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

Graduate Programs in Health Research and Policy

The programs in Epidemiology and the programs 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, send email to hrpadmissions@stanford.edu.

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

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 program 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 and others with a strong background in health policy analysis. The core faculty interests include outcomes research, health economics, health care organization, health care access, implementation science, 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</th>
<th>Title and Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>HRP 261</td>
<td>Intermediate Biostatistics: Analysis of Discrete Data 3</td>
</tr>
<tr>
<td>HRP 262</td>
<td>Intermediate Biostatistics: Regression, Prediction, Survival Analysis 3</td>
</tr>
<tr>
<td>HRP 391</td>
<td>Health Law: Finance and Insurance 3</td>
</tr>
<tr>
<td>HRP 392</td>
<td>Analysis of Costs, Risks, and Benefits of Health Care 4</td>
</tr>
<tr>
<td>MED 255</td>
<td>The Responsible Conduct of Research 1</td>
</tr>
</tbody>
</table>

For additional 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.

Concentration Requirements:

Choose 1 of the following Concentration Courses:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title and Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>HRP 218</td>
<td>Methods for Health Care Delivery Innovation, Implementation and Evaluation 2</td>
</tr>
<tr>
<td>HRP 252</td>
<td>Outcomes Analysis 4</td>
</tr>
<tr>
<td>HRP 256</td>
<td>Economics of Health and Medical Care 5</td>
</tr>
<tr>
<td>HRP 263</td>
<td>Advanced Decision Science Methods and Modeling in Health 3</td>
</tr>
</tbody>
</table>

Thesis Units:

At least 12 units of thesis units:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title and Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>HRP 399</td>
<td>Graduate Research 12-15</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</th>
<th>Title and Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOMEDIN 215</td>
<td>Data Driven Medicine 3</td>
</tr>
<tr>
<td>HRP 201A</td>
<td>Health Policy Graduate Student Tutorial I 1-2</td>
</tr>
<tr>
<td>HRP 201B</td>
<td>Health Policy Graduate Student Tutorial II 1-2</td>
</tr>
<tr>
<td>HRP 201C</td>
<td>Health Policy Graduate Student Tutorial III 1-2</td>
</tr>
<tr>
<td>HRP 206</td>
<td>Meta-research: Appraising Research Findings, Bias, and Meta-analysis 3</td>
</tr>
<tr>
<td>HRP 214</td>
<td>Scientific Writing 2-3</td>
</tr>
<tr>
<td>HRP 219</td>
<td>Evaluating Technologies for Diagnosis, Prediction and Screening 3</td>
</tr>
<tr>
<td>HRP 223</td>
<td>Introduction to Data Management and Analysis in SAS 2</td>
</tr>
<tr>
<td>HRP 249</td>
<td>Topics in Health Economics I 2-5</td>
</tr>
<tr>
<td>HRP 251</td>
<td>Design and Conduct of Clinical Trials 3</td>
</tr>
<tr>
<td>HRP 257</td>
<td>Advanced Topics in the Economics of Health and Medical Care 2</td>
</tr>
<tr>
<td>HRP 258</td>
<td>Introduction to Probability and Statistics for Clinical Research 3</td>
</tr>
<tr>
<td>HRP 259</td>
<td>Introduction to Probability and Statistics for Epidemiology 3</td>
</tr>
<tr>
<td>HRP 264</td>
<td>Foundations of Statistical and Scientific Inference 1</td>
</tr>
<tr>
<td>HRP 292</td>
<td>Advanced Statistical Methods for Observational Studies 2-3</td>
</tr>
<tr>
<td>GSBGEN 551</td>
<td>Innovation and Management in Health Care 2</td>
</tr>
<tr>
<td>MED 129</td>
<td>Health Care Systems Around the World 4</td>
</tr>
<tr>
<td>MED 236</td>
<td>Economics of Infectious Disease and Global Health 3</td>
</tr>
<tr>
<td>MED 273</td>
<td>Biodesign for Digital Health 3</td>
</tr>
<tr>
<td>PEDS 202A</td>
<td>Practical Applications for Qualitative Data Analysis 3</td>
</tr>
<tr>
<td>PEDS 202B</td>
<td>Practical Applications for Qualitative Data Analysis 3</td>
</tr>
<tr>
<td>STATS 216</td>
<td>Introduction to Statistical Learning 3</td>
</tr>
</tbody>
</table>
For additional information on course requirements and admissions process, please see our department website (http://med.stanford.edu/hrpadmissions/programs/mshsr.html). GRE is required.

