CONTENTS

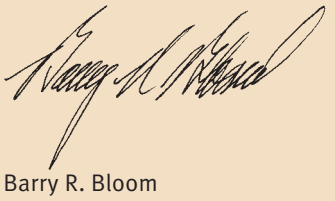
from the dean

The twentieth century witnessed the greatest gains in quality and duration of life. Most of the gains achieved prior to antibiotics and vaccines are truly attributable to public health. In the United States, for example, life expectancy has been extended from an average of forty-seven years in 1900 to over seventy-seven years in 2004. Yet there are major disparities in life expectancy and harsh inequities in individuals' ability to get access to the care they need—both between parts of the world and within this and other countries. Some infectious diseases have been vanquished, but new ones such as AIDS and SARS emerge or reemerge in drug-resistant strains. Violence, injuries, the great parasitic diseases that kill and handicap millions, environmental and occupational hazards, and health management and financing issues are just some of the challenges within the purview and mandate of public health. The improvement of the health of the nation's and the world's populations demands diverse professional skills combined with the integration of varied disciplines.

The courses, departments, programs, and facilities described here in the catalog of the Harvard School of Public Health reflect the full scope of the contemporary public health enterprise. The interests and expertise of faculty at the school are similarly broad, extending across biological, social, political, and population sciences. There are programs and projects ranging from the molecular biology of AIDS vaccines to the epidemiology of cancer; from women's and children's health to quality-of-care measurement; from risk assessment to international health and human rights. All of these programs are approached with a true sense of dedication on the part of the faculty, students, and staff and with a mutual respect for different ways of contributing to our shared purpose.

Our overarching mission is to advance the public's health through learning, discovery, and communication. Our objectives are to provide the highest level of education for public health scientists, practitioners, and leaders; to foster new discoveries leading to the improved health of the people of this country and all nations; to strengthen health capacities and services for communities; and to inform policy debate, disseminate health information, and increase awareness of public health as a public good and a fundamental right.

We are engaged in an enterprise of vital importance to every individual and to our global society. We welcome those who wish to help us meet these challenges and share the satisfying work of changing the world of health and improving the health of the world.



Barry R. Bloom
Dean

THE HARVARD SCHOOL OF PUBLIC HEALTH

The Harvard School of Public Health (HSPH) is a direct descendant of the first professional training program in public health in America, the Harvard-MIT School for Health Officers, a joint venture that began in 1913. In 1922 Harvard split off from MIT, and the Harvard School of Public Health was formally established. In 1946 the school celebrated its new status as a freestanding faculty of Harvard University, no longer an administrative part of the medical school.

Since its founding, the school, through its faculty and graduates, has been at the forefront of efforts to stem disease and promote health worldwide. During the early years the focus was on infectious diseases, deadly workplace exposures, and sanitation—from Alice Hamilton's pioneering studies of lead and mercury poisoning, to Thomas Weller's pathbreaking research on the polio virus and Philip Drinker's invention of the iron lung. More recently the school has expanded its reach to new areas, including the effects of race, gender, class, and social isolation on health; the reform of national health systems; and cutting-edge research on the biomarkers of disease. Three Nobel Prizes, a Lasker Prize, two MacArthur Awards, presidential citations, and countless other honors attest to the excellence and impact of this work. Five successive HSPH alumni led the U.S. Centers for Disease Control and Prevention for an unprecedented twenty-seven years (1962–89). More difficult to quantify—but a far better gauge—are the perceptible gains in length and quality of life that have been realized through all these efforts.

Today the faculty of the Harvard School of Public Health includes over 385 members from the diverse fields and disciplines that constitute public health. The student body comprises over a thousand individuals from throughout the United States and fifty-one other countries. Students, like faculty members, come from an array of fields and include physicians, health services administrators, epidemiologists, nurses, dentists, lawyers, statisticians, environmental scientists, engineers, research assistants, psychologists, and social workers. Thirty percent of current HSPH students are enrolled in the interdisciplinary master of public health (MPH) program, 26 percent in master of science programs, and 44 percent in doctoral (doctor of science, doctor of public health, or doctor of philosophy) programs.

The school is organized into nine academic departments, the locus of most teaching and research activity; two interdisciplinary divisions (Biological Sciences and Public Health Practice); the Office for Professional Education (for the MPH and other professional programs); and a number of specialized research centers. The school's academic programs are described in detail here in the catalog.

ACADEMIC DEPARTMENTS

> My ultimate goal is to combine my interest in mathematics with my desire to improve health in high-risk communities.

BETHANY HEDT
Master's student, Department of Biostatistics

Bethany Hedt says she is drawn to biostatistics because it is "mathematics with a conscience." This sensibility is undoubtedly what led her to join the Peace Corps after graduating in mathematics from the University of North Carolina in 1999.

The Peace Corps sent Bethany to Namibia. For two-and-a-half years, Bethany taught science and math to high school students, some almost as old as she, who had been denied access to education during the years the country had been governed by South African apartheid policies. Before beginning graduate school, Bethany went back to Namibia for an additional year as a member of the Crisis Corps, which returns experienced Peace Corps volunteers to areas in the midst of humanitarian emergencies. This time she ran HIV-AIDS prevention and support programs for students and teachers.

Now in her first year of her master's program at HSPH, Bethany says, "I have never worked so hard in my life, but there is something so satisfying about being pushed and pushing yourself." She loves the diversity of her fellow students and is looking forward to exploring a range of subjects beyond biostatistics, especially HIV-AIDS.

As for the future, Bethany says she may continue on for a doctoral degree or perhaps teach. "My ultimate goal is to combine my interest in mathematics with my desire to improve health in high-risk communities," she comments. "I am excited to see where this degree will take me."

DEPARTMENT OF BIOSTATISTICS

Biostatistics involves the theory and application of statistical science to analyze public health problems and to further biomedical research.

The faculty includes leaders in the development of statistical methods for clinical trials and observational studies, studies on the environment, and genomics/genetics. The department's research in statistical methods and interdisciplinary collaborations provide many opportunities for student participation.

Current departmental research on statistical and computing methods for observational studies and clinical trials includes survival analysis, missing-data problems, and causal inference. Other areas of investigation are environmental research (methods for longitudinal studies, analyses with incomplete data, and meta-analysis); statistical aspects of the study of AIDS and cancer; quantitative problems in health-risk analysis, technology assessment, and clinical decision making; statistical methodology in psychiatric research and in genetic studies; Bayesian statistics; statistical computing; statistical genetics and computational biology; and collaborative research activities with biomedical scientists in other Harvard-affiliated institutions.

Degree Programs in Biostatistics

As described below, the department offers both 80-credit and 40-credit master of science (SM) programs and a doctor of philosophy (PhD) program with a concentration in biostatistics, as well as both 80-credit and 40-credit SM programs with a concentration in health decision sciences. The PhD is offered under the aegis of the Harvard University Graduate School of Arts and Sciences.

Detailed information about requirements and elective options can be found in a handbook distributed by the department. A master of public health program in quantitative methods is described in the interdisciplinary section of this catalog.

The programs offered by the Department of Biostatistics provide rigorous training in the development of methodology, collaboration, teaching, and consultation on a broad spectrum of health-related problems. The department prepares students for academic and private-sector research careers in the fields of biostatistics and health decision sciences. Recent graduates have assumed faculty posts at universities, as well as positions in research laboratories, federal government centers, pharmaceutical companies, and research institutes.

Applicants to the department should have successfully completed calculus through multivariable integration and at least one semester of linear algebra and have knowledge of a programming language such as C or FORTRAN. In addition, applicants are strongly encouraged to have completed courses in probability, statistics, advanced calculus, and numerical analysis. Practical knowledge of a statistical computing package such as SAS, S, Stata, or SPSS is also desirable.

Master of Science in Biostatistics (80-credit and 40-credit programs)

All master's degree programs offered by the department are aimed at students seeking a terminal master's degree. Students ultimately interested in a doctoral degree are encouraged to apply directly to the PhD program. For information about schoolwide requirements for master's degrees, see page 58.

Biostatistics The biostatistics concentration offers training in statistical theory and a variety of methods commonly used in the field of biostatistics. For the 80-credit program 25 credits must be earned in core courses on probability theory and applications, statistical inference, methods, and regression and analysis of variance. An additional 15 credits must be chosen from biostatistics courses, of which 10 credits must be selected from a specific list of biostatistics, health policy and management, and interdisciplinary offerings. In addition to formal course work, students acquire experience in the planning of experiments and the analysis of data by participating in a consulting seminar. Students also choose from a variety of elective courses.

The 40-credit program is designed for students who have a master's degree in one of the mathematical sciences or a doctorate in a quantitative field. Applicants must have a mathematical and statistical background sufficient to achieve a level of proficiency after one year of study comparable to that attained in the 80-credit program. As courses must be taken out of sequence to complete the program in one year, considerable background in probability and statistical inference is needed. The requirements for this degree are essentially the same as for the 80-credit program. The 25-credit core must be completed, although students who have taken equivalent course work elsewhere may petition to substitute more advanced courses. More flexibility is allowed in other requirements since only 40 total credits are required. Other courses are selected in consultation with a faculty adviser.

Health decision sciences The concentration in health decision sciences offers integrated educational training in decision sciences within the context of health problems. This program draws on courses offered by the Departments of Biostatistics and Health Policy and Management.

For the 80-credit program, in addition to schoolwide requirements, students must complete core courses in decision analysis for health and medical practices or for clinical research, methods, theory, management science, probability theory and applications, statistical inference, and computing; a research seminar; and a practicum. Ten additional credits must be earned from the health decision sciences core and extended core. The consulting requirement may be met by obtaining practical experience under the tutelage of a faculty member. Students also choose from a variety of elective courses.

For the 40-credit program applicants must have a statistical and decision science background sufficient to achieve a level of proficiency after one year of study comparable to that attained in the 80-credit program.

Doctor of Philosophy in Biostatistics

The PhD program is designed for those who have demonstrated both interest and ability in scholarly research. Qualified applicants may apply to this program without a prior advanced degree. Please note that Graduate School of Arts and Sciences application forms must be used. The deadline for applying to the PhD program is December 15, 2004.

The course work for the PhD program is built on a 30-credit core curriculum similar to that for the master's degree (see above). In addition, 25 credits of biostatistics courses are required; these courses are chosen by the student in consultation with an adviser. Students must also complete a 10-credit cognate requirement (or minor) in a substantive area (such as the biology of cancer or AIDS). Given the increasing reliance of statistical practice on computing technology, one or more courses in statistical computing are also recommended. PhD students are required to participate as a teaching assistant in a course offered by the department and to satisfy a consulting requirement.

Funding is available to qualified students pursuing the PhD degree. Most of the funding is through five biostatistics training grants in AIDS, cancer, the environment, mental health, and public health training for underrepresented minorities. These traineeships require U.S. citizenship or permanent residency. Other limited funding (for example, teaching and research assistantships) is awarded on a competitive basis to qualified applicants.

Related Offerings

Interdisciplinary concentration in genetic and molecular epidemiology, see page 56.
Interdisciplinary concentration in the epidemiology of infectious disease, see page 56.
MPH concentration in quantitative methods, see page 53.
PhD Program in Health Policy, see page 27.

Contact Information

For more information about research and training in biostatistics, please contact David Wypij, director of student admissions and advising, Department of Biostatistics, 655 Huntington Avenue, Boston, MA 02115.
Phone: 617-432-1056
Fax: 617-739-1781
Email: dept@hsph.harvard.edu
Web: http://www.biostat.harvard.edu

For more information about research and training in health decision sciences, please contact Milton C. Weinstein, PhD, Department of Health Policy and Management, 718 Huntington Avenue, Boston, MA 02115.
Phone: 617-432-0805
Email: mcw@hsph.harvard.edu

For the PhD program online submissions are encouraged, using the Graduate School of Arts and Sciences (GSAS) application form available at the web address below.
Web:http://www.gsas.harvard.edu/admissions/apply.html

For information on postdoctoral fellowships, please contact the chair of the Postdoctoral Committee, Department of Biostatistics, 655 Huntington Avenue, Boston, MA 02115.
Phone: 617-432-1056
Fax: 617-739-1781
Email: dept@hsph.harvard.edu

COURSES OF INSTRUCTION

Please note that the courses listed are subject to change and some are not offered every year. Complete course descriptions are available at http://www.harvard.edu/registrar/courses.

Introduction to Programming in SAS
Introduction to Data Management and Programming in SAS
Principles of Biostatistics—Introductory, I, and II
Introduction to Statistical Methods
Statistical Methods for Health and Social Policy
Statistics for Medical Research—Introductory, II, Advanced, and Translational
Analysis of Rates and Proportions
Regression and Analysis of Variance in Experimental Research
Survey Research Methods in Community Health
Applied Regression for Clinical Research
Principles of Clinical Trials
Basics of Statistical Inference
Applied Survival Analysis and Discrete Data Analysis
Survival Methods in Clinical Research
Applied Longitudinal Analysis
Fundamental Concepts in Gene Mapping
Statistical Genetics in Complex Human Disease
Pattern Recognition of Genomic Data
Probability Theory and Applications I and II
Statistical Inference I and II
Methods I and II
Research Synthesis and Meta-Analysis of Public Health and Medicine
Regression and Analysis of Variance
Sample Surveys
Nonparametric Methods
Analysis of Failure Time Data
Analysis of Multivariate and Longitudinal Data
Design of Scientific Investigations
Advanced Statistical Computing
Bayesian Methods in Biostatistics
Statistical Problems in Drug Development
Computational Methods for Categorical Data Analysis
Seminar on Statistical Methods in Human Genetics
Statistical Science Outreach
Statistical Computing Environments
Applied Stochastic Processes and Models in Public Health
Operational Mathematics
Sequential Analysis
Computational Biology
Smoothing in Biostatistical Modeling
Introduction to Computational Molecular Biology I and II
Theory of Parametric, Semiparametric, and Nonparametric Inference
Spatial Statistics for Health Research
Introduction to Genomics
Public Health Surveillance
Semiparametric Methods for Analysis of Missing and Censored Data
Reading the Medical Literature: A Course for Statisticians
Linear and Longitudinal Regression
Introduction to Stochastic Processes
Independent Study, Tutorials

DEPARTMENT FACULTY

Please note that some faculty members may be on leave during academic year 2004–05.

Department chair: Stephen W. Lagakos, MPhil, PhD; Henry Pickering Walcott Professor of Biostatistics. Statistical methods in AIDS research; clinical trials.

Rebecca A. Betensky, PhD; Associate Professor of Biostatistics. Sequential analysis; correlated binary data.

Marco Bonetti, MS, PhD; Assistant Professor of Biostatistics. Clinical trial and growth data; stochastic geometry and applications to disease spatial clustering.

Tianxi Cai, SD; Assistant Professor of Biostatistics. Analysis of clustered survival data; medical diagnostic testing; semiparametric estimation.

Paul J. Catalano, SD; Lecturer on Biostatistics. Repeated measures; multivariate models; dose-response modeling; risk assessment; environmental statistics.

Brent A. Coull, MS, PhD; Assistant Professor of Biostatistics. Categorical data analysis; generalized linear mixed models; generalized additive models.

Victor G. De Gruttola, SM, SM, SD; Professor of Biostatistics. Methods for analysis of repeated measures from longitudinal studies.

Gregory DiRienzo, MS, PhD; Assistant Professor of Biostatistics. Statistical methods arising in AIDS research; clinical trials.

Garrett Fitzmaurice, MSc, MA, SD; Associate Professor of Biostatistics. Likelihood and nonlikelihood approaches to analyzing multivariate binary outcomes.

Robert C. Gentleman, MSc, PhD; Associate Professor of Biostatistics. Statistical computing and the analysis of censored data.

Robert J. Gray, SM, PhD; Professor of Biostatistics. Clinical trials; survival analysis; techniques for exploratory data analysis and model building.

David P. Harrington, AM, PhD; Professor of Biostatistics. Nonparametric methods for censored data; sequential designs for clinical trials.

Chengcheng Hu, MA, MS, PhD; Assistant Professor of Biostatistics. Failure-time data; measurement error; missing data; longitudinal data; clinical trials.

Michael D. Hughes, MSc, PhD; Professor of Biostatistics. Statistical methods in the design, analysis, and reporting of clinical trials and overviews.

Hongyu Jiang, PhD; Assistant Professor of Biostatistics. Methodology for clinical trials and epidemiologic studies; multivariate survival analysis; bioinformatics.

Karen M. Kuntz, SM, SD; Associate Professor of Health Decision Science. Cost-effectiveness analysis of cancer-screening strategies.

Nan M. Laird, PhD; Professor of Biostatistics. Longitudinal studies; nonresponse and missing-data methods; discrete data analysis; Bayesian methods; statistical genetics.

Christoph Lange, MS, PhD; Assistant Professor of Biostatistics. Statistical methods in genetics; generalized linear models; robust statistics; time series analysis.

Cheng Li, PhD; Assistant Professor of Biostatistics. Computational biology; genetic network modeling.

Yi Li, MS, MS, PhD; Assistant Professor of Biostatistics. Survival analysis; longitudinal and spatial data analysis.

Xiaole (Shirley) Liu, PhD; Assistant Professor of Biostatistics. Computational genomics, especially sequence analysis related to transcription and translation regulations.

Donna S. Neuberg, MA, MS, SD; Lecturer on Biostatistics. Cancer clinical trials; genetic epidemiology.

Marcello Pagano, SM, PhD; Professor of Statistical Computing. Statistical computing; clinical trials; epidemic modeling.

James M. Robins, MD; Mitchell L. and Robin LaFoley Dong Professor of Epidemiology. Analytic methods for drawing causal inferences from complex observational and randomized studies.

Andrea G. Rotnitzky, MA, PhD; Senior Lecturer on Biostatistics. Longitudinal data analysis; analysis of repeated categorical data and cluster correlated data.

Louise M. Ryan, PhD; Professor of Biostatistics. Rodent tumorigenicity experiments; teratology experiments; clinical trials; goodness-of-fit tests; survival analysis.

Mei-Chiung Shih, MS, PhD; Assistant Professor of Biostatistics. Statistical genetics and genetic epidemiology; longitudinal studies; group sequential designs.

Donna L. Spiegelman, SM, SD; Professor of Epidemiologic Methods. Binary data models with measurement error and misclassification in model covariates.

Kenneth E. Stanley, MA, PhD; Lecturer on Biostatistics. Estimating mortality attributable to tobacco in the presence of incomplete information.

Marcia A. Testa, MPH, MPhil, PhD; Senior Lecturer on Biostatistics. Evaluation of quality-of-life indexes in therapeutic clinical trials.

Florin Vaida, PhD; Assistant Professor of Biostatistics. Markov chain Monte Carlo; likelihood inference; nonparametric modeling; longitudinal data.

Molin Wang, ME, PhD; Assistant Professor of Biostatistics. Estimation of functions; nuisance parameters; stratified, sparse, and clustered data; measurement of error.

Wei Wang, MS, PhD; Assistant Professor of Biostatistics. Survival analysis; longitudinal and functional data analysis; semiparametric modeling.

James H. Ware, PhD; Frederick Mosteller Professor of Biostatistics and Dean for Academic Affairs. Design and analysis of longitudinal studies.

Lee-Jen Wei, PhD; Professor of Biostatistics. Design and analysis of clinical trials; repeated measurements analysis; survival analysis.

Milton C. Weinstein, AM, MPP, PhD; Henry J. Kaiser Professor of Health Policy and Management. Cost-effectiveness of health practices and technologies.

Paige L. Williams, BSPH, PhD; Lecturer on Biostatistics. Cancer risk assessment and other areas of environmental statistics.

Wing Hung Wong, MS, MS, PhD; Professor of Computational Biology. Bayesian computation; high-dimensional molecular biology and genetics.

Ronghui (Lily) Xu, MA, PhD; Assistant Professor of Biostatistics. Survival analysis, particularly in relation to proportional hazards models; goodness of fit.

Marvin Zelen, AM, PhD; Professor of Statistical Science and Member of the Faculty of Arts and Sciences. Theory and practice of clinical trials.

Secondary Appointments

(primary appointments at Harvard Medical School or Faculty of Arts and Sciences)

Roger B. Davis, MA; Associate Professor in the Department of Biostatistics. Design and analysis of clinical trials; recursive partitioning methods.

Dianne M. Finkelstein, AM, PhD; Associate Professor in the Department of Biostatistics. Carcinogenicity experiments; survival analysis.

Kimberlee Gauvreau, SM, SD; Assistant Professor in the Department of Biostatistics. Biostatistical issues in clinical studies in pediatric cardiology; institutional variability in outcomes after congenital heart disease surgery.

Richard D. Gelber, SM, PhD; Professor in the Department of Biostatistics. Design/ analysis of clinical trials.

Rebecca S. Gelman, PhD; Associate Professor in the Department of Biostatistics. Clinical trials; disease screening; survival methods.

Robert J. Glynn, MA, PhD, SM, SD; Associate Professor in the Department of Biostatistics. Analysis of longitudinal data; nonresponse in sample surveys.

Nicholas T. Lange, MS, SD; Associate Professor in the Department of Biostatistics. Statistical methodology for human and animal brain mapping.

Mei-Ling Ting Lee, MS, MA, PhD; Associate Professor in the Department of Biostatistics. Lifetime data analysis; categorical data analysis.

Jun Liu, PhD; Professor in the Department of Biostatistics. Genetics; computational biology; missing data; Bayesian methodology.

Sharon-Lise T. Normand, MSc, PhD; Professor in the Department of Biostatistics. Bayesian inference; graphical models; meta-analysis.

E. John Orav, PhD; Associate Professor in the Department of Biostatistics. Statistical computing and simulation; stochastic modeling; bioassay.

Bernard A. Rosner, MA, PhD; Professor in the Department of Biostatistics. Analysis of clustered binary data; longitudinal data analysis.

David A. Schoenfeld, MA, PhD; Professor in the Department of Biostatistics. Statistics in medical research; gene arrays; survival theory.

David Wypij, ScM, MS, PhD; Associate Professor in the Department of Biostatistics. Longitudinal data analysis; repeated measures and growth curve models.

Grace Wyshak, SM, PhD; Associate Professor in the Departments of Biostatistics and Population and International Health. Biostatistical/demographic methods.

Adjunct Faculty

Scarlett L. Bellamy, SM, SD. University of Pennsylvania School of Medicine.

Els Goetghebeur, MS, PhD. Ghent University, Belgium.

Cyrus R. Mehta, SM, PhD. Cytel Software Corporation.

Michael A. Stoto, PhD. Department of Epidemiology and Biostatistics, George Washington University.

> There is a rare combination of political will and financial support from the European Union. After I complete my studies, I want to be part of that effort.

TYLER LANE

Master's student, Department of Environmental Health

Tyler Lane has long been concerned about the environment and the impact of its degradation on human populations. Tyler combined a major in international relations with minors in environmental science and philosophy at the University of Virginia. Graduating in 1998, he went to Mauritania as a Peace Corps volunteer in the agricultural and forestry sector. "In Mauritania," he says, "so many public health issues—deforestation, pesticide exposures, nutrition—presented themselves firsthand."

In 2001 Tyler got a job with the Environmental Protection Agency as a chemical review manager. During his two-and-a-half years at EPA, Tyler was detailed for six months to the NAFTA Secretariat, harmonizing the pesticide regulatory activities of Mexico, Canada, and the United States. As a result of these experiences, Tyler realized that he wanted to move beyond regulatory work and needed a more technical background necessary to effect change.

Tyler decided to come to HSPH for a master's program in industrial hygiene, with a focus on hazardous substances. For his required internship, he plans to spend the summer and fall at the Institute for the Ecology of Industrial Areas in Katowice, Poland. Tyler feels that eastern Europe, where industrial contamination is high and regulation sparse, represents an extraordinary opportunity for environmental progress. "There is a rare combination of political will and financial support from the European Union," he says. "After I complete my studies, I want to be part of that effort."

DEPARTMENT OF ENVIRONMENTAL HEALTH

THE MISSION OF THE DEPARTMENT of Environmental Health is to advance the health of all people in the United States and around the world through research and training in environmental health. The department emphasizes the role of air, water, the built environment, and the workplace as critical determinants of health.

Faculty members in the department study the pathogenesis and prevention of environmentally produced illnesses and act as catalysts for scientifically based public health advances. Research approaches range from the molecular to the epidemiologic.

The Department of Environmental Health focuses on complex problems that require the contributions of many specialties. The department's faculty, research staff, and students reflect the multidisciplinary nature of the field and include chemists, engineers, epidemiologists, applied mathematicians, physicians, occupational health nurses, physiologists, cell biologists, molecular biologists, and microbiologists. Teaching and research activities of the department are carried out through four concentrations:

- exposure, epidemiology, and risk
- occupational health
- physiology
- population genetics

EXPOSURE, EPIDEMIOLOGY, AND RISK

The mission of the concentration in exposure, epidemiology, and risk is the investigation and mitigation of health risks associated with environmental and occupational hazards. The concentration addresses these environmental challenges to our society through an interdisciplinary approach. This involves the characterization of contaminant sources and environmental transport, identification of routes of exposure, investigation of health effects, and the employment of risk assessment and management strategies to minimize adverse outcomes.

Faculty members focus their research, and students acquire core competencies, in three domains:

- exposure, which emphasizes the chemical, physical, microbiological, and engineering aspects of environmental and occupational exposures. Faculty members study the transport and fate of environmental contaminants by measurement and modeling of ambient, indoor, and personal exposures to environmental and workplace contaminants. They also develop instruments and methods for collecting, analyzing, and assessing the effects of physical, chemical, and biological stressors.

- epidemiology, which focuses on identifying and measuring the influence of environmental factors (physical, chemical, and biologic) on human disease in communities to provide scientific evidence for sound environmental and health policies.

- risk assessment, involving the integration of evidence from exposure assessment, epidemiology, toxicology, and other disciplines to inform policy decisions in the presence of uncertainty. Faculty members are involved in research and training on analytic methods to quantify human health risks, with applications that include evaluations of new products, fuels, water supplies, technologies, remediation strategies, and development of policies to protect both ecological and human health.

In addition, students specialize in one or more of the areas of interest described below:

Environmental epidemiology This area is for students interested in measuring the influence of environmental factors (physical, chemical, and biologic) on human disease in communities to provide scientific evidence for sound environmental and health policies.

Environmental health management This area is geared toward midcareer professionals with interests in learning skills that can inform environmental policies in developing countries. Topics include environmental science, energy systems, epidemiology, risk assessment, resource management, and negotiation skills.

Ergonomics and safety This area provides a public health and engineering approach to the prevention of work-related injuries.

Exposure assessment This area of interest prepares students to identify and characterize human and ecological exposures to environmental contaminants, model fate and transport, and develop strategies to control environmental hazards, allergens, and pathogens.

Industrial hygiene This area of interest offers training in the anticipation, identification, evaluation, and control of occupational hazards.

Risk assessment This area provides an integrated education in environmental science, risk analysis, and decision science applied to environmental management.

Degree Programs in Exposure, Epidemiology, and Risk

The exposure, epidemiology, and risk concentration offers both 80-credit and 40-credit master of science (SM) programs in environmental health, including the 80-credit SM in industrial hygiene, as well as a program leading to the doctor of science (SD) degree.

All students must meet the school requirements for core knowledge in public health (for information about schoolwide requirements for master's and doctoral students, see page 58). In addition, both doctoral and master's students in this concentration take core courses in human physiology and toxicology, analytical chemistry and exposure assessment, environmental and occupational epidemiology, and risk assessment. Beyond the general core requirements, areas of interest have specific course requirements. Advanced courses in exposure, epidemiology, and risk are oriented toward specific pollutants or media (such as air, surface water, or groundwater). They may focus on monitoring, modeling, or the control of pollutants; health effects; or management, regulation, and policy.

Many students also take courses at MIT and at other Harvard schools, including the Kennedy School of Government and the Faculty of Arts and Sciences.

Master of Science in Environmental Health (80-credit and 40-credit programs)

Graduates of these professional programs assume positions in government, in private companies, or in research institutions. In the past few years some graduates have gone to work as scientists in environmental consulting firms, as industrial hygienists, or as academic and government researchers. Some are working for nonprofit community and international organizations, while others have gone on to pursue doctoral programs.

Applicants' personal statements should clearly state their preferred area of interest within the exposure, epidemiology, and risk concentration and the ways that the program will further their careers.

Applicants to the 80-credit program generally have undergraduate degrees and limited work experience. Consistent with the interdisciplinary nature of the concentration, a broad range of undergraduate or graduate degrees are acceptable. Among these are environmental science, physics, mathematics, biology, chemistry, engineering, geology, meteorology, and decision analysis. Applicants to the program are expected to have evidence of strong quantitative skills. Occasionally applicants with social science, business, or policy backgrounds are successful if they can demonstrate some academic background in math, chemistry, and biology. At times applicants are accepted conditional upon completing science and/or math courses.

Applicants with exceptional credentials (including postbaccalaureate degrees and/or professional experience) may request consideration for admission to a 40-credit SM program.

The exposure, epidemiology, and risk master's programs are based on a set of core courses in the first two semesters, followed by more specialized courses in the later semesters. Within these constraints students have some flexibility to change their focus within the program. Students enrolled in the 80-credit program in industrial hygiene follow the same general curriculum and may also elect a focus in hazardous substances, which involves several additional targeted courses and a related internship.

Doctor of Science in Environmental Health

Doctoral graduates are qualified for research and teaching positions in schools of public health and other academic institutions, in local and federal agencies, and in the private sector. Recent graduates have taken positions as junior faculty members; as research scientists with the Environmental Protection Agency, the National Institute for Occupational Safety and Health (NIOSH), the environmental division of Health Canada, and Taiwan's Institute of Occupational Health and Safety; and as staff scientists with the National Research Council, the Mexican Ministry of Health, and consulting organizations.

Applicants to the doctoral program normally have a master's degree in a related science or math field and strong scientific and quantitative skills. Admission into the doctoral program in all areas of interest depends upon demonstrated competence in the requirements for an SM program described above. Those applying to study industrial hygiene usually have several years of relevant work experience in addition to a master's degree.

Students interested in a research career in environmental epidemiology are encouraged to apply to the doctoral program in epidemiology with a minor in environmental health (see page 18).

Students with a strong interest in both environmental science and methodological aspects of the decision sciences are encouraged to apply to the environmental science and risk management area of interest for doctoral students. This program involves admission to both the Department of Environmental Health and the Department of Health Policy and Management and requires a double major. Students uncertain about whether their interests are better suited for the risk assessment area of the exposure, epidemiology, and risk concentration or the joint degree program should contact the concentration for clarification.

Doctoral candidates are provided training in teaching and oral presentation. They serve as teaching assistants and receive training, evaluations, and academic credit for this work. They are also expected to present their research in departmental seminars. During the course of their program, doctoral students are encouraged to present papers at scientific conferences.

Depending on the specialty area, doctoral students may be funded either fully or partially through research or training-grant fellowships. National Institutes of Health (NIH) traineeships are restricted to doctoral students who are U.S. citizens or permanent residents. For students specializing in industrial hygiene, tuition support may be available through a NIOSH Education and Research Center Grant for highly qualified U.S. citizens.

