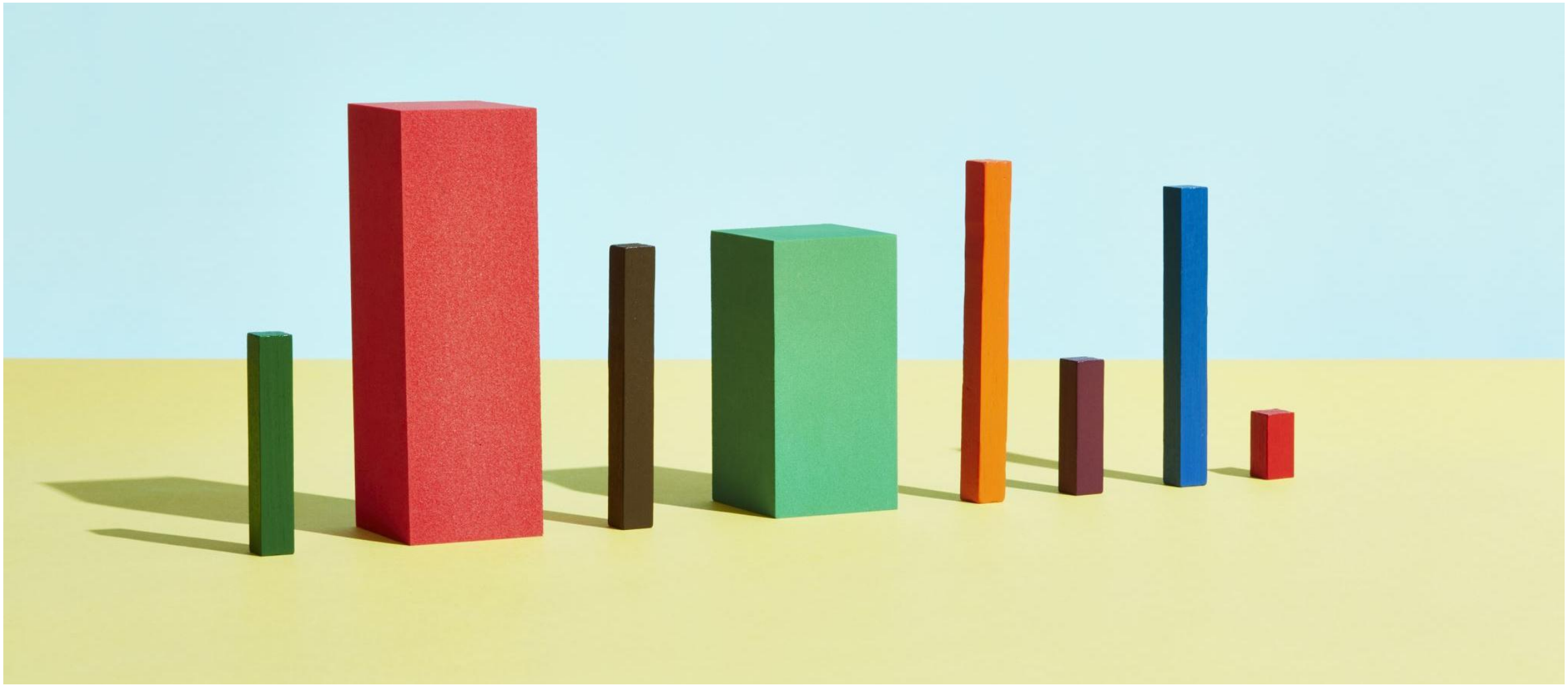
COMMON CHART TYPES.



COMMON CHART TYPES.

The foundational Stage - recognising that data exists and influences decisions.

Key Abilities:

Recognise that data is information we can capture, store and analyse.

Understand why we visualise data.

Notice when data is being used to persuade or inform.

Identify data types and simple charts.

Typical Learner Mindset:

"I know data is important, and I can spot when it is being used"

AGENDA.

