

Solutions

7.1 Choosing a Chart Type

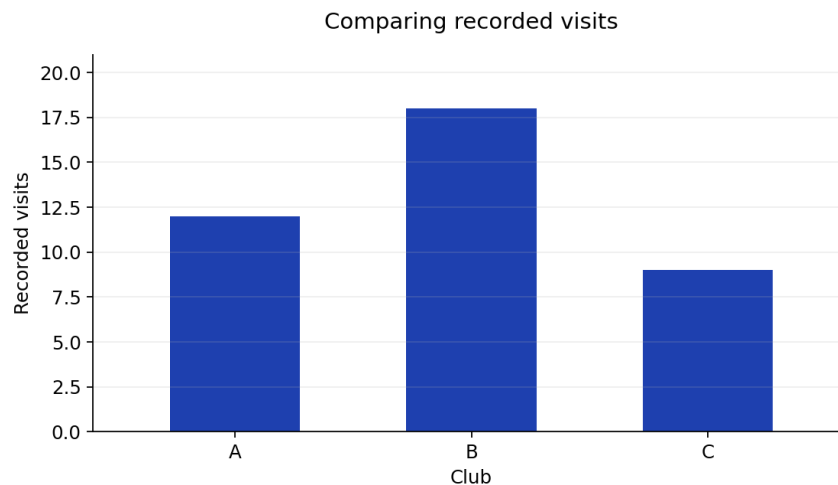
Reference example

Categories: club A, club B, club C

Visit counts: 12, 18, 9

Question: compare counts across clubs

Choice: labeled bar chart



Category counts use a zero baseline; these are visits, not unique people.

7.1.1 - Explain

Choose chart types for weekly attendance, score distributions, and height versus arm span.

A line chart fits ordered weekly attendance, a histogram can show score distribution, and a scatter plot can show paired height and arm-span measurements.

7.1.2 - Explain

Why should club names not usually be connected with a line suggesting continuous interpolation?

The categories are distinct and have no defined intermediate numeric positions. A connecting line can imply continuity or an ordering that the data do not support.

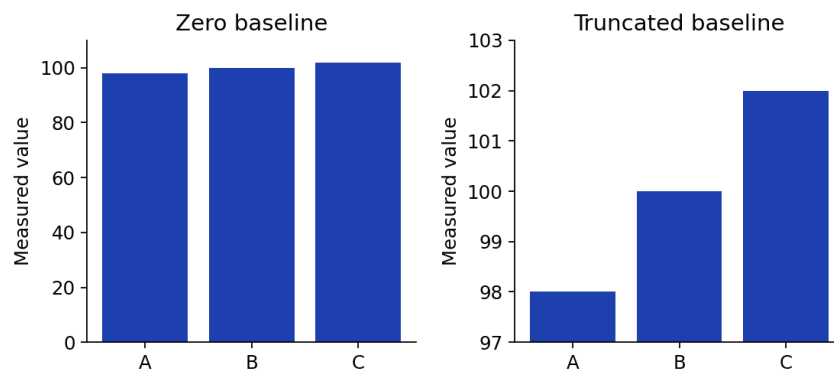
Solutions

7.2 Labels and Scale

Reference example

Measurements: 98, 100, 102
Chart A vertical range: 0 to 110
Chart B vertical range: 97 to 103
Both show the same numbers

The same data on two scales



A truncated bar baseline exaggerates relative length differences.

7.2.1 - Explain

What labels belong on a plot of time in seconds versus distance in meters?

Label the horizontal axis time (seconds), the vertical axis distance (meters), and give a title or caption identifying the measured activity.

7.2.2 - Explain

Why can a bar chart starting at 97 exaggerate the relative difference between 98 and 102?

Bar lengths would represent 1 and 5 rather than the actual magnitudes, making a small relative difference appear much larger. Use an appropriate zero baseline or another clearly explained design.