Related Programs

Interdisciplinary concentration in genetic and molecular epidemiology, see page 56.

Contact Information

For more information about research and training in environmental science and engineering, please contact the exposure, epidemiology, and risk concentration, HSPH Landmark Center, Box 15677, 401 Park Drive West, Boston, MA 02215.

Applicants to the doctoral program are strongly encouraged to arrange an interview with faculty members. Please contact Avis Stiller, academic coordinator, exposure, epidemiology, and risk concentration, at the address above.
Phone: 617-384-8822
Fax: 671-384-8728
Email: astiller@hsph.harvard.edu

OCCUPATIONAL HEALTH

This concentration is designed to train occupational health and safety professionals to recognize and prevent occupational disease and injuries. Faculty members carry out research spanning a wide range of occupational health problems, with the broad objective of identifying and contributing to the reduction or elimination of job-related health hazards. Research topics include respiratory disease among exposed populations (including construction, auto, textile, and agricultural workers, workers exposed to particles, and building occupants); reproductive and chronic disease studies of populations exposed to petrochemicals, heavy metals, and persistent organic compounds; biological and chemical hazards assessment; epidemiology of acute injury and cumulative trauma disorders; occupational and environmental cancers such as lung, skin, and bladder cancer; biomonitoring and medical surveillance; occupational and environmental health research and training in developing countries; and occupational health policy and services research. Faculty members have been in the forefront of the development of biochemical, molecular, and genetic markers and their applications in epidemiologic studies of exposed populations. Additional areas of interest within this concentration include environmental molecular epidemiology and occupational epidemiology.

Degree Programs in Occupational Health

The training programs in occupational health are offered through the NIOSH-sponsored Harvard Education and Research Center for Occupational Safety and Health. As described below, the following programs are offered: master of occupational health (MOH); master of science (SM) in primary health care nursing (from Simmons College) and dual-degree SM in environmental health and primary health care nursing (from HSPH, in cooperation with Simmons College); SM in environmental health with a focus on occupational safety and health; and doctor of science (SD) or doctor of public health (DPH). For information about schoolwide requirements for master's and doctoral degrees, see page 58.

Master of Occupational Health (40-credit program)

This professional program is designed to train physicians in the public health disciplines relevant to the prevention and control of occupational disease and injury. Physicians interested in occupational and environmental medicine may apply either to the MOH program or to the occupational and environmental health concentration of the master of public health (MPH) program. Either the MOH or the MPH is taken as the first year of a two-year Occupational and Environmental Medicine Residency (see below).

For the MOH (or the MPH) program, in addition to schoolwide requirements, students take core courses in toxicology, ergonomics and human factors, occupational safety, occupational health policy and administration, the work environment, occupational and environmental medicine, environmental and occupational epidemiology, and the practice of occupational health. Recommended electives include the analysis of rates and proportions, regression and analysis of variance in experimental research, and the ethical basis of the practice of public health.

Master of Science in Environmental Health (80-credit and 40-credit programs)

The occupational health concentration emphasizes the epidemiologic and biostatistical aspects of this field. The SM is normally an 80-credit program, although an individual with a PhD or JD may be admitted to a 40-credit program. It is generally expected that students without a prior doctoral degree will wish to enroll in a subsequent doctoral program.

This program provides training appropriate for those who wish to work in research or teaching environments. Applicants normally have a bachelor's degree and advanced training in science, including college-level organic and inorganic chemistry. Those currently holding positions in the field of occupational safety and health and planning to return to these positions are considered particularly strong candidates for admission.

In addition to schoolwide requirements, students take courses in toxicology, pathophysiology, ergonomics and human factors, occupational safety, occupational health policy and administration, the work environment, environmental and occupational epidemiology, the practice of occupational health, advanced biostatistics, and ethics.

Master of Science in Primary Health Care Nursing (40-credit program)

This program is offered by the Harvard Education and Research Center and Simmons College, which awards the degree. The program is designed for registered nurses seeking preparation as occupational health nurse practitioners.

Applicants must have at least a bachelor's degree in nursing from a program accredited by the National League of Nursing, must show satisfactory completion of basic statistics and physical assessment courses, and must be registered to practice nursing in a U.S. state or territory.

Participants undertake practica in industrial settings, clinics, and hospital-based occupational health programs and complete a course at HSPH in occupational health policy and administration and courses at Simmons College in normal and abnormal human physiology, research methods, the theory and practice of primary health care nursing, the theoretical foundations for nursing practice, clinical pharmacology for nurses in ambulatory care,

health in the workplace, health care systems, and health promotion.

Master of Science in Environmental Health (HSPH) and Primary Health Care Nursing (Simmons College) (dual-degree, 80-credit program)

This dual-degree professional program emphasizes identification of health hazards, workplace assessment, program planning and intervention, worker health promotion, and disease and injury prevention. The program integrates curricula from HSPH and Simmons College, with courses taken concurrently at these institutions.

The program focusing on occupational health nursing is also aimed at preparing nurses for positions as occupational health nurse practitioners. Practice locations include workplaces/corporations, clinics (including occupational and environmental medicine facilities), and hospitals.

Applicants must have at least a bachelor's degree in nursing from a program accredited by the National League of Nursing, must show satisfactory completion of a basic statistics course, and must be registered to practice nursing in a U.S. state or territory. Nurses interested in this program must apply to, be accepted by, and maintain satisfactory academic progress in both schools.

Students in this program must fulfill essentially the same course requirements at Simmons College as those enrolled in the master of science in primary health care nursing (see above). At HSPH, in addition to schoolwide requirements, students take courses covering ergonomics and human factors, the work environment, occupational safety, and environmental and occupational epidemiology; a tutorial in toxicology; and two electives. Students must also complete an independent study project.

Doctor of Science in Environmental Health/Doctor of Public Health

The SD or DPH degree may be earned by students who wish to concentrate in occupational health. Applicants to the DPH program must hold an MPH and a prior doctoral degree.

In addition to schoolwide requirements, students in the doctoral program complete many of the same courses as those in the SM program (see above) and also courses in exposure assessment for epidemiology, biomarkers in chronic disease, and advanced epidemiology.

Some financial support may be available for doctoral students who are U.S. citizens or permanent residents through NIH National Research Service Awards, NIOSH or other traineeships, or scholarships.

Occupational and Environmental Medicine Residency

The residency is a two-year program consisting of an academic year leading to the master of public health or master of occupational health degree and a practicum year devoted to the development of skills in clinical occupational and environmental medicine and epidemiologic research. During the practicum year acquired knowledge and skills are applied to patient management and workplace community problem solving; at least one short-term research project is designed, executed, and documented under faculty supervision. Field experience includes rotations through hospital- and community-based occupational and environmental health clinics. Additional rotation choices are available in corporate medical departments and governmental agencies. The residency is fully accredited by the Accreditation Council for Graduate Medical Education.

Applicants must be graduates of an approved school of medicine and must have completed at least one year of internship training in an accredited U.S. or Canadian clinical program; board eligibility or certification in a primary care specialty is preferred. Physicians currently holding positions in the field of occupational safety and health who plan to return to these positions are considered strong candidates for admission.

In addition to submitting an application to the degree program, prospective residents should send a letter of interest to the occupational health concentration, enclosing a curriculum vitae listing medical training and experience, research experience, and publications. Admission to the practicum year of the residency is a separate process from, and usually occurs shortly after, admission to the degree program. Applicants to the MOH program and the MPH program with a concentration in occupational and environmental health who are also applying to the Occupational and Environmental Medicine Residency program must apply by September 1, 2004, for 2005–06 matriculation. Continuation into the second year of the residency is contingent upon having had adequate prior clinical experience and exemplary performance in the didactic phase of the program.

COURSES OF INSTRUCTION

Please note that the courses listed are subject to change and some are not offered every year. Complete course descriptions are available at http://www.hsph.harvard. edu/registrar/courses.

Introduction to Environmental Health
Principles of Environmental Health
Human Physiology
Advanced Respiratory Physiology
Advanced Topics in Physiology
Occupational Health Policy and Administration
Introduction to Occupational and Environmental Medicine
Epidemiologic Basis of Occupational Health Standards
Occupational Safety and Injury Prevention
Ergonomics and Human Factors
Protecting Workers and Communities from Hazardous Substances
Ventilation and Indoor Air Quality
Evaluation and Control of Noise and Vibration
Introduction to Aerobiology
Water Pollution
Properties of Environmental Contaminants
Introduction to the Work Environment
Analytical Methodology and Exposure Assessment
Water Systems Management
Industrial Hygiene/Ergonomics Internship and Environmental Sciences Research Seminar
Exposure Assessment for Environmental and Occupational Epidemiology
Genetic Epidemiology and Gene-Mapping
Human Health and Global Environmental Change
Radiation Environment: Identification, Evaluation, and Control
Occupational Health Care Delivery
Injury Epidemiology and Prevention
Industrial Ecology and Life-Cycle Assessment
Research in Physiology
Properties and Behavior of Airborne Particles
Air Pollution and Energy Processes
Advanced Seminar in Aerobiology
Regulatory Toxicology
Environmental and Occupational Epidemiology
Respiratory Epidemiology
Advanced Regression for Environmental Epidemiology
Risk Assessment
Environmental Science and Risk Management Practicum
Independent Research, Tutorials

Some financial support for residency candidates who are U.S. citizens or permanent residents may be available through traineeships.

Related Offerings

Environmental/occupational epidemiology area of interest, Department of Epidemiology, see page 18.
MPH concentration in occupational and environmental health, see page 53.

Contact Information

For more information about the occupational health concentration, MOH program, training in occupational epidemiology, and related offerings, please contact David C. Christiani, MD, MPH, SM, Department of Environmental Health, 665 Huntington Avenue, Boston, MA 02115.
Phone: 617-432-1260
Fax: 617-432-3441
Email: dchristi@hsph.harvard.edu
Web: http://www.hsph.harvard.edu/erc

For more information about the Occupational and Environmental Medicine Residency, please contact Howard Hu, MD, SM, SD, Department of Environmental Health, 665 Huntington Avenue, Boston, MA 02115.
Phone: 617-432-2790
Fax: 617-432-0219
Email: howard.hu@channing.harvard. edu
Web: http://www.hsph.harvard.edu/erc

PHYSIOLOGY

The concentration in physiology focuses on normal and pathological functions of organisms. It centers on the respiratory system, which presents an immense thin-surface area to the environment, and thus is an important route of entry and site of damage from toxins and infections. Areas of research include biomechanical properties of cells/tissue in normal/inflamed lungs; smooth muscle and airway constriction in asthma; mediators and adhesion molecules involved in pulmonary inflammation; effects of inhaled particles; lung infections; control of breathing in humans; sleep-related breathing disorders; respiratory sensations; and epithelial cell, macrophage, lymphocyte, and neutrophil lung biology. The biology is broadly based, ranging from molecular and cell biology to integrated organismic, environmental, and comparative physiology.

The physiology concentration integrates a range of scientific disciplines, including physics, bioengineering, physiology, biomathematics, cell biology, molecular biology, proteomics and genomics, clinical science, and epidemiology. By working within this rich interdisciplinary environment, students learn many measurement technologies, discover a variety of disciplinary approaches, and develop mature scientific thinking.

Degree Programs in Physiology

As described below, the concentration in physiology leads either to the doctor of science (SD) degree, offered through the Department of Environmental Health, or to the doctor of philosophy (PhD) degree, offered through the Division of Biological Sciences.

Doctor of Science in Environmental Health

Students wishing to study cellular, integrative, or engineering approaches as they pertain to problems in the environment, physiology, or public health may apply directly to the SD program in the Department of Environmental Health.

The SD program prepares students for research careers in respiratory physiology, cell and molecular biology, or bioengineering. Graduates assume positions as faculty members and research scientists at medical schools, research institutes, and schools of public health. Career opportunities in physiology as they apply to public health are expected to grow both in academia and in the biotechnology and pharmaceutical industries.

Applicants to the program generally have a bachelor's degree and demonstrated competence in organic and biological chemistry, general biology, physics, and calculus. Students in this program follow a different curriculum from those in the PhD program. In consultation with their adviser, students design a program of course work with their specific objectives in mind. The program offers a firm foundation in the basic biomedical sciences, as well as in epidemiology and biostatistics, and provides the opportunity for students to engage in laboratory rotations. For information about schoolwide requirements for doctoral degrees, see page 58.

Most students admitted to the SD program receive a stipend, as well as tuition and health insurance support. Students are encouraged to apply for fellowships from outside sources since certain external fellowships provide higher stipends.

Doctor of Philosophy in Biological Sciences in Public Health (Physiology)

Students wishing to study cellular and molecular biology or physiology as it pertains to major problems in public health may apply to the PhD program offered by the Division of Biological Sciences through the Harvard University Graduate School of Arts and Sciences. The PhD program is designed to prepare students for research careers in respiratory physiology, cell and molecular biology, or bioengineering. For more information about the PhD program, see page 55.

Contact Information

For more information about research and training in physiology or about the SD program, please contact Jeffrey J. Fredberg, PhD, Department of Environmental Health, 665 Huntington Avenue, Boston, MA 02115.
Phone: 617-432-0198
Fax: 617-432-3468
Email: jfredber@hsph.harvard.edu

POPULATION GENETICS

The aim of the population genetics concentration is to consider the effects of genes, environmental risk factors, and the interaction of the two in the process for genetically complex diseases such as asthma, osteoporosis, diabetes, hypertension, nicotine addiction, and reproductive health.

Population genetics is a multidisciplinary field, combining various aspects of genetics, epidemiology, statistics, biology, medicine, and computer science; those who work in this field have equally diverse backgrounds. The concentration in population genetics is intended to provide candidates with ample training in all critical areas needed to carry on independent research in this field, including gene-mapping to identify the genetic loci and variants responsible for the genetic contribution to complex diseases; gene assessment to investigate the role of a particular (candidate) gene in disease pathogenesis; gene expression profiling to investigate the genes with differential expression in normal and disease tissues and in subtypes of diseases; analysis of gene-environmental interactions to investigate the relative contributions of genetic and environmental factors in disease manifestation; development of novel statistical methods and tools for genetic analysis; and development of databases and bioinformatics tools for data management and information extraction from public databases.

Investigators in the concentration are presently engaged in several large-scale studies of common, genetically complex human diseases. In addition, population genetics investigators collaborate closely on related studies in occupational health; exposure, epidemiology, and risk; and other programs in the Departments of Environmental Health, Epidemiology, Biostatistics, and Nutrition.

Degree Programs in Population Genetics

As described below, the concentration offers a doctor of science (SD) program. No master's degree programs are currently available.

Doctor of Science in Environmental Health

While the program aims to prepare every student for an academic career in research and teaching, graduates are well prepared for a variety of potential career paths. Opportunities for research careers in the private sector (for example, biotech and genetics/genomics companies) have increased greatly in recent years. Graduates have also found themselves to be highly sought by management consulting firms and other organizations requiring strong technical backgrounds and problem-solving skills.

Applicants to the SD program are required to have an undergraduate degree in any area of the natural sciences, and some research experience is desirable. Students from any branch of the life sciences are the most logical candidates, but the statistical foundations of population genetics make applicants with degrees in mathematics, physics, or chemistry highly competitive. Some familiarity with basic concepts of biology and genetics is recommended; the necessary fundamentals of biology, genetics, biochemistry, epidemiology, and medicine can be acquired through course work following acceptance. Highly motivated applicants from nonscientific fields may be accepted in exceptional circumstances.

In addition to the schoolwide requirements, doctoral students must complete 30 credits emphasizing population genetics, including elements of epidemiologic research, the design and analysis of case-control and cohort studies, the molecular epidemiology of cancer, studies in molecular epidemiology, human physiology, environmental and occupational epidemiology, exposure assessment for environmental and occupational epidemiology, modern genetic epidemiology and gene-mapping, the genetic basis of human disease, and molecular biology for epidemiologists. Students take an additional 10 credits from a list of electives. For information on schoolwide requirements for doctoral degrees, see page 58.

Some financial support for doctoral students may be available to U.S citizens and permanent residents.

Contact Information

For more information about research and training in population genetics, please contact Xiping Xu, MD, PhD, SM, Department of Environmental Health, 665 Huntington Avenue, Boston, MA 02115.
Phone: 617-432-2959
Fax: 617-432-2956
Email: xu@hsph.harvard.edu

DEPARTMENT FACULTY

Please note that some faculty members may be on leave during academic year 2004–05.

Department chair: Joseph D. Brain, SM, SM, SD; Cecil K. and Philip Drinker Professor of Environmental Physiology. Function and structure of pulmonary macrophages; deposition and clearance of inhaled particles and responses to them; respiratory infection.

Deborah H. Bennett, MS, PhD; Assistant Professor of Environmental Health and Risk Assessment. Fate and transport of persistent organic chemicals in a multimedia environment as related to environmental risk analysis.

James P. Butler, AM, PhD; Senior Lecturer on Physiology. Lung structure and function; parenchymal micromechanics; magnetic twisting cytometry; nemoendocrinology; avian physiology.

David C. Christiani, MD, SM, MPH; Professor of Occupational Medicine and Epidemiology. Occupational diseases; biomarkers and molecular epidemiology.

Philip Demokritou, MEng, PhD; Assistant Professor of Aerosol Physics. Development of human exposure measurement techniques; sources, transport, and the fate of air pollutants in the built environment.

Jack T. Dennerlein, SM, PhD; Assistant Professor of Ergonomics and Safety. Work-related chronic musculoskeletal disorders; design of human-machine interfaces.

Douglas W. Dockery, SM, SM, SD; Professor of Environmental Epidemiology. Epidemiologic studies of respiratory health effects of air pollution; environmental exposures and lifetime development of respiratory disease.

John S. Evans, SM, SM, SD; Senior Lecturer on Environmental Science. Assessment of human exposures to pollutants; evaluation of uncertainty; application of decision analysis; assessment of health risk from waste disposal and energy production.

Jeffrey J. Fredberg, SMME, ME, PhD; Professor of Bioengineering and Physiology. Identification of the mechanical basis of airway and lung parenchymal function at the levels of organ, tissue, cell, and protein.

Beatriz S. González-Flecha, MS, PhD; Assistant Professor of Molecular Biology and Environmental Health. Biochemistry of oxygen free radicals; oxidative stress in biological systems; mechanisms of oxidative damage in eukaryotic and prokaryotic cells.

Joseph J. Harrington, AM, PhD; Professor of Environmental Health Engineering. Water resources planning and quality management; environmental monitoring and control systems; applied statistics for modeling; management for tropical disease control.

Russ B. Hauser, MD, MPH, SD; Associate Professor of Occupational Health. Epidemiology of reproductive health in relation to occupational and environmental exposure to dioxins, pesticides, phthalates, and PCBs.

Robert F. Herrick, MS, SD; Senior Lecturer on Industrial Hygiene. Exposure-reactive aerosols; characterization of complex exposures; interaction of individuals with a source of exposure.

Howard Hu, MD, MPH, SM, SD; Professor of Occupational and Environmental Medicine. Epidemiology of metals toxicity using novel biological markers of dose and genetic susceptibility.

Karl T. Kelsey, MD, MOH; Professor of Cancer Biology and Environmental Health. Occupational and environ-

mental carcinogenesis, with emphasis on the study of workplace mutagen and carcinogen exposure.

Petros Koutrakis, MS, PhD; Professor of Environmental Sciences. Sampling and analysis of air pollutants; atmospheric, indoor air, and aerosol chemistry; application of multivariate techniques to source apportionment; acid rain; urban air pollution.

Francine Laden, MS, SD; Assistant Professor of Environmental Epidemiology. Environmental epidemiology of cancer and respiratory disease.

Jonathan I. Levy, SD; Assistant Professor of Environmental Health and Risk Assessment. Health effects of air pollution; public health benefits of energy conservation; methods for assessing environmental risks in developing countries.

Nancy C. Long Sieber, PhD. Lecturer on Physiology. Mechanisms of pulmonary inflammation, particularly interactions between lung infection and air pollution; transport of heavy metals from respiratory and gastrointestinal tracts.

Donald K. Milton, MD, MPH, DPH; Lecturer on Occupational and Environmental Health. Measurement of airborne endotoxin; epidemiology of acute and chronic responses to bioaerosol exposure.

Joseph P. Mizgerd, SD; Associate Professor of Physiology and Cell Biology. Physiology of inflammation, particularly the molecular mechanisms regulating the emigration of neutrophils.

Richard R. Monson, MD, SM, SD; Professor of Epidemiology and Associate Dean for Professional Education. Relationship between the workplace, the environment, and disease.

Heather H. Nelson, MPH, PhD; Assistant Professor of Environmental Epidemiology. Cancer susceptibility and etiology, with particular emphasis on gene-environment interaction and the genetic epidemiology of somatically acquired changes in malignant disease.

Melissa Perry, ScD, MHS; Assistant Professor of Occupational Epidemiology. Occupational injury epidemiology and prevention, especially methods to collect risk-factor information for interventions to reduce injury morbidity and mortality in high-risk industries.

Stephen N. Rudnick, MS, SM, SD; Lecturer on Industrial Hygiene Engineering. Engineering control of particulate air contaminants in indoor and occupational settings and engineering control systems; sampling and analysis of air contaminants.

Joel D. Schwartz, PhD; Associate Professor of Environmental Epidemiology. Environmental epidemiology; natural history of lung function and disease; cost-benefit analysis; nonclassical time series analysis; nonparametric smoothing and graphical methods.

Jacob Shapiro, SM, PhD; Lecturer on Biophysics. Occupational and environmental radiation protection; low-level radioactive waste disposal; radiation dosimetry and protection standards; environmental radiation surveillance.

James P. Shine, PhD; Assistant Professor of Aquatic Chemistry. Distribution, fate, and effects of contaminants in aquatic ecosystems; influence of environmental variables on routes of exposure to toxic substances.

Stephanie A. Shore, PhD; Senior Lecturer on Physiology. Airway physiology and pharmacology; role of neuropeptides in the pathogenesis of airway disease.

Thomas J. Smith, MPH, MS, PhD; Professor of Industrial Hygiene. Evaluation of exposure-response relationships through occupational epidemiologic studies; application of pharmacokinetic modeling to exposure-tissue dose relationships.

Frank E. Speizer, MD; Professor of Environmental Science. Environmental epidemiology; pulmonary diseases; cancer and nutrition; health effects of air pollution; occupational and environmental medicine.

John D. Spengler, PhD, SM; Akira Yamaguchi Professor of Environmental Health and Human Habitation. Personal monitoring, air pollution health effects, and indoor air pollution; effects of ventilation rates, building materials, allergens.

Helen H. Suh, SM, SD; Associate Professor of Environmental Chemistry and Exposure Assessment. Multimedia exposure assessment; exposure modeling; ambient and indoor air pollution; study design.

Daniel Tschumperlin, MS, PhD; Assistant Professor of Bioengineering and Airway Biology. Remodeling of the airway biology wall and its implications in asthma; transduction of physical forces at a cellular and molecular level.

Ning Wang, MS, SD; Associate Professor of Physiology and Cell Biology. Cytoskeletal mechanics; mechanochemical signal transduction; cell adhesion and migration; cancer metastasis; effects of mechanical forces on cells.

Xin Xu, MD, PhD; Assistant Professor of Genetic Epidemiology. Genetic epidemiology of complex traits in humans, with specific reference to asthma and hypertension; statistical methods and tools; bioinformatics.

Xiping Xu, MD, PhD, SM; Associate Professor of Occupational Epidemiology. Environmental, occupational, and genetic epidemiology of respiratory, cardiovascular, and metabolic diseases.

Secondary Appointments

(primary appointments at Harvard Medical School)

Robert B. Banzett, PhD; Associate Professor in the Department of Environmental Health. Respiratory neurophysiology and mechanics; perceived sensation; control; interaction with locomotion; fluid dynamics in the avian lung.

David C. Bellinger, PhD, MSc; Professor in the Department of Environmental Health. Developmental impact of early metabolic and chemical insults to the nervous system; neuropsychological toxicology.

Jeffrey M. Drazen, MD; Professor in the Department of Environmental Health. Pulmonary and respiratory pharmacology; mediators of immediate hypersensitivity; mucus regulation and expression in chronic bronchitis.

John J. Godleski, MD; Associate Professor in the Department of Environmental Health. Experimental models of normal and pathologic responses to inhaled particles.

Diane R. Gold, MD, MPH; Associate Professor in the Department of Environmental Health. Acute lower-respiratory illness in childhood as a predictor of lung function and chronic respiratory symptoms; air pollution and childhood respiratory morbidity.

Rose H. Goldman, MD, MPH, SM; Associate Professor in the Department of Environmental Health. Occupational health in the biotechnology industry; metal poisoning; neurotoxicity; cumulative trauma injuries.

Stefanos N. Kales, MD, MPH; Assistant Professor in the Department of Environmental Health. Occupational and environmental lung disease; occupational/environmental toxicology.

Jeffrey N. Katz, SM, MD; Associate Professor in the Departments of Environmental Health and Health Policy and Management. Clinical policy relating to noninflammatory musculoskeletal conditions; health policy questions; back pain and upper-extremity disorders.

Lester Kobzik, MD; Associate Professor in the Department of Environmental Health. Lung macrophage phagocytosis and response to inhaled particles; pulmonary inflammation and pathology.

Stephen H. Loring, BMS, MD; Associate Professor in the Department of Environmental Health. Chest-wall mechanics, hyperinflation, and lung transplantation; mechanics and physiology of respiratory muscles and the pleural space.

Edward A. Nardell, MD; Associate Professor in the Departments of Environmental Health and Immunology and Infectious Diseases. Airborne transmission and infection control of *Mycobacterium tuberculosis;* air disinfection with ultraviolet irradiation.

Steven Shapiro, MD; Professor in the Department of Environmental Health. Metalloproteinases in the pathogenesis of lung diseases and the role of neutrophil elastase in smoking-related emphysema.

Eric Silverman, MD; Assistant Professor in the Department of Environmental Health. Gene regulatory mechanisms and gene sequence variability as it effects the pathogenesis of asthma and other pulmonary diseases.

George P. Topulos, MD; Assistant Professor in the Department of Environmental Health. Pulmonary micromechanics and pulmonary circulation.

Richard Verrier, PhD; Associate Professor in the Department of Environmental Health. Neural triggers of sudden cardiac death; cardiac electrophysiology; T-wave alternans; coronary hemodynamic function; novel delivery systems for anti-arrhythmic therapy.

Scott T. Weiss, MD, SM; Professor in the Department of Environmental Health. Natural history of chronic lung disease; epidemiology of asthma and hypertension; cardiovascular, occupational, environmental, and genetic epidemiology.

Robert O. Wright, MD, MPH; Assistant Professor in the Department of Environmental Health. Pediatric environmental health; gene-environmental interactions and psychosocial factors as modifiers of chemical neurotoxicants.

Adjunct Faculty

Harriet A. Burge, MA, PhD. Environmental Microbiology Laboratory.

Allard E. Dembe, MA, DS. University of Massachusetts Medical School.

Ellen A. Eisen, SM, SM, SD. University of Massachusetts, Lowell.

Alan Eschenroeder, BME, PhD. Consultant.

Timothy E. Ford, PhD. Montana State University.

Philippe Grandjean, MD, DMSc. Odense University, Denmark.

Steven R. Hanna, MS, PhD. School of Computational Sciences, George Mason University.

Robert B. Pojasek, PhD. Cambridge Environmental, Inc.

David H. Wegman, MD, SM. Department of Work Environment, University of Massachusetts, Lowell.

"My work is at the crossroads of many disciplines—molecular biology, mathematical modeling, epidemiology. I like the fact that in order to solve the next problem I may have to learn something completely new."

THEODORE COHEN
Doctoral student, Department of Epidemiology

A neuroscience major at Oberlin College, Ted Cohen originally thought he wanted to become a bench scientist. A year in a lab investigating how snakes learn may have helped to cure him of that notion, and he decided to go to medical school instead.

The curriculum at Duke University Medical School allowed Ted to pursue an MPH degree at the University of North Carolina during his third year. There he became interested in public health, especially infectious disease epidemiology. "Public health had a lot of appeal intuitively—it seemed a perfect blend of the things I liked best about research and medicine. The policy implications were immediate," he says.

Ted came to Boston intending to do a residency in internal medicine at Brigham and Women's Hospital. In a few months, however, he found his way to HSPH, initially as Dr. Megan Murray's postdoc and now as a doctoral student. Drawing on data from Russia, South Africa, and U.S. homeless shelters, Ted is investigating TB, which he describes as "one of the longest studied but least understood diseases." He has also done some research on the epidemiology of SARS.

He says, "My work is at the crossroads of many disciplines—molecular biology, mathematical modeling, epidemiology. I like the fact that in order to solve the next problem I may have to learn something completely new."

DEPARTMENT OF EPIDEMIOLOGY

EPIDEMIOLOGY—THE STUDY OF the frequency, distribution, and determinants of disease in humans—is a fundamental science of public health. Epidemiologists use many approaches, but the ultimate aim of epidemiologic research is the prevention or effective control of human disease.

The Department of Epidemiology has a long tradition of teaching and research in the epidemiology of cancer, cardiovascular disease, and other chronic diseases, as well as in epidemiologic methodology. Current research in the department includes the role of viruses in the etiology of cancer; the connection between diet and risk of cancer, cardiovascular disease, and other major chronic diseases; the relationship between exposure to chemicals in the workplace and the development of cancer; the epidemiology of infectious disease; factors in early life predisposing individuals to chronic diseases; case identification and risk factors in mental disorders; health effects of drugs, vaccines, and medical devices; and causes of human infertility.

Degree Programs in Epidemiology

As described below, the department offers both 80-credit and 40-credit master of science (SM) programs, as well as a doctor of science (SD) and doctor of public health (DPH) program. For information about schoolwide requirements for master's and doctoral programs, see page 58.

Students in all degree programs choose from among fourteen areas of interest:

Cancer epidemiology In addition to research methodology, the curriculum in this area includes courses on the biology and genetics of cancer; the basic concepts and issues of cancer epidemiology; the roles of diet, oncogenic viruses, and occupational exposures in the etiology of cancer; the integration of biomarkers into research; the prevention of cancer; and research methods. Research opportunities for students include a large number of ongoing cohort and case-control studies within the department and in conjunction with the Dana-Farber/ Harvard Comprehensive Cancer Center.

Cancer prevention This area provides students with knowledge of the science of cancer prevention, expertise in a specialized research area, skill in policy analysis, and an introduction to professional networks. Social and behavioral scientists prepare to advance alternative strategies for inducing behavioral change at the individual, institutional, community, or policy levels. Physicians prepare for careers as clinical investigators or public health practitioners specializing in cancer prevention. The program combines the interdisciplinary resources of the Harvard Center for Cancer Prevention and the Division of Cancer Epidemiology and Control in the Dana-Farber Cancer Institute.

Cardiovascular epidemiology This area provides training in research methodology and the epidemiology of cardiovascular diseases. Doctoral students conduct research in a substantive or methodological area related to cardiovascular epidemiology.

Clinical epidemiology This area is designed primarily for clinicians and other health care professionals who wish to develop the quantitative and analytic skills needed for clinical research. Students take core courses in epidemiology and biostatistics to develop basic skills in study design and analysis that will allow them to examine clinical questions related to the diagnosis and treatment of disease. Additional courses in epidemiology and courses offered by other departments address related topics such as health status and quality-of-life measurement, decision analysis, cost-effectiveness analysis, health services research, and quality improvement of health care.