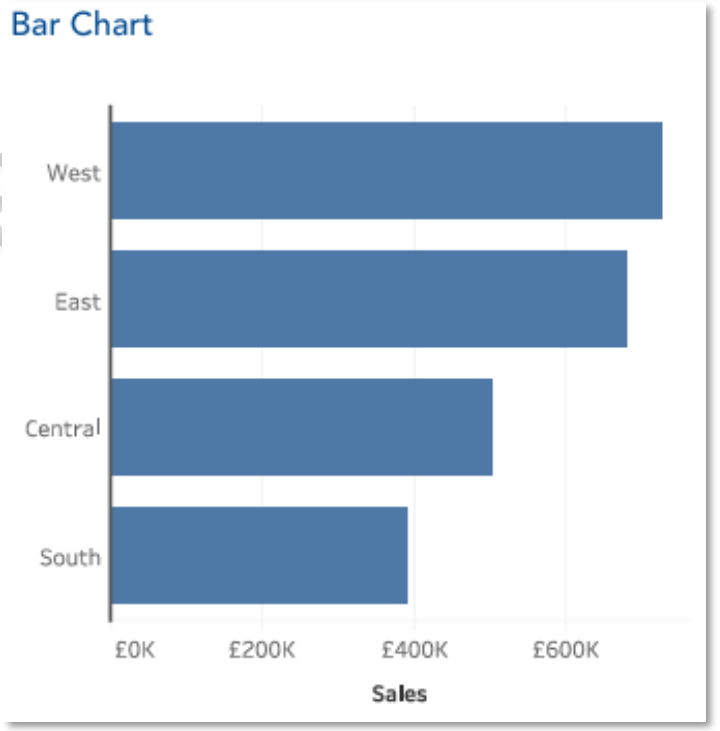
- Common Chart Types
- Bar Chart
- Time Series Line Chart
- Scatter Plot
- Dot Plot
- Choropleth Map
- Symbol Map
- Table / Highlight Table
- Bullet Graph
- Counter Example – The Killers
- Counter Example – Sales And Profit By Category And Segment
- Pie Chart
- Every Decision Is A Compromise
- Further Charts
- Summary

COMMON CHART TYPES.

- In this section, we briefly outline the most **common chart types**.
- This list is **intentionally short**.
- Even if you use only the charts listed here, you would be able to **cover the majority** of needs when **visualising** your data.

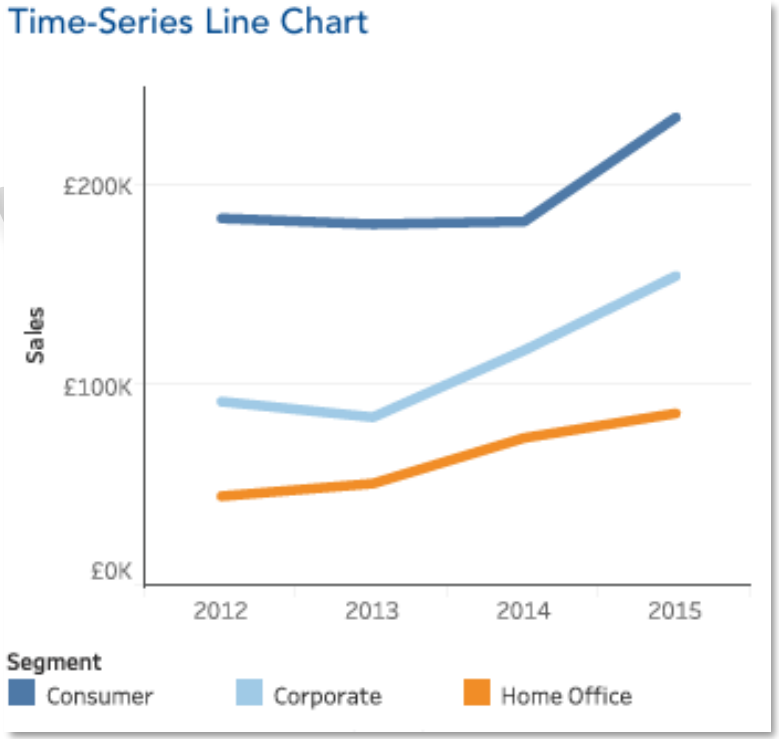
BAR CHART.

- A **bar chart** uses length to **represent a measure**.
- Human beings are **extremely good** at seeing even **small differences** in length from a common baseline.
- **Bars** are widely used in **data visualisation** because they are often the **most effective** way to **compare categories**.
- **Bars** can be oriented **horizontally** or **vertically**.
- **Sorting** them can be very helpful because the most **common task** when bar charts are used is to **spot the biggest / smallest items**.



