Reporting with Numbers: Proportion

When a reporter gives her readers proportion, she explains thing relative to the size or the magnitude of the whole.

Percentages

Percentages are basic building blocks used to explain proportion. To calculate a percentage, take the proportion you want to measure, divide it by the whole and then move the decimal point two places to the right.

Remember it this way.

To calculate a percentage:

• Portion ÷ Whole = xxx.
• Move decimal point two places: .xxx = xx.x%

If a councilman attended 42 out of 45 meetings, his attendance rate is 93 percent.

\[
42 ÷ 45 = 0.93333333
\]

93 percent

If a chess club won 44 out of 55 matches one year, it won 80 percent of its matches.

\[
44 ÷ 55 = 0.8000
\]

80 percent

If someone is giving you percentages, you must ask what population the figures are based on. Example: If a principal tells you he needs more money for a reading program because 20 percent of his students are failing standardized reading tests, this number can mean different things depending on what population was used to arrive at 20 percent.

Ask the following questions: Was the population you used to figure this number the total number of students you’ve had in the school during your seven years as principal? Was it the number this year alone? Were ESL and special education students included in this study?

Margin of error: Though most readers and reporters ignore this number, they shouldn’t. Example: If a poll states that the president’s approval rating is 48 percent with a margin of error of plus or minus one point, his approval rating is between 47 and 49 percent. If, however, the margin of error were plus or minus seven percent in the poll, the president’s approval rating is between 41 and 55 percent. That’s a huge difference.
**Percentage Change**

This number explains how much something goes up or down.

**Example:** To find the percentage change of a municipal budget, you do the following calculation: increase (or decrease) divided by the old budget.

If a municipal budget increases by 500,000 dollars in a year, you can find the percentage change by using this formula. So, if the budget went from $1,785,500 to $2,285,500, just do the following calculation: $500,000 ÷ $1,785,500. The result is .28. Move the decimal point two places to the right, and you get 28 percent. The budget increased by 28 percent.

Notice that if the next year the budget increases by 500,000 dollars, the percentage change would be different. Suppose the budget increases from $2,285,500 to $2,785,500. This time the equation is $500,000 ÷ $2,285,500, yielding a 21.9 percent increase from the previous year. It’s a smaller percentage increase because the base year changed.

Sometimes it’s better to translate the numbers into plain words rather than using a percentage figure.

**Example:** Your town decided to spend $370,000 on planting trees in its new budget and spent $240,500 last year. First, you subtract the old number from the new number ($370,000 - $240,500 = $129,500. The percentage change is $129,500 ÷ $240,500, or a 54 percent increase from the previous year. That’s a nice headline for your story.

**Remember it this way.**

To calculate percentage change:

- **(New Number) – (Old Number) = Change.**
- **Change ÷ Old Number = .xxx.**
- **Move decimal point two places to the right: .xxx = xx.x%**.
- **The percentage change can be a positive or a negative number.**

**Averages and Medians**

The **average** is the number you obtain when you add a list of figures then divide the total by the number of figures in the list.

The **median** is the midpoint of the list. Half the figures fall above it, and half the figures fall below it.

While the average and the median might be very close in some cases, they might be very different in others.

**Caution:** Averages tend to give an accurate picture only when there are no large gaps among the numbers.

**Example:** You are working on a story about home prices in a city, and you want to compare the average salary with the average home price to give readers an idea how difficult it is to buy a home. For the sake of argument, let’s assume the city has five residents. Their yearly salaries are $11,836, $12,972, $13,087, $15,948 and $89,634 respectively.

The average salary of $34,695 doesn’t paint an accurate picture of what people make in this town because 80 percent of the city’s population makes far less than this amount.

The median salary of $13,087 more accurately reflects the salary of the majority of the town’s residents. You can use this method whether your city has five, 500,000 or 5 million residents.
Remember it this way.
To compute an average:
**Step 1:** Add the figures.
**Step 2:** Divide the total by the number of figures:
\[
\text{Total} \div \text{Number of Figures.}
\]
**The result is the average.**

To find the median:
**Step 1:** Arrange the figures in rank order.
**Step 2:** Identify the figure midway between the highest and lowest numbers.
**That figure is the median.**
**Note:** When you have an even number of figures, the median is the average of the two middle figures.

**Rates**

A rate is a term used to make fair comparisons between different populations. One example of a rate comparison is **per capita**, or **per person, spending**, such as for school funding.

**Example:** In order to justify the low test scores under his watch, School Superintendent Smith of District B claims his students don’t have adequate funding. As evidence, he cites that School District A spends $1 million per year more than School District B, even though it has only 500 more students.

An unskilled reporter might run this story with Superintendent Smith’s quotes alone, giving the reader the impression that students in district B had indeed been slighted in the education budget. But as you’ll often find in reporting, checking the facts might totally change the story.

In doing research, you find that District A spends $2,000,000 for 1,000 students. District B, on the other hand, spends $3,000,000 for 1,500 students. As it turns out, Superintendent Smith was right in part of his statement. When you go the next step to figure out how much money was spent per pupil, however, something interesting happens.

District A: $2,000,000 ÷ 1,000 = $2,000
District B: $3,000,000 ÷ 1,500 = $2,000

As it turns out, both school districts spend exactly the same amount per pupil. Superintendent Smith was twisting the numbers in order to help him account for the low test scores. The only thing that kept him from doing so was your good reporting.

**Note:** Had the numbers been larger, say 15,000 students in District A and 20,000 in District B, the per pupil amounts would be different. The reporter’s job is to check out all the numbers involved to paint an accurate picture for the reader.

*Elements from the following book were used in this handout:*