Solutions

7.3 Honest Presentation

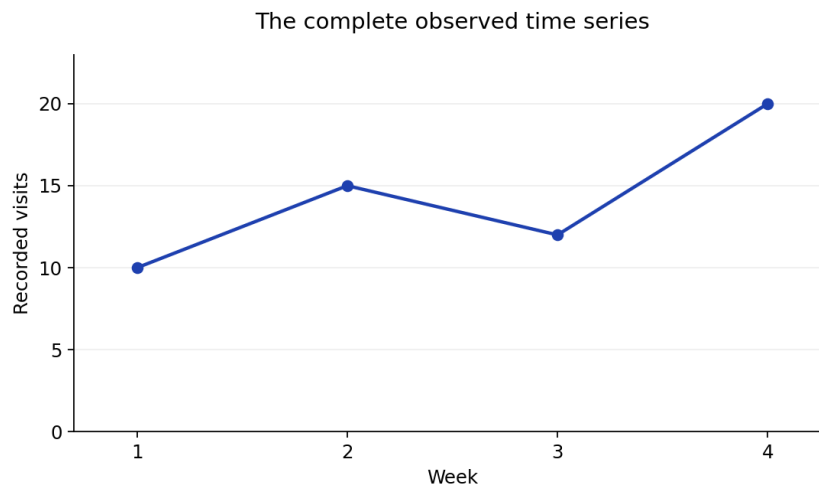
Reference example

Week: 1, 2, 3, 4

Visits: 10, 15, 12, 20

Do not omit week 3 merely because it interrupts the rise

Publish the full observed series



Include the decline in week 3 rather than omitting inconvenient observations.

7.3.1 - Explain

Why does a chart showing more study time with higher scores not alone prove study time caused the score difference?

Other factors or selection effects may explain part of the association. A causal conclusion needs an appropriate study design and additional reasoning.

7.3.2 - Explain

How should a report handle a legitimate outlier?

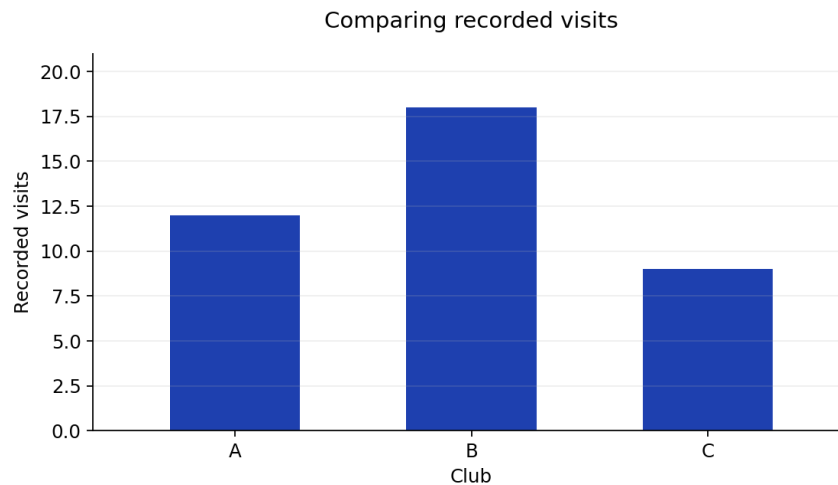
Investigate its origin, apply a documented rule consistent with the goal, and disclose any exclusion. Removing it only to improve the desired story is misleading.

Solutions

7.4 Explaining a Result

Reference example

Club A: 12 visits
Club B: 18 visits
Club C: 9 visits
Observed period: one week
Records count visits, not unique people



Category counts use a zero baseline; these are visits, not unique people.

7.4.1 - Explain

Write one supported conclusion and one unsupported claim from the displayed data.

Supported: club B recorded the most visits during the observed week. Unsupported: club B necessarily has the most distinct members or is preferred by all students.

7.4.2 - Explain

What additional information would help compare participation fairly across clubs of different sizes?

Collect appropriate membership counts or unique-participant measures, define the time period, and consider a rate per eligible person while documenting missing or repeated records.