

Credits:	3
Meeting Days:	Thursdays
Meeting Time:	09:05 A.M. - 12:05 P.M.
Meeting Place:	MoosT 1-450B
Instructor:	Douglas Wholey
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Office Hours:	By appointment

I. Course Description

Managing health information is a central function of health care organizations. Information is used for managing population health, profiling providers, and measuring quality. This course describes the organizational context of health information. Sources and types of health information, organizational processes affecting information quality, consistency, completeness, and accuracy, methods for organizing information, and use of information will be discussed. Relational data theory will be used to describe the structure of information and Structured Query Language (SQL) will be used to create and query databases. Students will be introduced to the basic programming skills necessary to manage data in research projects. Programming aspects of the course will use SQL procedure in the SAS language.

II. Course Prerequisites

Admission to a University of Minnesota Masters program. Permission of instructor.

III. Course Goals and Objectives

Objectives

At the conclusion of the course, you will know:

- How health care organizations use data and information.
- Strengths and weaknesses of health information sources: administrative data, clinical data, and survey data.
- Health information flows and effect of organizational structures and processes on quality and accuracy of health information sources.
- Relationship between information source and measurement; uses of health information.
- Relational data modeling: relations, attributes, functional dependency, keys, normalization and normal forms, modification anomalies, referential integrity.
- Semantic object modeling: simple and group attributes; cardinality; domains; simple, composite, compound, hybrid, association, parent/subtype objects.

- SQL: Structured Query Language.

At the conclusion of the course, you will be able to::

- Sniff test health information.
- Construct measures from health information and describe the quality of the measurement.
- Construct semantic objects from knowledge of a user's problem domain.
- Construct a normalized relational data model from semantic objects.
- Selecting data, grouping data, reporting data using SQL.
- Combine information from multiple tables using joins in SQL.
- Structuring queries with subqueries and correlated subqueries using SQL.
- Constructing diseases rates and measures of comorbidity using SQL

IV. Methods of Instruction and Work Expectations

The course includes lectures, participation in lectures, a paper, and an examination.

Participation

Reading assignments are listed by date on the course schedule. Come to class prepared to discuss the **assigned** readings and how the readings apply to your topic of interest.

Class participation will be evaluated by students' preparation for and participation in class discussion. At least one week prior to each class, responsibility for summarizing the assigned readings in class will be assigned to students. If you are unable to attend class on the assigned day, arrange to trade with another student.

All reading summaries must be presented from notes - the article that is the basis of the summary must be put away during the presentation. Reading summaries should be brief (5 to 10 minutes) covering the following points:

1. What is the main message or major themes highlighted in the article?
2. What are the key concepts of interest?
3. If the paper is a research paper, what are the main hypotheses (statements about the relationship between key concepts)? If the paper is a descriptive paper, what are the main topics being described?
4. What arguments and evidence presented support the hypotheses or main points?
5. What question did the reading raise for you?
6. What is the take-away from the article? What are the key points you take away from it? How does it relate to managing health information?

Students are encouraged to post discussion questions pertaining to their assigned reading on the discussion board for the week.

Forms of participation that will be measured:

- Participation in the weekly Vista discussion area.
- Contributing and speaking in class, especially if it demonstrates good preparation of the readings.
- Quality of article summaries that are assigned.

Course Paper

You have the choice of doing a paper by yourself or working with a classmate. You can either (1) propose a disease management or quality measurement project or (2) review the literature on a quality and/or productivity measures for a condition.

Option 1: Disease management or quality measurement project

The goals of this exercise are:

Consider care delivery from a population perspective

Review and utilize actual patient claims data to assess the health of a care delivery to a population

Use the internet to locate and critically evaluate articles focusing on disease management programs

Apply the material from PubH 6802 to a particular condition

Instructions

Assume you are the medical director of a small clinic. Your clinic is located in an urban area and serves about 20,000 individuals. The claims utilization data for the past year is at the [Administrative Data Web Site](#) under the population labeled "All Urban." For this population, your goal is to develop either a disease management or quality measurement program for a significant condition. Disease management and quality measurement programs are designed to improve the quality of care delivered to the individuals in your patient population afflicted with that illness. Your proposal will be presented to other main participants in your clinic, who will be making a decision about whether to adopt your recommendation.

