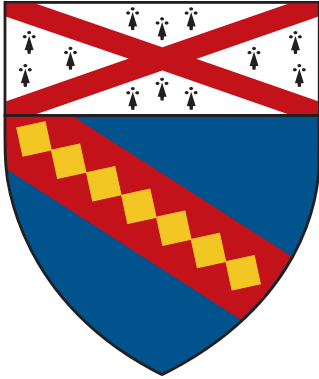


School of Public Health

2009–2010



BULLETIN OF YALE UNIVERSITY

Series 105 Number 6 July 30, 2009

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The University reserves the right to withdraw or modify the courses of instruction or to change the instructors at any time.

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School of Public Health

2009–2010

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Academic and Grading Calendars

ACADEMIC CALENDAR

Summer Term 2009

July 6	M	Classes begin for AP M.P.H. summer session
Aug. 21	F	Classes end for AP M.P.H. summer session

Fall Term 2009

Sept. 2	W	<i>Fall-term classes begin</i>
Sept. 2–14	W–M	Course “shopping period”
Sept. 7	M	Labor Day. No classes
Sept. 14	M	Course registration deadline (late fee \$50)
Oct. 23	F	Last day to withdraw from a fall-term course without the course appearing on the transcript
Nov. 20	F	Fall recess begins at 6 p.m.
Nov. 30	M	Classes resume at 8:30 a.m.
Dec. 4	F	Last day to withdraw from a fall-term course
Dec. 7–11	M–F	Reading period*
Dec. 14–18	M–F	Final examination period

Spring Term 2010

Jan. 11	M	<i>Spring-term classes begin</i>
Jan. 18	M	Martin Luther King, Jr. Day. No classes
Jan. 11–18	M–M	Course “shopping period”
Jan. 18	M	Course registration deadline (late fee \$50)
Mar. 5	F	Last day to withdraw from a spring-term course without the course appearing on the transcript
Mar. 5	F	Spring recess begins at 6 p.m.
Mar. 22	M	Classes resume at 8:30 a.m.
Apr. 23	F	Last day to withdraw from a spring-term course
Apr. 26–30	M–F	Reading period*
May 3–7	M–F	Final examination period
May 24	M	University Commencement

GRADING CALENDAR

Aug. 28	F	Final grades are due for AP M.P.H. summer session
Jan. 4	M	Grades are due for all students
May 1	SA	Final thesis grades due to registrar
May 15	SA	Final grades due for all graduating students
May 31	M	Grades due for all continuing students

*Some classes may meet during the reading period.

The President and Fellows of Yale University

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Richard Charles Levin, B.A., B.Litt., Ph.D.

Fellows

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His Honor the Lieutenant Governor of Connecticut, *ex officio*

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Edward Perry Bass, B.S., Fort Worth, Texas

Roland Whitney Betts, B.A., J.D., New York, New York

Jeffrey Lawrence Bewkes, B.A., M.B.A., New York, New York

Peter Brendan Dervan, B.S., Ph.D., San Marino, California (*June 2014*)

Donna Lee Dubinsky, B.A., M.B.A., Portola Valley, California

Mimi Gardner Gates, B.A., M.A., Ph.D., Seattle, Washington (*June 2013*)

Paul Lewis Joskow, B.A., Ph.D., Locust Valley, New York

Neal Leonard Keny-Guyer, B.A., M.P.P.M., Portland, Oregon (*June 2015*)

Margaret Hilary Marshall, B.A., M.Ed., J.D., Cambridge, Massachusetts (*June 2010*)

William Irwin Miller, B.A., M.B.A., Columbus, Indiana (*June 2011*)

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Barrington Daniels Parker, B.A., LL.B., Stamford, Connecticut

Douglas Alexander Warner III, B.A., New York, New York

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Alyson Zeitlin, B.A., Faculty Affairs Coordinator

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Heping Zhang, Ph.D., Professor
Hongyu Zhao, Ph.D., Professor

Chronic Disease Epidemiology

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Michael B. Bracken, M.P.H., Ph.D., Professor
Kelly D. Brownell, Ph.D., Professor (Psychology; Program in Social and Behavioral Sciences)
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Feng Zhao, M.P.H., M.D., Ph.D., Lecturer
Joseph Zaccagnino, M.P.H., Lecturer

Faculty Profiles

Paul Cleary C-E.A. Winslow Professor, Dean of Public Health, and Chair of the Department of Epidemiology and Public Health. Professor Cleary's research includes developing better methods for using patient reports about their care and health status to evaluate the quality of medical care and studying the relationships between clinician and organizational characteristics and the quality of medical care. His recent research includes a study of how organizational characteristics affect the costs and quality of care for persons with AIDS, a national evaluation of a continuous quality improvement initiative in clinics providing care to HIV-infected individuals, developing Web-based decision tools to improve cancer care decision making, and a study of the long-term impact of patient-centered hospital care. He also is principal investigator of one of the Consumer Assessment of Healthcare Providers and Systems (CAHPS) grants funded by the Agency for Health Care Policy and Research to develop surveys for collecting information from consumers regarding their health plans and services. Ph.D. University of Wisconsin

Brian P. Leaderer Susan Dwight Bliss Professor of Public Health, Deputy Dean/Vice Chair of Public Health. Professor Leaderer's research activities focus on developing tools and methods for assessing human exposures to air contaminants, and assessing the impact of health and comfort resulting from those exposures. His research involves both controlled human studies conducted in environmental chambers and epidemiologic studies. Professor Leaderer's chamber-based research includes characterizing air emissions from important indoor sources (environmental tobacco smoke [ETS], kerosene space heaters, building materials and building furnishings), developing inexpensive passive monitors for monitoring concentrations of indoor air contaminants (i.e., ETS and nitrous acid), and assessing the odor and irritation of emissions of volatile organic compounds from building furnishings. Professor Leaderer's air pollution epidemiologic research studies include assessing the impact of particle and vapor phase acids on the respiratory health of infants and their mothers; determining the impact of ETS exposure on pregnancy outcome; assessing the impact of environmental agents (residential aeroallergens, suspended particles, ozone, etc.) on the development and severity of asthma in children; investigating the nature and causes of the building-related occupancy complaint syndrome (BROCS); and a study of the impact of unvented wood burning for cooking on the birthweights of infants and incidence of childhood pneumonia in the Mam Indians in Quetzaltenango in the highlands of Guatemala. Professor Leaderer is co-director of the Yale Center for Perinatal, Pediatric, and Environmental Epidemiology. Ph.D. Yale University

Serap Aksoy Professor and Head, Division of Epidemiology of Microbial Diseases. A major goal of Professor Aksoy's research is to understand the molecular mechanisms that enable tsetse to transmit trypanosomes, in particular insect midgut and salivary gland gene products that may allow the parasites to differentiate and establish. Ph.D. Columbia University

Colleen L. Barry Associate Professor, Division of Health Policy and Administration. Professor Barry's current research interests include government regulation of health

insurance markets, policy approaches to improving the quality of mental health care, and the politics of health reform. In recent work she studied health plan responses to mental health and substance abuse parity regulation in the federal employees' health insurance program. In other research Professor Barry has examined trends in the design and organization of mental health insurance using national employer survey data, and the effects of state parity laws on out-of-pocket spending and use of mental health services. In current research, she is evaluating strategies to overcome economic and institutional barriers to quality improvement for depression care in historically fragmented public sector programs. Ph.D. Harvard University

Jonathan B. Borak Clinical Professor, Division of Environmental Health Sciences. Dr. Borak's research/scholarly activities during the past fifteen years have mainly addressed the human toxicology of industrial chemicals. At first, his activities focused on acute high-dose exposures to "hazardous materials." His more recent work has focused on the quality of toxicological data utilized in quantitative risk assessments. Of particular interest have been the methods and adequacy of exposure assessments and the nature of susceptible populations. A number of his published studies were based on data that were initially compiled and presented to regulatory agencies (e.g., USEPA, OSHA) and advisory boards (e.g., NAS, ACGIH), and have proven influential. M.D. New York University

Michael B. Bracken Susan Dwight Bliss Professor of Epidemiology, Division of Chronic Disease Epidemiology. Professor Bracken's primary research interest is in the area of the epidemiology of diseases of pregnancy, newborns, and early childhood with an emphasis on genetic and environmental risk factors for causation and iatrogenic factors in patient care. Professor Bracken is co-director of the Yale Center for Perinatal, Pediatric, and Environmental Epidemiology. He has been the recipient of numerous grant awards and has published over three hundred papers, chapters, and reports, and two books: *Perinatal Epidemiology* (Oxford 1984) and *Effective Care of the Newborn Infant* (with J. C. Sinclair, Oxford 1992). Ph.D. Yale University

Elizabeth H. Bradley Professor and Director, Health Management Program, Division of Health Policy and Administration, and Director of Global Health Initiatives. Professor Bradley's research interests span domestic and international health care quality with focus on quality improvement and outcomes research. She is working on two projects to improve cardiovascular care as well as hospice care in the U.S., and she also leads several projects aimed at health system strengthening in Ethiopia, Liberia, South Africa, and China. Ph.D. Yale University

Susan H. Busch Associate Professor, Division of Health Policy and Administration. Professor Busch conducts health services research on the treatment of depression and managed care. She has extensive training in management and economics. Ph.D. Harvard University

Elizabeth B. Claus Professor and Director of Medical Research, Division of Biostatistics. Dr. Claus's work has focused on (1) cancer and genetic epidemiology, with an emphasis on breast cancer, and (2) the development and implementation of statistical models of cancer risk. She has recently completed a state-wide population-based case/control study

of breast carcinoma in situ. This is the largest prospective study of its type and will be used to define genetic and epidemiologic risk factors for the disease. Over the next five years, Dr. Claus will follow this group of women in an effort to define factors that predict medical and quality-of-life outcomes for women diagnosed with breast carcinoma in situ. In addition to her work in breast cancer, Dr. Claus's research interests include the study of neurosurgical outcomes, particularly for pediatric patients. M.D., Ph.D. Yale University

Mayur M. Desai Assistant Professor, Division of Chronic Disease Epidemiology, and Director of the Advanced Professional M.P.H. Program. Professor Desai's primary research interest lies at the interface between mental health and medical comorbidity. Much of his work focuses on examining the impact of psychiatric and substance use disorders on the utilization, quality, and outcomes of primary and specialty medical care. His other areas of interest include aging, psychiatric epidemiology, mental health services research, and homelessness. Professor Desai teaches courses focused on epidemiologic research methods and data analysis. Ph.D. Yale University

Andrew DeWan Assistant Professor, Division of Chronic Disease Epidemiology. Professor DeWan's research interest is to understand how variation in the human genome contributes to complex human diseases. His current work uses high-throughput methods to conduct genome-wide association studies to map disease susceptibility loci as well as developing methods to improve how this information is utilized and interpreted. He is also interested in identifying genetic and environmental factors that interact and contribute to disease susceptibility. Ph.D. Rockefeller University

Maria Diuk-Wasser Assistant Professor, Division of Epidemiology of Microbial Diseases. Professor Diuk-Wasser's research interest focuses on understanding the transmission patterns of vector-borne and zoonotic pathogens. She studies the ecology and distribution of pathogens, vectors, and reservoir hosts and generates predictive maps of human risk of acquiring these pathogens. In areas where pathogens, vectors, and hosts coexist, she is interested in how host-vector contact rates affect pathogen transmission dynamics. Her research systems include malaria, Lyme disease, and West Nile virus (WNV). Her malaria research addressed the question of why high mosquito densities in irrigated areas do not always lead to more malaria transmission. Current research includes the development of a national risk map for Lyme disease, studies on the distribution of WNV in Connecticut, and a study of ecological factors affecting *Culex* spp. blood-feeding behavior and WNV transmission dynamics in Connecticut. Ph.D. University of California, Los Angeles

Arthur B. DuBois Professor Emeritus, Division of Environmental Health Sciences. Dr. DuBois's research activities concern nitric oxide emanating from the lungs and nasal cavity in humans and in animals. One object is to find out whether inflammation of the lungs produces more nitric oxide, and whether that gas can be used as a measure of the amount of lung irritation during health surveys. Another object is to determine why nitric oxide concentrations in the human nose can be a thousand times as great as those in the air expired from the lungs of the same person. Dr. DuBois's recent interests have concerned mechanisms by which inhaled dust particles initiate bronchoconstriction and immune

responses in the lung alveoli. His summer research has included brain tissue hypoxia as it affects the blood pressure of bluefish. Past studies have been on body fluid redistribution in gravity and under weightless conditions. Previously, his primary research was on pulmonary physiology and lung function in normal people and in people with respiratory insufficiency. M.D. Cornell University

Robert Dubrow Associate Professor, Division of Chronic Disease Epidemiology and Associate Dean, Academic Affairs. Professor Dubrow has a strong interest in public health education. His primary research interests historically have been occupational epidemiology and cancer epidemiology and prevention. He has published on colorectal cancer, stomach cancer, esophageal cancer, breast cancer, prostate cancer, endometrial cancer, malignant melanoma, and osteosarcoma. In recent years he has turned his attention to HIV/AIDS, with a particular interest in the role of diagnosis of acute HIV infection in prevention. Professor Dubrow serves as director of the Office of International Training and the Development Core at the Center for Interdisciplinary Research on AIDS. M.D., Ph.D. University of Pennsylvania

Andrew J. Epstein Assistant Professor, Division of Health Policy and Administration. Professor Epstein is a health care economist with a primary research focus on provider behavior and quality improvement, and additional interest in the economics of the pharmaceutical industry. He has recently studied responses to cardiac surgery mortality report cards, the association between provider volume and patient outcomes, determinants of C-section use, and the effectiveness of pharmaceutical mergers. Ph.D. University of Pennsylvania

