

Stat 104 – Lecture 1

Course Objectives

- Develop Statistical Thinking.
 - Display and summarize data.
 - Evaluate probabilities.
 - Use statistical methods to reach informed decisions.

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Prerequisites

- Make sure you can do basic algebra.
 - There will be a pre-test in lab.
- Make sure you can use a calculator.
 - Bring your calculator to lab.

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How can I do well in this class?

- Attend all lectures and pay attention.
- Attend all labs and participate.
- Complete all assignments.
- Go over answers to assignments.
- READ and STUDY the textbook.
- Ask questions.
- Form study groups.

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What Is Statistics?

- Statistics is a way of reasoning about and understanding the world around us.
- Statistics helps us use data to learn and to make informed decisions.

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Statistics in a Word

- Statistics is about ...variation.
 - The world is full of data.
 - Data exhibit variation.
 - Recognizing, displaying and quantifying variation in data can help us make sense of the world.
 - Try to explain variation.

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Class activity

- Heights of Stat 104 students
- Everyone stand up.
- Is there variability in student heights?

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Class activity

- Everyone 6 feet and over go to the back of the class.
- Everyone under 6 feet go to the front of the class.
- What do you notice?

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Statistics involves

- Design – planning how to obtain data.
- Description – summarizing data.
- Inference – making decisions based on data.

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Poll on the Environment

- ABC/Washington Post poll conducted June 18 – 21, 2009
- “Do you think the federal government should or should not regulate greenhouse gases from sources like power plants, cars and factories in an effort to reduce global warming?”

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Poll on the Environment

- Design – select a random sample of 1,001 U.S. adults.
- Description – 75% of the sample think greenhouse gases should be regulated.
- Inference – between 71.8% and 78.2% of the entire population would think the federal government should regulate greenhouse gases.

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Population – all items of interest.
Example: Adults in the U.S.

Sample – a few items from the population.
Example: 1,001 U.S. adults.

Parameter – numerical summary of the entire **population**.
Example: **proportion** of the **population** who think greenhouse gases should be regulated.

Statistic – numerical summary of the **sample**.
Example: **proportion** of the **sample** who think greenhouse gases should be regulated.

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Data

- Information
- Context is important
 - **Who** are we collecting data on?
 - Cases: Rows in a data table.
 - **What** data are we collecting?
 - Variables: Columns in a data table.

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| | | | | | |
|---------------------------------|-------|------|----|----|-----|
| <i>Acacia bonariensis</i> | Moist | 1.59 | 35 | 59 | 94 |
| <i>Dendropanax arboreus</i> | Moist | 1.46 | 25 | 31 | 56 |
| <i>Heliocarpus americanus</i> | Moist | 2.36 | 30 | 40 | 70 |
| <i>Margaritaria nobilis</i> | Moist | 1.84 | 24 | 23 | 47 |
| <i>Pouteria macrophylla</i> | Moist | 1.55 | 57 | 46 | 103 |
| <i>Bougainvillea modesta</i> | Dry | 2.19 | 12 | 12 | 24 |
| <i>Chrysophyllum gonocarpon</i> | Dry | 1.42 | 59 | 70 | 129 |
| <i>Jacaratia</i> sp. | Dry | 2.12 | 21 | 50 | 71 |
| <i>Phyllostylon rhamnoides</i> | Dry | 1.49 | 18 | 21 | 39 |
| <i>Sweetia fruticosa</i> | Dry | 1.70 | 28 | 26 | 54 |

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Data

- Who?
 - Tropical trees/shrubs.
- What?
 - Species, type of forest
 - Average crown exposure, sugar (mg/g), starch (mg/g), nonstructural carbohydrate (mg/g)

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What?

- Variables
 - Categorical (Qualitative) variable
 - Species
 - Type of forest
 - Numerical (Quantitative) variable
 - Crown exposure
 - Sugar, starch, and NCH concentration

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