Sampling

Communication Research Methods

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Stanford University

January 29, 2016

Announcements

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- Midterm review Feb 4, Feb 5 section (no section Feb 8)

Overview

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  - Summarizing data: descriptive statistics
  - Basics of R: tool for working with quantitative data
- Today
  - Getting representative data: random sampling and pitfalls

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  - Population: all US citizens...who intend to vote? who are eligible to vote?

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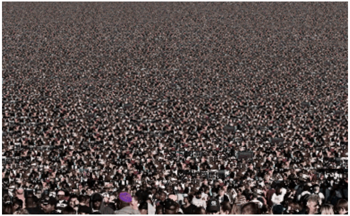

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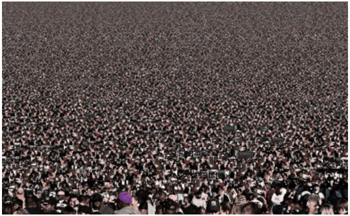

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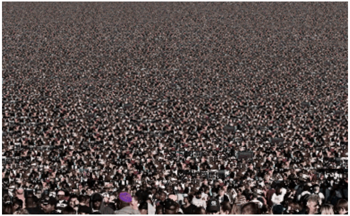

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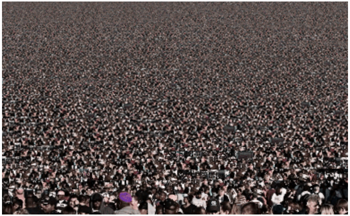

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- Recall: Inference is a part of what makes research scientific: infer something about the world beyond what we observe

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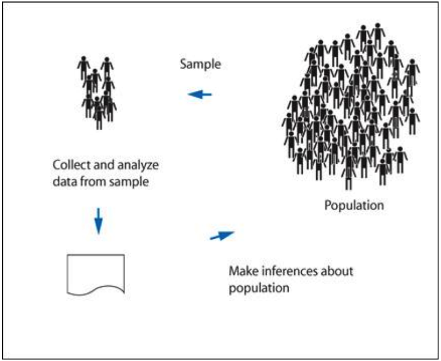
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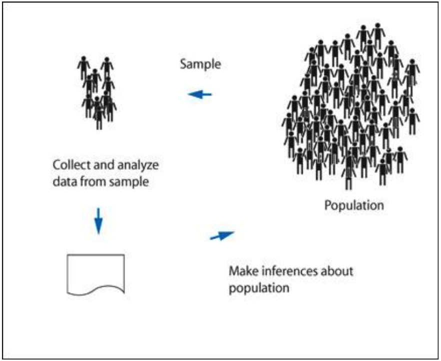
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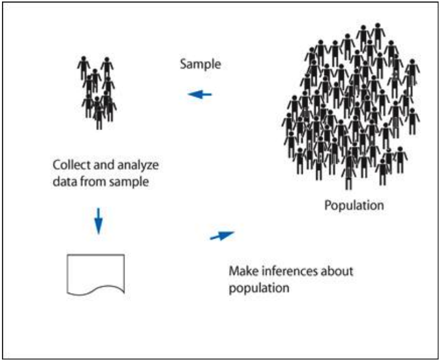
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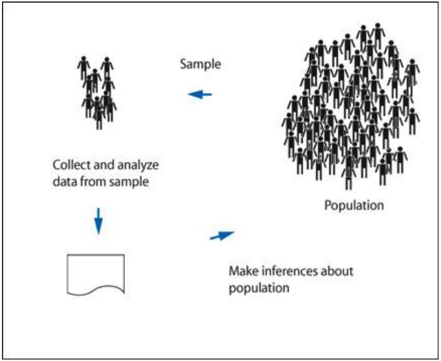
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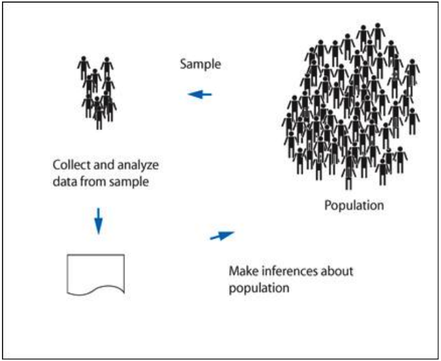
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- Afghanistan data: n = 2754 respondents was used to infer experiences of N = 15 million civilians

