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From Theory
to Research, to Practice

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INTRODUCTION

Guidelines that bring research and practice together and that take visual perception and cognition into account are both necessary and useful when visualising information. Moreover, guidelines are open to interpretation and can be adjusted to the specific information context being dealt with. Guidelines are for responding to context, not for setting it (Berinato, 2016).

I wanted to bring together existing literature and experiences in good information design to create a series of best practice guidelines. I reviewed literature to:

1. Identify principles for the effective use of information visualisation;
2. Identify obstacles to effective communication;
3. Ascertain and examine case studies where information communication was significant to the outcome;
4. Develop rationales for good practice.

I identified a total of 486 information visualisation guidelines in the literature. These are guidelines from research that were identified in academic papers involving experimental testing, academic papers with a more theoretical focus, academic papers reviewing and discussing existing research, etc. Additional practice-based guidelines, i.e., that give recommendations based on experience from practice, were also identified in several books, online articles, blogs, etc. Although practice-based guidelines are less reliable, as they have not been tested with the end user, they are good to fill in the gaps that research has not been able to fill in yet. They are also important to give a more industry-related approach to any design solution.

Instead of presenting all 486 guidelines, in this chapter I present guidelines in a more applicable and engaging way by doing the following. At the start of each section, i.e., for each design feature, a rationale is given to explain why it is important to consider such guidelines, linking where possible to cognition, perception and user behaviour. Findings from research, i.e., relevant findings generated by the experimental studies reviewed, are also given to reinforce and validate the guidelines as well as to make them more user-centred. Top guidelines for the different elements of information visualisation are then presented by combining text and visuals to illustrate what the guideline means in practice. A final section discusses

an example of how theory and research findings can be applied to practice, using infographics as an example.

In sum, in this chapter we move from context to best practice. Best practice is then distilled into key guidelines and actual examples are given at the end to further understanding of how these can be applied in practice. This structure is established to avoid situations like the one described in the Introduction of this book where well-researched guidelines were misinterpreted and did more harm than good.

INFOGRAPHICS VS DATA VISUALISATION

Information visualisation includes two categories: information graphics and data visualisation. Infographics is the contraction of 'information graphics'. Infographics are used to communicate specific information to specific users. They are visual representations of information, data and knowledge and are designed with the goal of communicating complex information in a clearer and more accessible manner than text alone, as well as grabbing attention and interest. The use of text, icons, colours and graphics lend infographics the role of telling the story behind the information and data in a more focused, organised, intuitive and engaging way.

Data visualisations are not infographics, but are featured within infographics. Data visualisation is the visualisation of numeric values with charts, tables and graphics by transforming raw and dense data into visual presentations. It includes clear information based on measurable statistical data.

Data visualisation and infographics, however, exist on a continuum. Of the elements used in infographics, data visualisation is one of the strongest, if not the strongest. First, because it summarises hundreds and thousands of numbers into a digested visual form, and second, because it has direct effect on the credibility and persuasiveness of infographics.

Each section in this book uses infographics to show application to practice and the impact of applying or dismissing information visualisation guidelines. If designed well, effective infographics capture complex ideas, behaviours or knowledge in an easily digestible visual format; deliver maximum information in a minimum amount of time and space; and combine visuals and words to increase consumer comprehension and retention.