1. *Title of Proposal*
2. *Objectives:* Briefly list, as specifically as possible, the objectives of your disease management or quality measurement program.
3. *Population Targeted:* Briefly profile the populations (age, gender, condition, etc) who will be targeted for disease management or quality measurement. Justify the selection of this population using concepts from the course, the literature on the condition, and data on prevalence and costs within your population. In justifying your choice, be clear why other reasonable alternatives were not chosen.
4. *Population Finding:* How will you locate the individuals from the population using the administrative data at your disposal? What diagnoses, procedures, and drug codes do you propose to use? What are the selection rules? Who is excluded, although similar? Why? What is the prevalence of the population within your overall practice population? How does it vary by selection rules?
5. *Outcome Measurement:* How will you determine if your program has achieved its objectives? For each objective you listed above, describe in one or a few phrases the way you will measure how it has or has not been met. Using the administrative data, how will you measure performance in meeting objectives? What other types of tools do you propose to use to measure performance?
6. *Costs and Implementation:* We realize this will be a bit more difficult. Take a stab at listing the sources and magnitude of added costs and benefits, if any, your disease management program will bring to the health plan. What implementation difficulties do you foresee?
7. *Generalizability:* The clinic is considering moving into new geographic areas. Assess how your recommendations generalize to the "All FFS," "All Rural," and "All Medicare" Populations.

The product of your work should be a proposal of 10 pages in length, double-spaced and typed. The paper is due the last day of class.

Option 2: Literature review for measuring quality and/or productivity

For a population with a condition of your choice, do a literature review for measuring quality (outcome, process, or both) and/or productivity. One or more measures can be recommended, with the recommendation justified for in terms of why the measurement would be useful (see McGlynn's article on choosing measures). The recommendation should demonstrate why the recommendation is better than reasonable alternatives. The review should be grounded in the care process for the condition, describe the aspects of the treatment process and outcomes to be measured, recommend a way to collect the measure(s) and define the population with a condition. The recommendations should rule out plausible alternatives (e.g., if you recommend using administrative data for measurement, why do you recommend administrative data rather than surveys or medical records and how is the recommendation supported by the research). Your recommendation should be evaluated in terms of reliability, validity, cost, and openness to gaming. The paper should be grounded in the current measurement literature (at least 15 citations reviewed).

The product of your work should be a proposal of 10 pages in length, double-spaced and typed. The paper is due the last day of class.

1. *Title of Proposal*
2. *Condition:* Describe and justify the condition chosen for review.
3. *Population:* Describe how the population will be identified. Justify the selection of this population using concepts from the course, the literature on the condition, and reliability/validity of the identification method. In justifying your choice, be clear why reasonable alternatives were not chosen.

4. *Quality and/or Productivity Measures*: What quality and/or productivity measures do you recommend? How are the measures related to the treatment process? Is one or multiple measures being used? Is one or multiple types of measures being used? How are they resistant to gaming? Why are they better than alternative measures?
5. *Quality and/or Productivity Measurement*: What types of data sources will you use for the measures you recommend? What are the implications from the literature for reliability, validity, and cost? Why is the cost justified? What is the implication from the literature about why are these data sources and measurement methods are better than reasonable alternatives?
6. *Risk Adjustment*: How will you manage risk adjustment in the measurement?

Exams

There will be two tests during the term, one for each major section. Each quiz will take 1 1/2 hours. The Organizations and Information quiz will cover organizational uses of information and the other topics associated with health care information. The relational database theory and structured query language quizzes will be technical in nature (e.g., given a table, identify what normalization form it is; write a query to retrieve information).

V. Course Text and Readings

Elizabeth McGlynn, Cheryl Damberg, Eve Kerr, and Robert H. Brook, 1998, *Health Information Systems: Design Issues and Applications*. RAND Health. It is available on the web at <http://www.rand.org/publications/MR/MR967/MR967.pdf>. This book is referenced in the readings as a guide to related material.

Judith S. Bowman, Sandra L. Emerson, and Marcy Darnovsky, *The Practical SQL Handbook: Using Structured SQL, Fourth Edition*. Addison-Wesley Professional, 2001.

Articles available within course schedule.