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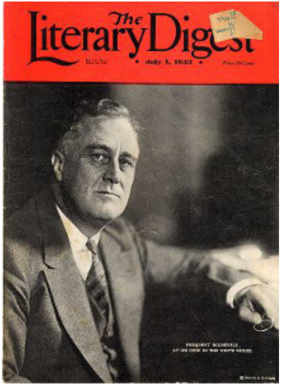

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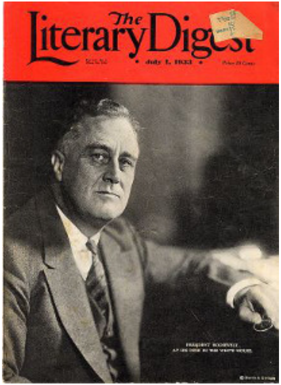

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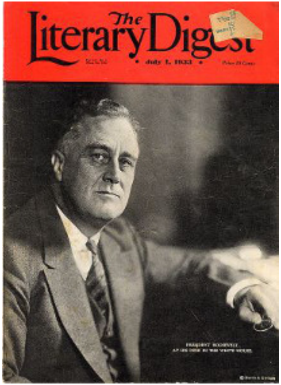

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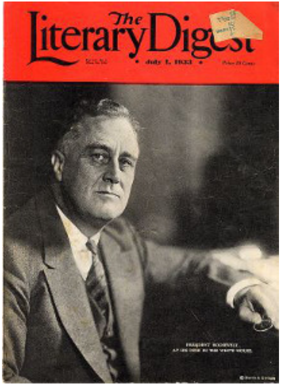

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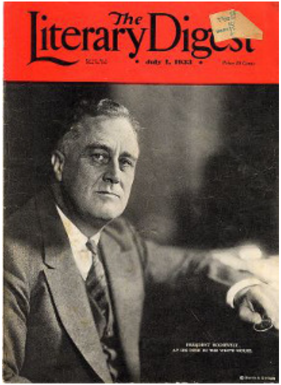

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- Actual:
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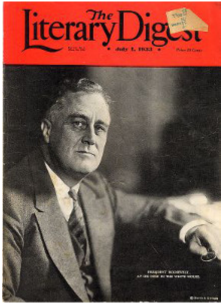

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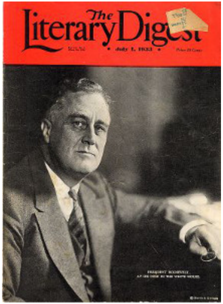

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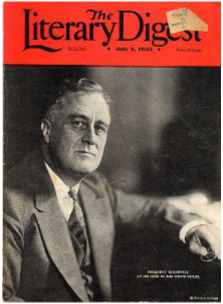

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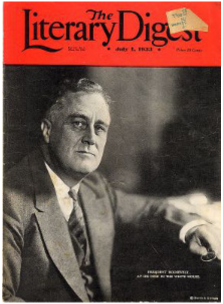

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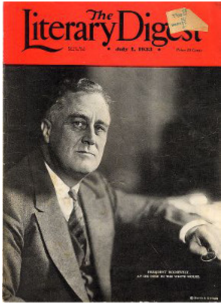

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  - Was the probability $\frac{n}{N}$ where n = 2.4 million, N = 46 million voters?

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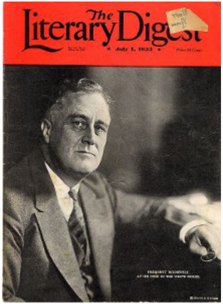

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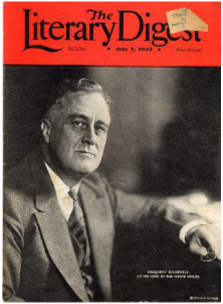
  - Was the probability $\frac{n}{N}$ where n = 2.4 million, N = 46 million voters?
  - NO! It was 0

Random Sampling Fail

What went wrong?



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  - NO! It was 0
- If you were a rich, city-dwelling lawyer, what is your probability of being in thatsample?