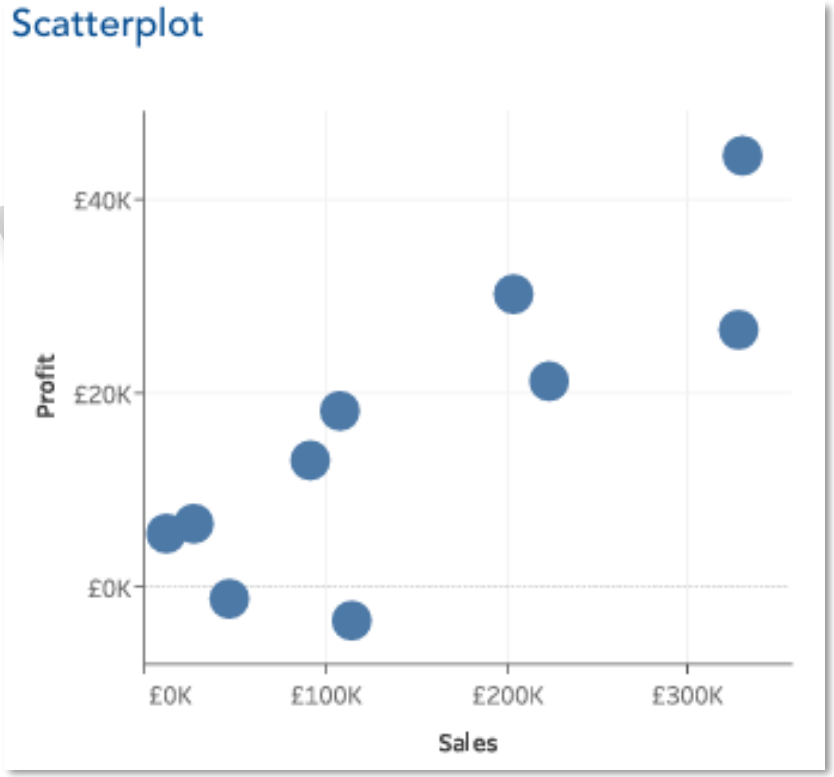
TIME SERIES LINE CHART.

- **Line charts** usually show **change over time**.
- **Time** is represented by position on the horizontal x-axis.
- The measures are shown on the vertical y-axis.
  - The height and slopes of the line **let us see trends**.



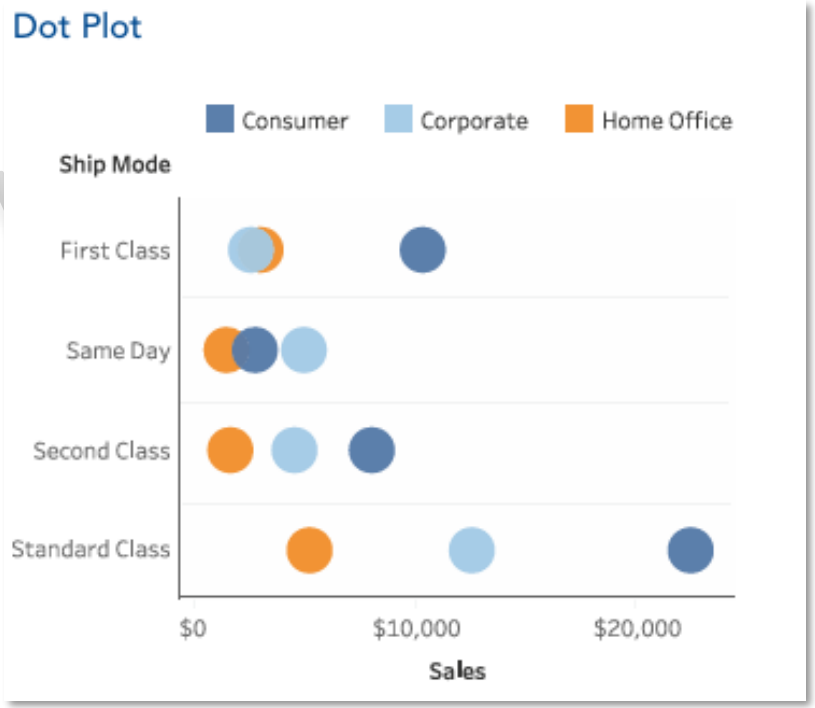
SCATTER PLOT.

- A **scatterplot** lets you **compare two different measures**.
  - Each **measure** is **encoded** using position on the horizontal and vertical axes.
  - **Scatterplots** are useful when looking for **relationships between two variables**.



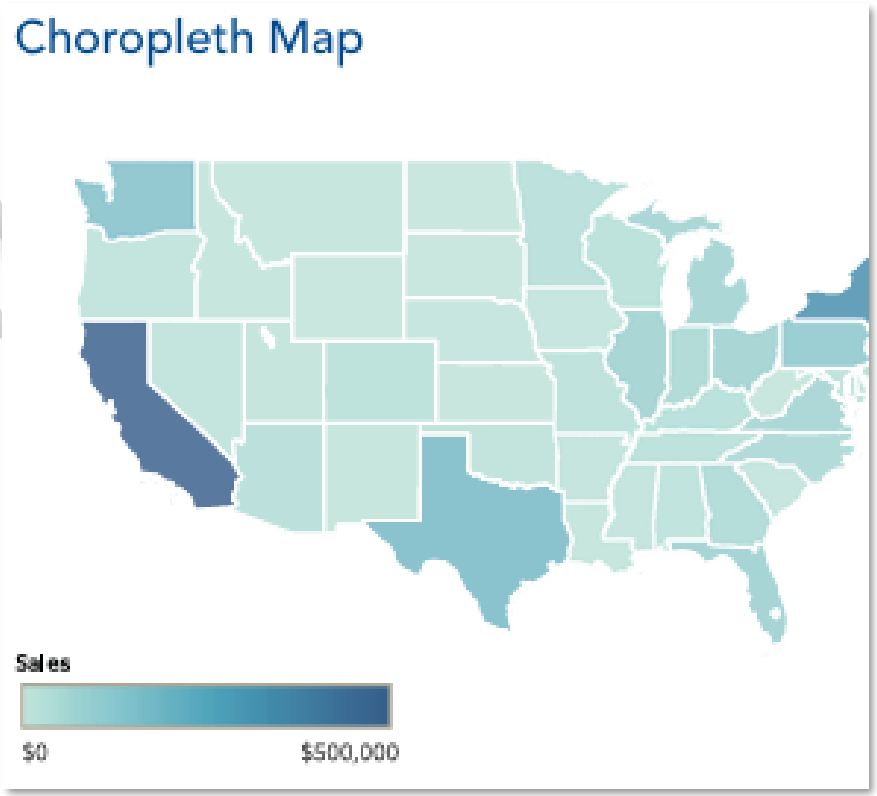
DOT PLOT.