VI. Course Outline/Weekly Schedule

*'d articles should be read by everyone

Week 1 - September 7, 2006 - Organizations and Information

- [Lecture Overheads](#) - will be handed out in class
- How is 6802 organized? What is expected?
 - Course organization and assignments, expectations and article discussion, teams
 - Course resources, administrative data web site
 - See [Resources](#) for useful material related to the course.
- How are data and information used in organizations?
 - *[Martha S. Feldman and James G. March](#). 1981. "Information in organizations as signal and symbol." *Administrative Science Quarterly* 26:171-186.
- Point-Counterpoint: What is the productivity paradox? When are information systems useful? What makes them useful?
 - * [Richard Hillestad, James Bigelow, Anthony Bower, Federico Giroso, Robin Meili, Richard Scoville, and Roger Taylor](#). 2005. "Can Electronic Medical Record Systems Transform Health Care? Potential Health Benefits, Savings, And Costs." *Health Affairs* 24:1103-1117.
 - *[David U. Himmelstein and Steffie Woolhandler](#). 2005. "Hope And Hype: Predicting The Impact Of Electronic Medical Records." *Health Affairs* 24:1121-1123.
 - *[Jaan Sidorov](#). 2006. "It Ain't Necessarily So: The Electronic Health Record And The Unlikely Prospect Of Reducing Health Care Costs." *Health Affairs* 25(4): 1079-1085.
 - *[Paul Attewell](#). 1994. "Information technology and the productivity paradox." in *Organizational linkages: Understanding the productivity paradox*, edited by D. H. Harris. Washington, D.C.: National Academy Press, pages 13-53. (Skim first part for arguments about whether the productivity paradox exists, read the latter part for reasons)
 - Optional:
 - A common citation for this is [Erik Brynjolfsson](#). 1993. "The productivity paradox of information technology." *Communications of the ACM* 36:66-77.

- For an example, see LisePoissant, Jennifer Pereira, Robyn Tamblyn, and Yuko Kawasumi. 2005. "The Impact of Electronic Health Records on Time Efficiency of Physicians and Nurses: A Systematic Review." J Am Med Inform Assoc 12:505-516. [Abstract](#).
- Opportunities for measuring quality, cost, and effectiveness in health care
 - *[Paul A. Fishman, Mark C. Hornbrook, Richard T. Meenan, and Michael J. Goodman](#). 2004. "Opportunities and challenges for measuring cost, quality, and clinical effectiveness in health care." Medical Care Research and Review 61, 3_suppl:124S-143.

Week 2 - September 14, 2006 - Health Data Analysis

- Examples of health data analysis - the first half of class will be spent discussing these examples - each student should read the Wennberg & Gittelsohn and one of the others. .
 - *[Wennberg, J., A. Gittelsohn](#). Small area variations in health care delivery. Science. 1973;182:1102-1108.
 - Read one of
 - [Wennberg, J. E., E. S. Fisher, T. A. Stukel, and S. M. Sharp](#). 2004. "Use of medicare claims data to monitor provider-specific performance among patients with severe chronic illness." in Health Affairs. .
 - [Doran, T., C. Fullwood, H. Gravelle, D. Reeves, E. Kontopantelis, U. Hiroeh, M. Roland](#). Pay-for-performance programs in family practices in the United Kingdom. N Engl J Med. Jul 27 2006;355(4):375-384.
 - [Warren, J. L., G. F. Riley, A. L. Potosky, C. N. Klabunde, E. Richter, R. Ballard-Barbash](#). Trends and outcomes of outpatient mastectomy in elderly women. J Natl Cancer Inst. Jun 3 1998;90(11):833-840.
 - [McGlynn E. A., Asch S. M., Adams J., Keeseey J., Hicks J., DeCristofaro A., Kerr E. A.](#), The Quality of Health Care Delivered to Adults in the United States, N Engl J Med 2003; 348:2635-2645, Jun 26, 2003.
 - What makes these articles good? bad? What do you think are pitfalls in doing this type of work? How do you think you would organize data to do this type of work?
- What is information quality?
 - *[Diane M.Strong, Yang W. Lee, and Richard Y. Wang](#). 1997. "Data quality in context." Communications of the ACM 40:103-110.
 - See the [Information Quality program at MIT](#) for more information on IQ. The [publications](#) page lists publications - if you have difficulty retrieving publications from the MIT site, you can obtain many through the [electronic library at the University of Minnesota](#).
- How does the use of and context of health information affect the need to for data quality?
 - *[Leif Solberg, Gordon Mosser, and S. McDonald](#). 1997. "The three faces of performance measurement: improvement, accountability, and research." Jt Comm J Qual Improv 23:135-147.
 - *[M. R. Chassin, E. L. Hannan, and B. A. DeBuono](#). 1996. "Benefits and hazards of reporting medical outcomes publicly." New England Journal of Medicine 334:394-398.
- Are there some risks of public reporting that improved data quality is unlikely to overcome?
 - *[Craig R. Narins, Ann M. Dozier, Frederick S. Ling, and Wojciech Zareba](#). 2005. "The influence of public reporting of outcome data on medical decision making by physicians." Archives of Internal Medicine 165:83-87.
 - Optional reference (this makes a similar point to Narins in a different way): [David Dranove, Daniel Kessler, Mark McClellan, and Mark Satterthwaite](#). 2003. "Is more information better? The effects of "report cards" on health care providers." Journal of Political Economy 111:555-588.

