intuitive and help communicate complex information more easily and instantly. That's what data visualisation is all about: to communicate data quickly and efficiently.

“ That’s what data visualisation is all about: to communicate data quickly and efficiently. ”

It can start with very simple tools (like bar, line or pie charts), then get a bit more complex (scatter plots or streamgraphs) or just turn plain funky and artsy (infographics!). This document explores the basics of data visualisation, how far (and awesome) it can go, how it applies to you as a charity professional, some free tools and resources you can use to continue your data visualisation journey on your own.

The ABC of data visualisation

Data visualisation tools and techniques can rank from very simple to very complex ones. Here below is a short overview of some of the most well-known graphs, diagrams and maps used in data visualisation.



So, how do you know which one to go with? It depends on two criteria: **your data and audience**.

First, what data do you have and what type of information are you trying to convey with it? For example, if you are trying to show all the areas your charity is working in, a map might be useful, since the information you are trying to visualise is a list of locations. But if you are trying to show which areas are the ones where your charity is having the most and the least impact, a bar chart might be more useful since the information you want to visualise is a comparison of your performances in different locations.

“ So, which one to go with? Well, it all depends on two criteria: your data and your audience. ”

Second, who is your audience? For example, if your audience is extremely familiar with the information you are about to share, they might want to be able to explore the data themselves in extreme levels of details, like an interactive dashboard with filters and tooltips (next page, Figure D). But if your audience is the general public whom you are trying to inform a specific issue, they might not be able (or have the time to) process complex visualisations, and would rather view something simple and entertaining so they can understand and retain the information quickly and easily, like an infographic using actual photographs (next page, Figure E).

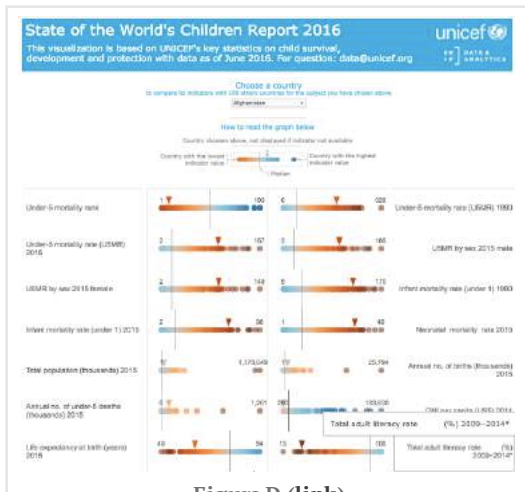


Figure D ([link](#))



Figure E ([link](#))

The relative objectivity of data

As much as one would like to believe that data & graphs are more objective than words & speeches, that is not true. Data will be as objective as you are allowing it to be. And chances are that you won't allow for much objectivity in your data at all. Data will always be affected by human bias – how the data is collected, how much of this data makes it through the visualisation and how much is left off, how it is presented and emphasized through visual effects, etc.

“Data will be as objective as you are allowing it to be.”

One of the best examples to illustrate this relative objectivity of data is a visualisation realised by Simon Scarr. Scarr regularly creates infographics for international newspapers, and this particular data viz got him to win a Malofiej International Infographics Award. Bluntly titled “Iraq Bloody Toll” (see on the next page), the orientation and colour of the bar chart has purposely been chosen to demonstrate how costly the war has been for soldiers and civilians lives.

Right next to it is the exact same bar chart (Figure I) revised by Andy Cotgreave, a data visualisation expert. He simply gave it a different orientation and colour, and, of course, a different title that highlights a quite different information: deaths in the Iraq war are on the decline.

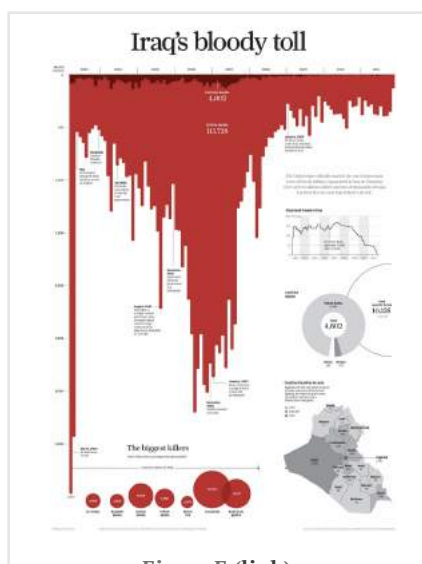


Figure F ([link](#))