DESIGN GUIDELINES

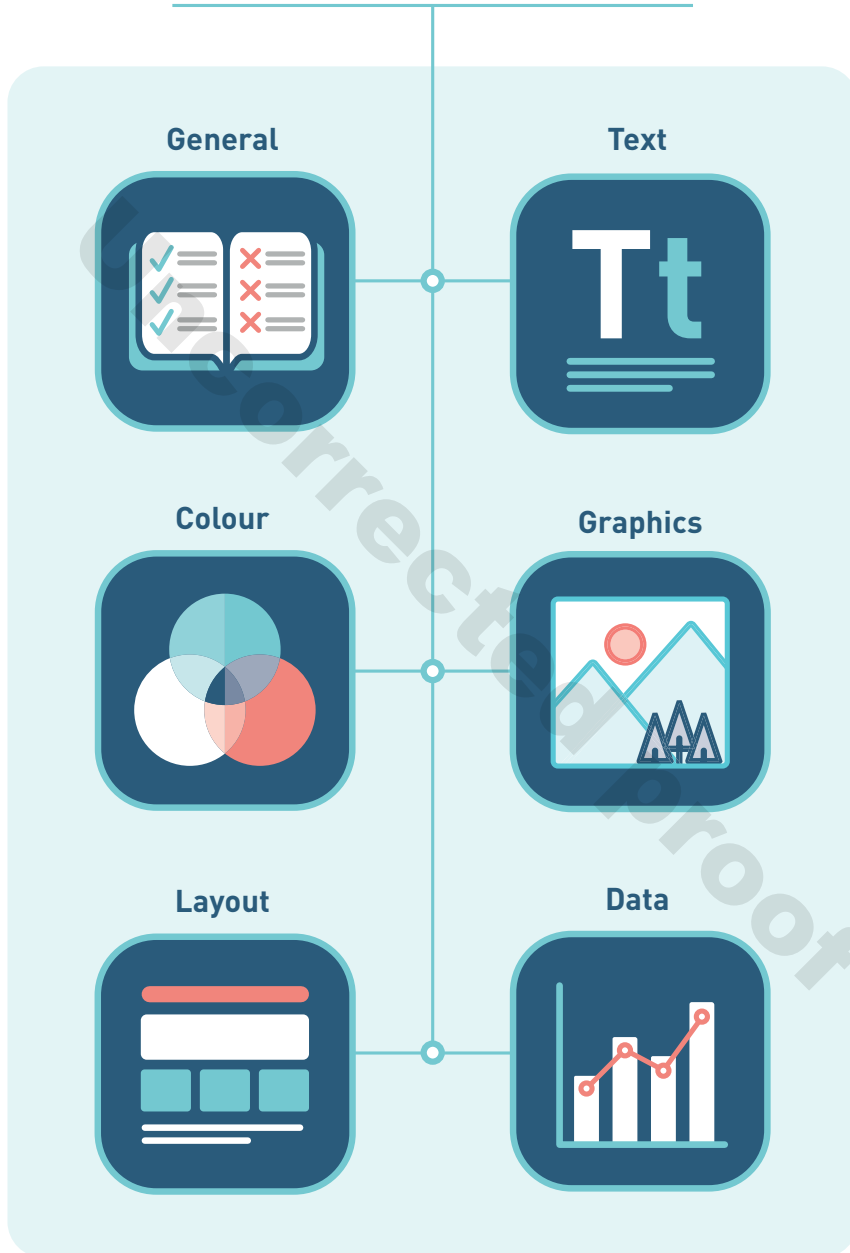


Figure 30 Design guidelines – Areas covered in Chapter 2

2.1 | GENERAL GUIDELINES

What to consider before designing

General best practice findings

Top general guidelines

Application to practice (don't)

Application to practice (do)

WHAT TO CONSIDER BEFORE DESIGNING

Presenting information with infographics can enhance understanding and learning, and influence decision making, i.e., how quickly users can interpret information, but also how the information is interpreted and acted upon. Infographics should therefore be focused, accurate, accessible and clear, instead of overwhelming the users, distracting users from the key message, and leaving users confused and with more questions than the answers the infographic provides.

Infographics also tell a story, even if just a simple data comparison. Graphics, typography, colour and images are the elements used to this end and choosing them inappropriately may result in misunderstanding of the content/story. Moreover, the information needs to be filtered and synthesised, the relationship between the information and elements needs to be established, and patterns need to be represented in a simple way. Good design choices, simple communication of information, and the reduction of elements that distract from the message, require mastery. If these are not achieved, the result will be a loss of information and the production of incomplete and incoherent infographics.

Although appeal is important to grab attention, the main goal of an infographic should be to communicate the information in order to facilitate comprehension and retention. The visual appeal of an infographic alone will not make up for poor design and content.

The way most users interact with infographics is by skimming, hence the need for the key message to be clear and straightforward. Moreover, keeping an infographic to one page ensures that all the elements contribute to the communication of the message at the same time, and that the infographic is easier to scan and then skim.

Therefore, the two essential elements for the development of an infographic are taking into account the target audience and conducting frequent evaluations with users, which should be repeated throughout the design process.

GENERAL BEST PRACTICE FINDINGS

- Infographics were found to facilitate a quick grasp of information, i.e., obtain information in little time and with little effort in situations of time pressure (Zhang, 2017).
 - Infographics were considered highly informative, practical, useful and valuable in decision making and business operations. For example, historical data to help with decision making, reports to help with strategy, and tips for better performance (Zhang, 2017).
 - The combination of text and graphics in a meaningful and calculated way (as in infographics) was found to be very effective in a variety of learning, instructional and persuasive tasks as well as technical documentation (Zacks et al., 2001; Kendler, 2005; Lyra et al., 2016).
 - Infographics within news stories were found to achieve longer viewing times than other images (Holmqvist and Wartenberg, 2005).
 - Infographics were found to be intrinsically memorable, with consistency across various groups of people (Borkin et al., 2013).
 - The use of visual cues (icons and words) was found to help clarify the meaning of the data and assist in making the right choice (Hibbard et al., 2002; Gerteis et al., 2007; Hildon et al., 2012).
 - For comparison of the relative size of two categories, judgement was found to be most accurate along a common scale (simple bar chart), was of intermediate accuracy when assessing length (divided or stacked bar charts), and was the least accurate when assessing angles (pie charts) (Cleveland and McGill, 1984; Simkin and Hastie, 1987; Heer and Bostock, 2010; Schonlau and Peters, 2012).
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TOP GENERAL GUIDELINES

1 CLEAR FOCUS AND PURPOSE – Infographics should have a clear focus and purpose, communicate complex information quickly and clearly, and communicate information that is accurate, complete and relevant. Infographics should be efficient, simple (but not simplistic), concise (without leaving important information out), and clear by ensuring that every element in the infographic has a specific purpose and will not be misunderstood by users.

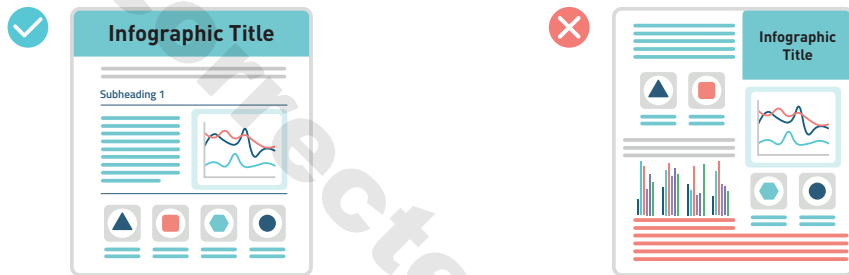


Figure 31 Top general guideline – Clear focus and purpose

2 KEY MESSAGE IN A BLINK OF AN EYE – The key message in an infographic should be communicated in less than five seconds and should be the first information users understand and remember after reading the infographic. When quick comprehension and decision making are at stake, simple and plain infographics should be used and limited to one page (or a maximum of two pages).

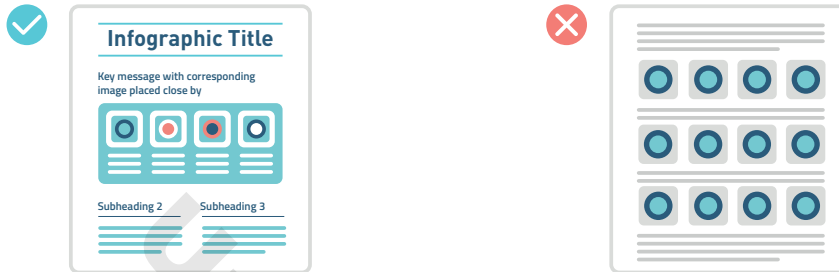


Figure 32 Top general guideline – Key message in the blink of an eye

3 VISUALS FOR ATTENTION AND COMPREHENSION – For attention seeking, infographics can communicate simple messages with the help of visual elements, such as the use of bright colours and relevant images. For wider appeal and to enhance the comprehension and recall of information, embellished infographics can be used with caution and should not be purely ornamental.