- A **dot plot** allows you to **compare values across two dimensions**.
  - In our example, each row shows sales by ship mode.
  - The dots show **sales for each ship** mode, broken down by **each segment**.
  - In the example, you can see that corporate sales are highest with standard class ship mode.



CHOROPLETH MAP.

- A **choropleth** (also known as a filled) map uses **differences in shading** or **colouring** within predefined areas to **indicate the values or categories** in those areas.



SYMBOL MAP.

- A **symbol map** shows **values in specific places**.
- These could be the **center points** of large regions.
  - E.g., the center of each U.S. state or specific locations determined by an exact latitude / longitude measurement.

TABLE / HIGHLIGHT TABLE.

- A **Table**.
  - Sometimes you do need to be able to look up **exact values**.
  - A table is an **acceptable way** to show data in that situation.
  - On most dashboards, a table shows **details alongside summary charts**.

- A **Highlight Table**.
  - **Adding colour** to your tables can transform them in to highly visual views that also enable the **lookup of any value.**

$111K	**$131K**	**$138K**	**$154K**
$132K	**$117K**	**$157K**	**$215K**
$77K	**$68K**	**$79K**	**$106K**

$111K	**$131K**	**$138K**	**$154K**
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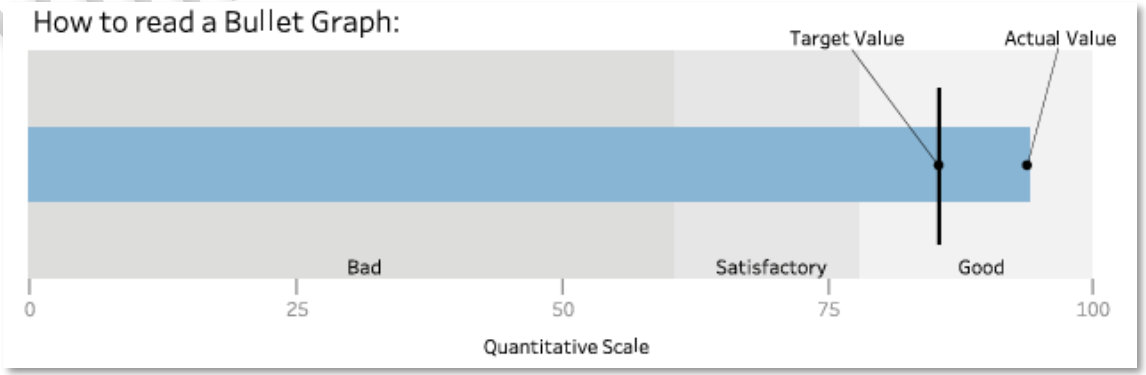
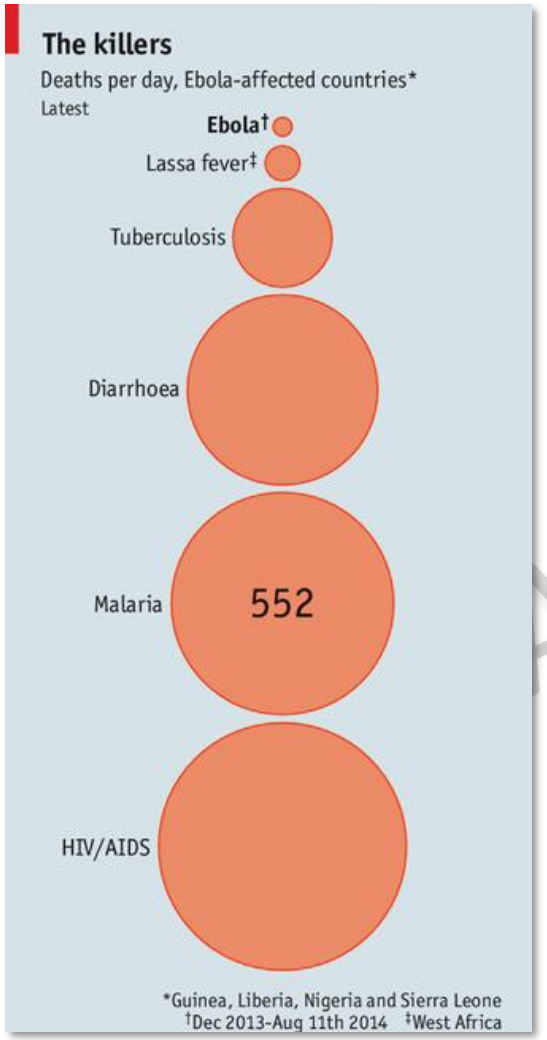
BULLET GRAPH.

