

DATA VISUALISATION: WHAT'S IT ALL ABOUT?

NPC briefing, August 2017

Oliver Carrington and Sarah Handley

On 14 June 2017, NPC held a seminar for charities on data visualisation. The event, chaired by **Lucy de Las Casas, Director of Think Tank and External Affairs, NPC**, was part of NPC's measurement seminar series designed to support charities to make the most of their data.

At the event, **Sarah Handley, Deputy Head of Measurement and Evaluation at NPC**, provided an introduction to data visualisation and the benefits that it can bring. Delegates then heard from **Debra Hertzberg, Research Manager, Homeless Link**, and **Siân Whyte, Head of Impact and Evaluation, Citizens Advice**, who talked about how their organisations use data visualisation techniques.

This report summarises the main themes and advice from the event, also drawing on the questions of those who attended. It looks at what data visualisation is, how charities can think about using it and provides some tips and resources.

What is data visualisation?

Data visualisation is a catch-all term for presenting information in a visual way. For charities, this is often information about the people they work with, the activities they do or the differences that they make. Visualisations can range from snazzy infographics and complex interactive tools to humble bar charts and line graphs.

Although commonly found in social media, television and newspapers today, visualising data isn't new. Charts, maps and infographics have been used to visualise data for centuries—for instance, Charles Booth's coloured map (Figure 1) highlighted areas of poverty in Victorian London.¹ Whilst not new, society's appetite for visual ways to make sense of information quickly has grown. At the same time, advances in digital technology have it made much easier to create and share data visualisations. You no longer need to be a mathematician or an artist to create a good chart or a graphic and this briefing will highlight some of the tools and approaches that you can take.

Figure 1: Charles Booth's poverty map from 1889



¹ Charles Booth's poverty map: <https://booth.lse.ac.uk/learn-more/download-maps/sheet3>

How can visualising data help your charity?

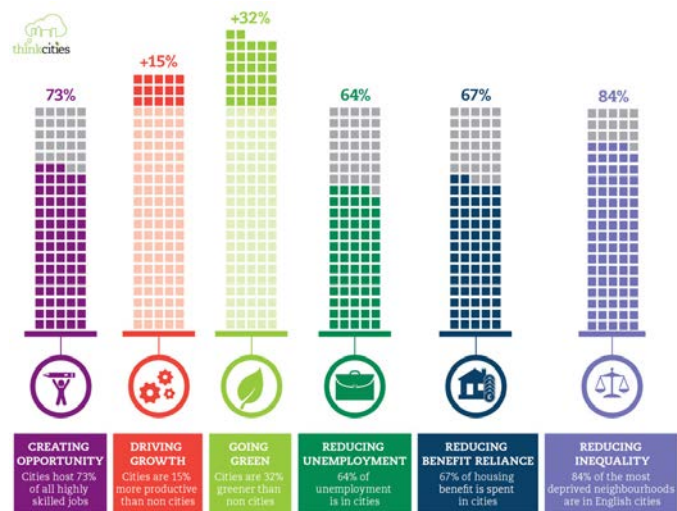
Raw data needs to be translated into meaningful information for it to be useful. Analysing information and presenting it visually can make it more memorable and help people interact with the data and understand what is happening in ways that might not have been immediately apparent. Charities can use visuals to make the most of their data for both external and internal purposes.

Communicating your data to external audiences

Data visualisation is often used to make data more accessible and attractive to external audiences. For example, an interactive tool on the Centre for Cities website (Figure 2) allows users to view economic data through heat maps, bubble charts and scatter graphs.² Data visualisation can also provide inventive ways for users to access information services. Citizens Advice has a live dashboard on its website (Figure 3), allowing users to see how many people are currently on the website and click through to see the results of their searches.³

A key strength of using data visualisation is how it can communicate your research or survey results to people who might be unlikely to read a long report. Homeless Link and Citizens Advice both use infographics to present the headline statistics from their research to encourage people to find out more about the charity and its causes.