Durland Fish Professor, Division of Epidemiology of Microbial Diseases. Professor Fish's research interests are in the areas of ecology and prevention of vector-borne infectious diseases. Recent emphasis has been on tick-borne pathogens causing Lyme disease and human ehrlichiosis in the northeastern United States. Current projects include natural and artificial regulation of vector populations, vector competence for viral and bacterial pathogens, co-infection and transmissions of multiple pathogens, geographic and spatial analysis of epidemiological data, and use of satellite imagery to predict vector-borne disease risk. Ph.D. University of Florida

Jason M. Fletcher Assistant Professor, Division of Health Policy and Administration. Professor Fletcher's research focuses on examining social influences on adolescent education and health outcomes, long-term consequences of childhood mental illness, and child and adolescent mental health policy. Specific areas include autism, adolescent depression, child and adolescent obesity, attention deficit hyperactivity disorder (ADHD), and adolescent risky behavior choices. He is also examining the long-term health consequences of occupation choices and occupational stress. Ph.D. University of Wisconsin, Madison

Alison P. Galvani Associate Professor, Division of Epidemiology of Microbial Diseases. Professor Galvani is focusing her research on theoretical modeling of the evolution and epidemiology of infectious diseases. She is particularly interested in evaluating both the short-term and long-term repercussions of different public health policies on the prevalence and intensity of disease, including emerging diseases. Ph.D. Oxford University

Yongtao Guan Associate Professor, Division of Biostatistics. Professor Guan's research interests are in spatial analysis of biological and epidemiological data. Current projects include analysis of Texas childhood leukemia data and modeling vector-borne disease in both urban and rural areas. Ph.D. Texas A&M University

Robert Heimer Professor, Division of Epidemiology of Microbial Diseases. Professor Heimer's major research efforts include scientific evaluation of HIV prevention programs for drug injectors, virological assessment of the risk of drug injection behaviors, and analysis of the interrelationship between hepatitis virus infections and injection drug use. Ph.D. Yale University

Josephine Hoh Associate Professor, Division of Chronic Disease Epidemiology. Professor Hoh's current research focuses on developing analytical methods in mapping genetic origins and assessing environmental risks in human diseases and complex traits, and functional genomic and evolutionary studies of p53 responsive genes. Ph.D. Rutgers University

Theodore R. Holford Susan Dwight Bliss Professor of Public Health and Head, Division of Biostatistics. Professor Holford's primary research interests are in the development and application of statistical methods in public health and medicine. One topic he has especially focused on recently has been how trends in cancer epidemiology are described, especially through the use of age-period-cohort models. The development and application of statistical models that incorporate the underlying biology motivate other aspects of his research as well. His collaboration with the National Acute Spinal Cord Injury Study has led to the development of new ways of analyzing data collected from clinical trials of patients who have this type of injury. These methods enable investigators to better understand the effect of improvements in overall neurological function by separating the components due to the level on the spinal cord that is injured and the severity of that injury. Ph.D. Yale University

Jeannette R. Ickovics Professor and Director, Social and Behavioral Sciences Program, Division of Chronic Disease Epidemiology. Professor Ickovics's research lies at the intersection between public health and psychology. She investigates the interplay of the complex psychological, medical, and social factors that influence the health of the person and of the community. She uses this lens to examine the challenges faced by those who have often been marginalized by the health care system and by society. She is an authority on women's health, with a particular focus on HIV/AIDS (including both prevention and adjustment to disease) as well as more general research on the interaction of biomedical and psychosocial factors that promote good health and recovery. Professor Ickovics's recent research has been directed toward a series of community-based longitudinal studies examining the associations between adolescent pregnancy and risk for sexually transmitted diseases and HIV. She is currently conducting large randomized controlled trials on the effects of "bundled" group prenatal care on diverse reproductive health outcomes. Professor Ickovics is director of CARE: Community Alliance for Research and Engagement, which works on a large research initiative linking neighborhood revitalization and health. Ph.D. George Washington University

Melinda L. Irwin Associate Professor, Division of Chronic Disease Epidemiology. Professor Irwin's primary research interests are in the area of physical activity and cancer prevention and prognosis. She is trained in exercise physiology, epidemiology, and clinical trials. Specifically, Professor Irwin's research involves the exercise effect on breast cancer biomarkers among high-risk individuals and cancer survivors. Other ongoing research includes determinants of exercise adherence and physical activity methodology. Ph.D. University of South Carolina

Stanislav V. Kasl Professor, Division of Chronic Disease Epidemiology. Professor Kasl's primary research interest is in psychosocial epidemiology, the study of social and psychological risk factors for physical illness. Studies include incidence of disease, course of illness and disability, and case fatality. His secondary research interest is in psychiatric epidemiology, the study of risk factors for psychiatric outcomes, and aspects of mental health and well-being. Current studies include psychosocial influences on mortality, morbidity, and disability in the elderly; race differences in cancer stage at diagnosis, screening behaviors, and cancer survival; job loss among older workers; end-of-life issues, bereavement, and complicated grief. Ph.D. University of Michigan

Patricia S. Keenan Assistant Professor, Division of Health Policy and Administration. Professor Keenan draws on political and economic perspectives in her research on Medicare regulation, aging policy, health insurance markets, and health care spending. Her main projects assess important factors in Medicare coverage decisions, health habit changes, and health insurance coverage trends. Ph.D. Harvard University

Trace Kershaw Associate Professor, Division of Chronic Disease Epidemiology. Professor Kershaw's research is in the area of HIV/STD prevention and reproductive and maternal-child health epidemiology. Specifically, Professor Kershaw is interested in integrating HIV/STD and unwanted pregnancy prevention with prenatal and postnatal care for young high-risk women and their male partners. He is currently involved in several research projects assessing the influence of behavioral interventions aimed to reduce the occurrence of HIV/STD and negative perinatal and postnatal outcomes (e.g., low birth weight, maternal mortality) for young pregnant women in the United States and abroad (e.g., South Africa, Haiti). Ph.D. Wayne State University

Kaveh Khoshnood Assistant Professor, Division of Epidemiology of Microbial Diseases. Professor Khoshnood is involved in several studies of HIV infection and health service utilization among drug users. His other areas of research interest are program evaluation, drug policy reform, and the linkage between health and human rights. Ph.D. Yale University

Becca R. Levy Associate Professor, Division of Chronic Disease Epidemiology. Professor Levy's research explores psychosocial influences on aging. Her studies focus on how these influences, particularly older individuals' perceptions of aging, affect cognition and health in old age. She studies this by examining: (1) how the aging process differs among cultures that vary in their stereotypes of aging; and (2) how a psychosocial intervention, designed to trigger either positive or negative perceptions of aging, influences a variety of outcomes in older individuals including memory, physical performance, and

cardiovascular response to stress. In addition, Professor Levy examines how psychosocial factors influence recovery and survival in old age. Ph.D. Harvard University

Tené T. Lewis Assistant Professor, Division of Chronic Disease Epidemiology. Professor Lewis' primary area of research is in psychosocial epidemiology, with an emphasis on cardiovascular disease (CVD) in women. She has a particular interest in understanding how social and psychological factors might contribute to the disproportionately high rates of CVD morbidity and mortality observed in African American women compared to women of other racial/ethnic groups. Professor Lewis is currently involved in research projects designed to examine the role of depressive symptoms, hostility, and experiences of discrimination as correlates of adverse CVD outcomes in African American and Caucasian women. Ph.D. University of California, Los Angeles

Judith H. Lichtman Associate Professor, Division of Chronic Disease Epidemiology. Professor Lichtman's research covers a broad range of cardiovascular diseases including myocardial infarction, stroke, and congestive heart failure. In addition to studying clinical factors associated with disease prevention, she has been interested in the development of risk stratification scales to identify individuals at greatest risk for recurrent vascular events. A specific focus of her research has been the overlap between vascular diseases, such as the risk of stroke following myocardial infarction. Her current research includes the development of a longitudinal, patient-linked Medicare database to examine clinical aspects of cardiovascular, peripheral vascular, and cerebrovascular disease in the elderly. This work will examine the rates and trends of vascular disease over time, the utilization of vascular procedures, and short- and long-term vascular outcomes including mortality and recurrent illness. An important component of this research will be to determine how rates and outcomes vary by age, race, gender, and geographic location. Ph.D. Yale University

Haiqun Lin Associate Professor, Division of Biostatistics. Dr. Lin's primary research interests concern the development, implementation, and application of statistical methods in longitudinal biomarkers for disease processes. Her research activity has been directed toward characterizing the joint responses of the longitudinal PSA readings and prostate cancer incidence utilizing mixture models. She had been trained in medicine and molecular and cellular biology prior to a formal education in statistics. M.D. Beijing Medical University; Ph.D. Cornell University

Shuangge Ma Assistant Professor, Division of Biostatistics. Professor Ma's research interests include analysis of interval censored survival data and regularized estimation with applications to analysis of high-dimensional genomic data. He is currently working on analysis of case I interval censored data with cure proportion and analysis of genomic data with clustering structures. He is also interested in clinical trial design, cardiovascular study, and HIV study. Ph.D. University of Wisconsin

Xiaomei Ma Associate Professor, Division of Chronic Disease Epidemiology. Professor Ma's research interest is in the etiology of chronic noninfectious diseases, particularly cancer. She has been studying the role of immunologic factors and environmental chemical exposures in the etiology of childhood leukemia for the last few years. She is also interested in molecular classification and genetic susceptibility of the disease. Other

ongoing research includes methodological issues in selection of control subjects in case control studies, and DNA methylation in leukemia cases. Ph.D. University of California, Berkeley

Robert W. Makuch Professor, Division of Biostatistics. Professor Makuch's primary research interests involve methodologic issues in the design, conduct, and analysis of clinical studies. In particular, he is interested in the appropriate design and analysis of active control equivalence studies, and he has described how controls should be selected, how the sample size for these studies is determined, and what constitutes appropriate methods of analysis. Interim analysis in general, and the development and application of conditional power methodology in particular, is another active research area. These methods have been used in numerous settings, including a multicenter, Yale-based study for the identification of a new therapy for the treatment of intraventricular hemorrhage. Analytic areas of interest include prospective individual matching designs and methods for the analysis of longitudinal data. These methodological developments have been directed primarily in the area of cancer and HIV. Ph.D. Yale University

Lawrence E. Marks Professor, Division of Environmental Health Sciences. Professor Marks's research interests focus on the development of quantitative models to account for human sensory and perceptual responses to environmental stimuli. One interest is the perception of flavors of foods. A goal is to understand better how food flavors guide eating behaviors and food intake. This line of research focuses on mechanisms by which stimulations of flavor receptors in the mouth (gustation) and nose (olfaction) interact to allow rapid detection and identification of flavors. A second interest is the role of selective attention in perception. This line of research asks how attention to particular stimuli increases speed and accuracy in perceiving those stimuli. A third interest is in synesthesia in perception. A small portion of the population consistently experiences unusual perceptions involving "secondary" sensory qualities, for instance, seeing shapes and colors when hearing sounds. This line of research aims at clarifying the place of synesthesia in perception, language, and cognition. Ph.D. Harvard University

Susan T. Mayne Professor and Head, Division of Chronic Disease Epidemiology. Professor Mayne's primary research interests are in the area of nutrition and cancer prevention. She is trained in nutritional biochemistry, epidemiology, and clinical trials. She has been studying the role of dietary factors in the etiology of various cancers for more than two decades, and she also has a broader research interest in the role of lifestyle factors in cancer, including their interactions with genetic factors. She is currently PI of two NCI-funded research projects: one evaluating a novel methodology for assessing nutrient status noninvasively using human skin, and a second project that is evaluating lifestyle factors and genetics in relation to basal cell carcinoma risk. The latter project is part of the Yale SPORE (Specialized Program of Research Excellence) in skin cancer. Professor Mayne is the primary liaison between the Yale School of Public Health and the Yale Comprehensive Cancer Center, where she serves as program leader for the Cancer Prevention and Control Research Program, and also an associate director for population sciences for the Yale Cancer Center. She is a member of the Board of Scientific Counselors for the U.S. National Cancer Institute, and also the Food and Nutrition Board, National Academy of Sciences. Ph.D. Cornell University

Kathleen M. McCarty Assistant Professor, Division of Environmental Health Sciences. Professor McCarty's research interests are related to environmental and molecular epidemiology as it applies to environmental exposures and genetic susceptibility to cancer and non-cancer endpoints. Her main research projects involve environmental co-factors, genetic susceptibility, and arsenic exposure and health outcomes; gene-environmental interactions and breast cancer risk. S.D. Harvard University

Diane McMahon-Pratt Professor, Division of Epidemiology of Microbial Diseases, and Director of Post-Doctoral Affairs. The focus of the research in Professor McMahon-Pratt's laboratory is the genus of parasitic protozoan, *Leishmania*, which causes a spectrum of diseases known as leishmaniasis. Using biochemical and molecular genetic approaches, the laboratory is involved in the study of molecules that are developmentally regulated by the parasite during its life cycle; these molecules should provide clues as to how the parasite survives and/or manipulates its environment within either the insect vector or mammalian host. She is also interested in understanding and elucidating the immune effector mechanisms involved in the control of infection by the mammalian host. Ph.D. Harvard University

Annette Molinaro Assistant Professor, Division of Biostatistics. Professor Molinaro's research has focused on prediction of survival outcomes with large data sets as frequently encountered in genomics. These projects have revolved around epidemiologic and genetic associations in primary occurrence and recurrences in breast, ovarian, and cervical cancer. Ph.D. University of California, Berkeley

Ingrid M. Nembhard Assistant Professor, Division of Health Policy and Administration. Professor Nembhard's research examines organizational learning and quality improvement in health care organizations through an organizational behavior lens. In recent work she has studied the influence of leadership, front-line staff interactions, and team learning strategies on the success of improvement projects. Her ongoing research studies the conditions under which health care organizations participate in interorganizational learning to facilitate organizational change. Ph.D. Harvard University