Week 3 - September 21, 2006 - Measuring Health Quality and Health Information Sources

- Lecture Overheads
- What are we trying to measure? Defining and measuring quality: What is health care quality?
 - *[S. M. Campbell, M. O. Roland, and S. A. Buetow](#). 2000. "Defining quality of care." Social Science and Medicine 51:1611-1625.
 - Optional:
 - [David Blumenthal](#). 1996. "Quality of care -- what is it? Part one of six." New England Journal of Medicine 335:891-894

- [R. H. Brook, E. A. McGlynn, and P. D. Cleary](#). 1996. "Quality of health care. Part 2: Measuring quality of care." *New England Journal of Medicine* 335:966-970.
- What are rules for selecting measures and how can existing data be used creatively to measure quality?
 - *[E. A. McGlynn](#). 2003. "Selecting common measures of quality and system performance." *Medical Care* 41:139-47.
 - *[James, B.](#) 2003. "Information system concepts for quality measurement." *Med Care* 41:171-9.
 - Optional:
 - [E. A. McGlynn](#). 1998. "Choosing and evaluating clinical performance measures." *Joint Commission Journal on Quality Improvement* 24:470-9.
 - [Azim Lakhani, James Coles, Daniel Eayres, Craig Spence, and Bernard Rachet](#). 2005. "Creative use of existing clinical and health outcomes data to assess NHS performance in England: Part 1--performance indicators closely linked to clinical care." *British Medical Journal* 330:1426-1431
 - [Azim Lakhani, James Coles, Daniel Eayres, Craig Spence, and Colin Sanderson](#). 2005. "Creative use of existing clinical and health outcomes data to assess NHS performance in England: Part 2--more challenging aspects of monitoring." *British Medical Journal* 330:1486-1492.
 - See [Links to quality measurement material](#)
- What are sources of health information for measuring quality?
 - *Chapters 1, 2, and 5 [Elizabeth McGlynn, Cheryl Damberg, Eve Kerr, and Robert H. Brook](#). 1998. *Health information systems: Design issues and applications*. Santa Monica, CA: Rand Health. The link will take you to the Rand website where the book is available in PDF (Acrobat) format.
 - Reference material - [Data Sources Often Used in Health Care](#) provides pointers to a wide variety of health care data sources.
- Public health uses of administrative data?
 - *[Beth A. Virnig and Marshall McBean](#). 2001. "Administrative data for public health surveillance and planning." *Annual Review of Public Health* 22:213-30.

Week 4 - September 28, 2006 Nomenclature and Grouping

- Lecture
- How is health information coded? What is the nomenclature?
 - *[Health care nomenclature](#) - from J. H. van Bommel, M. A. Musen, *Handbook of Medical Informatics*, Bohn: Springer-Verlag, 1997.
 - Reference material - [Links to sources for various coding methods](#)
- Conceptual: How is data grouped into meaningful units such as conditions or episodes
 - Hornbrook, M. C. 1982. "Hospital case mix: Its definition, measurement and use: Part i. The conceptual framework." *Med Care Rev* 39, 1:1-43.
 - *[M. C. Hornbrook, A. V. Hurtado, and R. E. Johnson](#). 1985. "Health care episodes: Definition, measurement and use." *Med Care Rev* 42:163-218.
 - Link to [Symmetry Health Data Systems](#), a leading provider of episode of care software. Their [primer on episode treatment groups](#).
- Reference material - examples of groupers and analyses of groupers
 - [Clinical Classification Software](#) from the Agency for Health Care Research and Quality
 - Fetter, R. B., Y. Shin, J. L. Freeman, R. F. Averill, and J. D. Thompson. 1980. "Case mix definition by diagnosis-related groups." *Medical Care* 18, 2 Suppl:iii, 1-53.
 - [B. Starfield, J. Weiner, L. Mumford, and D. Steinwachs](#). 1991. "Ambulatory care groups: A categorization of diagnoses for research and management." *Health Services Research* 26:53-74.
 - Link to the [Johns Hopkins University ACG Case-Mix System](#)
 - A. K. Rosen and A. Mayer-Oakes. 1999. "Episodes of care: Theoretical frameworks versus current operational realities." *Joint Commission Journal on Quality Improvement* 25:111-28. This article compares some of the major tools that are available for episode of care grouping.
- [Grouping Exercise](#) using [Administrative Data Web site](#)