Figure 2: Infographic from Centre for Cities

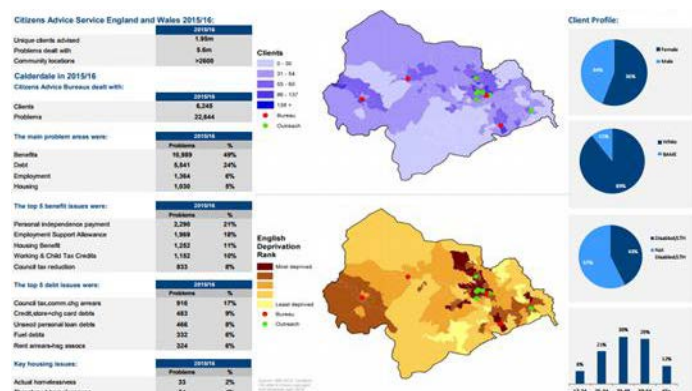


'You can use data visualisation to entice people into a full report—it's about having a mix of methods to present the data.'

Sian Whyte, Head of Impact and Evaluation, Citizens Advice

A good infographic or chart can be used to highlight a social injustice or show the impact and progress of your activities. This can trigger strong emotions and help spur your viewers into action—whether that action is signing your charity's petition, pledging to volunteer or deciding to donate. If your graphic is designed for social media it can potentially reach a large number of people, communicating a message in a simple bitesize way. Tweets with images are much more likely to get the attention of users (Figure 4).⁴ Debra Hertzberg also pointed out the benefit of being able to control this message when it has been shared more widely. Unlike a quote, a carefully prepared graphic with key figures is less likely to be miscommunicated or taken out of context.

Figure 3: A Citizens Advice dashboard



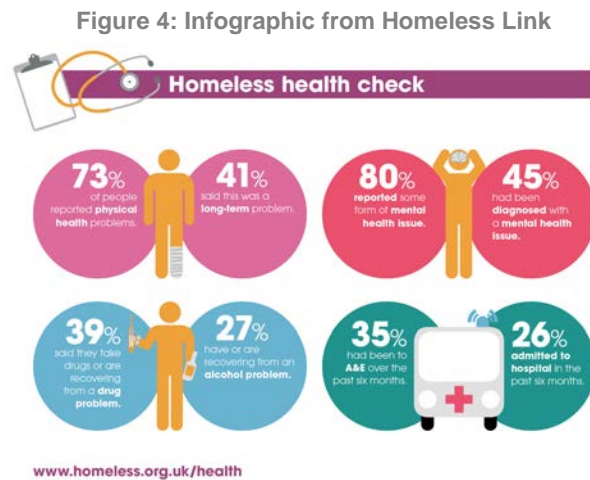
² The Centre of Cities tool www.centreforcities.org/data-tool

³ Citizens Advice tracker: www.advicetracker.devops.citizensadvice.org.uk

⁴ Homeless health check tool: www.homelesshub.ca/blog/infographic-unhealthy-state-homelessness

Empowering your internal audiences

For internal audiences, visualisation can help uncover patterns and trends from your data to support staff and trustees to make decisions based on evidence. This might be the results of a campaign, the changing characteristics of your charity's service-users or the geographic spread of applications made to a grant-making programme in relation to population levels. Sophisticated dashboards can be developed allowing you to add filters to make sense of your data. Presenting data clearly through graphics can also secure buy-in from frontline staff—helping your staff engage with your charity's results and see the difference that it makes.



NPC's *Global innovations in measurement and evaluation* looked in detail at how network analysis⁵ formed part of an evaluation of Elefriends, Mind's peer-to-peer support forum. By visualising the data, it became evident that users interacted within small clusters rather than creating wider peer networks—allowing the charity to make decisions on how to spread information throughout the forum.⁶

Case study: Infographics and interactive tools at Homeless Link

Homeless Link is a national membership body for charities working directly with people who are homeless or who live with housing, care and support needs. It campaigns for policy change on their behalf, shares advice on good practice, provides training and explores new ways to tackle homelessness. Data visualisation has been a useful tool for Homeless Link in helping it share data on homelessness to its members and communicating key findings to a wider audience.

Homeless Link has interactive tools embedded on its website for users to access official data on statutory homelessness figures. Users can make multiple queries to compare this data and take a closer look at the details at a national and local level. This helps to make data from government reports much more accessible and useful to charities, researchers and the press—without the need to trawl through large data sets.

