HEALTH RESEARCH AND POLICY

Courses offered by the Department of Health Research and Policy are listed under the subject code HRP on the Stanford Bulletin’s ExploreCourses web site.

The Department of Health Research and Policy has two principal areas of scholarly interest:

1. Epidemiology is the study of the distribution and determinants of illness and impairment in human populations. Epidemiology training provides analytic tools for clinical and translational research, including studies of disease etiology, prevention, and therapy.

2. Health Services/Health Policy Research is concerned with many aspects of health policy analysis in the public and private sectors.

Graduate Programs in Health Research and Policy

The Program in Epidemiology and the Program in Health Policy are housed in the Department of Health Research and Policy. These programs offer master’s degrees and doctoral degrees in Epidemiology and Clinical Research and in Health Policy.

For additional information, Misty Mazzara, mmazzara@stanford.edu, 650-723-5456, or Kevin Horner, kahorner@stanford.edu, 650-723-5082.

The department offers a Master of Science in Health Policy and a Master of Science in Epidemiology.

Master of Science in Health Policy

University requirements for the M.S. degree are described in the "Graduate Degrees (http://exploredegrees.stanford.edu/graduatedegrees)" section of this bulletin.

The master’s degree program in Health Policy seeks to train students in the quantitative analysis of issues in health and medical care. The program is based upon an individual development plan, and includes both course work and completion of a master’s project under the direction of a course core faculty member. The typical student in the program is a physician who has completed residency training and is preparing for a research career; the program also admits Stanford medical students or others with a strong background in health policy analysis. The core faculty interests include outcomes research, health economics, health care organization, health care access, quality of care, decision analysis, clinical guidelines, and assessment of patient preferences and quality of life.

To receive the degree, students are expected to demonstrate knowledge of issues in health policy and the quantitative skills necessary for research in this area. Students must take at least 45 units of course work and write a University thesis. The course work requirements are:

Required Courses:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>HRP 256</td>
<td>Economics of Health and Medical Care</td>
<td>5</td>
</tr>
<tr>
<td>or</td>
<td>Health Law: Finance and Insurance</td>
<td></td>
</tr>
<tr>
<td>HRP 391</td>
<td>Analysis of Costs, Risks, and Benefits of Health Care</td>
<td>4</td>
</tr>
<tr>
<td>HRP 392</td>
<td>Intermediate Biostatistics: Analysis of Discrete Data</td>
<td>3</td>
</tr>
<tr>
<td>HRP 261</td>
<td>Intermediate Biostatistics: Regression, Prediction, Survival Analysis</td>
<td>3</td>
</tr>
</tbody>
</table>

Concentration Requirements:

Empirical Methods Concentration:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>HRP 252</td>
<td>Outcomes Analysis</td>
<td>4</td>
</tr>
</tbody>
</table>
| Clinical Decision Making Concentration:
| HRP 263     | Advanced Decision Science Methods and Modeling in Health   | 3     |
| Health Economics and Policy Concentration:
| HRP 256     | Economics of Health and Medical Care                       | 5     |
| HRP 391     | Health Law: Finance and Insurance                          | 3     |
| or          | Economics of Health Improvement in Developing Countries    |       |

Thesis Units:

At least 15 units of thesis units:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>HRP 299</td>
<td>Directed Reading in Health Research and Policy</td>
<td>1-18</td>
</tr>
<tr>
<td>or</td>
<td>HRP 399 Graduate Research</td>
<td></td>
</tr>
</tbody>
</table>

Pre-approved electives include:

Additional approved elective courses to complete the program total of at least 45 units. Other electives, consistent with the student’s individual development plan, may be approved by the student’s faculty adviser and the program director.

<table>
<thead>
<tr>
<th>Course Code</th>
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</tr>
</thead>
<tbody>
<tr>
<td>HRP 206</td>
<td>Meta-research: Appraising Research Findings, Bias, and Meta-analysis</td>
<td>3</td>
</tr>
<tr>
<td>HRP 214</td>
<td>Scientific Writing</td>
<td>2-3</td>
</tr>
<tr>
<td>HRP 218</td>
<td>Methods for Health Care Delivery Innovation, Implementation</td>
<td>2</td>
</tr>
<tr>
<td>or</td>
<td>Evaluation and Screening</td>
<td></td>
</tr>
<tr>
<td>HRP 219</td>
<td>Evaluating Technologies for Diagnosis, Prediction</td>
<td>3</td>
</tr>
<tr>
<td>or</td>
<td>and Screening</td>
<td></td>
</tr>
<tr>
<td>HRP 223</td>
<td>Introduction to Data Management and Analysis in SAS</td>
<td>2</td>
</tr>
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<td>HRP 251</td>
<td>Design and Conduct of Clinical Trials</td>
<td>3</td>
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<td>Observational Studies</td>
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<td>Introduction to Probability and Statistics for Clinical Research</td>
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<td>HRP 274</td>
<td>Design for Service Innovation</td>
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</tr>
<tr>
<td>MED 255</td>
<td>The Responsible Conduct of Research</td>
<td>1</td>
</tr>
<tr>
<td>MS&amp;E 292</td>
<td>Health Policy Modeling</td>
<td>3</td>
</tr>
<tr>
<td>STATS 266</td>
<td>Advanced Statistical Methods for Observational Studies</td>
<td>2-3</td>
</tr>
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</table>

For additional information, address inquiries to the educational program manager at 650-723-5456, Redwood Building, room T152F.

Master of Science in Epidemiology & Clinical Research

University requirements for the M.S. degree are described in the "Graduate Degrees (http://exploredegrees.stanford.edu/graduatedegrees)" section of this bulletin.

The Graduate Program in Epidemiology offers instruction and interdisciplinary research opportunities leading to the M.S. degree in Epidemiology and Clinical Research. Epidemiology is the study of the distribution and determinants of illness and impairment in human populations. Epidemiologic methods are used by clinical investigators and by other scientists who conduct observational and experimental studies. The Program in Epidemiology and Clinical Research is housed in the Department of Health Research and Policy. The epidemiology graduate program is part of a larger graduate program offering master’s degrees and doctoral degrees in Epidemiology and Clinical Research and in Health Policy. The epidemiology graduate program is also associated with the Program in Health Policy, housed in the Department of Health Research and Policy.

Courses offered by the Department of Health Research and Policy are listed under the subject code HRP on the Stanford Bulletin’s ExploreCourses web site.

To receive the degree, students are expected to demonstrate knowledge of issues in health policy and the quantitative skills necessary for research in this area. Students must take at least 45 units of course work and write a University thesis. The course work requirements are:

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For additional information, address inquiries to the educational program manager at 650-723-5456, Redwood Building, room T152F.
research on the identification, prevention, and treatment of human disorders.

Core and affiliated faculty come from the Department of Health Research and Policy and other Stanford University departments. The program has particular strengths in cancer epidemiology, cardiovascular disease epidemiology, epidemiologic methods, global health, infectious disease epidemiology, musculoskeletal disease epidemiology, neuroepidemiology, aspects of genetic epidemiology, and reproductive epidemiology and women's health. Students can select an optional concentration in global health or infectious diseases.