Linda M. Niccolai Associate Professor, Division of Epidemiology of Microbial Diseases. Professor Niccolai's primary research interest is in behavioral aspects of HIV and STD prevention. Specifically she is interested in studying individual- and partnership-level determinants of sexual risk behaviors, particularly among underserved populations. Other ongoing research activities include studies of woman's reproductive health (including pregnant women) and HIV/STD prevention. Ph.D. Tulane University

A. David Paltiel Professor, Division of Health Policy and Administration. Professor Paltiel is engaged in numerous research projects concerned broadly with issues of resource allocation and decision making in the health sector. His work focuses on the development of methods and models for the economic evaluation of a variety of pharmaceutical products, medical technologies, and public health activities. He has published on such subjects as the costs and consequences of antiretroviral therapy, the economics of HIV and cancer screening, the theoretical foundations of cost-effectiveness analysis for resource allocation, optimal timing and targeting policies for AIDS prevention and treatment policies, and the cost-effectiveness of preventing AIDS complications. Ph.D. Yale University

Curtis L. Patton Professor Emeritus, Division of Epidemiology of Microbial Diseases. Professor Patton's research interests include identification and characterization of trypanosome specific calmodulin response elements, as well as studies of structure and biological function of trypanosome calmodulin. Under physiological conditions, treatment with methylating agents induces synchronous differentiation in these parasites. In his research Professor Patton is characterizing carboxyl methyltransferases and methylsterases and determining the role of S-adenosyl-methionine and decarboxylated S-adenosylmethionine in alpha-difluoromethylornithine-induced differentiation. Ph.D. Michigan State University

Peter Peduzzi Professor (Adjunct), Biostatistics Division. Professor Peduzzi's primary research interests involve the development of statistical methods for the design, conduct, and analysis of clinical trials and research on aging. In particular, he is interested in the design and analysis of comparative effectiveness clinical trials to evaluate the relative effectiveness of different options for treating a specific medical condition in a selected population, including the determination of which patients benefit most from treatment. Other research activities include matching of Bayesian and frequentist approaches to sample size and monitoring of clinical trials and analyzing longitudinal studies in which death is a competing event. He is also principal investigator of the VA Cooperative Studies Program Coordinating Center at the VA Connecticut Healthcare System, West Haven, Connecticut, and the co-director of the Biostatistics Core of the Yale Pepper Center. Ph.D. Yale University

Rafael Pérez-Escamilla Professor, Chronic Disease Epidemiology Division and Director, Office of Community Health. Professor Pérez-Escamilla's research program concentrates on domestic and global community/public health nutrition issues including (a) efficacy and effectiveness of community health worker models for improving behavioral, metabolic, and disease outcomes among Latinos with type 2 diabetes, (b) prenatal and infant nutrition, (c) household food security measurement and policies, (d) growth and development of infants born to HIV-positive women, and (e) nutrition education program design and evaluation. He is currently (co)leading health disparities, nutrition, and food security capacity building programs in Connecticut, Ghana, and Brazil. All of his projects include strong community outreach and workforce development efforts to help translate scientific findings into improved practices and health outcomes at the community level. Ph.D. University of California at Davis

Melinda M. Pettigrew Associate Professor, Division of Epidemiology of Microbial Diseases. Professor Pettigrew uses a combined molecular and epidemiologic approach to understand infectious diseases in infants and young children. Her main projects involve the identification of bacterial factors important for the pathogenesis of pneumococcal infections and an analysis of the impact of environmental exposures on otitis media. Ph.D. Yale University

Harvey A. Risch Professor, Division of Chronic Disease Epidemiology. Professor Risch's research interests are in the areas of cancer etiology and prevention, and in epidemiology methods. His work has included studies on the etiology of pancreatic, ovarian, and upper gastrointestinal neoplasms, with particular emphasis on genetic polymorphisms and major genes, hormonal factors and cancer, occupational/environmental exposures and

cancer, diet and cancer, and *Helicobacter pylori* and cancer. He has been principal investigator of two case-control studies of pancreas cancer, in Connecticut and in Shanghai, China, and co-investigator on a third study in Queensland, Australia, as well as PI of three large case-control studies of ovarian cancer, two in Canada and one in Connecticut, and a case-control study of esophageal and stomach cancer in Connecticut. He is associate editor of the *Journal of the National Cancer Institute* and of the *American Journal of Epidemiology*, and editor of the *International Journal of Cancer*. M.D. University of California, San Diego; Ph.D. University of Chicago

Nancy H. Ruddle John Rodman Paul Professor Emeritus of Epidemiology and Public Health, Division of Epidemiology of Microbial Diseases. Professor Ruddle's laboratory is interested in several aspects of protein products of thymus-derived lymphocytes, particularly cytokines of the tumor necrosis factor (TNF) family, their regulation and roles in lymphoid development and pathogenesis of viral and autoimmune disease. Her laboratory has studied the regulation, mechanism of action, and biological role of a family of lymphokines called lymphotoxin (LT, LT α , TNF- β), LT- β and tumor necrosis factor (TNF- α). They have studied molecular regulation of LT, LT- β , and TNF- α production and identified negative and positive elements in the genes and flanking DNAs and evaluated different mechanisms of post-transcriptional regulation of these genes. They are studying the role of LT, LT- β , and TNF- α in pathogenesis of inflammation in diabetes, multiple sclerosis, and HTLV-1 hypercalcemia and have developed transgenic mouse models to study their activities in these diseases. Ph.D. Yale University

Jennifer Prah Ruger Associate Professor, Division of Health Policy and Administration. Professor Ruger is Co-Director of the Yale/World Health Organization (WHO) Collaborating Centre for Health Promotion, Policy and Research and Senior Research Fellow at the MacMillan Center for International and Area Studies. She is a faculty associate of Yale's Interdisciplinary Center for Bioethics, Center for Interdisciplinary Research on AIDS, and the Rudd Center for Food Policy and Obesity. She has authored numerous theoretical and empirical studies on the equity and efficiency of health system access, financing, resource allocation, policy reform, and the social determinants of health. These contributions are unified by an overarching interest in equity and disparities in health and health care, focusing on vulnerable and impoverished populations, especially those with addictions. Her work has been published in *Lancet*; *American Journal of Public Health*; *British Medical Journal*; *Quarterly Journal of Medicine*; *Academic Emergency Medicine*; *Yale Journal of Law and the Humanities*; *Journal of Epidemiology and Community Health*; *Health Affairs*; and *Journal of Health Politics, Policy and Law*. Following a postdoctoral fellowship (Bell Fellowship) at Harvard's Center for Population and Development Studies, she served on the health and development satellite secretariat of WHO Director-General Dr. Gro Harlem Brundtland's Transition Team and at the World Bank as health economist and speechwriter to president James D. Wolfensohn. Ph.D. Harvard University, M.Sc. Oxford University

Mark J. Schlesinger Professor, Division of Health Policy and Administration. Professor Schlesinger's health policy research includes assessments of federal programs for children and the elderly; studies of the growth of for-profit enterprises in health and mental health care; investigations of the scope and consequences of various forms of

“managed care” and utilization management, including their application to “managed competition”; and analyses of public attitudes toward health care reform. His research on other aspects of social policy includes studies of government contracting for services from private agencies; public perceptions and attitudes shaping intergenerational tensions and age-targeted social programs; and the comparative performance of private nonprofit, for-profit, and public agencies. Ph.D. University of Wisconsin

Jody Sindelar Professor and Head, Division of Health Policy and Administration. Professor Sindelar also has an appointment at the Institute of Social and Policy Studies at Yale and is a research associate at the National Bureau of Economics Research. She is president of the American Society of Health Economics, and serves on several advisory and editorial boards. Her primary research area is the economics of substance abuse including smoking, alcohol, illicit drugs, and obesity. Her work has been published in medical care, health services, addiction, and economics journals. Professor Sindelar has been a PI on multiple grants with funding from NIAAA, NIDA, NIA, and the Robert Wood Johnson Foundation, among others. Current research interests include (1) analyzing the roles of socioeconomic factors, health habits, and work-life on the aging process, (2) the role of stress and self-control grant on stress and addiction as part of a roadmap grant, and (3) behavioral economics. Ph.D. Stanford University

Christian Tschudi Associate Professor, Division of Epidemiology of Microbial Diseases, and Director of Graduate Studies. Professor Tschudi’s studies focus on the biology of trypanosomes, the causative agent of devastating diseases in Africa and South America. Most projects utilize bioinformatics and modern genetic techniques to identify and dissect parasite-specific functions with the long-term goal to identify candidate molecules that can be targets for chemotherapy. He is also interested in understanding gene silencing by RNA interference in African trypanosomes with the objective of uncovering its biological function. Ph.D. University of Basel, Switzerland

Zuoheng Wang Assistant Professor, Division of Biostatistics. Professor Wang’s research focuses on the development of statistical and computational methods to address problems in genetics, in particular, genome-wide association studies. Her current project involves identifying genomic variants contributing to Type 2 diabetes. She is also interested in integrating information from genomics and expression experiments to understand the genetic basis of human complex diseases. Ph.D. University of Chicago

Catherine Yeckel Assistant Professor, Division of Environmental Health Sciences. Professor Yeckel’s research interests center on environmental influences on metabolism, with special interest in interventions, such as thermal exposure and exercise, that affect obesity, insulin resistance, and consequently risk for type two diabetes, particularly in children and adolescents. Her research on this topic has already garnered grant support from the American Diabetes Association. Dr. Yeckel will help expand the core of researchers concerned with obesity and diabetes. Ph.D. University of Texas

Herbert Yu Associate Professor, Division of Chronic Disease Epidemiology. Professor Yu’s research is in the field of molecular epidemiology with focus on elucidating cancer etiology and identifying tumor markers for cancer management. His current research projects include studying gene-environmental interaction in the etiology of breast and

endometrial cancers with emphasis on the interplay between genetic polymorphisms and lifestyle features; examining the impact of aging on epigenetic regulation of cancer-related genes and its association with prostate cancer risk; and assessing molecular and genetic markers for the prognosis of ovarian and breast cancers. M.D. Shanghai Medical University, Ph.D. University of Toronto

Daniel Zelterman Professor, Division of Biostatistics. Professor Zelterman's research interests are centered in applied statistics. Before coming to Yale in 1995, he studied the limits of human longevity and models related to other extreme value models. He is currently doing research on clinical trials at the Yale Cancer Center. This research covers survival analysis, modeling of cancer mechanisms, and discrete distributions. His interests in cancer epidemiology and genetics have brought him to examine the analysis of pedigrees, familial clusters of disease, and similar computationally intensive statistical methods. Ph.D. Yale University

Heping Zhang Professor, Division of Biostatistics. Professor Zhang's research interests are in the general area of regression analysis: theory, methodology, and applications. Recently, he has been developing and implementing a nonparametric tree-based method that allows one to analyze data with multidimensional responses and with continuous and/or categorical covariates. This tree-based method is especially suitable for risk factor analyses of large, complex epidemiologic studies. Professor Zhang is also interested in statistical genetics and neuroimaging analyses. Ph.D. Stanford University

Yawei Zhang Assistant Professor, Division of Environmental Health Science. Professor Zhang's research interests are in the areas of cancer epidemiology, etiology, and prognosis. She is especially interested in the effects of environmental factors, endogenous and exogenous hormones, genetic susceptibility, and gene-environmental interactions on human cancer risk. Her main research projects involve environmental factors, genetic susceptibility, and non-Hodgkin's lymphoma; gene-environmental interactions and breast cancer risk; early life exposures and breast and testicular cancer risk. M.D. West China University of Medical Science, China; Ph.D. Yale University

Hongyu Zhao Professor, Division of Biostatistics. Professor Zhao's research interests focus on applications of probability and statistics to molecular biology and genetics. The projects in his laboratory include (1) genome-wide association studies, (2) haplotype analysis in population-based and family-based studies, (3) eQTL mapping in different organisms, (4) pathway-based genomics analysis, (5) transcriptional regulatory network reconstruction, (6) protein interaction networks, and (7) disease biomarker identification through proteomics. Ph.D. University of California, Berkeley

Tongzhang Zheng Professor and Head, Division of Environmental Health Sciences. Professor Zheng's research interests have been in the area of cancer epidemiology and environmental epidemiology. He is the principal investigator for a number of ongoing case-control studies, including a case-control study of GST genetic polymorphisms and environmental factors and risk of female breast cancer; a case-control study of non-Hodgkin's lymphoma; a case-control study of viral and environmental etiology of Hodgkin's disease; a case-control study of multiple myeloma in Connecticut; and

a case-control study of cancers of the stomach and esophagus in China. He is also the principal investigator for a case-control study of indoor air pollution and asthma among schoolchildren in Beijing. Sc.D. Harvard University

Yong Zhu Associate Professor, Division of Environmental Health Sciences. Dr. Zhu's research interests focus on using a molecular epidemiological approach to study genetic susceptibility markers and their interactions with environmental exposure in human disease development. He has been developing and validating novel phenotypic and genotypic assays and biomarkers for several smoking-related cancers. By utilizing various techniques in molecular biology, molecular cytogenetics, cell biology, and computational biology, he identifies biomarkers that can characterize inherited genetic predisposition and cellular response to environmental factors. In addition, Dr. Zhu is interested in applying evolutionary concepts and tools in biomarker study and medical research. He is currently using phylogenetic analysis to screen biomarkers for molecular epidemiological study and addressing the role of gene-environment interaction in human disease in the context of human evolutionary history. Ph.D. Rice University

History of the Yale School of Public Health/ Department of Epidemiology and Public Health

The Yale School of Public Health is one of the oldest nationally accredited schools of public health in the country. It was one of the eight existing schools that were to be first accredited by the American Public Health Association in 1946, though its origins date back three decades earlier as a department in the Yale School of Medicine, a status it still maintains.