Please address inquiries to the HRP Education Program Manager at hrpadmissions@stanford.edu.

**Master of Science in Epidemiology and Clinical Research**

University requirements for the M.S. degree are described in the "Graduate Degrees" 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 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, genetic epidemiology, global health, infectious disease epidemiology, musculoskeletal disease epidemiology, neuroepidemiology, 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, diversity, 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 offers a coterminal M.S. 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 on our coterminal M.S. program can be found on our department website (http://med.stanford.edu/epidemiology/coterm.html).

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 approved course work as well as a master's thesis which is usually based on original research related to clinical epidemiology.

**REQUIRED COURSES:**

**Epidemiologic methods:**

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>HRP 225</td>
<td>Introduction to Epidemiologic and Clinical Research Methods</td>
<td>3</td>
</tr>
<tr>
<td>HRP 226</td>
<td>Intermediate Epidemiologic and Clinical Research Methods</td>
<td>3</td>
</tr>
<tr>
<td>HRP 251</td>
<td>Design and Conduct of Clinical Trials</td>
<td>3</td>
</tr>
</tbody>
</table>

**Biostatistics:**

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

**Research seminar:**

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>HRP 236</td>
<td>Epidemiology Research Seminar (at least 3 units)</td>
<td>1</td>
</tr>
</tbody>
</table>

**Research:**

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>HRP 399</td>
<td>Graduate Research (at least 12 units)</td>
<td>12</td>
</tr>
</tbody>
</table>

**Research conduct:**

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>MED 255</td>
<td>The Responsible Conduct of Research</td>
<td>1</td>
</tr>
<tr>
<td>MED 255C</td>
<td>The Responsible Conduct of Research for Clinical and Community Researchers</td>
<td>1</td>
</tr>
</tbody>
</table>

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

**Pre-approved Electives**

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Units</th>
</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 212</td>
<td>Cross Cultural Medicine</td>
<td>3</td>
</tr>
<tr>
<td>HRP 214</td>
<td>Scientific Writing</td>
<td>2-3</td>
</tr>
<tr>
<td>HRP 216</td>
<td>Analytical and Practical Issues in the Conduct of Clinical and Epidemiologic Research</td>
<td>2-3</td>
</tr>
<tr>
<td>HRP 218</td>
<td>Methods for Health Care Delivery Innovation, Implementation and Evaluation</td>
<td>2</td>
</tr>
<tr>
<td>HRP 219</td>
<td>Evaluating Technologies for Diagnosis, Prediction and Screening</td>
<td>3</td>
</tr>
<tr>
<td>HRP 223</td>
<td>Introduction to Data Management and Analysis in SAS</td>
<td>2</td>
</tr>
<tr>
<td>HRP 231</td>
<td>Epidemiology of Infectious Diseases</td>
<td>3</td>
</tr>
<tr>
<td>HRP 235</td>
<td>Designing Research-Based Interventions to Solve Global Health Problems</td>
<td>3-4</td>
</tr>
<tr>
<td>HRP 237</td>
<td>Practical Approaches to Global Health Research</td>
<td>1-3</td>
</tr>
<tr>
<td>HRP 238</td>
<td>Genes and Environment in Disease Causation: Implications for Medicine and Public Health</td>
<td>2-3</td>
</tr>
<tr>
<td>HRP 239</td>
<td>Statistical Methods for Group Comparisons and Causal Inference</td>
<td>3</td>
</tr>
</tbody>
</table>
Before pursuing a research project, the student must make arrangements in the areas (Infectious Diseases, Global Health), although this is not required. The student is not required to take the course in Clinical Trials. Students who have completed 2 units of Epidemiology and Clinical Research may be considered for transfer to the graduate program. For additional information on the application process, see the department's coterminal page (http://med.stanford.edu/epidemiology/co-term.html). Address inquiries to the HRP Education Program Manager at hrpadmissions@stanford.edu.*GRE scores are recommended but not required for coterm applications.

