

STAT 540 — Computing in Statistics

Data Visualization Principles — Exercise Quiz

Yen-Yi Ho

University of South Carolina

2026-09-23

Section 1

The Questions

Q1. When Is a Pie Chart Appropriate?

Pie charts are appropriate:

- A.** When we want to display percentages
- B.** When `ggplot2` is not available
- C.** When I am in a bakery
- D.** Never — barplots and tables are always better

Q1. When Is a Pie Chart Appropriate?

Pie charts are appropriate:

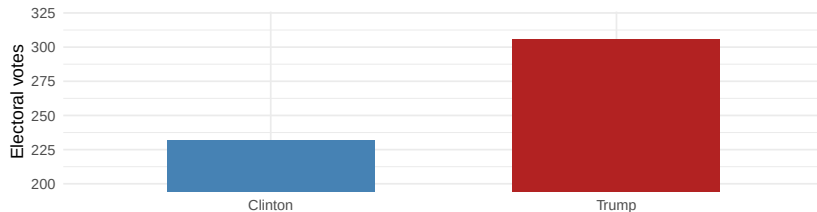
- A. When we want to display percentages
- B. When ggplot2 is not available
- C. When I am in a bakery
- D. Never — barplots and tables are always better

Answer: D

Pie slices encode quantity with **angle and area**, the two cues people read least accurately. A barplot (position + aligned length) or a plain table communicates the same percentages without asking the eye to do arithmetic it cannot do.

Q2. The Electoral Vote Barplot

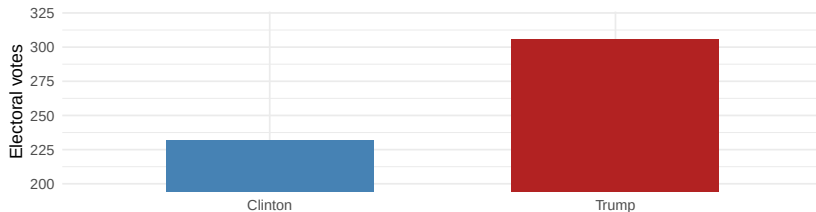
A widely shared barplot compared the 2016 electoral vote (Trump 306, Clinton 232). What is wrong with it?



- A.** The values are wrong **B.** The axis does not start at 0 **C.** The colors should match **D.** Use a pie chart

Q2. The Electoral Vote Barplot

A widely shared barplot compared the 2016 electoral vote (Trump 306, Clinton 232). What is wrong with it?



- A.** The values are wrong **B.** The axis does not start at 0 **C.** The colors should match **D.** Use a pie chart

Answer: B — the axis does not start at 0

Judging by bar **length**, Trump appears to have roughly three times as many votes; the real difference is about **30%**. Bars measure length from a baseline, so the baseline must be zero.

Q3. Two Views of 1928 Measles Rates

Two barplots show 1928 measles rates for the 50 states: one with states in **alphabetical** order, one **ordered by rate**. Which is better and why?

- A. They carry the same information, so they are equally good
- B. The ordered plot is better because alphabetical order is meaningful
- C. The ordered plot is better: ranking by the value shows the highest and lowest states at a glance
- D. Both should be pie charts

Q3. Two Views of 1928 Measles Rates

Two barplots show 1928 measles rates for the 50 states: one with states in **alphabetical** order, one **ordered by rate**. Which is better and why?

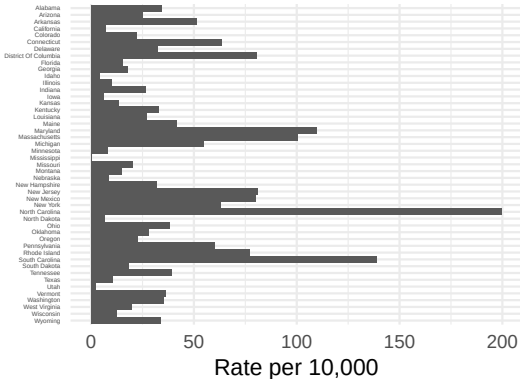
- A. They carry the same information, so they are equally good
- B. The ordered plot is better because alphabetical order is meaningful
- C. The ordered plot is better: ranking by the value shows the highest and lowest states at a glance
- D. Both should be pie charts

Answer: C

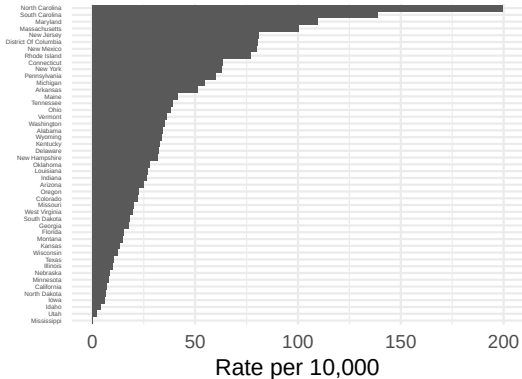
Alphabetical order is an accident of the labels, not information. **Order categories by a meaningful value** so that the comparison you care about — here, which states are extreme — can be read directly off the plot.

Q3 Illustration

Alphabetical



Ordered by rate



Q4. Gun Murder Rates by Region

We see this plot and decide to move to a state in the western region. What is the main problem with this interpretation?



- A.** The plot is fine; the West is safest **B.** The graph does not show standard errors.
C. Averages hide the variability between states **D.** Regions should be ordered alphabetically

Q4. Gun Murder Rates by Region

We see this plot and decide to move to a state in the western region. What is the main problem with this interpretation?



- A.** The plot is fine; the West is safest **B.** The graph does not show standard errors.
C. Averages hide the variability between states **D.** Regions should be ordered alphabetically

Answer: C

The barplot shows five numbers and **throws away 51 data points**. Categories can overlap almost completely and still have different means, so “the West is safest” does not follow. Show the data.

Question 5

What is in a Bland-Altman plot

- A.** X-axis is the average, Y-axis is the difference the average **B.** X-axis is the difference, Y-axis is the average
C. it is the same as a scatter plot

Answer: A