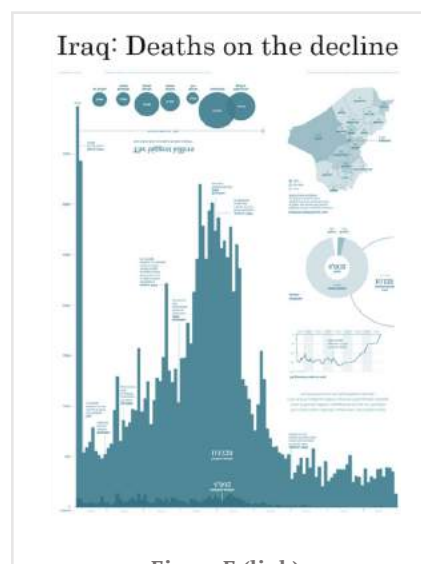


Figure F ([link](#))

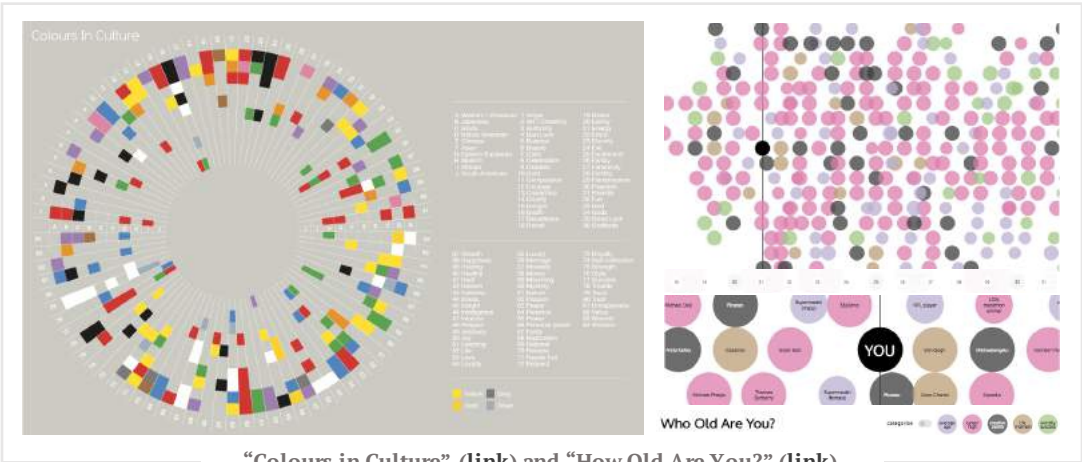
So when visualising data, be aware of your own choices. Be aware of your own end goal (why did you make that visualisation in the first place). Be aware of the message your visualisation is conveying and how it might impact the information. Be aware enough to be able to explain every one of your choices to your audience.

Between art and science

Talking about relative objectivity, this next paragraph might not be too impartial as we try to explore the visual wonders of data visualisation. “Attractive data sets” is not an oxymoron. Indeed, data visualisation benefits a lot from the artistic sense of designers – they will be able to turn raw data into appealing visual displays that will in turn get audiences interested in the data itself!

“ *Data visualisation benefits a lot from (...) designers.* ”

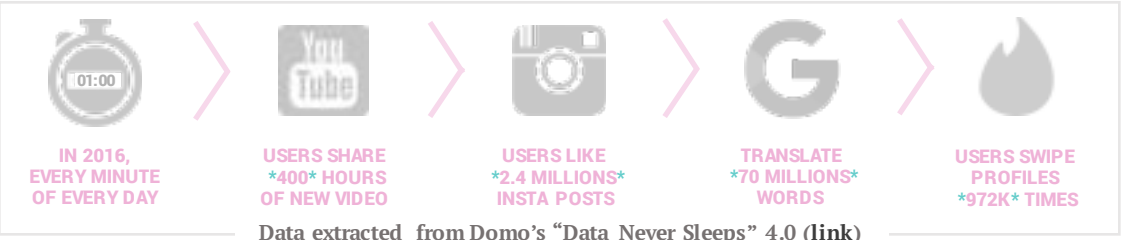
One of the most ardent guardian and trailblazer of “data turned into art” is David McCandless. Successful writer and designer based in London, he published two infographics books appositely named “Knowledge is Beautiful” and “Information is Beautiful”.