Homeless Link also creates compelling infographics from key findings from this data that can be shared widely. These graphics help to highlight the cause and keep the issues of homelessness at the front of people's minds. They are custom-made by an external expert who uses a consistent style and the charity's colours and style to reinforce the charity's brand.

'Sharing infographics based on data about people who are homeless keeps the issue on the agenda.'

Debra Hertzberg, Research Manager, Homeless Link

⁵ Weston, A., Kazimirski, A., Kenley, A., McLeod, R., Gripper, R. *Global innovations in measurement and evaluation*. New Philanthropy Capital. (Page 20).

⁶ Mind's Elefriends evaluation: <http://2plqyp1e0nbi44cllfr7pbor.wpengin.netdna-cdn.com/files/2013/01/Social-media-and-austerity-Interim-report.pdf>

Where to start in data visualisation?

Looking at the wide range of data visualisation tools available it is tempting to get stuck in straightaway. But speakers at the seminar suggested that you should carefully think through the approach to take.

Step 1: Figure out what you want it to achieve

Being clear about the goal of presenting your data visually will help you design it in the right way. Do you want to use this opportunity to teach, engage or persuade someone to act upon this information? What is the takeaway message that you want viewers to leave with? Defining your message is a crucial step in the process and your graphic should reinforce who your organisation is and what it does. Sarah Handley suggested writing down a narrative of the key points that you want your visualisation to communicate before starting.

'Be clear from the start about what you want to say with your data.'

Debra Hertzberg, Research Manager, Homeless Link

Step 2: Think about your audience

For all its benefits, data visualisation may not be the best option for every circumstance. If you don't have a public-facing platform to share your message or if your internal audience requires information to be presented in a specific format, it is unlikely to be as useful to you. This will not be a barrier for many charities, but it is still important to consider how to best reach your audience.

Ask yourself what they know already, what you want them to find out and how much detail they require. If you have a specific group of people in mind, like your trustee board, check whether there are any disabilities to take into account such as colour blindness. Then think about how you can share this message with this audience. This will help you decide whether your graphic needs to be social media friendly, embedded on your website, as an image within a longer report or at the top of your trustee papers. These different ways are likely to both limit and open up possible ways of displaying this data.

Step 3: Prepare your data

'There is no point creating a beautiful graphic if the data behind it doesn't make sense.'

Sarah Handley, Deputy Head of Measurement and Evaluation, NPC

Data visualisations must be based on good quality data from a verifiable source. The same principles and practice of data collection, protection and analysis apply to any data behind the visualisation. Debra Hertzberg warned that it is important to clean your data before using it—which can often be the hardest part of the process. When working with large data sets, it is worth investing in a database or customer relationship management system (CRM) to help you prepare your data. Above all, you should visualise data in an honest and transparent way.

The type of data that you have is also important. Quantitative data lends itself to data visualisation more than qualitative data, as numbers are much easier to compare and to present visually. There are some tools that can be used to visualise qualitative (see word clouds in Table 1), but these methods are not good substitutes to rigorous qualitative data analysis.

Step 4: Think about how to visualise your story

Once you have analysed your data you should have a good idea about what data properties you want to present—this could be a highlighting variation or comparing change over time of data for different groups. For example, you might want to create a map to show where in the UK your service-users live in order to focus support and uncover gaps. Or you could use a graph to show stakeholders that your charity is focusing on the hardest people to reach, comparing the percentage of pupils on your in-school programme that are eligible to receive free school meals with the national

average. Table 1 below gives some examples of the best visualisation techniques to use depending on what your data is telling you.

'Use the clearest and simplest designs to present your data.'

Siân Whyte, Head of Impact and Evaluation, Citizens Advice

The key message at the seminar on visualising your story was to keep your data visualisation as simple as possible. Simplicity can help achieve clarity, which is essential in a good infographic or chart (see Figure 5)⁷. By including overly complex and unnecessary information, this can detract from the point that you are trying to make. After all, the reason for visualising your data should be that viewers can quickly and easily understand the message.

This doesn't mean it has to be boring. Siân Whyte described how Citizens Advice often use familiar forms such as bar charts, but presented in a stylish and engaging way. The humble bar chart is a visual that people are used to and they are also very versatile—able to show change over time as well comparison between different categories.

