

When the population consists of people, obtaining a representative sample can be difficult. For various reasons, the sample can be **biased**, which means that it is not representative of the entire population.

EXAMPLE 4 Analyzing Biased Samples

Why might the following samples be biased?

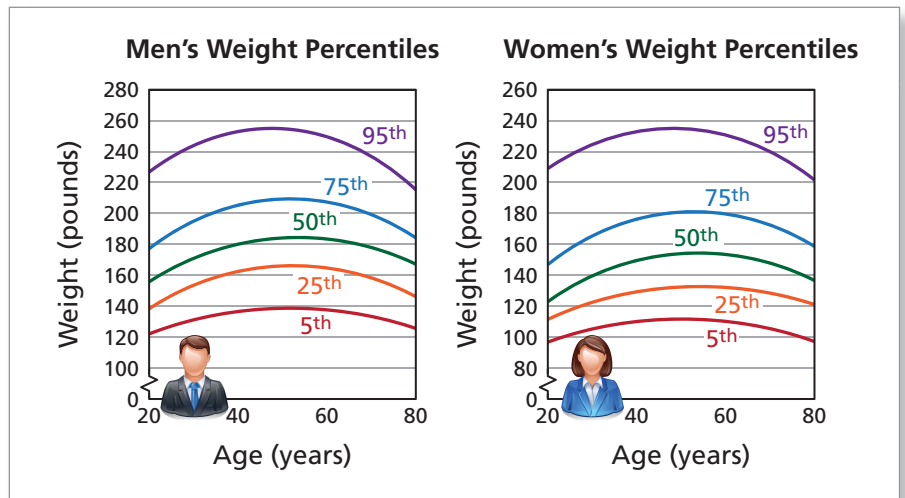
- a. In 1936, *The Literary Digest* used the results of more than two million responses to a survey to predict that the Republican presidential candidate, Alfred Landon, would defeat the incumbent, Franklin Roosevelt, by a large margin.
- b. In 2010, the Pew Research Center conducted a pre-election survey of likely voters and found Republican candidates leading by 12 points, 51% to 39%.
- c. In the 1940s, the Metropolitan Life Insurance Company introduced its standard height-weight tables for men and women. To create the tables, the company used the weights of people who were insured with the company and lived the longest.

SOLUTION



Alfred Mossman "Alf" Landon (1887–1987) was the 26th governor of Kansas. He was the Republican nominee in the 1936 presidential election.

- a. *The Literary Digest* primarily collected its sample from people who, during the depression, could afford cars, phones, and magazine subscriptions. This sample overrepresented higher income people, who were more likely to vote for the Republican candidate. Also, Landon supporters may have been more likely to return the survey than Roosevelt supporters, creating what is called a nonresponse bias. By contrast, a poll by George Gallup’s organization successfully predicted the result because its sample was more representative of the voting population.
- b. In a sample that included both landline *and* cell phone interviews, the Republican lead was only 6 points, 48% to 42%. Based on this and other surveys, the Pew Research Center concluded that landline-only surveys tend to be biased toward Republicans.
- c. The sample may have been biased because it contained only the weights of people who were insured with the company.



✓ Checkpoint

Give another example of a biased sample.

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