The mission of the Stanford University School of Medicine is to be a premier research-intensive medical school that improves health through leadership and collaborative discoveries and innovation in patient care, education and research. The graduate program in Epidemiology fosters this mission through the training of physician investigators in techniques of clinical research. The department also welcomes students from other disciplines who would benefit from formal training in epidemiologic methods. The master’s degree in Epidemiology and Clinical Research provides students with the skills essential to patient-oriented clinical research, including epidemiologic methods and statistical analysis.

For undergraduates at Stanford University, the program also offers a coterminal master’s degree in Epidemiology and Clinical Research. Coterminal students have the opportunity to pursue epidemiological research at the intersection of public health, disease treatment, and disease prevention.

Additional information is available on the Division of Epidemiology web site (http://med.stanford.edu/epidemiology/grad_programs/MS-overview).

To receive the M.S. degree, students are expected to obtain a grounding in epidemiologic methods and applied biostatistics and to demonstrate research skills through the completion of a thesis. The master’s degree program is typically completed in two years (four to six quarters).

Students must complete at least 45 units of course work as well as a master’s thesis, which is usually based on original research related to clinical epidemiology.

1. **Epidemiologic methods:**

<table>
<thead>
<tr>
<th>Course</th>
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</tr>
</thead>
<tbody>
<tr>
<td>HRP 225</td>
<td>Design and Conduct of Clinical and Epidemiologic Studies</td>
<td>3-4</td>
</tr>
<tr>
<td>HRP 226</td>
<td>Advanced Epidemiologic and Clinical Research Methods</td>
<td>3-4</td>
</tr>
<tr>
<td>HRP 231</td>
<td>Epidemiology of Infectious Diseases</td>
<td>3</td>
</tr>
<tr>
<td>HRP 251</td>
<td>Design and Conduct of Clinical Trials</td>
<td>3</td>
</tr>
<tr>
<td>HRP 267</td>
<td>Life Course Epidemiology</td>
<td>2</td>
</tr>
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</table>

2. **Biostatistics:**

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
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</tr>
</thead>
<tbody>
<tr>
<td>HRP 239</td>
<td>Statistical Methods for Group Comparisons and Causal Inference</td>
<td>3</td>
</tr>
<tr>
<td>HRP 259</td>
<td>Introduction to Probability and Statistics for Epidemiology</td>
<td>3-4</td>
</tr>
<tr>
<td>HRP 261</td>
<td>Intermediate Biostatistics: Analysis of Discrete Data</td>
<td>3</td>
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<tr>
<td>HRP 262</td>
<td>Intermediate Biostatistics: Regression, Prediction, Survival Analysis</td>
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</tbody>
</table>

3. **Research seminars:**

   - HRP 236 Epidemiology Research Seminar (at least 3 units)

4. **Research:**

   - HRP 399 Graduate Research (at least 12 units)

5. **Research conduct:**

   - MED 255 The Responsible Conduct of Research

Additional approved selective and elective courses to complete the program total of at least 45 units.

Students in Global Health and Infectious Diseases concentrations have other requirements and HRP 251 is not required.

Students are assigned a methodology mentor from the Division of Epidemiology and they also select a research mentor, who may be from another department. For physicians, the research mentor is often an affiliated faculty member from the department of the student’s clinical specialty.

**Ph.D. in Epidemiology and Clinical Research**

**Overview**

The field of epidemiology is poised to undergo major changes, and this Ph.D. program offers a cutting-edge curriculum that reflects this shift. Driven by technological advancements, the availability of very large datasets, and the omics revolution, epidemiology is moving toward what some have called Big Epidemiology, where epidemiologists partner with other scientists to study vast amounts of data. Thus, this program will train epidemiologists and clinical researchers to be savvy in technology, computing, data mining, bioinformatics, and genomics. The curriculum capitalizes on Stanford’s unique strengths in these disciplines.

After matriculating, students will meet with their academic advisors to plan out an individually tailored curriculum. Students who matriculate with prior training in epidemiology and statistics may replace introductory core courses with more advanced courses, subject to approval. Beyond core course requirements, students select electives that delve deeper into a particular area of specialization of their choosing. Innovative online learning approaches will help meet the needs of physician-students, who will also be busy with clinical duties.

Students will take core courses in epidemiology and biostatistics. In addition to these core courses, Ph.D. students must additionally take 3 “big epidemiology” elective courses in three key areas:

<table>
<thead>
<tr>
<th>Units</th>
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</thead>
<tbody>
<tr>
<td>1. an advanced quantitative course (encompassing statistics, computer science, or economics)</td>
</tr>
<tr>
<td>2. a big data course</td>
</tr>
<tr>
<td>3. a genetics/genomics/bioinformatics course</td>
</tr>
</tbody>
</table>

**Degree Requirements**

University requirements for the Ph.D. are described in the “Graduate Degrees (http://stanford.edu/dept/registrar/bulletin/4901.htm)” section of this bulletin.

Ph.D. students must complete a minimum of 135 units (as per University requirements), including 45 course units exclusive of HRP 236
Epidemiology Research Seminar, HRP 299 Directed Reading in Health Research and Policy, and HRP 399 Graduate Research.

<table>
<thead>
<tr>
<th>Units</th>
<th>Epidemiologic methods sequence</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>HRP 225 Design and Conduct of Clinical and Epidemiologic Studies 3-4</td>
</tr>
<tr>
<td></td>
<td>HRP 226 Advanced Epidemiologic and Clinical Research Methods 3-4</td>
</tr>
<tr>
<td></td>
<td>HRP 251 Design and Conduct of Clinical Trials (Required of students in the clinical research concentration: other doctoral students may opt to replace HRP251 with an alternate epidemiology course.) 3</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Biostatistics sequence</th>
</tr>
</thead>
<tbody>
<tr>
<td>HRP 259 Introduction to Probability and Statistics for Epidemiology 3-4</td>
</tr>
<tr>
<td>HRP/STATS 261 Intermediate Biostatistics: Analysis of Discrete Data 3</td>
</tr>
<tr>
<td>HRP 262 Intermediate Biostatistics: Regression, Prediction, Survival Analysis 3</td>
</tr>
</tbody>
</table>

**"Big Epidemiology" elective course**

Take one of the following advanced quantitative courses 3-4

- Any 200-level STATS course (other than STATS 260)
- STATS 116 Theory of Probability
- HRP 216 Analytical and Practical Issues in the Conduct of Clinical and Epidemiologic Research
- HRP 252 Outcomes Analysis
- HRP 392 Analysis of Costs, Risks, and Benefits of Health Care
- HRP/ MED 206/STATS 211 Meta-research: Appraising Research Findings, Bias, and Meta-analysis
- CHPR 290 Advanced Statistical Methods for Observational Studies

**Big data course**

Take one of the following big data courses 3-4

- BIOMEDIN 215 Data Driven Medicine
- CS 246 Mining Massive Data Sets
- STATS 202 Data Mining and Analysis
- CS 229 Machine Learning
- COMM 382 Big Data and Causal Inference

**Genetics/genomics/bioinformatics course**

Take one of the following genetics/genomics/bioinformatics courses 3-4

- BIOMEDIN 217/CS 275 Translational Bioinformatics
- GENE 244 Introduction to Statistical Genetics
- HUMBIO 151R Biology, Health and Big Data
- GENE 224 Principles of Pharmacogenomics
- CS 262 A Computational Tour of the Human Genome
- BIOMEDIN/DBIO/CS 273A Genomics and Personalized Medicine
- GENE 210/DBIO 220
- STATS 345 Statistical and Machine Learning Methods for Genomics
- or GENE 245 Statistical and Machine Learning Methods for Genomics

**Other core courses/requirements**

- MED 255 The Responsible Conduct of Research 1

**Electives**

Take electives chosen in consultation with the academic adviser to total 135 units.