University Coterminal Requirements

Coterminal master's degree candidates are expected to complete all master's degree requirements as described in this bulletin. University requirements for the coterminal master's degree are described in the "Coterminal Master's Program (http://exploredegrees.stanford.edu/cotermdegrees)" section of this bulletin. After accepting admission to this coterminal master's degree program, students may request transfer of courses from the undergraduate to the graduate career to satisfy requirements for the master's degree. Transfer of courses to the graduate career requires review and approval of both the undergraduate and graduate programs on a case by case basis.

In this master's program, courses taken during or after the first quarter of the sophomore year are eligible for consideration for transfer to the graduate career; the timing of the first graduate quarter is not a factor. No courses taken prior to the first quarter of the sophomore year may be used to meet master's degree requirements.

Course transfers are not possible after the bachelor's degree has been conferred.

The University requires that the graduate adviser be assigned in the department by the end of the student's first graduate quarter. University fellowships and assistantships. However, many federal and private fellowships are awarded only to students who have received the bachelor's degree. Even after the conferral of the bachelor's degree, there is no guarantee is not required to take the course in Clinical Trials. Students who have completed 180 units are eligible for University fellowships and assistantships. However, many federal and private fellowships are awarded only to students who have received the bachelor's degree. Even after the conferral of the bachelor's degree, there is no guarantee that a coterminal student be awarded financial support via a RA-ship, TA-ship, or fellowship.

Coterminal Master of Science in Epidemiology and Clinical Research

The coterminal master's degree is available only to current Stanford undergraduates. The M.S. entails a minimum of 45 units of coursework but can require more depending upon the courses chosen and the previous training of the student; a minimum of 12 units must be applied towards the master's thesis.

The coterminal Master of Science program follows the same program requirements as the Master of Science (academic), except that the student is not required to take the course in Clinical Trials. Students who desire to concentrate in a specific area can participate in one of the track areas (Infectious Diseases, Global Health), although this is not required. To pursue a research project, the student must make arrangements with program faculty. Coterminal students are enrolled full-time and courses are taken on campus. Graduates of this program are prepared to contribute creatively to basic or applied projects in epidemiology and clinical research. The department anticipates that many go on to Ph.D. programs, M.D. degrees, or to pursue careers in public health, pharma or biotech.

Coterminal students must have at least one quarter of overlap in the undergraduate and graduate career prior to conferring their undergraduate degree. See the "Coterminal Degrees (http://exploredegrees.stanford.edu/cotermdegrees)" section of this bulletin for additional details. See also the Registrar’s coterminal degrees (https://registrar.stanford.edu/students/coterminal-degree-programs) pages.

Funding Sources

Access to financial aid and other options for coterminal students depends on the number of units and quarters as a registered student at Stanford. Coterminal students have full access to undergraduate sources of financial aid until their twelfth quarter or four years of study. Coterminal students who have completed 180 units are eligible for University fellowships and assistantships. However, many federal and private fellowships and assistantships are awarded only to students who have received the bachelor's degree. Even after the conferral of the bachelor's degree, there is no guarantee that a coterminal student be awarded financial support via a RA-ship, TA-ship, or fellowship.

