

SAN DIEGO STATE UNIVERSITY
Graduate School of Public Health
Division of Epidemiology/Biostatistics

Fall 2006

PH 627 Advanced Statistical Methods in Public Health

<u>Serial No.</u>	<u>Section</u>	<u>No.of Units</u>	<u>Day</u>	<u>Time</u>	<u>Location</u>
25911	1	3	MW	1400-1515	HH214

Instructor: Don Slymen, PhD
Office Hours: MW 1230-1400
Office Phone: 594-6439
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Prerequisites: 1)PH 602, and 2) Concurrent enrollment in the SAS lab course or a good working knowledge of SAS.

Required Reading Materials:

1. Kleinbaum, Kupper, et al. Applied Regression Analysis and Multivariable Methods, 3 Ed.

2. Slymen and Perry, "Annotated SAS Output for Public Health 627" (Customized Materials).

(Note: The annotated output should be brought to every class lecture).

3. Lecture notes available on Blackboard

Basis of Grading:

Exercises	15%	
Midterm	35%	(October 25)
Final	50%	(Dec 13 1300-1500)

Grading System:

A :	100-93	C+:	80-77
A-:	93-90	C :	77-73
B+:	90-87	C-:	73-70
B :	87-83	D :	69-60
B-:	83-80	F :	<60

Both the midterm and final are in-class exams, open book and open notes. Bring a calculator with you. The final is comprehensive.

Class attendance is not required but very strongly encouraged.

Exercises:

Exercises will be taken from problems in the text and other sources. Some of the problems will require the use of SAS.

Objectives:

Upon completion of this course the student will learn the appropriate use of advanced statistical methods for the analysis of data with continuous and binary responses, and the analysis of survival data. Emphasis will be placed on regression techniques where multivariable adjustment and the simultaneous evaluation of risk factors are required.

Specific learning objectives are:

- 1) To explain the basic mathematical models used in multiple linear regression, analysis of variance, logistic regression, and survival analysis.
- 2) To recognize the appropriate use of these methods in solving public health problems, and to become knowledgeable about the strengths and limitations of these methods.
- 3) To be able to interpret the results from appropriate models, and to summarize and apply the results that are relevant for theses and reports.
- 4) To develop the basic technical skills needed for data analysis by examples of SAS output discussed in class and the SAS lab course.
- 5) To be able to critically review public health and epidemiologic literature, and carry out statistical analyses independently for your thesis and professional work.

Note: It is assumed that students know the material in PH602 including simple linear regression and one-way ANOVA. If necessary, review the relevant portions of your 602 text or Chapter 5 of Kleinbaum, Kupper, et al.

Course Outline for PH 627

<u>Topic</u>	<u>Approx # Sem Hrs.</u>	<u>Book Chapters</u>
Regression: Continuous response		
Displaying results in ANOVA table	1	7
Multiple regression	4	8 & 9
Multiple and partial correlation	2	10
Confounding and interaction	1	11
Dummy variables	2	14
Analysis of covariance	2	15
Variable selection (briefly)	1	16
Analysis of variance		
One-way	1	17
Random vs fixed effects	1	17
Multiple comparisons	1	17
Two-way	5	
One observation per cell		18
> 1 observation per cell		
Equal cells		19
Unequal cells		20
Regression: Binary response		
Introduction to logistic regression	2	23
Adjusted odds ratio	1	
Maximum likelihood estimation	1	
Confidence intervals & hypothesis testing	2	
Modeling issues	2	
Analysis of survival data		
Concepts & examples	1	*
Functions of survival time	1	
Estimation: Product-limit estimate	1	
Life tables	1	
Two-sample problem: Log-rank & generalized Wilcoxon tests	2	
Regression- Cox proportional hazards model		
Concepts	2	
Estimation & hypothesis testing	3	
Modeling issues	3	

* Readings for survival analysis are available on Blackboard.