In 1914 Yale University received an endowment from the Anna M. R. Lauder family to establish a chair in public health in the School of Medicine. This chair was filled in 1915 by Charles-Edward Amory Winslow, who was to be a central figure in the development of public health at Yale. In 1920 Winslow set forth a definition of public health:

Public health is the science and the art of preventing disease, prolonging life and promoting physical health and efficiency through organized community efforts for the sanitation of the environment, the control of community infections, the education of the individual in principles and personal hygiene, the organization of medical and nursing services for the early diagnosis and preventive treatment of disease, and the development of the social machinery which will ensure to every individual a standard of living adequate for the maintenance of health; organizing these benefits in such a fashion as to enable every citizen to realize his birthright of health and longevity.

In the early 1920s Winslow's Department of Public Health at Yale was a catalyst for public health reform in Connecticut, and the health surveys prepared by him and his faculty and students led to considerable improvements in public health organization. He also successfully campaigned to improve health laws in Connecticut and for the passage of a bill that created the State Department of Public Health.

Winslow focused on "the education of undergraduate medical students along the lines of preventive medicine." He also established a one-year program leading to a Certificate in Public Health. From the beginning, Winslow sought to build bridges between the Department of Public Health, the Scientific School, and the Graduate School by making courses available to students in the other schools. He was also able to establish Bacteriology, Pathology, and Public Health as a single, unified department in the Graduate School.

Winslow looked to a number of existing departments (Bacteriology, Immunology, Medicine, Pathology, Pediatrics, Physiological Chemistry, Sanitary Engineering, and Zoology) to supplement his own courses in public health principles, public health administration, and vital statistics. He established a comprehensive non-medical program that graduated eighteen students with a Certificate in Public Health, ten with a Ph.D., and four with a Dr.P.H. by 1925. His students specialized in administration, bacteriology, or statistics.

During Winslow's thirty years at Yale, hygiene developed into preventive medicine; bacteriology evolved into microbiology to include parasitology and virology; classic epidemiology evolved into clinical epidemiology; control of communicable diseases became chronic disease control; and public health assimilated the social dimensions of sickness

and health and appropriated such disciplines as medical economics and medical care organization. It was due to Winslow's innovative foresight and commitment to interdisciplinary education that the department's academic programs earned recognition as a nationally accredited School of Public Health in 1946.

In the early 1960s, the Yale Department of Public Health merged with the Section of Epidemiology and Preventive Medicine, a unit within the Department of Internal Medicine, resulting in the Department of Epidemiology and Public Health. In 1964 the new department moved into its own building, the Laboratory of Epidemiology and Public Health, which was designed by Philip Johnson and continues as its primary location for research and teaching.

Nearly a century after Winslow's appointment, the department continues to strengthen its interdisciplinary research partnerships with numerous entities at the School of Medicine and across Yale's campus. In its dual capacity as a nationally accredited School of Public Health and department in the Yale School of Medicine, it honors Winslow's commitment to public health education across disciplines and community practice through an array of degrees offered to a wide audience, ranging from undergraduates to advanced professionals, in conjunction with Yale College as well as eight Yale professional schools.

Master of Public Health

TRADITIONAL TWO-YEAR PROGRAM

Yale's Master of Public Health (M.P.H.) degree program is designed for highly motivated students with related work experience or a professional degree as well as a substantial interest in an area of public health. A unique sequencing of courses, community-based programmatic activities, and field or laboratory research provides students with multiple opportunities to define their specialty and to tailor their course of study.

Individualized programs are shaped through frequent interactions with faculty through courses, field experiences, and the thesis. An important component of the M.P.H. program is the faculty-student relationship, institutionalized in the form of an advisory system. Students are expected to work with their adviser in selecting appropriate courses, deciding on their internship and thesis, and integrating learning from all their experiences.

All students focus their studies in one of seven academic programs—Biostatistics, Chronic Disease Epidemiology, Social and Behavioral Sciences, Environmental Health Sciences, Epidemiology of Microbial Diseases, Health Policy, and Health Management. Students apply to one of the specific divisions but are urged to develop programs of study that include courses from other divisions within YSPH and throughout the University. Students in all divisions benefit from the strengths of Yale's professional and graduate schools and learn ways to understand the complexity and multidimensionality of most public health issues.

The majority of M.P.H. students are registered for full-time study and spend two years in residence completing the requirements for the M.P.H. degree. Students in the M.P.H. program are required to complete 20 course units, which include the core curriculum, divisional requirements, and electives both within YSPH and in other schools at the University. Course units are not given for seminars and colloquia.

Full-time students must carry a minimum of 4 course units per term for four terms and must complete all course requirements (including the thesis) within five years of matriculation.

Students may elect to take more than the minimum number of course units needed to graduate; however, no student may shorten the four-term program by accumulating course units sufficient to graduate at the end of three terms. Full-time students must carry a minimum of 4 course units in their final term.

Part-time student status is granted to those students taking fewer than 4 course units per term. Part-time students are encouraged to take at least 2 course units per term and must complete all course requirements (including the thesis) within five years of matriculation. Those considering part-time study should be aware that there are no courses offered during the evening, on weekends, or during the summer months.

First-year students in the M.P.H. program may apply to another professional or graduate program within Yale for a joint-degree program. If admitted, students must notify the associate dean for student affairs. Joint-degree students must fulfill all degree requirements for both programs.

CORE CURRICULUM FOR THE M.P.H.

<i>Course number</i>	<i>Course title</i>	<i>Course units</i>
BIS 505a and b	Introduction to Statistical Thinking I & II	1 each term
CDE/EMD 508a	Principles of Epidemiology I	1
EPH 515b	Seminar on Introduction to Research Ethics	0
EPH 520c	Summer Internship	0
EPH 525b	Thesis	2

One of the following:

CDE 505a	Social and Behavioral Influences on Health	1
CDE 571b	Psychosocial and Behavioral Epidemiology	1

One of the following:

EHS 503a	Introduction to Toxicology	1
EHS 510a	Contemporary Issues in Environmental Health	1
EHS 511b	Applied Risk Assessment I	1

One of the following:

HPA 510a	Health Policy and Health Systems	1
HPA 560b	Health Care Finance and Delivery	1

Public Health Practice requirement All students in the M.P.H. program are required to complete a Public Health Practice experience. YSPH Public Health Practice requirement guidelines are outlined in Appendix I. There are four options for satisfying this requirement:

EPH 500b	Public Health Practicum	1
EPH 520c	Summer Internship (with prior approval from the Office of Community Health)	0
EPH 542b	Community Health Program Planning	1
HPA 555a or b	Health Management Practicum (HPA/HMP students only)	1

Learning Objectives of the Core Curriculum

Upon completing the core curriculum of the M.P.H. program, the student will be able to:

- Demonstrate a knowledge base in the disciplines of biostatistics, chronic and infectious disease epidemiology, health systems, public policy, social and behavioral sciences, and environmental health.
- Apply basic research skills to specific public health problems in both group and individual settings, including the ability to define problems; construct, articulate, and test hypotheses; draw conclusions; and communicate findings to a variety of audiences.
- Explain the interrelationships between a multitude of factors that can impact on a public health problem, including scientific, medical, environmental, cultural, social, behavioral, economic, political, and ethical factors.
- Review, critique, and evaluate public health reports and research articles.

- Apply public health concepts, principles, and methodologies acquired through formal course work to actual problems experienced in the community or work environment.
- Critically evaluate programs, interventions, and outcomes that relate to public health practice.
- Apply ethical standards and professional values as they relate to the practice of public health.
- Demonstrate sensitivity to the social context within which public health professionals practice.

M.P.H. DIVISIONAL PROGRAMS

Biostatistics

Theodore Holford, Ph.D., Division Head

Biostatistics is one of the skills necessary for the development and practice of public health because health-related research and resultant policy decisions often have a quantitative foundation. Biostatistical methods and knowledge are essential for the following: (a) valid and efficient study designs, (b) data collection so that study objectives can be realized, and (c) data analysis so that valid conclusions can be drawn from a study's results. These methods can be appropriate for quantifying the possible effect of risk factors and health interventions on individual subjects, as well as groups of people. Hence, the sound practice of biostatistics has a substantial impact on all aspects of research in the health sciences.

DIVISIONAL REQUIREMENTS FOR THE M.P.H. IN BIOSTATISTICS

<i>Course number</i>	<i>Course title</i>	<i>Course units</i>
BIS 525a and b	Seminar in Biostatistics	0
BIS 540a	Fundamentals of Clinical Trials	1
BIS 623a	Applied Regression Analysis	1
BIS 625a	Categorical Data Analysis	1
BIS 628b	Longitudinal Data Analysis	1
*BIS 630b	Applied Survival Analysis	0.5
*BIS 632b	Design and Analysis of Epidemiologic Studies	0.5
†STAT 541a	Probability Theory	1
†STAT 542b	Theory of Statistics	1
One of the following:		
BIS 643a	Theory of Survival Analysis and Its Applications	1
BIS 646a	Nonparametric Statistical Methods and Their Applications	1
BIS 651b	Spatial Statistics	1
BIS 691b	Theory of Generalized Linear Models	1

*These are half-term courses.

†These courses are offered in the Graduate School of Arts and Sciences.

LEARNING OBJECTIVES FOR THE M.P.H. IN BIostatISTICS

Upon receiving an M.P.H. with a concentration in Biostatistics, the student will be able to:

- Describe advanced concepts of probability, random variation, and commonly used statistical probability distributions.
- Develop an efficient design for collecting, recording, and storing data collected in the conduct of public health and medical research.
- Develop sample size and statistical power calculations for basic study designs including those utilized in clinical trials.
- Design efficient computer programs for study management, statistical analysis, as well as presentation using SAS and other programming languages.
- Produce edited data sets suitable for statistical analyses.
- Apply advanced informatics techniques with vital statistics and public health records in the description of public health characteristics and in public health research and evaluation.
- Perform analyses of stated hypotheses using a variety of analytical tools including analysis of variance, multiple regression, nonparametric statistics, logistic regression, multivariate analyses, and methods for analyzing rates and failure time data.
- Interpret results of advanced statistical analyses and use these results to make relevant inferences from data.
- Produce working tables and statistical summaries describing research in health science.
- Develop written presentations based on intermediate to advanced statistical analyses for both public health professionals and educated lay audiences.
- Develop oral presentations based on intermediate to advanced statistical analyses for both public health professionals and educated lay audiences.

Regulatory Affairs Program

Robert W. Makuch, Ph.D., Program Director

Since the 2006–2007 academic year the School of Public Health has offered a Regulatory Affairs Program (RAP). The program is directed by Robert Makuch, Professor of Biostatistics, and funded by a grant from Bayer.

The goal of the Regulatory Affairs Program is to prepare professionals for work in this complex and growing field through an interdisciplinary curriculum and relevant internship experiences. The program addresses a variety of complex issues related to obtaining government approval to market drug, biological, and medical devices; scientific policy; and legal and ethical concerns. Course work includes pharmacoepidemiology, clinical trials, policy analysis, health economics, decision analysis, and health care law and ethics. An integral part of the RAP is the summer internship, in which students gain practical training through placements at major pharmaceutical firms.

Students apply to the RAP in the spring term of their first year in the M.P.H. program. The program intends to enroll students with a broad range of academic and professional backgrounds. It is expected that no more than six students will be admitted each year. All applicants to the program must have a complete command of both spoken and written English.

The RAP has as its central academic core the M.P.H. core curriculum, and students will complete all the requirements of their home division. The RAP has three required courses, as well as recommended elective courses on relevant topics from various EPH divisions.

RAP REQUIRED COURSES

<i>Course number</i>	<i>Course title</i>	<i>Course units</i>
BIS 540a	Fundamentals of Clinical Trials	1
CDE 518b	Introduction to Pharmacoepidemiology	1
HPA 547a	Law and Ethics of Health Care Organizations	1

RAP RECOMMENDED ELECTIVES

BIS 525a and b	Seminar in Biostatistics	1
BIS 561b	Advanced Topics and Case Studies in Multicenter Clinical Trials	1
CDE 534b	Approaches to Data Management and Analysis of Epidemiologic Data	1
CDE 617b	Developing a Research Protocol	1
HPA 514b	Health Politics and Policy	1
HPA 544a	Public Law and Public Health: The Law, the Individual, and the State	1
HPA 570a	Cost-Effectiveness Analysis and Decision Making	1

For further information about the Regulatory Affairs Program, please contact Professor Robert Makuch, Division of Biostatistics, 203.785.2838 or robert.makuch@yale.edu.

Chronic Disease Epidemiology

Susan T. Mayne, Ph.D., Division Head

Epidemiology is the study of the frequency, distribution, and causes of diseases in human populations. In Chronic Disease Epidemiology (CDE), the laboratories are the city block or town, the state or country, the housing project, the newborn nursery or nursing home, and the senior center or hospital.

CDE students will learn how to identify the type of data needed, choose appropriate data collection methods, collect the data, and analyze such data appropriately so that the whole research effort leads to the improvement of the health of communities. The CDE curriculum emphasizes critical thinking, based on thorough knowledge of research methods, and its application to the literature, to the development of research protocols, and to the conduct and analysis of epidemiologic investigations. The principal research instrument of the chronic disease epidemiologist is often the questionnaire. The development of valid, reliable, and unambiguous questionnaires is a skill taught to all CDE students. Increasingly, epidemiologists also make use of genetic and biologic markers to indicate exposure to potentially damaging agents or as signs for the early onset of disease. Students learn the role of these innovative advances throughout the program.