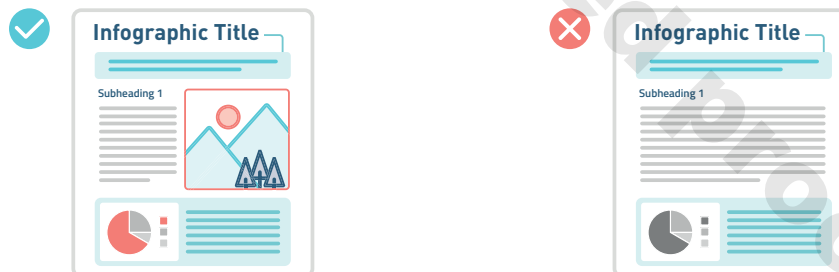


Figure 33 Top general guideline – Visuals for attention and comprehension

4 COMPREHENSIBLE TEXT IN AN APPROPRIATE TYPEFACE – Text in infographics should be transparent (i.e., not call attention to itself), easy to read and self-explanatory. In terms of the typefaces used, these should be chosen appropriately for their function, i.e., to convey the infographic message effectively and to fit with the purpose of the text and the infographic. Typefaces with unusual features, typefaces that distract from the text content, and typefaces that have not been tested objectively should be avoided.

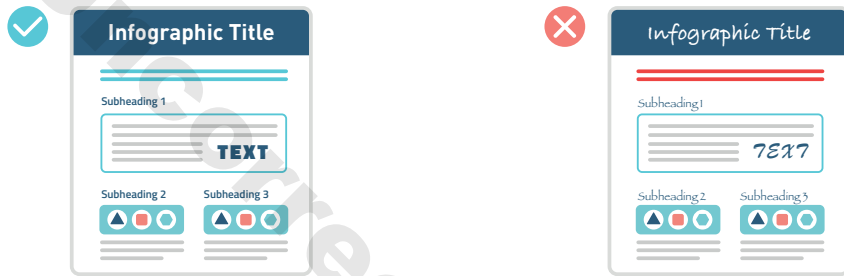


Figure 34 Top general guideline – Comprehensible text in an appropriate typeface

5 DELIBERATE COLOUR SELECTION – Colour selection in infographics should not be subjective or based on personal preferences but informed and deliberate to fulfil the specific needs and purposes of the infographic. Colour can subtly affect mood and opinion, and therefore should be used harmoniously to support effective communication and make users comfortable with the colours used. The meaning of colours also varies in different cultures, regions and contexts. Colours must therefore be taken into account to ensure they do not offend or send the wrong messages to the target audience and have negative consequences.

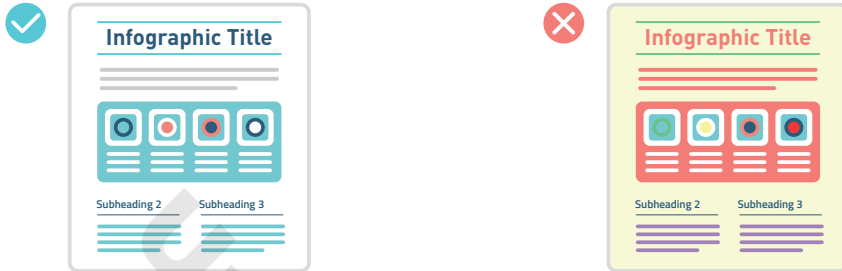


Figure 35 Top general guideline – Deliberate colour selection

6 EFFECTIVE VISUAL ELEMENTS – Visual elements should be used effectively, be consistent with the function, content and key message of the infographic, and be arranged adequately within the infographic's structure.

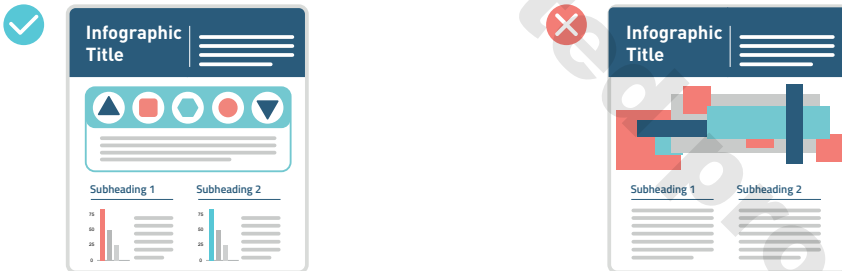


Figure 36 Top general guideline – Effective visual elements

7 APPROPRIATE DATA VISUALISATION – Within an infographic, multiple data visualisation formats should be considered, to suit the type of data to be communicated and the target audience in question. When choosing a visual display for the data, the following questions should be asked: What do users need to find out? What is the best chart for the specific need? Is this chart the easiest for users to interpret?.

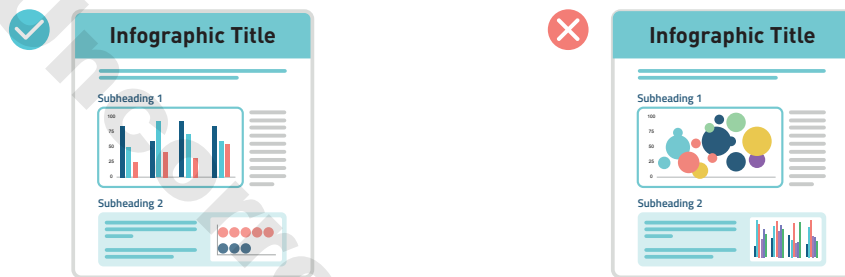


Figure 37 Top general guideline – Appropriate data visualisation

8 USER-FRIENDLY STRUCTURED CHARTS – The content of a chart itself should be organised by:

- Analysing the data thoroughly;
- Classifying it in order of relevance;
- Associating it according to its meaning.