While the appropriate content for this area may be covered by taking courses offered during the regular academic year (fall and spring semesters), requirements for the 40-credit SM degree in epidemiology may also be partially fulfilled by taking the summer courses offered through the Summer Program in Clinical Effectiveness. Students begin their program by taking a core set of clinical effectiveness courses during an initial summer period. They complete the SM program by taking advanced courses during the regular academic year and, if desired, during a second summer period. Alternatively clinical effectiveness students who only take courses during two summer periods can satisfy the requirements for the SM degree by completing a supervised research project. The content of this project typically entails the design and implementation of a clinical study, the analysis of the resulting data, and the creation of a manu-

COURSES OF INSTRUCTION

Please note that the courses listed are subject to change and some are not offered every year. Complete course descriptions are available at http://www.hsph.harvard.edu/registrar/courses.

Principles of Epidemiology
Introduction to Epidemiology
Elements of Epidemiologic Research
Design of Cohort and Case-Control Studies
Analysis of Case-Control and Cohort Studies
Practice of Epidemiology
Advanced Epidemiologic Methods
Introduction to Clinical Epidemiology
Epidemiology of Cancer
Epidemiologic Analysis of Outbreaks and Infectious Diseases
Epidemiology in Public Health Practice
Epidemiology of Adult Psychiatric Disorders
Assessment Concepts and Methods in Psychiatric Epidemiology
Psychiatric Diagnosis in Clinic and Community Populations
Genetic Epidemiology of Diabetes and Its Complications
Cardiovascular Epidemiology
Cancer Prevention
Oral Epidemiology
Ophthalmic Epidemiology
Research Synthesis and Meta-Analysis
Epidemiologic Methods in Health Services Research
Analytical Aspects of Clinical Epidemiology
Use of Biomarkers in Epidemiologic Research
Measuring Health Status
Seminar in Applied Research in Clinical Epidemiology
Genetic Epidemiologic Methods for Psychiatric and Other Disorders
Epidemiologic Methods Development—Past and Present
Molecular Biology for Epidemiologists
Molecular Epidemiology of Chronic Diseases
Studies in Molecular Epidemiology
Infections and Cancer
Epidemiology of Aging
Epidemiology of HIV Infection, I: Etiology, Natural History, and Transmission
Epidemiology of HIV Infection, II: Therapeutic and Prevention Interventions
Advanced Seminar in Cancer Epidemiology
Mathematical Modeling of Infectious Diseases
Epidemiologic Research in Obstetrics and Gynecology
Advanced Reproductive Epidemiology
Propensity Score Analysis: Theoretical and Practical Considerations
Pharmacoepidemiology—Introduction and Advanced
Epidemiology of Neurologic Diseases
Infectious Disease Dynamics
Epidemiology of Reproductive Morbidity Due to Trauma, Stress, and Psychological Health
Data Mining and Prediction
Causal Inference and Study Design in Epidemiologic Research
Research in Clinical Epidemiology
Oral Health Policy Research Seminar
Epidemiologic Investigation of Social and Environmental Risks for Psychiatric Disorders
Implementing Prevention
Inference in Infectious Disease Epidemiology
Independent Study, Tutorials

script of quality suitable for publication. An outline for this project must be submitted at time of application.

Environmental/occupational epidemiology This area is closely associated with the concentrations in exposure, epidemiology, and risk and in occupational health in the Department of Environmental Health. Students take courses in epidemiology, environmental health, occupational health, biostatistics, and toxicology. Doctoral students conduct research in a substantive or methodologic area related to environmental or occupational health.

Epidemiologic methods This area provides training in the development and application of new methods in epidemiologic research. Students learn to use and justify classical epidemiologic methods in study design, data analysis, and interpretation of results. Students also receive training in biostatistical areas most relevant to epidemiologic research. Recent innovations in epidemiologic methodology are introduced through advanced courses and tutorials. Doctoral students conduct research with faculty members in the development of new methodologies and in novel applications of existing methodologies. Those enrolling in this area of interest ordinarily have completed four semesters of college calculus and one semester of linear algebra.

Epidemiology of aging This area is geared toward those interested in the diseases and conditions, as well as research methods, specific to older populations. Social and cultural aspects of health in older persons are also covered. Core courses focus on the epidemiologic aspects of the study of aging and include topics in biology, statistics, and other relevant fields. Numerous research opportunities on a wide range of issues, including neurologic diseases, osteoporosis, incontinence, and others, are available in the Department of Epidemiology, as well as the Department of Nutrition, Channing Laboratory, the Division of Preventive Medicine at Brigham and Women's Hospital, and Hebrew Rehabilitation Center for the Aged.

Infectious diseases This area is designed to familiarize students with the epidemiology and biology necessary to understand the interactions of infectious agents, their hosts, and their vectors. Social and cultural aspects of infectious diseases and of related health services are covered, as are new and resurgent infectious diseases. Students in this area take courses in the Departments of Epidemiology, Immunology and Infectious Diseases, and Population and International Health. More advanced topics of infectious disease epidemiology are covered in tutorials with faculty members focusing on this area.

Molecular/genetic epidemiology This area introduces students to the application of molecular and genetic methods in epidemiology. These methods may be useful as measures of exposure, disease susceptibility, or disease outcome. Training encompasses family-based association methods, gene-mapping to identify the chromosomal localization of genes associated with disease, and fine mapping and identification of these genes. Population-based studies correlate variation in genes with disease risk and prognosis and assess gene-environment interactions. Relevant courses explore the genetic epidemiology of complex diseases, including cancer, cardiovascular disease, diabetes, psychiatric illnesses, Alzheimer's disease, and asthma, as well as individual variation in drug response (pharmacogenomics). Students can collaborate with the Department of Environmental Health (including the concentration in population genetics), the Channing Laboratory, Dana-Farber Cancer Institute, and other research groups.

Nutritional epidemiology Through courses in the Departments of Epidemiology and Nutrition, students in this area learn methods of nutritional assessment and their related strengths and weaknesses. Students also receive advanced training in the nutritional determinants of disease and in methods for analysis specific to research in nutritional epidemiology. Students can conduct research within several large prospective ongoing studies at HSPH and Harvard Medical School, including an examination of dietary factors in

relation to cardiovascular disease, cancer, and other chronic diseases; a study of the interactions between nutritional and genetic determinants of disease; and the assessment of nutritional supplementation in relation to infectious agents and malnutrition.

Oral and dental health epidemiology This area prepares dentists and others interested in oral diseases for research and teaching careers in epidemiology with an emphasis on oral epidemiology and dental health. A new focus area is the links between oral conditions, nutrition, and systemic diseases such as coronary heart disease, stroke, diabetes, and adverse pregnancy outcomes. Students can participate in field research activities; epidemiologic studies of oral health; or clinical trials designed to test preventive, diagnostic, or therapeutic interventions. This area of interest is jointly administered by the Department of Oral Health Policy and Epidemiology in the Harvard School of Dental Medicine and the HSPH Department of Epidemiology.

Pharmacoepidemiology This area focuses on the determinants of both unintended and expected effects of drugs, vaccines, and medical devices. Patterns of utilization of drugs, vaccines, and devices, cost-benefit and risk-benefit analyses, and investigation of the distribution of diseases possibly amenable to medical intervention represent important secondary themes. The Department of Epidemiology offers courses in pharmacoepidemiology and a variety of ongoing research projects. Relevant courses elsewhere in the school cover such areas as clinical trials, meta-analysis, drug regulatory affairs, decision analysis, and health services research. Students in pharmacoepidemiology have the opportunity to attend courses and congresses outside the school and are encouraged to undertake internships in regulatory agencies or pharmaceutical and biotechnology companies. Students ordinarily have a prior degree in medicine or pharmacy. Others are expected to acquire substantially equivalent expertise in areas related to their research.

Psychiatric epidemiology This area introduces students to concepts and methods for studying the genetic and psychosocial factors that relate to the prevalence, incidence, and outcome of different types of psychiatric illnesses. Emphasis is given to issues of reliability and validity in studying such disorders among children, adolescents, and adults. The curriculum consists of six specialized courses, as well as related courses offered in the Departments of Epidemiology, Biostatistics, and Society, Human Development, and Health.

Reproductive epidemiology In addition to unique methodological issues, this area encompasses clinical, environmental, cancer, and infectious disease epidemiology. Reproductive epidemiologists choose as their interest the broad topic of the determinants and consequences of reproduction, including women's health and male infertility. Students can explore menarche, the menstrual cycle, infertility, conception, and pregnancy as endpoints or as factors influencing disease outcomes. The Obstetrics and Gynecology Epidemiology Center, based at Brigham and Women's Hospital, offers the opportunity to gain experience in data collection and analysis of large-scale population- and clinical-based epidemiologic studies. Students may collaborate with faculty members at HSPH and Harvard Medical School and also have the opportunity to pursue gynecological and reproductive health research at the many resources available in the area, including the Channing Laboratory, Harvard Pilgrim Health Care, and the Division of Preventive Medicine at Brigham and Women's Hospital. Students are encouraged and given guidance on how to submit their own research proposals for private or federal funding.

Master of Science in Epidemiology (80-credit and 40-credit programs)

The master's programs provide students with basic skills in epidemiologic and quantitative methods and in computing, in preparation for research or academic careers. Graduates have taken positions as researchers in university and hospital settings and as epidemiologists for public health agencies and private companies.

The 80-credit SM program is designed for individuals who hold a bachelor's degree and have a strong background in biology and mathematics. The 40-credit program is open to applicants with a medical degree or master's-level background in biology.

Required courses for the 80-credit and 40-credit programs are the same and include schoolwide requirements, elements of epidemiologic research, the design and analysis of case-control and cohort studies, and the analysis of rates and proportions.

In addition to epidemiology and statistics courses, students in the 80-credit program study the basic medical sciences and the biological aspects of public health problems. The program is primarily intended for students who expect to continue toward a doctoral degree. Recommended courses cover human physiology and the pathophysiology of human disease, regression and analysis of variance in experimental research and applied regression for clinical research, introductory cancer biology, principles of toxicology, and the practice of quantitative methods.

In the 40-credit program remaining courses reflect areas of special interest and may include supervised research.

Doctor of Science in Epidemiology/ Doctor of Public Health

The doctoral programs are designed for students who plan careers in epidemiologic research or teaching or for those who aspire to leadership roles in the health professions. Recent graduates are working in major universities, medical schools, and research institutes. They also serve as epidemiologists for the National Cancer Institute, Centers for Disease Control and Prevention, other domestic and international governmental institutions, and private industry.

Applicants to the SD program should hold at least a bachelor's degree and have a strong background in biology and mathematics. For these individuals the degree generally takes four to five years to complete; candidates with relevant doctoral degrees may complete the program in three years. The DPH degree is available to students holding a prior doctorate and an MPH degree.

Normally most of the first two years is devoted to course work. Course requirements are the same as for the SM program, with the addition of courses on the practice of epidemiology, advanced epidemiologic methods, and principles of screening; and for nonphysicians, human physiology and the pathophysiology of human disease. Ten credits are also required in substantive courses offered by the department. Of the two minors required for the degree, one must be in advanced biostatistics.

Funding may be available for U.S. citizens or permanent residents enrolled in the doctoral program or a postdoctoral fellowship program; depending on the specialty area, funding sources include the National Cancer Institute and the National Institute of Mental Health. For U.S. citizens and permanent residents interested in cardiovascular disease or aging, research traineeships may be available through Harvard Medical School. The National Institute of Aging also offers research traineeships for doctoral students, postdoctoral fellows, and physicians engaged in postdoctoral training.

Related Offerings

Exposure, epidemiology, and risk and occupational health concentrations, Department of Environmental Health, see pages 9 and 11.
Interdisciplinary concentration in genetic and molecular epidemiology, see page 56.
Interdisciplinary concentration in the epidemiology of infectious disease, see page 56.
Interdisciplinary concentration in women, gender, and health, see page 56.
Summer Program in Clinical Effectiveness, see page 57.

Contact Information

For more information about research and training in epidemiology, please contact Coordinator of Academic Services, Department of Epidemiology, 677 Huntington Avenue, Boston, MA 02115.
Phone: 617-432-1055
Fax: 617-566-7805
Web: http://www.hsph.harvard.edu/Academics/epidem/index.html

DEPARTMENT FACULTY

Please note that some faculty members may be on leave during academic year 2004–05.

Department chair: Meir J. Stampfer, MD, MPH, DPH; Professor of Nutrition and Epidemiology. Influence of diet and exogenous hormones on health, particularly heart disease and cancer.

Alberto Ascherio, MD, MPH, DPH; Associate Professor of Nutrition and Epidemiology. Relation of dietary factors to the occurrence of human disease.

Lisa F. Berkman, MS, PhD; Thomas D. Cabot Professor of Public Policy. Social epidemiology; epidemiology of aging.

Stephen L. Buka, SM, SM, SD; Associate Professor of Society, Human Development, and Health and of Epidemiology. Causes and prevention of behavioral and developmental disorders of children.

Kin-Wei Arnold Chan, MD, MPH, SD; Associate Professor of Epidemiology. Pharmacoepidemiology.

David C. Christiani, MD, SM, MPH; Professor of Occupational Medicine and Epidemiology. Occupational diseases; biomarkers and molecular epidemiology.

E. Francis Cook, MA, SM, SD; Professor of Epidemiology. Epidemiologic methods; clinical epidemiology.

Douglas W. Dockery, SM, SM, SD; Professor of Environmental Epidemiology. Epidemiologic studies of respiratory health effects of air pollution; environmental exposures and lifetime development of respiratory disease.

Wafaie W. Fawzi, MB, BS, MPH, SM, DPH; Associate Professor of Nutrition and Epidemiology. Etiologies of infectious diseases and perinatal conditions with emphasis on dietary and nutritional causes; relationships of dietary factors to disease in pregnancy and childhood.

Edward L. Giovannucci, MD, MPH, SD; Professor of Nutrition and Epidemiology. Etiologies of cancer with emphasis on dietary causes; methodologies to measure dietary factors in epidemiologic studies.

Susan E. Hankinson, MS, MPH, SD; Associate Professor of Epidemiology. Relationships between hormonal factors and risk of breast and ovarian cancers.

Miguel A. Hernán, MD, MPH, MS, DrPH; Assistant Professor of Epidemiology. Epidemiologic methods; neuroepidemiology; HIV/AIDS.

Frank B. Hu, MD, MPH, PhD; Associate Professor of Nutrition and Epidemiology. Diet and physical activity in relation to cardiovascular disease and type-2 diabetes; role of diet and lifestyle in preventing macrovascular complications in diabetics.

David J. Hunter, MB, BS, MPH, SD; Professor of Epidemiology and Nutrition. Cancer epidemiology; molecular and genetic epidemiology.

Peter Kraft, MA, MS, PhD; Assistant Professor of Epidemiology. Genetic epidemiology of complex disease; survival analysis.

Frederick P. Li, MD, MA; Professor of Clinical Cancer Epidemiology. Inherited susceptibility to cancer; clinical and molecular epidemiology.

Marc Lipsitch, DPhil; Assistant Professor of Epidemiology. Theoretical, statistical, and experimental approaches to population biology and the epidemiology of infectious diseases.

Giancarlo Logroscino, MD, PhD; Associate Professor of Epidemiology. Neurodegenerative diseases epidemiology, including Alzheimer's disease, Parkinson's

disease, amyotrophic lateral sclerosis, and epilepsy; epidemiologic methods; genetic epidemiology; idiopathic dystonias.

Dominique S. Michaud, SD; Assistant Professor of Epidemiology. Modifiable and inherent risk factors of bladder and pancreatic cancers; insulin resistance and inflammation in relation to cancer etiology.

Richard R. Monson, MD, SM, SD; Professor of Epidemiology and Associate Dean for Professional Education. Relationship between the workplace, the environment, and disease.

Nancy E. Mueller, SM, SD; Professor of Epidemiology. The role of viruses in the etiology of cancer; cancer epidemiology.

Megan Murray, MD, MPH, SD; Assistant Professor of Epidemiology. Use and evolution of molecular markers in tuberculosis; transmission dynamics of infectious diseases; study of vaccine effects.

Eric B. Rimm, SD; Associate Professor of Epidemiology and Nutrition. Relation of dietary factors to the occurrence of human diseases, in particular cardiovascular disease.

James M. Robins, MD; Mitchell L. and Robin LaFoley Dong Professor of Epidemiology. Development of analytic methods for drawing causal inferences from complex observational and randomized studies with time-varying exposures or treatments.

Joel D. Schwartz, PhD; Associate Professor of Environmental Epidemiology. Environmental epidemiology; natural history of lung function and disease; cost-benefit analysis; nonclassical time series analysis; nonparametric smoothing and graphical methods.

George R. Seage III, MPH, DSc; Associate Professor of Epidemiology. HIV epidemiology; determining the clinical outcomes of HIV patients.

Stephanie A. Smith-Warner, MS, PhD; Assistant Professor of Nutritional Epidemiology. Examination of dietary factors in relation to cancer risk; evaluation of dietary assessment methods.

Donna L. Spiegelman, SM, SD; Professor of Epidemiologic Methods. Binary data models with measurement error and misclassification in model covariates.

Dimitrios V. Trichopoulos, MD, SM; Vincent L. Gregory Professor of Cancer Prevention. Cancer epidemiology.

Walter C. Willett, MD, MPH, DPH; Fredrick John Stare Professor of Epidemiology and Nutrition. Relation of dietary factors to the occurrence of human disease, in particular heart disease and cancer.

Xiping Xu, MD, PhD, SM; Associate Professor of Occupational Epidemiology. Environmental, occupational, and genetic epidemiology of respiratory, cardiovascular, and metabolic diseases.

Secondary Appointments

(primary appointments at Harvard Medical School or Harvard School of Dental Medicine)

Deborah Blacker, MD, SD; Associate Professor in the Department of Epidemiology. Genetic epidemiology and early recognition of Alzheimer's disease and other neuropsychiatric disorders; genetic association analysis.

Julie Buring, MS, SD; Professor in the Department of Epidemiology. Epidemiology of chronic disease, primarily cardiovascular disease and cancer; epidemiologic methodology, especially clinical trials.

Carlos A. Camargo, Jr., MPH, MD, DPH; Associate Professor in the Department of Epidemiology. Asthma/COPD; emergency medicine.

Graham A. Colditz, MB, BS, MPH, DPH; Professor in the Department of Epidemiology. Cancer epidemiology; diet, activity, and chronic diseases.

Gary C. Curhan, MD, SM, SD; Associate Professor in the Department of Epidemiology. Nephrolithiasis risk factors and prevention; analgesic nephropathy; hypertension risk factors and prevention; hypertensive disorders of pregnancy; interstitial cystitis.

Immaculata DeVivo, MPH, PhD; Assistant Professor in the Department of Epidemiology. Etiology of cancer, specifically the relationship between genetic variation and disease risk for future prevention.

Chester W. Douglass, DMD, MPH, PhD; Professor in the Department of Epidemiology. Oral epidemiology and health policy.

Stephen V. Faraone, MA, PhD; Professor in the Department of Epidemiology. Etiology of attention deficit hyperactivity disorder, juvenile bipolar disorder, and schizophrenia; psychiatric epidemiology and genetic studies.

Francine Grodstein, SD; Associate Professor in the Department of Epidemiology. Aging; health effects of exogenous hormones; risk factors for Alzheimer's disease.

Bernard L. Harlow, MPH, PhD; Associate Professor in the Department of Epidemiology. Survey research methods; risk factors associated with borderline and malignant ovarian tumors; epidemiologic indicators for adverse obstetrical outcomes.

Catherine Hayes, DMD, SM, DMSc; Assistant Professor in the Department of Epidemiology. Epidemiology of craniofacial anomalies; outcomes research in the area of periodontal disease.

Kaumudi J. Joshipura, SM, SD; Associate Professor in the Department of Epidemiology. Oral epidemiology.

I-Min Lee, MB, BS, MPH, SD; Associate Professor in the Department of Epidemiology. Epidemiology of cancer; physical activity and fitness and cancer incidence.

Simin Liu, MD, MS, MPH, SD; Assistant Professor in the Department of Epidemiology. Etiologies of obesity, diabetes, heart disease, and cancer; epidemiologic methods for population studies.

JoAnn E. Manson, MD, MPH, DPH; Professor in the Department of Epidemiology. Chronic disease epidemiology; cardiovascular and diabetes epidemiology; hormone replacement therapy; biomarkers.

Karin B. Michels, MS, MPH, SD, MSc; Associate Professor in the Department of Epidemiology. Nutritional epidemiology and methodology; perinatal and reproductive risk factors for breast cancer.

Murray A. Mittleman, MDCM, MPH, DPH; Associate Professor in the Department of Epidemiology. Epidemiology of acute risk factors triggering myocardial infarction and stroke; methodological problems in implementing case-crossover studies.

Jane M. Murphy, PhD; Professor in the Department of Epidemiology. Longitudinal studies of psychiatric epidemiology in general populations.

J**anet Wilson Rich-Edwards,** MPH, SD; Assistant Professor in the Department of Epidemiology. Prenatal and childhood predictors of cardiovascular disease and diabetes; lifestyle determinants of fertility and pregnancy outcome.

Susan L. Santangelo, SD; Assistant Professor in the Department of Epidemiology. Genetic epidemiology of psychiatric disorders; statistical modeling of genetically complex (non-Mendelian) diseases.

Debra A. Schaumberg, MPH, SD; Assistant Professor in the Department of Epidemiology. Epidemiology of eye disease and diabetes; use of biomarkers in epidemiologic research.

Sebastian Schneeweiss, MD, SM, SD; Assistant Professor in the Department of Epidemiology. Pharmacoepidemiology and pharmaceutical outcomes research.

Daniel E. Singer, MA, MD; Professor in the Department of Epidemiology. Preventive health care.

Philip Sung-En Wang, MD, MPH, DrPH; Assistant Professor in the Department of Epidemiology. Pharmacoepidemiology of psychiatric medications; mental health services research; trials to improve the use and quality of mental health treatments.

Shumin Zhang, MD, MSc, SD; Assistant Professor in the Department of Epidemiology. Etiology of cancer; nutritional epidemiology; health effects of antioxidants, folates, alcohol, lipids, and obesity; biomarkers of nutrients.

Adjunct Faculty

Hans-Olov Adami, MD, PhD. Karolinska Institutes, Uppsala, Sweden.

Monique M. B. Breteler, MSc, MD, PhD. Erasmus University Medical Center, Rotterdam, the Netherlands.

Richard C. Dicker, MD, SM. Centers for Disease Control and Prevention.

Kathleen M. Egan, MPH, SD. Vanderbilt University.

Anders Ekbom, MB, MD, PhD. University Hospital, Uppsala, Sweden.

Albert Hofman, MD, PhD. Department of Epidemiology and Biostatistics, Erasmus University Medical School, Rotterdam, the Netherlands.

Chung-Cheng Hsieh, MPH, SM, SD. Division of Biostatistics and Epidemiology, University of Massachusetts Medical Center.

K. Malcolm Maclure, SM, SD. Ministry of Health, Province of British Columbia, Canada.

Ralph S. Paffenbarger, MD, MPH, DPH. Stanford University.

Kenneth J. Rothman, DMD, MPH, DPH. Departments of Epidemiology and Community Medicine, Boston University.

John D. Seeger, MPH, DrPH. Ingenix Pharmaceutical Services.

Sherri O. Stuver, SD. Boston University School of Public Health.

Ralph J. Timperi, Jr., MPH. Massachusetts Department of Public Health.

Ming T. Tsuang, MD, PhD. University of California, San Diego.

Alexander M. Walker, MD, MPH, DPH. Ingenix Pharmaceutical Services.

> In high school I got this idea in my head that I wanted to work on cancer.

VANESSA LOPEZ-PAJARES
Doctoral student, Department of Genetics and Complex Diseases

The daughter of Peruvian immigrants, Vanessa Lopez-Pajares describes with pride her father's ascent from gas-station attendant to vice president of a New York bank. The same kind of resolve has marked Vanessa's own course to date.

She says, "In high school I got this idea in my head that I wanted to work on cancer." Medicine was her first thought, but after four years at Cornell and a double major in chemistry and biology, she decided that biochemistry might be the right approach.

The next step was a placement in the summer Internship Program for Minority Students, sponsored by the HSPH Division of Biological Sciences. Then she was accepted into the doctoral program in genetics and complex diseases.

Vanessa remarks that she likes the school's interdisciplinary atmosphere and its ties to the many Harvard-associated labs and institutes in the area. Her own research is an investigation of the role of tumor suppressor p53. She explains, "p53 is a gene that responds to damage to the cell. That damage, if not repaired, can lead to cancer. I am trying to learn how the protein is regulated."

In the longer term Vanessa knows that she wants to balance the demands of her research with family life. In the short term her antidote to the rigor of her academic program is the volleyball court.

DEPARTMENT OF GENETICS AND COMPLEX DISEASES

The complex interplay of biological processes with environmental factors as they apply to chronic, multigenic, and multifactorial diseases is the focus of the new Department of Genetics and Complex Diseases. Department faculty members conduct research to elucidate the molecular mechanisms underlying this intricate interaction between genetic determinants and its divergent responses to environmental signals to affect the health of human populations.

The research activities in the Department of Genetics and Complex Diseases and its training programs in toxicology, radiation biology, and nutritional biochemistry concentrate on the molecular, cellular, and organismic adaptations and responses to stress, toxins, radiation, and nutrients and explore the genetic basis controlling the heterogeneity of these interactions in human populations. Department faculty members are interested in an integrated approach to understand, prevent, and treat complex human diseases.

Research focuses on several broad categories, including stress and inflammatory signaling pathways, nutrient sensing and molecular transport, oxidative stress, and genomic instability. The diseases under study include nutritional and metabolic diseases, such as obesity, diabetes, and cardiovascular diseases; cancer; and aging, both at the mechanistic level and in the context of population studies. Department faculty members are involved in multidisciplinary collaborations with faculty in other HSPH departments and Harvard-affiliated centers, as well as other institutions. The department also offers interdisciplinary training opportunities.

Degree Programs in Genetics and Complex Diseases

As described below, the department offers the doctor of philosophy (PhD) program. No master of science programs are available.

Doctor of Philosophy in Biological Sciences in Public Health (Genetics and Complex Diseases)

Students wishing to study disease mechanisms and the integrated biology of chronic complex diseases (including cancer, metabolic disorders, and aging) as they pertain to major problems in public health should apply to the PhD program offered by the Division of Biological Sciences through the Harvard University Graduate School of Arts and Sciences. For more information about the PhD program, see page 55.

Contact Information

For more information about research and training in genetics and complex diseases, please contact Julie Gound, assistant director of administration, Department of Genetics and Complex Diseases, 665 Huntington Avenue, Boston, MA 02115.
Phone: 617-432-0054
Fax: 617-432-5236
Email: jgound@hsph.harvard.edu

COURSES OF INSTRUCTION

Please note that the courses listed are subject to change and some are not offered every year. Complete course descriptions are available at http://www.hsph.harvard. edu/registrar/courses.

Cell Response to Mutagens and Carcinogens

Principles of Toxicology

Functional Genomics and Proteomics

Independent Study, Tutorials

DEPARTMENT FACULTY

Please note that some faculty members may be on leave during academic year 2004–05.

Department chair: Gökhan S. Hotamisligil, MD, PhD; James Stevens Simmons Professor of Genetics and Metabolism. Molecular basis of metabolic diseases; studies on regulatory pathways; signal transduction in mammalian cells; biology of fatty-acid binding proteins.

Bruce Demple, PhD; Professor of Toxicology. Repair enzymes for oxidative DNA damage; molecular biology of cellular responses to oxidative stress.

Karl T. Kelsey, MD, MOH; Professor of Cancer Biology and Environmental Health. Occupational and environmental carcinogenesis, including molecular epidemiologic studies of the determinants of somatic genetic changes in cancer; cancer susceptibility.

Marianne Wessling-Resnick, MS, PhD; Professor of Nutritional Biochemistry. Regulation of the cellular uptake of macromolecular nutrients; molecular basis of iron transport.

Dieter Wolf, MD; James Stevens Simmons Associate Professor of Molecular Oncology. Maintenance of normal genome copy through replication control and genetic identification of conserved components; role of proteolysis in replication control.

Zhi-Min Yuan, MD, PhD; James Stevens Simmons Associate Professor of Radiobiology. Cancer biology; radiation research; cell-cycle regulation; signaling pathways.

Adjunct Faculty

Peter Ofner, MRSC, PhD. Department of Pharmacology and Experimental Therapeutics, Tufts University School of Medicine.

Guy L. Reed III, MS, MD. Medical College of Georgia.

Leona D. Samson, PhD. Department of Bioengineering and Environmental Health, MIT.

> This is not the ivy tower. These people are successful in the real world as well.

SUSAN BENTSI-ENCHILL

Master's student, Department of Health Policy and Management

"My dream is to start a generic drug company in Ghana," says Susan Bentsi-Enchill. "To do that, I need to understand not only health care financing but also public health structures, distribution networks, donor organizations, hospital management, payment systems—a host of factors."

Susan was born in Ghana, spent seven years in Saudi Arabia, returned to Accra, and then came to Smith College in the United States. A chemistry major, Susan was active in Amnesty International at Smith and did two summer internships: one with the UN's environmental program in Japan; another at WHO in Geneva, where she wrote documents on the right of women to protection against violence and the right of all people to clean water and sanitation.

While working as a consultant, Susan began to focus on health care, specifically pharmaceuticals. This interest led her to the master's program in the Department of Health Policy and Management. At HSPH Susan says she especially enjoys being surrounded by faculty members who are leaders in health management. "This is not the ivy tower. These people are successful in the real world as well," she says. Susan is also taking advantage of internships at Pfizer, Commons Capital, and Digene.

Not content with these responsibilities, Susan is helping to organize drives to send books to Africa and medical supplies to a hospital in Boston's Ghanian sister city, Sekondi-Takoradi.

DEPARTMENT OF HEALTH POLICY AND MANAGEMENT

The Department of Health Policy and Management is a mission-oriented department concerned with improving the health care delivery system and mitigating public health risks in the United States and abroad. The department is dedicated to resolving major management and health policy problems through original research, advanced training, and dispute resolution. Research priorities in the Department of Health Policy and Management are organized into nine broad areas:

- health financing and insurance, including the creation of new physician payment systems and the design of public policies dealing with rising insurance premiums
- management of health hazards, including use of risk assessment to set priorities for environmental health protection
- study of the causes and etiology of injury and the application of that work to the development and evaluation of prevention and intervention strategies and policy
- management of health care organizations, encompassing the application of corporate strategic-planning concepts to the challenges faced by health systems and pharmaceutical firms
- evaluation and management of medical technology, including the meta-analysis of data from clinical trials
- business and labor in health, including the negotiation of occupational safety and health care benefits in the collective-bargaining process
- international health, including evaluation of the cost-effectiveness of health programs in developing countries
- quality of health care, encompassing the design of better methods to measure quality
- health care reform, involving the development of partnerships between the department and the corporate community to explore critical aspects of health policy and management

The department's problem-solving orientation is exemplified by its strong ties to leading health practitioners in hospitals, managed-care plans, community health centers, health advocacy groups, corporate medical departments, health and environmental consulting firms, state and local health departments, legislative committees, federal regulatory agencies, and international agencies. Practical skills are emphasized by an interdisciplinary faculty that includes management specialists, decision analysts, accountants, physicians, lawyers, policy analysts, economists, political scientists, and program evaluators.