**Additional Requirements**

2. Attendance at one meeting of the GCRC Protocol Review Committee.
3. R Proficiency: students must show proficiency in the computing language R or must take an approved course in R.
4. Attendance at the twice monthly Epidemiology and Clinical Research PhD workshops.
5. Doctoral students fulfill the remaining University unit requirements through doctoral dissertation work.

**Ph.D. in Health Policy**

Stanford Health Policy, through the Department of Health Research and Policy at the Stanford University School of Medicine, offers a Ph.D. program which promises to educate students to be scholarly leaders in the field of health policy, and to be highly knowledgeable about the theoretical and empirical approaches that can be applied in the development of improvements in health policy and the health care system. The curriculum offers courses across a wide range of health policy areas including health economics, health insurance and government program operation, health financing, international health policy and economic development, cost-effectiveness analysis and the evaluation of new technologies, relevant statistical and methodological approaches, and health policy issues related to public health concerns such as obesity and chronic disease.

In addition to taking a set of core courses, students are expected to complete course work in one of two tracks:

- **Health Economics**: including the economic behavior of individuals, providers, insurers, and governments and how their actions affect health and medical care.
- **Decision Sciences**: with quantitative techniques to assess the effectiveness and value of medical treatments and for decision making about medical care at the individual and/or collective level.

**Requirements**

University requirements for the Ph.D. are described in the "Graduate Degrees (http://exploredegrees.stanford.edu/graduatedegrees)" section of this bulletin.

Additional requirements:

**First Year**

- Completion of first year course work with minimum grades of 'B' and an overall/average GPA of a B (3.0).
- Individual development plan (IDP) meeting with primary adviser within the first quarter.
- Meeting with adviser(s) on a regular basis, to be determined with adviser(s).
- Completion of course work in the responsible conduct of research.

**Second Year**

- Completion of course work with minimum grades of 'B' and an overall/average GPA of a B (3.0).
- Final course work must total at least 40 units for core courses, and 40 units for area of specialization.
• Individual development plan (IDP) meeting with primary adviser before the end of Autumn Quarter.
• Meeting with adviser(s) on a regular basis, to be determined with adviser(s).

Third and Fourth Years
• Advancement to Ph.D. Candidacy (see below).
• Taking and passing the department Ph.D. oral exam (see below).
• Individual development plan (IDP) meeting with primary adviser before the end of Autumn Quarter.
• Meeting with adviser(s) on a regular basis, to be determined with adviser(s).

Course Work
Complete course work in one of the following two tracks.

Health Economics Track

<table>
<thead>
<tr>
<th>Units</th>
<th>Statistical Data Analysis, Econometrics, and Casual Inference</th>
</tr>
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<tbody>
<tr>
<td>ECON 270</td>
<td>Intermediate Econometrics I</td>
</tr>
<tr>
<td>ECON 271</td>
<td>Intermediate Econometrics II</td>
</tr>
<tr>
<td>ECON 272</td>
<td>Intermediate Econometrics III</td>
</tr>
<tr>
<td>OR</td>
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<td>ECON 202</td>
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<tr>
<td>ECON 203</td>
<td>Microeconomics II</td>
</tr>
<tr>
<td>ECON 204</td>
<td>Microeconomics III</td>
</tr>
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</table>

Or equivalent: GSBGEN 675 or MGTECON 600 can be substituted for ECON 202 and/or MGTECON 601 can be substituted for ECON 203.

Discipline-Specific Courses
Required:
HRP 249 | Topics in Health Economics I | 2-5

Choose 4 courses in the following 4 fields in economics:
Development Economics
Public Finance
Labor Economics
Industrial Organization

Health Policy
Required:
HRP 252 | Outcomes Analysis | 4
HRP 256 | Economics of Health and Medical Care | 5
HRP 392 | Analysis of Costs, Risks, and Benefits of Health Care | 4

Choose 3 additional health-related courses such as:
HRP 391 | Health Law: Finance and Insurance | 3
LAW 3002 | Health Law: Quality and Safety of Care | 3

Practice of Research
Required:
First-year core tutorial (HRP 201A, HRP 201B, and HRP 201C)
Second-year core tutorial (HRP 800)
Research in Progress Seminar (HRP 283)
Health Economics Seminar

Decision Science Track

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Or
ECON 202N | Microeconomics I For Non-Economics PhDs |
ECON 203N | Microeconomics II For Non-Economics PhDs |

Discipline-Specific Courses
Required:
HRP 263 | Advanced Decision Science Methods and Modeling in Health |
HRP 206 | Meta-research: Appraising Research Findings, Bias, and Meta-analysis |

Choose 4 methods courses such as:
MS&E 201 | Dynamic Systems |
MS&E 211 | Linear and Nonlinear Optimization |
MS&E 223 | Simulation |
MS&E 252 | Decision Analysis I: Foundations of Decision Analysis |
MS&E 263 | Healthcare Operations Management |

Health Policy
Required:
HRP 252 | Outcomes Analysis |
HRP 256 | Economics of Health and Medical Care |
HRP 392 | Analysis of Costs, Risks, and Benefits of Health Care |

Choose 3 additional health-related courses such as:
HRP 391 | Health Law: Finance and Insurance |
LAW 3002 | Health Law: Quality and Safety of Care |

Practice of Research
Required:
First-year core tutorial
Second-year core tutorial
Research in Progress Seminar

Ph.D. Candidacy
• Approval by advisers.
• Satisfactory completion of course work with minimum grades of ‘B’ and an overall/average GPA of a B (3.0).
• Final course work must total at least 40 units for core courses and 40 units in area of specialization.
• Satisfactory completion of program requirements.
• Submission and approval of the second year paper by end of Spring Quarter in the student’s second year.
• In early Summer Quarter of second year, student must take and pass written qualifying exam.

Oral Exam
• In accordance with University policy, students must take and pass an oral examination as part of the Ph.D. degree requirements.
• The oral examination is focused mainly on the student’s dissertation proposal. As well as examining feasibility and understanding of the dissertation proposal, it tests the candidate’s command of the field of study.
• Students are required to take the oral exam after passing their written qualifying exam, and when the adviser believes that the student is ready.
• The oral exam must be taken and passed no later than the end of Spring Quarter of the student’s third year.
• The student’s oral exam committee is chaired by an out-of-department chairperson. The other members of the oral exam committee are the student’s primary adviser and at least three core faculty members.
• Students provide committee members with an abstract/summary of their proposal (roughly 1500 words in length) three weeks ahead of their oral exam dates

Ph.D. Dissertation
• Must present a Ph.D. dissertation that is the result of independent investigation and that constitutes a contribution to knowledge in health services research and health policy.
• Must select a primary dissertation adviser and at least two additional faculty members to serve on the dissertation committee.
• Presentation of a prospectus outlining the proposed research to the committee.
• Receipt of written approval from the dissertation committee chair.
• Submission of a final draft of the work signed by all members of the dissertation committee.