Visual attributes should then be used to help:

- Group information into meaningful sections;
- Establish hierarchy and order of importance;
- Sequence the information according to the order in which it should be read.

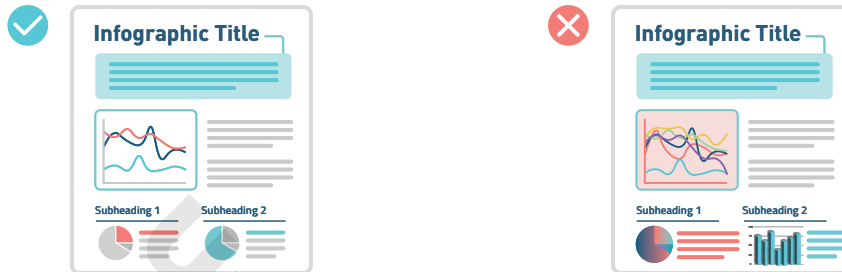


Figure 38 Top general guideline – User-friendly structured charts

9 ACCURATE DATA PRESENTATION – Data quality, accuracy and simplicity should be ensured by:

- Keeping text, colours, symbols and metrics consistent;
- Carefully selecting a few visual cues to help clarify the meaning of the data;
- Creating clear captions, titles and annotations on how to interpret the visualisation (in particular when less familiar formats are used);
- Ordering the information by rank and relevance;
- Clarifying uncertainty (e.g., clearly labelling associations, comparisons, etc.);
- Displaying data accurately and in context, avoiding distortion and bias.

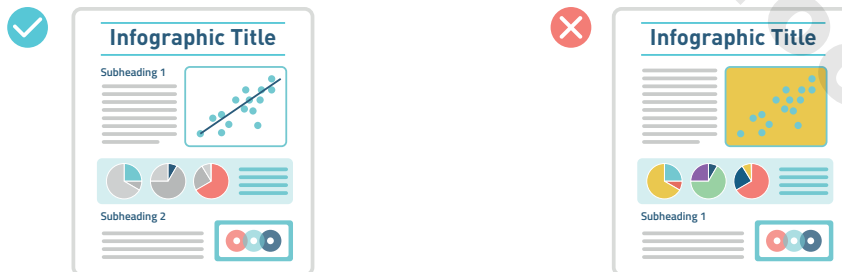


Figure 39 Top general guideline – Accurate data presentation

10 UNCLUTTERED AND WELL BALANCED – Chart junk and cluttering should be minimised by avoiding distracting patterns, overbearing colours, shading, 3D, unnecessary grids, etc. When considering aesthetics in data visualisation, things to take into account are:

- Be smart with colour – colour should always be used with an intention and used sparingly to highlight relevant parts;
- Pay attention to alignment – elements should be organised in clean vertical and horizontal lines to achieve a sense of unity and cohesion;
- Maximise the use of white space – margins should be preserved by not including unnecessary elements simply because there is space.

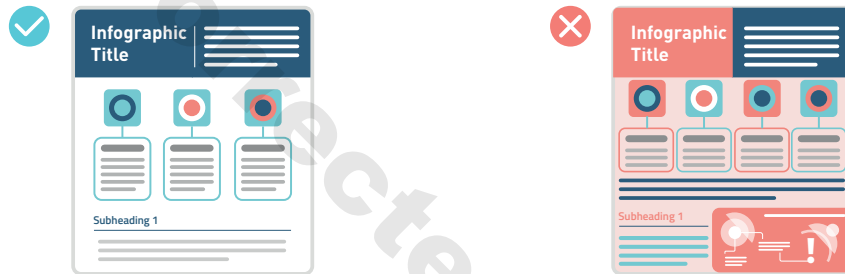


Figure 40 Top general guideline – Uncluttered and well balanced

11 TARGETED AT THE NEEDS OF THE USER – The needs and expectations of the audience should be considered at all times and the target audience should be involved in the design, evaluation and dissemination of information. Information visualisations should be validated by usability and performance studies and user feedback. For example, once a few initial infographic designs have been developed, they should be tested by showing them to users and ascertain:

- Where users focus;
- What information users are able to find and how quickly;
- What feedback users give;
- What do users struggle with;
- What questions do users have.

An iterative process of test, refine and test again, should be followed, which will confirm whether the right design is being developed and what changes are needed.

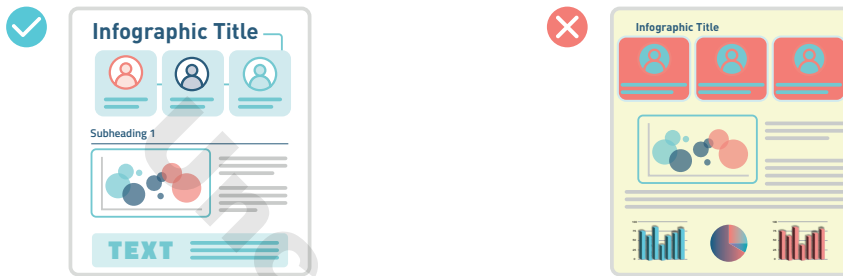
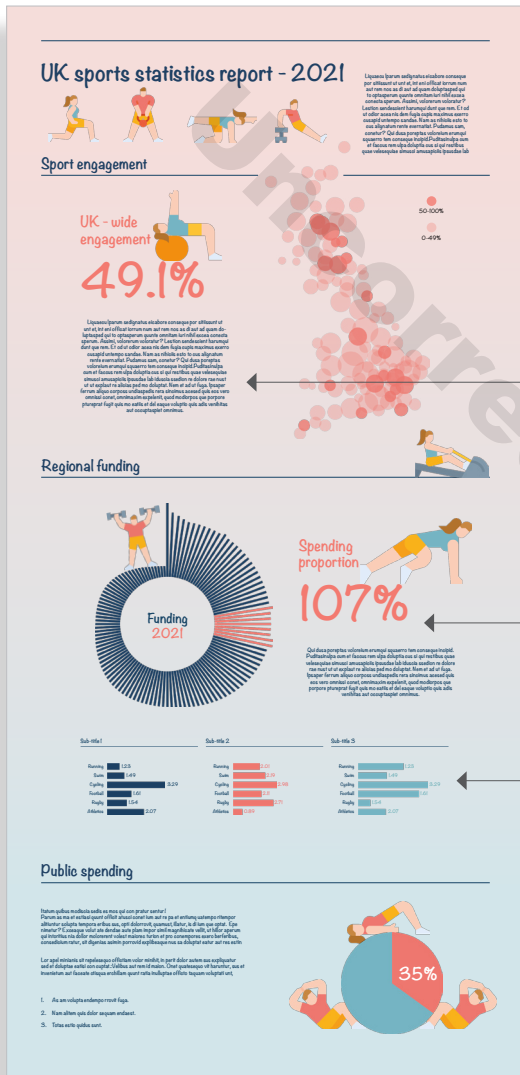