“Colours in Culture” ([link](#)) and “How Old Are You?” ([link](#))

Beyond art, data visualisation is also a science. For example, many of its principles and tools are grounded in descriptive statistics and some complex calculations used in data visualisations will need the author to have solid knowledge of maths and statistical queries.

Moreover, increasing amounts of data created by Internet activity (what is referred to as “Big Data” or “The Internet of Things”) makes it more difficult to store, sort, process and visualize data. Data science and roles like data engineers and data scientists have been created to tackle these new challenges.

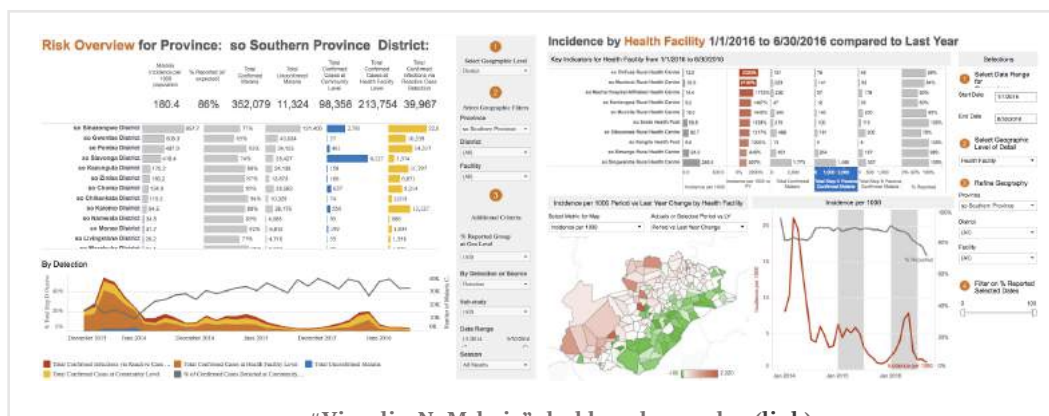


Charity sector case studies

So, how does all of this applies to you as a charity professional? Data visualisation has multiple uses for charities, from monitoring their internal resources to engaging with their audience, as well as supporting them in their daily actions. This was the case for #VisualizeNoMalaria, a project started by Tableau (a data visualization software company), PATH (an international non-profit organisation) and the Zambian government.

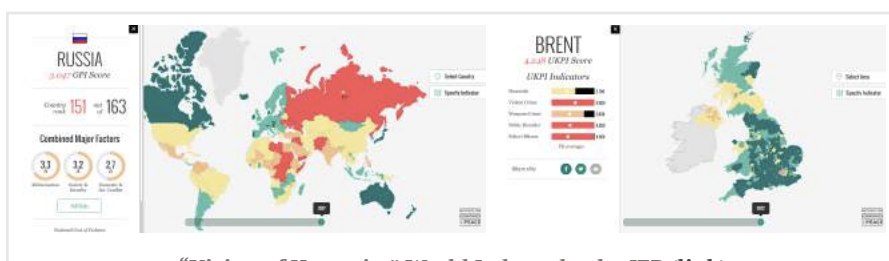
“ [...] from monitoring their internal resources to engaging with their audience, as well as supporting them in their daily actions ”

Built as a 5-years campaign, #VisualizeNoMalaria aimed at empowering first responders by providing real-time analytics. They would be given access to dashboards that would visually display overall risk rates, monitor incidents and reports from health facilities, so that they could dispatch appropriate resources where it was needed the most. Here below are a few screenshots of these dashboards (you can explore more on their website).



#VisualizeNoMalaria” dashboard examples ([link](#))

Another use for data visualisation is to highlight your charity mission in a more interactive and comprehensive way. The Institute for Economics & Peace allows users to explore up to date world indexes highlighting all the missions they have given themselves. Not only does it highlight their organizational purpose, but also helps track the impact of their actions. It is engaging yet educating, allowing them to be transparent with their data while raising awareness.



“Vision of Humanity” World Indexes by the IEP ([link](#))

Last but not least, data visualisation can be used by charities through infographics, as a way to tell more powerful stories to their audience. Half of our brain is involved in visual processing and the large majority of our sensory receptors are in our eyes. Thus people tend to better process (and more importantly, retain) information when they view it rather than hear it.