Advising
All matriculating students are assigned a faculty adviser from the group of core faculty to help them design their academic program. Students remain with this adviser until the time that they have developed other arrangements for advising.

Students are expected to identify a group of normally three thesis advisers before or, at the latest, shortly after the time that they advance to candidacy for the degree. This group consists of one primary and two secondary advisers, who may or may not be the same as the initially assigned faculty adviser. The primary adviser must be from the group of core faculty, unless specific approval of the executive committee is obtained. Such approval would not be routinely granted. However, in rare cases, it may be optimal for a student's progress to implement a co-primary mentor arrangement in which a core faculty member from health policy and another faculty member from outside the core faculty jointly serve as primary mentors. This arrangement might occur in rare circumstances with students seeking to integrate areas of science into their policy training that are outside the expertise of the core faculty.

Secondary advisers are normally expected to come from the core faculty, but could include faculty from outside the core group upon approval of the executive committee. Students are encouraged to seek advisers with complementary expertise as needed, and the Director of Graduate Studies and executive committee monitor advising arrangements to ensure that students receive adequate supervision.

Health Research and Policy
Chair: Laurence Baker
Professors: Laurence Baker, Steven Goodman, Victor W. Henderson, Mark Hlatky, John Ioannidis, Abby C. King, Yvonne Maldonado, Michelle Mello, Julie Parsonnet, Alice S. Whittemore
Associate Professor: Kate Bundorf, Allison Kurian, Lorene M. Nelson, Kristin Sainani
Associate Professor (Clinical): Rita Popat
Assistant Professors: Maria Polyakova, Julia Simard
Emeriti: (Professors) Dan Bloch, Jennifer Kelsey
Consulting Professors: Jay Bhattacharya, Mary Goldstein, Robert Haile, Paul Heidenreich, Daniel Kessler, Alex Macario, Douglas Owens, Paul Wise
Consulting Associate Professors: Manisha Desai, Jeremy Goldhaber-Fiebert, Jennifer Lee, Grant Miller
Consulting Assistant Professor: Minang Turakhia
Senior Lecturer: Irene Corso
Consulting Professors: Paul Barnett, Gary Friedman, Sally Glaser, Laurel Habel, Pamela Horn-Ross, Esther John, Eugene Lewitt, George Lundberg, Peggy Reynolds, Jeffrey Rideout, Henrik Sorensen, Todd Wagner
Consulting Associate Professors: Christina Clarke-Dur, Scarlett Gomez
Consulting Assistant Professors: Ellen Chang, Minh-Tram Le, Bang Nguyen, Ingrid Oakley-Girvan, Salma Sharif-Marco

Health Services Research
Director: Kate Bundorf (Associate Professor, Health Research and Policy)
Executive Committee: Laurence Baker (Professor, Health Research and Policy), Kate Bundorf (Associate Professor, Health Research and Policy), Mary Goldstein (Professor, Medicine), Mark Hlatky (Professor, Health Research and Policy, and Medicine), Douglas Owens (Professor, Medicine)
Participating Faculty and Staff by Department:
Anesthesia: Alex Macario (Professor)
Business: Alain Enthoven (Professor, emeritus)
Health Research and Policy: Laurence Baker (Professor), Paul Barnett (Consulting Professor), M. Kate Bundorf (Associate Professor), Victor Fuchs (Professor, emeritus), Mark Hlatky (Professor), Michelle Mello (Professor) Maria Polyakova (Assistant Professor)
Law: Henry Greely (Professor), Daniel Kessler (Professor)
Management Science and Engineering: Margaret Brandeau (Professor)
Medicine: Jay Bhattacharya (Professor), Jeremy Goldhaber-Fiebert (Associate Professor), Mary Goldstein (Professor), Paul Heidenreich (Associate Professor), Mark Hlatky (Professor), Grant Miller (Associate Professor), Douglas Owens (Professor), Wolfgang Winkelmayer (Associate Professor)
Pediatrics: Paul Wise (Professor)
Psychiatry: Rudolph Moos (Professor, emeritus)
Sociology: Richard Scott (Professor, emeritus)

**Epidemiology**

Director: Steven Goodman (Professor, Health Research and Policy, and of Medicine)

Core Faculty and Academic Teaching Staff: Victor W. Henderson (Professor, Health Research and Policy, and Neurology and Neurological Sciences), John Ioannidis (C.F. Reinhberg Professor in Disease Prevention, and of Health Research and Policy), Abby C. King (Professor, Health Research and Policy, and Medicine), Allison Kurian (Associate Professor, Medicine, and Health Research and Policy), Yvonne A. Maldonado (Professor, Pediatrics), Lorene M. Nelson (Associate Professor, Health Research and Policy), Julie Parsonnet (Professor, Medicine, and Health Research and Policy), Rita A. Popat (Clinical Associate Professor, Health Research and Policy), Kristin L. Sainani (Associate Professor, Health Research and Policy), Julia Simard (Assistant Professor, Health Research and Policy), Alice S. Whitemore (Professor, Health Research and Policy)

**Courses**


Examines four aspects of Alzheimer’s disease. Goal is to give participants a clearer sense of the struggle that patients actually feel and experience during the progression of the disease. Also explores difficulties and issues that many relatives face in assuming the responsibility of full-time caregiver for an Alzheimer’s patient. Addresses ethical considerations on genetic testing, should these advances be embraced or should we be wary of the knowledge they may bring? Finally, explores the notion of service through engaged scholarship by exposing oneself to cutting-edge discoveries as researchers attempt to unravel the puzzle.

HRP 89Q. Introduction to Cross Cultural Issues in Medicine. 3 Units.

Preference to sophomores. Introduction to social factors that impact health care delivery, such as ethnicity, immigration, language barriers, and patient service expectations. Focus is on developing a framework to understand culturally unique and non-English speaking populations in the health care system.

HRP 199. Undergraduate Research. 1-18 Unit.

Students undertake investigations sponsored by individual faculty members. Prerequisite: consent of instructor.

HRP 201A. Health Policy PhD Core Seminar I—First Year. 2 Units.

Seminar series is the core tutorial for first-year Health Policy and Health Services Research graduate students. Major themes in fields of study including health insurance, healthcare financing and delivery, health systems and reform and disparities in the US and globally, health and economic development, health law and policy, resource allocation, efficiency and equity, healthcare quality, measurement and the efficacy and effectiveness of interventions. Blocks of session led by Stanford expert faculty in particular fields of study. Same as: MED 215A

HRP 201B. Health Policy PhD Core Seminar II—First Year. 2 Units.

Second in a three-quarter seminar series is the core tutorial for first-year Health Policy and Health Services Research graduate students. Major themes in fields of study including health insurance, healthcare financing and delivery, health systems and reform and disparities in the US and globally, health and economic development, health law and policy, resource allocation, efficiency and equity, healthcare quality, measurement and the efficacy and effectiveness of interventions. Blocks of session led by Stanford expert faculty in particular fields of study. Same as: MED 215B

HRP 201C. Health Policy PhD Core Seminar III—First Year. 2 Units.