Figure 5: Citizens Advice graphic map

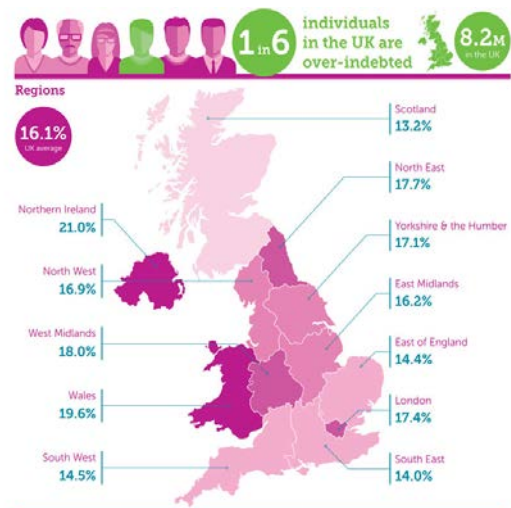


Table 1: Different visualisation techniques and what they can be used for

What your data shows	Appropriate visualisation technique to use
Facts and figures	Icons and images to draw attention to the data values
Comparison, rank and distribution	Bar charts and heat maps using shapes and colours to represent numerical values
Proportion or part-to-whole	Pie charts, donuts, stacked bar charts, tree maps show distribution within a group
Change over time	Line graphs for time-series analyses with optional trend lines to decipher patterns
Relationships and trends	Scatter plot and bubble graphs can help show correlation
Geographical spread	Heat maps to show concentration on a map
Text analysis	Word clouds to visually display the most common words in a qualitative dataset

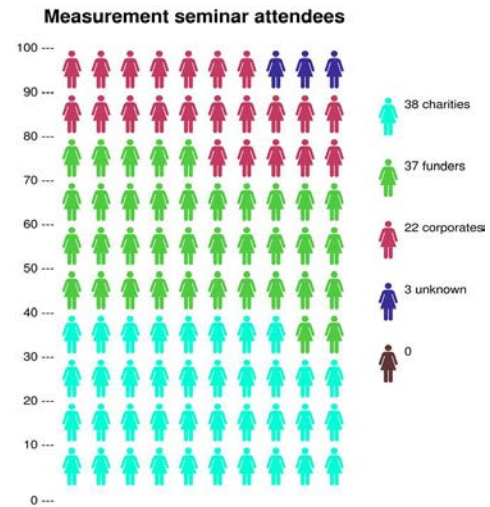
⁷ Citizens Advice graphic map: www.relateni.org/citizens_advice_new_free_debt_advice_service

Step 5: Decide if you need support

Thanks to the wide range of digital tools available you do not need to be expert to create compelling and effective graphics and charts. The tools are designed to be user friendly and when you get stuck, you can find many step-by-step tutorials on the relevant websites. At the seminar, Sarah Handley shared an infographic that she mocked up in a matter of minutes using [Icon Array](#) (Figure 6).⁸ You can find more tools on page 8. Don't forget Excel: it is the most common tool for data visualisation and can create many good charts and graphs.

At the same time, do not underestimate how much time and thought can go into a good chart or graphic. This is particularly true if your data set is very complicated. You can use data scientists to help explore your data and designers to present your information in a sophisticated and original way. Citizens Advice has in-house expertise in data visualisation, while Homeless Link uses an external expert to create graphics with a consistent style in line with its brand colours. Prices can vary, but it need not cost the earth. One audience member mentioned www.peopleperhour.com⁹ as an easy way to find freelance professionals for short-term projects.

Figure 6: An example of a quick infographic created on Icon Array



Case Study: Visualising data scale at Citizens Advice

The Citizens Advice service is made up of a national charity and a network of around 300 Citizens Advice members that are all independent charities. It provides free, confidential and independent advice, and works to fix the underlying causes of people's problems. Last year, 2.7 million people sought help from Citizens Advice about 6.3 million issues, to help solve problems with their finances, employment or housing

'Data is at the heart of what we do at Citizens Advice.'