Oxfam created an infographic to help their audience understand the vocabulary differences between hunger crises. Not only the clear visuals helped non-professional audience to know exactly what type of crisis Oxfam is trying to tackle, but it also made them more likely to retain the information for later fundraising calls.



Let's Talk About Hunger – Oxfam ([link](#))

Tools & resources to kick off with

Now, it is time to practice: let's talk tools! As much as we would like to dive into the magical landscapes of data visualisation software, we know your time and resources as a charity professional are precious and limited. This is why this list only mentions four: Excel, Tableau, Visual.ly and Google Data Studio. However, if you are interested in more, have a look at [this 38-items list](#) or this [12-tools comparison](#). And please, please, forgive our terrible pun titles.



I Excel, you Excel, we all Excel at data visualisation

Free: Excel Online (or alternative, Google Sheets)
Free with condition: in the Microsoft Office Suite

If you have the Microsoft Office suite already installed on your computer, then Excel will allow you to take baby steps into the world of data visualisation. Start importing data from FileMaker, HTML, Text or connecting to your database (SQL Server or query).

Then practice the essentials of data visualisation using graphs and charts. Although it has its limits, whether it comes to the choice of available visual options or even the data capacity (one million rows maximum), Excel stays easy to practise with before taking a leap into the pool of pure data visualisation software.

It tends to be quite reassuring to use as most people have used the software at least once to create a table and will let you learn easily how to further explore your data thanks to the long (long) list of automated calculations available. If you are looking to easily create graphs and charts without wanting to go the extra step in visual "wow" and interactivity (tooltips and complex filters), the Excel is your go-to software.



Find the Leonard Data Vinci in you with Tableau

Free: Tableau Online

Free with condition: Tableau Desktop if you are a registered charity

Let's be completely transparent here – we could dedicate an entire page to the wonders of this software and never get bored. Incredibly intuitive, Tableau offers you an infinite of options to display and connect to your data. 24 charts, graphs and maps are suggested by default but it also allows you to build very complex charts and data displays thanks to the use of calculated fields.

It connects to Excel, Text & JSON files but also Google Sheets, Google Analytics, Oracle, Hadoop, Dropbox, Amazon Redshift and a very (very) complete list of SQL servers. It automatically suggests you which joint or union to do, which chart to pick or which calculated field to create, in a way that will help complete beginners while satisfying confirmed analysts.

You can create very clean and interactive dashboards in a few drags and drops, and if you ever needed help, they have an entire blog filled with videos and posts to help you learn and use the software alone. Last but not least, the online community around Tableau is quite incredible (share of tips, data sets) and will be ready to help you with the most completed and detailed advice if needed. If we had to write a love letter to a software, Tableau would be the one.



*Let's get visual *visual* with Visual.ly*

Free: using the Visual.ly platform and gallery for inspiration

On quote: hiring the Visual.ly designers to work on your project

If your focus is more visuals rather than data, infographics rather than complex dashboards, then Visual.ly is your tool buddy! Their design resources allow to build stunning visualisations in a few easy steps. Just have a look at their extensive online gallery: this is what pure information awesomeness looks like! So, how does it work?

First, you describe your project (infographic, video, e-book, presentation) and audience (businesses, consumers, non-profit) to Visual.ly. Then, they connect you with the most qualified and designers who can get your idea to the next step of visual magic. In fact, several of their team members won multiple design awards while working for Visual.ly.

Visual.ly works with business giants like Salesforce, LinkedIn and Spotify, newspapers like The Economist, Huffington Post and National Geographic, but also major international organisations like the UN, Unicef and Unesco – so you can be assured they will deliver some of the best and most engaging visualisations in town.



It is time to Google “Google Data Studio”

Free: Free version of Google Data Studio 360 (includes unlimited reports since 2017)

Not free: Premium version (includes multiple user accounts and customer service)