Third in a three-quarter seminar series is the core tutorial for first-year Health Policy and Health Services Research graduate students. Major themes in fields of study including health insurance, healthcare financing and delivery, health systems and reform and disparities in the US and globally, health and economic development, health law and policy, resource allocation, efficiency and equity, healthcare quality, measurement and the efficacy and effectiveness of interventions. Blocks of session led by Stanford expert faculty in particular fields of study. Same as: MED 215C

HRP 206. Meta-research: Appraising Research Findings, Bias, and Meta-analysis. 3 Units.

Open to graduate, medical, and undergraduate students. Appraisal of the quality and credibility of research findings; evaluation of sources of bias. Meta-analysis as a quantitative (statistical) method for combining results of independent studies. Examples from medicine, epidemiology, genomics, ecology, social/behavioral sciences, education. Collaborative analyses. Project involving generation of a meta-research project or reworking and evaluation of an existing published meta-analysis. Prerequisite: knowledge of basic statistics. Same as: CHPR 206, MED 206, STATS 211

HRP 207. Introduction to Concepts and Methods in Health Services and Policy Research I. 2 Units.

Primarily for medical students in the Health Services and Policy Research scholarly concentration. Topics include health economics, statistics, decision analysis, study design, quality measurement, cost benefit and effectiveness analysis, and evidence based guidelines.

HRP 208. Introduction to Concepts and Methods in Health Services and Policy Research II. 3 Units.

Primarily for medical students in the Health Services and Policy Research scholarly concentration; continuation of 207. Topics include health economics, statistics, decision analysis, study design, quality measurement, cost benefit and effectiveness analysis, and evidence based guidelines. Recommended: 207.

HRP 209. Health Law: The FDA. 2-3 Units.

(Same as LAW 3003) Open to law and medical students; other graduate students by consent of instructor. The FDA’s regulatory authority over drugs, biologics, medical devices, and dietary supplements. The nature of the pharmaceutical, biotech, medical device, and nutritional supplement industries.

HRP 210. Health Law and Policy. 3 Units.

(Same as Law 313) Open to law, medicine, business, and graduate students. Focus this term is on the physician/patient relationship, medical ethics, and public health law.

HRP 211. Law and the Biosciences: Neuroscience. 3 Units.

(Formerly LAW 368) Legal, social, and ethical issues arising from advances in neuroscience, including effects upon law and society through improvements in predicting illnesses and behaviors, reading minds through neuroimaging, understanding responsibility and consciousness, treating criminal behavior, and cognitive enhancement.

HRP 212. Cross Cultural Medicine. 3 Units.

Developing interviewing and behavioral skills needed to facilitate culturally relevant health care across all population groups. Discussions focus on explicit and implicit cultural influences operating in formal and informal medical contexts.

HRP 213. Writing in the Sciences. 2-3 Units.

Primarily for medical students in the Clinical Research Scholarly concentration; open to graduate students except Epidemiology graduate students. Development of research questions and plans for statistical analysis. Study design, sample size and power calculations, and statistical analysis of study data. Analytic methods to carry out statistical power and sample size calculations. Prerequisites: 225, and 258 or 259, or consent of instructor.
HRP 214. Scientific Writing. 2-3 Units.
Step-by-step through the process of writing and publishing a scientific manuscript. How to write effectively, concisely, and clearly. Preparation of an actual scientific manuscript. Students are encouraged to bring a manuscript on which they are currently working to develop and polish throughout the course.

HRP 215. Scientific Writing for Basic and Translational Scientists. 2-3 Units.
Teaches students in the basic sciences how to write clearly, concisely, and effectively. Focuses on the process of writing and publishing a scientific manuscript. 3 unit option requires work on a manuscript. Not intended for epidemiology graduate students.

HRP 216. Analytical and Practical Issues in the Conduct of Clinical and Epidemiologic Research. 2-3 Units.
Topics include: advanced aspects of study design and data analyses; evaluating confounding and interaction; modeling continuous characteristics of exposure; building prediction models; methods of summarizing literature and quantifying effect sizes (meta-analysis); handling missing data; and propensity score methods. 3 units requires a data analysis project. Prerequisites: 258 or 261, or consent of instructor.

HRP 218. Methods for Health Care Delivery Innovation, Implementation and Evaluation. 2 Units.
Preference given to postgraduate fellows and graduate students. Focus is on implementation science and evaluation of health care delivery innovations. Topics include implementation science theory, frameworks, and measurement principles; qualitative and quantitative approaches to designing and evaluating new health care models; hybrid design trials that simultaneously evaluate implementation and effectiveness; distinction between quality improvement and research, and implications for regulatory requirements and publication; and grant-writing strategies for implementation science and evaluation. Students will develop a mock (or actual) grant proposal to conduct a needs assessment or evaluate a Stanford/VA/community intervention, incorporating concepts, frameworks, and methods discussed in class. Priority for enrollment for CHPR 212 will be given to CHPR master's students. Same as: CHPR 212, MED 212

HRP 219. Evaluating Technologies for Diagnosis, Prediction and Screening. 3 Units.
New technologies designed to monitor and improve health outcomes are constantly emerging, but most fail in the clinic and in the marketplace because relatively few are supported by reliable, reproducible evidence that they produce a health benefit. This course covers the designs and methods that should be used to evaluate technologies to diagnose patients, predict prognosis or other health events, or screen for disease. These technologies can include devices, statistical prediction rules, biomarkers, gene panels, algorithms, imaging, or any information used to predict a future or a previously unknown health state. Specific topics to be covered include the phases of test development, how to frame a proper evaluation question, measures of test accuracy, Bayes theorem, internal and external validation, prediction evaluation criteria, decision analysis, net-utility, ROC curves, c-statistics, net reclassification index, decision curves and reporting standards. Examples of technology assessments and original methods papers are used. Software used in the course is R or Stata. Open to graduate students with a solid understanding of introductory biostatistics, epidemiologic and clinical research study design, and of medical conditions and related technologies required. Basic understanding of Stata or R is also required. Undergraduates may enroll with consent of instructor.

HRP 220. BIOTECHNOLOGY LAW AND POLICY. 3 Units.
(Same as LAW 440) Open to all law or medical students; other graduate students by consent of the instructor. Focuses on the biotechnology industry, with some discussion of the "med tech" or medical device industry and the pharmaceutical industry. The life cycle of a biotech firm, from a good idea to a start-up company to FDA approval and beyond. Guest speakers. In addition to a final exam, students are required to participate in a group project during the term, making law and business recommendations about a biotech firm.

HRP 221. Law and the Biosciences: Genetics. 3 Units.
(Same as LAW 3004) Open to all law or medical students; other graduate students by consent of the instructor. Focus is on ethical, legal, and social issues arising from advances in our knowledge of human genetics. Includes forensic uses of genetics, genetic testing, widespread whole genome sequencing, the consequences of genetics for human reproduction, and the ethics of genomic biobanks for research. Research paper required.

HRP 222A. Advising Congress on Health Policy. 1 Unit.
(Same as LAW 413L) Focus on conducting research on national health policy problems for the Medicare Payment Advisory Commission, or MedPAC. Students work in teams with lawyers and PhD economists from MedPAC, resident and fellow physicians from Stanford Hospital, and other students from throughout the University on expanding the healthcare workforce through reform of states' scope of practice regulation or designing antitrust policy to achieve the benefits of coordination and avoid the costs of consolidation. Application required.

