

Epidemiology 766

Discussion Guide: Readings 1

HIV and CD4 counts: Describing Patterns Over Time and Modeling Impact of Covariates on This Pattern

Articles

1. Taylor JMG, Fahey JL, Detels R, et al. *Journal of Acquired Immune Deficiency Syndromes* **2**:114–124; 1989 (11–21)
2. Galai N, et al. Changes in Markers of Disease Progression in HIV-1 Seroconverters: A Comparison Between Cohorts of Injecting Drugs Users and Homosexual Men. *Journal of Acquired Immune Deficiency Syndromes* **8**:66–73; 1995 (23–31)

Focus:

Today's discussion will focus on two articles which describe historical efforts to understand and measure the impact of HIV infection and disease on immune function over time. These articles provide a good example of the importance of understanding how the outcome of interest varies over time in order to be able to define and address subsequent questions about the disease process or disease risk. The earlier article by Taylor et al. illustrates the difficulties of graphing and comprehending a previously undescribed disease process. The Galai et al. article provides a more elegant summary of similar disease process and also examines how a particular risk factor may influence this process.

General Points: For each article, consider the following points for discussion:

- a). What is/are the scientific questions being asked by the investigators? Be as precise as possible. Why is this question of clinical interest? Of epidemiologic interest? What would be the ideal data for answering the scientific question(s)?
- b) What is the nature of the data being analyzed?
 - 1) What is being measured?
 - 2) How many measurements are taken (for each subject), how frequently, in how many people?
 - 3) Is the population stratified, if so by what criteria into how many groups?
- c) How does the outcome of interest vary over time?,... The independent variable? What methods are used to describe patterns over time? Do the authors use all of the available data? Can you distinguish individual patterns? Can you infer individual patterns?
- d) How did the frequency and timing of measurements affect the investigators options for analyzing the data and the type of scientific questions that could be answered?
- e) Are there missing data?
 - 1) How many measurements are missing? in how many people?
 - 2) Is there a pattern to the missing data?
 - 3) How might missing data influence the results?

Some additional Specific Questions:

1. Taylor et al

- a) What is the reliability coefficient? What does it measure
- b) What does Figure 3 describe about the patterns over time? How does the information in Figure 3 compare to the information in Figure 4?
- c) What do the authors mean by “This indicates that the natural variation is dominated by the effect of HIV infection of these low levels”? (page 119, last line) What is the natural variation that they refer to?

2. Galai et al

- a) How do the authors model change in CD4/CD8 counts over time? How does this differ from the previous two paper?
- b) How do they model the impact of HIV risk status on this outcome?
- (a) How is the authors use of cohort data limited by the question they are answering (e.g., which individuals have they had excluded?)

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Discussion Guide: Readings 2

Menstrual Cycle Length: Applications of Repeated Measures Approach to Discrete and Continuous Outcomes

Articles

1. Harlow SD, Campbell B, Lin X and Raz J. Ethnic Differences in the length of the Menstrual Cycle During the Post Menarcheal Period. *American Journal of Epidemiology*. **146**:572–580; 1997 (33–41)
2. Waller K, Swan SH, Windham GC et al. Use of Urine Biomarkers to Evaluate Menstrual Function in Healthy Premenopausal Women. *American Journal of Epidemiology*. **147**:1071–80; 1998 (43–52)
3. Fenster L, Waller K, Chen J, et al. Psychological Stress in the Workplace and Menstrual Function. *American Journal of Epidemiology*. **149**:127–34; 1998 (53-60)

Focus

These three articles each examine factors associated with menstrual cycle length. The Waller et al. and Fenster et al. articles are based on the same data sets but take very different approaches to the data. Each data set provides examples using repeated measures approaches to analyze both discrete and continuous outcomes. These articles help illustrate how availability of data permit the investigator to adopt different strategies for data analysis (consider how menstrual endpoints are defined in each of the three articles).

General Points:

- a) address questions outlined in points a-e of the general points for the first discussion.
- b) how are the data available in these data sets similar? how are they different? how do the differences in the data influence the definition of menstrual endpoints? how different are the investigators approaches to the data analysis?
- c) in each data set, the investigators have analyzed both continuous and discrete outcome? what is the motivation for describing a continuous vs. a discrete outcome in each case? could the investigators have used a different approach?
- d) compare the approaches to analyzing within-person variability in each of the two data sets. what are the strengths and weaknesses of each approach?

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Discussion Guide: Readings 3

Change in Blood Pressure and/or Serum Lipids with Age – Designing a Better Analytical Approach

Articles

Blood Pressure:

1. Salmond CE et al. Blood Pressure Patterns and Migration: A 14-year Cohort Study of Adult Tokelauans. *American Journal of Epidemiology*. **130**:37–52; 1989 (81–89)

Serum Lipids:

1. Freedman DS et al. Tracking of Serum Lipids and Lipoproteins in Children over an 8-year period: The Bogalusa Heart Study. *Preventive Medicine* **14**:203–216; 1985 (61–68)
2. Lauer RM, Lee J and Clarke WR. Factors affecting the relationship between childhood and adult cholesterol levels: The Muscatine Study. *Pediatrics* **92** 309–18; 1988 (91–100)

Blood Pressure and Serum Lipids:

1. Webber LS et al. Cardiovascular Risk Factors in Hispanic, White and Black Children: the Brooks County and Bogalusa Heart Studies. *American Journal of Epidemiology*. **133**:704–14; 1991 (69–79)
2. Clarke WR et al. Tracking of blood lipids and blood pressures in school age children: the Muscatine Study. *Circulation* **58**: 626–34; 1978 (101–109)

Focus

Epidemiologists are often interested in whether certain physiologic patterns “track” within individuals over time, that is, whether individuals with high values tend to remain high over time or whether individuals move from low to high or high to low values over time. Six articles are provided which have explored this question for blood pressure and blood lipids over the last decades. As with the HIV articles, the earlier articles, in their efforts to describe how individual’s values change over time without the benefit of longitudinal techniques, help illustrate the problems of graphing with and making sense of this kind of data. After discussing the articles, try to define and frame precisely the principle scientific questions of interest. Describe the ideal data for answering these questions and then define your analytical approach.