Degree Programs in Health Policy and Management

As described below, the department offers both 80-credit and 40-credit master of science (SM) programs, a nonresidential, part-time SM in health care management for physician and dental executives, and a doctor of science (SD) program. The department also participates in the universitywide doctor of philosophy (PhD) Program in Health Policy. For information about schoolwide requirements for master's and doctoral degrees, see page 58.

Master of Science in Health Policy and Management (80-credit and 40-credit programs)

The 80-credit SM program emphasizes professional skills and concepts; a solid grounding in the substance of health problems; rigorous quantitative training; and a curriculum that combines professional, academic, and clinical activities. Acquired knowledge is applied to practical situations through a required summer internship program and a field research project. This professional program is designed for students who are building careers in health-related fields and who aspire to leadership roles in the public or private sector. Recent graduates have taken positions in local, state, and federal government agencies; consulting companies; public policy research organizations; community health centers; hospitals; health plans; and pharmaceutical companies. Others have gone on to doctoral and fellowship programs.

Applicants to the 80-credit program come from a wide variety of undergraduate fields. They are expected to have full-time work experience and an academic record, particularly in quantitative and analytical courses, that suggest outstanding potential in the areas of health policy and management. Applicants

should have at least two years of relevant post-baccalaureate work experience in the health field; exceptions are occasionally made for outstanding candidates. Deferred admission is available for applicants who demonstrate strong potential but who lack sufficient professional experience in the health sector. These applicants work within the health field in positions approved by the program for a minimum of one year before matriculating.

Of the 80 credits necessary to earn the SM, required courses account for 30 to 35. In addition to fulfilling schoolwide requirements, students must satisfy the requirements of at least one of three areas of interest:

Management This area of interest is for students pursuing management careers in public- or private-sector health institutions

Policy This area is intended for those who wish to become involved in the formulation of health policy, including medical care policy, heath finance and insurance, access to health care, payment to institutions and practitioners, political analysis and strategy, and medicare and medicaid reform.

Research This area is geared toward students looking toward doctoral education and research careers in fields such as health economics, quality of care, technology assessment, health decision analysis, and advanced statistical analysis.

The requirements for the management, policy, and research areas of interest are described in a guide available from the department. After the required credits have been completed, students are encouraged to enroll in relevant courses at Harvard Business School, Kennedy School of Government, and Harvard Graduate School of Education.

The 40-credit SM program is designed for students pursuing research careers in public- or private-sector health care institutions, particularly physicians and other candidates with relevant advanced degrees who desire intensive training in analytic and quantitative skills. The degree is appropriate for students interested in either domestic or international research questions. Recent graduates have taken research positions at academic medical centers and other health care organizations.

Applicants to the 40-credit program should hold graduate medical or other professional degrees and have significant experience in health services. They typically expect to devote a substantial portion of their careers to research in areas such as health services research, cost-effectiveness analysis, and clinical decision making.

Students fulfill schoolwide requirements and take up to 10 tutorial credits and an additional 10 credits in courses within the department. Recommended electives include upper-level courses in biostatistics, epidemiology, health economics, health services research, health decision sciences, quality improvement, technology assessment, and program evaluation.

Master of Science in Health Care Management

The SM in health care management is a 40-credit, two-year, part-time, nonresidential degree program, which trains clinicians in the executive skills required for management. This professional program is targeted to midcareer MDs, DMDs, and DDSs with significant management responsibilities who wish to be more effective in their roles in the health care sector.

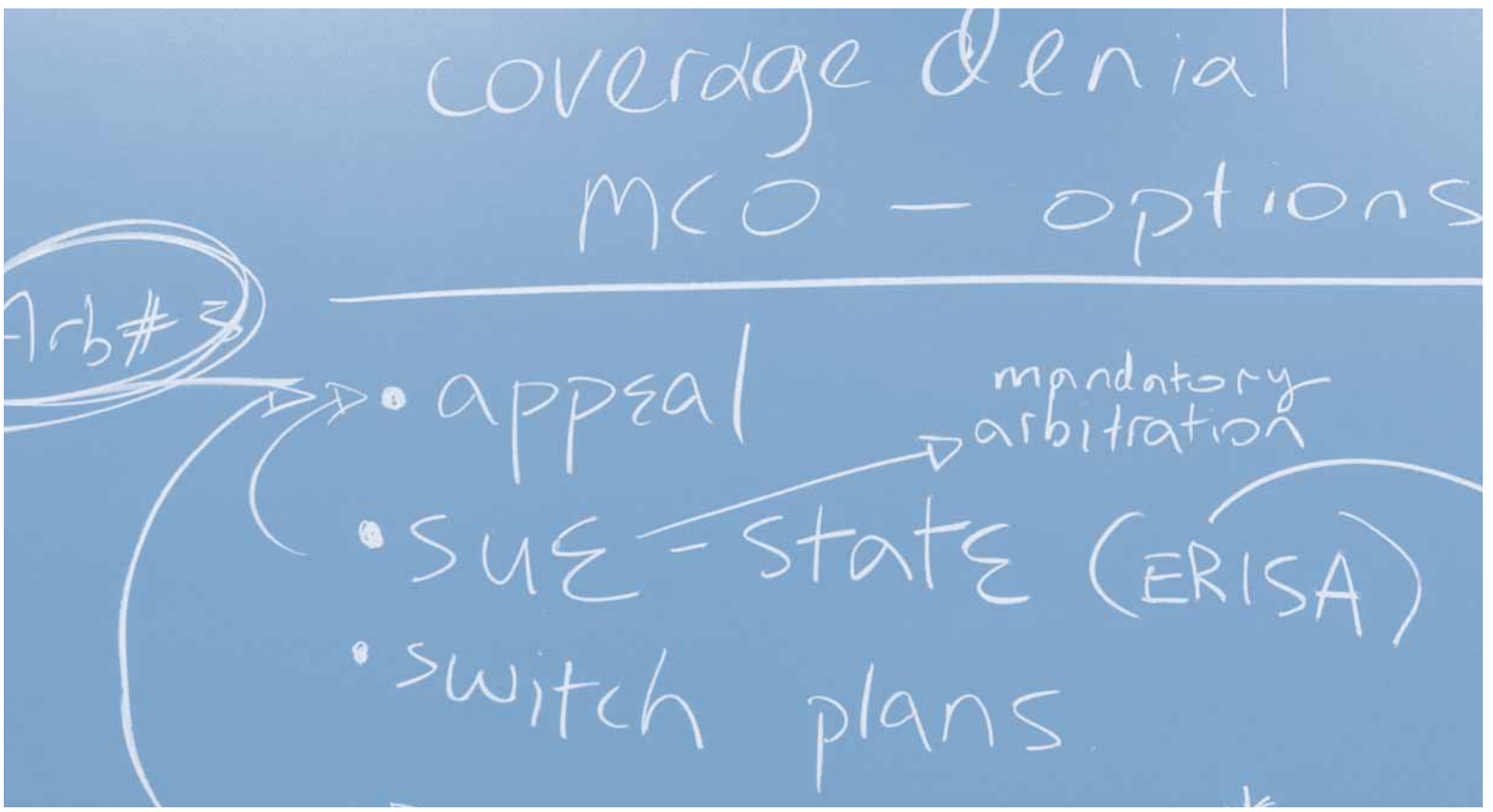
The program includes course work on strategy determination, financial analysis, negotiation, organizational behavior, operations management, information systems, and quality-of-care management. Degree candidates are required to spend three weeks each summer on campus, as well as five four-day weekends (Friday through Monday) each academic year. Scheduled teleconferences, an estimated ten to fifteen hours per week of assignments, and a final practicum are also required.

This is a closed-cohort learning situation. Attendance at all sessions is mandatory, and previous courses and/or degrees will not be applied to degree requirements. No auditing or cross-registration is allowed.

Doctor of Science in Health Policy and Management

The SD program in health policy and management is designed for physicians, lawyers, and other professionals who are interested in doctoral-level research training in health policy and who are committed to applied, interdisciplinary research. The program prepares graduates to perform research in the academic or professional realm.

Applicants must hold an MD, a DDS, a PhD, or a JD degree. Moreover, applicants should have a strong aptitude in a quantitative discipline (demonstrated by prior academic performance, work experience, and standardized



COURSES OF INSTRUCTION

Please note that the courses listed are subject to change and some are not offered every year. Complete course descriptions are available at http://www.hsph.harvard.edu/registrar/courses.

Economic Analysis for Public Health—Introductory and Intermediate
Health Care Regulation and Planning
Economics of Health Policy
Capstone Course in Law and Public Health
Program Evaluation in Health Policy
Public Health Law
Health Care Law and Policy
Advanced Topics in Health Law and Policy
Financial Transactions and Analysis
Financial Management and Control
Financial Management of Health Care Organizations
Public Speaking for Managers
Legal and Ethical Issues in the AIDS Epidemic
Economics of Health Policy
Introduction to the New American Health Care System: Law, Policy, and Management
Managing People in Health Care Organizations
Competitive Strategy
Operations Management in Service Delivery Organizations
Strategic Marketing Management in Health Systems
Managed Care Policy Issues
Strategic Use of Information Systems in Health Care Delivery
Health Economics: Economic Analysis of the Health Care System
Pharmaceutical and Biotechnology Industries: Public Policy and Regulatory Issues
Public Health Leadership Skills
Seminar in Health Policy
Political Analysis and Strategy for U.S. Health Policy
Quality Improvement in Health Care
Payment Systems in Health Care
Health Policy Issues: Access to Dental Services
Survey of Methods in Health Services Research
Current Issues in Health Policy
Skills and Methods of Health Care Negotiation and Conflict Resolution
Applied Research and Practice in Health Policy and Management
Applied Research in the Law of Health Policy and Management
Research Ethics
Doctoral Seminar in Health Economics
Public Opinion, Polling, and Public Policy
Research with Large Databases
Introduction to Management of Health Care Organizations
Medical Informatics
Developing Questionnaires to Measure Outcomes of Health Care
Quality Measurement in Health Care
Quality Improvement in Health Care
American Violence: The Intersection Between Home and Street
Organizing Consumer and Community Interests in the Health System
Racial and Ethnic Disparities in Health: Historical and Contemporary Issues
Principles of Injury Control
Politics and Strategies for Change in Health Policy
Environmental Health Risk: Concepts and Cases
Theory and Practice of Public Health in the United States
Pharmacoeconomics and Economic Evaluation of Medical Technology
Decision Analysis for Health and Medical Practices
Methods for Decision Analysis in Public Health and Medicine
Cost-Effectiveness and Cost-Benefit Analysis for Health Programs Evaluations
Decision Theory
Decision Analysis in Clinical Research
Research Seminar on Risk and Decision Analysis
Independent Study, Tutorials

test scores), experience in the health sector, and the ability to perform original and independent work. Applicants should indicate their anticipated area of interest within the department and anticipated faculty mentor (if known) in their application essay. An environmental science and risk management area of interest is offered jointly with the Department of Environmental Health.

In addition to schoolwide requirements, candidates complete a set of required courses in decision science, economics, program evaluation, health politics, and public health law (lawyers only). Each student works closely with a faculty adviser to develop an individual plan of study. While students in this program have the opportunity to take courses throughout the university, all required courses are offered through HSPH.

Financial aid is generally available to applicants admitted to the program, especially from the Agency for Healthcare Research and Quality and the National Institute of Mental Health. Full tuition and stipend are available to admitted minority students with demonstrated need.

Doctor of Philosophy in Health Policy

The doctor of philosophy in health policy is a collaborative program of five Harvard University faculties: the Graduate School of Arts and Sciences, School of Public Health, Medical School, Kennedy School of Government, and Business School. Because this is an interfaculty program, enrolled students take courses throughout the university. The PhD is awarded by the Faculty of Arts and Sciences. Please note that Graduate School of Arts and Sciences application forms must be used when applying to the PhD Program in Health Policy. The deadline for applying to the PhD program is mid-December.

Individuals with doctoral-level training in health policy are highly sought as teachers in institutions of higher learning and/or as researchers. Graduates of the program are employed in tenure-track positions at schools of public health; medical schools; schools of public policy; organizations such as the Kaiser Family Foundation, the RAND Corporation, and the Urban Institute; and government agencies such as the Congressional Budget Office.

Applicants must submit GRE or GMAT exam scores that are less than five years old, and individuals whose native language is not English must submit TOEFL scores. Preference is given to applicants with either relevant work experience or some prior graduate work, although a graduate degree is not required for admission.

Applicants wishing to combine the MD program at Harvard Medical School with the PhD Program in Health Policy must apply separately to each program and indicate in the PhD application that they are also applying to the MD program.

Degree requirements include approximately two years of course work; a concentration in one academic discipline (decision science, economics, ethics, evaluative science and statistics, management, medical sociology, or political analysis); at the thesis stage specialization in one of five policy areas (environmental health, health care services, international health, mental health, or public health); general and concentration exams (usually at the end of the second year); a thesis prospectus and oral examination; a thesis based on original research; and a thesis defense.

Financial aid is available to applicants admitted to the program, especially from the Agency for Healthcare Research and Quality and the National Institute of Mental Health. Full tuition and stipend are available to admitted minority students with demonstrated need.

Postdoctoral Fellowships

The department offers two-year postdoctoral fellowships to candidates who wish to do independent research in such areas as quality of medical care, technology assessment and cost-effectiveness, health care policy, management of health care organizations, and AIDS policy. The program emphasizes methodology in evaluation research, decision science, economics, and organizational analysis and permits fellows to design individualized programs of study. Fellows may also apply for admission to a formal degree program. Candidates must hold an MD, DDS, PhD, or equivalent degree and must be U.S. citizens or permanent residents. Applicants must submit a curriculum vitae; three letters of reference; and a statement describing career goals, research interests, and reasons for applying. The application deadline is November 15, 2004, for a fellowship beginning in July 2005.

Related Offerings

Environmental science and risk management area of interest, Department of Environmental Health, see page 10.
Health decision sciences concentration, Department of Biostatistics, see page 5.
Interdisciplinary concentration in the epidemiology of infectious disease, see page 56.
MPH concentrations in health care management and in law and public health, see page 52.

Contact Information

For more information about SM and SD programs in health policy and management, please contact Anne Occhipinti, director of academic programs, Department of Health Policy and Management, 677 Huntington Avenue, Boston, MA 02115.
Phone: 617-432-4511
Fax: 617-432-3699
Email: aocchipi@hsph.harvard.edu
Web: http://www.hsph.harvard.edu/hpm

For more information about the SM degree in health care management, please contact Sharon O'Brien, administrative director, 677 Huntington Avenue, Boston, MA 02115.
Phone: 617-432-4324
Email: smobrien@hsph.harvard.edu
Web: http://www.hsph.harvard.edu/mhcm

For the PhD program online submissions are encouraged, using the Graduate School of Arts and Sciences (GSAS) application form available at the web address below.
Web: http://www.gsas.harvard.edu/admissions/apply.html

For specific information about the PhD program, please contact Sunny Alvear, assistant director, PhD Program in Health Policy, 79 John F. Kennedy Street, Cambridge, MA 02138.
Phone: 617-496-5506
Fax: 617-496-2860
Email: Sunny_Alvear@harvard.edu
Web: http://www.fas.harvard.edu/~healthpl

DEPARTMENT FACULTY

Please note that some faculty members may be on leave during academic year 2004–05.

Department chair: Arnold M. Epstein, AM, MD; John H. Foster Professor of Health Policy and Management. Access and quality of care, especially in disadvantaged populations.

Deborah H. Bennett, MS, PhD; Assistant Professor of Environmental Health and Risk Assessment. Fate and transport of persistent organic chemicals in a multimedia environment as related to environmental risk analysis.

Robert J. Blendon, MBA, MPH, ScD; Professor of Health Policy and Management. Politics of health care; access to health care; approaches to health care reform; influence of public opinion in shaping health policy.

Paul H. Campbell, MPA, SD; Lecturer on Management. Financial management, strategic planning, and public health infrastructure; health system issues in developing countries.

Susanne J. Goldie, MD, MPH; Associate Professor of Health Decision Science. Development of disease-specific transition models; quality-of-life assessment; cost-effectiveness analysis of preventive interventions.

George M. Gray, MS, PhD; Lecturer on Risk Analysis. Risk characterization to inform policy decisions; risk assessment and right-to-know; food safety.

James K. Hammitt, SM, MPP, PhD; Professor of Economics and Decision Sciences. Mathematical modeling and analysis of economic behavior and decision making under uncertainty.

David Hemenway, AM, PhD; Professor of Health Policy. Intentional and unintentional injury; health care economics.

William C. Hsiao, MPA, PhD; K. T. Li Professor of Economics. Health care systems; control of health care costs; universal insurance coverage.

Nancy M. Kane, MBA, DBA; Professor of Health Policy and Management. Financial strategies of health care organizations; provider behavior under third-party payment systems.

Jack Kasten, MPH, JD; Lecturer on Health Services. Managed care; service utilization; manpower issues; hospital organization and management.

Howard K. Koh, MD, MPH; Professor of Health Policy and Management and Associate Dean of Public Health Practice. Cancer prevention and control; skin oncology; tobacco control; health disparities.

Karen M. Kuntz, SM, SD; Associate Professor of Health Decision Science. Cost-effectiveness analysis of cancer-screening strategies and development of disease-specific multiattribute utility scales.

Jonathan I. Levy, SD; Assistant Professor of Environmental Health and Risk Assessment. Estimation of health effects of air pollution, using both health metrics and monetary valuations; public health benefits of energy conservation.

Leonard J. Marcus, MSW, PhD; Lecturer on Public Health Practice. Negotiation, conflict resolution, and use of mediation in health care settings; effects of conflict on health care decision making and outcomes.

Michelle M. Mello, MPhil, PhD, JD; Assistant Professor of Health Policy and Law. Empirical analysis of health law issues; medical malpractice; patient safety; ethics; managed care; pharmaceuticals; public health law.

Matthew J. Miller, MD, MPH, SD; Assistant Professor of Health Policy and Management. Injury and violence prevention; medical ethics in clinical trials; health economics.

Peter J. Neumann, MA, SD; Associate Professor of Policy and Decision Science. Cost-effectiveness analysis in health and medicine; pharmacoeconomics; medical technology assessment; government policy on pharmaceuticals and medical technology.

Joseph P. Newhouse, PhD; John D. MacArthur Professor of Health Policy and Management. Financing and organization of medical care; medical malpractice; manpower policy; outcomes research.

R. Heather Palmer, MB, BCh, SM; Professor of Health Policy and Management. Quality of health care; incorporation of evaluation measures into health care reform plans.

Deborah B. Prothrow-Stith, MD; Professor of Public Health Practice. Community-based violence prevention; violence prevention protocols for primary care settings.

Marc J. Roberts, PhD; Professor of Political Economy. Health policy; environmental policy; ethical aspects of allocating scarce public health resources.

Meredith Rosenthal, PhD; Assistant Professor of Health Economics and Policy. Empirical studies of the impact of financial incentives and organization on physician behavior; econometric models of health care provider behavior.

David M. Studdert, LLB, MPH, SD; Associate Professor of Law and Public Health. Medical malpractice and quality of care; health law and regulation; dispute resolution; injury and disability policy; medical ethics.

Katherine Swartz, MS, PhD; Professor of Health Policy and Management. Populations without health insurance; financing of universal health insurance; structures of financial incentives for physicians.

Kimberly M. Thompson, MS, SD; Associate Professor of Risk Analysis and Decision Science. Analysis of the risks, costs, and benefits of using airbags as lifesaving devices; applications of value of information techniques to environmental health decisions.

Nancy Turnbull, MBA. Lecturer on Health Policy. Health insurance regulation; health care access; international applications of managed care.

Milton C. Weinstein, AM, MPP, PhD; Henry J. Kaiser Professor of Health Policy and Management. Cost-effectiveness of health practices and technologies.

Secondary Appointments

(primary appointments at Harvard Medical School)

John Z. Ayanian, MD, MPP; Associate Professor in the Department of Health Policy and Management. Impact of gender, race, insurance coverage, and socioeconomics on access to care and clinical outcomes.

David W. Bates, MD, SM; Professor in the Department of Health Policy and Management. Clinical decision making and physician behavior; quality of care and cost-effectiveness; outcome assessment.

Donald M. Berwick, MPP, MD; Professor in the Department of Health Policy and Management. Health care quality assessment, management, and improvement; technology assessment and cost-effectiveness analysis; decision analysis and clinical epidemiology.

Troyen A. Brennan, MA, JD, MPH, MD; Professor in the Department of Health Policy and Management. Medical ethics; personal injury and environmental litigation; medical malpractice and health policy reform.

David J. Cohen, MD, SM; Associate Professor in the Department of Health Policy and Management. Application of health outcomes research and cost-effectiveness analysis to interventional cardiology.

Craig C. Earle, MD, MSc; Assistant Professor in the Department of Health Policy and Management. Clinical epidemiology; economic evaluation; quality assessment.

Kenneth A. Freedberg, MD, SM; Associate Professor in the Department of Health Policy and Management. Cost-effectiveness of preventing AIDS complications; outcomes research in HIV disease.

Atul A. Gawande, MD, MPH; Assistant Professor in the Department of Health Policy and Management. Reduction of errors and complications in surgery; global provision of surgical care; narratives from medicine.

G. Scott Gazelle, MD, MPH, PhD; Associate Professor in the Department of Health Policy and Management. Technology assessment; health services research.

Robert A. Greenes, MD, PhD; Professor in the Department of Health Policy and Management. Biomedical informatics; knowledge management and decision support strategies for enhancing quality and safety of health care.

Edward Guadagnoli, MA, PhD; Professor in the Department of Health Policy and Management. Evaluation of the outcomes of health care, access to care, and health care interventions.

Jeffrey N. Katz, SM, MD; Associate Professor in the Departments of Environmental Health and Health Policy and Management. Clinical policy relating to noninflammatory musculoskeletal conditions; health policy questions; back pain and upper-extremity disorders.

Thomas H. Lee, Jr., MD, SM; Associate Professor in the Department of Health Policy and Management. Prognostic stratification in and cost-effectiveness analysis of cardiovascular disease management.

Matthew H. Liang, MD, MPH; Professor in the Department of Health Policy and Management. Epidemiology of rheumatic disease and disability; clinimetrics; health services research; technology assessment.

Tracy A. Lieu, MD, MPH; Associate Professor in the Department of Health Policy and Management. Children's primary care delivery and outcomes; cost-effectiveness analysis.

Eric C. Schneider, MSc, MD; Assistant Professor in the Department of Health Policy and Management. Health care quality, including quality measurement, organizational and socioeconomic influences, and quality improvement strategies.

Jane C. Weeks, MD, SM; Associate Professor in the Department of Health Policy and Management. Outcomes of cancer treatment; effectiveness of resource utilization in medical oncology; medical decision making in oncology.

Adjunct Faculty

Donald S. Bialek, MD, SM, MPH. Consultant.

Angela Browne, PhD. Soros Institute of Peace.

David E. Burmaster, MPP, PhD. Alecon.

Gail Charnley, PhD. Energy Resources Company.

Karl Claxton, MSC, PhD. University of York, United Kingdom.

Mark G. Field, AM, PhD. Boston University.

Pamela S. Green, JD. Consultant.

Sheldon Greenfield, MD. Tufts University.

Richard C. Hermann, MD, SM. Tufts University.

Maria G. M. Hunink, MD, PhD. Erasmus University Medical School, the Netherlands.

Andrew L. Hyams, JD, MPH. Urban Health Institute, Boston Department of Health and Hospitals.

Sherrie H. Kaplan, MPH, MSPH, MS, PhD. Tufts University School of Medicine.

Zita Lazzarini, MPH, JD. University of Connecticut School of Medicine.

Lucian L. Leape, MD. Institute for Healthcare Improvement.

Bengt Liljas, PhL, PhD. Medical and Scientific Affairs, Astra Pharmaceuticals and AstraZeneca.

Eugene Litvak, MS, PhD. Boston University School of Public Health.

Ragnar E. Losfstedt , MA, PhD. Kings Centre for Risk Management, King's College, United Kingdom.

George D. Lundberg II, MD, MS, ScD. Medscape.

John E. McDonough, MPH, PhD. Health Care for All.

George B. Moseley III, MBA, JD. University Seminar Center.

Benjamin W. Moulton, MPH, JD. American Society of Law, Medicine, and Ethics.

Jack Needleman, MA, PhD. Department of Health Services, UCLA School of Public Health.

Jeremy J. Nobel, MD, MPH, SM. GTE Laboratories.

Alice A. Noble, JD, MPH. Attorney at law in private practice.

John A. Norris, JD, MBA. John A. Norris Esquire, PC.

Joseph S. Pliskin, SM, PhD. Ben-Gurion University, Israel.

Dorothy E. Puhy, MBA. Dana-Farber Cancer Institute.

Howard Rivenson, MBA. East Boston Neighborhood Health Center.

Richard B. Siegrist, Jr., MS, MBA. HealthShare Technology, Inc.

Glenn K. Wasek, SM. John Snow, Inc.

"I wanted to study something that was personally satisfying and had global significance. I liked the broader aims of public health."

SLOAN SIEGRIST

Doctoral student, Department of Immunology and Infectious Diseases

Sloan Siegrist, a resident of Guam, hopes one day to return there—to open her own lab, perhaps to study waterborne pathogens. Her interest in emerging viruses and infectious diseases was sparked in high school, when she saw the film *Outbreak* and read *The Coming Plague* and *The Hot Zone*.

Sloan went on to Stanford University and majored in human biology. After graduating in 2002, she began looking for a graduate research program in microbiology. In addition, she says, "I wanted to study something that was personally satisfying and had global significance. I liked the broader aims of public health."

Sloan is now in year two of her doctoral program in immunology and infectious diseases at HSPH. After an intense first year of classes and laboratory rotations, she is spending more time in the lab of her adviser, Dr. Eric Rubin, researching the role of protein secretion in the cell-to-cell spread of *Mycobacterium tuberculosis*. She has just completed the training necessary to work independently in the school's Biosafety Level Three Laboratory.

Sloan manages to combine her academic responsibilities with a serious commitment to running. Representing Guam, she won silver and bronze medals at the South Pacific Games in Fiji and recently ran the 800-meter race at the World Track and Field Championships in Budapest. She'll also represent Guam at the 2004 Summer Olympics.

DEPARTMENT OF IMMUNOLOGY AND INFECTIOUS DISEASES

The Department of Immunology and Infectious Diseases focuses on the biological, immunological, epidemiological, and ecological aspects of viral, bacterial, protozoan, and helminthic diseases of animals and humans and the vectors that transmit some of these infectious agents.

Research in the department emphasizes basic pathogenic mechanisms that may lead to better diagnostic tools, the development of vaccines and other interventions for prevention and control of infection and disease, and the identification of new targets for antiviral and antiparasitic drugs. Laboratory-based research within the school may be supplemented by field-based studies of epidemiological and ecological aspects of infectious disease transmission and control. Diseases of developing countries are emphasized.

Members of the department take a multidisciplinary approach that includes immunology, molecular biology, public health entomology, cell biology and ultrastructure, biochemistry, pathology, virology, epidemiology, and ecology. The faculty undertakes research both within the school and around the world.

Infectious diseases currently under study include protozoa (malaria, leishmania, ameba, giardia), helminths (schistosomes, filaria, onchocerca), viruses (HIVs, leukemia retroviruses, West Nile and eastern equine encephalitis), and bacteria (Lyme disease agents, ehrlichia, tuberculosis). Further immunologic studies focus on genetic regulation of the immune response, molecular mechanisms of the regulation of class II genes, the function and regulation of T-cell-derived cytokines, and cytokines involved in the regulation of inflammation.

Degree Programs in Immunology and Infectious Diseases

As described below, the department offers doctor of science (SD) and doctor of philosophy (PhD) degree programs. No master of science programs are available.

Students in both programs choose among the areas of interest described below:

Immunology The curriculum currently focuses on genetic regulation of the immune response, molecular mechanisms of the regulation of class II genes, and the function and regulation of T-cell-derived cytokines. Students take courses in cell biology, immunology, and molecular immunology.

Immunology and molecular biology of parasitic and other infections This area of interest introduces students to recent advances in the biology of parasitic and infectious diseases and provides background for conducting research on these diseases. The program emphasizes molecular biology, immunology, cell biology, and the epidemiology of parasites.

Infectious disease epidemiology and tropical public health This area of interest provides a solid understanding of epidemiology, ecology, and control of infectious diseases in developing countries. It emphasizes control and prevention measures and the biological basis of diseases caused by pathogens that range from viruses to parasites.

Vector biology, ecology, and control This area of interest focuses on the manner in which blood-feeding arthropods interact with their various vertebrate hosts and with the human pathogens that they transmit. These interests combine biological experimentation, epidemiological analysis, and population studies. Students become familiar with the various arthropods that are associated with human disease and learn the ways environmental change may result in ill health. Students conduct studies on mechanisms of transmission of vector-borne pathogens, both in the laboratory and in the field, and devise novel intervention strategies.

Virology This area of interest is designed to prepare a future generation of experts for new developments in the pathogenesis and prevention of AIDS and other infectious diseases. At present the program emphasizes the epidemiology, biology, and vaccinology of AIDS as an example of a complex infectious disease. Students take courses in virology, vaccine development, and related fields.

Doctor of Science in Immunology and Infectious Diseases

The SD program is designed for those interested in immunology, molecular biology, virology, and the epidemiology of infectious diseases. The program prepares students for postdoctoral research fellowships; junior faculty positions at academic institutions; and positions in independent research institutions, governmental agencies, and the biotechnology industry.

Applicants to the SD program should have a clinical degree (MD, DVM, DMD, or equivalent). This program is also available to candidates without a clinical degree who wish to apply to the interdisciplinary area of interest in the epidemiology of infectious disease. To enter the program through the Department of Immunology and Infectious Diseases, candidates must have adequate background in modern biology, including microbiology.

This program aims to develop the basic skills in laboratory techniques and data handling necessary for undertaking original research. Course work during the first one or two years emphasizes cellular and molecular biology, virology, immunology, and genetics. Course work for students focusing on the epidemiology of infections also emphasizes epidemiology, biostatistics, and ecology. Electives are chosen according to a student's needs and interests. Courses may be taken at Harvard Medical School, the Graduate School of Arts and Sciences, and MIT, as well as at HSPH.

Students are encouraged to participate in the numerous seminar series and informal discussion groups offered on the Longwood campus. The department emphasizes publication of research results in the standard research literature, and most doctoral students publish several papers before completing the degree. The doctoral thesis is based on intensive laboratory research under the guidance of a faculty adviser in the student's area of interest. Students choose a faculty adviser whose research interests match their own when beginning to research their thesis topic. For information about schoolwide requirements for doctoral degrees, see page 58.