Week 5 - October 5, 2006 Risk Adjustment

What is risk adjustment and comorbidity? Why is it needed? How is it done? David Knutson, Park Nicollet Research Foundation, guest lecturer

- Risk adjustment basics
 - *Chapter 9: An Overview of Risk Adjustment, [Elizabeth McGlynn, Cheryl Camberg, Eve Kerr, and Robert H. Brook](#). 1998. Health information systems: Design issues and applications. Santa Monica, CA: Rand Health. The link will take you to the Rand website where the book is available in PDF (Acrobat) format.
 - *[Lee, Carole and Deborah Rogal](#). 1997. "Risk Adjustment: A Special Report - A Key to Changing Incentives in the Health Insurance Market." Alpha Center, Robert Wood Johnson, Washington, DC.
 - *[Martin, Kathryn E. , Deborah L. Rogal, and Sharon B. Arnold](#). 2004. "Health-Based Risk Assessment: Risk-Adjusted Payments and Beyond." Academy Health, Health Care Financing and Organization, The Robert Wood Johnson Foundation., Washington, DC.
 - An excellent reference on risk adjustment is: Lisa I. Iezzoni, 2003. "Risk Adjustment for Measuring Health Care Outcomes." Chicago, IL: Health Administration Press.
- Examples - read one - each article will be assigned and we will discuss them all
 - [A. Elixhauser, C. Steiner, D. R. Harris, and R. M. Coffey](#). 1998. "Comorbidity measures for use with administrative data." Medical Care 36:8-27.
 - [Baldwin, L. M., C. N. Klabunde, P. Green, W. Barlow, and G. Wright](#). 2006. "In Search of the Perfect Comorbidity Measure for Use With Administrative Claims Data: Does It Exist?" Med Care 44:745-753.
 - [J. W. Thomas, K. L. Grazier, and K. Ward](#). 2004. "Economic profiling of primary care physicians: Consistency among risk-adjusted measures." Health Services Research 39:985-1003
 - [Fishman, P. A., M. J. Goodman, M. C. Hornbrook, R. T. Meenan, D. J. Bachman, and M. C. O'Keeffe Rosetti](#). 2003. "Risk adjustment using automated ambulatory pharmacy data: the RxRisk model." Med Care 41:84-99.
- *[Johnson, Michael L](#). 2003. "Risk Assessment and Adjustment: Adjusting for Sick Patients or a Sick System? [Editorial]." Medical Care 41:4-7.
- See [Resources](#) for a more extended bibliography of research on risk adjustment.

Week 6 - October 12, 2006 Work Processes and Data Quality

- Your analysis is only as good as the data you use. What affects data quality?
- How does the way claims are generated in work processes affect what you see in them?
 - David Knutson, Park Nicollet Research Foundation, guest lecturer
 - How are claims submitted? How do the submission process and incentives affect what is observed? Links to provide examples of coding and transaction submission rules .
 - [Centers for Medicare and Medicaid Services forms](#) for submitting claims
 - [HIPAA Transactions & Code Sets](#)
- Is data uniform across multiple health plans? Combining data from multiple health plans. Michael Goodman, Health Partners Research Foundation, guest lecturer.
 - [M. C. Hornbrook, M. J. Goodman, P. A. Fishman, R. T. Meenan, M. O'Keeffe-Rosetti, and D. J. Bachman](#). 1998. "Building health plan databases to risk adjust outcomes and payments." International Journal for Quality in Health Care 10:531-538.
 - [R. T. Meenan, M. J. Goodman, P. A. Fishman, M. C. Hornbrook, M. C. O'Keeffe-Rosetti, and D. J. Bachman](#). 2002. "Issues in pooling administrative data for economic evaluation." American Journal of Managed Care 8:45-53.

