Part to Whole: Overview and Best Practices

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Part to Whole

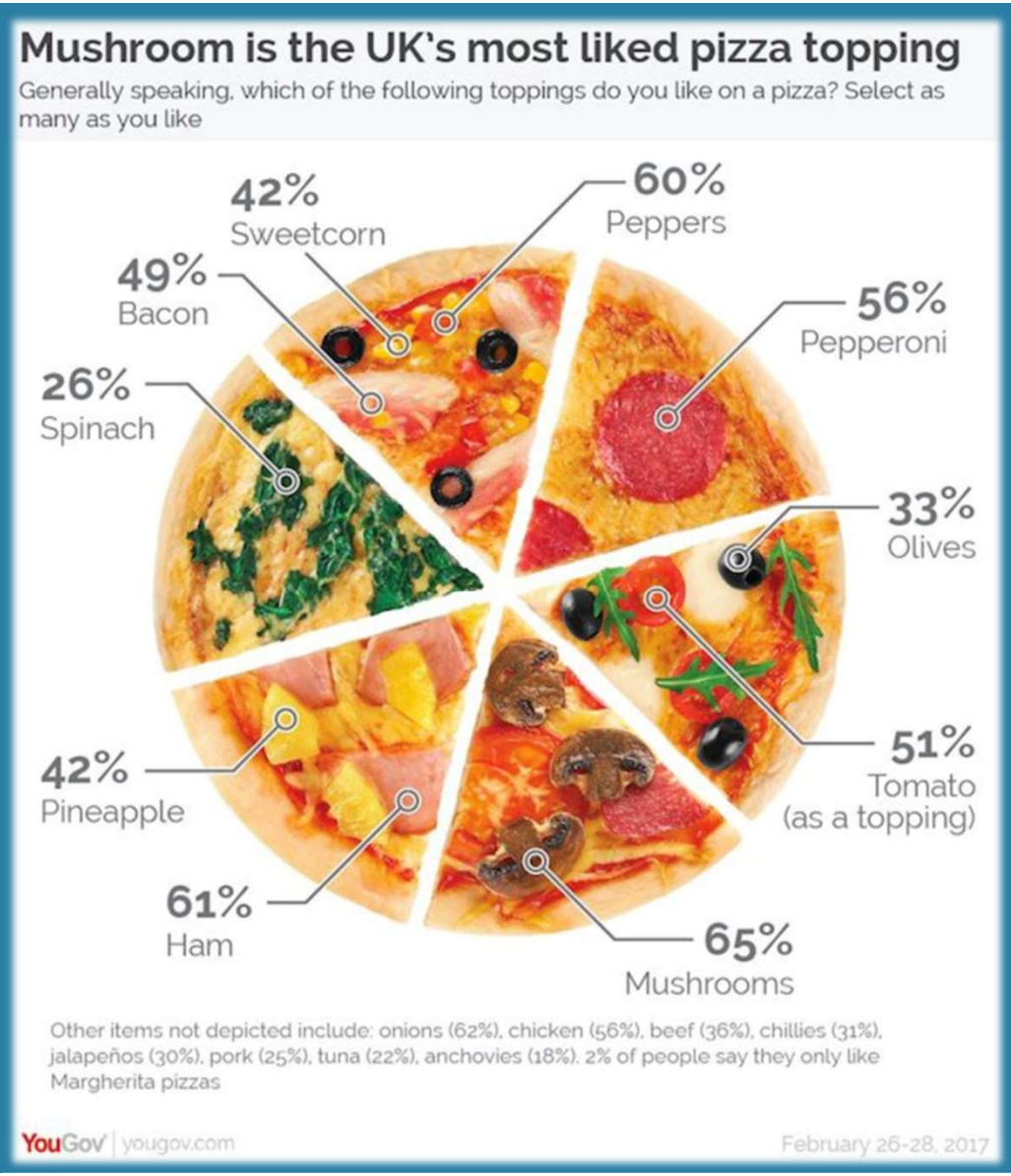
- Definition
  - The relationship of a proportion of a whole to itself
- Key Terms
  - Rate or rate of total
  - Percent or percentage of total
  - Share
  - “Accounts for X percent”

“Not Wrong” Graphs – Pie Chart

- Pie chart is the most commonly used AND MISUSED chart for part-to-whole visualization.
- They are intuitive, but should be used only in narrow cases

Pie Charts – The Bad

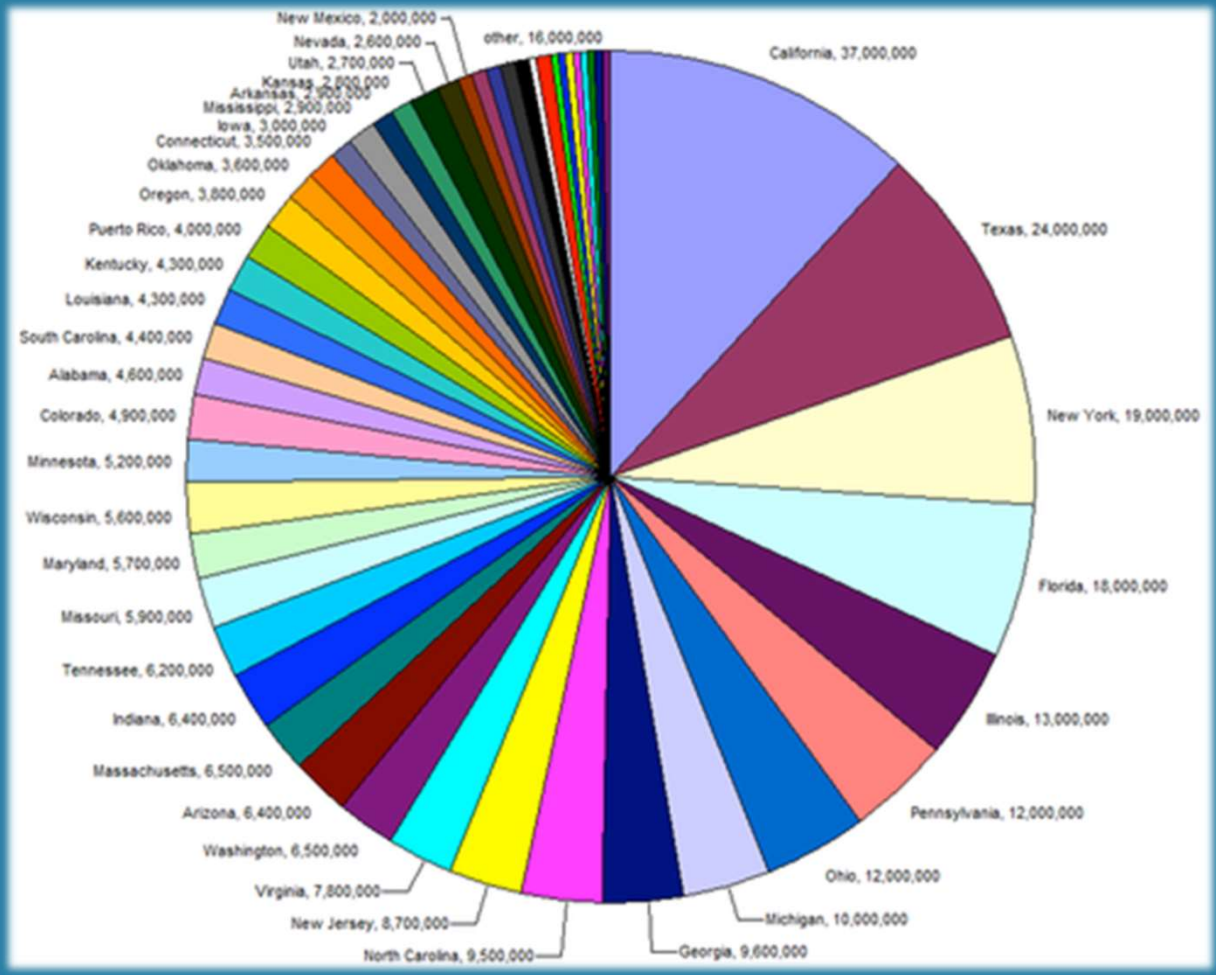
- Graphs like this give pie charts a bad name.
  - Doesn't add up to 100%
  - Slices are all equal, while percentages differ.
  - Pizza image is design element – not quantitative element.



