Options for the display of Quantitative Data

Method	Description	Advantage	Limitations or Disadvantages
Bar chart	´A bar graph is composed of discrete bars that represent different categories of data. The length or height of the bar is equal to the quantity within that category of data´ ([CDC definition](#)) Best suited for *categorical data*	▶ Versatile ▶ Facilitates quick and easy comparison and effectively conveys prominent data (highs and lows) ▶ Straightforward to create	▶ Depending on the data (and its range), the units represented on the Y axis (vertical) may be too small to illustrate meaningful differences ▶ May need accompanying information about the data
Histogram	Histograms show the distribution of data across different groups. *´Histograms are a special form of bar chart where the data represents continuous rather than discrete categories… unlike a bar chart, in a histogram both the x- and y- axis have a scale. This means that it is the area of the bar that is proportional to the size of the category represented and not just its height´* [*(University of Leicester)*](#) Best suited for *continuous data*	▶ Appropriate for data sets with a large range ▶ As above, useful for quick and easy comparison and effectively conveys prominent data (highs and lows)	▶ As the data is presented using scales and intervals, exact, individual measures are not obtainable form the graph (this also means that common tendency measures such as mean, median and mode are not obtainable from the data presented within a histogram)
Line Graph	*'A line graph displays the relationship between two types of information'.* ([CDC definition](#)) Best suited for *categorical data*	▶ Useful for demonstrating trends over fixed periods ▶ Facilitates the visualisation of differences between distinct groups	▶ Too many data lines can be confusing or unclear
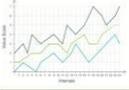
Method	Description	Advant	Limitations or Disadvantages
Pie Chart	´A pie chart is a circular chart used to compare parts of the whole. It is divided into sectors that are equal in size to the quantity represented ` ([CDC definition](#)) Best suited for *categorical data*	▶ Effectively depicts proportionality and percentages and provides an easily interpretable ´snapshot´ of results	▶ Only suitable for a few categories, as having many can be confusing or even misleading ▶ Not ideal for showing trends ▶ Supplementary information is often needed to avoid confusion (e.g. if sampling is used it may be unclear that the chart does not represent the population as a whole – this is true in all cases but especially for pie charts as they represent proportions of a ´whole´) ▶ Pie charts are limited to proportionality and percentages but are often misused, leading to unclear data representation
Scatter Plot and Bubble charts	´Scatter plots are used to show the relationship between pairs of quantitative measurements made for the same object or individual´. *(University of Leicester)* Used to show concentrations and trends. Scatter plots are often used with a ´line of best fit´ *Bubble charts* are a sub-type of scatter plots, which are used to add additional meaning to the data through the use of bubbles of various sizes	▶ Allows for a deeper analysis to demonstrate the relationship between different variables ▶ (specific to bubble charts) Allows for answering multiple questions or displaying various aspects of the data at once	▶ More of an analytical tool which is used to gain a sense of trends, rather than for presenting data externally

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Illustrations	Illustrations can include a wide variety of forms and formats. Common formats include maps, and drawings. Illustrations are often used to report in a way that is more engaging or creative, and are useful when there is a need to combine different types of data sets (qualitative and quantitative)	▶ Versatile ▶ Can display a lot of different types of information in the same space (compact). ▶ Can combine technical and geographic data	▶ Might take up a lot of space ▶ May need to be kept simple for the reader to understand the rationale behind the diagram (if unfamiliar format)
Tables	Tables enable the presentation of data when there is a single data category measured at different variables (time, place etc.) Tables allow for the visualisation of a combination of qualitative and quantitative data	▶ Allows for the presentation of precise values (when precision is key) ▶ Useful when there are a few extreme values in the data and you don't want this to dominate the interpretation of the data set. For instance, the extreme values may require additional explanatory context that isn't relevant to the particular audience or would distract from the main message you wanted to put forward. An example would be if certain values had been afected by unusual external circumstances, these would draw attention away from more subtle, yet significant, trends within the rest of the data	▶ In cases where the data sets are more complex or show less variation, tables can be less effective at conveying meaning and trends