Students learn about the role of epidemiology in a broad range of public health and medical arenas, including the fields of aging, cancer, cardiovascular disease, perinatal

and reproductive epidemiology, and psychosocial epidemiology, all areas in which the division has particular strength. Among the resources available to students are the Yale Cancer Center, the Connecticut Tumor Registry (the oldest of its kind in the world), the Center for Perinatal, Pediatric, and Environmental Epidemiology, and the Yale Center on Aging. M.P.H. graduates of the CDE program find employment in academic institutions; in public health agencies at the national, state, and local level; in divisions of preventable or chronic diseases; in health surveillance; and in applied research. Voluntary agencies such as cancer or heart associations recruit graduates to participate in or direct community programs.

Graduates also obtain intermediate-level research positions in such federal agencies as the National Institutes of Health. Private industries, including the pharmaceutical industry, find the quantitative skills of CDE graduates useful in monitoring drug safety and in clinical research. Many CDE graduates subsequently pursue doctoral degrees in public health or other professional or academic fields.

DIVISIONAL REQUIREMENTS FOR THE M.P.H. IN CHRONIC DISEASE EPIDEMIOLOGY

<i>Course number</i>	<i>Course title</i>	<i>Course units</i>
CDE 516b	Principles of Epidemiology II	1
CDE 523b	Measurement Issues in CDE	1
CDE 525a and b	Seminar in CDE/Social and Behavioral Sciences	0
CDE 534b	Approaches to Data Management and Analysis of Epidemiologic Data	1
One additional biostatistics course beyond BIS 505a and BIS 505b		1
One of the following two:		
CDE 532b	Epidemiology of Cancer	1
CDE 535b	Epidemiology of Heart Disease and Stroke	1

Students are advised to take two additional CDE elective courses.

LEARNING OBJECTIVES FOR THE M.P.H. IN CHRONIC DISEASE EPIDEMIOLOGY

Upon receiving an M.P.H. with a concentration in Chronic Disease Epidemiology, the student will be able to:

- Evaluate the scientific merit and feasibility of epidemiologic study designs.
- Describe the epidemiology of common chronic diseases with more in-depth knowledge of a specialty area.
- Apply basic principles of disease prevention to prevent and control chronic diseases.
- Synthesize information from a variety of epidemiologic and related studies.
- Design and carry out epidemiologic studies, with minimal supervision.
- Analyze data and draw appropriate inferences from epidemiologic studies at an intermediate level.
- Demonstrate oral and written communication and presentation skills to effectively communicate and disseminate results to various professional and community audiences.

- Describe basic pathophysiologic and/or psychopathologic mechanisms.
- Identify, interpret, and use routinely collected data on disease occurrence.
- Review, critique and evaluate epidemiologic reports and research articles at an intermediate level.

Social and Behavioral Sciences Program

Jeannette Ickovics, Ph.D., Director

The CDE division offers a program that enables students to receive specialized training in Social and Behavioral Sciences (SBS). The overall purpose of this program is to provide instruction in the theory and methods of the social and behavioral sciences that emphasize the behavioral, psychological, and social influences on health, illness, and recovery. The primary emphases are to (1) understand how behavioral, psychological, and social influences interact with biological factors to affect health, and (2) evaluate and develop strategies to promote health and prevent disease by altering adverse life styles and psychosocial risk factors at the level of the individual, primary social groups and communities.

The SBS curriculum is unique in that it combines courses in social and behavioral sciences and epidemiology. Students in the SBS program will share a core of courses with other CDE students in epidemiologic methods and biostatistics. Students specializing in SBS will be required to take two additional courses in intervention research. The first addresses theory, methods, and evaluation of preventive interventions. The second teaches students practical and advanced skills for the development and implementation of their own interventions in health promotion and disease prevention.

DIVISIONAL REQUIREMENTS FOR THE M.P.H. IN SOCIAL AND BEHAVIORAL SCIENCES

<i>Course number</i>	<i>Course title</i>	<i>Course units</i>
CDE 516b	Principles of Epidemiology II	1
CDE 525a and b	Seminar in CDE/Social and Behavioral Sciences	0
CDE 534b	Approaches to Data Management and Analysis of Epidemiologic Data	1
CDE 572a	Preventive Interventions: Theory, Methods, and Evaluation	1
CDE 574b	Developing a Health Promotion and Disease Prevention Intervention	1

Students are advised to take two of the following five electives:

CDE 531a	Health and Aging	1
CDE 545b	Health Disparities by Race and Social Class	1
CDE 570a	Epidemiology of Psychiatric Disorders	1
CDE 571b	Psychosocial and Behavioral Epidemiology	1
CDE 575b	Religion, Health, and Society	1

LEARNING OBJECTIVES FOR THE M.P.H. IN SOCIAL AND BEHAVIORAL SCIENCES

Upon receiving an M.P.H. with a concentration in Social and Behavioral Sciences, the student will be able to:

- Identify the effects of social, psychological, and behavioral factors on individual and population health, including prevention, treatment and management of chronic disease, adjustment to illness, adherence to treatment regimens, and promotion of recovery.
- Analyze health from multiple levels, including the individual, the social group, and society.
- Critically evaluate and interpret the public health scientific literature as presented in professional journals and the popular media, including descriptive, analytic, and intervention studies.
- Construct research hypotheses and design a study to test these hypotheses.
- Apply social, psychological and behavioral theory in the design, implementation, and evaluation of prevention interventions aimed toward: (a) decreasing health damaging behaviors (e.g., risky sex); (b) increasing health promoting behaviors (e.g., exercise); and (c) increasing psychosocial well-being (e.g. coping with chronic illness).
- Design an intervention aimed at changing a particular health behavior or preventing a disease.
- Develop procedures and training materials to implement effective behavioral interventions.
- Describe how culture, social inequities, and biology influence health across the lifespan.
- Identify ways to address health inequalities and promote health equity.
- Describe the appropriate statistical analyses to examine different types of research questions in the social and behavioral sciences.
- Demonstrate oral and written communication and presentation skills to effectively communicate and disseminate results to various professional and community audiences.
- Explain the dynamic interaction between policies and the social and behavioral sciences.
- Apply the ethical principles involved in social and behavioral sciences as they relate to public health.

Environmental Health Sciences

Tongzhang Zheng, Sc.D., Division Head

In the course of their daily activities individuals spend time in a variety of spaces (i.e., residences, industrial and nonindustrial workplaces, automobiles, outdoors), and are engaged in a number of activities (i.e., work, eating, drinking, hobbies), which can result in exposure to a wide range of biological, chemical, and physical environmental stressors. Exposures to these stressors are associated with a number of health and comfort effects.

The division of Environmental Health Sciences (EHS) seeks to produce M.P.H. graduates who are able to recognize and assess the impact of environmental health hazards on human health in the community and occupational setting and to identify a range of options available to reduce exposures to those hazards.

Students in EHS can choose tracks in environmental epidemiology, environmental policy, or risk assessment. Within these tracks there is flexibility for students to design with their adviser a program to meet individual needs. Students take advantage of the wide variety of courses relevant to environmental health offered by the division, the department, and throughout the University, particularly those in the School of Forestry & Environmental Studies.

M.P.H. graduates of the EHS program find employment in public agencies at the community, city, state, and federal levels; in pharmaceutical companies in areas such as risk assessment and occupational health and safety; in environmental consulting organizations; and in private sector companies in the area of corporate health and safety. They also take research positions in organizations including the National Institutes of Health, the Centers for Disease Control, and the Environmental Protection Agency.

DIVISIONAL REQUIREMENTS FOR THE M.P.H. IN ENVIRONMENTAL HEALTH SCIENCES

<i>Course number</i>	<i>Course title</i>	<i>Course units</i>
EHS/CDE 502a	Physiology for Public Health	1
EHS 503a	Introduction to Toxicology	1
EHS 507a	Environmental Epidemiology	1
EHS 508b	Assessing Exposures to Environmental Stressors	1
EHS 511b	Applied Risk Assessment I	1
EHS 525a	Seminar in Environmental Health (two fall terms required)	0
CDE 516b	Principles of Epidemiology II	1
CDE 534b	Approaches to Data Management and Analysis of Epidemiologic Data	1

LEARNING OBJECTIVES FOR THE M.P.H. IN ENVIRONMENTAL HEALTH SCIENCES

Upon receiving an M.P.H. with a concentration in Environmental Health Sciences, the student will be able to:

- Discuss the basic principles of how contaminants are introduced into the air, water, soil, and food and then transported through the environment.
- Describe the mechanisms of toxicity of biological, chemical, and physical stressors, including absorption, distribution, metabolic transformation, elimination, and genetic susceptibility.
- Use toxicological, statistical, epidemiological, and exposure assessment techniques in assessing the risks associated with environmental hazards in the working, residential, and community environments.
- Apply the basic principles used to manage risks associated with exposure to environmental hazards.
- Review, critique, and evaluate environmental health reports and research articles.

- Evaluate the scientific merit and feasibility of environmental health study designs.
- Synthesize information from a variety of environmental health and related studies.
- Design and carry out an environmental health study, with minimal supervision.
- Write up and present research findings to professional audiences.

Epidemiology of Microbial Diseases

Serap Aksoy, Ph.D., Division Head

Microbial disease epidemiology is the science of the cause, distribution, frequency of, and resistance to infections caused by viruses, parasites, and bacteria, and of the distribution, transmission, and control of these agents.

The M.P.H. curriculum for the division of Epidemiology of Microbial Diseases (EMD) is designed to train the student to understand the epidemiology of the major infectious agents, the diseases they cause, and the host response to those diseases. The interaction of the agent (parasite, bacterium, or virus) with the host and the influence of the environment on both agent and host are studied. The curriculum considers the role of age, immunological response, genetics, natural history of vectors, geographical distribution, and transmission and transport of agents. In addition to epidemiology courses, the division's faculty teach microbiology courses relating to bacteria, viruses, and parasites, including classification, replication, biochemistry, genetics, immunology, and pathogenesis—essential to the understanding of the epidemiology of microbial disease. Through these experiences the student gains a clear understanding of the quantitative and qualitative biological spectrum of microbial diseases.

Using a problem-solving approach the student learns about surveillance through collection and analysis of data followed by synthesis of information as a basis for public health decisions. The same approach is used to investigate epidemics and to study basic biologic problems.

Emphasis is placed on the application of epidemiological concepts to intervention in transmission cycles and disease progression. Intervention may be accomplished through such measures as vaccination, antimicrobial therapy, vector control, or behavior modification. The student is encouraged to obtain a solid laboratory foundation for diagnosis, for population-based serologic surveys, and for understanding the molecular basis of the disease process and intervention strategies. Third World infectious disease problems and their solutions are considered extensively.

Nearly half of EMD graduates in the M.P.H. program enter administrative/epidemiological control units at the local, state, or national level, and a portion of the remainder enter hospital, medical center, or industrial programs. Many students continue graduate and professional education beyond the M.P.H. degree.

DIVISIONAL REQUIREMENTS FOR THE M.P.H. IN EPIDEMIOLOGY OF MICROBIAL DISEASES

<i>Course number</i>	<i>Course title</i>	<i>Course units</i>
EMD 512a	Immunology for Epidemiologists	1
EMD 525a and b	Seminar in Epidemiology of Microbial Diseases	0
EMD 542b	Biology and Epidemiology of Infectious Agents	1

One of the following three:

EMD 560b	Epidemiologic Methods in STD/HIV Research	1
EMD 565a	Modeling the Epidemiology of Infectious Diseases	1
BIS 511a	GIS Applications in Epidemiology and Public Health	1

One of the following two:

CDE 516b	Principles of Epidemiology II	1
CDE 534b	Approaches to Data Management and Analysis of Epidemiologic Data	1

Students are required to choose at least two additional EMD courses in collaboration with their adviser.

LEARNING OBJECTIVES FOR THE M.P.H. IN EPIDEMIOLOGY OF MICROBIAL DISEASES

Upon receiving an M.P.H. with a concentration in Epidemiology of Microbial Diseases, the student will be able to:

- Define the causes, detection, transport, transmission, and pathogenesis of infectious diseases.
- Describe major infectious disease problems in terms of magnitude, person, time, and place.
- Describe molecular, immunologic, environmental, and behavioral factors that affect exposure/and or susceptibility to infectious agents.
- Integrate general molecular, immunological, ecological, and behavioral concepts of infectious diseases of public health importance.
- Compare the available solutions and approaches for the control of important global infectious diseases and appraise the challenges in their effective control.
- Design studies of the etiology, prevention, control, and detection of infectious diseases.
- Describe the interactions of infectious agents with vertebrate and/or invertebrate hosts and the environment.
- Explain the immunological basis of vaccination and describe how the use of vaccines allows for the effective control of infectious diseases in the U.S. and abroad.
- Describe the spatial and temporal dynamics of infectious disease epidemics.
- Define the ethical challenges in research, prevention, and control of infectious diseases in the U.S. and abroad.

Health Policy and Administration

Jody Sindelar, Ph.D., Division Head

The goal of the division of Health Policy and Administration (HPA) is to address the critical issues in improving the nation's public health, especially the health of high risk and vulnerable populations. The division offers two M.P.H. degree programs: Health Policy and Health Management.

The specific objectives of the M.P.H. program in Health Policy and Administration are: (1) to provide its students with a basic foundation of knowledge in public health,

health policy, and health services management, and (2) to teach concepts, principles, and scientific skills necessary for health services management and health services policy development and evaluation. The program aims to have students develop an understanding of the importance of research as a policy and management tool. Students are taught to anticipate future needs relative to expanding technology, changing patterns of community health, and emerging societal and programmatic needs.

The division's program consists of a unique, unified approach to policy and management. It is built on the recognition that issues of health policy cannot be divorced from principles of sound management, nor can health care management or policy be developed without a fundamental understanding of morbidity, mortality, and epidemiologic methods. Further, the division recognizes that leaders cannot make successful decisions about the delivery of health care nor solve the health problems affecting society over the next decades without extensive analytic and decision-making skills. Students need to be able to translate sound scientific evidence into effective health policy. The HPA program emphasizes training in quantitative methods, economics, financing, epidemiology, and evaluative methods for policy and management. Social and behavioral sciences are integral parts of many courses throughout the two-year curriculum.