HRP 223. Introduction to Data Management and Analysis in SAS. 2 Units.
Provides hands-on introduction to basic data management and analysis techniques using SAS. Data management topics include: Introduction to SAS and SAS syntax, importing data, creating and reading SAS datasets, data cleaning and validation, creating new variables, and combining data sets. Analysis techniques include: basic descriptive statistics (e.g., means, frequency) and bivariate procedures for continuous and categorical variables (e.g., t-tests, chi-squares).

HRP 225. Design and Conduct of Clinical and Epidemiologic Studies. 3-4 Units.
Intermediate-level. The skills to design, carry out, and interpret epidemiologic studies, particularly of chronic diseases. Topics: epidemiologic concepts, sources of data, cohort studies, case-control studies, cross-sectional studies, sampling, measures of association, estimating sample size, and sources of bias. Prerequisite: A basic/introductory course in statistics or consent of instructor.

HRP 226. Advanced Epidemiologic and Clinical Research Methods. 3-4 Units.
The principles of measurement, measures of effect, confounding, effect modification, and strategies for minimizing bias in clinical and epidemiologic studies. Students enrolled for 4 units complete an additional assignment or paper. Prerequisite: 225 or consent of instructor.

HRP 228. Genetic Epidemiology. 2 Units.
Provides framework for physicians, epidemiologists, and other scientists to interpret the literature and incorporate genetic information into human disease research. Topics include: common genetic measures, approaches to finding disease genes, study design and analysis issues, genome-wide association studies, meta-analysis of genetic studies, genetic risk prediction, and applications of new genomic technologies. Includes reading seminal papers in genetic epidemiology.
HRP 229. Spectrum Scholars Seminar. 1 Unit.
Preference to trainees awarded Stanford internal KL2, TL1 grants. Focus is on students and junior faculty who have received a Spectrum KL2 or TL1 Award. Discussions include progress and challenges involved in starting and conducting disease-based research, current courses, time management and resources; support from peers; education and professional development. All scholars are required to attend a weekly seminar series meeting throughout the year that will cover an array of cross-cutting methodological topics with published examples of implementation. Prerequisite: Awarded a Spectrum KL2, TL1 Grant or Spectrum UL1.

HRP 230. Cancer Epidemiology. 2-3 Units.
Descriptive epidemiology and sources of incidence/mortality data; the biological basis of carcinogenesis and its implications for epidemiologic research; methodological issues relevant to cancer research; causal inference; major environmental risk factors; genetic susceptibility; cancer control; examples of current research; and critique of the literature. 3 units requires paper or project. Prerequisite: 225, or consent of instructor.

HRP 231. Epidemiology of Infectious Diseases. 3 Units.
Principles of the transmission of the infectious agents (viruses, bacteria, rickettsiae, mycoplasma, fungi, and protozoan and helminth parasites). The role of vectors, reservoirs, and environmental factors. Pathogen and host characteristics that determine the spectrum of infection and disease. Endemicity, outbreaks, and epidemics of selected infectious diseases. Principles of control and surveillance.

HRP 234. Engineering Better Health Systems: modeling for public health. 4 Units.
This course teaches engineering, operations research and modeling techniques to improve public health programs and systems. Students will engage in in-depth study of disease detection and control strategies from a "systems science" perspective, which involves the use of common engineering, operations research, and mathematical modeling techniques such as optimization, queuing theory, Markov and Kermack-McKendrick models, and microsimulation. Lectures and problem sets will focus on applying these techniques to classical public health dilemmas such as how to optimize screening programs, reduce waiting times for healthcare services, solve resource allocation problems, and compare macro-scale disease control strategies that cannot be easily evaluated through randomized trials. Readings will complement the lectures and problem sets by offering critical perspectives from the public health history, sociology, and epidemiology. In-depth case studies from non-governmental organizations, departments of public health, and international agencies will drive the course. Prerequisites: A course in introductory statistics, and a course in multivariable calculus including ordinarily differential equations. Open to upper-division undergraduate students and graduate students. Human Biology majors enroll in HUMBIO 154A.
Same as: CHPR 254, HUMBIO 154A

HRP 235. Designing Research-Based Interventions to Solve Global Health Problems. 3-4 Units.
The excitement around social innovation and entrepreneurship has spawned numerous startups focused on tackling world problems, particularly in the fields of education and health. The best social ventures are launched with careful consideration paid to research, design, and efficacy. This course offers students insights into understanding how to effectively develop, evaluate, and scale social ventures. Using TeachAIDS (an award-winning nonprofit educational technology social venture used in 78 countries) as a primary case study, students will be given an in-depth look into how the entity was founded and scaled globally. Guest speakers will include world-class experts and entrepreneurs in Philanthropy, Medicine, Communications, Education, and Technology. Open to both undergraduate and graduate students.
Same as: AFRICAST 135, AFRICAST 235, EDUC 135, EDUC 335, HUMBIO 26, MED 235

HRP 236. Epidemiology Research Seminar. 1 Unit.
Weekly forum for ongoing epidemiologic research by faculty, staff, guests, and students, emphasizing research issues relevant to disease causation, prevention, and treatment. May be repeated for credit.

HRP 237. Practical Approaches to Global Health Research. 3 Units.
How do you develop research questions? How do you come up with a concept note and get your project funded? How do you manage personnel in the field, difficult cultural situations, or unexpected problems? How do you create a sampling strategy, select a study design, and ensure ethical conduct with human subjects? This course takes students through the process of health research in under-resourced countries from the development of the initial research question and literature review to securing support and detailed planning for field work. Students progressively develop and receive weekly feedback on a concept note to support a funding proposal addressing a research question of their choosing. Aims at graduate students; undergraduates in their junior or senior year may enroll with instructor consent. This course is restricted to undergraduates unless they have completed 85 units or more.
Same as: IPS 290, MED 226

HRP 238. Genes and Environment in Disease Causation: Implications for Medicine and Public Health. 2-3 Units.
The historical, contemporary, and future research and practice among genetics, epidemiology, clinical medicine, and public health as a source of insight for medicine and public health. Genetic and environmental contributions to multifactorial diseases; multidisciplinary approach to enhancing detection and diagnosis. The impact of the Human Genome Project on analysis of cardiovascular and neurological diseases, and cancer. Ethical and social issues in the use of genetic information. Prerequisite: basic course in genetics; for undergraduates, Human Biology core or equivalent or consent of instructor. This course must be taken for a minimum of 3 units and a letter grade to be eligible for Ways credit.
Same as: HUMBIO 159

HRP 239. Statistical Methods for Group Comparisons and Causal Inference. 3 Units.
Critical examination of statistical methods in social science and life sciences applications, especially for cause and effect determinations. Topics: mediating and moderating variables, potential outcomes framework, encouragement designs, multilevel models, matching and propensity score methods, analysis of covariance, instrumental variables, compliance, path analysis and graphical models, group comparisons with longitudinal data. See http://rogosateaching.com/stat209/. Prerequisite: intermediate-level statistical methods.
Same as: EDUC 260A, STATS 209

HRP 243. Policy & Healthcare Delivery. 1 Unit.
This seminar course is intended to introduce students to the role of policy in the delivery of healthcare in the United States. In addition to speakers from the law school, SIEPR, HRP, and School of Medicine, we will be bringing in speakers from outside organizations such as the Pacific Business Group on Health, managed care organizations, and the Palo Alto Medical Foundation. There will be no assignments and lunch will be provided.