Limited funding is available to qualified SD students who are U.S. citizens or permanent residents. A training grant from the NIH Fogarty Institute also provides some support for international students.

Doctor of Philosophy in Biological Sciences in Public Health (Immunology and Infectious Diseases)

Students wishing to study cellular and molecular biology, immunology, virology, or physiology as it pertains to major problems in public health should apply to the PhD program offered by the Division of Biological Sciences through the Harvard University Graduate School of Arts and Sciences. The PhD program is designed to train scientists in state-of-the-art concepts and methods in immunology, immune system disorders, virology, the biology of parasites, or important infectious diseases. For more information about the PhD program, see page 55.

Related Offerings

Interdisciplinary concentration in the epidemiology of infectious disease, see page 56.

Contact Information

For more information about the SD program in immunology and infectious diseases or other departmental inquiries, please contact the main departmental office, Department of Immunology and Infectious Diseases, 651 Huntington Avenue, Boston, MA 02115.
Phone: 617-432-2334
Fax: 617-739-8348
Web: http://www.hsph.harvard.edu/Academics/iid/index.html

COURSES OF INSTRUCTION

Please note that courses listed are subject to change and some are not offered every year. Complete course descriptions are available at http://www.hsph.harvard.edu/registrar/courses.

Malaria and Human Affairs

Ecology, Epidemiology, and Control of Important Parasitic Diseases of Developing Areas

Tuberculosis: The Host, the Organism, and the Global Threat

Survey of Immunology

Principles of Public Health Entomology

Immunology of Infectious Diseases

Cellular and Molecular Biology of Parasites

Design and Development of a Vaccine

Independent Study, Tutorials

DEPARTMENT FACULTY

Please note that some faculty members may be on leave during academic year 2004–05.

Department chair: Myron (Max) Essex, DVM, PhD; John LaPorte Given Professor of Infectious Diseases. Role of retroviruses as infectious agents in AIDS; mechanisms of immunosuppression by retroviruses; African HIVs.

Barry R. Bloom, PhD; Joan L. and Julius H. Jacobson Professor of Public Health and Dean of the Faculty of Public Health. Mechanisms of resistance and pathogenesis of diseases, particularly tuberculosis and leprosy; genetic analysis of host resistance; genetically engineered vaccines against tuberculosis.

Barbara Burleigh, PhD; Assistant Professor of Immunology and Infectious Diseases. Molecular and cellular basis of *Trypanosoma cruzi*–host cell interactions; host cell invasion; signal transduction; *Trypanosoma cruzi* differentiation.

Manoj T. Duraisingh, MSc, PhD; Assistant Professor of Infectious Diseases. Molecular basis of the mechanisms underlying the pathogenesis of *Plasmodium falciparum* malaria; vaccine and drug strategies for control of the disease.

Laurie H. Glimcher, MD; Irene Heinz Given Professor of Immunology. Genetic regulation of the immune response; the role of 1a (class II) major histocompatibility complex molecules and T-cell receptor proteins in T-lymphocyte activation.

Michael J. Grusby, PhD; Professor of Molecular Immunology. Molecular and genetic analysis of the JAK/STAT signaling pathway.

Donald A. Harn, Jr., AM, PhD; Professor of Tropical Public Health. Regulation or direction of immune responses due to molecular composition of particular antigens; synthetic peptide and DNA vaccines for parasitic diseases.

Phyllis J. Kanki, DVM, SD; Professor of Immunology and Infectious Diseases. Pathobiology of human and simian retroviruses; characterization of the immune response to various viral antigens and their correlation to stage of infection or disease.

Igor Kramnik, MD, PhD; Assistant Professor of Immunology and Infectious Diseases. Immunology and immunogenetics of infectious diseases; diagnostic tools for predicting the susceptibility to tuberculosis in experimental models and human populations.

Tun-Hou Lee, SM, SD; Professor of Virology. Virology of human immunodeficiency viruses; design of an HIV vaccine.

Eric J. Rubin, MD, PhD; Assistant Professor of Immunology and Infectious Diseases. Virulence factors of mycobacteria; acquisition of virulence determinants by *Vibrio cholerae;* generalized transposon mutagenesis systems for bacteria.

Andrew Spielman, ScD; Professor of Tropical Public Health. Epidemiology of vector-borne disease; physiology and ecology of mosquitoes and ticks; development of infectivity of pathogens in mosquitoes and ticks.

Ali A. Sultan, MB, BS, PhD; Assistant Professor of Immunology and Infectious Diseases. Biochemistry and molecular pathogenesis of parasites.

Dyann F. Wirth, PhD; Professor of Infectious Diseases. Mechanisms of drug resistance in malaria, including molecular genetic analysis and field-based studies; genetic analysis of malaria transmission; analysis of gene expression.

Secondary Appointments

(primary appointments at Harvard Medical School)

Marcia B. Goldberg, MD; Associate Professor in the Department of Immunology and Infectious Diseases. Characterization of the molecular mechanism and function of unipolar localization of *Shigella IcsA;* mechanism of actin assembly by *Shigella IcsA.*

Donald A. Goldmann, MD; Professor in the Department of Immunology and Infectious Diseases. Epidemiology of nosocomial infections; epidemiologic approaches to medical outcomes assessment and hospital quality improvement.

Martin S. Hirsch, MD; Professor in the Department of Immunology and Infectious Diseases. Pathogenesis and therapy of human retrovirus and herpes virus infections.

I-Cheng Ho, MD, PhD; Assistant Professor of Immunology and Infectious Diseases. Molecular mechanisms regulating the development and differentiation of T cells.

Kenneth McIntosh, MD; Professor in the Department of Immunology and Infectious Diseases. Pathogenesis, prevention, and treatment of pediatric respiratory viral diseases; coronaviruses; new methods in viral diagnosis; epidemiology and pathogenesis of respiratory infections.

Edward A. Nardell, MD; Associate Professor in the Departments of Environmental Health and Immunology and Infectious Diseases. Airborne transmission and infection control of *Mycobacterium tuberculosis;* air disinfection with ultraviolet irradiation.

Edward T. Ryan, MD, DTM&H; Assistant Professor in the Department of Immunology and Infectious Diseases. Enteric infections and the development of vaccines protective against such infections.

Joseph G. Sodroski, MD; Professor in the Department of Immunology and Infectious Diseases. Role of the HIV-1 envelope glycoproteins in virus entry; topological and structural analysis of the HIV-1 envelope glycoproteins; generation of HIV-1 neutralizing antibodies.

Adjunct Faculty

Kenneth H. Mayer, MD. Brown University School of Medicine.

Thomas P.C. Monath, MD. Vice President, Research and Medical Affairs, Acambis, Inc.

Abhay R. Satoskar, MD, PhD. Ohio State University.

> I see that I can make a difference, contribute to improving health in my own country.

SWAPNIL RAJPATHAK

Doctoral student, Departments of Nutrition and Epidemiology

"People still focus on undernutrition in the developing world," says Swapnil Rajpathak, "but in urban India obesity and diabetes are much bigger concerns." Estimating the prevalence of diabetes in urban India at a startling 10 percent, he attributes the problem to a newfound preference for fast food over a more healthful traditional diet.

While a resident at the All India Institute of Diabetes, Swapnil grew interested in public health approaches to obesity and diabetes. In 1999 he came to the United States to do an MPH in epidemiology at George Washington University in Washington, DC. During this period he was also a research intern for the Program on Noncommunicable Diseases at the Pan American Health Organization.

Swapnil decided to apply to a doctoral program in nutrition and epidemiology at HSPH. He began his studies in 2001 and has been working with Dr. Frank Hu on the Health Professionals Follow-up Study. Swapnil's own research has focused on the relationship between minerals—specifically chromium and calcium—and the risk of diabetes, heart disease, and obesity. "On a personal level," he says, "the greatest thing about my experience has been the respect with which I've been treated by the faculty."

Swapnil hopes to graduate in 2005, then stay at the school for a postdoctoral fellowship. Eventually he wants to return to India to apply what he has learned. "I see that I can make a difference, contribute to improving health in my own country."

DEPARTMENT OF NUTRITION

THE MISSION OF THE DEPARTMENT of Nutrition is to improve human health through enhanced nutrition. The department strives to accomplish this goal through research aimed at improved understanding of how diet influences health, the dissemination of new knowledge about nutrition to health professionals and the public, the development of nutritional strategies, and the education of researchers and practitioners.

The Department of Nutrition provides training and research opportunities in basic science relating to nutrition and in epidemiologic aspects of nutrition as they affect public health. Nutrition policy and the evaluation of nutritional interventions are long-standing interests of the department, particularly as they concern the populations of Latin America, Africa, Asia, and the United States. Department research ranges from molecular biology to human studies of cancer and heart disease, including the conduct of population-based intervention trials. Students learn and use the latest techniques in biochemistry, physiology, biostatistics, epidemiology, and related fields. Departmental research, whether basic or applied, is relevant to human health.

Current research covers a wide range of topics, including large prospective studies of dietary factors in relation to heart disease, cancer, diabetes, and ophthalmologic disease; development of methods to assess nutritional status by analysis of body tissue; the interaction of nutritional factors with genetic determinants of disease; the interaction of nutritional factors and infectious agents; nutritional influence on blood pressure; effects of nutrition programs on the mental and physical consequences of malnutrition; nutritional determinants of blood lipid factors; lipoprotein metabolism; molecular mechanisms of diabetes and obesity; regulation of the intra- and intercellular delivery of macromolecular nutrients; and the molecular mechanism leading to atherosclerosis and thrombosis.

Degree Programs in Nutrition

As described below, the department offers two doctoral programs. The first is a program leading to the doctor of science (SD) or doctor of public health (DPH) degree in nutrition, with concentrations in either nutritional epidemiology or public health nutrition. The second is a doctor of philosophy (PhD) program in biological sciences in public health (nutritional biochemistry/cardiovascular biology). Applicants to the PhD program who hold a clinical degree in medicine, veterinary medicine, or dentistry may prefer to follow a different curriculum leading to the SD degree in nutritional biochemistry. This option may be available by special arrangement with the department. No master's degree programs are available.

Doctor of Science in Nutrition/Doctor of Public Health

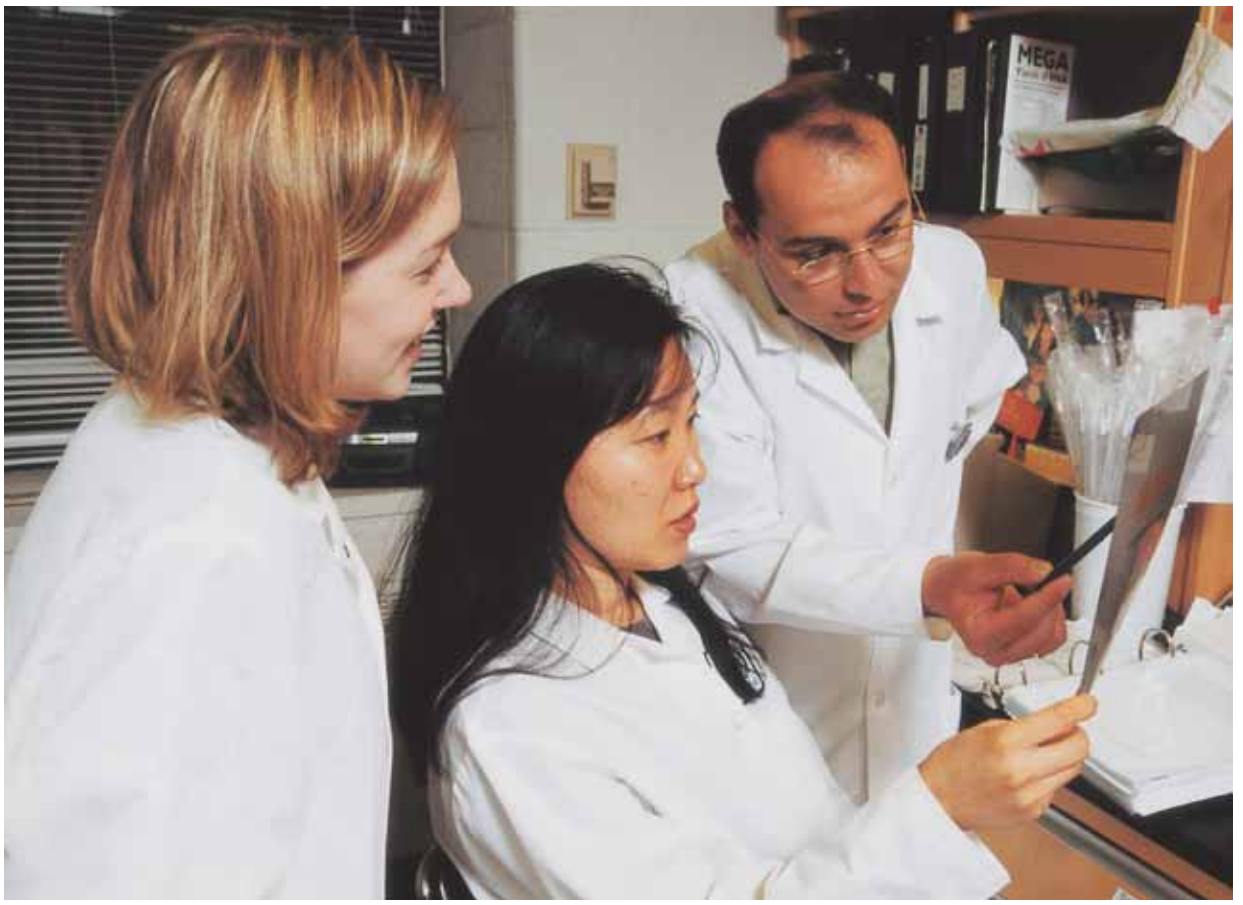
The concentration in nutritional epidemiology or in public health nutrition, leading to the SD or DPH degree, provides rigorous training in epidemiology and biostatistics as well as the biological aspects of nutrition. The overall objective of the nutritional epidemiology concentration is to enable students to investigate relationships between diet and disease. Students in public health nutrition combine behavioral sciences with biologic and quantitative approaches to design and evaluate nutrition programs, policies, and the dissemination of nutrition research.

Graduates are prepared for careers as research scientists in academic institutions, private-sector organizations, and public health agencies in state, national, and international settings. Recent graduates are now working at universities, research foundations, pharmaceutical companies, the National Cancer Institute, and the American Cancer Society.

Applicants must have a strong background in biology and mathematics. An MD or other professional health-related degree is desirable but not required. Applicants to the DPH program must hold an MPH and a prior doctoral degree.

For the nutritional epidemiology concentration, one of the two required minors must be in epidemiology; for the public health nutrition concentration, students complete one minor in quantitative methods (biostatistics or epidemiology) and one minor in a behavioral science relevant to the development of public health programs and policies (for example, society, human development, and health). For more information on schoolwide requirements for doctoral degrees, see page 58.

Admission to a joint program with the Department of Epidemiology requires the approval of both departments, and applicants should contact the Department of Nutrition before making formal application. All students in a joint program with Epidemiology must satisfy the



COURSES OF INSTRUCTION

Please note that courses listed are subject to change and some are not offered every year. Complete course descriptions are available at http://www.hsph.harvard.edu/registrar/courses.

Nutritional Epidemiology

Programs and Principles of Public Health Nutrition

Principles of Nutrition

Science of Human Nutrition

Nutrition Seminars I and II

Advanced Topics in Nutrition I and II

Seminars in Food Science and Technology

Nutritional Problems of Less-Developed Countries

Research Techniques in Nutritional Biochemistry

Nutrition/Health Promotion in the Mass Media

Independent Study, Tutorials

major requirements of both departments, complete a minor acceptable to both, and write a thesis on a topic concerning both nutrition and epidemiology.

For the SD and DPH programs, funding may be available through the NIH-supported Training Program in Nutritional Science for students with previous doctoral degrees.

Doctor of Philosophy in Biological Sciences in Public Health (Nutritional Biochemistry/Cardiovascular Biology)

Students wishing to study cellular and molecular biology or physiology as it pertains to major problems in public health should apply to the PhD program offered by the Division of Biological Sciences through the Harvard University Graduate School of Arts and Sciences. The PhD program in nutritional biochemistry offers rigorous training in biochemistry, cell biology, and metabolism, allowing students to work toward solving nutritional and metabolic problems in the laboratory. Students in cardiovascular biology learn to use cutting-edge technologies from molecular biology, biochemistry, and genetics to critically dissect the mechanisms underlying cardiovascular diseases such as heart attacks, strokes, heart failure, atherosclerosis, and congenital heart disease. For more information about the PhD program, see page 55.

Related Offerings

Interdisciplinary concentration in genetic and molecular epidemiology, see page 56.
Interdisciplinary concentration in the epidemiology of infectious disease, see page 56.
MPH concentration in family and community health, see page 52.
Nutritional epidemiology area of interest, Department of Epidemiology, see page 19.

Contact Information

For more information about research and training in nutrition, please contact Kathy McLoughlin, Department of Nutrition, 655 Huntington Avenue, Boston, MA 02115.
Phone: 617-432-1851
Fax: 617-432-2435
Email: nutrition@hsph.harvard.edu

DEPARTMENT FACULTY

Please note that some faculty members may be on leave during academic year 2004–05.

Department chair: Walter C. Willett, MD, MPH, DPH; Fredrick John Stare Professor of Epidemiology and Nutrition. Investigation of dietary factors, using epidemiological methods, in the cause and prevention of cardiovascular and other diseases.

Alberto Ascherio, MD, MPH, DPH; Associate Professor of Nutrition and Epidemiology. Relation of dietary factors to cardiovascular and neurological diseases; nutritional epidemiology of multiple sclerosis and Parkinson's disease.

Hannia Campos, MS, PhD; Associate Professor of Nutrition. Dietary and genetic factors affecting lipoprotein metabolism and heart disease in humans; biochemical markers of dietary intake.

Wafaie W. Fawzi, MB, BS, MPH, SM, DPH; Associate Professor of Nutrition and Epidemiology. Etiologies of infectious diseases and perinatal conditions with emphasis on dietary and nutritional causes; dietary factors in disease in pregnancy and childhood.

Edward L. Giovannucci, MD, MPH, SD; Professor of Nutrition and Epidemiology. Etiologies of cancer with emphasis on dietary causes; methodologies to measure dietary factors in epidemiologic studies.

Gökhan S. Hotamisligil, MD, PhD; James Stevens Simmons Professor of Genetics and Metabolism. Molecular basis of metabolic diseases; studies on regulatory pathways; signal transduction in mammalian cells; biology of fatty-acid binding proteins.

Frank B. Hu, MD, MPH, PhD; Associate Professor of Nutrition and Epidemiology. Diet and physical activity in relation to cardiovascular disease and type-2 diabetes; role of diet and lifestyle in preventing macrovascular complications in diabetics.

David J. Hunter, MB, BS, MPH, SD; Professor of Epidemiology and Nutrition. Cancer epidemiology; molecular and genetic epidemiology.

Karen E. Peterson, RD, SD; Associate Professor of Nutrition and Society, Human Development, and Health. Nutrition and activity surveillance systems and interventions in low-income, multiethnic populations; methodological issues affecting interpretation of growth and nutrition indicators.

Eric B. Rimm, SD; Associate Professor of Epidemiology and Nutrition. Relation of diet to diseases, especially obesity, diabetes, and cardiovascular disease; impact of antioxidants, B vitamins, fiber, and alcohol on serum and genetic markers.

Frank M. Sacks, MD; Professor of Cardiovascular Disease Prevention. Human lipoprotein metabolism; effects of diet and hormones; dietary fatty acids and cardiovascular disease.

Stephanie A. Smith-Warner, MS, PhD; Assistant Professor of Nutritional Epidemiology. Examination of dietary factors in relation to cancer risk; evaluation of dietary assessment methods.

Meir J. Stampfer, MD, MPH, DPH; Professor of Nutrition and Epidemiology. Influence of diet and exogenous hormones on health, particularly heart disease and cancer.

Marianne Wessling-Resnick, MS, PhD; Professor of Nutritional Biochemistry. Regulation of the cellular uptake of macromolecular nutrients; molecular basis of iron transport.

Secondary Appointments

(primary appointments at Harvard Medical School)

Christopher P. Duggan, MD, MPH; Assistant Professor in the Department of Nutrition. Oral rehydration solutions for acute diarrhea; nutritional requirements of catabolic patients; micronutrient needs in infectious and critical illness.

Mathew W. Gillman, MD, SM; Associate Professor in the Department of Nutrition. Relationship of diet to chronic conditions and diseases; early origins and early-life prevention of adult chronic diseases; disease prevention in defined populations.

Clifford W. Lo, MD, MPH, ScD; Assistant Professor in the Department of Nutrition. Vitamin D and calcium nutrition; total parenteral nutrition.

W. Allan Walker, MD; Professor in the Department of Nutrition. Nutrition and developmental gastroenterology; nutrition and mucosal immunology; gastrointestinal immunology; protective functions of breast milk.

Adjunct Faculty

Teresa T. Fung, MS, SD. Simmons College.

Guy L. Reed III, MS, MD. Medical College of Georgia.

> Vietnam has a good medical health system, but there is room for public health.

DUC HA

Master's student, Department of Population and International Health

Duc Ha's parents urged him to become a doctor, so he did. As he gained in experience, however, he realized that he might do more good by taking a broader view of health care in Vietnam.

Duc finished his medical studies at Hanoi Medical School in 1996 and worked for several years for a medical supply company. In 1998 he became an officer at the Vietnamese Ministry of Health, responsible for work ranging from administration and coordination to the formulation of national health policy and regulations. Duc comments, "Vietnam has a good medical health system, but there is room for public health."

Seeking the training that would help him improve health policy implementation, Duc won a Warren Buffett Foundation scholarship to HSPH. Here he has been dividing his time between the Department of Population and International Health and the Department of Health Policy and Management. "I want to obtain practical experience from the developing world and applicable knowledge from the developed world," he says. Health care financing, quality of care, and management control are some of his concerns.

Duc will complete the doctor of public health program at Boston University before returning to Vietnam and the ministry of health. He is confident that he can make the system more effective and efficient: "If I can show that my ideas work, they will listen."

DEPARTMENT OF POPULATION AND INTERNATIONAL HEALTH

The Department of Population and International Health seeks to improve global health through education, research, and service from a population-based perspective.

The twenty-first century has arrived with complex changes in demographic patterns, disease burdens, and health policies. These changes are affecting all societies, rich and poor, developed and developing. The department's approach to these problems combines the analysis of population and health using quantitative and qualitative methods, the investigation of policies that affect health, and a concern with the politics and ethics of health and development.

The department's members generate knowledge and ideas through their research, strengthen technical and leadership skills through educational programs, and enhance national capacities through collaborative projects, especially in the developing world. In their examination of population and international health issues, department faculty members draw on their disciplinary expertise in many areas: anthropology, biostatistics, demography, ecology, economics, epidemiology, ethics, medicine, political science, reproductive biology, and sociology. The department's research interests span a wide spectrum of topics, including social and economic development, health policy, and demography; design and financing of health care systems; women's health and children's health; and prevention and control of infectious and chronic diseases. The department has a special concern with questions of health equity and human rights, particularly in relation to health and population issues in developing countries.

Students in the department come with various backgrounds. Many students are from developing countries. All have an interest in the health of disadvantaged populations worldwide.

Degree Programs in Population and International Health

As described below, the department offers both an 80-credit master of science (SM) program and a program leading to the doctor of science (SD) or doctor of public health (DPH) degree. For information on schoolwide requirements for master's and doctoral degrees, see page 58.

In addition to these programs, the department hosts research fellows and midcareer leaders in international health and in research ethics and undertakes cooperative technical projects overseas.

Master of Science in Population and International Health

The department's SM program offers two tracks, each comprising 80 course credits, geared toward preparing individuals for academic and public service careers, respectively. Students on the academic track generally continue with doctoral work at the end of the master's program; their eventual aim is to work as researchers in academic institutions. Graduates of the professional track pursue a variety of careers in national and international agencies and institutions.

Applicants in both tracks must hold a bachelor's degree or equivalent, although many students already hold advanced degrees in medicine or a social science discipline. The program strongly prefers applicants with relevant work experience in population or international public health.

In both tracks the courses and the thesis work are based on practical aspects of current health and population issues in developing countries and at the same time introduce students to the major theoretical concerns in international health and population. In addition to meeting schoolwide requirements, students acquire a grounding in the concepts and tools used for field survey work, experience with data analysis and qualitative research methods, and familiarity with the classic literature in population and international public health.

The first year of study is devoted to full-time course work. During the summer between the first and second years, students are encouraged to gain practical experience by undertaking an internship. The second year generally involves

a combination of course work and independent research linked to completion of a required master's thesis, which is usually based on the summer internship experience. The thesis provides an opportunity for the student to bring together the conceptual models and analytic skills presented in the courses and to apply them to a single issue. For students continuing into a doctoral program, the thesis often forms the core of the research proposal for more advanced work.

Doctor of Science in Population and International Health/Doctor of Public Health

The doctoral programs are designed to prepare students both for professional leadership positions in the public or private sectors of public health and for academic careers in universities or research institutions. Recent graduates have taken positions with the Centers for Disease Control and Prevention, the World Bank, and nongovernmental organizations and have assumed postdoctoral and teaching positions with universities in the United States and around the world.

Desired applicants have outstanding academic records, substantial relevant experience in the international public health arena, and professional interests relevant to the department. Applicants to the DPH program must hold an MPH and a prior doctoral degree. Though not required for the SD program, a master's degree is strongly recommended. Students are encouraged to enter the department's 80-credit master's degree program and apply to enter the doctoral program at a later date. Entry to the doctoral program will then depend upon outstanding performance in the master's degree program and acceptance through the regular doctoral program admission process.

In addition to schoolwide requirements, doctoral students must complete a common core of course work with a focus on global health. The core course work is completed in the first year. The second year of the doctoral program usually involves both course work and research planning. Core courses cover economics, ethics, politics, quantitative and qualitative methods, and population health measurement.

Applicants to the doctoral program must select one of three areas of interest currently offered by the department. The selected area becomes the student's required major for the doctoral program. Although course requirements for a specific area of interest may be taken concurrently with the core, the majority of these will be taken during the second year of study. Minor fields may be chosen from the department or from allied departments of the school or university, including the HSPH Departments of Biostatistics; Epidemiology; Immunology and Infectious Diseases; Nutrition; or Society, Human Development, and Health.

The three areas of interest offered by the department are described below:

Economics Economic analysis underlies many decisions being made in health care and population policy. A World Health Organization (WHO) report has argued the case for investing in health both as an intrinsic good and as an instrument for promoting economic growth.

The economics area of interest is designed to give students a strong foundation in microeconomic theory and to develop their skills in applying economic analysis to issues in population and international health. In addition to economic theory, students will also study recent empirical economic research on population and international health issues. The rigorous training provided in this area of interest, together with interdisciplinary training in other areas, will allow students to undertake their own research using economic models of behavior. While the required courses for this area can be completed in two years, it is sometimes recommended that students take additional advanced courses during their third year in the Department of Economics in the Harvard University Faculty of Arts and Sciences.

Research topics that might be pursued within the economics area of interest include the costs and benefits of medical interventions,

COURSES OF INSTRUCTION

Please note that the courses listed are subject to change and some are not offered every year. Complete course descriptions are available at http://www.hsph.harvard.edu/registrar/courses.

Societal Response to Disaster
Epidemiology of Infectious Diseases of Public Health Importance in Developing Countries
Ethical Basis of the Practice of Public Health
Introduction to the Practice of International Health
Financing Health Care in Developing Countries
Bioterrorism: Public Health Preparedness and Response
Culminating Experience for International Health and MPH Students
Justice and Resource Allocation
Program Evaluation of Lead Poison Prevention
Computer Methods for Population Health Measurements
Management Control in Health Organizations
Health, Human Rights, and the International System
Health and Human Rights: Concepts and Methods for Public Health
Fertility Analysis
Policy Implementation and Management of Health Programs
Health Sector Reform: A Worldwide Perspective
Population and Development Policy Making
People in War: Developing New Strategies to Promote Human Security
Planning and Evaluation of Health Programs
Human Ecology
Business Planning for Health Organizations
Frontiers of Knowledge in HIV/AIDS Prevention, Care, and Research
Mathematical Models in Biology and Public Health
Grant Writing for Funding of Research and Health Care Projects
Ethical Issues in International Health Research
HIV/AIDS in Developing Countries: Epidemiology and National Responses
Field Experience in Health and Human Rights
Applied Politics and Economics: Political Economy of Health
Political Analysis and Implementation of International Health Reform
Foundations of Global Population and Health I and II
Applied Quantitative Methods
Measuring Population Health
Pharmaceutical Policy and Global Health
Econometrics for Health Policy I and II
Issues in Health and Human Rights
Geographical Information Systems and Health Planning
Microeconomics and Applications to Public Health in Developing Countries
Individual and Social Responsibility for Health
International Health Economics I and II
Field Trip: Health Reform and Community Medicine in Chile
Field Trip to Kerala, India
Population Ethics
Research Methods in Population
Ethics and Health Disparities
Independent Study, Tutorials

the effect of poverty and social deprivation on health, the impact of medical care costs on use of services, the effect of government regulation on market structures and private health care provision, mechanisms for developing new drugs and treatments, and the effect of family size on child poverty and health.

Health systems Health care systems today provide the critical link between the development of interventions capable of achieving significant population health improvements and the realization of this improvement. As recently defined by WHO, health systems include four major functions: creation of resources, financing, service provision, and stewardship.

The health systems area of interest trains students to apply a multidisciplinary approach to advanced research on health care systems. The focus of this area is to develop new knowledge to improve the design, implementation, and evaluation of strategies to improve health and equity in middle- and lower-income countries through better health system performance. Through course work and applied research, students will learn to integrate theories and methods from economics, political science, and management and administration and to apply them to the critical international health system issues of the day.

Examples of research topics in this area of interest might include the impact on national health spending of changes in health system organization, the effect of decentralization on priority health service programs, consumer response to characteristics of public and private health care providers in developing countries, and evaluation of strategies to improve administrative and management efficiency in government services.

Population and reproductive health Assessments of the global and local burden of disease in both high- and low-income countries have become an important resource. These studies involve an understanding of the growth, structure, and change of human populations (demography) and additional training in biostatistics and epidemiology. Such global, regional, and national analyses, attempting to partition the factors determining population health, require competence in several areas, including the capacity to translate census, survey, and routine health statistics into summary assessments for both priority setting and action. Another aspect of these analyses, focusing on women, is to measure the contribution of sex and reproduction to the burden of disease in those of reproductive age and beyond.

The population and reproductive health area of interest is designed to provide the foundation for work on population health around the world but especially in low-income countries. The area utilizes demographic analysis as an essential tool for the measurement of mortality and fertility. Several courses illustrate the way in which models and well-established demographic estimation techniques can be applied to new challenges in burden of disease assessments. Other recommended courses describe major methods of data collection and analysis, especially in Africa. Although the training is primarily quantitative, an understanding of the value of qualitative and ethnographic approaches is encouraged.