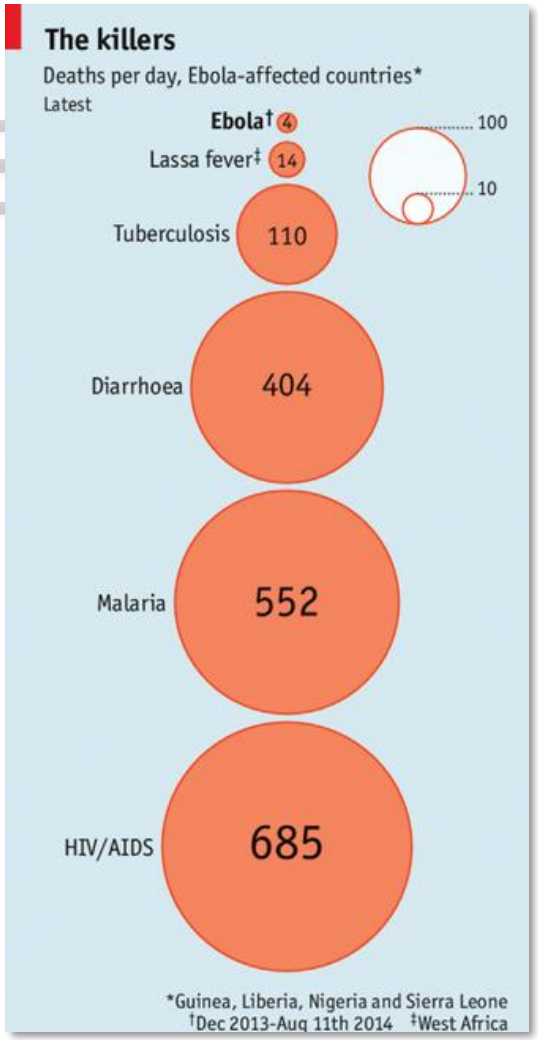
- A **Bullet Graph.**
  - A **bullet graph** is one of the best ways to show **actual versus target comparisons**.
  - The **blue bar** represents the **actual value**, the **black line** shows the **target value**, and the areas of **gray shading** are **performance bands**.



COUNTER EXAMPLES – THE KILLERS.