Random Sampling Fail

Another example: Republican Primary 2007

- CNBC post-debate online poll: "who won the debate?"
- 7,000 respondents: Ron Paul won with 75% of the vote

Random Sampling: Afghanistan Data

- Altitude and population in surveyed and non-surveyed villages
- Some outliers
- Distribution of these two variables is largely similar between the sampled and non-sampled villages

Sampling Bias

- Sampling bias: wrong sampling frame (some types of people, car owners, rich, more likely to be included in survey than others)
    - How successful is Alcoholics Anonymous? (But who selects into AA? what are their motivations?)
    - If certain 'types' of units are systematically more or less likely to appear in your sample, you probably have a selection effect

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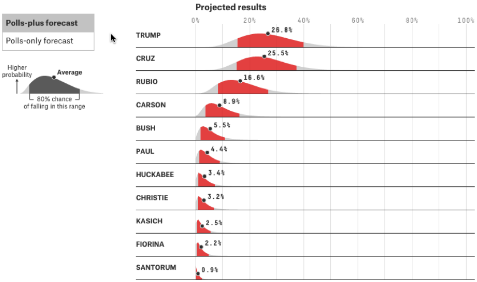
    - Measure heights
    - By chance 38% of our sample is less than 5'9", but 36% of true population is less than 5'9"

Random Sampling Error: Primaries



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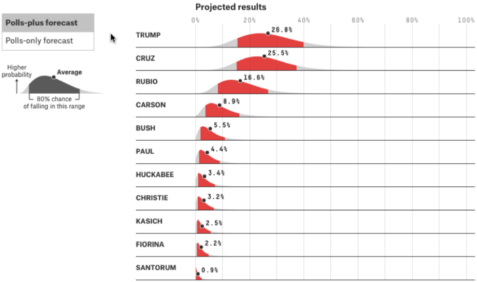

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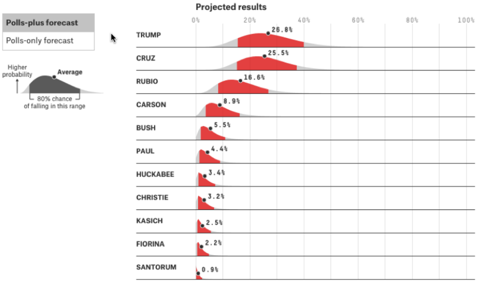

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- Random sampling error can lead to an overestimate or underestimate relative to true parameter value
- Trump 26.8% is somewhere between 15% and 40%

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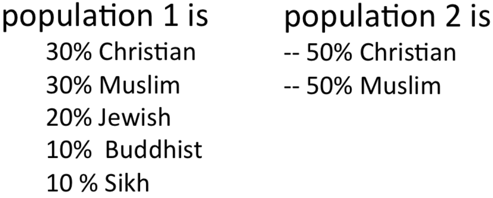

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30% Christian
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20% Jewish
10% Buddhist
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population 2 is

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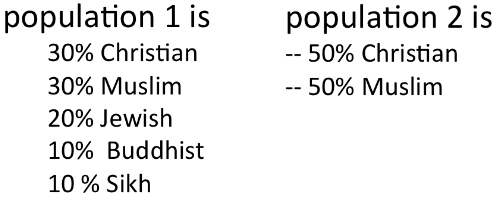

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Which population is likely to be better represented with a sample of 10 people?

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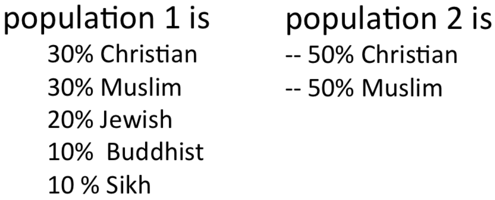

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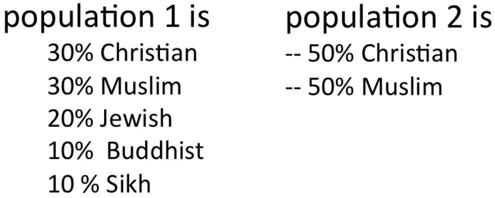

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Population 2 better represented with a sample of 1000 people than 10 people?

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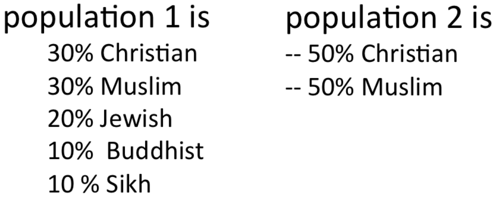

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Benefit to size not linear: doubling the sample size does not make the estimate twice as good

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- Observer effects: people being surveyed are affected (act differently) by being observed

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