Coterminal students who have completed 180 units are eligible for University fellowships and assistantships. However, many federal and private fellowships are awarded only to students who have received the bachelor's degree. Even after the conferral of the bachelor's degree, there is no guarantee that a coterminal student be awarded financial support via a RA-ship, TA-ship, or fellowship.

Coterminal students may choose to obtain their bachelor's degree early after completion of requirements. However, all classes after conferral of the degree may only be counted towards the graduate degree. Part of the strategy that allows coterms maximal flexibility in their course of study is their dual status as both undergraduate and graduate student.

For additional information on the application process, see the department's coterminal page (http://med.stanford.edu/epidemiology/co-term.html). Address inquiries to the HRP Education Program Manager at hrpadmissions@stanford.edu. *GRE scores are recommended but not required for coterm applications.

University Coterminal Requirements

Coterminal master's degree candidates are expected to complete all master's degree requirements as described in this bulletin. University requirements for the coterminal master's degree are described in the "Coterminal Master's Program (http://exploredegrees.stanford.edu/cotermdegrees)" section. University requirements for the master's degree are described in the "Graduate Degrees (http://exploredegrees.stanford.edu/graduatedegrees/#masterstext)" section of this bulletin.

After accepting admission to this coterminal master's degree program, students may request transfer of courses from the undergraduate to the graduate career to satisfy requirements for the master's degree. Transfer of courses to the graduate career requires review and approval of both the undergraduate and graduate programs on a case by case basis.

In this master's program, courses taken during or after the first quarter of the sophomore year are eligible for consideration for transfer to the graduate career; the timing of the first quarter of the sophomore year is not a factor. No courses taken prior to the first quarter of the sophomore year may be used to meet master's degree requirements.

Course transfers are not possible after the bachelor's degree has been conferred.

The University requires that the graduate adviser be assigned in the student's first graduate quarter even though the undergraduate career may still be open. The University also requires that the Master's Degree Program Proposal be completed by the student and approved by the department by the end of the student's first graduate quarter.

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 advisers 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:

1. an advanced quantitative course (encompassing statistics, computer science, or economics)
2. a big data course
3. a genetics/genomics/bioinformatics course

**Degree Requirements**

University requirements for the Ph.D. are described in the "Graduate Degrees (http://stanford.edu/dept/registrar/bulletin/4901.html)" 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.

### Epidemiologic methods sequence

- **HRP 225** Introduction to Epidemiologic and Clinical Research Methods: 3 units
- **HRP 226** Intermediate Epidemiologic and Clinical Research Methods: 3 units
- **HRP 251** Design and Conduct of Clinical Trials (Required of students in the clinical research concentration: other doctoral students may opt to replace HRP 251 with an alternate epidemiology course): 3 units

### Biostatistics sequence

- **HRP 259** Introduction to Probability and Statistics for Epidemiology: 3 units
- **HRP/STATS 261** Intermediate Biostatistics: Analysis of Discrete Data: 3 units
- **HRP 262** Intermediate Biostatistics: Regression, Prediction, Survival Analysis: 3 units

### “Big Epidemiology” elective course

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>HRP 216</td>
<td>Analytical and Practical Issues in the Conduct of Clinical and Epidemiologic Research</td>
<td>3</td>
</tr>
<tr>
<td>HRP 252</td>
<td>Outcomes Analysis</td>
<td>3</td>
</tr>
<tr>
<td>HRP 392</td>
<td>Analysis of Costs, Risks, and Benefits of Health Care</td>
<td>3</td>
</tr>
</tbody>
</table>
| HRP/MED 206/STATS 211 | Meta-research: Appraising Research | 3 | Findings, Bias, and Meta-analysis