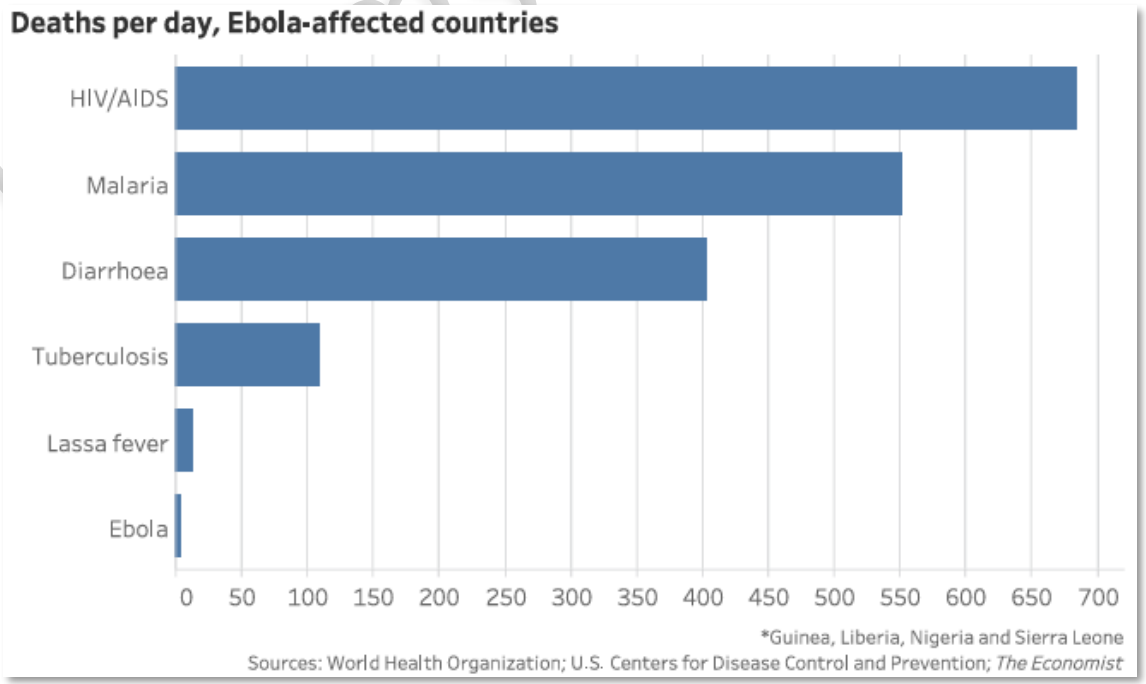


- The image shows the **number of deaths** each day from **various diseases** in Africa.
- Each **circle** is **sized** according to the number of deaths.
- We have removed all the labels **except** the one for malaria (552 deaths per day).
- **How many** deaths per day are there from diarrhea ?
- **How much bigger** is the HIV/AIDS circle than the diarrhea circle ?
- Most people **underestimate** the size of the bigger circles.
- The point is that while **size is preattentive**, we're **not able to tell the differences** with any **accuracy**.



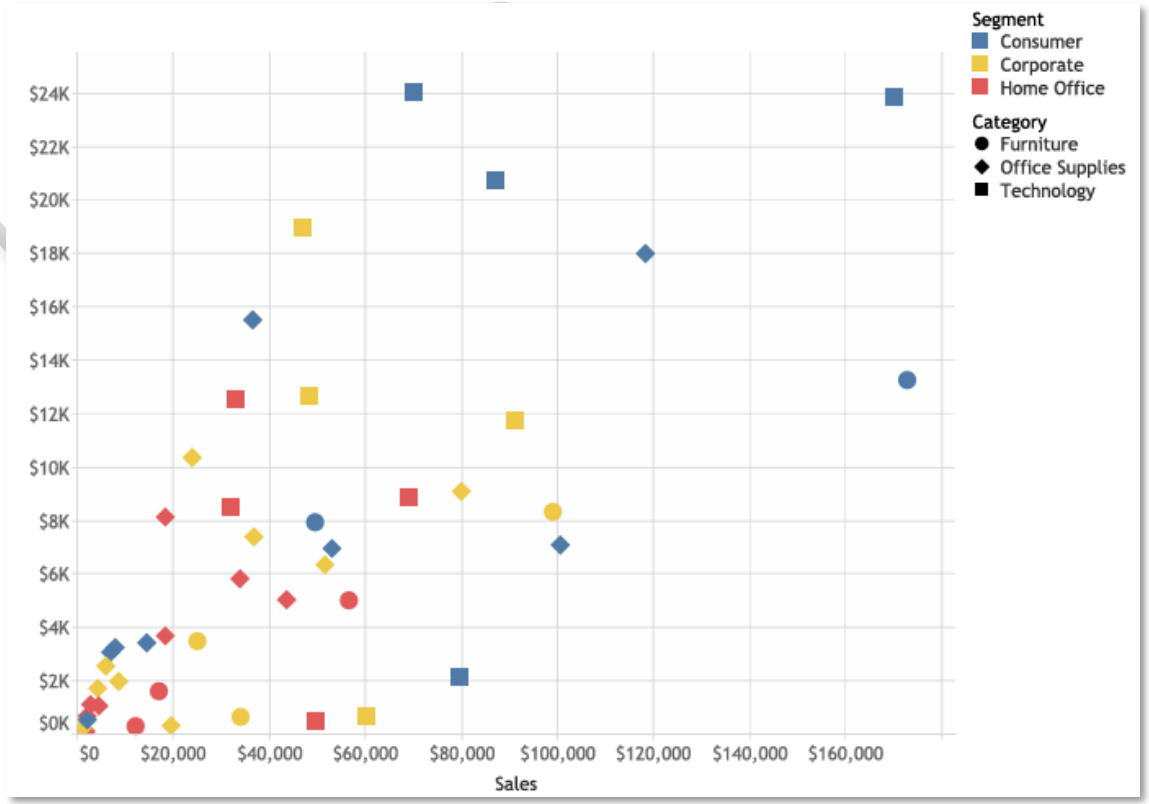
COUNTER EXAMPLES – THE KILLERS.

- In the **bar chart**, we are **encoding** the **quantitative variable**, deaths per day, using length.
  - Notice how **accurately** you can see the **differences**.
  - This is why the **bar chart** is such a **reliable chart** to use:
    - **Length** is one of the most **efficient preattentive** attributes for us to process.



