



Using math in journalism

- Proportion – Explain issues relative to the size or magnitude as a whole:
- \$250,000 increase in Brookline taxes compared to \$250,000 Pittsburgh increase (residential numbers below are an illustration, not accurate)
- Per capita – Helps explain an issue relative to “per individual” affected
- \$250,000 increase for city of 3,000 is \$83.33 per capita – establishes a rate
- \$250,000 increase for city of 2 million is 12.5 cents per capita – establishes a rate



Using math in journalism

- Percentages – change divided by the original, and then move decimal point two places
- 16-hour delays vs. 46-hour delays
- 30 (increase/change) divided by 16 (the baseline/the original number)=
- 1.875 – move decimal two: 187.5% increase
- Percentage is one of the most common methods used to help communicate change
- Negative percentages are also possible -- if the change is a decrease



Using math in journalism

- Average – Add numbers and divide by the number of elements involved – same as the mean
- Median – The middle number in any series – it is NOT the average
- Median draws attention to the midpoint of numbers
 - Example to illustrate the differences: Certain employees' salaries with the average skewed



Salaries of the 7 employees:

- \$19,000
 - \$20,000
 - \$22,000
 - **\$23,000**
 - \$24,000
 - \$25,000
 - \$230,000
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- Median \$23,000 vs. average of \$51,857



Considering median value

- Seven employees, salary average: \$51,857.
- That sounds attractive **on average**
- Consider **the median** of the 7: \$23,000
- Why the discrepancy?
- What does it reveal?
- Why does a journalist at times have to report BOTH numbers?



What is more fair now?

- This makes the company's average much larger when boss' (considered an employee!) salary included
- Unfair to audience to suggest the \$51,000 average salary if no other employee makes more than \$25,000
- Audience can understand **median** to help more fully explain **an inflated** average
- The company is not lying by suggesting the average salary is almost \$52,000, but you as the journalist would look like a fool to report that number without the other



Majority vs. plurality

- **Majority** – at least 50% + 1 of vote
- No majority if no one exceeds 50%
- **Plurality** – difference between top vote-getter and the second-place finisher
- Do not refer to a plurality for the difference between second and third, or third and fourth, etc.
- Does the U.S. presidential election require a majority or plurality to determine the winner?



Majority vs. plurality

- Three students run for USG president
- Results of 6,959 students voting:
 - Smith with 2,987 - 43%
 - Jones with 2,087 - 30%
 - Dunbar with 1,885 - 27% (all percentages are rounded)
- So, who won?



Majority vs. plurality

- This election requires a **majority**
- So, do we have a winner?
- No – but one loser **and now** a runoff

- Smith - 2,987 – 900-vote plurality
- Jones - 2,087 – 202-vote edge over Dunbar
- Dunbar - 1,885 – No longer in race



Using information from a poll

- Identify sponsor
 - Exact wording of questions
 - Definition of the population sampled
 - Sample size and, if needed, response rate
 - Allowance for sampling error
 - Margin of error
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- Some information goes into main story; other gets teased to your Web site



Using information from a poll

- When the info was collected
 - When a poll was conducted can tell you a lot about the results it found
- How info was collected
 - Phone (most common)
 - In homes
 - In person
 - By mail
 - On the street



Potential problems with polls

- People interviewed must truly be selected in random fashion if you want to generalize
- Closer the results, the harder to say anything definitive
- Polls that claim to measure opinion on sensitive, complicated issues
- Polls never, ever, ever predict an outcome!