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>STATS 116</td>
<td>Theory of Probability</td>
<td>3</td>
</tr>
<tr>
<td>HRP 216</td>
<td>Analytical and Practical Issues in the Conduct of Clinical and Epidemiologic Research</td>
<td>3</td>
</tr>
<tr>
<td>HRP 252</td>
<td>Outcomes Analysis</td>
<td>3</td>
</tr>
<tr>
<td>HRP 392</td>
<td>Analysis of Costs, Risks, and Benefits of Health Care</td>
<td>3</td>
</tr>
</tbody>
</table>
| HRP/MED 206/STATS 211 | Meta-research: Appraising Research | 3 | Findings, Bias, and Meta-analysis

### Big data course

- Take one of the following big data courses
  - BIOMEDIN 215 Data Driven Medicine: 3-4 units
  - CS 246 Mining Massive Data Sets: 3-4 units
  - STATS 202 Data Mining and Analysis: 3-4 units
  - CS 229 Machine Learning: 3-4 units
  - COMM 382 Big Data and Causal Inference: 3-4 units

#### Genetics/genomics/bioinformatics course

- Take one of the following genetics/genomics/bioinformatics courses
  - BIOMEDIN 217/CS 275 Translational Bioinformatics: 3-4 units
  - GENE 244 Introduction to Statistical Genetics: 3-4 units
  - HUMBIO 151R Biology, Health and Big Data: 3-4 units
  - GENE 224 Principles of Pharmacogenomics: 3-4 units
  - BIOMEDIN/DBIO/CS 273A The Human Genome Source Code: 3-4 units
  - GENE 210/DBIO 220 Genomics and Personalized Medicine: 3-4 units
  - STATS 345 Statistical and Machine Learning Methods for Genomics: 3-4 units
  - or GENE 245 Statistical and Machine Learning Methods for Genomics: 3-4 units

### Other core courses/requirements

- **MED 255** The Responsible Conduct of Research: 3-4 units
- **Other electives chosen in consultation with the academic adviser to total 135 units:** 64-71 units

**Total Units Required**: 135

### 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.

### Advising

Academic advising by our faculty is a critical component of our graduate students' education.

All matriculating students will be assigned a faculty adviser from the group of core faculty to help them design their academic program.


See the department’s website (http://med.stanford.edu/epidemiology/grad_programs/phd-ecr.html) for additional information on degree requirements and admissions process (GRE is required). Address inquiries to the HRP Education Program Manager at hrpadmissions@stanford.edu.
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.

More complete program requirement details can be found in the Stanford GAP (https://gap.stanford.edu) manual, the program website (http://med.stanford.edu/hsr/grad_programs/phd.html), and program handbook (link on program website).

Select requirements

- Completion of course work (see below) 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 of each year.
- Meeting with adviser(s) on a regular basis.
- Completion of progress assessment/milestone meeting with primary adviser each year (during Spring quarters).
- Completion of course work in the responsible conduct of research.
- Final course work (for both first and second year) must total at least 75 units for both core and track specific courses.
- Taking and passing the Written Qualifying Exam.
- Taking and passing the Oral Exam.
- Students must develop, write and 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.
- A final presentation is required for graduation - the final presentation is a summary of the work accomplished on the Ph.D. research and should occur while the student is still matriculated, during the regular academic quarter.

Course Work

The minimum number of units required for a Ph.D. degree at Stanford (satisfied both through coursework and research units) is 135.

PhD students will complete work in one of the following two tracks.

### Health Economics Track

<table>
<thead>
<tr>
<th>Statistical Data Analysis, Econometrics, and Causal Inference</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Required - one year sequence in econometrics:</td>
<td></td>
</tr>
<tr>
<td>ECON 270 Intermediate Econometrics I</td>
<td>2-5</td>
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<tr>
<td>ECON 271 Intermediate Econometrics II</td>
<td>2-5</td>
</tr>
<tr>
<td>ECON 272 Intermediate Econometrics III</td>
<td>2-5</td>
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<tr>
<td>OR</td>
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<tr>
<td>MGTECON 603 Econometric Methods I</td>
<td>4</td>
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<tr>
<td>MGTECON 604 Econometric Methods II</td>
<td>3</td>
</tr>
<tr>
<td>MGTECON 605 Econometric Methods III</td>
<td>3</td>
</tr>
</tbody>
</table>