Week 7 - October 19, 2006 - Measurement Methods, Truth, and Gold Standards I

- What affects coding accuracy?
 - [D. W. Simborg](#). 1981. "DRG creep: A new hospital-acquired disease." New England Journal of Medicine 304:1602-1604.

- [D. C. Hsia, W. M. Krushat, A. B. Fagan, J. A. Tebbutt, and R. P. Kusserow](#). 1988. "Accuracy of diagnostic coding for medicare patients under the prospective-payment system." *New England Journal of Medicine* 318:352-355.
- [B. G. Saver, D. P. Ritzwoller, M. Maciosek, M. J. Goodman, D. A. Conrad, E. Finkelstein, M. Haase, P. Barrett, and K. C. Cain](#). 2004. "Does payment drive procedures? Payment for specialty services and procedure rate variations in 3 hmos." *American Journal of Managed Care* 10:229-37.
- Remember from Week 2: [Doran, T., C. Fullwood, H. Gravelle, D. Reeves, E. Kontopantelis, U. Hiroeh, M. Roland](#). Pay-for-performance programs in family practices in the United Kingdom. *N Engl J Med*. Jul 27 2006;355(4):375-384.
- How consistent are measures from different sources?
 - [K. C. Stange, S. J. Zyzanski, T. F. Smith, R. Kelly, D. M. Langa, S. A. Flocke, and C. R. Jaen](#). 1998. "How valid are medical records and patient questionnaires for physician profiling and health services research? A comparison with direct observation of patients visits." *Medical Care* 36:851-867.

Week 8 - October 26, 2006 - Measurement Methods, Truth, and Gold Standards II

- How sensitive and specific are measures? Identifying denominators.
 - G. S. Cooper, Z. Yuan, K. C. Stange, L. K. Dennis, S. B. Amini, and A. A. Rimm. 1999. "The sensitivity of medicare claims data for case ascertainment of six common cancers." *Medical Care* 37:436-444. Go to [Electronic Journals](#), search for *Medical Care*, and then locate article and print it
- How reliable are measures for different levels of analysis?
 - [T. P. Hofer, R. A. Hayward, S. Greenfield, E. H. Wagner, S. H. Kaplan, and W. G. Manning](#). 1999. "The unreliability of individual physician "report cards" for assessing the costs and quality of care of a chronic disease." *Journal of the American Medical Association* 281:2098-105.
 - [S. A. Kirk, S. M. Campbell, S. Kennell-Webb, D. Reeves, M. O. Roland, and M. N. Marshall](#). 2003. "Assessing the quality of care of multiple conditions in general practice: Practical and methodological problems." *Quality and Safety in Health Care* 12:421-427.

Week 9 - November 2, 2006 - Exam on First Half of Course and Introduction to Relational Database Theory

- What types of data are there? Transaction and research data - relational databases as an intermediary.
- What are the basic principles of relational data theory? What is normalization?
 - Bowman, Emerson, and Darnovsky, Chapters 1 and 2
 - [A normalization problem \(to read\) - to listen](#) - we will discuss it November 9th
 - [Entities and relations](#) - exercise to think about for class November 9th
- [Normalization exercise](#) - A transaction format description for claims data will be provided to you. Your responsibility is to to develop relational data tables for the data. Due November 30. It is handed out now so there is lots of lead time.

Week 10 - November 9, 2006 - Basic Operations With Relational Databases: Filling, Selecting, and Grouping

