Epidemiology 766
Discussion Guide: Readings 1

Article 1

Focus: Describing Patterns Over Time Using Graphical Tools:

This paper was written before the software for analyzing longitudinal data was available and illustrates the difficulties of graphing and comprehending a previously un-described disease process.

Points to Consider: Consider the following points for discussion:

a). What is/are the scientific questions being asked by the investigators? Why is this question of clinical/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?

c) How does the outcome of interest vary over time? 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) 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?

e) What is the reliability coefficient? What does it measure? Write down the statistical model necessary for its calculation.

f) What does Figure 3 describe about the patterns over time? How does the information in Figure 3 compare to the information in Figure 4?

g) 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?
Article 2


Focus: Describing and Comparing Slopes Between Groups Using Linear Mixed Models:

This paper used piece-wise linear mixed models with multiple random effects to describe and compare many kinds of slopes (rates of change) of the major outcome: glomerular filtration rate (GFR). It requires some algebra to derive the models we need to fit.

Discussion Points: Consider the following points for discussion:

a). What kind of study was presented? What is/are the scientific questions being asked by the investigators?

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?

c) How does the outcome of interest vary over time?, 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) 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?

e) How are acute, chronic and total slopes of GFR defined?

f) Can you write down the linear mixed model and the corresponding SAS program for comparing the total slopes between amlodipine and metoprolol, between ramipril and metoprolol or between the groups of usual blood pressure to lower blood pressure?

g) What is the meaning of “intent to treat”?
Article 1

**Focus**: Application of GEE to discrete (binary) longitudinal data and linear mixed model to continuous longitudinal data

**Points to consider:**

a) How is the continuous longitudinal data (menstrual cycle length) defined and obtained? What kind of random effects were used in the linear mixed model to examine the association between factors and menstrual cycle length? How did the investigator examine the association of between/within women variation and other factors?

b) How is the binary longitudinal data (whether or not having extreme menstrual cycle length) defined? What approach (GEE or GLMM) was used to model the association between the probability of having an extreme cycle and other factors
Article 2


**Focus**: Application of GLMM to discrete (binary) longitudinal data

**Points to consider**: 

a) What is the response variable considered in this paper? What is/are the major research hypothesis?

b) What is the model used to analyze the longitudinal data. How is the correlation handled?

c) In analyzing the longitudinal data, subjects with missing baseline data were excluded. Comment this practice.