

4.1: SAMPLING AND SURVEYS

Part 2

RANDOM SAMPLING

- Gives every sample of size n equal chance of being chosen from a population.
- Label individuals in a population
- Randomly choose sample using slips of paper, random digits, or technology.

STRATIFIED RANDOM SAMPLE

- Classify population into groups (**strata**) **before** the sample is taken.
- Choose a **separate SRS** from each strata (**not all** members of strata are included in SRS)
- Combine the SRS to form the sample.

CLUSTER SAMPLE

- Classify the population into **groups of individuals** that are located near each other, called **clusters**.
- Choose an **SRS of the clusters**.
- **All individuals** in the chosen clusters are in the sample.

COMPARING STRATIFIED WITH CLUSTER SAMPLING

- Strata: Should contain **similar** individuals; there should be large differences between strata.
- In stratified sampling, **some of** each strata are sampled.
- **More precise estimates** when using stratified random sampling.
- Hard to use for large geographical areas.

COMPARING STRATIFIED WITH CLUSTER SAMPLING

- For clusters, ideally each should look just like **population**, but on a smaller scale.
- In cluster sampling, **all** of a chosen cluster is sampled.
- May have as much **variability** as population).

TYPES OF BIAS

■ Undercoverage

- *When some members of the population cannot be chosen in a sample*

■ Nonresponse

- *When an individual chosen for the sample can't be contacted or refuses to participate*

