

SPHA H518 Statistical Methods for Health Services Management
Spring 2007 (revised 25/1/07)

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Class Time:	R: 6:00-8:40	Office Hours:	W 1:30-2:30; R 4:00-5:00
Course URL:	http://php.spea.iupui.edu/aholmes/H518/home.htm		

Names and Phone _____
Nos. of 3 Students _____

Statistics is the study of the collection, analysis, interpretation, and presentation of numerical data. In 2005, the MHA Faculty identified 10 areas in which students should achieve competency by the conclusion of the program (see <http://php.spea.iupui.edu/aholmes/h518/Competencies.htm>). The primary contribution of this course is to instruct students in the appropriate use of quantitative analysis (including the measurement and assessment of health status, basic principles of statistical analysis, and the empirical evaluation of health care processes and quality improvements), and to develop a working familiarity with administrative and clinical data needed to make policy and administrative decisions in a health services setting.

The central learning objectives for this course are that the student be able to:

- 1) Identify the data commonly needed to support decision-making in healthcare administration, the strengths and weaknesses of such data in these applications, and possible sources for such data;
- 2) Identify appropriate descriptive, inferential and relational statistics to inform administrative decision-making; and
- 3) Communicate the administrative implications of such statistical analyses.

The adjuvant learning objectives are that the student be able to:

- 1) Use standard programs to generate such statistical analyses.

The course is divided into three sections. In the first, we will review issues related to the measurement of health care concepts (including basic principles of managerial epidemiology), the use of descriptive statistics (both numerical and graphic) to summarize such measures, and cover basic statistical quality control tools. In the second, we will evaluate different research designs and sampling strategies, the use of appropriate inferential statistics to evaluate specific hypotheses, and their application in the evaluation of health services and identification of determinants of population health. In the final section, we will cover statistical tools that examine the relationship between variables, particularly regression analysis, and review their use in risk assessment and risk stratification exercises.

Prerequisite: Undergraduate statistics course with a C or better.

Primary Text: James E. Veney. *Statistics for Health Policy and Administration Using Microsoft Excel*. San Francisco, CA: Jossey-Bass, 2003. (ISBN 0-7879-6458-1)

Supplementary Text: Denise M. Oleske (editor). *Epidemiology and the Delivery of Healthcare Services*. 2nd ed. Hingham, MA: Kluwer Academic Publishers, 2001. (Available as an e-book through the Ruth Lilly Medical Library).

Assessment:

Tentatively, grades will be based on three tests (60%), and a series of assignments (40%). Assignments may be done individually or in pairs (additional collaboration may result in grade deductions). Embedded in first two assignments will be questions that require the student to apply statistical thinking to a real world problem he or she has identified. If the student's performance on the first two-thirds of the course is strong (B+ or higher), the student will have the option of completing the analysis for this problem in lieu of the final exam. The instructor reserves the right to adjust grades fractionally (e.g., from an A- to an A, or from a B+ to a B) on the basis of individual contribution to group learning.

Late assignments will be given lower grades at the discretion of the instructor. Make-up exams will be granted only in exceptional and unforeseen circumstances (e.g., medically verified incapacitation).

Policies regarding academic dishonesty are described in the **IU Code of Student Rights, Responsibilities, and Conduct** (available electronically at <http://dsa.indiana.edu/Code/index.html>). SPEA-specific policies are described in http://php.spea.iupui.edu/aholmes/Syllabus_Addendum.htm. All students are expected to familiarize themselves with these two documents.

Grades will be assigned on the following criteria:

A+:	95-100%	B+:	80-84.9%	C+:	65-69.9%
A :	90-94.9%	B:	75-79.9%	C:	60-64.9%
A-:	85-89.9%	B-:	70-74.9%	F:	<60%

Policies regarding P/F, I, and W marks are given in the **SPEA Graduate Programs Bulletin** (available electronically at <http://www.bulletin.iupui.edu/spea/>).

Description of Course Deliverables

- 1) Tests – these will be conducted in class as closed book exams and are tentatively scheduled for **February 15th**, **March 22nd**, and **May 3rd**. Each test will focus on the material covered in the section of the course covered since the previous exam (i.e., are not cumulative except as far as the material covered in any section draws on concepts covered in earlier sections).
- 2) Assignments – these will be a combination of (i) set homework problems, and (ii) a quantitative analysis to address a health services issue of the student's own choosing. Assignment due dates will typically be one week prior to the exams described above.

Lecture Topics (tentative):

DATE	TOPIC	READING
Lecture 1 (January 11 th)	Measurement in Health Care; Epidemiologic Principles, Data Sources	Veney 3.1, 3.3; Oleske C2
Lecture 2 (January 18 th)	Graphical Presentation of Data; the Excel Add-ins	Veney C2, C4
Lecture 3 (January 25 th)	Numerical Description of Data; Data Distributions	Veney 5.1, 5.5; Veney 6.1-2; 6.4-5
Lecture 4 (February 1 st)	Sampling Methods; Sample Sizes; Estimation of Confidence Intervals	Veney 3.2, Veney 7.1-2, 7.5
Lecture 5 (February 8 th)	Applications: Examining Health Distributions, Statistical Process Control	Oleske C7
Lecture 6 (February 15th)	Test 1; Project Progress Report 1	
Lecture 7 (February 22 th)	Steps in Hypothesis Testing; the <i>t</i> -test	Veney 7.3-4; Veney 9
Lecture 8 (March 1 st)	Hypothesis Testing; additional variants of the <i>t</i> -test	
Lecture 9 (March 8 th)	Applications: Determinants of Population Health, Program Evaluation	Oleske C6
Spring Break (March 15 th)		
Lecture 10 (March 22nd)	Test 2; Project Progress Report 2	
Lecture 11 (March 29 th)	Relationships between Categorical Variables: χ^2 and Risk Ratios	Veney C8;
Lecture 12 (April 5 th)	Relationships with Continuous Variables: Regression	Veney C11, C12
Lecture 13 (April 12 th)	Additional Regression Topics: Dummy Variables, Non-Linear	Veney C13.1, 13.4
Lecture 14 (April 19 th)	Relationships with Mixed Variables: Logit Analysis	Veney C14
Lecture 15 (April 26 th)	Application: Risk Assessment and Adjustment	Boles and Fleming*
5:45-7:45 May 3rd	Final Exam (note time)	

Note: details for specific lectures will be made available on the course webpage, <http://php.spea.iupui.edu/aholmes/h518/home.htm>. Please check this page regularly for updates throughout the semester.