

Inference in Practice

Sections 18.1, 18.3

Lecture 34

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- 1 Inference in Practice
 - Simple Random Sample
 - Sample Size
 - Normal Population
 - Standard Deviation

- 2 Assignment

1 Inference in Practice

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2 Assignment

Inference in Practice

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- The population standard deviation σ must be known.

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Simple Random Sample

- The sample is a simple random sample.
- This is the most difficult requirement to guarantee.
- See article on the Michigan primary survey.

The Michigan Primary

- Pollsters underestimated
 - Youth turnout.
 - Sanders's dominance among young voters.
 - The number of independent voters who would participate in the primary.
 - Sanders's support among black voters.
- Pollsters missed a late break to Sanders by not doing enough polling after Sunday.
- Some Clinton supporters chose to vote in the Republican primary.
- Pollsters had little recent history to work with.
- This is an outlier, a perfectly rotten combination of bad luck and bad timing.

1 Inference in Practice

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2 Assignment

Sample Size vs. Population Size

- The sample size is small relative to the size of the population ($n < 5\%$ of population).
- This is generally not a problem because populations are usually enormous.
- However, if a population is not very large, then additional factors (which we will not discuss) must be taken into account.

Outline

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- Given the sample size, a set of “expected z-scores” is produced for a sample of that size from a normal population.
 - 68% fall within 1 standard deviation.
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 - Etc.
- These expected z-scores are compared to the actual z-scores.
- If they are “reasonably close,” then we have sufficient evidence that the population is normal.

1 Inference in Practice

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2 Assignment

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- We typically do not know that population standard deviation σ .
- However, we do know the sample standard deviation s .
- And s is an estimator of σ .
- For large samples ($n \geq 100$), s estimates σ very well.
- For smaller samples, we must take additional steps (Chapter 20).

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- Read Sections 18.1, 18.3.
- Apply Your Knowledge: 1, 2, 4, 8, 11.
- Check Your Skills: 19, 20, 21, 25.
- Exercises 30, 31, 36, 38.