Figure 41 Top general guideline – Targeted at the needs of the user

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APPLICATION TO PRACTICE



Text problems | Overall text has been poorly designed in this infographic. The font used is too elaborate for the narrative text (better suited for titles and headings). Moreover, narrative text is small and legibility is further impaired because the text is also bold and justified to the centre. These three practices impair legibility and speed of reading. Centred text is particularly problematic because the reader does not have a consistent starting point when changing line of text. Compared to fully justified text, centred text slows reading even more and leads to more error and frustration.

Visual aids problems | Illustration can be used very effectively. However, it needs to be appropriate for the target audience, used with purpose (not simply as ornament), and placed where it will not distract the reader from the most important information.

Colour problems | The colour palette is not a problem per se, but the simple choice of using a coloured background with gradient makes all the information more difficult to scan, read and understand.

Figure 42 Poor application of general guidelines



APPLICATION TO PRACTICE

Text efficiency | Text is now following several principles of legibility. Dark text on a light background with good contrast. Line lengths that are not too long or too narrow. Good use of font size and font weight to establish a hierarchy of information and guide users on what to read first, second, and so on. Coloured text is used only to emphasise information. Text is always aligned to the left and ragged right, for ease of reading.

Visualisation efficiency | Visualisation is sparingly used and only to complement, clarify and enhance information. Even if more illustrative graphs are used, these fit well with the theme of the infographic and do not impair understanding. Charts and graphs are also very smartly distributed to create visual balance on the page.

Good efficiency | A two-colour palette is mostly used with a third colour only being introduced when data distinction is required. Shades of the same colour are also used very effectively without needing a second colour to emphasise information.

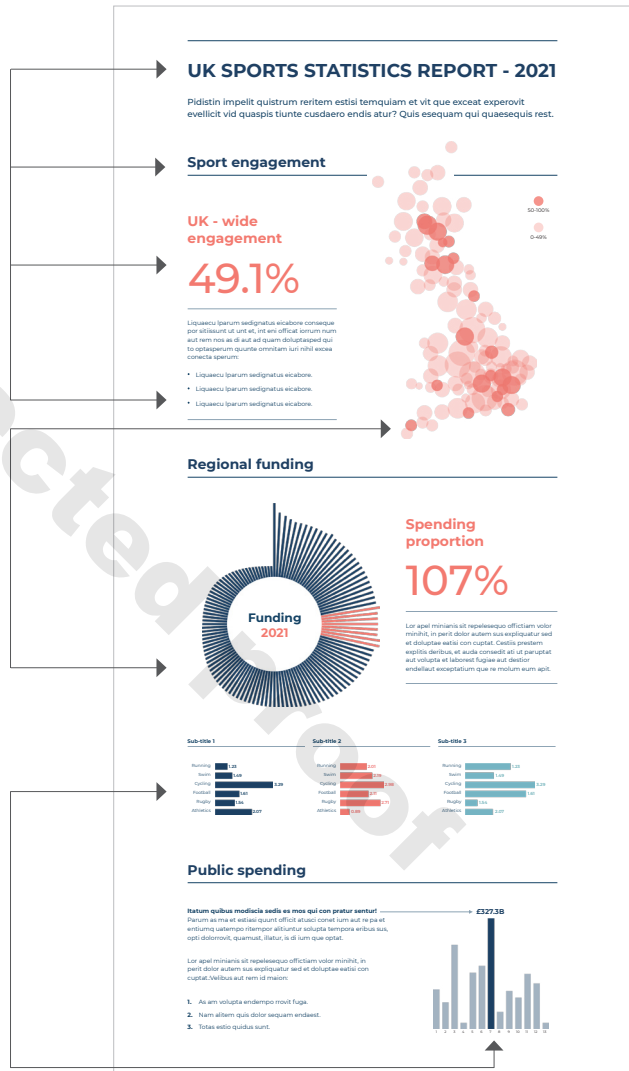


Figure 43 Good application of general guidelines

2.2 | TEXT AND TYPOGRAPHY

Why typography is important

Typography best practice findings

Top guidelines

Application to practice (don't)

Application to practice (do)

WHY TYPOGRAPHY IS IMPORTANT

Infographics are used to communicate large amounts of information, and typography is inevitably one of the most important design tools to help towards that end.

However, it is the combination and manipulation of various typographic features as a group that makes the text legible and perceived as easier to read. Each typographic feature should be selected in relation to the others.

Bad organisation of typographic information throughout the layout or infographics can impair readability and legibility of information. Bad choice of type size, colour and space between words and lines of text can not only cause reading difficulties, but also affect the users' reading experience. Even titles, if set in italic or in small typefaces, or set against a dark background, can be hard to spot and read. However, the title is a very important element of an infographic since it reveals the key message and is where most users start processing the information to quickly decide whether they will continue reading the infographic or not.