Pie Charts – The Bad

- Silly, but real example…

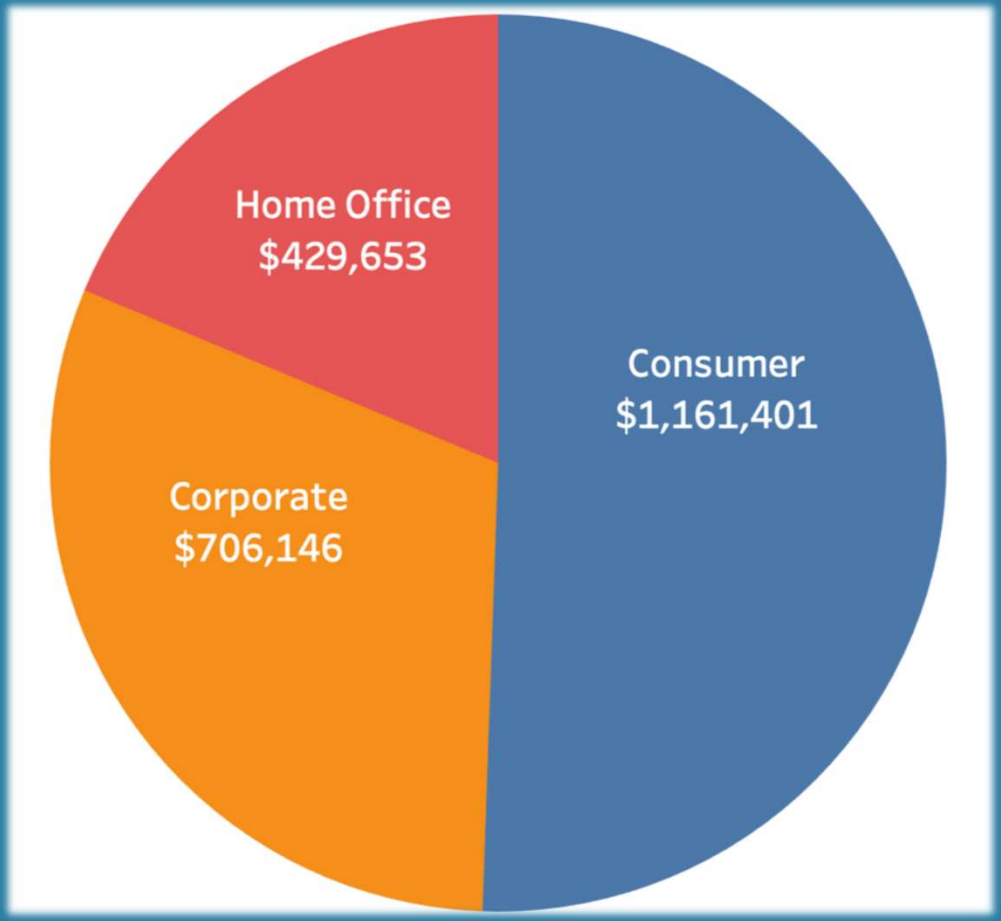
- Too many slices
- Labels still required
- Brain cannot determine more than “small, medium, large”



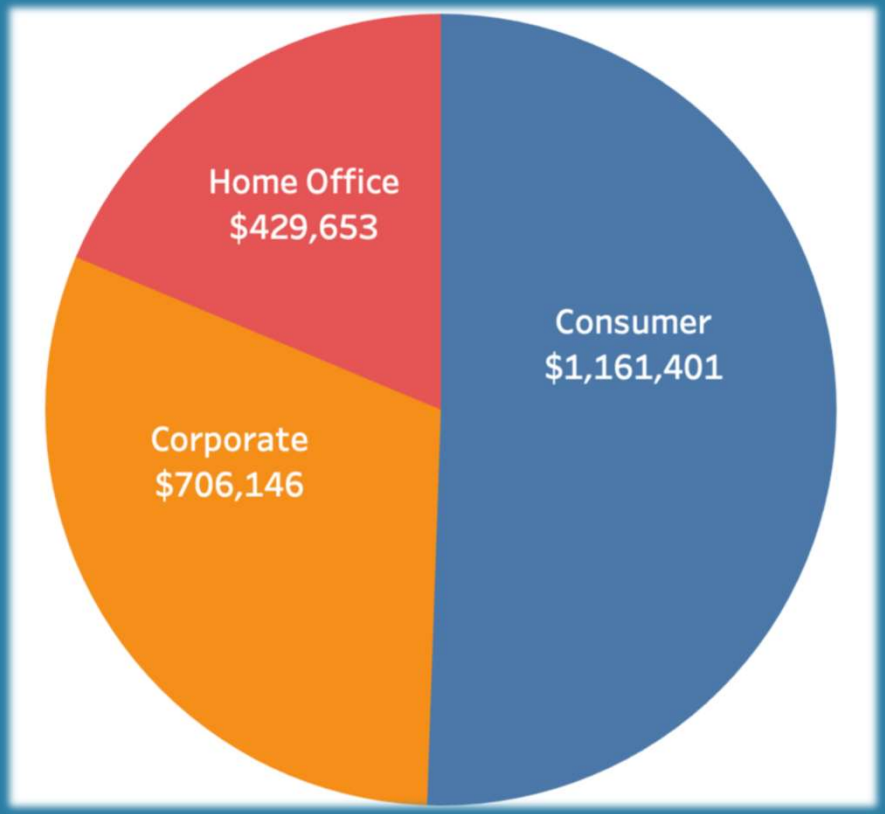
Pie Charts – The Good

- Use a pie chart with:
  - No more than 3 slices
  - Slices are clearly different size
  - Continuous Data
    - NOT ordinal data

- Always show 100% of the whole
- No 3-D
- No Exploded Slices
- All positive numbers
- Never multiple pie charts