Students within this area have recently written theses on such topics as HIV/AIDS and infertility in Tanzania, longitudinal studies of child growth and development in rural Africa, the causes and consequences of induced abortion in Mexico and Ghana, domestic violence as a public health issue in Jordan, and the contribution of primary health care to child survival in Africa.

Postdoctoral Fellowships

The Department of Population and International Health offers two nondegree postdoctoral fellowship programs.

The Fellowship Program on Ethical Issues in International Health Research, sponsored by the Fogarty International Center of the National Institutes of Health, provides support for up to two years. During their residence at HSPH for the first ten months, fellows study ethical issues in health research and develop a project proposal. During the second year fellows return to their home countries and complete their projects.

The Takemi Program offers fellowships for professionals and scholars from around the world for research and advanced, interdisciplinary training on critical issues of international health, especially those related to developing countries. The program addresses problems of mobilizing, allocating, and managing scarce resources to improve health, and of designing strategies for disease control and health promotion. The program can fund a limited number of fellowships each year and can assist in identifying external sources of funding, which applicants are encouraged to pursue.

Related Offerings

MPH concentration in international health, see page 52.
Interdisciplinary concentration in the epidemiology of infectious disease, see page 56.
Interdisciplinary concentration in women, gender, and health, see page 56.

Contact Information

For general information about the Department of Population and International Health, please contact the department at 665 Huntington Avenue, Boston, MA 02115.
Phone: 617-432-1232
Fax: 617-566-0365

For more information about master's and doctoral programs in population and international health, please contact the Education Office, Department of Population and International Health, at the address above.
Phone: 617-432-2253
Fax: 617-566-0365
Email: ajaimung@hsph.harvard.edu
Web: http://www.hsph.harvard.edu/Academics/pih/index.html

For more information about the Fellowship Program in Ethical Issues in International Health Research, please contact Richard A. Cash, MD, MPH, Department of Population and International Health, 665 Huntington Avenue, Boston, MA 02115.
Phone: 617-432-1076
Fax: 617-566-0365
Email: rcash@hsph.harvard.edu
Web: http://www.hsph.harvard.edu/bioethics

For more information about the Takemi Program in International Health, please contact Michael R. Reich, PhD, Department of Population and International Health, 665 Huntington Avenue, Boston, MA 02115.
Phone: 617-432-0686
Fax: 617-432-1251
Email: takemi@hsph.harvard.edu
Web: http://www.hsph.harvard.edu/takemi

DEPARTMENT FACULTY

Please note that some faculty members may be on leave during academic year 2004–05.

Department chair: David E. Bloom, MA, PhD; Clarence James Gamble Professor. Applied microeconomics: labor, population, health, development, and environment; demography.

Iain W. Aitken, MB, BChir, MPH; Lecturer on Society, Human Development, and Health. Maternal health care; management of primary health care workers; design and financing of urban health care systems in developing countries.

Peter A. Berman, MSc, PhD; Professor of Population and International Health Economics. Health care financing in developing countries; economic assessment of health policies and programs.

Barry R. Bloom, PhD; Joan L. and Julius H. Jacobson Professor of Public Health and Dean of the Faculty of Public Health. Mechanisms of resistance and pathogenesis of diseases in developing countries, particularly tuberculosis and leprosy; genetic analysis of host resistance; development of genetically engineered vaccines against tuberculosis.

Thomas J. Bossert, MA, PhD; Lecturer on International Health Policy. Health policy in developing countries, especially in Latin America, Africa, and Indonesia.

Claude Bruderlein, Lic.ès Droit, LLM; Lecturer on International Health. Human rights and humanitarian law; protection of civilians in war; role of international institutions in humanitarian intervention.

Paul H. Campbell, MPA, SD; Lecturer on Management. Financial management, strategic planning, and public health infrastructure; health system issues in developing countries.

David Canning, PhD; Professor of Economics and International Health. Economic development, particularly the role of health and demography in economic growth.

Richard A. Cash, MD, MPH; Senior Lecturer on International Health. Development of health systems for rural and urban populations in developing countries.

Norman Daniels, MA, PhD; Professor of Ethics and Population Health. Ethics and health care.

Arthur J. Dyck, AM, PhD; Mary B. Saltonstall Professor of Population Ethics. Concepts of human rights, including ethical issues.

Majid Ezzati, MEng, MA, PhD; Assistant Professor of International Health. Technology-environment-health interactions; impact of economic development, urbanization, and industrialization on health risks.

Sofia M. Gruskin, JD, SD; Associate Professor of Health and Human Rights. Health and human rights; gender, reproductive, and sexual health; global implications for the rights of children to health; links between HIV/AIDS, health, and human rights.

Allan G. Hill, MA, PhD; Andelot Professor of Demography. Demography of the Middle East and West Africa; impact on mortality of child survival programs; modern contraception and reproductive health.

Saidi H. Kapiga, MD, MPH, SD; Assistant Professor of Reproductive Health. Development and assessment of community-based HIV/STD control programs; development and testing of interventions to reduce perinatal transmission of HIV; determinants of fertility, provision of family-planning services, and cervical cancer.

Ulla M. Larsen, MA, PhD; Associate Professor of Demography. Interface of demography and health; sterility and reproductive health; focus on Africa.

Jennifer Leaning, SM, MD; Professor of International Health. Medical human rights and international law; complex humanitarian emergencies; medical triage in war and disasters; environmental effects of war.

Richard Levins, PhD; John Rock Professor of Population Sciences. Human ecology; viability of populations and environments; special interest in Caribbean region.

Yuanli Liu, MD, MPH, SM, PhD; Assistant Professor of International Health. Equity in health care; health care financing in developing countries; Chinese health care system; interaction of health and social security systems.

Ajay Mahal, MS, PhD; Assistant Professor of International Health Economics. Macro implications of the AIDS epidemic; implications of rationally guided behavior for HIV transmission; impact of decentralization on effectiveness of health services delivery.

Stephen P. Marks, Doctorat d'état; François-Xavier Bagnoud Professor of Health and Human Rights. Human rights and international affairs.

Marc D. Mitchell, MD, MS; Lecturer on International Health. Management of health care programs in developing countries.

Christopher J. L. Murray, MD, DPhil; Richard Saltonstall Professor of Population Policy. Health system performance assessment; burden of disease; cost-effectiveness analysis; health system financing; health and poverty.

Michael R. Reich, AM, PhD; Taro Takemi Professor of International Health Policy. Political economy of health, population, and development; pharmaceutical policy and global health.

Joshua A. Salomon, PhD; Assistant Professor of International Health. Measurement of population health status and health valuations; evaluation of potential impact and cost-effectiveness of health interventions.

Joseph Sevilla, AM, PhD; Assistant Professor of International Health Economics. Effect of health improvements on economic growth and well-being; determinants of child mortality; most effective means of reducing child mortality.

Daniel Wikler, PhD; Professor of Ethics and Population Health. Ethics and health care.

Chi-Man (Winnie) Yip, PhD; Associate Professor of International Health Policy and Economics. Application of economic models and econometric techniques to study of health care policies.

Secondary Appointments

(primary appointments at Harvard Medical School or Kennedy School of Government)

Jonathan L. Burstein, MD; Assistant Professor in the Department of Population and International Health. Emergency medicine in the field, in hospitals, and in disaster situations.

Sheila Sen Jasanoff, MA, PhD, JD; Professor in the Department of Population and International Health. Comparative study of biotechnology in Britain, Germany, and the United States.

Grace Wyshak, SM, PhD; Associate Professor in the Departments of Biostatistics and Population and International Health. Biostatistical and demographic methods; women's reproductive health.

Adjunct Faculty

Donald S. Bialek, MD, SM, MPH. Consultant.

Joel H. Lamstein, SM. John Snow, Inc.

Adetokunbo O. Lucas, MD, SM. Consultant.

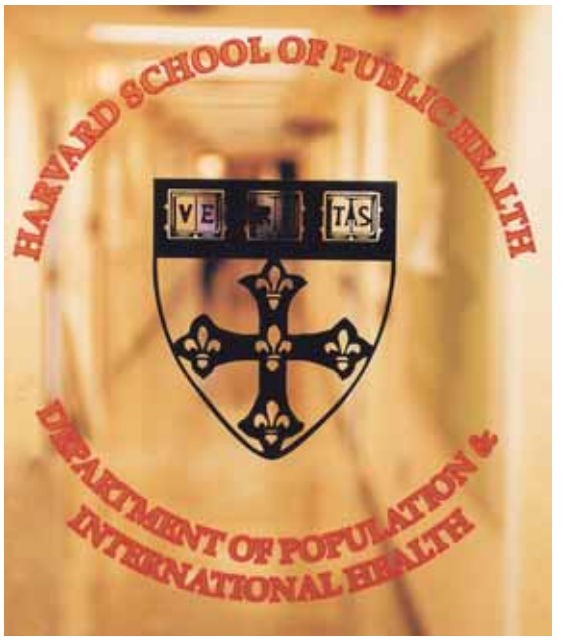
Carla M. Obermeyer, MA, MSc, SD. World Health Organization.

M. Omar Rahman, MD, MPH, SD. Independent University of Bangladesh.

Amartya K. Sen, MA, PhD. Trinity College, Cambridge University, United Kingdom.

Gita Sen, MA, PhD. Indian Institute of Management.

Arjun Sengupta, MA, PhD. School of International Studies, Jwaharlal Nehru University, India.



> I realized that the department provided the language and concepts to do the interdisciplinary research on racial and ethnic disparities that attracted me.

REGINALD TUCKER

Master's student, Department of Society, Human Development, and Health

Reginald Tucker entered the field of public health by an unlikely route. Awarded a full scholarship to the University of Tulsa, he majored in accounting. "I quickly learned it was a mismatch," he says. "But I was the first person in my extended family to attend college, and I knew the job market was strong for accountants."

During five years in a management training program and later as an internal auditor at Saint Louis University, he says, "I learned a great deal about the world of work." While at Saint Louis University, he completed a master's degree in counseling and family therapy, but he knew that such an "emotionally exhausting" field was not for him.

Reginald happened to read an article by Norman Anderson, then a professor in the Department of Society, Human Development, and Health, about the relationship between stress and race. Looking at the SHDH website, he says, "I realized that the department provided the language and concepts to do the interdisciplinary research on racial and ethnic disparities that attracted me."

It took Reginald some time to clarify his goals when he began his master's program at HSPH. Then he took a course that introduced him to the idea of geography and fiscal disparities as influences on health; he immediately felt a connection to his own background and interests. Reginald plans to pursue these themes in a doctoral program at HSPH and later as an academic researcher.

DEPARTMENT OF SOCIETY, HUMAN DEVELOPMENT, AND HEALTH

THE MISSION OF THE DEPARTMENT of Society, Human Development, and Health (SHDH) is to improve health throughout the lifespan, including a special emphasis on children and adolescents. This mission is achieved through research to identify the social and behavioral determinants of health, development and evaluation of interventions and policies leading to the improvement of population health, and the preparation of professionals and researchers who will fill leadership positions in advocacy and public service.

The department's educational mission is to train both scholars and practitioners: scholars whose research will illuminate basic social determinants of health and who will identify and test innovative social policy and service interventions; practitioners who are skilled in designing, implementing, and evaluating health-enhancing interventions in action settings.

The department highlights four areas of interest:

Health and social policy A wide range of social policies—including but not limited to labor, poverty, family, housing, and educational policy—have a dramatic impact on health. This area of interest prepares students to design new and improve existing social policies and focuses on strategies for the successful implementation of social policies that improve health. Students who study in this area may be interested in working on public policy through research, within the government, or in a nonprofit organization.

Human development The department's emphasis on human development across the life course results from faculty research and interest in three areas: the physical, mental, and behavioral health and well-being of children and adolescents; basic developmental processes (including physical growth, nutrition, and psychological development); and growing attention to the impact of early-life conditions on long-term health and functioning. Course work includes material on physical growth and development, principles of psychological and social development, and longitudinal research methods. Research conducted by faculty members involves longitudinal studies of both at-risk and community samples, emphasizing cumulative risk and protective influences across the lifespan and implications for prevention, early intervention, and treatment strategies.

Planned social change This area of interest focuses on the application of theory in the design of intervention programs, as well as on research and evaluation methodology. The area includes work on interventions using randomized clinical trial designs and quasi-experimental approaches. Attention is given to the following design steps: problem diagnosis, assessment, formative research, program design, and evaluation. The social settings for interventions may be communities, workplaces, schools and colleges, and health care facilities. Populations of interest include those who are underserved, marginalized, and in special need. Intervention strategies include educational interventions, community organizing and development, social marketing, communication, adult-learning approaches, and advocacy.

Social determinants of health This area of interest emphasizes the analysis of the major social conditions that affect the health of populations. Research stresses socioeconomic position, social and economic inequality, discrimination, social networks and support, social capital, work conditions, and psychological states. Seminars, tutorials, and courses enable students to explore a range of the health consequences of various social factors by studying varied subgroups, at different times and places and under diverse and changing conditions. Students examine mechanisms and processes through which social factors exert their impact, and also investigate mechanisms that mediate or moderate relationships between social factors and health outcomes.

Degree Programs in Society, Human Development, and Health

As described below, the department offers both 80-credit and 40-credit master of science (SM) programs, a dual-degree master's program for nurses, and a doctoral program leading to the doctor of science (SD) or doctor of public health (DPH) degree. Within both the doctoral program and the 80-credit master's program, students may follow a concentration in maternal and child health (MCH). For information about schoolwide requirements for master's and doctoral degrees, see page 58.

Master of Science in Society, Human Development, and Health (80-credit and 40-credit programs)

The 80-credit, professional SM program prepares students for a variety of positions in community, public, and private settings. These roles include the design, management, and evaluation of programs, particularly health promotion and disease prevention programs, health communication programs, and those providing services to women, youth, and children. Other roles include work in research, public policy, and advocacy. Students in the MCH concentration are prepared for careers in maternal and child health practice, research, planning, policy development, and advocacy.

Recent graduates have taken such positions as the evaluator on a violence prevention program for adolescents, associate director of public health and research at Georgetown University, assistant medical director of the Rhode Island Health Department, and intern in the Presidential Management Program, Office of the Budget for Health and Human Services; others have gone on to earn doctoral degrees.

Applications are encouraged from students who have a strong social sciences and/or natural sciences background, public health experience, and defined public health goals. Solid mathematics and writing skills and successful experience with course work requiring critical reading and writing, drawing of inferences, and rigorous analysis are crucial. Previous graduate work is not required.

Students must earn at least 20 credits in departmental courses. They are not required to declare an area of interest within the department but are encouraged to take course work in all four. In addition to fulfilling HSPH, SHDH, and practice core requirements, students are expected to delineate professional goals and to develop an area of expertise. They often focus on a subject area (such as AIDS; addiction; cardiovascular or cancer risk reduction; the health of children, adolescents or women; and mental health) and/or a skill area (such as program design and evaluation, communication, policy analysis, or marketing). Students must complete a practicum, which consists of skill development in a practice setting, a seminar, and a final paper.

Students in the MCH concentration elect one of two focus areas, each of which has specific requirements in addition to the basic master's degree curriculum. The epidemiology focus is for those wishing to develop research skills for work in research, advocacy, or policy organizations; the MCH program planning and policy focus is geared toward those interested in policy formulation or program design and management.

The 40-credit SM program is intended to prepare students for research careers in public and private agencies. Applicants eligible for the 40-credit program are established practitioners or investigators holding prior master's or doctoral degrees in the social/behavioral sciences, health care, or a public health field. Students in this program must fulfill the schoolwide requirements and earn 15 credits in departmental courses. They should work closely with their advisers to develop a study plan to meet their particular academic and career goals.

Master of Science in Society, Human Development, and Health (HSPH 40-credit program) and Parent-Child Nursing or Women's Health (Simmons College 40-credit program)

This professional, dual-degree program, which requires that 40 credits be earned at HSPH and 40 at Simmons, is designed to prepare nurse practitioners for leadership roles in child, youth, women's, or school health programs. Recent graduates have taken such positions as director of clinical services for the Family Planning Association of Maine and staff director for the World Health Organization Maternal Health and Safe Motherhood Program.

Applicants should hold a bachelor's degree from a program accredited by the National League for Nursing, a license to practice nursing, and the equivalent of at least three years of full-time nursing experience. International nurses with equivalent backgrounds are eligible to apply. Applicants must meet the general admission requirements of both HSPH and Simmons College.

Students enroll in half-time study at both Simmons College and HSPH for two academic years, in addition to studying at Simmons for one summer session. The curriculum of the HSPH portion of the program is the same as that for the 40-credit SM program. Continued matriculation is dependent on maintaining satisfactory academic progress in both programs.

Doctor of Science in Society, Human Development, and Health/Doctor of Public Health

The doctoral program provides a common core education addressing issues of society, human development, and health at the same time as developing expertise in one of the four previously described areas (health and social policy, human development, planned social change, and the social determinants of health). Students select one of the four areas of interest as their major. Students in the MCH concentration complete the normal requirements for the doctoral program. They select one of the four areas of interest as a major and complete a minor in maternal and child health. All students should consult the department's Curriculum and Advising Guide for a listing of required courses in each area.

Current and recent doctoral students in the department have undertaken dissertation research projects on the following topics: socioeconomic position, allergic disease, and cancer risk; cross-national comparisons of perinatal care technologies on neonatal survival; poverty, policy, neighborhoods, and health; effectiveness of public policies for children with disabilities; social influences on health behaviors of college students with same-sex experience; depressive symptoms in postpartum women; gender inequality and health; measurement and social and physical contexts of physical activity; and cost-effectiveness of lead-poisoning prevention programs.

Recent graduates have taken such positions as Epidemic Intelligence Service officer at the Centers for Disease Control and Prevention (CDC) in Atlanta, postdoctoral fellow at the National Development and Research Institute in New York, research scientist at Harvard University, project officers in philanthropic foundations, and assistant professors at schools of public health and medical schools. Graduates are pursuing careers in academia, government, and nonprofit organizations as leading researchers, teachers, policymakers, and program developers, such as chair of a department of obstetrics in Taiwan and chief of the lead-poisoning branch at the CDC.

Most students enter the doctoral program with a strong foundation in the social, behavioral, clinical, public health, or natural sciences and with an earned master's degree in a social science (such as sociology, psychology, economics, political science, public policy, and anthropology); clinical health (such as nursing and social work); public health (such as epidemiology and health education); or natural sciences (such as biology, physiology, and neurosciences).

For the SD the department accepts a small number of students without a master's degree directly into the program. Applicants to the DPH program must hold an MPH and a prior doctoral degree.

Limited funding is awarded on a competitive basis to qualified applicants in both master's and doctoral programs. Two training grants from the Maternal and Child Health Bureau support students in the MCH concentration. A fellowship for doctoral students is available in the area of cancer prevention, and some doctoral fellowships may also be available for underrepresented minorities. A limited number of universitywide presidential fellowships are available on a competitive basis to underrepresented minorities and to students from developing countries who are planning on public service or academic careers.

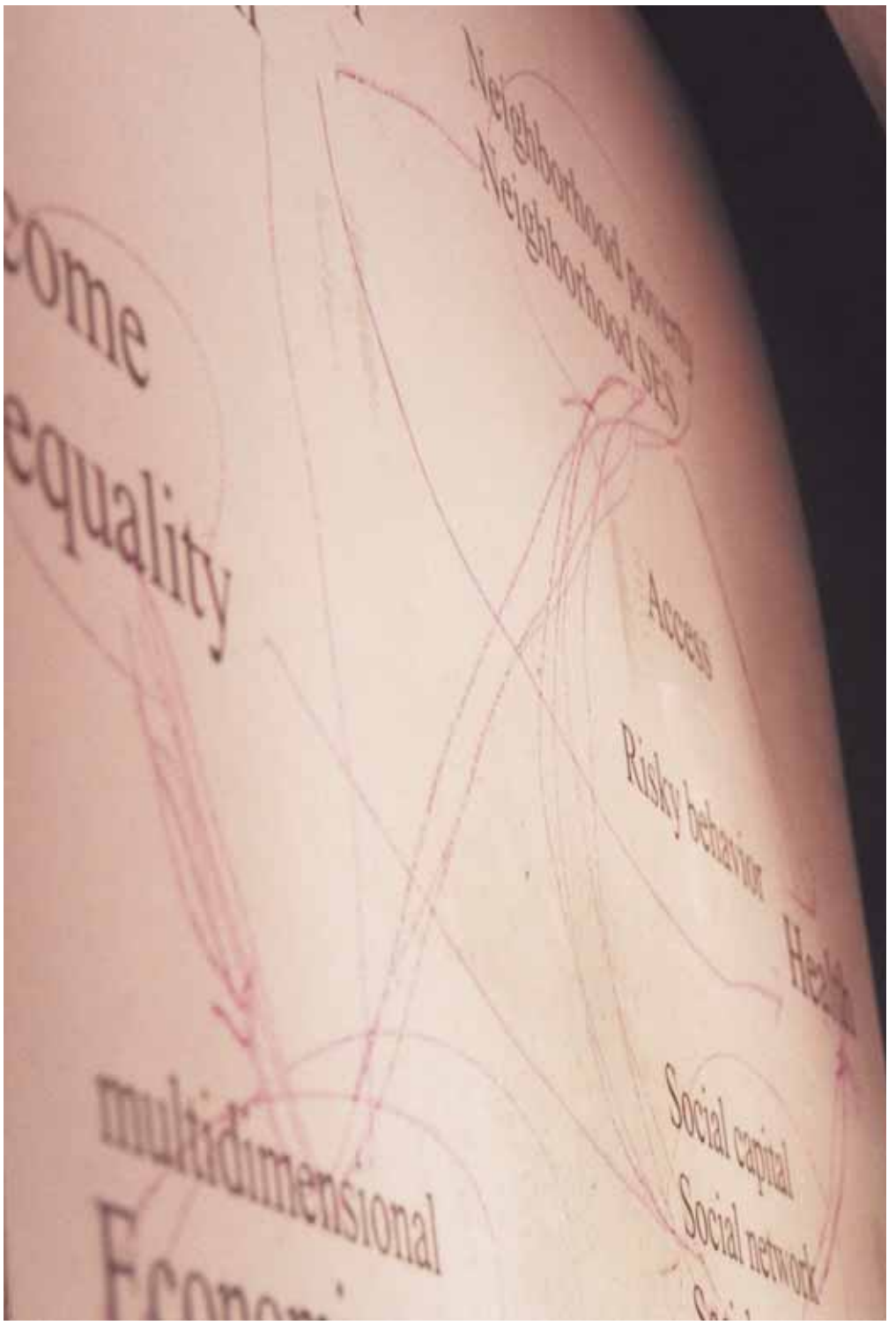
Traineeships have also been awarded in psychiatric epidemiology and aging. Students receive funding in other areas through research assistantships and their own grant applications.

Related Offerings

Interdisciplinary concentration in women, gender, and health, see page 56.
MPH concentration in family and community health, see page 52.

Contact Information

For more information about research and training in Society, Human Development, and Health, please contact Patricia Lavoie, Department of Society, Human Development, and Health, 677 Huntington Avenue, Boston, MA 02115.
Phone: 617-432-3762
Fax: 617-432-3755
Email: tlavoie@hsph.harvard.edu



DEPARTMENT FACULTY

Please note that some faculty members may be on leave during academic year 2004–05.

Department chair: Lisa F. Berkman, MS, PhD; Thomas D. Cabot Professor of Public Policy. Social epidemiology; epidemiology of aging.

Dolores Acevedo-Garcia, MPA, PhD; Assistant Professor of Society, Human Development, and Health. Effects of residential segregation on minority health; health effects of welfare reform and immigration policies on U.S. immigrants and citizens.

Iain W. Aitken, MB, BChir, MPH; Lecturer on Society, Human Development, and Health. Maternal health care; management of primary health care workers; design and financing of urban health care systems in developing countries.

Elizabeth M. Barbeau, MPH, ScD; Assistant Professor of Society, Human Development, and Health. Workplace health and safety policy; work-site cancer prevention; tobacco policy; health inequalities.

COURSES OF INSTRUCTION

Please note that the courses listed are subject to change and some are not offered every year. Complete course descriptions are available at http://www.hsph.harvard.edu/registrar/courses.

Physical Growth and Development

Nutrition in Child Health and Development

Nutritional Surveillance

Biological and Clinical Foundations of Reproductive and Child Health

Social Epidemiology

Reproductive Health Care in Developing Countries

Community-Based Child Health Programs in Developing Countries

Mental Health of Children and Adolescents

Media and Health Communication: Practical Skills

Practicum in Program Assessment, Monitoring, and Evaluation

Human Development and Public Health: A Life-course Approach

Society and Health

Communication in Health Care Settings

Race, Ethnicity, and Health: Perspectives from Social and Behavioral Sciences

Adolescent Health

Women, Health, and Development: Reconciling Science and Policy

Health Promotion Through Mass Media

Developmental Disabilities I: Evaluation, Assessment, and Systems

Developing Radio Communications

Developmental Disabilities II: Value, Policy, and Change

History, Politics, and Public Health: Theories of Disease Distribution

Childbirth Health Policy and Epidemiology

Introduction to High-Risk Behavior: Epidemiology, Prevention, and Public Policy

Society and Its Effects on Child Health

Psychosocial Theories of Health and Health Behavior

Social Services for Children, Adolescents, and Families

Services for Children with Disabilities

Health and Social Policy in the Workplace

Psychosocial Aspects of Aging

Future Health Communication: New Media and Emerging Technologies

Community Intervention Research Methods

Child Abuse and Neglect: Current Topics

SHDH Department Proseminar

Public Health Genetics: Contemporary Issues and Challenges

Qualitative Research Methods for Public Health

Practice of Preventing Intimate Partner Violence

Social Policy and Legal Dilemmas: Child Custody and Visitation

Applied Methods for Secondary Data

Multilevel Methods for SHDH Statistical Research: Concept and Application

Analytic Techniques of Secondary Data

Social and Behavioral Research Methods

Issues in MCH Programs and Policies

Introductory Physiology and Social Determinants of Health

Approaches to International Tobacco Control

Inequality and Health

Violence Against Women

SHDH Master's Seminar

Doctoral Seminar on Society, Human Development, and Health

Innovative Strategies in Health Education

Health Literacy

Methods for Research on Social and Behavioral Dimensions of Public Health

Planned Social Change

Personality and Cognitive Development: Application to Public Health

MCH Doctoral Seminar

Policy Analysis Methods for Public Health

Advanced SHDH Doctoral Seminar

Place, Migration, and Health

Health and Social Policy Doctoral Seminar

Leadership in Minority Health Policy

Issues in Minority Health Policy

Clinical Effectiveness Seminar

Infant Assessment in the Context of Perinatal Exposure

Independent Study, Tutorials

Gary G. Bennett, MA, PhD; Assistant Professor of Society, Human Development, and Health. Social/pychosocial determinants of racial and ethnic disparities in chronic disease morbidity and mortality; development of web-based health behavior change interventions.

Stephen L. Buka, SM, SM, SD; Associate Professor of Society, Human Development, and Health and of Epidemiology. Causes and prevention of behavioral and developmental disorders of children.

Felton J. Earls, MD; Professor of Human Behavior and Development. Longitudinal research to understand how community, family, and individual factors influence delinquent and criminal behavior.

Karen M. Emmons, MA, PhD; Professor of Society, Human Development, and Health. Cancer prevention; smoking and health effects of environmental tobacco smoke; health care and community-based interventions.

Michael L. Ganz, MS, MPhil, PhD; Assistant Professor of Society, Human Development, and Health. Relationship between socioeconomic factors, behaviors, ecologic factors, and maternal and child health measures.

Steven L. Gortmaker, SM, PhD; Professor of Society, Human Development, and Health. Statistical evaluation methods; socioeconomic position and child health; social, behavioral, environmental, and policy influences on obesity and other chronic conditions.

S. Jody Heymann, MPP, MD, PhD; Associate Professor of Society, Human Development, and Health. Influence of social, labor, education, and poverty policies on health; strategies for decreasing the incidence and impact of diseases burdening poor and marginalized populations.

Ichiro Kawachi, MD, PhD; Professor of Social Epidemiology. Social inequalities in health, especially related to income distribution; stress and cardiovascular disease; quality of life and healthy aging; tobacco control.

Nancy Krieger, MS, PhD; Associate Professor of Society, Human Development, and Health. Social inequalities in health, especially regarding race/ethnicity, social class, and gender; cancer, especially breast cancer; cardiovascular disease, especially hypertension.

Laura D. Kubzansky, MSc, PhD, MPH; Assistant Professor of Society, Human Development, and Health. Psychosocial determinants of health; social inequality and health; emotion and cardiovascular disease.

Laura A. McCloskey, PhD; Associate Professor of Society, Human Development, and Health. Origins and sequelae of wife and child abuse; family origins of child psychopathology; women's mental health and victimization; posttraumatic stress.

Marie C. McCormick, MD, ScD; Sumner and Esther Feldberg Professor of Maternal and Child Health. Infant mortality; outcomes of high-risk neonates and interventions to ameliorate adverse outcomes.

Beth E. Molnar, SM, SD; Assistant Professor of Society, Human Development, and Health. Child and adolescent mental health; family violence and abuse; psychiatric epidemiology.

Karen E. Peterson, RD, SD; Associate Professor of Nutrition and Society, Human Development, and Health. Epidemiology of malnutrition in industrialized and developing countries.

Rima E. Rudd, MSPH, ScD; Senior Lecturer on Society, Human Development, and Health. Public health and adult education pedagogy; normative change and change strategies, including small-group communications and social marketing.

Jay G. Silverman, PhD. Assistant Professor of Society, Human Development, and Health. Effects and prevention of intimate partner violence against adolescents and adult women.

Glorian Sorensen, MPH, PhD; Professor of Society, Human Development, and Health. Cancer prevention in the workplace; intervention research in community and occupational settings.

S. V. Subramanian, MA, MPhil, PhD; Assistant Professor of Society, Human Development, and Health. Application of multilevel methodologies for analyzing complex socioeconomic data structures.

Kimberly M. Thompson, MS, SD; Associate Professor of Risk Analysis and Decision Science. Analysis of the risks, costs, and benefits of using airbags as life-saving devices; applications of value of information techniques to environmental health decisions.

K.Viswanath, MCJ, MA, PhD; Associate Professor of Society, Human Development, and Health. Mass media and public health; communication and social inequities in health; risk communication; new media developments in health communication.

Henry Wechsler, AM, PhD; Lecturer on Society, Human Development, and Health. Alcohol and drug use and related high-risk behaviors among youth; epidemiologic, preventive, and public policy approaches to substance-abuse prevention.

Secondary Appointments

(primary appointments at Harvard Medical School)

Allen C. Crocker, MD; Associate Professor in the Department of Society, Human Development, and Health. Chronic illness and developmental disabilities in children; mechanisms of disability.

Barbara Gottlieb, MD, MPH; Assistant Professor in the Department of Society, Human Development, and Health. Women's health; unintended pregnancy; depression; minority and community health; adolescent and school health.

Charles J. Homer, MD, MPH; Associate Professor in the Department of Society, Human Development, and Health. Application of epidemiologic methods to assess the effectiveness of health care services.

