Introduction to
PubH 6414
Biostatistical Methods I

Lesson slides for this course have been compiled from current and previous instructors of PubH 6414, University of Minnesota, School of Public Health: Ann Brearley PhD MS, Cynthia Davey MS, Susan Telke MS, Judy Bebchuck PhD, Melanie Wall PhD, Chap T. Le PhD

About PubH 6414

- 3 credit course
- The prerequisite is college algebra. No calculus is required for this course.
- Meets the MPH core requirement
- First in a two course sequence: 6414- 6415
- Excel is used as the computing tool for 6414

PubH 6414 – Biostatistical Methods I

Instructor: Susan Telke

email: telke001@umn.edu (office hours: Tuesdays from 11:15am – 12:15pm or by appointment, location –A454 Mayo building)

Teaching Assistants:

Taufik, Tim and Kristen

Web Page: www.biostat.umn.edu/~susant/

Class Location: Jackson Hall 2-137

Web Page

Information on the web:

1. Syllabus
2. Course Lecture notes (updated weekly)
3. TA Office Hours/ Labs/ Emails
4. Homework
5. Excel Modules for Labs

Computer Labs
Labs begin week of September 13

- Mayo C381 (Biostatistics Lab)

  Teaching Assistants will have computer sessions located in the mayo lab to help you with your homework assignments.

- Deihl Hall (Medical Library)

- Coffman Union

- Carlson School of Management

- School of Public Health Student Lounge

PubH 6414 Course Content

- Sampling methods, Study Design and Measurement scales of data

- Descriptive Statistics and Graphing methods

- Probability and Probability Models

- Inferential statistics
  - Confidence Intervals
  - Hypothesis tests
  - Regression Analysis and ANOVA

Textbook for 6414

- **Basic and Clinical Biostatistics 4th edition** by Beth Dawson and Robert G. Trapp, Lange Medical Books / McGraw Hill, 2004
    - The text comes with a CD-ROM of data and software. Any data required for the course will be provided in course materials. We won't be using the software provided with the text.
    - YOU DO NOT NEED THE CD.

Additional resource text available online

- Pocket Dictionary of Statistics: http://www.mhhe.com/business/opsci/bstat/keyterm.mhtml

Course Syllabus

- Please refer to the syllabus for
  - Weekly schedule of lessons and readings
  - Homework Due Dates
  - Scheduled Exam dates
  - Grading criteria
  - University of Minnesota policies and links to information on these.

Excel

- Excel is a computing program that can be used as a tool to complete homework assignments.

- You may choose to use a different language, but we cannot guarantee support.

- All labs will be done using Excel

- You will need to have the Data Analysis Tool installed in EXCEL for this course.

Why Excel?

- Excel is a practical statistical software package for this course because
  - It is readily available
  - It provides functions for most of the statistical methods covered in this introductory course
  - It has effective graphing capabilities
  - You can quickly calculate statistics and perform basic statistical analysis using Excel
- Excel Modules are provided for each Lesson to illustrate the functions introduced in the Lesson. These will be introduced and used during lab sessions.

Data Analysis Tool (2003 version)

- If Using Excel at home or work: Check to make sure you have the Data Analysis Tool installed in Excel
    - Open Excel and Go to 'Tools' on the Toolbar
    - Select 'Data Analysis' - you should see an 'Analysis Tools' box
- If you don't see the 'Data Analysis' option under 'Tools', select 'Add Ins' under 'Tools' and check the box next to 'Analysis ToolPak'
- If the Data Analysis tool isn't installed and the Analysis ToolPak isn't an Add In option you may need to re-install your Excel program and select the Data Analysis Tool as an option.
- If you no longer have your original Excel software, you can purchase a copy of Excel through ACDS (the University of Minnesota computer services) at a student discount.

Adding the Data Analysis Tool Pak in Excel 2007

Here are the steps for Excel 2007

- 1. Open up Excel 2007
- 2. Click on the colored Excel icon in the upper left hand corner
- 3. A window opens which includes "Print", etc.
- 4. At the bottom of that window, click on "Excel Options"
- 5. The "Excel Options" window opens
- 6. Click on "Add Ins"
- 7. A window opens that shows what is and is not installed
- 8. If "Data Analysis" is not installed, click on it and click OK
- 9. The "Data Analysis Tool Pak" will be installed
- 10. On the main toolbar, click on the "Data" tab
- 11. In the far, upper right corner "Data Analysis" should be shown
- 12. Click on "Data Analysis" and a window will open with choices to use

Note for Mac Users

- Office 200r for Mac does have the Excel Data Analysis Tool and will work just fine.