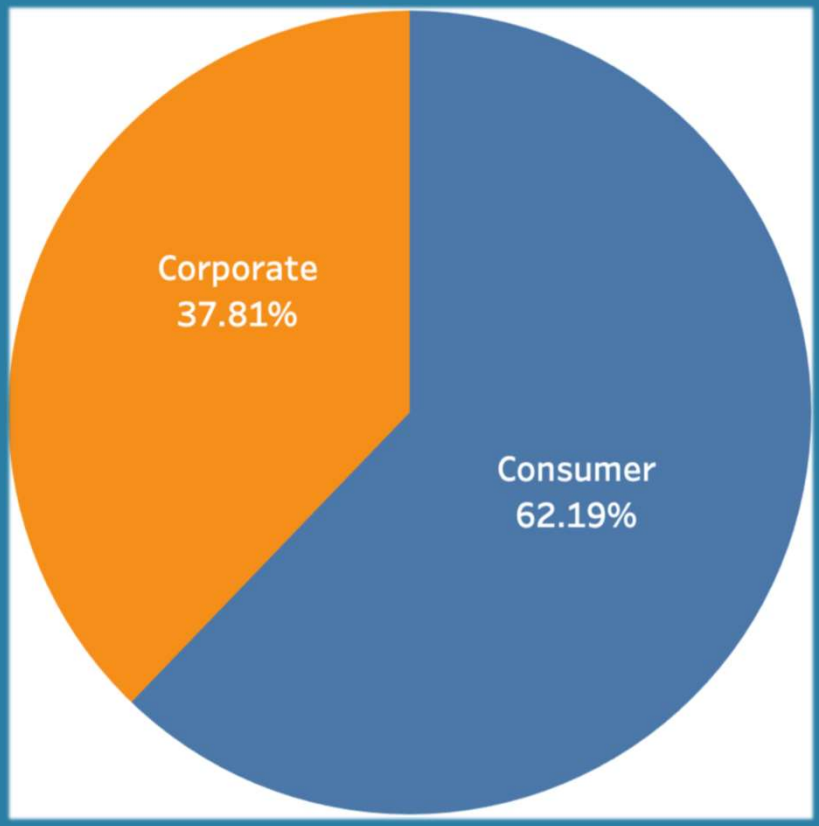


Pie Charts – Always show 100%

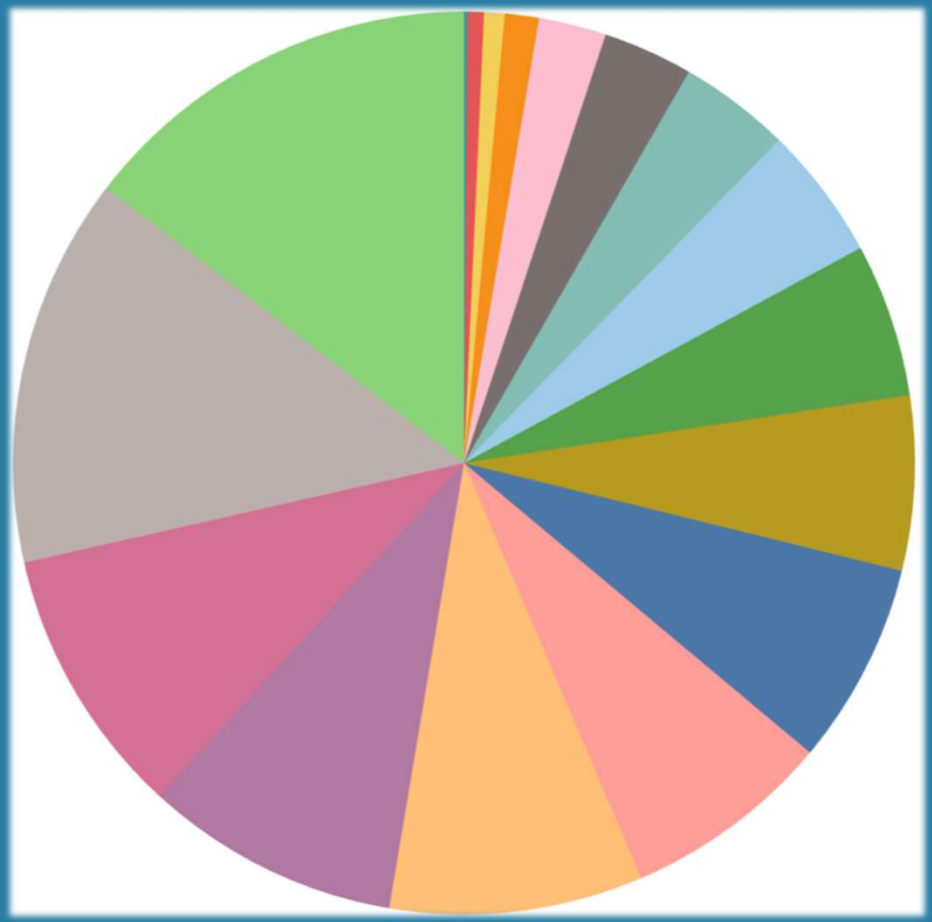


<-Yes

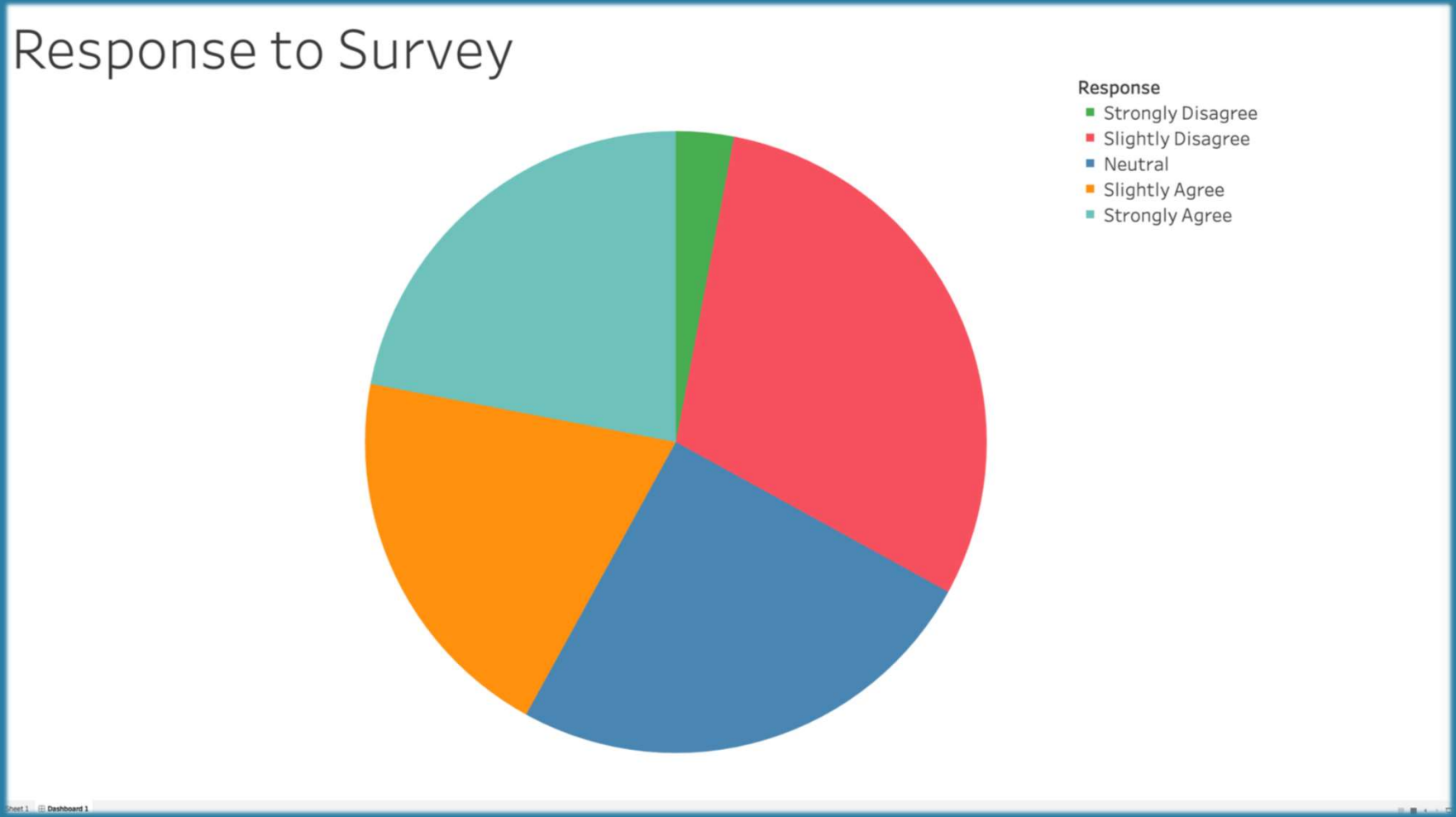
No->



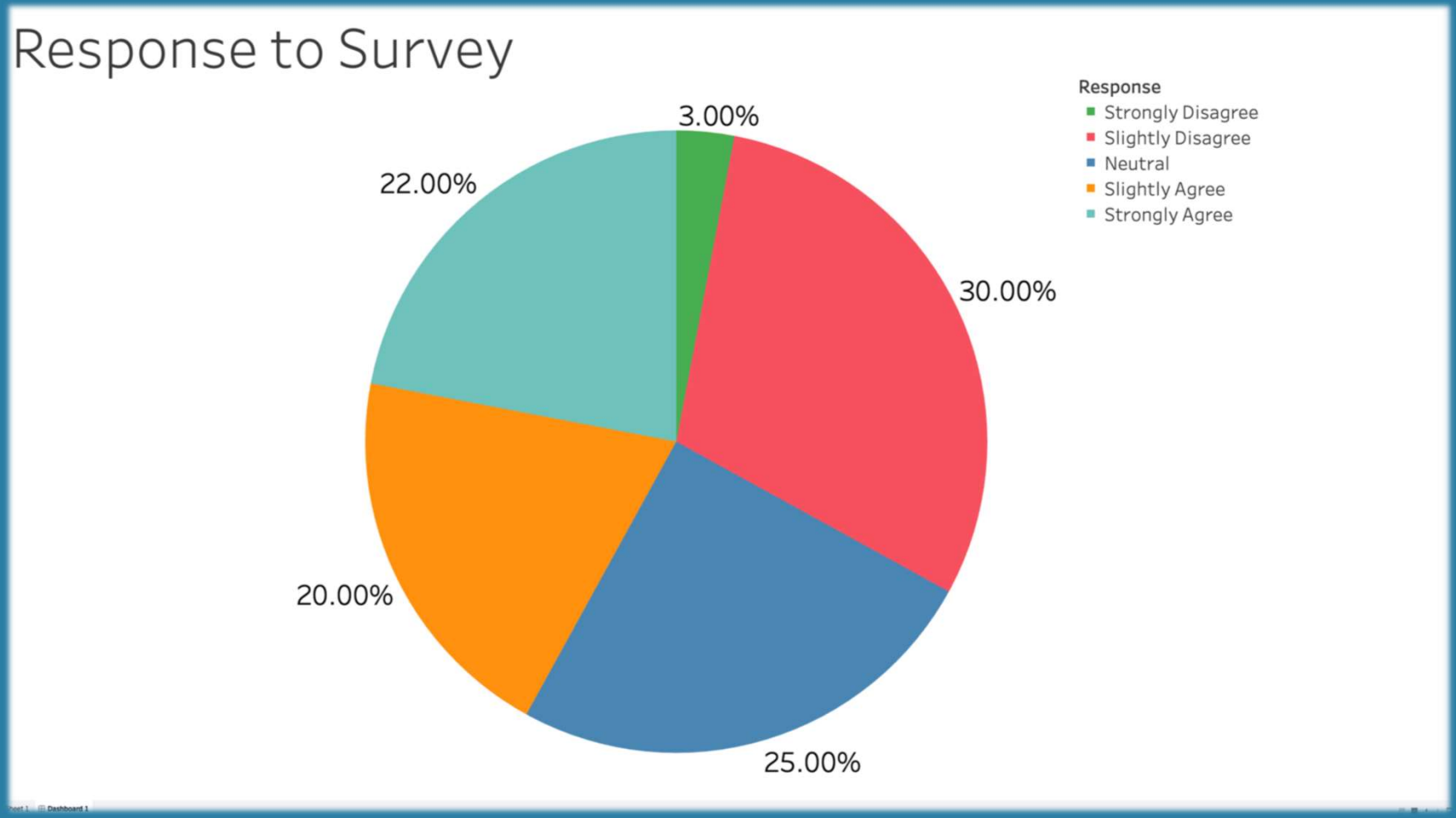