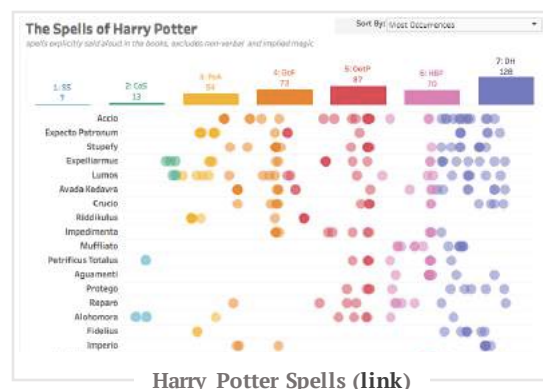
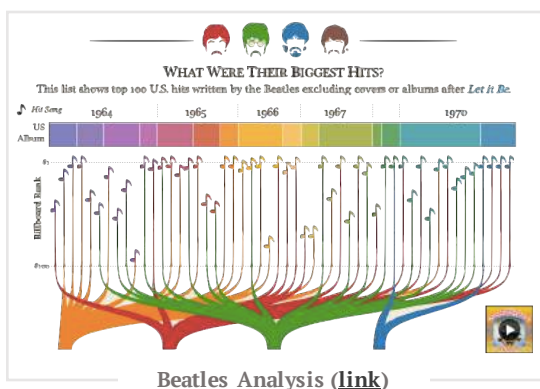
First, Data Studio is (obviously) easy to connect to Google Analytics, Sheets, AdWords and YouTube – which is a plus when you are short on time and haven’t practiced database unions and joins. Second, it allows you to create visualisations in a few clicks thanks to a great drag & drop menu, templates and a plethora of solutions predicted by the software from your Google data.

It is very easy to use and quick to figure out from the get-go, even if you are not a Google Analytics pro yourself. Customisation is obviously available and you should be able to come up with clear reports than anybody can access and view it from any device (the mobile optimisation of the views is very well made) – which is great for collaboration and sharing.

The main limit of Data Studio is that you cannot drill down and explore your data in too much depth. In the end, it is a perfect tool for data visualisation, as long as you are not looking at relying too much on actual data analytics behind the visuals.

What next?

If you want to learn more about the science behind visual perception, have a read at [this](#) paper and [this](#) infographic about infographics (#inception). If you need inspiration, explore the galleries of Tableau Public (below), Visual.ly or browse the Information is Beautiful blog. And if you are eager to start creating information awesomeness, check out the “[Data Viz Checklist](#)” we created just for you on the next page! You are welcome!



That’s it for now! Want more?

Head to the CharityConnect website to engage, learn and thrive with charity professionals. See you there!

 **CharityConnect**



My Data Viz Checklist

Decide of your overall goal

In data visualization, ideas are as important as the data. You need to decide of your overall goal: what are you trying to achieve by making this data viz? Inform about a subject? Report trends? Present results?

Write down your message

Based on that overall goal, you can deduce the message of your data viz. Write down in once sentence what your visualization should express. E.g. "Oceans levels are rising"; "Illiteracy is decreasing in Europe".

Know what your data can do

Actually, just know your data. Full stop. Take a moment to explore what you have: the scope, the level of details, the possibilities of filtering or interactivity, etc. Know its limits, know its horizons.

Assess your audience

Who will see your data viz? Just you? Your top management? Your entire charity audience? Are they experts or novices regarding the data you are sharing? Will they be familiar or new to your message?

"Steal like an artist"

Like Austin Kleon's eponymous book explains: there is nothing wrong with inspiring oneself from others. Creative work builds on what came before, including somebody's else viz. Needless to say - don't plagiarize.

Make choices (even hard ones)

Like we discussed before, data visualisation is all about making choices. What to show, what not to show. Choose your scope, your dates, your tooltips, your colours. Make sure they serve your goal and message.

Draw your viz by hand first

Get your Picasso on. Grab a pencil, get sketching. It will allow you to view and place all the elements of your viz quickly and easily – don't forget to include eventual legends, titles, subtitles, tooltips, filters, etc.

Find a functional vs. beautiful balance

Truth and accuracy should never come second because of aesthetic purposes. When making your choices, make sure than even when telling a beautiful story, your data viz stays functional and correct.

Keep it simple stupid

KISS is an acronym for "Keep it simple stupid" noted by the US Navy in 1960s. It is pretty straightforward: any unnecessary complexity should be avoided in design in general, but in data visualisation especially.

Keep trying and practising

Print out Becket's famous quote ("Fail, fail again, fail better") and put it up next to your screen. Complex data visualisation don't come to their authors in an hour, it takes time and practice. So let's get vizzin' !



THIS DIGITAL GUIDE
WAS CREATED BY
CLAIRE DEVILARD FOR



CharityConnect
Engage. Learn. Thrive.