- Office 2008 for Mac does **not** have the Excel Data Analysis Tool!!

- If you are using Office 2008 for Mac, you will need to use the patch indicated in the syllabus.

Grades

- Homework and Exams contribute to the final grade as follows:
  - Homework: 20% of the final grade
  - Exam 1: 25% of the final grade
  - Exam 2: 25% of the final grade
  - Exam 3: 30% of the final grade
- See the course syllabus for the grading criteria.

Homework

- There are 11 homework assignments
  - Only the top 9 grades count towards the final grade.

- Homework assignments are found under Homework Assignment Course Link on our website
- Homework assignments are to be completed in Word and submitted on paper at the beginning of class on the due date.
- Late assignments do not receive full credit.
- You may work with other students in the class on the homework assignments, but must write up your own work.

About the Exams

- There are three exams: two midterms and a final.
- The exams are 'open-book, open-notes'
- The exams cover primarily the material covered since the previous exam. However, as in any math course, the material builds on previous concepts so, in that sense, the exams are comprehensive.
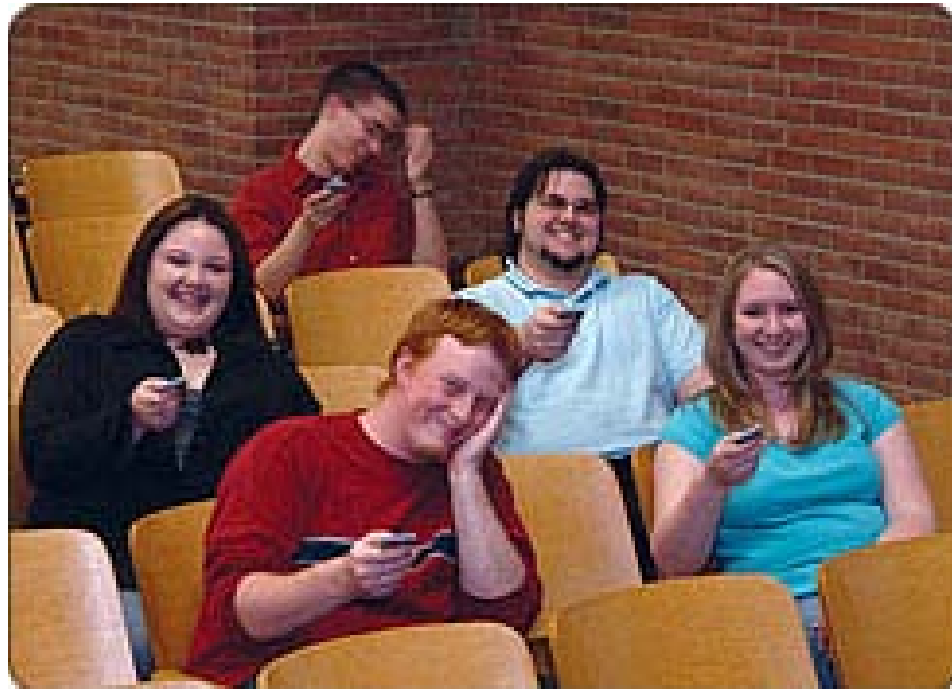
Course Announcements

- Course announcements will be sent out via email.
- The X500 email account address(the University provided email) will be used. (XXX001@umn.edu)

- You should have already received an email from me regarding labs!

You are responsible for knowing reading and knowing your X500 email account.

Turning Point

Audience Response System

Online Math Refresher

- A Math Refresher website is available at

- http://www.sph.umn.edu/ce/tools/math/

- This is an optional site that is available to help you feel confident of the basic mathematical operations that are referred to in this course

  - Ratios and Proportions

  - Algebraic expressions

  - Exponents

  - Logarithms

Review the Course site

- Take some time to review the course website:
  - Read through the Syllabus and note the assignment due dates and scheduled exam dates
  - Check the Office Hours
  - Look through the first lecture notes.
  - Find 'Homework Assignments'

What is Biostatistics?

- The study of *statistics* explores the collection, organization, analysis and interpretation of numerical data.

- Analysis and Interpretation of data require some understanding of *probability* rules and probability models

- *Biostatistics* is the application of statistical methods to biological, medical and public health data.

Reading and Assignments

- Reading
  - Chapter 1: Introduction to Medical Research
- Excel Introduction to Try:
  - Online Excel tutorial:

    http://usd.edu/~bwjames/tut/excel/