

Mean vs Median When Data Are Skewed

Toggle the one extreme value below on and off to see how much it moves the mean compared to the median, using the same fixed five other values each time.



Mean vs Median When Data Are Skewed

Exported from statreason.com. Deterministic, browser-local content; not professional statistical or research advice.

Include the extreme value (100) in the dataset

Fixed values: 4, 5, 6, 7, 8, plus this one optional value.

Mean = 21.67, Median = 6.50

Dataset	4, 5, 6, 7, 8, 100
Mean	21.67
Median	6.50

Check both on your own data: [Mean Calculator](#) and [Median Calculator](#)

What this answers

This visual answers "why do people recommend the median instead of the mean for skewed data?" It uses one fixed dataset with a single value you can add or remove, so you can see directly how much one extreme value moves each summary.

Why the mean moves more

The mean uses the exact magnitude of every value, so a single very large or very small number pulls the total, and therefore the average, toward it in proportion to how extreme it is. The median only depends on which value sits in the middle position once the data are sorted; an extreme value only changes the median if it changes which value occupies that middle position, and even then it only shifts the median to the next value in the sorted order, never in proportion to how extreme the added value is.

Worked example

With the values 4, 5, 6, 7, and 8, the mean and median are both 6. Add a sixth value of 100 and the mean jumps to about 21.7, more than three times its previous value, while the median only moves to 6.5, the average of the two middle values in the now six-value sorted list. The median barely reacted because it does not use the magnitude of the extreme value, only its rank.

Assumption audit

Calculated from your data: in this visual, the exact mean and median for whichever version of the fixed dataset you select; the linked calculators compute both from your own actual data.

Evidence to review: a [skewness measure](#) or histogram of your own data to see whether it resembles this toggled example.

You must verify: whether an extreme value in your own data is a genuine observation or an error before deciding which summary, or whether both, best represents your data; see [Outliers Need Investigation Not Automatic Deletion](#).

Source

This comparison follows the standard descriptive-statistics treatment of skew sensitivity in the NIST/SEMATECH e-Handbook of Statistical Methods and the shared statistical reasoning contract every StatReason engine is built against.

Limitations

This visual uses one fixed illustrative dataset; the actual sensitivity difference in your own data depends on its specific values and sample size. Neither the mean nor the median is universally correct; report whichever, or both, best answers your specific question.