Ellice S. Lieberman, MD, MPH, DPH; Associate Professor in the Department of Society, Human Development, and Health. Perinatal epidemiology; risk factors for adverse pregnancy outcomes; assessment of new technologies and care practices in obstetrics.

Judith S. Palfrey, MD; Professor in the Department of Society, Human Development, and Health. Development of preschool children; interface of health and educational services for children.

Joan Y. Reede, MD, MPH, SM; Assistant Professor in the Department of Society, Human Development, and Health. Biomedical manpower and academic/research career development; health services to and impact of health policy on minority and other populations.

Michael O. Rich, MD, MPH; Assistant Professor in the Department of Society, Human Development, and Health. Children's health and communications media; the illness experience from the patient's perspective.

Benjamin P. Sachs, MD, BS, MRCS, LRCP, DPH; Professor in the Department of Society, Human Development, and Health. Epidemiology and health policy relating to women and children in technological evaluation, infant mortality, and medical services.

Edward C. Tronick, MS, PhD; Associate Professor in the Department of Society, Human Development, and Health. Neurodevelopment of infants and children exposed to drugs in utero; depressive symptoms and mother-infant interaction.

Adjunct Faculty

Norman B. Anderson, MA, PhD. American Psychological Association.

Robin J. R. Blatt, MPH. Massachusetts Department of Public Health.

Mary Jean Brown, SM, SD. National Center for Environmental Health, Centers for Disease Prevention and Control.

H. William DeJong, MA, PhD. Boston University School of Public Health.

Johanna T. Dwyer, SM, SM, SD. Stern Nutrition Center, Tufts Medical Center.

Roberta E. Goldman, MA, PhD. Boston University School of Medicine.

David T. Helm, MA, PhD. Children's Hospital.

Daniel J. Kindlon, MS, PhD. Consultant.

Lawrence C. Kleinman, MD, MPH. Psychologist in private practice.

Michael G. Marmot, MB, MPH, PhD. International Centre for Health and Society, University of London, United Kingdom.

Anne M. Stoddard, SM, SD. New England Research Institute.

Norma M. Swenson, MPH. Consultant.

Lisa Tieszen, MA. Beth Israel Deaconess Medical Center.

Deborah K. Walker, EdM, EdD. Programs and Prevention, Massachusetts Department of Public Health.

INTERDISCIPLINARY PROGRAMS

> "I wanted to do an MPH—to focus on things I had already been doing but to learn to do them better."

ONDREJ MACH
Master of public health student

Motivated by a "probably naive" sense of idealism and the desire to experience different cultures, Ondrej Mach left Prague right after his medical studies at Charles University to work for two years as a general practitioner in rural Bolivia. He next accepted a deployment to Bosnia from the International Medical Corps. Arriving in 1995, just after the Srebrenica massacre, Ondrej provided vaccinations and primary care services in the Muslim enclaves. He extended his work to the equally ravaged Serbian sectors after the Dayton accord.

Three years later, posted by the IMC to Burundi, Ondrej established a center in the north for severely malnourished children, many of whom had been displaced by civil war. "Six percent of all children under five were so severely malnourished that they would die without treatment," he says. Ondrej also went to Ingushetia to help implement a program for Chechen refugees.

His many journeys finally led him to Boston, where he is currently a part-time master of public health student at HSPH, as well as a fellow at the International Emergency Medicine and Health, based at Brigham and Women's Hospital. "I wanted to do an MPH—to focus on things I had already been doing but to learn to do them better," he says. He is finding the quantitative and human rights training high points of his program.

After graduation this June, Ondrej will enter the Centers for Disease Control and Prevention's Epidemic Intelligence Service. Not surprisingly, he hopes to work with refugees.

MASTER OF PUBLIC HEALTH PROGRAM

The master of public health (MPH) degree is the most widely recognized professional credential for leadership in public health. The program emphasizes active, student-directed learning, problem solving, and the acquisition of skills essential to the practice of public health. The program is organized around seven career-oriented concentrations (see below). In addition to the common core curriculum, each concentration offers specialty electives and a selection of areas of interest, allowing students to explore in depth one or more spheres of particular relevance to their career goals. The concentrations and areas of interest enable students in the interdisciplinary MPH program to establish a second "home" in one of the school's academic departments, such as Health Policy and Management or Population and International Health.

Coming from all parts of the world, MPH students bring a wide variety of backgrounds and experiences to the program. The majority of these students are health professionals, with a minimum of three to five years of work experience, who are preparing for advancement in their organizations or for transition into new fields. The MPH program is geared toward professionals who hold a doctoral degree in medicine (or foreign degree equivalent), dentistry, veterinary medicine, law, or other fields related to public health (for example, biology, behavioral sciences, or natural and social sciences) or a master's degree in nursing. Individuals with a master's degree in a field closely related to public health and at least three years of related work experience may also be considered for admission to the program. Preference is given to applicants with clearly identified career goals relevant to the program and who demonstrate a strong academic background. Those without the required professional training or experience should consider a master of science program offered by one of the HSPH departments.

Students enrolled in MD, DMD, or DDS programs (and some law students) who have a career interest in public health and/or preventive medicine are also eligible to apply for admission to the MPH program. Medical and dental students undertake the MPH program while on leave of absence between the third and fourth year of medical or dental school. They receive the MPH degree upon successful completion of both programs and conferral of the doctoral degree. The MPH program serves as a required academic year for residency training in general preventive medicine, aerospace medicine, or occupational and environmental medicine.

Students accepted to Harvard Law School may simultaneously pursue an MPH under Harvard's JD/MPH joint degree program. Prospective students apply to the joint program either concurrently with their application to Harvard Law School or during their first year of law school. HSPH course work begins in the summer following the first year of law school and continues over the next two years.

MPH students are required to complete a minimum of 40 course credits and must fulfill core requirements in the fundamental public health disciplines (see page 58) and a course on the ethical basis of the practice of public health. Within their selected concentration students choose a second tier of recommended or required courses and complete a practice course, which generally serves as the required culminating experience, following concentration guidelines. Beyond the program and concentration requirements, students are encouraged to consult with faculty advisers to choose elective courses best suited to their needs. Requirements and concentration guidelines are available from the Office for Professional Education.

MPH candidates may complete the requirements for the degree on a full-time or part-time basis (or may change from one status to the other). Full-time students normally complete the program in two consecutive semesters (September through May). Part-time students complete the requirements for the degree over a period of two or three years. Students may elect to begin their course work in July by enrolling in the Summer Session for Public Health Studies; those interested in this option should contact the Office for Professional Education for guidance.

A summer-only MPH program is also available for students in two concentrations: quantitative methods and clinical effectiveness. The program can be completed by taking courses in three consecutive enrollments in the Summer Session for Public Health Studies; students in this program can also take courses during the HSPH WinterSession. Students wishing to apply for the summer MPH in

quantitative methods or clinical effectiveness must observe the same admissions deadlines as all MPH degree applicants.

Concentration goals and areas of interest are described below:

Clinical effectiveness Concerned with identifying the most appropriate, ethical, and cost-effective means of providing health care through prevention, early detection, or treatment, the concentration is designed to provide the analytic and quantitative training necessary to evaluate clinical practices. Major areas of professional interest for concentrators include clinical epidemiology and biostatistics, cost-effectiveness analysis, medical decision analysis, health services research, quality improvement in health care, and measurement of health-related quality of life. The concentration is limited to clinicians enrolled initially in the Summer Program in Clinical Effectiveness.

This concentration prepares physicians for clinical research responsibilities and for leadership roles in evaluating and improving all aspects of health care delivery. Along with the broad perspective the program offers on general aspects of public health, this training provides a basis for identifying the health policy implications and public health benefits of the results of clinical investigations.

Family and community health This concentration focuses on the promotion of health and the prevention of disease, especially in more vulnerable populations. Course work emphasizes strategies for needs assessment and establishment of health objectives, data collection and analysis, leadership skills, consultation, communication, advocacy, and policy formation in the public sector. Beyond the MPH core requirements students are encouraged to develop expertise in a focus area geared to their professional interests. Areas of interest include maternal and child health, women and health, mental health, violence and substance abuse, health disparities, community health, health promotion, and disease prevention.

The program prepares students for working in diverse spheres, including federal, state, and local government; advocacy groups; voluntary health organizations; and community-based primary care settings in the United States and other countries. Posts filled by graduates of this concentration include state health director; medical director of programs for child, adolescent, or women's health; health policy analyst; and health educator. Other graduates have gone on to academic positions.

Health care management This concentration offers training with either a management or a policy focus. In addition to fulfilling the MPH core requirements, students select from clusters of courses to gain depth in their chosen area. Students choosing the management area of interest take courses providing practical management skills, such as finance and financial analysis, operations, marketing, information systems, quality improvement, management of people, and strategy determination. Students selecting the policy focus take courses in health economics, political science, and applied policy in areas like payment systems, insurance, mental health and substance abuse, community health, and health promotion and disease prevention.

Graduates assume leadership positions in health care organizations that provide direct care (such as hospitals, group practices, and home health agencies), those that pay for and/or organize health care (such as governments, health insurers, and health maintenance organizations), and those that supply direct-care providers (such as pharmaceutical companies and biotechnology firms). Program graduates fill many roles—from consultants and staff analysts to middle-management and executive positions.

International health This concentration enables students to work toward health improvement by taking account of demographic and epidemiologic changes; the organization of health care and evolving patterns of health care demand; new scientific knowledge and technology; and the roles of professionals in policy, law, communications, and advocacy. It also assists them in finding new ways to strengthen national and institutional capacities for health policy-making and management. The international health concentration has several areas of professional interest, including international health policy and management; population, reproduction, and child health; infectious disease epidemiology; research and evaluation methods; health promotion; and humanitarian studies. The last area focuses on population support during war, civil conflict, or disaster and features a three-month summer field placement.

The program is intended to prepare health professionals with prior international health experience for leadership roles in the practice of international health, with a special emphasis on the populations in developing countries. Graduates of the program work in national ministries of health, international organizations, donor aid agencies, private voluntary organizations, research and academic institutions, and the private sector.

COURSES OF INSTRUCTION

Please note that the courses are subject to change.

Practice of Family and Community Health

Practice of Health Care Management

Ethical Basis of the Practice of Public Health

Practice of Quantitative Methods

Summer MPH Practicum and Culminating Experience

Field Study Experience

Law and public health The course of study introduces lawyers to the science of public health, provides them with skills in analysis of public health problems, and allows them to design a curriculum that will meet their particular interests. Beyond the MPH core requirements, which include three law-related courses, lawyers are encouraged to develop an area of interest by choosing elective courses in a specific field such as health care delivery or environmental health.

The concentration is designed to train leaders in the field of public health law. Graduates are prepared for careers in a variety of settings, including health or environmental law work in a law firm, nongovernmental organization, or in-house counsel's office; policy positions in local, state, and federal government; or posts in academia.

Occupational and environmental health This concentration focuses on workplace and environmental hazards, the physiologic and biomechanical aspects of work, the risks posed by the interaction of genetic and environmental factors, and a practical approach to solving health problems in various work and community settings. The concentration features three areas of interest: occupational/environmental medicine, occupational health, and environmental health.

The program is designed for physicians and other professionals who intend to practice occupational/environmental medicine or to hold responsible positions in occupational and/or environmental policy and management. The occupational/environmental medicine area fulfills the first-year requirements of the two-year Occupational and Environmental Medicine Residency. This area is also intended for other physicians who wish to satisfy the didactic requirements of the American Board of Preventive Medicine for certification in occupational and environmental medicine. The requirements for the master of occupational health (MOH) degree are similar to those of the MPH in occupational medicine; physicians may elect either degree.

Quantitative methods The concentration emphasizes study design, data analysis, and the application of quantitative methods to decision making and to research in public health. Beyond the MPH core requirements concentrators must take an additional 2.5 credits of introductory epidemiology and 7.5 credits in intermediate/advanced biostatistics, epidemiology, or decision sciences and an approved practice course in the Spring 2 term. At HSPH and elsewhere within the university, concentrators may choose from advanced quantitative courses that include biostatistics, epidemiology, decision sciences, demography, needs assessment, and evaluation.

The program is geared toward health professionals requiring analytical and statistical skills for successful public health practice and research. It is designed for both midcareer health professionals and those in the early stages of their careers. Program graduates commonly supervise population-based health research in government, health care institutions, and private industry. Many graduates practice in academic medicine.

Related Offerings

Master of occupational health, see page 11.
Occupational and Environmental Medicine Residency, see page 12.
Summer Program in Clinical Effectiveness, see page 57.
Summer Session for Public Health Studies, see page 57.

Contact Information

For more information about the MPH program or the summer MPH in quantitative methods or clinical effectiveness, please contact Roberta Gianfortoni, assistant dean for professional education, Office for Professional Education, 677 Huntington Avenue, Boston, MA 02115.
Phone: 617-432-0090
Fax: 617-432-3365
Email: roberta@hsph.harvard.edu
Web: http://www.hsph.harvard.edu/mph

> As soon as I learned about DNA replication in my high school biology class, I thought, that's it! That's what I want to do with my life.

TIFFANY DESIMONE

PhD student, Division of Biological Sciences

Tiffany DeSimone recalls, "As soon as I learned about DNA replication in my high school biology class, I thought, that's it! That's what I want to do with my life."

The general choice of career resolved early on, Tiffany studied biology at Barnard College in New York City and worked in laboratories at Unilever Research, the Sackler Institute at New York University, Barnard, and Rutgers University. She assessed the efficacy of skin-care products, isolated antimicrobial peptides in hag fish, and examined the effects of ozone on pulmonary microphages. Along the way, she discovered that her passion was parasitology. She says, "What really interests me is host-parasite cross-talk."

Tiffany was planning to study immunology at Harvard Medical School but was advised that the HSPH program in immunology and infectious diseases would be a better fit. Now almost a year into her studies, she has found her research home in Dr. Manoj Duraisingh's malaria lab. She is investigating the pathways used by the malaria parasite to invade the red blood cells.

Tiffany is currently learning toward a position in industry so she can concentrate on research unencumbered by the funding obligations of heading an academic lab. Ultimately she would like to contribute to drug development. In the meantime, she says, she is thriving on the school's "learning atmosphere. I am never made to feel stupid when I make a mistake."

DIVISION OF BIOLOGICAL SCIENCES

The Division of Biological Sciences is an umbrella organization encompassing the HSPH Departments of Environmental Health, Genetics and Complex Diseases, Immunology and Infectious Diseases, and Nutrition. In most of these departments, two doctoral degrees are offered: the doctor of philosophy (PhD) and the doctor of science (SD). The PhD programs generally center on laboratory-based investigation in the biological sciences, whereas the SD programs emphasize epidemiological analysis. The PhD program is administered by the Division of Biological Sciences.

Doctor of Philosophy in Biological Sciences in Public Health

Students wishing to study cellular and molecular biology or physiology as it pertains to major problems in public health should apply to the PhD Program in Biological Sciences in Public Health (BPH). This program offers the PhD degree through the Harvard University Graduate School of Arts and Sciences.

Graduates ordinarily assume positions as faculty members and research scientists in graduate schools, medical schools, research institutes, or schools of public health. Career opportunities in the biological sciences as they apply to public health are expected to grow both in academia and in the biotechnology and pharmaceutical industries.

Applicants to the program generally have a bachelor's degree and demonstrated competence in organic and biological chemistry, general biology, physics, and calculus. Those deficient in one of these areas may be admitted provisionally on the condition that appropriate courses will be taken before and/or after entering the program. Applicants are required to take the GRE general test in time to meet the application deadline of December 8, 2004. Please note that Graduate School of Arts and Sciences application forms must be used when applying to the PhD Program in Biological Sciences in Public Health.

The BPH program offers a firm foundation in the basic biomedical sciences, as well as in epidemiology and biostatistics. The program also features interdisciplinary training, with students taking courses in several different departments to meet their individual requirements. All students complete core course requirements in biochemistry, cell biology, genetics, microbiology, and physiology and elective courses during their first two years of study. Elective courses cover principles of toxicology, introductory cancer biology, genetic toxicology, cell response to mutagens and carcinogens, human physiology, advanced respiratory physiology, advanced topics in physiology, immunology, cellular and molecular biology of parasites, and the science of human nutrition.

Participating HSPH departments offer PhD programs in the following areas:

- genetics and complex diseases (molecular mechanisms of adaptive responses to stress; molecular and cellular toxicology; radiobiology; nutritional biochemistry; genetic and molecular mechanisms of chronic diseases such as obesity, diabetes, and cancer)
- environmental health (physiology)
- immunology and infectious diseases (immunology and molecular biology of parasitic and other infections)
- nutrition (biochemistry; cardiovascular biology)

All students admitted to the PhD program receive a stipend, as well as tuition and health insurance support. Students are encouraged to apply for fellowships from outside sources since certain external fellowships provide higher stipends. While funds to support international students are limited, one special scholarship is available each year for a student from a developing, sub-Saharan African country. Harvard University Presidential Funds also support international doctoral students. A universitywide fellowship program provides funding to qualified underrepresented minority students in the sciences.

Contact Information

For the PhD Program in Biological Sciences in Public Health, online submissions are encouraged, using the Graduate School of Arts and Sciences (GSAS) application form available at the web address below:
Web: http://www.gsas.harvard.edu/admissions/apply.html

To request the required GSAS application in hard copy, please visit this web address:
Web: http://www.gsas.harvard.edu/admissions/application.html

Applicants with specific questions about the PhD program may contact Ruth Kenworthy, administrator, Division of Biological Sciences, 665 Huntington Avenue, Boston, MA 02115.
Phone: 617-432-2932
Fax: 617-432-4033
Email: bph@hsph.harvard.edu
Web: http://www.hsph.harvard.edu/bph

COURSES OF INSTRUCTION

Please note that the courses listed are subject to change.

Biological Sciences Seminars

Pathophysiology of Human Disease

Independent Study, Laboratory Rotations

DIVISION OF PUBLIC HEALTH PRACTICE

THE DIVISION OF PUBLIC HEALTH practice serves as a conduit between the work of HSPH academic departments, governmental and corporate agencies, and the community. The division's mission, "translating passion and learning into advances that protect the health of all," encompasses education, research, and service. Through education the division ensures that its students graduate with the core competencies of public health, including assessment, policy formulation, program development, and quality assurance, and with the vision to become effective public health leaders. Through research the division advances current methods of collaborative inquiry to evaluate questions raised in community-based public health practice, and also addresses the broader policy issues concerning the health effects of social inequality. Through service the division enhances the health of underserved communities by fostering collaborative efforts between HSPH faculty, staff, and students and community-based organizations, health departments, health care providers, and public policymakers to develop and implement sustainable innovative strategies. Programs included under the umbrella of the division are the Yerby Postdoctoral Fellowship Program and programs in conflict resolution, health disparities, health policy, national leadership initiatives, public health preparedness, tobacco control, and violence prevention.

Contact Information

For more information on the Division of Public Health Practice or the programs sponsored by the division, please visit the division web address below:
Web: http://www.hsph.harvard.edu/php

You may also contact Betty Johnson, assistant director for training and curriculum development, Division of Public Health Practice, 1552 Tremont Street, Boston, MA 02120.
Phone: 617-496-8064
Fax: 617-495-8543
Email: bljohnso@hsph.harvard.edu

INTERDISCIPLINARY CONCENTRATION IN GENETIC AND MOLECULAR EPIDEMIOLOGY

MOLECULAR EPIDEMIOLOGY IS A focus of attention in several of the school's departments. Members of the Department of Biostatistics are developing new methods for understanding molecular and genetic parameters governing disease occurrence. In the Department of Environmental Health, ongoing research utilizes biomarkers of exposure and exposure-related disease, as well as gene-environment interaction. The Department of Epidemiology is conducting molecular research in disease mechanism, outcome, and susceptibility. Finally, researchers in the Department of Nutrition are examining whether variation in enzymes that metabolize nutrients and various signaling and transport pathways alter the relations of diet and disease. Prospective doctoral students must apply to one of the participating departments, and the degree will be issued from that department. Students are responsible for completion of degree requirements in biology, genetics, exposure assessment, and epidemiology.

Contact Information

For more information about research and training in genetic and molecular epidemiology, please contact Karl T. Kelsey, MD, MOH, Department of Cancer Cell Biology, 665 Huntington Avenue, Boston, MA 02115.
Phone: 617-432-3313
Fax: 617-432-0107
Email: kelsey@hsph.harvard.edu

INTERDISCIPLINARY CONCENTRATION IN THE EPIDEMIOLOGY OF INFECTIOUS DISEASE

EDUCATION AND RESEARCH ON aspects of infectious disease occur in a number of HSPH departments, including the Departments of Biostatistics, Epidemiology, Health Policy and Management, Immunology and Infectious Diseases, and Population and International Health. These departments participate in the interdisciplinary concentration in the epidemiology of infectious disease, which focuses on population studies incorporating both epidemiologic and laboratory methods. This concentration is intended for those students who desire careers in research and teaching in infectious disease. Prospective students must apply to a degree program in one of the participating departments, which will issue the degree. Students are responsible for fulfilling the requirements of the home department in addition to the requirements of the concentration.

Contact Information

For more information about research and training in the epidemiology of infectious disease, please contact Alexander Villanueva, program coordinator, Department of Epidemiology, 677 Huntington Avenue, Boston, MA 02115.
Phone: 617-432-1498
Fax: 617-566-7805
Email: avillanu@hsph.harvard.edu

INTERDISCIPLINARY CONCENTRATION IN WOMEN, GENDER, AND HEALTH

THIS INTERDISCIPLINARY CONCENTRATION is geared toward students who desire careers in research, teaching, and programs related to women, gender, and health. Addressing issues of women, gender, and health requires the study of the health of women and girls—and men and boys—throughout the life course, with gender, gender equality, and biology understood as important and interacting determinants of well-being and disease. Prospective students may apply to any degree program in any department. Students must fulfill the requirements of the home department, which issues the degree, and the requirements of the concentration, which include core courses in women, gender, and health; gender analysis; and women's health.

Contact Information

For more information about research and training in women, gender, and health, please contact Corrine Williams, Department of Society, Human Development, and Health, 677 Huntington Avenue, Boston, MA 02115.
Phone: 617-432-3690
Fax: 617-432-3755
Email: williams@hsph.harvard.edu
Web: http://www.hsph.harvard.edu/wgh

COURSES OF INSTRUCTION

Please note that the courses listed are subject to change.

Women, Gender, and Health

Advanced Topics in Women, Gender, and Health

Women, Gender, and Health: Critical Issues in Mental Health

Women, Gender, and Health: Introductory Perspectives

RESEARCH CENTERS

HSPH HAS ESTABLISHED A NUMBER OF institutes and centers to advance research in areas of importance to public health. These efforts tend to be multidisciplinary in their approach, bringing together faculty members from several HSPH departments and in some cases from several faculties at Harvard University. Faculty affiliated with the centers offer courses in their field of interest through the school's academic departments and often provide opportunities for student involvement in research. Schoolwide research centers currently include the Center for Health Communication, François-Xavier Bagnoud Center for Health and Human Rights, Harvard AIDS Institute, Harvard Center for Cancer Prevention, Harvard Center for Population and Development Studies, Harvard Center for Society and Health, and the Harvard Injury Control Research Center.

ACADEMIC SUMMER PROGRAMS

SUMMER PROGRAM IN CLINICAL EFFECTIVENESS

THE SUMMER PROGRAM IN CLINICAL Effectiveness—affiliated with Brigham and Women's Hospital, Massachusetts General Hospital, and Harvard Medical School—is intended for physicians who have completed their residencies and wish to obtain the quantitative and analytical skills needed for careers in clinical research. Candidates must be fellows or faculty members and are usually sponsored by their clinical departments or divisions.

Students attend an intensive, seven-week, 15-credit summer program, comprising courses in biostatistics, epidemiology, and health policy and management. Upon completion of the summer program, qualified participants who apply and are admitted to a degree program may apply these academic credits toward the requirements for either a master of public health (MPH) or a master of science (SM) degree.

HSPH offers two specifically relevant degree programs: the MPH with a concentration in clinical effectiveness and the SM in epidemiology, with an area of interest in clinical epidemiology. Qualified participants may fulfill requirements for the summer-only SM in epidemiology by attending classes during a second summer period, or for the MPH in clinical effectiveness, by attending classes during second and third summer periods and by completing a supervised research project.

SUMMER SESSION FOR PUBLIC HEALTH STUDIES

THE HARVARD SUMMER SESSION FOR Public Health Studies introduces students to the core areas of public health in two intensive sessions. Courses in the program help students develop the ability to define, assess, and evaluate the health needs of populations; to participate in the development of health policy; and to ensure the delivery of health services.

Students in the Summer Session attend one or two sessions in July and August. The 2004 curriculum includes courses in biostatistics, epidemiology, health care management, health policy, ethics, environmental health, and social and behavioral science. Each course offers 2.5 credits, and the maximum recommended course load is 5 credits (two courses) per session. Because the course work is very intensive and fast paced, students registered for two courses in a session should not have other work commitments.

The Summer Session is intended for health professionals in training or those who are considering a midcareer change into public health and feel the need to develop their skills. Participants include public health professionals, primary care practitioners, physicians engaged in the evaluation of health care delivery and management, physicians in training (including preventive medicine residents and medical students in an MD/MPH joint-degree program), and candidates for a part-time MPH program. Students accepted for admission to an HSPH degree program may choose to begin their studies early by enrolling in the Summer Session; these students will have greater flexibility in course selection during the academic year. Other students may subsequently seek admission to an HSPH degree program. Students eligible for the MPH in the quantitative methods or clinical effectiveness concentrations may apply for a summer-only MPH, which must be completed in three consecutive summers.

Related Offerings

Clinical epidemiology area of interest, Department of Epidemiology, see page 17.
MPH concentrations in clinical effectiveness and in quantitative methods, see pages 52 and 53.

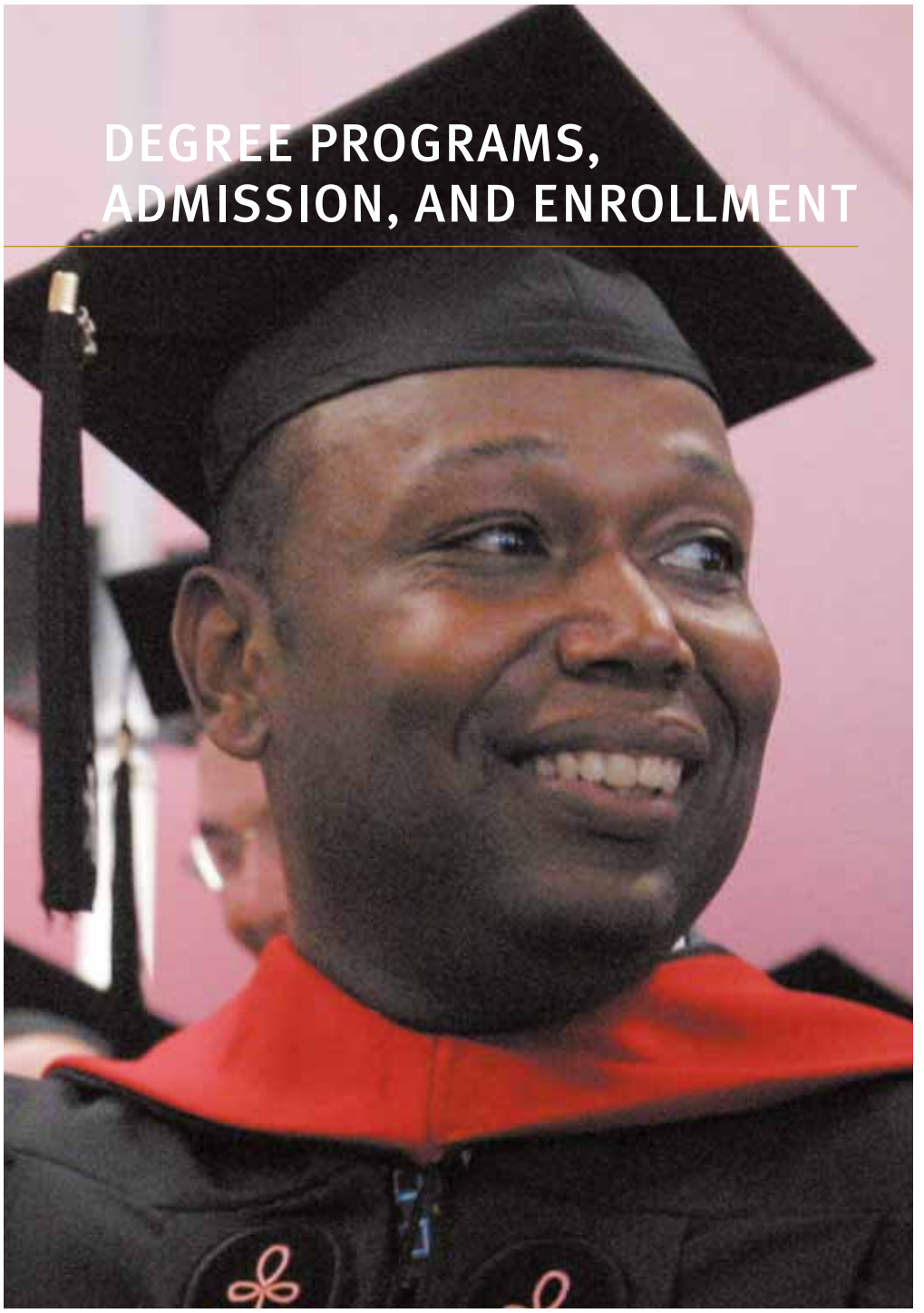
Contact Information

For information about the Summer Program in Clinical Effectiveness, or to request application materials, please contact Barbara Rosen, administrator, Program in Clinical Effectiveness, Division of General Medicine and Primary Care, Department of Medicine, Brigham and Women's Hospital, 1620 Tremont Street, Boston, MA 02120-1613.
Phone: 617-732-5648
Fax: 617-732-5344
Email: brosen@partners.org

For more information about the Summer Session, please contact Hildi Keary, administrative assistant for summer programs, Office of Enrollment Services, 677 Huntington Avenue, Boston, MA 02115.
Phone: 617-432-1052
Fax: 617-432-2009
Email: hkeary@hsph.harvard.edu
(specify Summer Session on subject line)
Web: http://www.hsph.harvard.edu/summer/brochure

For more information about the summer-only MPH degree program, please contact Roberta Gianfortoni, assistant dean for professional education, Office for Professional Education, 677 Huntington Avenue, Boston MA 02115.
Phone: 617-432-0090
Fax: 617-432-3365
Email: rgianfor@hsph.harvard.edu

DEGREE PROGRAMS, ADMISSION, AND ENROLLMENT



Degree Programs

The Harvard School of Public Health offers a number of degrees and degree programs (see inside front cover), reflecting a rich educational and research environment for students of many backgrounds and interests.

The degree programs have a range of purposes and requirements. Some master's programs are intended to prepare students for professional careers in public health; others focus on research training in preparation for doctoral study. The doctoral programs are designed for students with interests in the scientific basis of public health and preventive medicine who wish to pursue academic or research positions.

Schoolwide Degree Requirements

All HSPH degree programs require the completion of some course work intended to ensure basic competencies in public health sciences.