■ Wording

- Confusing questions
- Leading questions
- Order of questions

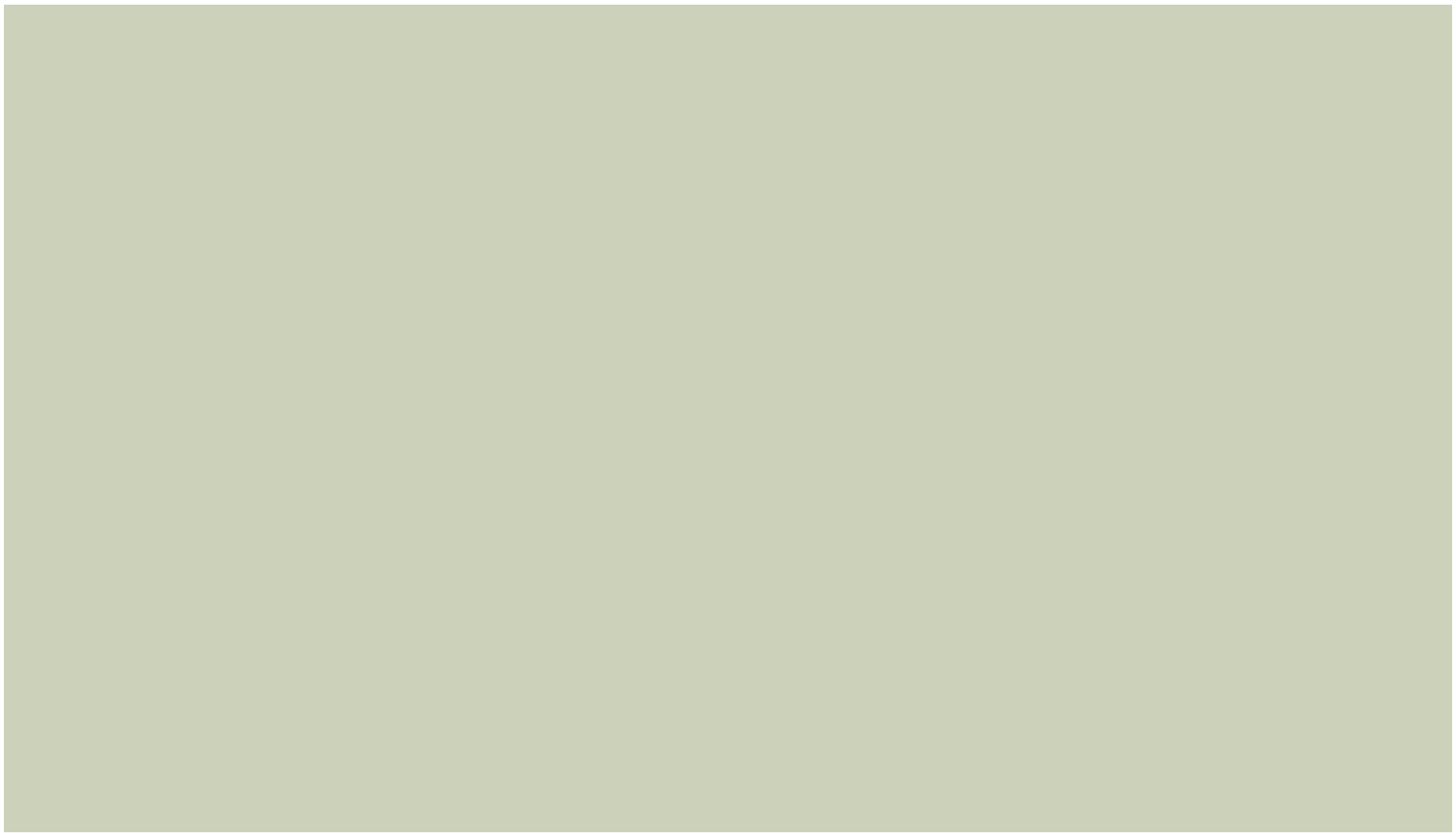
BIAS EXAMPLES

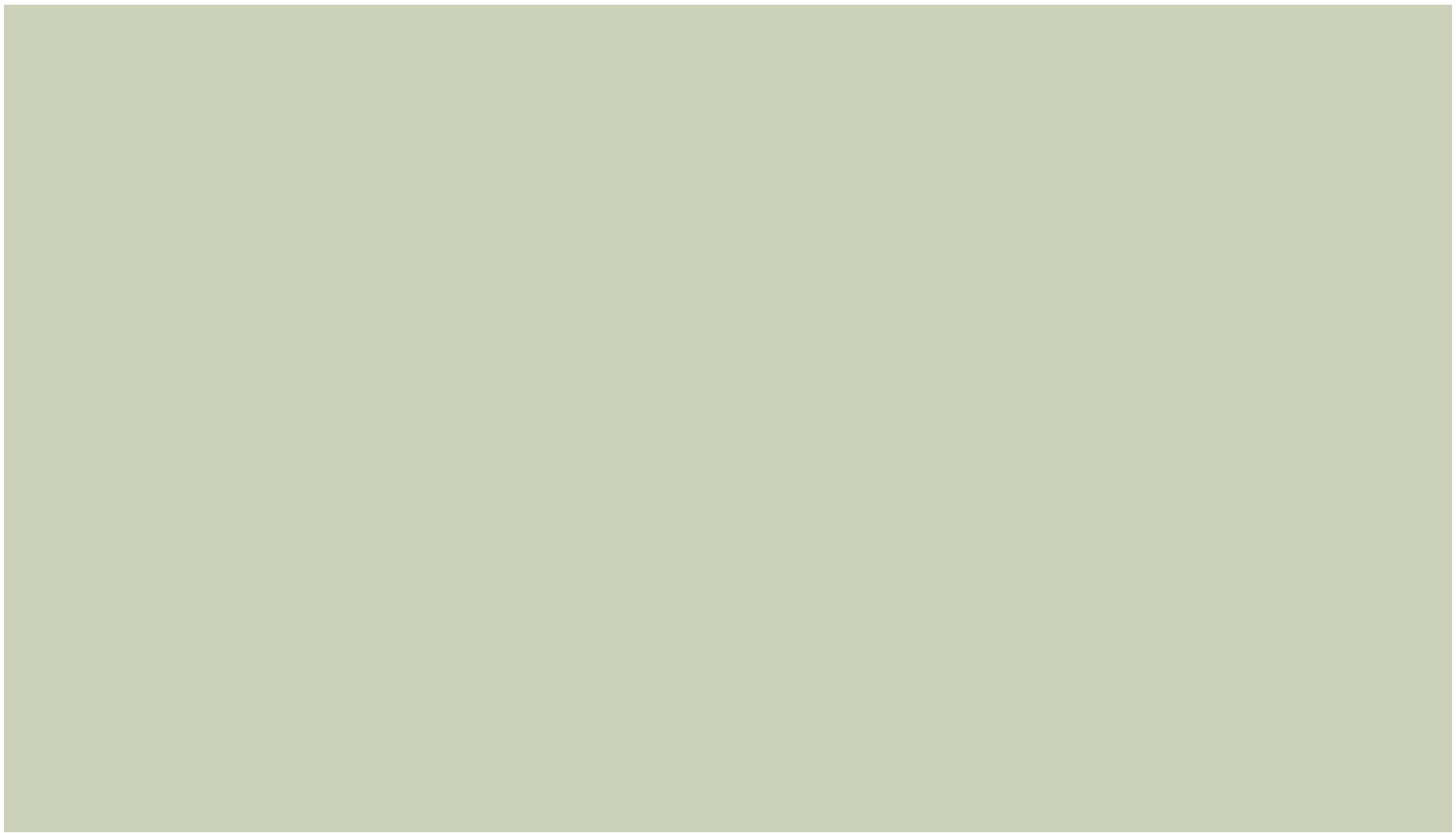
- Name the type of bias that could result from the following questions/scenarios:
- “How happy are you with your life? How many dates did you have last month?”
 - *Order of questions...how differently could people respond if the order of the questions was switched?*
- A sample is chosen at random from a telephone directory.
 - *Undercoverage*
- Some people cannot be contacted in five calls.
 - *Nonresponse*
- Interviewers choose people walking by on the sidewalk to interview.
 - *Undercoverage*