Sian Whyte, Head of Impact and Evaluation, Citizens Advice

In order to deliver an effective service to clients, data is systematically recorded within its CRM on the issues raised and characteristics of the people it helps. Once anonymised, it can provide real time data that can be downloaded for analysis into Excel or plugged into software like Tableau. This evidence enables Citizens Advice to identify the problems people are facing, understand what is causing them, and make recommendations to government, regulators and other organisations on how to fix them.

In recent years, Citizens Advice has aimed to encourage people to explore its data further. Effective data visualisation is one way of doing this—tailoring communications to various internal and external audiences who have different interests in their data. For example, their data team recently published an interactive 'Advice Trends' dashboard that enables the public to explore its data on types of issues they help with and how they cluster, as well as compare this across different time-periods, regional areas or client profiles.

Internally, local Citizens Advice can access interactive dashboards tailored to their communities. Doing this well takes investment in time and thought, as well as the right skills and products—but has considerable benefits. Good data visualisation has also played an important role in how Citizens Advice communicates what it does and how it reports its impact. Their first impact report helped consolidate their brand refresh, and was singled out for praise when Citizens Advice won 'Charity of the Year' in the 2015 Charity Times Awards.

⁸ Icon Array: www.iconarray.com

⁹ People per Hour: www.peopleperhour.com/

Top tips for visualising data

At the seminar, speakers shared their design tips as well as answering questions from the participants on how to get started in visualising their data.

Designing your data

All visualisations should summarise data and communicate your findings in an intuitive way. As well as the standard design guidelines of consistency and clarity, there are several specific points to keep in mind when creating your graphic or chart:¹⁰

- **Colour** can aid comparisons and highlight particular parts of the data—the best graphics use only a small number of contrasting but compatible colours, suitable for people with colour blindness and reprinting in black and white.
- **Order** data in graphs intentionally in a logical sequence, with appropriate data ranges, to help viewers interpret the data (eg, in numerical progression from greatest to least or by time period).
- **Avoid 3D charts**—do not be tempted to ‘spice up’ your graphic in this way, these are often difficult for viewers to read and can hide or distort data.
- **Simplicity** is key. Do not include different variables on different scales in your chart or dilute and overload with decoration, gridlines or unnecessary information—everything should have a purpose.

‘I’m sure you have experiences of becoming more confused rather than enlightened after viewing a particularly complex infographic or graph.’

Sarah Handley, Deputy Head of Measurement and Evaluation, NPC

Perfecting your charity’s approach to data visualisation

Your design ability will not be the only consideration. Here are some further tips for getting the process right:

- **Test out the graphic** and be prepared to adapt it. This can be as simple as sharing it first with people who are not as familiar with your work or comparing it to other people’s graphics that capture your attention.
- **Train up** in data visualisation and Excel skills, by attending courses or using free online courses like [FutureLearn](#)¹¹ and [Udemy](#)¹². Then become a ‘topic champion’ within your organisation, sharing your new found expertise at lunchtime sessions and when required in projects.
- **Transparent reporting**—a good chart or graphic can mask weak research and poor evaluation. Ensure that your visuals are communicating an honest picture.
- **Data protection** concerns should not put you off sharing your charity’s data—just apply your charity’s general data principles here as you would in any other part of your work, making it impossible for any identity to be revealed (for more on this contact the Information Commissioner’s Office and check out NPC’s guidance on [data protection](#)¹³).

‘You can often get attached to the images you produce, so take the effort to review them critically and be ready to adapt them if you are not getting the right message across.’

Siân Whyte, Head of Impact and Evaluation, Citizens Advice

¹⁰ Evergreen, and A. Emery. (2014) Data visualization checklist. www.stephanieevergreen.com/dataviz-checklist

¹¹ Future Learn: www.futurelearn.com

¹² Udemy: www.udemy.com

¹³ Gyateng, T. *Protecting your beneficiaries, projecting your organisation*. New Philanthropy Capital.

Final thoughts

Charts and graphics are powerful tools for analysis and communication, but many charities are still yet to benefit from using them effectively. To use data visualisation, charities should plan carefully and be prepared to experiment with the wide range of tools that are out there. To think carefully about how the use of charts and graphics could help increase the impact of your work both internally and externally—whether that is about reporting results, helping to make strategic decisions or persuading potential supporters to engage with your charity's cause.