Titles should indeed be one of the most dominant elements in an infographic and should quickly present the purpose of the content and the focus of the message. For example, when using a multiple display infographic (communicating various facts), the title should contain the topic of the infographic. When using a single display infographic, the title should communicate the main message (e.g., what was found). Titles can be left-aligned or centred, while headings should be aligned left.

Lowercase text is more legible and also takes less space on the page than all-capitals (about 35% less, for text of the same body size), resulting in economy of space, which is crucial in infographics to reduce the amount of visual information on the page. All-capitals can be used for titles, and condensed lowercase can be used when space is an issue, as it uses even less space than all-capitals.

Very wide space between words creates vertical white spaces, called 'rivers' – very apparent in newspapers due to short line length and fully justified text – which not only disrupt reading but also destroy the normal page texture. Very narrow space between letters and words makes them join too close together, leading to arduous reading, especially when the information has to be accessed in a quick glance. In terms of paragraphs, these should be denoted with a moderate indentation of one to

four ems, or separated by one line space. Short paragraphs should be avoided.

When text is set with very long line lengths, it makes it more difficult for the eyes to make an accurate return sweep (i.e., a long movement to the left from the end of a given line to the beginning of the next line), which increases the number of return sweeps and eye fixations before users finally find the right text line to read next. The same difficulty will exist when too much interlinear space is used (when text lines are too separated), increasing the time taken to get to the next line of text. Justification of text to the centre will also make it more difficult for the eyes to find the beginning of each line of text to continue reading after reaching the end of each line. Contrastingly, justifying text to the left creates a straight left edge and a consistent place that the eyes can easily follow.

Lastly, choosing typefaces and using them randomly in infographic design is bad practice. Contrastingly, creating a font palette can be fundamental to ensure a consistent design and improve the overall look of the infographic. This is known as 'font pairing', i.e., the technique used to put fonts together harmoniously in order to please the eye and match the intended message. However, having a font palette does not mean using several different typefaces (again, no more than two, or a maximum of three, typeface families should be used). Instead, different weights, sizes and colours for different sections can be used, but should be kept consistent. If two typefaces are used, then there should be good differentiation between them. For example, a serif and a sans serif type will have more contrast and will be better distinguished than two serif typefaces. For digital platforms and at smaller sizes, sans serif type is better to maintain legibility because small details like serifs will be lost in these situations.

TYPOGRAPHY BEST PRACTICE FINDINGS

- Standard typefaces that are used in everyday reading situations have been found to be equally legible (Pyke, 1926, Tinker, 1963; Paterson and Tinker, 1932; Lonsdale, 2014b).
 - No significant differences were found in comprehension and speed of reading between serif and sans serif type. No particular preference was found for either serif or sans serif type (Paterson and Tinker, 1932; Poulton, 1965; Moriarty and Scheiner, 1984; Lonsdale, 2014b).
 - Italic text was found to retard reading (Tinker and Paterson, 1928; Paterson and Tinker, 1940; Tinker, 1963, 1955; Lonsdale, 2014b).
 - Text in lowercase was found to be read quicker than all-capitals, and was also preferred (Tinker and Paterson, 1928, 1942; Tinker, 1955; Poulton, 1967; Lonsdale, 2014b).
 - Black print on a white background was found to be much more legible than white print on a black background (Tinker and Paterson, 1931; Luckiesh and Moss, 1938; Tinker, 1963; Lonsdale, 2014b).
 - Moderate text arrangements were found to be read faster than text in relatively long or short lines, small type sizes and with little or no interlinear space. Very short and very long lines, small type and little interlinear space were disliked by users (Tinker, 1963; Lonsdale et al., 2006; Lonsdale, 2007, 2014a, 2014b, 2016).
 - Type sizes of 9-, 10-, 11- and 12 pt with an interlinear space of one to four points and with a line length of around 60 to 70 characters per line were found to be the most legible (for print material like books that are read at ordinary distances of approximately 300–350 mm from the eyes) (Tinker, 1963; Lonsdale, 2006, 2014b).
 - Relative differences in sizes were found to be the best way to distinguish the hierarchy of headings and corresponding narrative text (Williams and Spyridakis, 1992; Lonsdale, 2014b). For example, a minimal difference of four points helps the reader in identifying the level of hierarchy.
 - Centred headings were judged as most important, then left-aligned headings, and embedded headings as least important (Williams and Spyridakis, 1992; Lonsdale, 2014b).
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TOP GUIDELINES

01. The number of typefaces used should be limited to one or two (maximum three); otherwise they will distract the reader and increase complexity.



TITLE

Heading

Lorem ipsum dolor sit amet.
Consectetuer adipiscing elit.



TITLE

Heading

Lorem ipsum dolor sit amet.
Consectetuer adipiscing elit.

02. Text and its background must have good contrast to be legible (from 70%).



03. All-capitals should be avoided for narrative text and whenever rapid reading is required. Can be used and works well for headings.



HEADING

All-capitals should
be avoided when rapid
reading is required.



HEADING

ALL-CAPITALS SHOULD
BE AVOIDED WHEN RAPID
READING IS REQUIRED

04. The contrast between the title, headings and narrative text should be clear in terms of size differences and the features of the typeface (e.g., bold and bigger size for the title and heading if the narrative text is regular).



TITLE

Heading

Lorem ipsum dolor sit amet,
consectetur adipiscing elit.



TITLE

Heading

Lorem ipsum dolor sit amet,
consectetur adipiscing elit,
sed diam nonummy nibh

05. Bold can be used to emphasise one piece of information over another, and as a technique to thicken the characters when these are to be printed or seen on a dark and/or coloured background.



06. Unsuitable backgrounds, such as multi-coloured or gradient backgrounds, should be avoided for text as these add complexity and decrease legibility.



07. When using white or light type on dark background, the amount of text should be small and a sans serif type should be used in a slightly bigger size to avoid loss of legibility.