Pie Charts – Three slices or fewer



Pie Charts – Continuous, Not Ordinal

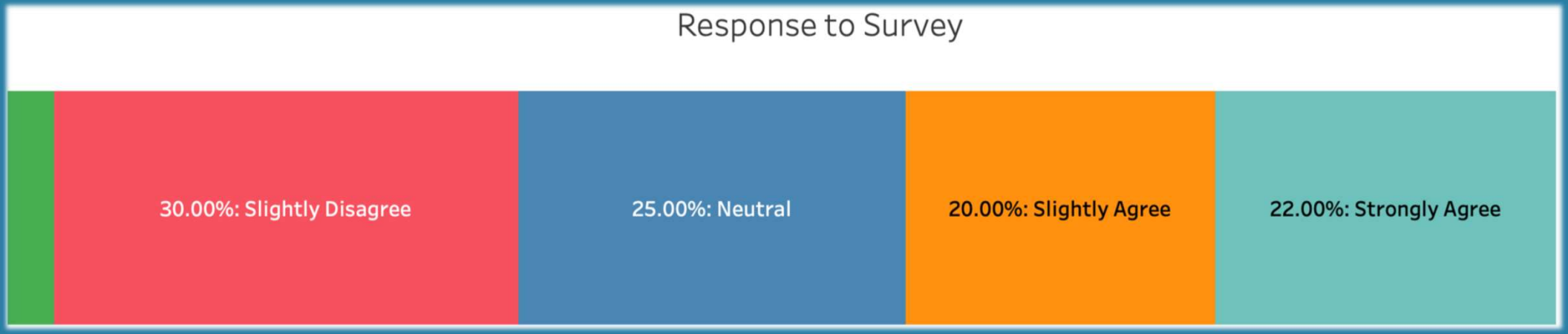


Pie Charts – Continuous, Not Ordinal



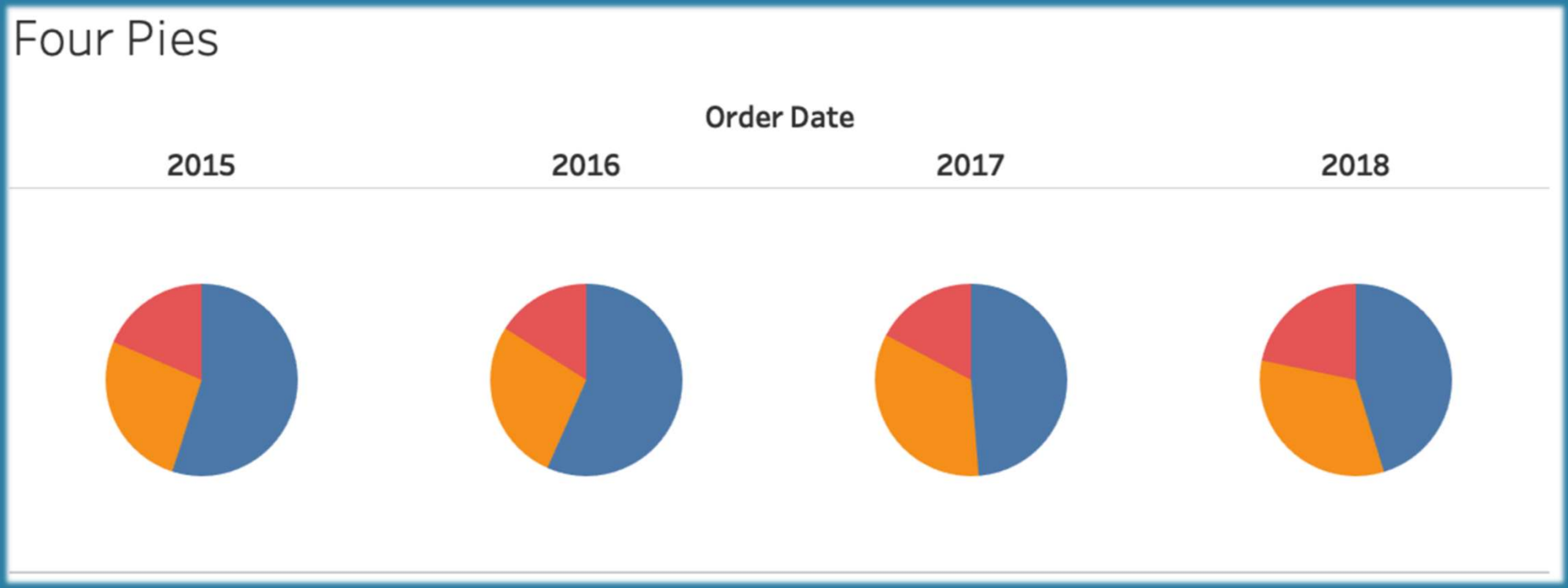
Ordinal Data Must be Presented in Natural Order