### Micro-Economics

Required - one year sequence in microeconomics:

- ECON 202 Microeconomics I 2-5
- ECON 203 Microeconomics II 2-5
- ECON 204 Microeconomics III 2-5

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
- HRP 257 Advanced Topics in the Economics of Health and Medical Care 2

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:

- EASTASN 217 Health and Healthcare Systems in East Asia 3-5
- HRP 209 Health Law: The FDA 2-3
- HRP 391 Health Law: Finance and Insurance 3
- LAW 3002 Health Law: Quality and Safety of Care 3
- LAW 3009 Health Law: Improving Public Health 3
- MED 238 Leading and Managing Health Care Organizations: Innovation and Collaboration in High Stakes Settings 3

### Practice of Research

Required:

- First-year core tutorial (HRP 201A, HRP 201B, and HRP 201C)
- Second-year core tutorial (HRP 800)
- Health Economics Seminar
- Research in Progress Seminar
- MED 255 The Responsible Conduct of Research 1

### Decision Science Track

<table>
<thead>
<tr>
<th>Statistical Data Analysis, Econometrics, and Causal Inference</th>
<th>Units</th>
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<tbody>
<tr>
<td>Required: at least two quarters of one of the two following sequences:</td>
<td></td>
</tr>
</tbody>
</table>
ECON 270  Intermediate Econometrics I  2-5
ECON 271  Intermediate Econometrics II  2-5
ECON 272  Intermediate Econometrics III  2-5
Or
MGTECON 603  Econometric Methods I  4
MGTECON 604  Econometric Methods II  3
MGTECON 605  Econometric Methods III  3

**Micro-Economics**
Required, at least one quarter:
GSBGEN 675  Microeconomic Theory  3
Or
MGTECON 600  Microeconomic Analysis I  4
MGTECON 601  Microeconomic Analysis II  3
Or
ECON 202N  Microeconomics I For Non-Economics PhDs  2-5
Or
ECON 202  Microeconomics I  2-5
ECON 203  Microeconomics II  2-5

**Discipline-Specific Courses**
Required:
HRP 263  Advanced Decision Science Methods and Modeling in Health  3

Choose 4 methods courses such as:
MS&E 201  Dynamic Systems  3
MS&E 211X  Introduction to Optimization (Accelerated)  3-4
MS&E 221  Stochastic Modeling  3
MS&E 223  Simulation  3
MS&E 226  Fundamentals of Data Science: Prediction, Inference, Causality  3
MS&E 263  Healthcare Operations Management  3
MS&E 463  Healthcare Systems Design  3-4

**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:
EASTASN 217  Health and Healthcare Systems in East Asia  3-5
HRP 209  Health Law: The FDA  2-3
HRP 391  Health Law: Finance and Insurance  3
LAW 3002  Health Law: Quality and Safety of Care  3
LAW 3009  Health Law: Improving Public Health  3
MED 238  Leading and Managing Health Care Organizations: Innovation and Collaboration in High Stakes Settings  3

**Practice of Research**
Required:
First-year core tutorial (HRP 201A, HRP 201B, HRP 201C)
Second-year core tutorial (HRP 800)
Research in Progress Seminar
MED 255  The Responsible Conduct of Research  1

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**Advising**

Academic advising by program faculty is a critical component of the program’s graduate students’ education.

All matriculating students are assigned a faculty adviser from the group of core faculty to help them design their academic program. Before or shortly after the time that they advance to candidacy for the degree, students are expected to identify a group of at least three thesis advisers (also known as the dissertation reading committee), including a primary thesis adviser. The thesis advisers are selected by the student on the basis of expertise relevant to the thesis project, and may or may not include the originally assigned faculty adviser.