For all professional master's degree programs, students must fulfill core requirements in biostatistics, epidemiology, environmental health sciences, health services administration, and social and behavioral sciences. In addition, students must complete a culminating experience, demonstrating integration of public health knowledge, and/or a practice experience. For research-oriented master's degree programs, students must fulfill the core requirements in biostatistics and epidemiology.

Students in HSPH doctoral programs must adhere to the doctoral timetable for maintaining satisfactory progress and must fulfill the following schoolwide requirements: completion of course work in one major field (20 credits) and two minor fields (10 credits each) and courses in introductory epidemiology and intermediate biostatistics; completion of the schoolwide oral qualifying examination, usually by the end of the second year (some departments also require a written qualifying examination); completion of a program of independent and original research in one of the basic disciplines of public health; the presentation and submission of this research in a thesis and the public defense of the thesis; and payment of at least two years of full-time tuition and one year of full-time reduced tuition.

Prospective students should consult the descriptions in this catalog for more information about particular programs and their specific admission and degree requirements. The Student Handbook, distributed during fall registration, also provides detailed information about requirements, timetables, and procedures.

Admission to Degree Programs

The admissions information in this section pertains to applications for degree programs offered by the Harvard School of Public Health. Applicants should contact the Admissions Office or consult the web for complete instructions and application forms. Note that application forms for PhD programs, offered under the auspices of the Harvard University Graduate School of Arts and Sciences (GSAS), are different from those used by applicants to programs administered by HSPH; these forms must be obtained directly from GSAS. The GSAS application deadline is December 8, 2004, for the PhD in biological sciences and December 15, 2004, for the PhDs in biostatistics and in health policy.

Entrance requirements for HSPH programs vary considerably by degree and also by department. Minimal entrance requirements for HSPH degree programs are as follows:

- Master of public health and one-year (40-credit) master of science: Candidates normally hold a doctoral degree in medicine, dentistry, veterinary medicine, law, or other public health–related field, or a master's degree in nursing. In some cases applicants with a master's degree in a public health–related field may be considered.

- Two-year (80-credit) master of science: Candidates must hold bachelor's degree in a relevant field; some work experience may also be required.

- Master of occupational health: Candidates must hold a doctoral degree in medicine.

- Doctor of science: Candidates must hold a bachelor's degree in a relevant field; some programs also require the completion of a master's degree at HSPH before doctoral work can be undertaken.

- Doctor of public health: Candidates must hold a doctoral degree in medicine, dental medicine, or veterinary medicine, or an advanced degree in a basic public health discipline; in addition, applicants must have an MPH degree or be in progress toward an MPH degree or its equivalent.

Please consult the descriptions of specific programs for more information.

HSPH Application Deadlines

Applications may be submitted beginning on September 1, 2004.

December 15, 2004, is the deadline for complete applications for all HSPH doctoral (SD and DPH) and master of science (SM) programs.

December 15 is also the deadline for applications to the MPH and MOH programs in the priority admission cycle. February 15, 2005, is the deadline for completing applications to MPH and MOH programs for review in a second cycle. Applicants should be aware that these degree programs may fill to capacity during the priority admission cycle.

Participants in the Summer Clinical Effectiveness and Summer Session programs matriculating in the 2005 summer program and wishing to apply for degree candidacy must meet application deadlines outlined above.

Applicants to the MPH or MOH programs who wish to participate in the Occupational and Environmental Medicine Residency must apply by September 1, 2004.

Application Procedures and Requirements

Applicants are encouraged to apply online. Only applications that are complete will be processed and reviewed for admission. For an application to be considered complete, the Admissions Office must receive the following application materials by the deadlines indicated above:

- A completed and signed application form, a resume, and a 500-word essay written by the applicant. The essay should describe the applicant's academic and professional history, area of interest at HSPH, reasons for wanting to enroll in the degree program, and professional or academic career plans upon completion of the program.

- Official transcripts from all colleges, graduate schools, and/or professional schools attended, whether or not the courses taken appear to be relevant to a degree in public health. Applicants are expected to have a distinguished undergraduate record, as well as excellent performance in any graduate work undertaken.

- Letters of recommendation from at least three people who are well acquainted with the applicant's academic work and/or professional experience (recommendation forms are provided in the application packet).

- Official scores of the Graduate Record Examination (GRE). While GRE scores are strongly preferred, some other tests may be substituted in circumstances specified in the application packet. The requirement for scores from a standardized test will not be waived on the basis of academic or professional background.

- Official scores of the Test of English as a Foreign Language (TOEFL), if applicable. Applicants (including those who have been U.S. citizens or permanent residents for less than one year) from countries where English is not the language of instruction must submit a score from the TOEFL. Those who have already taken the TOEFL may submit the score as long as it is not more than two years old. The International English Language Testing System (IELTS) exam will be accepted if the applicant's score is 7.0 or above.

- A nonrefundable application fee of U.S. $60, in the form of a check drawn on a bank in the United States, a postal money order, or an international money order payable to the Harvard School of Public Health.

Applicants may apply to only one degree program and must satisfy the requirements of the department or program to which they are applying. Those applying to joint degree programs (JD/MPH or MD/MPH) with other schools at Harvard must satisfy the entrance requirements to both schools. Applicants to doctoral programs must demonstrate the ability to undertake original research. All prospective students must apply for either full-time or part-time status. Most international students are eligible for full-time study only.

Admission is granted for the fall semester of a particular year (currently September 2005). Students unable to enroll at that time may request a deferral but may be required to reapply.

Application Review

Applicants are notified as soon as possible (in writing) about the status of their application. The Admissions Office will either confirm that an application is ready for review or will specify any missing documents. The decision of the Committee on Admissions and Degrees is final and is not subject to appeal. Applicants may apply a maximum of three times.

For all HSPH programs the Committee on Admissions and Degrees considers the academic ability of applicants, the relevance of their previous education and experience, and their overall qualifications for graduate education in public health, including those qualities of character that reflect upon an individual's suitability to be a public health professional. In decisions about admission and financial aid, HSPH does not discriminate against individuals on the basis of race, color, sex, sexual orientation, religion, age, national or ethnic origin, political beliefs, veteran status, or disability. The increased participation of underrepresented groups in public health practice and research is essential to the advancement of health, and the school is committed to expanding the diversity of its faculty, staff, and student body.

Tuition Deposit and Financial Certification

Applicants who are granted admission must submit a $500 tuition deposit when confirming acceptance of the offer of admission. This deposit, which is nonrefundable, will be applied toward the student's tuition and fees.

Accepted applicants who are not U.S. citizens or permanent residents must demonstrate that sufficient funds are available in U.S. currency to pay the costs (tuition, fees, and living expenses) of the full period of their academic program. International students supported by personal, family, or sponsors' funds not paid directly to Harvard University are required to deposit and retain adequate funds in a

Tuition and Fees, July 2004–June 2005

Tuition for full-time master's degree students and special students (20-credit minimum and 25-credit maximum per semester, fall and spring; may not exceed 45 credits per year)	$29,300 per year
Tuition for part-time master's degree students, special students, and affiliates (1–19 credits per semester, fall and spring, with a maximum of 15 summer credits. Part-time students may accrue 45 credits for the comparable full-time tuition rate.)	$732 per credit
Tuition for nonresidential master of science in health care management (2004–05 cohort)	$40,000 for two-year program
Tuition for full-time-resident doctoral students (20-credit minimum and 25-credit maximum per semester, fall and spring; may not exceed 45 credits per year)	
Full-time, years 1 and 2	$29,300 per year
Full-time reduced, year 3	$14,650 per year
Facilities fee, year 4 to thesis defense	$ 3,664 per year
Thesis defense fee (final semester before graduation)	$ 1,570 one semester
Tuition for part-time-resident doctoral students	
Credits 1–80	$ 732 per credit
Credits 81–120	$ 366 per credit
Credits 121 to thesis defense	$ 92 per credit
Thesis defense fee (final semester before graduation)	$ 1,570 one semester
Tuition for nonresident doctoral students, full-time or part-time	$ 1,970 per year
Tuition for Summer Session 2004	$ 732 per credit
Fees	
Registration fee (summer, fall, spring)	$ 125 per semester
Late registration fee	$ 80
Late add/drop/change fee	$ 80 per petition
Leave of absence fee	$ 125 per semester
Health fees (see page 61)	
Academic records fee (one-time fee):	$ 10

Note: Tuition rates are given in 2004–05 tuition dollars. Continuing students should expect annual increases.

Boston-area bank in an account bearing the student's name. Students bringing their families to the United States must transfer and certify adequate funds for their support as well. (Please see page 62 for an estimate of living expenses in the Boston area.)

Admission to Nondegree Status

Affiliates

Harvard faculty and staff, employees of Harvard-affiliated hospitals, HSPH alumni, and certain other Boston-area public health professionals may register for a maximum of 10 credits per semester as nondegree affiliates of the school. Affiliates must register in person at the HSPH Registrar's Office. Please call the Registrar's Office at 617-432-1032 to learn the exact dates for affiliate registration.

Enrollment of affiliate students in specific courses is subject to the availability of space and permission of the instructor and the registrar; if classes fill to capacity, preference is given to HSPH degree candidates. Payment is on a per-credit basis and is due at the time of registration. Payment is not refundable unless the student is unable to take the desired course because it is filled to capacity. Affiliate students may neither audit courses nor cross-register at other Harvard schools or MIT.

Special Students

Individuals who do not fall into one of the categories listed above may apply for special student status. Applicants for special student status are subject to the same admission and registration requirements, deadlines, and procedures as applicants for degree candidacy. U.S. citizens and permanent residents may apply to the Admissions Office for full-time or part-time special student status. As noted previously, foreign applicants are eligible for full-time status only. Admission to special student status is limited to one academic year. The deadline for applying for special student status is December 15, 2004.

Subsequent Application for Degree Candidacy

Affiliates and special students wishing to be admitted to degree candidacy must apply and will be considered on the same basis as other applicants for admission. At the time of their application, affiliates and special students who have taken courses at the school within the preceding three years may count up to 20 credits retroactively as part of the academic credit requirements.

Up to 20 credits of tuition previously paid to HSPH may be counted toward the school's tuition requirement for the degree program. Students whose credits as a cross-registrant from another school are transferred to their program at HSPH must pay tuition to HSPH for those credits.

Financial Aid

Estimated Student Expenses

The budget information on page 62 is intended to provide students with an estimate of how much it will cost to spend nine months at HSPH. These figures are for the 2004–05 academic year; applicants for subsequent years should anticipate increases.

Matriculation in Summer Programs

Tuition for the Clinical Effectiveness Program and the Summer Session for Public Health Studies in 2004 is $732 per credit. HSPH offers a special program in English communication in advance of the regular orientation for entering students; tuition for the English communication program is $800 for summer 2004. Living expenses, including rent, are about $1,600 a month.

Sources of Financial Aid

The Office of Student Financial Services and academic departments make every effort to assist students in finding resources to finance

their education at HSPH. It should be noted that the school's need-based grants are extremely limited. Students are urged to investigate all sources of support, including employers, government agencies, and civil and religious organizations.

Financial aid is available in the form of grants, scholarships, loans, and work programs, as follows:

Grants and scholarships Some departments may have grants or departmental scholarships that cover partial or full tuition; some grants also provide a stipend. Eligibility is generally based on career goals, academic merit, experience, and U.S. citizenship or permanent residency. Please contact the department to which you are applying for additional information.

The university offers a number of restricted scholarships to students who meet specific criteria. Please refer to the HSPH financial aid application packet for more information. An HSPH application for financial aid is required.

Federal student loans The Office of Student Financial Services administers the Federal Direct Loan and Federal Perkins Loan programs. The maximum amount a student may receive under the Direct Loan program is $18,500 per academic year. Some full-time students may be eligible for an additional $12,500. Students with extreme financial need may also be eligible for a Perkins Loan up to $6,000. To apply for these loan programs, a student must

- be a U.S. citizen or permanent resident
- not be in default on a prior federal loan or owe a refund on a federal student grant
- be enrolled at least half-time (10 or more credits per semester)
- complete the financial aid application process

Alternative student loans The Harvard University Loan Program (HELP) requires no fees or co-applicants and has a low interest rate of prime less 0.125 percent. Students are usually eligible regardless of their creditworthiness. Loan funds for international students are limited. The loan amount is determined by HSPH.

Work programs Some students may obtain part-time employment as research or teaching assistants in their academic departments. Additionally the school participates in the Federal Work-Study Program, which subsidizes between 50 percent and 75 percent of the on- or off-campus employer's costs. Eligibility for this program is the same as for federal student loans.

Please refer to the instruction booklet that accompanies the financial aid application forms for additional information about loan and work programs.

Registration

Students receive course descriptions and information about course meeting times, registration procedures and requirements, course load requirements, and payment of tuition and fees prior to registration. Every resident degree candidate is expected to check in—in person—on the date specified (September 1 for new students and September 7 for returning students in academic year 2004–05).

Cross-Registration

HSPH students may enroll in courses offered by the other Harvard faculties, MIT, and the Fletcher School of Law and Diplomacy at Tufts University. Students intending to cross-

Health Fees, September 2004–August 2005

University Health Services (UHS) Fee	Semester	Year
Individual	$632.00	$1,264.00
Family (student plus spouse)		2,854.00
Family (student plus spouse and one child)		4,116.00

The University Health Services (UHS) provides comprehensive prepaid medical care such as physical examinations, physician visits, laboratory tests, psychological counseling, and emergency services. The UHS fee is compulsory for all degree candidates and special students registered for more than 10 credits in a semester. Others may elect to waive UHS coverage; this must be done before the first day of fall registration.

Blue Cross/Blue Shield (BC/BS) Medical Insurance	Semester	Year
Individual	$724.00	$1,448.00
Family (student plus spouse)		3,264.00
Family (student plus spouse and one child)		4,720.00

The Blue Cross/Blue Shield (BC/BS) plan provides extensive benefits for ambulatory and inpatient care not offered at UHS. BC/BS coverage is compulsory for all non-immigrant international students and for all other students who do not have comparable insurance. International students whose spouse and/or children will also be living in the United States are required to enroll in the family plan. U.S. students who have comparable insurance may elect to waive BC/BS coverage; this must be done by October 31st for fall and April 30 for spring.

Note: UHS and BC/BS coverage extends from September 1 through August 31.

2004–05 Student Expense Budget (9 months)

Full-time tuition[1]		$29,300
University Health Services fee[2]	$632 per semester	$ 1,264
BC/BS health insurance fee[3]	$724 per semester	$ 1,448
Registration fee	$125 per semester	$ 250
Books/supplies	$615 per semester	$ 1,230
Living allowances		
Rent/utilities	$933 per month	$ 8,400
Food	$301 per month	$ 2,710
Personal	$354 per month	$ 3,190
Local transportation	$ 60 per month	$ 540
SUBTOTAL[4]		**$48,332**
Federal student loan fees[5]	3%	$ 555
TOTAL		**$48,887**

1. For part-time students, tuition charges are assessed based upon the number of credits for which a student is registered. For 2004–05, the charge is $732 per credit hour. Please refer to the HSPH Tuition and Fees Schedule for more information on billing procedures and payment requirements for part-time students. This is available from the HSPH Registrar's Office by calling 617-432-1032.

2. Part-time students taking 10 credits or fewer may waive the University Health Services fee if a waiver form is completed prior to registration.

3. The BC/BS health insurance fee can be waived upon proof of comparable coverage. The waiver form must be submitted prior to registration. Students with a spouse and/or children may request family coverage at a fee of $3,264 for an individual with one dependent or $4,720 for an individual with two or more dependents.

4. International students in the 40-credit programs must be able to demonstrate support of this level ($48,332) prior to the issuance of an appropriate visa. Other master's degree and doctoral candidates must demonstrate a 12-month support level of at least $53,268. Students with additional family members must demonstrate the following levels of support:

9-month	12-month	9-month	12-month
Student & spouse $56,193	Student & spouse $62,494	Student, spouse, & 1 child * $58,971	Student, spouse, & 1 child* $65,292

*For each additional child, add $1,485 for the 9-month and $1,980 for the 12-month budget.

5. Loan fees are based on borrowing $18,500 in Federal Direct Loans, available to U.S. citizens and permanent residents only.

register should be aware that registration deadlines and academic calendars vary from school to school; these students must conform to the registration requirements of the school into which they are cross-registering as well as those of HSPH. HSPH policies on cross-registration may be found at the following web address: http://www.hsph.harvard.edu/registrar/xreg/index.shtml

Harvard University maintains an online catalog of all courses offered at the university. This catalog is searchable by school, topic, time, and instructor. Also listed at this site are relevant, school-specific cross-registration policies and credit equivalencies. The address for the site is the following: http://crossreg.harvard.edu/OASIS/CrossReg/index.html

Contact Information

For information about registration or admission to affiliate status, please contact the HSPH Registrar's Office, 677 Huntington Avenue, Boston, MA 02115.
Phone: 617-432-1032
Fax: 617-432-2009
Email: registra@hsph.harvard.edu
Web: http://www.hsph.harvard.edu/registrar

For more information about student health insurance, please contact the Student Insurance Office, Harvard University Health Services, 75 Mt. Auburn Street, Cambridge, MA 02138.
Phone: 617-495-2008
Fax: 617-496-6125
Web: http://www.uhs.harvard.edu

For the PhD programs online submissions are encouraged, using the Graduate School of Arts and Sciences (GSAS) application form available at the web address below.
Web: http://www.gsas.harvard.edu/admissions/apply.html

For more information on HSPH-affiliated PhD programs, please visit the Harvard School of Public Health web address below. Be sure to check off PhD on the form.
Web: http://www.hsph.harvard.edu/admissions/request.html

Prospective degree candidates or special students who wish to request application materials, have questions about admission requirements, require assistance with the application process, or wish to visit the school should contact the HSPH Admissions Office, 677 Huntington Avenue, Boston, MA 02115.
Phone: 617-432-1031
Fax: 617-432-2009
Email: admisofc@hsph.harvard.edu

Online application information and forms are also available on the admissions page of the HSPH web site:
Web: http://www.hsph.harvard.edu/admissions

For more information about billing procedures or the financial aid application process, please contact the HSPH Office of Student Financial Services, 677 Huntington Avenue, Boston, MA 02115.
Phone: 617-432-1867
Fax: 617-432-2009
Email: osfs@hsph.harvard.edu

STUDENT LIFE

Boston, Massachusetts

The Harvard School of Public Health is located in Boston, Massachusetts, an important center of American history, culture, commerce, and education. Boston is New England's largest and one of America's oldest cities. A wealth of historical buildings and sites evokes the city's colonial past while providing a striking contrast to the skyscrapers of the business district. The Boston area is home to more than sixty colleges and universities and many renowned teaching and research hospitals.

The area hosts major art museums, museums devoted to science and children, the famous Boston Symphony and Boston Pops, several professional theater companies, and a number of professional sports teams. The city also offers elegant shopping and diverse dining, from casual ethnic restaurants to haute cuisine. Compact in scale, Boston invites walking but furnishes extensive public transportation.

The proximity of Cape Cod and Maine beaches, the mountains of Vermont and New Hampshire, and the charming villages of New England add to the appeal of Boston, one of America's most desirable places to live and study.

Harvard University

Founded in 1636, Harvard University is the oldest institution of higher learning in the United States. It has educated seven presidents of the United States, and its faculty has produced nearly forty Nobel laureates. Today Harvard has an enrollment of more than 18,000 degree candidates, and an additional 13,000 students are enrolled in the Harvard Extension School. Including HSPH, the university has ten graduate and professional schools. Its ninety individual collections constitute the largest academic library in the world, and ten art and science museums further enrich the quality of intellectual life.

The university has campuses both in Cambridge, Massachusetts, and in Boston.

Resources and Services for HSPH Students

The school's main buildings for research, teaching, and administration are located in the heart of Boston's hospital district and Harvard University's Longwood campus. The facilities adjoin those of Harvard's Medical School, School of Dental Medicine, and Francis A. Countway Library of Medicine and are near Children's Hospital Medical Center, Beth Israel Deaconess Hospital, Brigham and Women's Hospital, and other Harvard-affiliated hospitals. The school is within walking distance of many cultural institutions, such as Boston's Museum of Fine Arts, and public transportation is readily available to other parts of Boston and Cambridge, where students may cross-register for courses at other Harvard schools and at MIT. A shuttle bus runs between the Longwood campus and Harvard Yard in Cambridge.

Francis A. Countway Library of Medicine

The Countway Library is the principal provider of library services to the school. The Countway, one of the largest medical libraries in the world, houses over 630,000 bound volumes, 3,500 current biomedical journal titles, and 10,000 noncurrent titles. The library's website provides access to additional full-text journals in the biosciences and medicine and to many electronic databases. The Countway also owns an extensive collection of historical materials dating from the fifteenth century. Students have borrowing privileges throughout the Harvard University library system. The Boston Public Library, MIT libraries, and other area libraries add to the total book and periodical resources available.

Instructional Computing Facility

The HSPH Instructional Computing Facility is dedicated to serving the course work and research computing needs of the school's students and faculty. Resources include SUN Unix computers, 125 IBM personal computers, a Novell network, laser printers, a 35-mm slide maker, and an OCR scanner; a wide array of software, including statistical packages, programming languages, analytical programs, and word-processing packages; and services such as remote dial-in, file transfer, electronic mail, connections to the Internet, user assistance, short courses, and computer accounts for funded research. Many academic departments also provide computing resources for their students. Additional services, such as computer classes, discounted hardware and software, user groups, and technical support, are available through the offices of Harvard's University Information Systems.

Office for Student Affairs

The Office for Student Affairs (OSA) provides a variety of support services and offers educational, social, and cultural programs to enhance the student experience at HSPH. Staff members are available to respond to the needs of individual students as they deal with the many demands of their academic and personal lives. The office also works closely with student government and other student groups to address collective student concerns. The office sponsors noncredit academic support seminars on such topics as general and dissertation writing and can refer students to other sources of academic support. Staff members in the Office for Student Affairs are available to meet with students to discuss personal or academic problems and to help students and their families who have questions about living in Boston and the United States. The OSA also assists foreign students in adjusting to life in the United States. Another activity sponsored by the office is Global Chat, a seminar series featuring experts from around the world, including HSPH students, who share their experiences in an informal setting. The office also oversees the leasing process for the residential facilities and provides assistance to students with disabilities.

Student housing The Henry Lee Shattuck International House is operated by the school on a nonprofit basis for its full-time students and their families. In addition to providing living quarters, the facility offers a supportive environment for HSPH students. Located within a ten-minute walking distance of the school, the apartment complex consists of three buildings with seventy furnished studio, one-bedroom, and two-bedroom apartments that accommodate single students, roommates, and families. Several apartments are handicapped accessible. All apartments have private kitchens and baths, free Internet and email access via a data link to the school, two telephone lines, and interior cable access. Shared facilities include a computer room with a printer and copy machine, a library/reading room, an exercise room, a function room, a children's playroom, a laundry room, an indoor bicycle storage area, a piano room, a TV room with satellite TV and DVD, a recycling area, and an outdoor playground. Demand for the apartments often exceeds their availability. Applications are processed and apartments assigned on a first-come, first-served basis.

Students with disabilities The Office for Student Affairs furnishes a range of services to disabled students, including interpreters and note takers, tape recordings of class readings, arrangements for appropriate accommodations and transportation, and other services as necessary.

Career Services Office

The Office for Career Services offers counseling, employment resources, and networking opportunities to assist students and alumni in expanding their employment prospects. The office invites numerous organizations to campus to present information sessions and to interview prospective job applicants; organizations searching for employees are able to examine electronic resume books. The career services staff conducts workshops on resume and cover-letter writing, job search strategies, and interviewing/negotiating skills and organizes panel discussions featuring public health professionals, including HSPH alumni. Students and alumni have access to current online job postings and to fellowship and internship opportunities. The Career Services Office Resource Room contains job listings, resource directories, and other career-related information. The office also maintains the Alumni Career Advisory Network, an online database of alumni willing to advise students and fellow alumni on various career issues.

Child Care Facilities

There are a number of child care facilities located near the Longwood and Cambridge campuses. Referrals and information are provided by the Harvard University Office of Work and Family. Arrangements should be made as early as possible, as facilities are quickly filled.

International Students

During the 2003-04 academic year, about 30 percent of HSPH students came from outside the United States, representing fifty-one foreign countries. The experience international students bring to the school lends an important dimension to the academic program and adds to the diversity of the student population. International students organize many cultural events at the school and participate in the annual International Night talent show.

Harvard International Office

The Harvard International Office, located on the Cambridge campus, provides a variety of services to students from abroad, including orientations, newsletters, and cross-cultural workshops. One program, the Friends of International Students, matches students with a person or family who will welcome them and ease their transition to the United States. International student advisers from the Harvard International Office hold weekly office hours at HSPH to assist students with visa matters and to advise them on immigration regulations.

Student Organizations

The Student Coordinating Committee (SCC) includes elected representatives from each department, from the MPH program, and from the Division of Biological Sciences. The SCC meets regularly to discuss issues and plan activities related to student life at HSPH. The SCC also provides a mechanism for working with members of the school's faculty and administration on schoolwide issues, for sponsoring seminars and other educational programs, for organizing social activities, and for arranging for student representation on several of the school's faculty committees. The SCC frequently sponsors or cosponsors collaborative activities, such as toy drives, with the school and the neighboring community.

Various student organizations at HSPH geared toward the interests of specific constituencies include the Spanish Speaking Committee; the Asian Club; the Lesbian, Gay, Bisexual, and Transgender Alliance; and the Jewish Students Association. Other student organizations include the Health and Human Rights Committee; the Health Policy Forum; Reproductive Health and Rights; and Students for Socially Responsive Endeavors.

Office of Alumni Programs

The Office of Alumni Programs acts as a liaison between 9,500 HSPH alumni and school faculty, students, and administrators. The office develops and implements programs to facilitate alumni access to university resources and serves as a networking forum for students, alumni, faculty, and outside constituencies on local, regional, and international levels. A newly established alumni mentoring program links current students with their alumni counterparts.

In addition, HSPH alumni are available to answer questions that potential applicants may have about departments, curricula, and possible career opportunities. The office publishes the HSPH Alumni Directory and disseminates information about programs and events organized by the Harvard Alumni Association. The Office of Alumni Programs also works with the HSPH Alumni Association and the Alumni Council, the association's elected governing body, to organize regional gatherings in the United States and abroad.

Contact Information

For more information about student services, please contact Stanley Hudson, associate dean for student services, 677 Huntington Avenue, Boston, MA 02115.
Phone: 617-432-4703
Fax: 617-432-2009

For more information about career services, please contact Peter Crudele, director of career services, 677 Huntington Avenue, Boston, MA 02115.
Phone: 617-432-1034
Fax: 617-432-3184
Web: http://www.hsph.harvard.edu/careers

For more information about student affairs, Shattuck House, housing alternatives, or students with disabilities, please contact Jim Glover, director, Office for Student Affairs, 677 Huntington Avenue, Boston, MA 02115.
Phone: 617-432-0488
Fax: 617-432-3184
Web: http://www.hsph.harvard.edu/studentaffairs

For more information about child care centers in the area, please contact the Office of Work/Life Resources at 617-495-4100. The Medical Center Office of Work and Family at 617-432-1615 can also provide information on support services, resources, and programs.

For more information about services offered by the Harvard University International Office, please contact Adviser to Foreign Students and Scholars, Harvard International Office, 1350 Massachusetts Avenue, Cambridge, MA 02138.
Phone: 617-495-2789
Fax: 617-495-4088

For more information about alumni activities or alumni-applicant contacts, please contact Margaret Loret, director of alumni programs, 677 Huntington Avenue, Boston, MA 02115.
Phone: 617-432-2401
Fax: 617-432-4517
Email: mloret@hsph.harvard.edu

FACULTY INDEX

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Online Resources

A wealth of HSPH information can be accessed via the World Wide Web at http://www. hsph. harvard.edu. This site includes updated course, faculty, and educational information and school news. Information about Harvard's other faculties can be found at http://www.harvard.edu.

HSPH Catalog 2004–05

Every effort is made to ensure the information contained in this catalog is accurate at the time of publication. However, the Harvard School of Public Health reserves the right to make changes without notice in tuition and fees, admission and degree requirements, courses of instruction, faculty, and other information contained herein. These changes will govern all students, including those who matriculated prior to the changes coming into effect.

Editor: Elizabeth Jones
Graphic design: Cynthia Frawley
Photography: Richard Chase, Kent Dayton, Paula Lerner, Graham Ramsay, and Getty Images

Nondiscrimination Policy

As a matter of policy, law, and commitment, the Harvard School of Public Health does not discriminate against any person on the basis of race, color, sex, sexual orientation, religion, age, national or ethnic origin, political beliefs, veteran status, or handicap in admission to, access to, treatment in, or employment in its programs and activities. The following person has been designated to handle inquiries about nondiscrimination programs: Carolyn Everette, assistant dean for human resources, 677 Huntington Avenue, Boston, MA 02115 (phone: 617-432-1046). Inquiries about the application of nondiscrimination policies concerning race, color, national origin, age, sex, or handicap may also be referred to the Regional Director, Office for Civil Rights, U.S. Department of Education, J. W. McCormack POCH, Room 222, Post Office Square, Boston, MA 02109.

Disabilities

The university, in accordance with its obligations under the Americans with Disabilities Act and Section 504 of the Rehabilitation Act of 1973, does not discriminate against qualified individuals with disabilities in admission or access to programs and activities. The Office for Student Affairs assists all students with learning, manual, mobility, hearing, visual, and other disabilities.

Religious Holidays

According to Chapter 151c, Section 2B, of the General Laws of Massachusetts, any student in an educational or vocational training institution, other than a religious or denominational training institution, who is unable, because of his or her religious beliefs, to attend classes or to participate in any examination, study, or work requirement on a particular day shall be excused from any such examination or requirement which he or she may have missed because of such absence on any particular day, provided that such makeup examination or work shall not create an unreasonable burden upon the school. No fees of any kind shall be charged by the institution for making such opportunity available to the student, and no adverse or prejudicial effects shall result to any student for availing himself or herself of these provisions.

Campus Security

In compliance with the Student Right-to-Know and Campus Security Act of 1990, the Harvard University Police Department publishes an annual security booklet entitled *Playing It Safe.* The booklet describes Harvard's security policies, provides statistical information on the occurrence of crime on campus, and outlines some of the counseling programs the university offers. Students may obtain a copy of this booklet from the HSPH Admissions Office, 677 Huntington Avenue, Boston, MA 02115 (phone: 617-432-1031; web: http://www.hupd. harvard.edu).

Voter Registration

Massachusetts state law, as set forth in Chapter 51, Section 42E (Section 17 of Chapter 475 of the Acts of 1993), requires educational institutions to make available affidavits of voter registration. Eligible students may register to vote at registration, and mail-in registration affidavits are available from the Registrar's Office. Students from other states who desire to vote in a state other than Massachusetts may use the federal mail-in affidavit of voter registration or a mail-in form supplied by the state. These students must contact the appropriate state election official to receive the state form or may contact the Massachusetts Elections Division, Room 1705, McCormack Building, One Ashburton Place, Boston, MA 02108, for a federal form.

Accreditation

The Harvard School of Public Health is accredited by the Council on Education for Public Health.