Pie Charts – Continuous, Not Ordinal

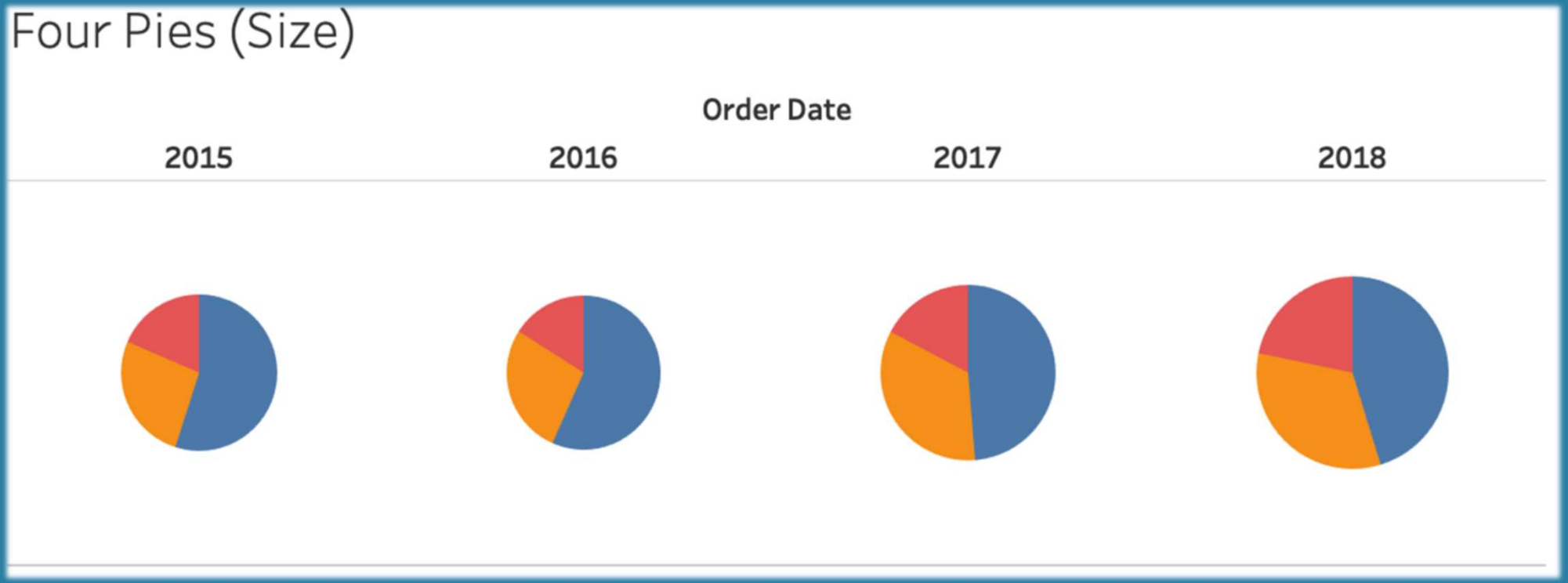


Ordinal Data Must be Presented in Natural Order

Pie Charts – No Multiples

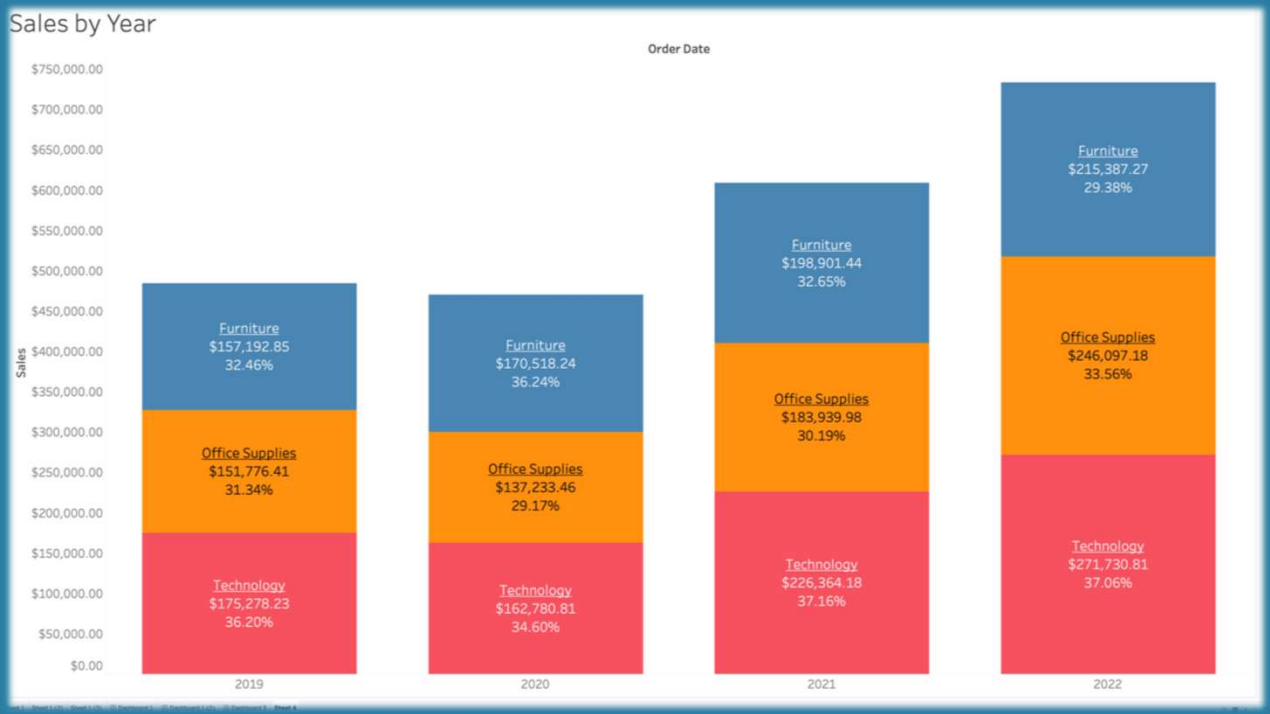


Pie Charts – No Multiples



“Not Wrong” Graphs – Stacked Column Chart

- Stacked Column Charts are excellent alternative to pie charts, especially when you need to compare multiple parts-to-whole.