HRP 244. Developing Measurement Tools for Health Research. 2 Units.
The focus of this course is on providing the skills necessary to develop, validate, and administer both qualitative and quantitative measures and instruments. Topics include creating valid measures, ensuring the measures used address and apply to the research questions, design and samples; determining when to use standardized measures or develop new ones; instrument validation techniques; factor analysis; and survey administration, including determining the most effective way of administering measures (e.g., online, paper-and-pencil, ACASI) ad the best way to design the survey.
HRP 247. Epidemic Intelligence: How to Identify, Investigate and Interrupt Outbreaks of Disease. 4 Units.
We will cover: the components of public health systems in the US; principles of outbreak investigation and disease surveillance; different types of study design for field investigation; visualization and interpretation of public health data, including identification and prevention of biases; and implementation of disease control by public health authorities. Students will meet with leaders of health departments of the state and the county and will be responsible for devising and conducting their own investigation of a health problem. HUMBIO students must enroll in HUMBIO 57. HRP students must enroll in HRP 247.
Same as: HUMBIO 57

HRP 249. Topics in Health Economics I. 2-5 Units.
Course will cover various topics in health economics, from theoretical and empirical perspectives. Topics will include public financing and public policy in health care and health insurance; demand and supply of health insurance and healthcare; physicians' incentives; patient decision-making; competition policy in healthcare markets, intellectual property in the context of pharmaceutical drugs and medical technology; other aspects of interaction between public and private sectors in healthcare and health insurance markets. Key emphasis on recent work and empirical methods and modelling. Prerequisites: Micro and Econometrics first year sequences (or equivalent).nCurricular prerequisites (if applicable): First year graduate Microeconomics and Econometrics sequences (or equivalent).
Same as: ECON 249, MED 249

HRP 251. Design and Conduct of Clinical Trials. 3 Units.
The rationale for phases 1-3 clinical trials, the recruitment of subjects, techniques for randomization, data collection and endpoints, interim monitoring, and reporting of results. Emphasis is on the theoretical underpinnings of clinical research and the practical aspects of conducting clinical trials.

HRP 252. Outcomes Analysis. 4 Units.
Methods of conducting empirical studies which use large existing medical, survey, and other databases to ask both clinical and policy questions. Econometric and statistical models used to conduct medical outcomes research. How research is conducted on medical and health economics questions when a randomized trial is impossible. Problem sets emphasize hands-on data analysis and application of methods, including re-analyses of well-known studies. Prerequisites: one or more courses in probability, and statistics or biostatistics.
Same as: BIOMEDIN 251, MED 252

HRP 254. Quality & Safety in U.S. Healthcare. 3 Units.
The course will provide an in-depth examination of the quality & patient safety movement in the US healthcare system, the array of quality measurement techniques and issues, and perspectives of quality and safety improvement efforts under the current policy landscape.
Same as: SURG 255

HRP 255. Observational Studies. 2-3 Units.
This course will cover statistical methods for the design and analysis of observational studies. Topics for the course will include the potential outcomes framework for causal inference; randomized experiments; methods for controlling for observed confounders in observational studies; sensitivity analysis for hidden bias; instrumental variables; tests of hidden bias; coherence; and design of observational studies.
Same as: STATS 355

HRP 256. Economics of Health and Medical Care. 5 Units.
Institutional, theoretical, and empirical analysis of the problems of health and medical care. Topics: demand for medical care and medical insurance; institutions in the health sector; economics of information applied to the market for health insurance and for health care; measurement and valuation of health; competition in health care delivery. Graduate students with research interests should take ECON 249. Prerequisites: ECON 50 and either ECON 102A or STATS 116 or the equivalent. Recommended: ECON 51.
Same as: BIOMEDIN 156, BIOMEDIN 256, ECON 126

HRP 257. Advanced Topics in the Economics of Health and Medical Care. 2 Units.
Emphasis is on research studies in health economics. Seminar style course focuses on Health Economics. To be taken with HRP 256. Students will be expected to read and present papers to the group and discuss concepts with faculty. Restricted to second year PhD students in economics & economics-related disciplines.
Same as: MED 265

HRP 258. Introduction to Probability and Statistics for Clinical Research. 3 Units.
Open to medical and graduate students; required of medical students in the Clinical Research Scholarly Concentration. Tools to evaluate medical literature. Topics include random variables, expectation, variance, probability distributions, the central limit theorem, sampling theory, hypothesis testing, confidence intervals, correlation, regression, analysis of variance, and survival analysis.

HRP 259. Introduction to Probability and Statistics for Epidemiology. 3-4 Units.
Topics: random variables, expectation, variance, probability distributions, the central limit theorem, sampling theory, hypothesis testing, confidence intervals. Correlation, regression, analysis of variance, and nonparametric tests. Introduction to least squares and maximum likelihood estimation. Emphasis is on medical applications. Differential between 3 and 4 units is the amount of out-of-class work required.

HRP 261. Intermediate Biostatistics: Analysis of Discrete Data. 3 Units.
Methods for analyzing data from case-control and cross-sectional studies: the 2x2 table, chi-square test, Fisher's exact test, odds ratios, Mantel-Haenzel methods, stratification, tests for matched data, logistic regression, conditional logistic regression. Emphasis is on data analysis in SAS. Special topics: cross-fold validation and bootstrap inference.
Same as: BIOMEDIN 233, STATS 261

HRP 262. Intermediate Biostatistics: Regression, Prediction, Survival Analysis. 3 Units.
Methods for analyzing longitudinal data. Topics include Kaplan-Meier methods, Cox regression, hazard ratios, time-dependent variables, longitudinal data structures, profile plots, missing data, modeling change, MANOVA, repeated-measures ANOVA, GEE, and mixed models. Emphasis is on practical applications. Prerequisites: basic ANOVA and linear regression.
Same as: STATS 262

HRP 263. Advanced Decision Science Methods and Modeling in Health. 3 Units.
Advanced methods currently used in published model-based cost-effectiveness analyses in medicine and public health, both theory and technical applications. Topics include: Markov and microsimulation models, model calibration and evaluation, and probabilistic sensitivity analyses. Prerequisites: a course in probability, a course in statistics or biostatistics, a course on cost-effectiveness such as HRP 392, a course in economics, and familiarity with decision modeling software such as TreeAge.
Same as: MED 263
HRP 264. Foundations of Statistical and Scientific Inference. 1 Unit.
The course will consist of readings and discussion of foundational papers and book sections in the domains of statistical and scientific inference. Topics to be covered include philosophy of science, interpretations of probability, Bayesian and frequentist approaches to statistical inference and current controversies about the proper use of p-values and research reproducibility. Recommended preparation: At least 2 quarters of biostatistics and one of epidemiology. Intended for second year Masters students, of PhD students with as least 1 year of preceding graduate training.