Online resources to help visualise your data

There is a wide range of tools that you can use and most are free.¹⁴ These tools may meet your needs completely or help you create a draft version that you can then pass to designers to perfect.

If all you need is images to break up the text, the **Noun Project** (www.thenounproject.com) has a wide range of free icons to download and use.

For more assistance in designing an infographic, **Icon Array** (www.iconarray.com) and **Piktochart** (www.piktochart.com) have free easy to use templates. **Canva** (www.canva.com) can also help bring different types of data together into one graphic.

To present qualitative data such as text from the open comments of a survey, you could create a **word cloud**. **Tagxedo** (www.tagxedo.com), **Wordclouds** (www.wordclouds.com), **Wordle** (www.wordle.net) and **Word tree** (www.jasondavies.com/wordtree) are all tools to analyse and show the frequent words in a body of text.

For charities with quantitative data to upload, **Datawrapper** (www.datawrapper.de), **amCharts** (www.amcharts.com) and **Highcharts** (www.highcharts.com) are open source tools that can help you create a range of infographics, charts and maps. **Carto** (www.carto.com) is another tool to help present data on geographic maps, while **Netlytic** (www.netlytic.org) specialises in visual analysis of social media and **Mindomo** (www.mindomo.com) can translate information into mind maps.

Tableau (www.tableau.com) has a suite of tools to create a variety of graphics and dashboards. **Tableau Public** is free to use, but may not be appropriate for your charity's sensitive data. Instead, non-profit licences for **Tableau Desktop** are available for a fraction of the price.¹⁵

For more adventurous users, business intelligence tools **Power BI** (www.powerbi.microsoft.com) and **QlikSense/Qlikview** (www.qlik.com) can help you create interactive visualisations, dashboards and apps.

Further reading

Boswell, K. and Handley, S. (2017) *Result! What good impact reporting looks like*. New Philanthropy Capital.

Harries, E. (2014) *Data that speaks for itself*. New Philanthropy Capital.

Gripper, R., Kazimirski, A., Kenley, A., McLeod, R. and Weston, A. (2017) *Global innovations in measurement and evaluation*. New Philanthropy Capital.

Gyateng, T. (2015) *Protecting your beneficiaries, protecting your organisation*. New Philanthropy Capital.

New Philanthropy Capital et al. (2012) *The principles of good impact reporting*. New Philanthropy Capital.

Hubspot, *An introduction to data visualization*

¹⁴ The Charity Catalogue has more tools here: www.charitycatalogue.com/collection/data-visualisation. DataVis also has more details on tools here: www.tdatavis.onthinktanks.org/data-visualisation-resources

¹⁵ For details on Tableau Desktop for charities: www.tt-exchange.org/product/7806/tableau-desktop-professional-2-year-subscription

TRANSFORMING THE CHARITY SECTOR

NPC is a charity think tank and consultancy. Over the past 15 years we have worked with charities, funders, philanthropists and others, supporting them to deliver the greatest possible impact for the causes and beneficiaries they exist to serve.

NPC occupies a unique position at the nexus between charities and funders. We are driven by the values and mission of the charity sector, to which we bring the rigour, clarity and analysis needed to better achieve the outcomes we all seek. We also share the motivations and passion of funders, to which we bring our expertise, experience and track record of success.

Increasing the impact of charities: NPC exists to make charities and social enterprises more successful in achieving their missions. Through rigorous analysis, practical advice and innovative thinking, we make charities' money and energy go further, and help them to achieve the greatest impact.

Increasing the impact of funders: NPC's role is to make funders more successful too. We share the passion funders have for helping charities and changing people's lives. We understand their motivations and their objectives, and we know that giving is more rewarding if it achieves the greatest impact it can.

Strengthening the partnership between charities and funders: NPC's mission is also to bring the two sides of the funding equation together, improving understanding and enhancing their combined impact. We can help funders and those they fund to connect and transform the way they work together to achieve their vision.

New Philanthropy Capital

185 Park Street, London SE1 9BL

020 7620 4850

info@thinkNPC.org

[@NPCthinks](https://www.thinknpc.org)

Registered charity No 1091450

A company limited by guarantee

Registered in England and Wales No 4244715

www.thinkNPC.org