



## **Communicating risk: illustrating risk**

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A great way to help improve your users' understanding of risk and statistics is to use visual aids in your content.<sup>1,2</sup> However, there are a few things to bear in mind before you go ahead.

### **Don't forget the numbers...**

First of all, it's important to realise that people vary in their ability to understand visual information.<sup>1</sup> It can be easy to assume that adding in a visual will automatically make your information easier to understand – but bear in mind that some people may find graphs and illustrations harder to comprehend than the actual numbers.

It's been suggested that visual displays may be most helpful for giving people the general 'gist' or overall pattern, whereas including actual numbers is better if you want to communicate more of the detail.<sup>1</sup> You may find you need to do a combination of both to get your message across, and understood, by as many of your users as possible.

### **Types of graphics**

There are many different types of formats for presenting risk. Which one is best for your content will depend on a number of factors. These include the type of statistics you're presenting and whether you're looking at how

data changes over a period of time, or just describing it at a single time point.<sup>2</sup>

Some of the main types of graphics used to illustrate risk include the following:

**Line graphs** – a simple graph with the risk/chance of the event on the vertical (y) axis and time period on the horizontal (x) axis, these tend to be better at communicating trends over time.<sup>1</sup>

**Bar graphs** – whether horizontal or vertical, these are useful for comparing two or more groups or scenarios.<sup>1</sup>

**Pie charts** – these are often used to give a quick overview of the frequency of a single, or multiple events. Take care when using them though – it can be easy for true proportions to appear distorted in pie charts, giving misleading messages.

**Icon arrays/Pictographs** – these use a matrix of icons (usually 100 or 1000) to represent the number of people at risk or the number of expected events, as well as the number not at risk or number of non-events. The icons can range from blocks to figures or smiley faces.


In general, icon arrays/pictographs are considered to be the most effective when communicating individual statistics (rather than comparing groups).<sup>2</sup> One of the plus points is that they convey the numerator (number of events) as well as the denominator (total number of people), and by showing both the positive and negative outcomes they avoid bias through ‘framing’.<sup>1,3</sup>

If you’re unsure which type of graphic best suits your needs, try the Wizard on the [Visualizing health](#) website, or take a look at some of the ideas on the [Understanding Uncertainty](#) website.

Finally, don’t forget to user-test which visual aids work best for your content and target audience. And this means not just looking at which type your users prefer, but more importantly, which one they understand the most and gives them the most accurate perception of risk.<sup>1</sup>

## PiF Toolkit: risk checklist

[www.pifonline.org.uk/toolkit](http://www.pifonline.org.uk/toolkit)

PiF Toolkit key step	Covered here
Be cautious using verbal descriptors of risk. If used, ensure these are accompanied by statistical information.	
Use absolute risk rather than relative risk.	
Use natural numbers rather than percentages.	
Consider using both positive and negative framing for risk.	
Communicate uncertainty of data; explain the effect confidence intervals have on data.	
<b>Consider using a mix of numerical and pictorial formats to communicate risk.</b>	
Make risks relevant. Consider using examples as a comparator.	

## References

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2. Fagerlin A, Zikmund-Fisher BJ, Ubel PA (2011). Helping patients decide: ten steps to better risk communication. J Natl Cancer Inst. 103(19): 1436–43. doi: 10.1093/jnci/djr318 [jnci.oxfordjournals.org/content/103/19/1436.long](http://jnci.oxfordjournals.org/content/103/19/1436.long).
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4. Zikmund-Fisher BJ, Fagerlin A, Ubel PA (2010). A Demonstration of “Less Can Be More” in Risk Graphics. Med Decis Making. 30(6): 661–71.

### **About the author and contributors**

This fact sheet was written and produced for PiF by Pippa Coulter. Pippa is a specialist in the production of consumer health content, with 15 years of experience in medical publishing and communications. She has extensive experience in producing high-quality, reliable and evidence-based health content for consumers. Pippa currently manages the health content library at Bupa. View Pippa's profile on [Linkedin](#).

The factsheet was kindly reviewed by David Spiegelhalter, Winton Professor for the Public Understanding of Risk in the Statistical Laboratory, Centre for Mathematical Sciences, University of Cambridge.

Hannah Bridges, HB Healthcare Comms, edited the factsheet.

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