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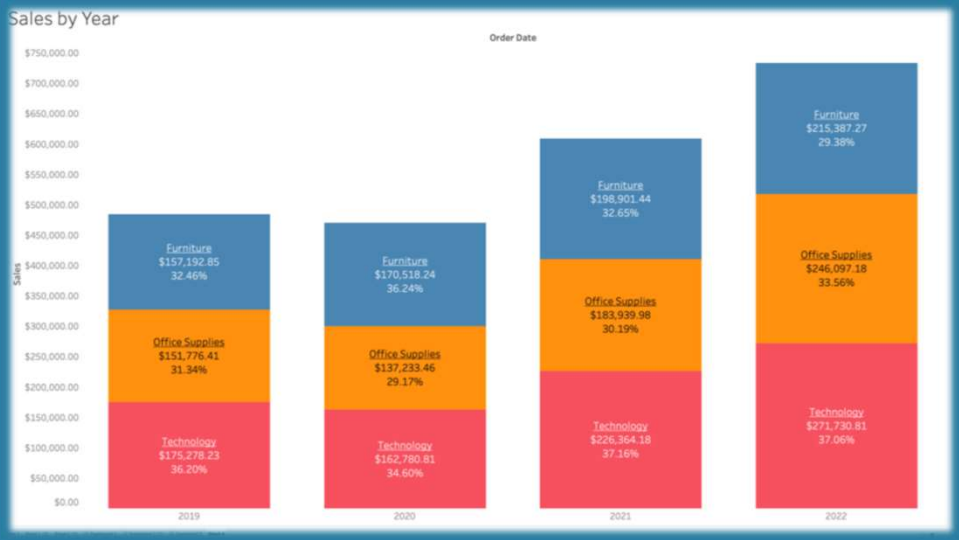
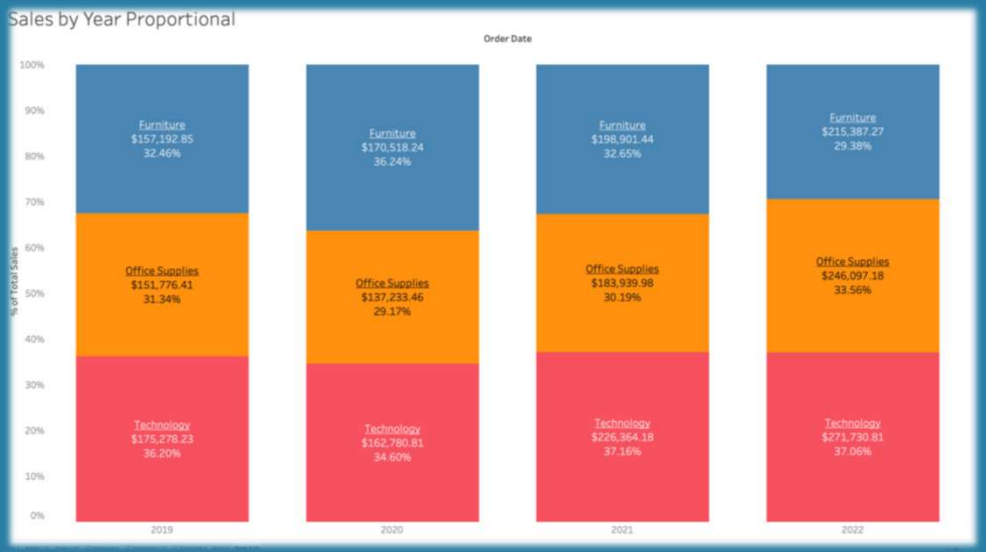
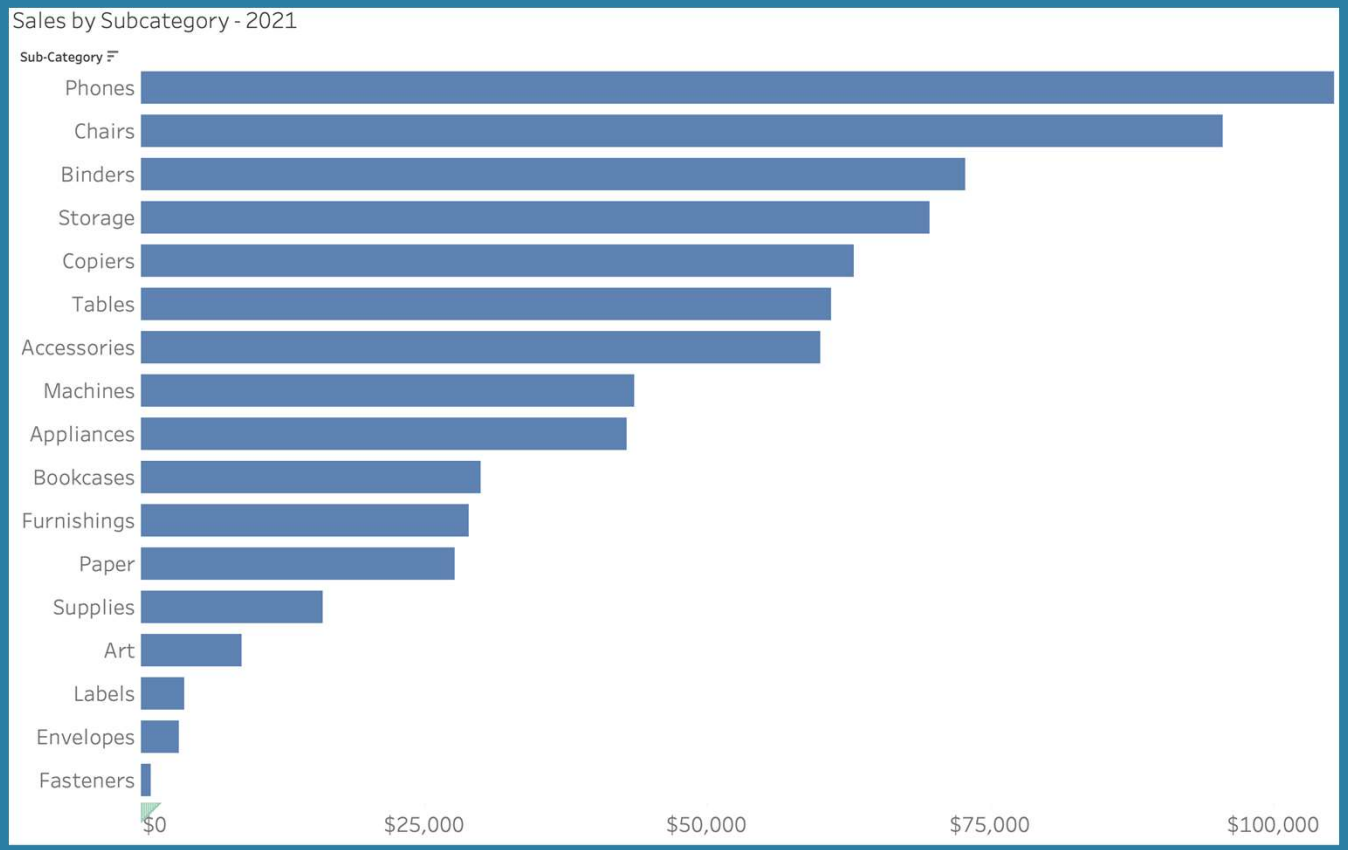