Advisers meet with students within the first quarter of each year to discuss students’ Individual Development Plan(s) (IDPs). Additionally, students meet with their adviser(s) on a regular basis throughout each year to discuss course selection, development of research projects, and career plans.

Academic progress and student completion of program requirements and milestones are monitored by the program staff and directors and also discussed at quarterly meetings of all Ph.D. advisers.

Requirements and milestones, as well as more detailed descriptions of the program’s expectations of advisers and students, are listed in the Student Handbook, found on the program website (http://med.stanford.edu/hsr/grad_programs/phd.html).

Additionally, the program adheres to the advising guidelines and responsibilities listed by the Office of the Vice Provost for Graduate Education (https://vpge.stanford.edu/academic-guidance/advising-mentoring) and in the Graduate Academic Policies and Procedures (https://gap.stanford.edu/handbooks/gap-handbook/chapter-3/subchapter-3/page-3-3-1) manual.

See the department’s website (http://med.stanford.edu/epidemiology/grad_programs/phd-ecr.html) for additional information on degree requirements, advising, program milestones, and admissions processes (GRE is required). Address inquiries to the HRP Education Program Manager at hradmissions@stanford.edu.

**Graduate Advising Expectations**

The Department of Health Research and Policy is committed to providing academic advising in support of graduate student scholarly and professional development. When most effective, this advising relationship entails collaborative and sustained engagement by both the adviser and the advisee. As a best practice, advising expectations should be periodically discussed and reviewed to ensure mutual understanding. Both the adviser and the advisee are expected to maintain professionalism and integrity.

Faculty advisers guide students in key areas such as selecting courses, designing and conducting research, developing teaching pedagogy, navigating policies and degree requirements, and exploring academic opportunities and professional pathways.

Graduate students are active contributors to the advising relationship, proactively seeking academic and professional guidance and taking responsibility for informing themselves of policies and degree requirements for their graduate program.

For a statement of University policy on graduate advising, see the "Graduate Advising (http://exploredegrees.stanford.edu/graduatedegrees/#advisingandcredentialtext)" section of this bulletin.

Health Research and Policy

Emeriti: (Professors) Dan Bloch, John Farquhar, Victor Fuchs, Jennifer Kelsey, Alice Whittmore

Chair: Laurence Baker

Director of Ph.D. Epidemiology: Kristin Sainani

Directors of M.S. Epidemiology: Rita Popat, Victor Henderson

Director of Ph.D. Health Policy: Corinna Haberland

Director of M.S. Health Policy: Kate Bundorf

Professors: Laurence Baker, Mark Cullen, Steven Goodman, Victor Henderson, Mark Hlatky, John Ioannidis, Abby King, Yvonne Maldonado, Michelle Mello, Julie Parsonnet

Associate Professors: Kate Bundorf, Allison Kurian, Lorene Nelson, Michelle Odden, Kristin Sainani

Associate Professor (Clinical): Rita Popat

Assistant Professors: Lisa Goldman-Rosas, Maria Polyakova, Maya Rossin-Slater, Julia Simard

Courtey Professors: Jay Bhattacharya, Suzan Carmichael, Glenn Chertow, Manisha Desai, Mary Goldstein, Bonnie Halpern-Felsher, Paul Fisher, Paul Heidenreich, Ann Hsing, Erik Ingelsson, Esther John, Daniel Kessler, Angelle (Desiree) LaBeaud, Mary Leonard, Eleni Linos, Ying Lu, Stephen Luby, David Maahs, Alex Macario, Doug Owens, Latha Palaniappan, James Quinn, Thomas Robinson, Joshua Salomon, Gary Shaw, Marcia Stefanick

Courtey Associate Professors: Themistocles Assimes, Eran Bendavid, Jeremy Goldhaber-Fiebert, Jennifer Lee, Grant Miller, Ciaran Phibbs, David Rehkopf, Lee Sanders, Holly Tabor, Jason Wang

