Module 5: Sampling

**Lesson 3: Nonresponse, Survey Quality, and R**

**Estimated Time**: 5 hours

**Concepts:** nonresponse bias; weighting; total survey quality; measurement error; coverage error;

**Lesson Description**: This lesson considers elements of survey quality, error, and bias resulting from how a survey is conducted and designed. It also introduces students to survey analysis in R for the first time.

**Instructor Preparation**: Read over ACS materials, set up Slido poll, read over 2011 CES documentation and solutions for 5.10 assessment

| **Materials and Resources** | **Learning Goals** |
| --- | --- |
| 1. Google slides    1. [08-Nonresponse-slides](https://docs.google.com/presentation/d/1S6yIt8OeVLcJ-1RwpwknBp4HZi4x4Vo4nRl4v0NBtjA/edit#slide=id.g109a439f543_0_0)    2. [09-Estimation and survey quality-slides](https://docs.google.com/presentation/d/1QrZ5c1IWYQe1lsWj3Bg1rwLcGWud1Cv0zGYrcP1dndU/edit#slide=id.g10a3f8530a8_0_113)    3. [10-Applications in R-slides](https://docs.google.com/presentation/d/1txwIo641wpwP3CyIQi-MxtaXpfNsuqOIzcFQEsr8VDk/edit#slide=id.g10b11d5601e_0_66) 2. American Community Survey Documentation    1. [American Community Survey Design and Methodology (January 2014), Chapter 11: Weighting and Estimation](https://www2.census.gov/programs-surveys/acs/methodology/design_and_methodology/acs_design_methodology_ch11_2014.pdf)    2. [An Overview of Addressing Nonresponse Bias in the American Community Survey During the COVID-19 Pandemic Using Administrative Data](https://www.census.gov/newsroom/blogs/random-samplings/2021/11/nonresponse-acs-covid-administrative-data.html) 3. R script files    1. *5.10-Applications in R-Example Code.R* | * Identify causes of and remedies for nonresponse * Assess survey quality through total survey error * Implement the concepts learned in Lessons 1 and 2 in R |

| **Time** | **Lesson Content** | **Instructor Notes** |
| --- | --- | --- |
| 15 minutes  45 minutes  60 minutes | **08-Nonresponse**  **Introduction**   1. Review previous day’s material   **Lesson**   1. [08-Nonresponse-slides](https://docs.google.com/presentation/d/1S6yIt8OeVLcJ-1RwpwknBp4HZi4x4Vo4nRl4v0NBtjA/edit#slide=id.g109a439f543_0_0)   **Activity / Discussion**   1. Have students identify and summarize methods for dealing with nonresponse in the American Community Survey. Consider response rates, nonresponse bias, and weighting methods.    1. [American Community Survey Design and Methodology (January 2014), Chapter 11: Weighting and Estimation](https://www2.census.gov/programs-surveys/acs/methodology/design_and_methodology/acs_design_methodology_ch11_2014.pdf)    2. [An Overview of Addressing Nonresponse Bias in the American Community Survey During the COVID-19 Pandemic Using Administrative Data](https://www.census.gov/newsroom/blogs/random-samplings/2021/11/nonresponse-acs-covid-administrative-data.html) | Ask students to name and describe sampling strategies discussed in [Lesson 2](https://docs.google.com/document/d/1yXcRbmkJdZe73GDimkjm_kkp3ue3hC6EefznokZlZNA/edit).              Discuss usual methodology first, then COVID-19 adjustments. Optional: Give half of the class the usual methodology documentation and give the other half the COVID-19 overview. Ask for short summaries of each. |
| 30 minutes | **09-Estimation and Survey Quality**  **Lesson**   1. [09-Estimation and survey quality-slides](https://docs.google.com/presentation/d/1QrZ5c1IWYQe1lsWj3Bg1rwLcGWud1Cv0zGYrcP1dndU/edit#slide=id.g10a3f8530a8_0_113) |  |
| 10 minutes  60 minutes  15 minutes  60 minutes | **10-Applications in R**  **Introduction**   1. Use [Slido](https://www.sli.do/) poll to assess students’ comfort level with R.    1. Did you participate in Module 3: R? Yes/No    2. How would you rate your comfort level with R? 1-5 2. Ensure all students have access to RStudio/RStudio Cloud/JupyterHub. 3. Distribute *5.10-Applications in R-Example Code.R* or *DSI-Sampling-Applications in R* repository.   **Lesson**   1. [10-Applications in R-slides](https://docs.google.com/presentation/d/1txwIo641wpwP3CyIQi-MxtaXpfNsuqOIzcFQEsr8VDk/edit#slide=id.g10b11d5601e_0_66)    1. **Slide 7:**  Instruct students to open up the data dictionary for the api data sets (*data\_documentation/api.pdf).* Ask them to observe the types of variables used.    2. **Slide 9:** Instruct students to open up the documentation for the yrbs data set (*data\_documentation/yrbs.pdf).* Ask them to identify the PSUs, SSUs, and TSUs, and what types of sampling were used. Answers on Slide 10. 2. Work through *5.10-Applications in R-Example Code.R* with students following along to familiarize them with the code.   **Assessment**   1. *5.10-Sampling-Applications in R.Rmd*    1. Using the survey package on the 2011 Canadian Election Study | Prompt students to pull up R documentation for functions and follow along with slides, identifying any additional arguments of interest.                    This assessment may require more than 60 minutes depending on students’ general familiarity with R. |