“Not Wrong” Graphs – Bar Graph



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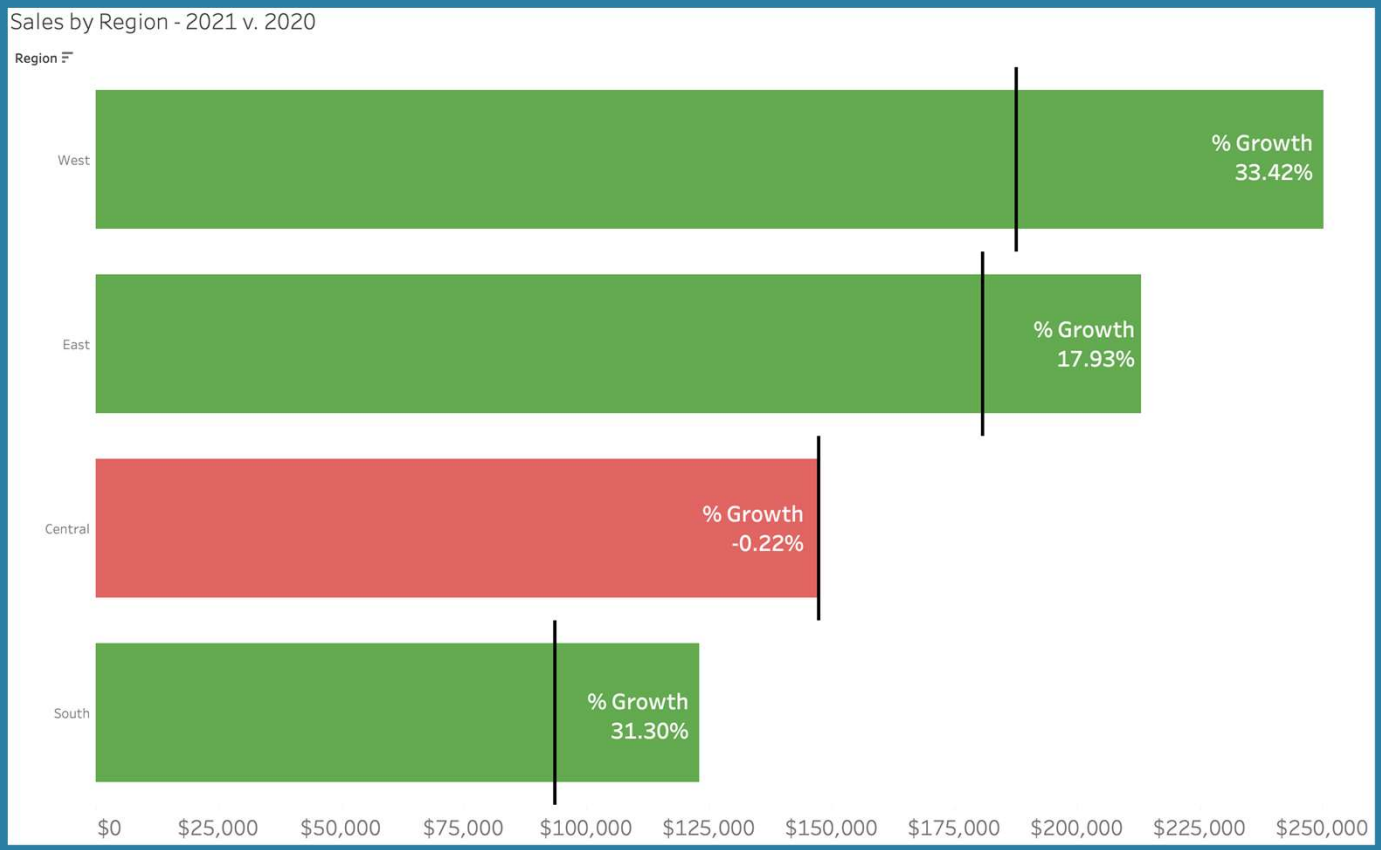
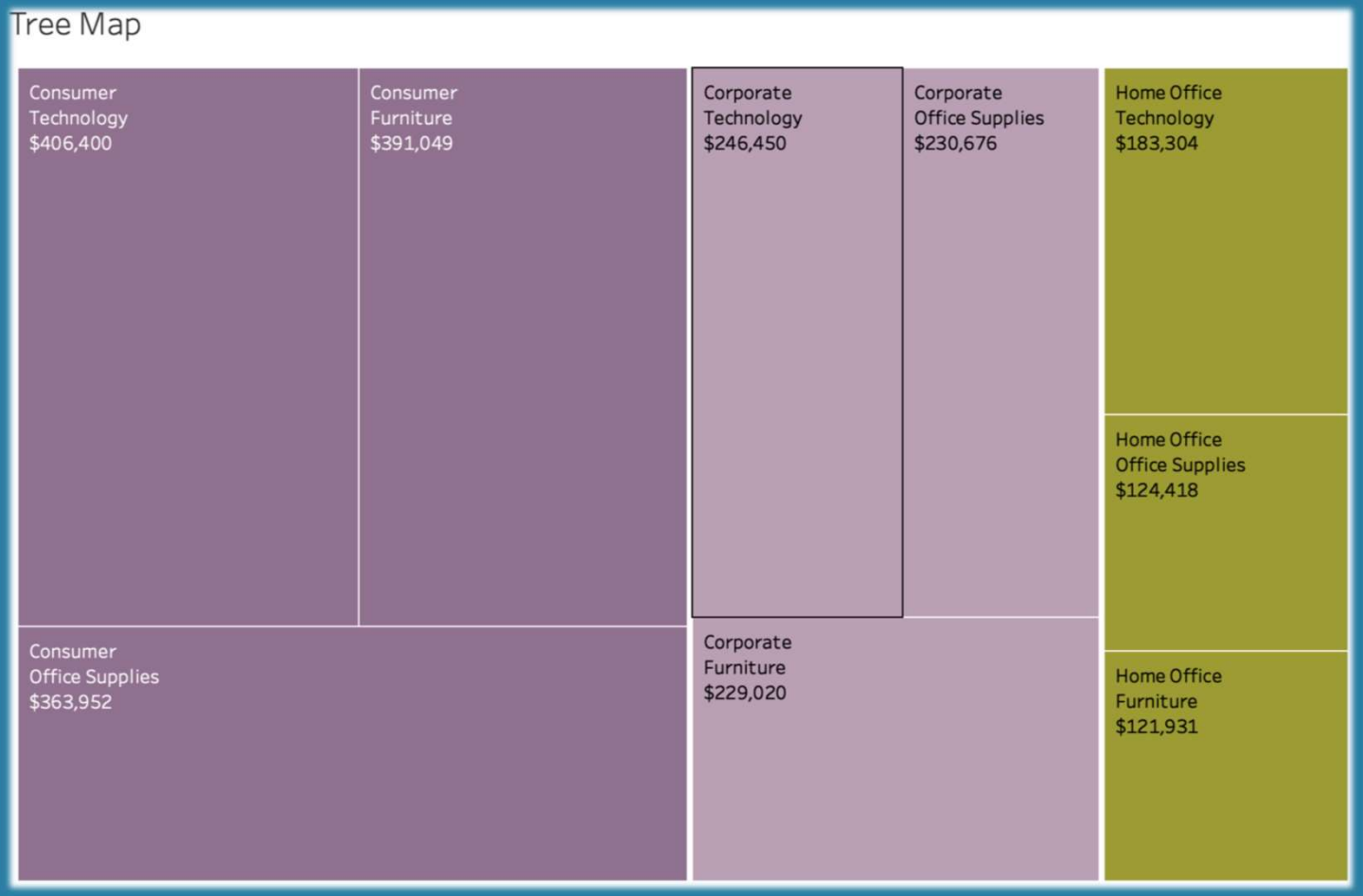


Special Note - Bar Charts

- When using a bar chart for Part-to-Whole representations:

You must show all the bars that make up the “whole”