- Bowman, Emerson, and Darnovsky, Chapters 3, 4, 5, and 6

Week 11 - November 16, 2006 - Joins

- Bowman, Emerson, and Darnovsky, Chapter 7

Week 12 - November 30, 2006 - Subqueries and Views

- Bowman, Emerson, and Darnovsky, Chapter 8 and 9

Week 13 - December 7 , 2006 - Exam on Relational Database Theory and SQL

- First half of class
 - The exam will occur in the computer cluster and will consist of a questions on relational data theory (normalization) and questions on SQL queries. The SQL queries will be written in SAS.
- Second half of class - discussion about data warehouses and insuring data quality (skim)
 - [S.R. Gardner](#). "Building the data warehouse." Communications of the ACM 41:52-60.
 - [Diane M. Strong, Yang W. Lee, and Richard Y. Wang](#). 1997. "10 potholes in the road to information quality." Computer 30:38-46.
 - [Philip J.B. Brown and Victoria Warmington](#). 2002. "Data quality probes - exploiting and improving the quality of electronic patient record data and patient care." International Journal of Medical Informatics 68:91-98.
 - If you are interested in data warehousing, data mining, information quality, INSPEC(available through University of Minnesota Libraries) and the [ACM \(Association for Computing Machinery\) Portal](#) are good on-line libraries to search. You can use data warehousing, data mining, information quality, data quality, and health care as keywords. It covers the information systems literature. There are many health related articles on information management that do not appear in Medline or Pubmed. Another good source for Total Quality Data Management is [MIT's Total Quality Data Management Program](#).

VII. Evaluation and Grading

Grading

Item	Percent
Exercises (relational database theory and SQL)	10%
Reading and participation	15%
Term paper	25%
Quizzes (Organizations and information; relational database theory and SQL) - 2 at 25% each	50%

Incomplete Grade

An incomplete grade is permitted only in cases of exceptional circumstances and following consultation with the instructor. In such cases an "I" grade will require a specific written agreement between the instructor and the student specifying the time and manner in which the student will complete the course requirements. Extension for completion of the work will not exceed one year.

University of Minnesota Uniform Grading and Transcript Policy

A link to the policy can be found at onestop.umn.edu.

VIII. Other Course Information and Policies

Grade Option Change (if applicable)

For full-semester courses, students may change their grad option, if applicable, through the second week of the semester. Grade option change deadlines for other terms (i.e. summer and half-semester) can be found at onestop.umn.edu.

Course Withdrawal

Students should refer to the Refund and Drop/Add Deadlines for the particular term at onestop.umn.edu for information and deadlines for withdrawing from a course. As a courtesy, students should notify their instructor and, if applicable, advisor of their intent to withdraw.

Students wishing to withdraw from a course after the noted final deadline for a particular term must contact the School of Public Health Student Services Center at sph-ssc@umn.edu for further information

Student Conduct, Scholastic Dishonesty and Sexual Harassment Policies

Students are responsible for knowing the University of Minnesota, Board of Regents' policy on Student Conduct and Sexual Harassment found at www.umn.edu/regents/polindex.html.

Students are responsible for maintaining scholastic honesty in their work at all times. Students engaged in scholastic dishonesty will be penalized, and offenses will be reported to the Office of Student Academic Integrity (OSAI, www.osai.umn.edu).

The University's Student Conduct Code defines scholastic dishonesty as "plagiarizing; cheating on assignments or examinations; engaging in unauthorized collaboration on academic work; taking, acquiring, or using test materials without faculty permission; submitting false or incomplete records of academic achievement; acting alone or in cooperation with another to falsify records or to obtain dishonestly grades, honors, awards, or professional endorsement; or altering, forging, or misusing a University academic record; or fabricating or falsifying of data, research procedures, or data analysis."

Plagiarism is an important element of this policy. It is defined as the presentation of another's writing or ideas as your own. Serious, intentional plagiarism will result in a grade of "F" or "N" for the entire course. For more information on this policy and for a helpful discussion of preventing plagiarism, please consult University policies and procedures regarding academic integrity: <http://writing.umn.edu/tww/plagiarism/>.

Students are urged to be careful that they properly attribute and cite others' work in their own writing. For guidelines for correctly citing sources, go to <http://tutorial.lib.umn.edu/> and click on "Citing Sources".

In addition, original work is expected in this course. It is unacceptable to hand in assignments for this course for which you receive credit in another course unless by prior agreement with the instructor. Building on a line of work begun in another course or leading to a thesis, dissertation, or final project is acceptable.

If you have any questions, consult the instructor.

Disability Statement

It is University policy to provide, on a flexible and individualized basis, reasonable accommodations to students who have a documented disability (e.g., physical, learning, psychiatric, vision, hearing, or systemic) that may affect their ability to participate in course activities or to meet course requirements. Students with disabilities are encouraged to contact Disability Services to have a confidential discussion of their individual needs for accommodations. Disability Services is located in Suite 180 McNamara Alumni Center, 200 Oak Street. Staff can be reached by calling 612/626-1333 (voice or TTY).