Students design their own sequence of courses to form a concentration in HPA. Students may emphasize either policy or management, and may also specialize in particular substantive areas (e.g., mental health, family health, health economics, or aging) or receive training at a more advanced level in health policy, administration, or management. Students are required to take an integrative seminar in either health policy or health management.

Given the sequence in the policy courses and the need to complete a rigorous methods course prior to the second year, transfers into the Health Policy program will not be allowed after the first term unless the student has successfully completed Methods in Health Services Research or Principles of Epidemiology II.

Graduates with an emphasis in Health Policy and Administration are employed in both the public and private sectors including federal and state agencies, for-profit and nonprofit health care organizations, hospitals, and private consulting firms, as well as in research.

DIVISIONAL REQUIREMENTS FOR THE M.P.H. IN HEALTH POLICY AND ADMINISTRATION

<i>Course number</i>	<i>Course title</i>	<i>Course units</i>
HPA 510a	Health Policy and Health Systems	1
HPA 514b	Health Politics and Policy	1
HPA 529a	Advanced Applications in Policy Analysis	1
HPA 583b	Methods in Health Services Research	1
HPA 586b	Microeconomics for Health Care Professionals	1
HPA 597b	Capstone Course in Health Policy	1

The thesis is not a requirement in the Health Policy Program.

LEARNING OBJECTIVES FOR THE M.P.H. IN HEALTH POLICY AND ADMINISTRATION

Upon receiving an M.P.H. with a concentration in Health Policy and Administration, the student will be able to:

- Apply the principles of microeconomics (e.g., markets and market failure) in a health policy context.
- Conduct economic analysis, including cost-effectiveness analysis, to inform public health decision making.
- Describe and assess the historical evolution of the U.S. health care system.
- Describe the role of the major U.S. political institutions in health policy and politics.
- Utilize statistical analysis skills to conduct health systems and policy research.
- Utilize research design and data management skills to conduct health policy and management research.
- Evaluate health care financing, regulatory, and delivery systems.
- Demonstrate written communication skills to effectively communicate in professional health policy and community settings.
- Demonstrate oral communication and presentation skills to effectively communicate in professional health policy and community settings.
- Describe conceptual frameworks for political agenda setting.
- Utilize advocacy, persuasion, and negotiation skills to influence health policy and management decision making.
- Perform strategic analysis and planning for public health care organizations.
- Evaluate health policies in terms of efficiency, efficacy, equity, and feasibility.
- Describe legal perspectives on health policy and management issues, including assessment of legal and regulatory environments in the context of public health.
- Apply ethical decision making in a health care context.
- Demonstrate leadership, team-based collaboration, and conflict management skills.
- Work with and incorporate the perspectives of culturally diverse groups.

Health Management Program

Elizabeth H. Bradley, Ph.D., Director

Future health care managers will be involved in a wide range of settings like hospitals, health systems, pharmaceutical and biotechnology companies, health maintenance organizations, managed care companies, insurance companies, and consulting. The Health Management Program was designed with the realization that both management training and public health training are needed to adequately prepare future leaders in health management in the years ahead.

The Health Management Program emphasizes this need for training in both management skills and public health. This track is offered in conjunction with the Yale School of Management (SOM). The management courses at SOM, combined with offerings in HPA in advanced health management and policy, and a capstone course in the second year, give students an excellent foundation for work in the field. Given the sequence of courses at YSPH and SOM, students are not allowed to transfer into the Health Management Program after the first two weeks of the first term.

**DIVISIONAL REQUIREMENTS FOR THE M.P.H.
IN HEALTH MANAGEMENT (FIRST-YEAR STUDENTS)**

<i>Course number</i>	<i>Course title</i>	<i>Course units</i>
HPA 547a	Law and Ethics of Health Care Organizations	1
HPA 561b	Capstone Course in Health Management	1
HPA 583b	Methods in Health Services Research	1
HPA 580a	Leadership, Organizational Behavior, and Improvement in Health Care (half-term)	0.5
HPA 586b	Microeconomics for Health Care Professionals	1
*MGT 402a	Financial Accounting (half-term)	0.5
*MGT 412a	Investor (half-term)	0.5
*MGT 422b	Operations Engine (half-term)	0.5
*MGT 423a	Sourcing and Managing Funds (half-term)	0.5
*MGT 525a	Competitive Strategy	1
*MGT 856b	Marketing (half-term)	0.5
*MGT 887b	Negotiation	1
	One half-term elective in the School of Management	0.5

*These courses are offered in the School of Management.

**DIVISIONAL REQUIREMENTS FOR THE M.P.H.
IN HEALTH MANAGEMENT (SECOND-YEAR STUDENTS)**

<i>Course number</i>	<i>Course title</i>	<i>Course units</i>
HPA 547a	Law and Ethics of Health Care Organizations	1
HPA 561b	Capstone Course in Health Management	1
HPA 583b	Methods in Health Services Research	1
HPA 586b	Microeconomics for Health Care Professionals	1
*MGT 402a	Financial Accounting (half-term)	0.5
*MGT 412a	Investor (half-term)	0.5
*MGT 422b	Operations Engine (half-term)	0.5
*MGT 525a	Competitive Strategy	1
*MGT 856b	Marketing (half-term)	0.5
*MGT 887b	Negotiation	1

*These courses are offered in the School of Management.

The thesis is not a requirement in the Health Management Program.

**LEARNING OBJECTIVES FOR THE M.P.H.
IN HEALTH MANAGEMENT**

Upon receiving an M.P.H. with a concentration in Health Management, the student will be able to:

- Conduct financial analyses, including reading and analyzing financial statements.
- Conduct economic analyses, including cost-effectiveness analysis, to inform public health management decision making.
- Apply operations management concepts to address organizational performance issues in health service organizations.

- Apply the principles of marketing analysis and planning to public health programs and health service organizations.
- Utilize statistical analysis skills to conduct health systems and policy research.
- Utilize research design and data management skills to conduct health policy and management research.
- Evaluate health care financing, regulatory, and delivery systems.
- Demonstrate written communication skills to effectively communicate in professional health policy and community settings.
- Demonstrate oral communication and presentation skills to effectively communicate in professional health policy and community settings.
- Utilize advocacy, persuasion, and negotiation skills to influence health policy and management decision making.
- Perform strategic analysis and planning for public health care organizations.
- Describe legal perspectives on health policy and management issues, including assessment of legal and regulatory environments in the context of public health.
- Apply ethical decision making in a health care context.
- Apply management problem-solving skills to improve functioning of organizations and agencies in health systems.
- Demonstrate leadership, team-based collaboration, and conflict management skills.
- Coach and provide constructive feedback to colleagues.
- Work with and incorporate perspectives of culturally diverse groups.

Global Health Concentration

Yale School of Public Health is pleased to announce our new Global Health Concentration. This concentration will be available for students matriculating in the 2009–2010 academic year. M.P.H. students in our traditional two-year program may complete this concentration while they satisfy the requirements of their respective divisions or programs. Students in the one-year Advanced Professional M.P.H. Program may enroll in a Global Health Track.

The multidisciplinary approach of the Global Health Concentration encourages creativity and innovation, while fostering a global perspective. The concentration emphasizes an integrative problem-solving approach to global health issues and to diseases and conditions that afflict developing and developed countries. Students who complete this concentration will be well prepared for positions in a variety of organizations—public and private, national, bilateral and multilateral—dedicated to global health challenges.

All students in the Global Health Concentration will complete two required global health courses and two elective global health courses, chosen from a menu of eight courses. Students also will participate in a global health seminar and complete a global health internship during the summer between first and second years of the M.P.H. Students in divisions that require a thesis must write a global health-related thesis, and all students are exposed to leading global health experts who participate in teaching, seminars, and research with students.

REQUIREMENTS FOR M.P.H. GLOBAL HEALTH CONCENTRATION

<i>Course number</i>	<i>Course title</i>	<i>Course units</i>
HPA 591b	Global Health Systems	1

CDE 591b	Epidemiology and Control of Disease in Low- and Middle-Income Countries	1
EPH 591a and b	Global Health Seminar	0
EPH 520c	Summer Internship (must be global health-related)	0
EPH 525b	Thesis (must be global health-related) (required for students in all programs except Health Policy and Health Management)	2
Two of the following:		
CDE 543a	Global Aspects of Food and Nutrition	1
CDE 588a	Geography of Health and Disease in the Global Context	1
EHS 585b	The Environment and Human Health	1
EMD 557b/ NURS 713b	Public Health Issues in HIV/AIDS	1
EMD 583b	Public Health Surveillance	1
HPA 512b	Health in Conflict	1
HPA 588b	Health and Human Rights	1
HPA 592b	Strategic Topics in Global Health	1
HPA 593b	Global Responsibilities for Global Health Rights	1
HPA 594b	Qualitative and Mixed Methods	1
HPA 595b	Economic, Social, and Political Dimensions of Development	1
HPA 599b	Global Health Ethics, Politics, and Economics	1
*ECON 325b	Economics of Developing Countries	1
†F&ES 52012a	Global Resources and the Environment	1
†F&ES 83073b	Households, Communities, and Gender	1
†F&ES 85035a	International Environmental Law and Policy	1
‡INRL 713b	Shifting the Development Policy Paradigm	1
‡MCDB 861b	Global Problems of Population Growth	1
§MGT 526a	Doing Business in the Developing World	1
§MGT 612a	Program Evaluation	1
*PLSC 141a	Ethics of Humanitarian Intervention	1
*PLSC 170b	African Poverty and Western Aid	1
*PLSC 430a	The Politics of Development Assistance	1
*PLSC 446b	Welfare States across Nations	1
*PLSC 447b	The Rwandan Genocide in Comparative Context	1
*SAST 276b	Public Health in India	1
*SAST 376a	Health and Inequality in India	1
*SOCY 363a	Genocide and Ethnic Conflict	1
*SOCY 395a	Wealth and Poverty in Modern China	1

*These courses are offered in Yale College.

†These courses are offered in the School of Forestry & Environmental Studies.

‡These courses are offered in the Graduate School of Arts and Sciences.

§These courses are offered in the School of Management.

**LEARNING OBJECTIVES FOR M.P.H. GLOBAL HEALTH
CONCENTRATION AND ADVANCED PROFESSIONAL M.P.H.
PROGRAM GLOBAL HEALTH TRACK**

Each student in the Global Health Concentration will master the core curriculum learning objectives and the learning objectives for the student's division or program. In addition, upon receiving an M.P.H. degree in the Global Health Concentration, the student will be able to:

- Describe the major causes of morbidity and mortality in the world and in the world's major regions: (a) infectious disease; (b) reproductive/maternal and child health; (c) chronic disease; (d) environmental developments
- Apply burden of disease measures to the analysis of global health disparities.
- Explain the causes of global health disparities.
- Review historical and current methods to control each of the world's major diseases.
- Evaluate which disease control measures would be most appropriate given the epidemiologic, political, and economic conditions of the setting.
- Describe cross-national determinants of health, including globalization, international trade policy, practices of multinational corporations, urbanization, migration, international conflict, and environmental change.
- Analyze global health problems taking into account their social, political, economic, legal, and human rights dimensions.
- Understand the different components of the global health governance infrastructure, and critically assess this infrastructure.
- Describe and analyze alternative approaches for health care delivery, regulation, and financing at the national and international level.
- Apply relevant concepts, theories, and skills to policy and management challenges faced by health systems in low-, middle-, and high-income countries.
- Assess global health issues from an interdisciplinary perspective, including public health disciplines, medicine, international relations, environmental studies, political science, law, anthropology, and others.
- Apply necessary leadership skills to serve as bridges between the global health research and practice settings.
- Apply quantitative and qualitative research methods to global health issues, including the design, monitoring, and evaluation of global health initiatives.
- Explain and propose solutions for the unique challenges involved in conducting public health research in low-resource settings.
- Describe and analyze different roles of global public health practitioners and apply this to individual career development.

ADVANCED PROFESSIONAL M.P.H. PROGRAM

Mayur M. Desai, Ph.D., M.P.H., Director

The Advanced Professional M.P.H. Program provides rigorous public health training to individuals with a doctoral-level degree in a field related to public health (e.g., M.D., D.V.M., D.D.S., or Ph.D. in the biological, behavioral, or social sciences) and to medical students who have completed their third year in an accredited medical school in the

United States. The program is designed for mature individuals with clear goals in public health. A student can enter the program to gain skills in clinical research methodology or to prepare to be the director of a community health center, a leader in a state or local health department, or a medical officer at the Centers for Disease Control and Prevention, among other goals. Physicians in preventive medicine or occupational medicine residency programs can enter the program to complete their M.P.H. degree requirement.

Students concentrate in one of six tracks: Applied Biostatistics and Epidemiology, Social and Behavioral Sciences, Health Policy and Administration, Global Health, Preventive Medicine (restricted to Preventive Medicine Residents), or Occupational and Environmental Medicine (restricted to Occupational and Environmental Medicine Fellows). The first four tracks consist of an intensive seven-week summer session, followed by two terms of study. All requirements must be completed within three years of the date of matriculation.