08. Large amounts of text should be left-aligned rather than centralised. Centralised justification should be restricted to very small amounts of text or titles and headings.



09. Type size, interlinear space and line length should be coordinated and chosen together (9–12 pt font size; 1–4 pt interlinear space; 60 to 70 characters per line).





APPLICATION TO PRACTICE

Good contrast | Good contrast between the text and the background throughout the infographic, allowing the user to quickly scan the title and then read the remaining information.

Clear hierarchy | Good dynamic in terms of hierarchy. When looking at a glance, we are quickly drawn to the information and directed as to what to read: first – the title in bigger size and emphasised by a coloured background; second – a text extract that quickly gives us a clue of what the infographic is focusing on; third – the introduction of the infographic, next to the heading, to give the context; fourth – narrative text with more details.

Good rhythm | Here text is justified to the left, there are no gaps between words, and the lines of text flow nicely from left to right creating a pleasant visual rhythm that guides our eyes from one line of text to the next. Because text always starts at the same place (left) but finishes at different points (ragged right), this gives us navigation clues and helps us to move from one line of text to another without getting lost (i.e., without missing lines of text as it often happens when text is justified to both sides).

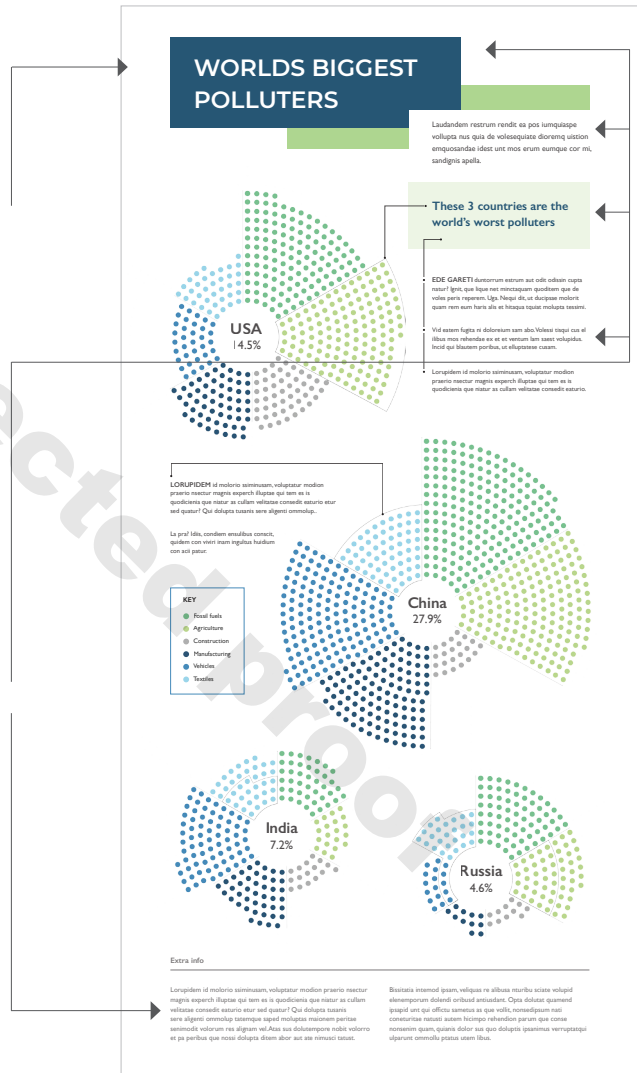


Figure 45 Good application of text and typography guidelines

2.3 | COLOUR AND FUNCTION

Why colour is important

Colour best practice findings

Top guidelines

Application to practice (don't)

Application to practice (do)

WHY COLOUR IS IMPORTANT

Poor use of colour distracts users' perception, decreases their performance, increases difficulty when making sense of the information, and ultimately will send the wrong message to users. Despite these potential risks of colour misuse, colour is a very powerful visual element that can greatly enhance communication of information. Therefore, to minimise potential risks, it is important to understand why colour can affect how information is processed, as well as how to make deliberate choices.

The ability of colour to grab attention is due to the fact that humans are more sensitive to chromatic variations and contrasts than light changes. Colours can also enhance memory and retention because they "generate more working memory" (which is important for reasoning and the guidance of decision making and behaviour) "and remain more significantly in the long-term memory" (Bursi-Amba et al., 2016, p. 5). To nurture these cognitive abilities and assist users to understand how colour is structured in an infographic, the relationship of hue, value and saturation needs to be considered and controlled.

It is also important to understand that we do not perceive colour in an absolute sense, but in relation to other colours. The same colour will be perceived differently, depending on the colours surrounding it. Although our eyes see colour in an absolute way, our brain, on the other hand, adjusts the colour according to its context.

The chaotic use of colour is particularly common in infographics. To avoid this, colour must be used with a function in mind. Colour can be used:

- To label (colour as noun);
- To measure (colour as quantity);
- To represent or imitate reality (colour as representation);
- To decorate (colour as beauty).

Furthermore, a harmonious and well thought through relationship between colour and text can significantly influence a document's effectiveness. When first looking at a document, users can easily distinguish levels of importance and decide what to read and look at first. Colour can help create a clear hierarchy in an infographic by

enhancing the organisation of the information, distinguishing hierarchal levels in texts, and providing signal cues.

Signal cues, if carefully considered, can also focus attention, group elements together, create specific points of information, and help users understand the relationships in an infographic. For example, colour coding (the process of structuring information by using different colours) enhances the users' capacity to distinguish between colours and associate each colour with a meaning. However, the eye only recognises a limited number of colours accurately and with confidence. More than three colours are difficult to recall. Users are also less likely to get confused or fail to distinguish the relative importance of specific colours if there is a strong distinction between different colours. Therefore, if too many colours are used in a colour coding system, if contrast is not strong enough, or if users do not know or understand the meaning to be associated with each colour represented in the system, colour will impair information extraction.