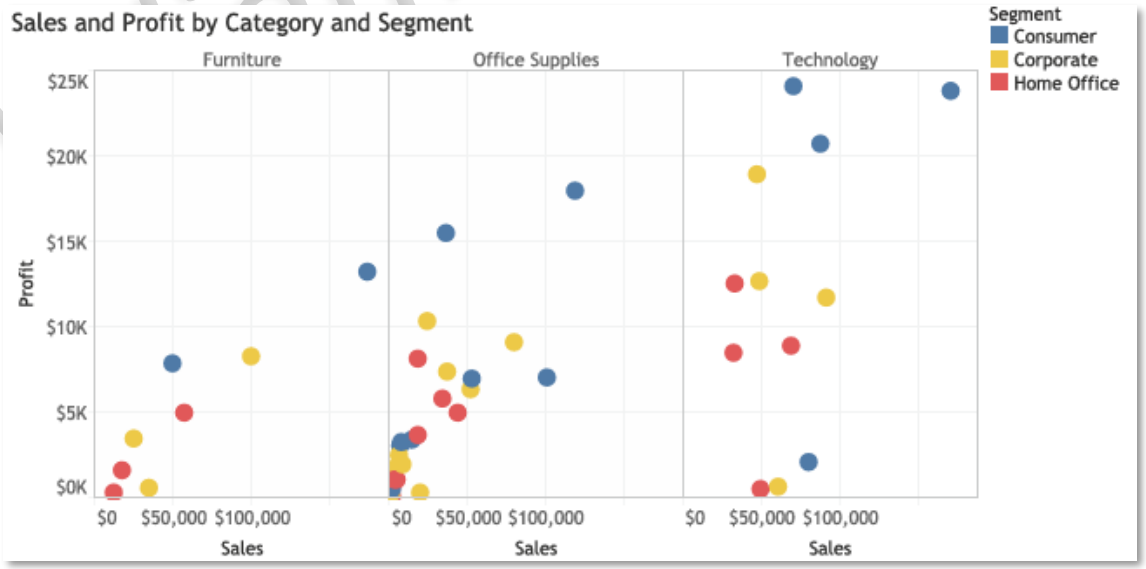
COUNTER EXAMPLE – SALES AND PROFIT BY CATEGORY AND SEGMENT.

- Yet using **multiple preattentive attributes** in one chart can lead to problems.
- The image shows a **scatterplot** of sales and profit for a fictional sales company.
- Position is used for sales (x-axis) and profit (y-axis).
- **Colour** shows different segments, and **shape** shows the categories of products.
- **Which category has, on average, the highest profits** ?
- It's **almost impossible** to see anything, isn't it ?
  - **Mixing position, colour, and shape does not make for easy reading**.



COUNTER EXAMPLE – SALES AND PROFIT BY CATEGORY AND SEGMENT.

- How about using **position** to represent category, breaking the **single scatterplot into three panels** ?
  - The result is much **clearer**.
  - Now you can even see that technology sales, on average, have a higher range of profits than furniture and office supplies.
  - That insight was certainly **not apparent** in the first scatterplot.

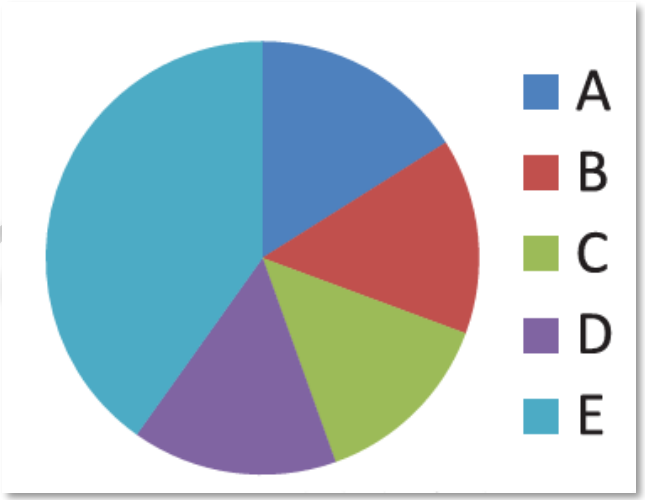


PIE CHART.