HRP 265. Methods for Network Meta-Analysis. 2 Units.
The course will cover the area of network meta-analysis, a technique used to compare treatments that have not been compared directly to each other, but are included in a “network” of randomized trials that allows inferences to be made based on indirect comparisons. In traditional meta-analysis all included studies compare the same intervention with the same comparator. Network meta-analysis extends this concept by including multiple pair-wise comparisons across a range of interventions and provides estimates of relative treatment effects between all interventions in the network. This technique is being increasingly used in evidence-based medicine, health technology assessments and policy making. Recommended preparation: HEP 206, and at least 2 quarters of biostatistics and one of epidemiology, including clinical research design. Familiarity with logistic and linear regression modeling required.

HRP 267. Life Course Epidemiology. 2 Units.
The focus of this course is on understanding the evidence for how exposure at multiple levels and at multiple ages influences an individual’s health at any given time. The course emphasizes the primary theories used to examine life course determinants of health and how these theories both facilitate and impede research. A secondary focus is on understanding the methodological challenges to studying health from a life course perspective, as well as how knowledge of life course determinants of health can inform interventions to improve health from a population perspective.

HRP 268. Genetics and Reproductive Technologies. 2 Units.
(Also as LAW 568) Examines the complex interrelationship among legal, political, ethical, and social issues shaping the intersection of genetics, reproductive technologies and reproductive rights. Issues discussed may include, but are not limited to: the commercialization and sale of reproductive materials like sperm, ovum, and surrogacy services; genetic technologies, prenatal genetic screening, and diagnostic testing of offspring; criminalization of reproductive decision-making such as sex-selection and genetic enhancement; stem cells, cloning, and abortion; DNA databanks and collection of genetic information; in vitro fertilization and other emerging reproductive technologies.

HRP 271. Preparation and Practice: Scientific Communication and Media. 1-2 Unit.
Through tailored lecture, case study, and a practical final project, academic and professional leaders will help you gain insight into the science communications and media industry and the skills necessary to succeed within the various positions and levels available within it. Recommended preparation: The course will consist of an introduction to the fundamentals of clinical research at Stanford, including the science of clinical research (design and analysis) and logistics (GCP, data management, regulatory). Material will be covered in approximately 4-6 3 hour sessions per quarter.

HRP 274. Design for Service Innovation. 4 Units.
(Also as OIT 343/01) Open to graduate students from all schools and departments. An experiential project course in which students work in multidisciplinary teams to design new services to address the needs of medically patients. Project teams partner with “safety net” hospitals and clinics to find better ways to deliver care to the low income and uninsured patients these institutions serve. Students learn proven innovation processes from experienced GSB, d. school, and SoM faculty, interface with students from across the university, and have the opportunity to see their ideas translated into improvements in the quality and efficiency of healthcare in the real world. Prerequisite: admission to the course is by application only. Applications available at http://DesignForService.stanford.edu. Applications must be submitted by November 16, 2011.

HRP 280. Spanish for Medical Students. 2-3 Units.
First quarter of three-quarter series. Goal is a practical and culturally appropriate command of spoken Spanish. Emphasis is on taking the medical history. Topics include the human body, hospital procedures, diagnostics, food, and essential doctor-patient phrases when dealing with Spanish-speaking patients. Series can be taken independently, depending on the level of prior knowledge. Offered to undergraduates for 3 units (2 units for medical students).

HRP 281. Spanish for Medical Students. 2 Units.
Second quarter of three-quarter series. Goal is a practical and culturally appropriate command of spoken Spanish. Emphasis is on performing a physical examination. Topics include the human body, hospital procedures, diagnostics, food, and essential doctor-patient phrases when dealing with Spanish-speaking patients. Series can be taken independently, depending on the level of prior knowledge. Offered to undergraduates for 3 units (2 units for medical students).
HRP 282. Spanish for Medical Students. 2-3 Units.
Third quarter of three-quarter series. Goal is a practical and culturally appropriate command of spoken Spanish. Emphasis is on different specialties and medical conditions. Topics include the human body, hospital procedures, diagnostics, food, and essential doctor-patient phrases when dealing with Spanish-speaking patients. Series can be taken independently, depending on the level of prior knowledge. Offered to undergraduates for 3 units (2 units for medical students).
Same as: SPANLANG 123M

HRP 283. Health Services Research Core Seminar. 1 Unit.
Presentation of research in progress and tutorials in the field of health services research.

HRP 289. Advanced Medical Spanish Oral Communication. 2 Units.
Enrollment limited to medical students. Designed to further develop linguistic skills, covering all medical specialties according to student needs. Sessions also include topics on patient education and diseases, such as diabetes, asthma, TB, and CVDs.

HRP 295. Advanced Topics in Epidemiologic and Clinical Research. 2 Units.
Topics include alternative study designs, causal inference methods, instrumental variables, time-varying confounding, registry-based research, missing data, and repeated events. Weekly readings and discussions will consider how these methods apply to numerous substantive areas including pharmacoepidemiology, reproductive and perinatal epidemiology, and many areas of chronic disease epidemiology. Prerequisite: HRP 225 and HRP 226 or permission of instructor.

HRP 296. Current Topics in Bioethics. 3 Units.
(Same as LAW 596) Explores the ethical, legal, and public policy issues arising from recent advances in biomedicine and the biosciences. Approaches to bioethical reasoning including casuistry, social justice, resource allocation, and individual rights in areas such as refusal of treatment conception. Topics include: the use of forensic genetics in criminal law, neuroscience and national security, race and ethnicity in genetic research, experimentation on human subjects and prisoners, privacy of medical and genetic information in the information age, synthetic biology, and do-it-yourself medical and genetic testing. No prior knowledge in science, medicine, philosophy or related disciplines is required.

HRP 299. Directed Reading in Health Research and Policy. 1-18 Unit.
Epidemiology, health services research, preventive medicine, medical genetics, public health, economics of medical care, occupational or environmental medicine, international health, or related fields. May be repeated for credit. Prerequisite: consent of instructor.

HRP 392. Analysis of Costs, Risks, and Benefits of Health Care. 4 Units.
(Same as MGTECON 332) For graduate students. How to do cost/benefit analysis when the output is difficult or impossible to measure. How do M.B.A. analytic tools apply in health services? Literature on the principles of cost/benefit analysis applied to health care. Critical review of actual studies. Emphasis is on the art of practical application.
Same as: BIOMEDIN 432

HRP 399. Graduate Research. 1-18 Unit.
Investigations sponsored by individual faculty members. Prerequisite: consent of instructor.

HRP 800. Second Year Health Policy PHD Tutorial. 3 Units.
The goal of the second year tutorial is to provide PHD students with advanced training in health policy research and to assist them in successfully developing research proposals.

HRP 801. TGR Project. 0 Units.

HRP 802. TGR Dissertation. 0 Units.

HRP 391. Health Law: Finance and Insurance. 3 Units.
(SAME AS LAW 3001, MGTECON 331) This course provides the legal, institutional, and economic background necessary to understand the financing and production of health services in the U.S. We will discuss the Affordable Care Act, health insurance (Medicare and Medicaid, employer-sponsored insurance, the uninsured), the approval process and IP protection for pharmaceuticals, and antitrust policy. We may discuss obesity and wellness, regulation of fraud and abuse, and medical malpractice. The syllabus for this course can be found at https://syllabus.stanford.edu. Elements used in grading: Participation, attendance, class presentation, and final exam.
Same as: PUBLPOL 231