“Not Wrong” Graphs – Tree Map



“Not Wrong” Graphs – Tree Map

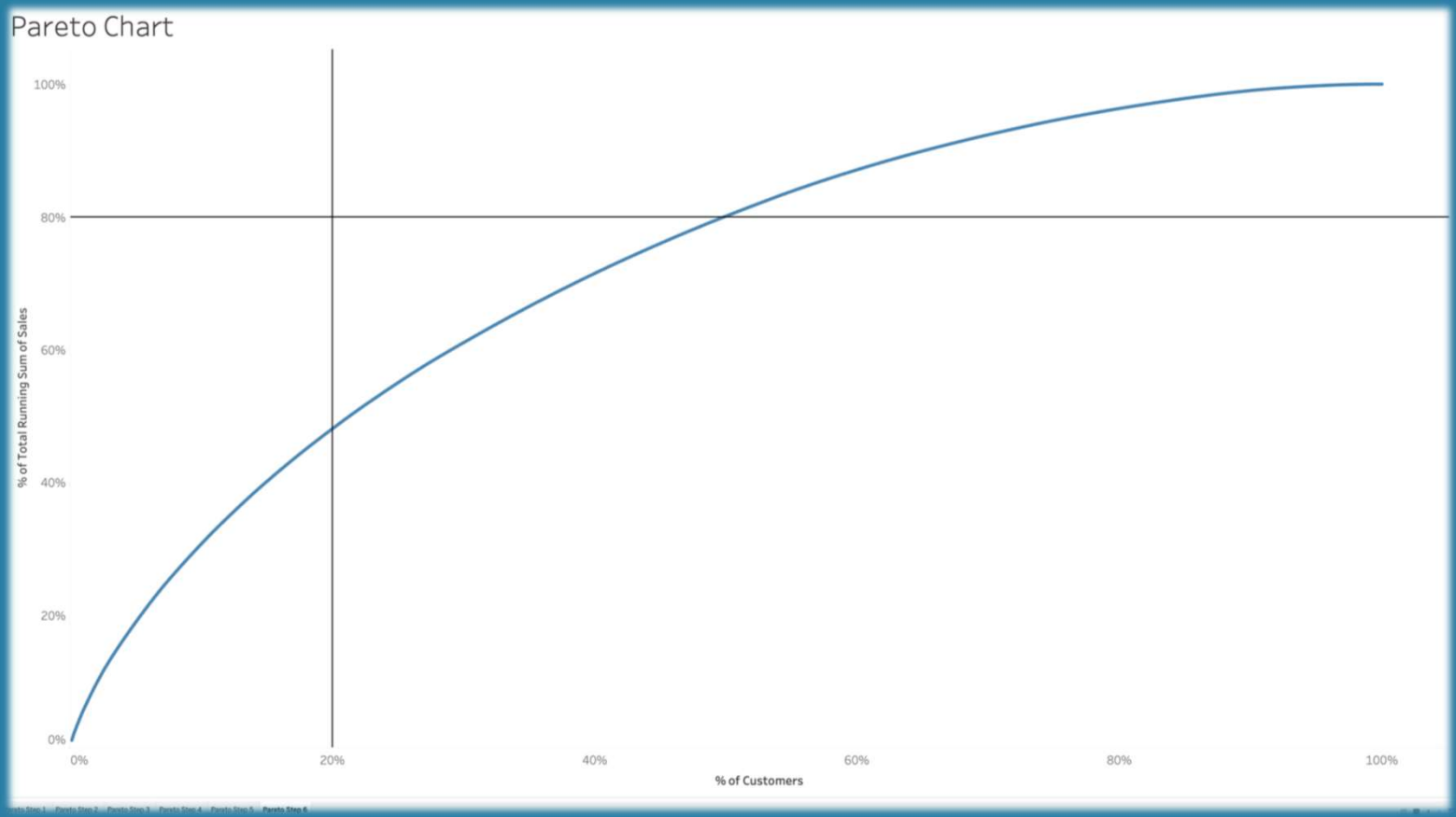
“Not Wrong” Graphs – Donut Chart

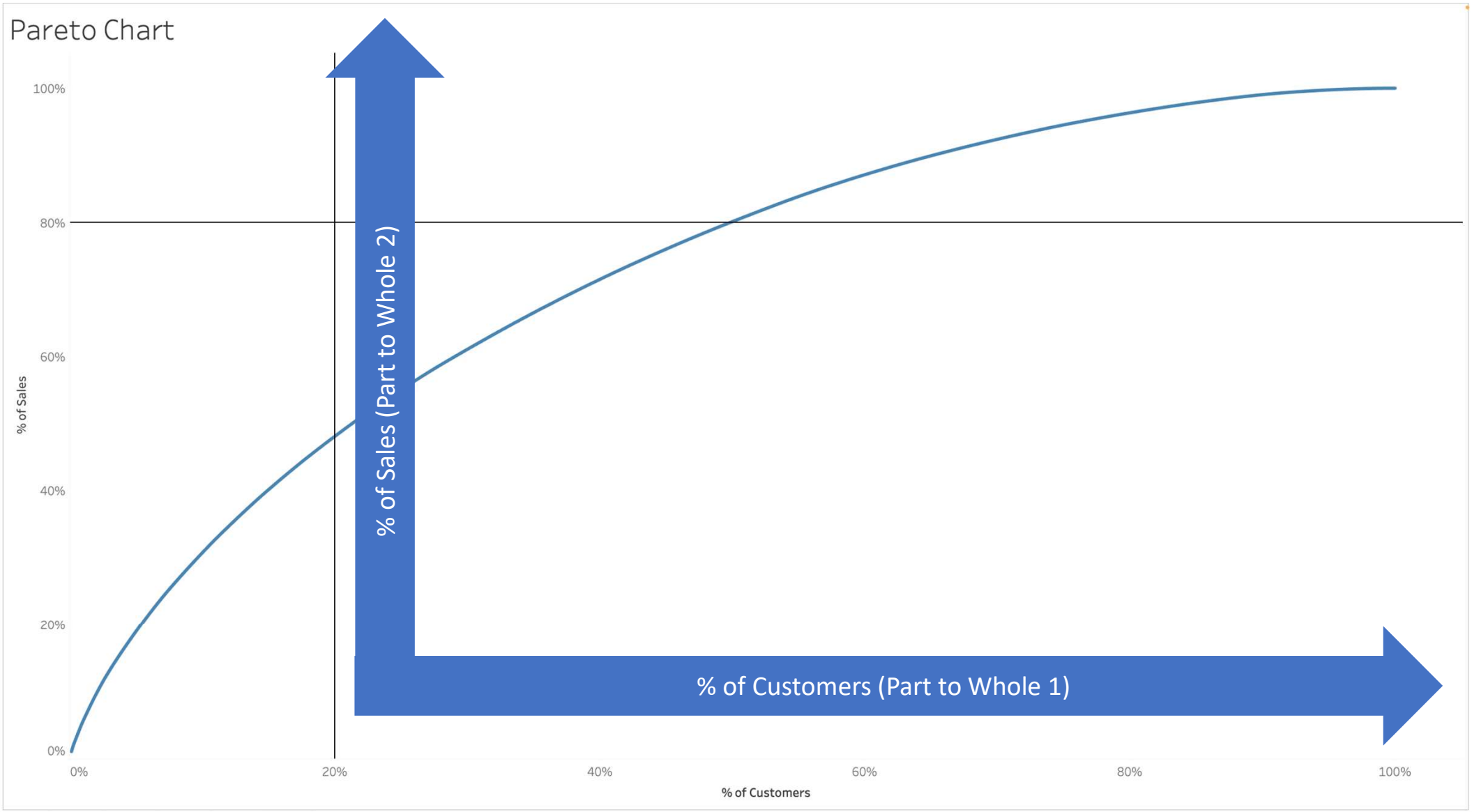
Other “Rules” For Part-to-Whole

- Generally, you should indicate the “whole” – especially when illustrating multiple parts-to-whole.
- More than 5-7 parts may overload the viewer’s ability to make comparisons.

Special Case – Two Simultaneous Parts to Whole

- Pareto Chart




Pareto Chart
100%
80%
60%
40%
20%
0%
% of Sales
0%
20%
40%
60%
80%
100%
% of Customers
% of Sales (Part to Whole 2)
% of Customers (Part to Whole 1)

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