TRUMP POLL

RESPONSE BIAS PROJECT

- Some examples:
- Two questions:
 - “Do you find females who wear makeup attractive?” (questioner is wearing makeup)
 - “Do you find females who wear makeup attractive?” (questioner is not wearing makeup)
- Cartoons:
 - “Do you watch cartoons?”
 - “Do you still watch cartoons?”
- Does the Order Matter?
 - “How hungry are you on a scale from 1 to 10?”
 - “How long has it been since your last meal?”





■ Weight. Wait, What?

- Females are asked how much they weight anonymously and in person.

■ How Do Eye Look?

- Females were asked whether they prefer blue eyes or green eyes by either an interviewer with blue eyes or an interviewer with green eyes.

■ Aid for the Poor?

- People were asked if there should be more funding to help the poor, but half of the people were shown a picture of a homeless mother and child when asked the question.

- A farmer has just cleared a new field for corn. It is a unique plot of land in that a river runs along one side. The corn looks good in some areas of the field but not others. The farmer is not sure that harvesting the field is worth the expense. He has decided to harvest 10 plots and use this information to estimate the total yield. Based on this estimate, he will decide whether to harvest the remaining plots.

A. METHOD NUMBER ONE: CONVENIENCE SAMPLE

- The farmer began by sampling plots easy to access. He drove his tractor out of the barn and sampled 10 contiguous plots, driving only horizontally or vertically. He may have driven over previously sampled plots, but he did not travel through a plot without sampling it. Mark 10 plots the farmer may have used.

B. METHOD NUMBER TWO: SIMPLE RANDOM SAMPLE

- Use your calculator or a random number table to choose 10 plots to harvest. Mark them on the grid below, and describe your method of selection.

C. METHOD NUMBER THREE: STRATIFIED SAMPLE

- Consider the field as grouped in vertical columns (called strata). Using your calculator or a random number table, randomly choose one plot from each vertical column and mark these plots on the grid.

OK, THE CROP IS READY.

- Now its time to see the actual yields in the field. Estimate the average yield per plot based on each of the four sampling techniques.