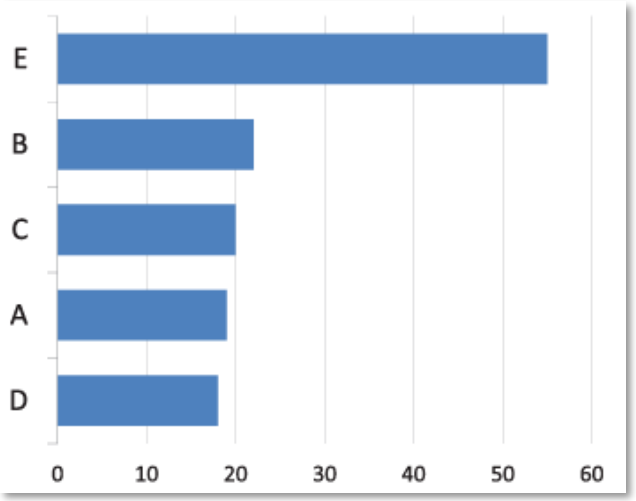
- **What percentage of each circle is covered by the blue segment** ?
- The one on the left is pretty easy:
  - **25 percent**.
- The middle ?
  - It's a little harder.
  - It's also **25 percent**, but because it's not aligned to a horizontal or vertical axis, it's harder to determine.
- And on the right ?
  - It's **13 percent**.
- We are simply **not able to make accurate estimates** of angle sizes, and if accurate estimates are the goal, it's a problem.

PIE CHART.

- The **biggest slice** is easy to spot.
- But what about the second, third, and fourth biggest slices ?



- The **sorted bar** chart makes it very easy to distinguish size differences:
  - Length is such an **effective visual attribute**; we can see very **small differences** with ease.
  - To make **effective** dashboards, you must **resist** the temptation to use **purely decorative** chart types.

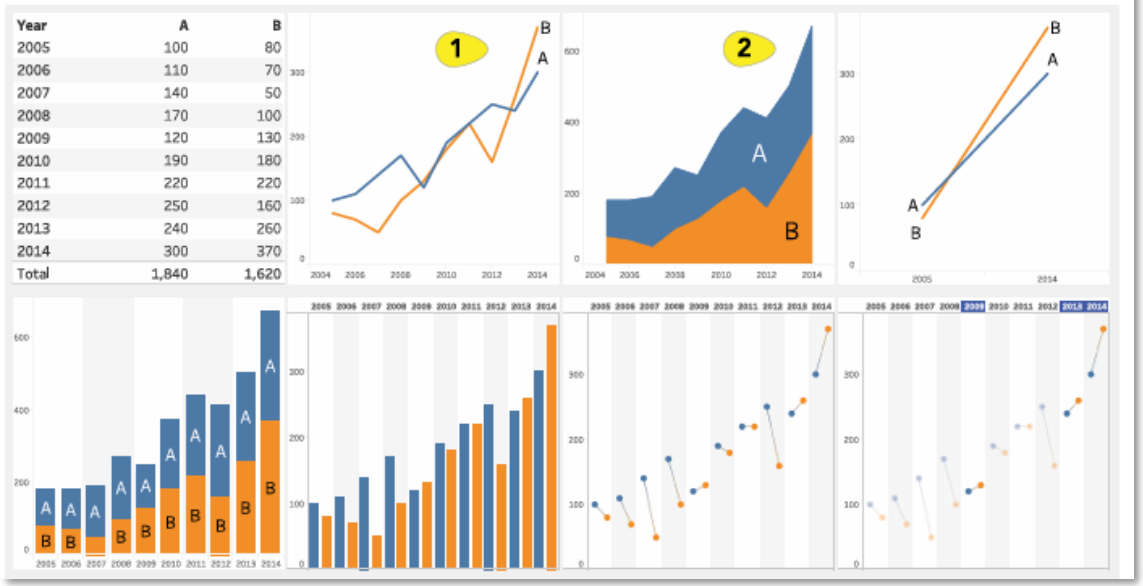


EVERY DECISION IS A COMPROMISE.

- However you choose to show your data, you will **emphasize one feature over another**. Let's have a look at an example.
- Let's imagine they are sales for two products, A and B, over 10 years.
- Each chart uses a **different mix** of **preattentive attributes**.
- Notice the compromises in the charts labeled 1 and 2.
- **A standard line chart (1)** showing each product lets us compare each product's sales very accurately.
- **The area chart (2)** lets us see total sales over time with ease, but now it is harder to compare the two products.
- You **can't**, in a single chart, **answer every possible question** or comparison.
- What you do need to do is **assess whether** the chart you do choose **answers the question being asked**.

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	Total
A	100	110	140	170	120	190	220	250	240	300	1840
B	80	70	50	100	130	180	220	160	260	370	1620

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	Total
A	100	110	140	170	120	190	220	250	240	300	1,840
B	80	70	50	100	130	180	220	160	260	370	1,620



FURTHER CHARTS.

Chart and Graphs

SUMMARY.

- **Core charts:**
- Bar, line scatter, dot, maps, tables/highlight tables and bullet graphs cover most dashboard needs.

- **Strengths:**
- Bar charts excel at comparisons, line charts show trends, scatterplots reveal relationships, and bullet graphs highlight actual vs target.

- **Limitations:**
- Pie chats and circle sizes are harder to interpret accurately; missing too many visual attributes reduces clarity.

- **Guiding Principle:**
- Every chart emphasizes some feature while obscuring others - choose the chart that best answers the specific analytical question.