Curriculum for the Advanced Professional M.P.H. Program

CORE CURRICULUM: APPLIED BIOSTATISTICS & EPIDEMIOLOGY, HEALTH POLICY & ADMINISTRATION, SOCIAL & BEHAVIORAL SCIENCES, AND GLOBAL HEALTH TRACKS

<i>Course number</i>	<i>Course title</i>	<i>Course units</i>
BIS 515c	Accelerated Biostatistics	2
CDE 515c	Accelerated Epidemiology	1
HPA 515c	Accelerated Health Politics and Policy	1
EPH 515b	Seminar on Introduction to Research Ethics	0

One of the following two:

CDE 505a	Social and Behavioral Influences on Health	1
CDE 571b	Psychosocial and Behavioral Epidemiology	1

One of the following five:

EHS 503a	Introduction to Toxicology	1
EHS 507a	Environmental Epidemiology	1
EHS 510a	Contemporary Issues in Environmental Health	1
EHS 511b	Applied Risk Assessment I	1
EHS 575a	Introduction to Occupational and Environmental Medicine	1

One of the following three:

EPH 500b	Public Health Practicum	1
EPH 542b	Community Health Program Planning	1
HPA 555a/b	Health Management Practicum (Health Policy and Administration track only)	1

Required Courses: Applied Biostatistics & Epidemiology Track

CDE 523b	Measurement Issues in Chronic Disease Epidemiology	1
CDE 650a	Introduction to Evidence-Based Medicine and Health Care	1

Two course units from the following five courses:

BIS 623a	Applied Regression Analysis	1
BIS 625a	Categorical Data Analysis	1
BIS 628b	Longitudinal Data Analysis	1
BIS 630b	Applied Survival Analysis	0.5
BIS 632b	Design and Analysis of Epidemiologic Studies	0.5

One additional Biostatistics course 1

One additional Chronic Disease Epidemiology course 1

Capstone course:

CDE 617b	Developing a Research Protocol	1
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Required Courses: Health Policy & Administration Track

HPA 510a	Health Policy and Health Systems	1
HPA 529a	Advanced Applications in Policy Analysis	1
HPA 583b	Methods in Health Services Research	1
HPA 586b	Microeconomics for Health Care Professionals	1

One additional Health Policy and Administration course 1

One of the following two capstone courses:

HPA 561b	Capstone Course in Health Management	1
HPA 597b	Capstone Course in Health Policy	1

Required Courses: Social & Behavioral Sciences Track

CDE 505a	Social and Behavioral Influences on Health	1
CDE 534b	Approaches to Data Management and Analysis of Epidemiologic Data	1
CDE 572a	Preventive Interventions: Theory, Methods, and Evaluation	1
CDE 574b	Developing a Health Promotion and Disease Prevention Intervention	1

Two of the following three:

CDE 531a	Health and Aging	1
CDE 545b	Health Disparities by Race and Social Class	1
CDE 571b	Psychosocial and Behavioral Epidemiology	1

Capstone course:

CDE 617b	Developing a Research Protocol	1
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Required Courses: Global Health Track

HPA 591b	Global Health Systems	1
CDE 591b	Epidemiology and Control of Disease in Low- and Middle-Income Countries	1
EPH 591a and b	Global Health Seminar	0

Two of the following:

CDE 543a	Global Aspects of Food and Nutrition	1
CDE 588a	Geography of Health and Disease in the Global Context	1
EHS 585b	The Environment and Human Health	1
EMD 557b/ NURS 713b	Public Health Issues in HIV/AIDS	1
EMD 583b	Public Health Surveillance	1
HPA 512b	Health in Conflict	1
HPA 588b	Health and Human Rights	1
HPA 592b	Strategic Topics in Global Health	1
HPA 593b	Global Responsibilities for Global Health Rights	1
HPA 594b	Qualitative and Mixed Methods	1
HPA 595b	Economic, Social, and Political Dimensions of Development	1
HPA 599b	Global Health Ethics, Politics, and Economics	1
*ECON 325b	Economics of Developing Countries	1
†F&ES 52012a	Global Resources and the Environment	1
†F&ES 83073b	Households, Communities, and Gender	1
†F&ES 85035a	International Environmental Law and Policy	1
‡INRL 713b	Shifting the Development Policy Paradigm	1
‡MCDB 861b	Global Problems of Population Growth	1
§MGT 526a	Doing Business in the Developing World	1
§MGT 612a	Program Evaluation	1
*PLSC 141a	Ethics of Humanitarian Intervention	1
*PLSC 170b	African Poverty and Western Aid	1
*PLSC 430a	The Politics of Development Assistance	1
*PLSC 446b	Welfare States across Nations	1
*PLSC 447b	The Rwandan Genocide in Comparative Context	1
*SAST 276b	Public Health in India	1
*SAST 376a	Health and Inequality in India	1
*SOCY 363a	Genocide and Ethnic Conflict	1
*SOCY 395a	Wealth and Poverty in Modern China	1

One of the following capstone courses:

CDE 574b	Developing a Health Promotion and Disease Prevention Intervention	1
CDE 617b	Developing a Research Protocol	1
HPA 561b	Capstone Course in Health Management	1
HPA 597b	Capstone Course in Health Policy	

*These courses are offered in Yale College.

†These courses are offered in the School of Forestry & Environmental Studies.

‡These courses are offered in the Graduate School of Arts and Sciences.

§These courses are offered in the School of Management.

CORE CURRICULUM:**OCCUPATIONAL & ENVIRONMENTAL MEDICINE TRACK**

<i>Course number</i>	<i>Course title</i>	<i>Course units</i>
BIS 505a	Introduction to Statistical Thinking I	1
BIS 505b	Introduction to Statistical Thinking II	1
CDE/EMD 508a	Principles of Epidemiology I	1
EPH 515b	Seminar on Introduction to Research Ethics	0

One of the following three:

EHS 503a	Introduction to Toxicology	1
EHS 510a	Contemporary Issues in Environmental Health	1
EHS 511b	Applied Risk Assessment I	1

One of the following two:

CDE 505a	Social and Behavioral Influences on Health	1
CDE 571b	Psychosocial and Behavioral Epidemiology	1

One of the following two:

HPA 510a	Health Policy and Health Systems	1
HPA 560b	Health Care Finance and Delivery	1

Required Courses

EHS 505b	Introduction to Industrial Hygiene	1
EHS 575a and b	Introduction to Occupational and Environmental Medicine	2
EPH 525	Thesis	2

Note: Occupational and Environmental Medicine Fellows may count their practicum year, accredited by the Accreditation Council for Graduate Medical Education, as the required practice experience for the M.P.H. program.

CORE CURRICULUM: PREVENTIVE MEDICINE TRACK

<i>Course number</i>	<i>Course title</i>	<i>Course units</i>
BIS 505a	Introduction to Statistical Thinking I	1
BIS 505b	Introduction to Statistical Thinking II	1
CDE/EMD 508a	Principles of Epidemiology I	1
EHS 575a	Introduction to Occupational and Environmental Medicine	1
EPH 515b	Seminar on Introduction to Research Ethics	0

One of the following two:

CDE 505a	Social and Behavioral Influences on Health	1
CDE 571b	Psychosocial and Behavioral Epidemiology	1

One of the following two:

HPA 510a	Health Policy and Health Systems	1
HPA 560b	Health Care Finance and Delivery	1

Required Courses

CDE 516b	Principles of Epidemiology II	1
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CDE 534b	Approaches to Data Management and Analysis of Epidemiologic Data	1
CDE 572a	Preventive Interventions: Theory, Methods, and Evaluation	1
EHS 575b	Introduction to Occupational and Environmental Medicine	1
Capstone course:		
CDE 617b	Developing a Research Protocol	1
Required only for residents in the cancer prevention track:		
CDE 532b	Epidemiology of Cancer	1

Note: Preventive Medicine Residents may count their practicum year, accredited by the Accreditation Council for Graduate Medical Education, as the required practice experience for the M.P.H. program.

Learning Objectives for the Advanced Professional M.P.H. Program

CORE CURRICULUM

Upon completing the core curriculum of the M.P.H. program, the student will be able to:

- Demonstrate a knowledge base in the disciplines of biostatistics, chronic and infectious disease epidemiology, health systems, public policy, social and behavioral sciences, and environmental health.
- Apply basic research skills to specific public health problems in both group and individual settings, including the ability to define problems; construct, articulate, and test hypotheses; draw conclusions; and communicate findings to a variety of audiences.
- Explain the interrelationships among a multitude of factors that can impact a public health problem, including scientific, medical, environmental, cultural, social, behavioral, economic, political, and ethical factors.
- Review, critique, and evaluate public health reports and research articles.
- Apply public health concepts, principles, and methodologies obtained through formal course work to actual problems experienced in the community or work environment.
- Critically evaluate programs, interventions, and outcomes that relate to public health practice.
- Apply ethical standards and professional values as they relate to the practice of public health.
- Demonstrate sensitivity to the social context within which public health professionals practice.

APPLIED BIOSTATISTICS & EPIDEMIOLOGY TRACK

Upon receiving an M.P.H. degree in the Advanced Professional M.P.H. Program, with a concentration in Applied Biostatistics and Epidemiology, the student will be able to:

- Describe intermediate to advanced concepts of random variation and commonly used statistical probability distributions.

- Develop an efficient design for collecting, recording, and storing data collected in the conduct of public health and medical research.
- Design efficient computer programs for study management, statistical analysis, as well as presentation using SAS and other programming languages.
- Produce edited data sets suitable for statistical analyses.
- Produce working tables and statistical summaries describing research in health science.
- Evaluate the scientific merit and feasibility of epidemiologic study designs.
- Describe the epidemiology of common chronic diseases.
- Synthesize information from a variety of epidemiologic and related studies.
- Design and carry out epidemiologic studies, with minimal supervision.
- Analyze data and draw appropriate inferences from epidemiologic studies at an intermediate to advanced level, using a variety of analytical tools.
- Write an NIH-type epidemiologic research proposal.
- Identify, interpret, and use routinely collected data on disease occurrence.
- Review, critique, and evaluate epidemiologic reports and research articles, as well as the broader health sciences literature, at an intermediate level, using principles of epidemiology and biostatistics.
- Develop written presentations based on intermediate to advanced statistical and epidemiologic analyses for both public health professionals and educated lay audiences.

HEALTH POLICY & ADMINISTRATION TRACK

Upon receiving an M.P.H. degree in the Advanced Professional M.P.H. Program, with a concentration in Health Policy and Administration, the student will be able to:

- Apply the principles of microeconomics (e.g., markets and market failure) in a health policy context.
- Conduct economic analysis, including cost-effectiveness analysis, to inform public health decision-making.
- Describe and assess the historical evolution of the U.S. health care system.
- Describe the role of the major U.S. political institutions in health policy and politics.
- Utilize statistical analysis skills to conduct health systems and policy research.
- Utilize research design and data management skills to conduct health policy and management research.
- Evaluate health care financing, regulatory, and delivery systems.
- Demonstrate written communication skills to effectively communicate in professional health policy and community settings.
- Demonstrate oral communication and presentation skills to effectively communicate in professional health policy and community settings.
- Describe conceptual frameworks for political agenda setting.
- Utilize advocacy, persuasion, and negotiation skills to influence health policy and management decision making.
- Perform strategic analysis and planning for public health care organizations.
- Evaluate health policies in terms of efficiency, efficacy, equity, and feasibility.
- Describe legal perspectives on health policy and management issues, including assessment of legal and regulatory environments in the context of public health.

- Apply ethical decision making in a health care context.
- Demonstrate leadership, team-based collaboration, and conflict management skills.
- Work with and incorporate the perspectives of culturally diverse groups.

SOCIAL & BEHAVIORAL SCIENCES TRACK

Upon receiving an M.P.H. degree in the Advanced Professional M.P.H. Program, with a concentration in Social and Behavioral Sciences, the student will be able to:

- Identify the effects of social, psychological, and behavioral factors on individual and population health, including prevention, treatment and management of chronic disease, adjustment to illness, adherence to treatment regimens, and promotion of recovery.
- Analyze health from multiple levels, including the individual, the social group, and society.
- Critically evaluate and interpret the public health scientific literature as presented in professional journals and the popular media, including descriptive, analytic, and intervention studies.
- Construct research hypotheses and design a study to test these hypotheses.
- Apply social, psychological and behavioral theory in the design, implementation, and evaluation of prevention interventions aimed toward: (a) decreasing health damaging behaviors (e.g. risky sex); (b) increasing health promoting behaviors (e.g. exercise); and (c) increasing psychosocial well-being (e.g. coping with chronic illness).
- Design an intervention aimed at changing a particular health behavior or preventing a disease.
- Develop procedures and training materials to implement effective behavioral interventions.
- Describe how culture, social inequities, and biology influence health across the lifespan.
- Identify ways to address health inequalities and promote health equity.
- Describe the appropriate statistical analyses to examine different types of research questions in the social and behavioral sciences.
- Demonstrate oral and written communication and presentation skills to effectively communicate and disseminate results to various professional and community audiences.
- Explain the dynamic interaction between policies and the social and behavioral sciences.
- Apply the ethical principles involved in social and behavioral sciences as they relate to public health.
- Write an NIH-type research proposal.

GLOBAL HEALTH TRACK

Upon receiving an M.P.H. degree in the Advanced Professional M.P.H. Program, with a concentration in Global Health, the student will be able to:

- Describe the major causes of morbidity and mortality in the world and in the world's major regions.
- Describe the epidemiology, transmission, and pathogenesis of global infectious diseases, including Neglected Tropical Diseases.

- Apply burden of disease measures to the analysis of global health disparities.
- Explain the causes of global health disparities.
- Review methods available to control each of the world's major diseases.
- Evaluate which disease control measures would be most appropriate for a given setting.
- Describe cross-national determinants of health, including globalization, international trade policy, practices of multinational corporations, urbanization, migration, international conflict, and environmental change.
- Analyze global health problems, taking into account their social, political, economic, legal, and human rights dimensions.
- Critically assess the global health governance infrastructure and analyze alternative approaches for health care delivery, regulation, and financing.
- Apply relevant concepts and theories to policy and management challenges faced by health systems in low-, middle-, and high-income countries.
- Assess global health issues from an interdisciplinary perspective, including public health disciplines, medicine, international relations, environmental studies, political science, law, anthropology, and others.
- Apply necessary leadership skills to serve as bridges between the global health research and practice settings.
- Apply quantitative and qualitative research methods to global health issues.
- Explain and propose solutions for the unique challenges involved in conducting public health research in low-resource settings.