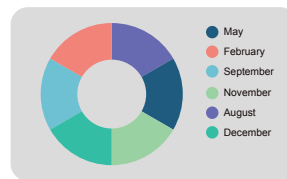
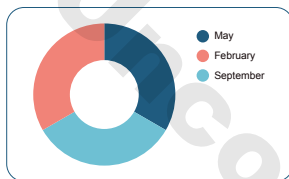
Using colour for decorative purposes can be considered colour misuse, as it adds complexity and may visually conflict or be confused with colours used with a function. All in all, colour should be used to focus user attention, clarify the meaning of the content, show differences in the information displayed, and ensure all information is clear, readable and can be accessed quickly.

COLOUR BEST PRACTICE FINDINGS

- Poor use of colour in infographics was found to compromise legibility (Stones and Gent, 2015).
 - For search and identification tasks, colour coding was found to work better than variation in shape and size (Christ, 1975; Hoadley, 1995; Menezes and Pereira, 2017).
 - Inconsistent application of colour schemes was identified as being a major design issue in infographics (Bursi-Amba et al., 2016).
 - The visual appeal of some infographics was found to be liked by users because of their simple and elegant colour combinations (e.g., blue, red and grey) (Zhang, 2017).
 - Infographics with multiple bright colours and shades were considered busy and confusing (Zhang, 2017).
 - The use of colour in infographics was found to enhance memorability and influence users' retention (Dae-Young, 2010; Borkin et al., 2013; Bursi-Amba et al., 2016).
 - Colour infographics were found to be more effective than black and white infographics (Bursi-Amba et al., 2016).
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TOP GUIDELINES

01. A three-colour palette should be used for infographics, and this should include the background if using a coloured background.



02. In a colour coding system, three colours (maximum five) should also be used for labelling/categorisation, and they should be of equal strength and contrast.



03. Instead of using more than three colours, a variation in saturation should be used to create a wider range within a palette.



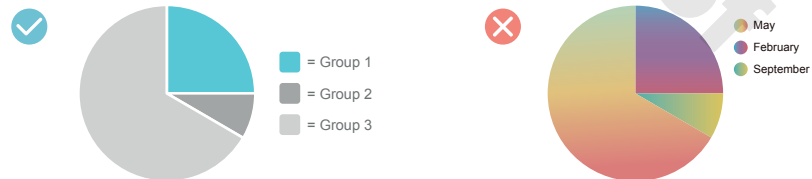
04. Colours adjacent to each other on the colour wheel should be avoided as they produce little contrast when used together.



05. Bright, highly saturated (primary) colours should be avoided, because they are visually too obtrusive and can create legibility problems.



06. Colour gradient effects should be avoided, as this makes the infographic busier.



07. Colour can be used to help organise chunks of information and group pieces of relevant data together.



08. Colour can be used to emphasise words, make headings stand out, signal relationships within a document, show hierarchal levels, and provide structure and organisation in a document.



09. The same attention should be paid to both text and its background colour. With text on coloured backgrounds, contrasting colours should be used and dark text and elements should be set on a light background, and vice versa.



APPLICATION TO PRACTICE



MALARIA DISEASE AWARENESS

HOW IS MALARIA SPREAD?
Malaria is a tropical disease that is spread by mosquitoes. It can only take one bite from an infected mosquito for someone to become infected.
The Plasmodium parasite is mainly spread by female Anopheles mosquitoes, which mainly bite at dusk and at night. When an infected mosquito bites a person, it passes the parasites into the bloodstream.

SYMPTOMS OF MALARIA

1. Flu like symptoms
2. Fever
3. Nausea
4. Muscle pain
5. Shivering
6. Sweating/feeling hot

WHERE IS MALARIA COMMON?

1. Africa
Most cases occur in sub-sahara
2. Parts of Asia
Particularly prevalent in India
3. South America
Not as common as in Africa
4. Central America
Risk is lower in the Caribbean
5. Haiti and Dominican Republic
It is important to take malaria prevention

WAYS TO PREVENT MALARIA:

- Medication
- Insect repellent
- Sleeping net
- Symptom awareness
- Air con
- Covering body
- Pesticide
- Window screens

IMPORTANT
If you are living or have recently visited an area where malaria is prevalent it is important that you look to receive medical attention. If untreated malaria can be fatal, especially in young children.

HISTORY OF MALARIA PREVENTION

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MALARIA STATISTICS

Malaria graph 1

33% Age 16-49
9% Age 5-14
57% Under 5's

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Year	Cases
2000	830,000
2005	730,000
2010	650,000
2015	430,000

Poor colour combination | Bright, highly saturated (primary) colours are used, which makes it very difficult to look at the text for any amount of time. It is like the text is coming out of the page and we cannot focus on it.

Poor contrast | It is difficult to discern the heading because there is not enough colour contrast between the heading and the background. This also decreases hierarchy because the heading does not stand out.

High number of colours | No need for the character to change colour, as it deviates the readers' attention from what is important.

Distress | There is too much use of dark pink and red colour throughout. Because Malaria and death are sensitive topics, this amount of pink and red increases distress and anxiety.

Coloured text | Too much coloured text is being used throughout, and with little contrast. This compromises legibility but also confuses readers in terms of hierarchy, i.e., what is most important, what needs to be read first, etc. Moreover, when too much is emphasised, then little is seen as standing out.

Figure 46 Poor application of colour and function guidelines



APPLICATION TO PRACTICE

Good contrast | Good contrast between the text and the background, facilitates reading and makes it more pleasant on the eye and quicker to read.

Soft colour palette | Using a softer colour palette with pastel colours and blue as the dominant colour (instead of red-like colours) creates a more relaxing visual tone.

Good emphasis | Pink is only used sparingly to emphasise and call attention to important information, without the need to use red.

Good hierarchy | Font size and font weight differences are enough to establish hierarchy. Colour is then only used for emphasis, for visualisation, or for colour coding data.

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Malaria graph 1

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Optio dolore voluptae et eveilqu untorro debbitati

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2015	430,000

Figure 47 Good application of colour and function guidelines