Unit 8: Sample Surveys

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Chapter 19: Surveys

Fact

Why take a survey?

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- *The investigators want to estimate a trait of some population.*

Surveys

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- A *sample* is part of a population.
- A *statistic* can be computed from a sample and is used to estimate a parameter.

Example

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With a sample of 500 people who live in Hamilton, one could calculate the following statistics:

- The average age of all people
- The percentage of students among all people living in Hamilton
- The percentage of all eligible voters
- The percentage of all eligible voters who are currently registered to vote.

Estimated parameter

Fact

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Estimated parameter (statistic) = actual parameter + bias in measurement + chance error

Example

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Gallup takes a sample of the population and estimates the parameter.

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- *Survey bias*

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- *Selection bias: a systematic tendency on the part of the sampling procedure to exclude one kid of person or another from the sample.*
- *Non-response bias: Non-respondents can be very different from respondents. When there is a high non-response rate, look out for non-response bias.*
- *Survey bias*
- *Wording of questions*

Reducing the error

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- *Large samples can reduce the spread of the error;*
- *They will not reduce, however, the bias!*
- *When a selection procedure is biased, taking a large sample does not help. This just repeats the basic mistake on a larger scale.*

How do we select?

1. Quota sampling

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1. Quota sampling
2. Probability methods

Quota sampling

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- *In quota sampling, the sample is hand-picked to resemble the population with respect to some key characteristics.*
- *The method seems reasonable, but does not work very well.*
- *The reason is unintentional bias on the part of the interviewers.*

Using chance in survey work

Fact

Simple random sampling *means drawing at random without replacement.*

Probabilistic methods

Fact

- *The interviewers have no discretion at all as to whom they interview*
- *There is a definite procedure for selecting the sample, and it involves the planned use of chance.*

Questions

Example

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Example

Polls are often taken by telephone.

- Could this bias the result? How?
- What if the sample is drawn from the telephone book?