

36-303: Sampling, Surveys and Society

What is Sampling?
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Today's Class

- Review Quiz
- What makes a sample representative?
 - Coakley (D) vs Brown (R) to replace Senator Ted Kennedy (D) in Mass.

REMINDER: Email brian@stat.cmu.edu with your proposed group members, by Friday at 5:00pm. ONE EMAIL PER GROUP. I will assign you to a group if you do not choose!

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Handouts

- Blog posts on Massachusetts special election
- Quiz
- Lecture Notes
- Non-Sampling Errors Handout (from 2003)

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Review Quiz

- Fill in your name.
- Answer questions on the handout.
- You have 30 minutes.

(If you are done early read through today's Blog posts handout with care.)

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What is Sampling?

- Sampling is a statistical process of "purposefully" selecting a subset of units from a population in order to make inferences about the entire population.
 - The "best" way to select a sample is through the use of probability methods, because this gives us a basis for inference.
 - *Utah v. Evans* (2003) : When is it OK to use sampling to supplement the US Census?

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Elements of a Sample

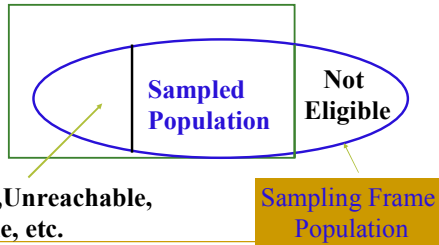
- Key elements to understanding properties of sample include:
 - *Observational Unit* - element to be measured (e.g. individual).
 - *Target Population* - collection of observations we want to study (e.g. possible voters in NH).
 - *Sampled Population* - all possible observation units that might have been sampled.
 - *Sample* - subset of population.
 - *Sampling Unit* - unit we actually sample (e.g. household).
 - *Sampling Frame* - list of all sampling units (e.g. list of telephone numbers).

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Schema

Target Population



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Does Sample Represent Population?

- “Representativeness” comes from
 - (a) match between target population and sampled population.
 - (b) method for drawing sample.
- Two kinds of errors:
 - Non-sampling
 - Sampling

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Two Kinds of Errors

- Non-sampling errors:
 - **Selection bias** - part of target population is not in sampled population.
 - **Measurement bias** - measuring instrument has tendency to differ from true value in one direction.
- **Sampling error** - results from taking a sample instead of whole population.

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Special Election to Replace Senator Ted Kennedy in Massachusetts

Pollster	Brown	Coakley
Publ Pol Poll	47%	47%
Boston Globe	36%	53%
Rasmussen	41%	50%

(Margin of error about 4% for all three polls)

- Why the discrepancies?

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Why the polling discrepancies?

- Sampling errors?
 - What was the sample size?
 - How do you calculate the “error”?
- Non-sampling errors?
 - Selection bias
 - Measurement bias

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Methodological Features of Examples

- What can we say about:
 - population of interest
 - frame/list
 - sampling technique
 - sample size
 - response rate
 - mode of interview
 - possible sources of selection bias and inaccuracy
 - other details on methodology relevant to inferences of interest

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Summary of Today's Lecture

- Review Quiz.
- Key elements of sampling.
- What makes a sample representative?
- Survey examples.