Courtey Assistant Professor: Jason Andrews, Michael Baiocchi, David Chan, Suzann Pershing, Eric Sun

Senior Lecturer: Irene Corso

Lecturer: Corinna Haberland

Adjunct Professor: Gary Friedman, Paul-Andre Genest, Jeroen Jansen, Eugene Lewit

Health Services Research

Director: Kate Bundorf (Associate Professor, Health Research and Policy)

Core Faculty and Academic Teaching Staff: Laurence Baker (Professor, Health Research and Policy), Kate Bundorf (Associate Professor, Health Research and Policy), Corinna Haberland (Lecturer, Health Research and Policy), Mark Hlatky (Professor, Health Research and Policy, Medicine), Michelle Mello (Professor, Law, and Health Research and Policy), Maria Polyakova (Assistant Professor, Health Research and Policy), Maya Rossin-Slater (Assistant Professor, Health Research and Policy)

Affiliated Faculty and Staff by Department:

Anesthesiology, Perioperative, and Pain Medicine: Alex Macario (Professor), Eric Sun (Assistant Professor)

Emergency Medicine: James Quinn (Professor)

Law: Daniel Kessler (Professor)

Medicine: Eran Bendavid (Associate Professor), Jay Bhattacharya (Professor), David Chan (Assistant Professor), Jeremy Goldhaber-Fiebert (Associate Professor), Mary Goldstein (Professor), Paul Heidenreich (Professor), Grant Miller (Associate Professor), Doug Owens (Professor), Joshua Salomon (Professor), Jason Wang (Associate Professor)

Ophthalmology: Suzann Pershing (Assistant Professor)

Pediatrics: Ciaran Phibbs (Associate Professor), Lee Sanders (Associate Professor)

Epidemiology

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

Core Faculty and Academic Teaching Staff: Mark Cullen (Professor, Medicine, Health Research and Policy, and Biomedical Data Science), Lisa Goldman-Rosas (Assistant Professor Health Research and Policy, and Medicine), Steven Goodman (Professor, Medicine, and Health Research and Policy), Victor Henderson (Professor, Health Research and Policy, Neurology and Neurological Sciences), John Ioannidis (Professor, Medicine, and Health Research and Policy), Esther John (Professor, Medicine), Abby King (Professor, Health Research and Policy, and Medicine), Allison Kurian (Associate Professor, Medicine, and Health Research and Policy), Yvonne Maldonado (Professor, Pediatrics, and Health Research and Policy), Lorene Nelson (Associate Professor, Health Research and Policy, Michelle Odden (Associate Professor, Health Research and Policy), Yvonne Maldonado (Professor, Pediatrics, and Health Research and Policy), Lorene Nelson (Associate Professor, Health Research and Policy), Lorene Nelson (Associate Professor, Health Research and Policy), Rita Popat (Clinical Associate Professor, Health Research and Policy, Kristin Sainani (Associate Professor, Health Research and Policy), Julia Simard (Assistant Professor, Health Research and Policy), Holly Tabor (Associate Professor, Medicine)

Affiliated Faculty and Staff by Department:

Biomedical Data Science: Ying Lu (Professor)

Dermatology: Eleni Linos (Professor)

Medicine: Jason Andrews (Assistant Professor), Themistocles Assimes (Associate Professor), Michael Baiocchi (Assistant Professor), Glenn Chertow (Professor), Ann Hsing (Professor), Erik Ingelsson (Professor), Jennifer Lee (Associate Professor), Mary Leonard (Professor), Stephen Luby (Professor), Latha Palaniappan (Professor), David Rehkopf (Associate Professor), Thomas Robinson (Professor), Marcia Stefanick (Professor)

Pediatrics: Suzan Carmichael (Professor), Bonnie Halpern-Felsher (Professor), Paul Fisher (Professor), Angelle (Desiree) LaBeaud (Professor), David Maahs (Professor), Lee Sanders (Associate Professor), Gary Shaw (Professor)