OCCUPATIONAL & ENVIRONMENTAL MEDICINE TRACK

Upon receiving an M.P.H. degree in the Advanced Professional M.P.H. Program, with a concentration in Occupational and Environmental Medicine, the student will be able to:

- Evaluate the scientific merit and feasibility of occupational and environmental health study designs.
- Describe and apply alternative strategies for assessment of occupational and environmental exposures.
- Design and conduct an occupational/environmental health study, with minimal supervision.
- Review, interpret, and evaluate epidemiologic reports and research articles pertaining to occupational and environmental risk factors.
- Review, interpret, and evaluate toxicological reports and research articles pertaining to occupational and environmental risk factors.
- Synthesize complex data sources about occupational and environmental hazards to make inferences about human risk.
- Evaluate a work, home and other environments for potential hazardous exposures.
- Utilize industrial hygiene principles to develop a plan to evaluate and control workplace hazards.
- Communicate occupational and environmental health information to employers, workers, professional audiences, and the general public, orally and in writing.

PREVENTIVE MEDICINE TRACK

Upon receiving an M.P.H. degree in the Advanced Professional M.P.H. Program, with a concentration in Preventive Medicine, the student will be able to:

- Evaluate the scientific merit and feasibility of epidemiologic study designs.
- Construct research hypotheses and design a study to test these hypotheses.
- Synthesize information from a variety of epidemiologic and related studies.
- Describe the appropriate statistical analyses to examine different types of epidemiologic and social and behavioral research questions.
- Identify, interpret, and use routinely collected data on disease occurrence.
- Review, critique and evaluate epidemiologic reports and research articles at an intermediate level.
- Write an NIH-type research proposal.
- Apply social, psychological and behavioral theory in the design, implementation, and evaluation of prevention interventions.
- Describe the role of health behavior in disease.
- Evaluate and interpret health behavior change interventions.
- Review, interpret, and evaluate epidemiologic reports and research articles pertaining to occupational and environmental risk factors.
- Review, interpret, and evaluate toxicological reports and research articles pertaining to occupational and environmental risk factors.
- Synthesize complex data sources about occupational and environmental hazards to make inferences about human risk.

B.A.-B.S./M.P.H. SELECT PROGRAM

The Select Program in Public Health gives Yale College students interested in the field of public health the opportunity to earn a bachelor's degree from Yale College and an M.P.H. degree from the Yale School of Public Health in a five-year joint program. During four years of Yale College enrollment, students will complete a standard Yale College major and six course units applicable toward the M.P.H. Students will complete a public health internship between the fourth and fifth years of the program. They will be at YSPH full time in their fifth year, during which they will complete the master's thesis and the remaining ten courses for the master's degree.

Candidates must present evidence of a commitment to public health, as well as one year of college-level mathematics and either biology, chemistry, or physics. Students may apply to YSPH for the joint program in the fall term of their junior year. Applicants must complete YSPH application forms, and must submit transcripts, SAT scores, three letters of recommendation, and a personal statement.

Financial aid, if provided during the fifth year, will come from YSPH. We cannot guarantee that the financial aid award in the fifth year will be equivalent to previous awards.

Further information about this program may be obtained from the Office of Student Affairs, 47 College St., Suite 108, New Haven CT 06510, 203.785.6260, or on the Web at www.publichealth.yale.edu.

Master of Science in Public Health

The Master of Science (M.S.) degree program in Epidemiology and Public Health is designed with an emphasis on mastering the skills in individual specialty areas within public health. The length of study leading to the M.S. degree may be either one or two academic years, and is determined by course requirements necessary for students to acquire a strong grounding in the skills in their chosen area of concentration. Programs are currently offered in Biostatistics and Chronic Disease Epidemiology.

The M.S. in EPH is offered through the department's affiliation with the Graduate School of Arts and Sciences. The departmental Doctoral Committee and the director of graduate studies (DGS) are responsible for overseeing the progress of M.S. students.

BIostatISTICS TRACK (BIS)

The M.S. in Biostatistics is a two-year program. It is designed to train students to meet the growing need in managed care organizations, medical research, and the pharmaceutical industry for graduates with technical skills in data analysis. In contrast to the more general M.P.H. degree, the M.S. degree emphasizes the mastery of biostatistical skills from the beginning of the plan of study. While graduates of this program may apply to the Ph.D. degree program, the M.S. degree is itself quite marketable as a terminal degree.

Degree Requirements

The Biostatistics track requires a minimum of 12 courses plus a master's thesis.

Curriculum

REQUIRED COURSES

<i>Course number</i>	<i>Course title</i>	<i>Course units</i>
BIS 540a	Fundamentals of Clinical Trials	1
BIS 623a	Applied Regression Analysis	1
BIS 625a	Categorical Data Analysis	1
BIS 628b	Longitudinal Data Analysis	1
*BIS 630b	Applied Survival Analysis	0.5
*BIS 632b	Design and Analysis of Epidemiologic Studies	0.5
†STAT 541a	Probability Theory	1
†STAT 542b	Theory of Statistics	1

*These are half-term courses.

†These courses are offered in the Graduate School of Arts and Sciences.

In addition, students must take five elective courses along with completing a master's thesis. Two of these electives must be in Biostatistics or Statistics and one must be in Epidemiology and Public Health (not Biostatistics). Two additional electives are required and can be taken in any area relevant to the student's interest.

Biostatistics electives are to be selected from courses such as Topics in Genetic Epidemiology (BIS 631); Theory of Generalized Linear Models (BIS 691); Nonparametric Statistical Methods and Their Applications (BIS 646); Theory of Survival Analysis and

Its Applications (BIS 643); or other biostatistics courses to be chosen with consent of the degree candidate's adviser.

Students demonstrating a mastery of topics covered by the required courses may replace them with more advanced courses, but must receive written permission from the DGS prior to enrolling in the substitute courses.

Learning Objectives

Upon receiving an M.S. in Epidemiology and Public Health, with a concentration in Biostatistics, the student will be able to:

- Describe advanced concepts of probability, random variation and commonly used statistical probability distributions.
- Develop an efficient design for collecting, recording, and storing data collected in the conduct of public health and medical research.
- Develop sample size and statistical power calculations for basic study designs including those utilized in clinical trials.
- Design efficient computer programs for study management, statistical analysis, as well as presentation using SAS and other programming languages.
- Produce edited data sets suitable for statistical analyses.
- Apply advanced informatics techniques with vital statistics and public health records in the description of public health characteristics and in public health research and evaluation.
- Perform analyses of stated hypotheses using a variety of analytical tools including analysis of variance, multiple regression, nonparametric statistics, logistic regression, multivariate analyses, and methods for analyzing rates and failure time data.
- Interpret results of advanced statistical analyses and use these results to make relevant inferences from data.
- Produce working tables and statistical summaries describing research in health science.
- Develop written presentations based on intermediate to advanced statistical analyses for both public health professionals and educated lay audiences.
- Develop oral presentations based on intermediate to advanced statistical analyses for both public health professionals and educated lay audiences.

Master's Thesis

In the second year of the program, the student is required to execute a program of independent research under the direction of a faculty member. This project usually falls into one of these main areas:

1. Development of a new statistical theory or methodology.
2. A computer-based simulation study to illustrate properties of an existing method.
3. The analysis of a real data set.

The student is required to prepare a written thesis under the supervision of a Biostatistics faculty member. Upon completion of the thesis, the student will make an oral presentation of the results of his/her work.

For specific instructions on the organization, mechanics, and publication of the thesis, see Appendix II: Thesis Guidelines.

CHRONIC DISEASE EPIDEMIOLOGY TRACK (CDE)

With the growth of biotechnology and medical research in the pharmaceutical industry there is a high demand for well-trained graduates in chronic disease epidemiology. This track provides intensive training in epidemiology and research methods for medical and health care professionals, or others seeking the skills necessary to conduct epidemiological research in their professional practice.

Applicants should have a basic understanding of quantitative science and statistics. It is recommended that candidates have strong science backgrounds and demonstrated competency in statistical analysis and logical thinking. Applicants from rigorous programs in the biological or social sciences will be given preference. At a minimum, applicants should have one year of course work in statistics or the equivalent prior to enrolling in this program. Full-time applicants are preferred.

Degree Requirements

The CDE track consists of required and elective course work and the satisfactory completion of the Capstone experience. A total of 10 courses are required. It is expected that this program will be completed during a single academic year. Students with an M.P.H. or other related degrees may be eligible to substitute advanced courses for some of the required courses. Written permission of the DGS is required prior to enrolling in substitute courses.

Curriculum

REQUIRED COURSES

<i>Course number</i>	<i>Course title</i>	<i>Course units</i>
BIS 623a	Applied Regression Analysis	1
BIS 625a	Categorical Data Analysis	1
*BIS 630b	Applied Survival Analysis	0.5
*BIS 632b	Design and Analysis of Epidemiologic Studies	0.5
CDE/EMD 508a	Principles of Epidemiology I	1
CDE 516b	Principles of Epidemiology II	1
CDE 523b	Measurement Issues in Chronic Disease Epidemiology	1
§CDE 617b	Developing a Research Protocol	1
Suggested electives (three courses are required):		
BIS 511a	GIS Applications in Epidemiology and Public Health	1
BIS 540a	Fundamentals of Clinical Trials	1
BIS 561b	Advanced Topics and Case Studies in Multicenter Clinical Trials	1
BIS 631a	Topics in Genetic Epidemiology	1
BIS 643a	Theory of Survival Analysis and Its Applications	1
BIS 645a	Statistical Methods in Human Genetics	1
CDE 518b	Introduction to Pharmacoepidemiology	1
CDE/EHS 520b	Chronic Disease Genetics and Genomics	1

CDE 531a	Health and Aging	1
CDE 532b	Epidemiology of Cancer	1
CDE 533b	Topics in Perinatal Epidemiology	1
CDE 535b	Epidemiology of Heart Disease and Stroke	1
CDE 562a	Nutrition and Chronic Disease	1
CDE 630a	Molecular Epidemiology of Chronic Disease	1
CDE 650a	Introduction to Evidence-Based Medicine and Health Care	1

*These are half-term courses.

§In this capstone course, the student is required to complete an NIH-type grant application that is deemed reasonably competitive by the instructor. An optional addition to the capstone experience is an individualized tutorial in which the student completes a manuscript that is suitable for submission for publication in a relevant journal, or a publishable systematic review.

Learning Objectives

Upon receiving an M.S. in Epidemiology and Public Health, with a concentration in Chronic Disease Epidemiology, the student will be able to:

- Explain and apply the terminology and definitions of epidemiology.
- Evaluate the scientific merit and feasibility of epidemiologic study designs.
- Describe the epidemiology of common chronic diseases.
- Synthesize information from a variety of epidemiologic and related studies.
- Design and carry out epidemiologic studies, with minimal supervision.
- Analyze data and draw appropriate inferences from epidemiologic studies at an intermediate to advanced level, using a variety of analytical tools including multivariate logistic regression, Poisson regression, linear regression, and survival analysis.
- Write an NIH-type epidemiologic research proposal.
- Identify, interpret, and use routinely collected data on disease occurrence.
- Review, critique, and evaluate epidemiologic reports and research articles at an intermediate level.

Doctoral Degrees

Doctoral training has been part of Yale's mission since early in its history. The University awarded the first Ph.D. in North America in 1861, and the doctoral program in public health began with the establishment of the department in 1915. Six years later, in 1922, Yale conferred the Doctor of Philosophy (Ph.D.) in Public Health on two candidates.

Public health spans disciplines that use tools available in the laboratory, field research, social sciences, the public policy arena, and mathematics. Students engage in a highly focused area of research reflecting scholarship at the doctoral level but are exposed to a broad view of public health as seen in the diverse research interests of the department's faculty.

The primary mission of the doctoral program in Epidemiology and Public Health is to provide scholars with the disciplinary background and skills required to contribute to the development of our understanding of better ways of measuring, maintaining, and improving the public's health. The core of such training includes the mastery of research tools in the specialty discipline chosen by the candidate.

Within the Yale academic community, the Ph.D. is the highest degree awarded by the University. EPH offers studies toward the Ph.D. degree through its affiliation with the Graduate School of Arts and Sciences. The Graduate School makes the final decision on accepting students into the program, admission to candidacy, and the awarding of the degree.

LEARNING OBJECTIVES FOR THE PH.D. IN EPIDEMIOLOGY AND PUBLIC HEALTH

Upon receiving a Ph.D. in Epidemiology and Public Health, the student will be able to:

- Describe basic public health principles.
- Critically evaluate public health and related literature.
- Discuss and critically evaluate the broad literature of the student's discipline.
- Review in depth the background and research advances in the student's specific research area.
- Apply at an advanced level the research methodology of the student's broader discipline and, in particular, the student's specific research area.
- Present research to colleagues and professionals on a national and international level at professional meetings.
- Design a course in the student's broad discipline.
- Explain the principles of research ethics and apply these principles to specific research projects.
- Design and conduct an advanced, original research project in the student's discipline.
- Generate data to create publishable manuscripts that represent important contributions to the literature.

It should be noted that the Ph.D and M.S. programs are governed by the Yale Graduate School of Arts and Sciences and not by the Yale School of Public Health. The Graduate

School is the final arbiter in decisions that affect all Ph.D. and M.S. students and their academic program.

ACADEMIC ADVISING

Each student is assigned to an academic adviser at the time of matriculation. The academic adviser is available for help with course selection and preparation for the qualifying examinations. A student must address a request for a change of his/her academic adviser in writing to the Director of Graduate Studies (DGS). The request must be co-signed by both the previous and new academic adviser.

TEACHING FELLOWSHIPS

Teaching experience is regarded as an integral part of the graduate training program. Doctoral students are required to complete four terms satisfactorily as a Teaching Fellow (10 hours per week). These teaching experiences are typically completed during the second and third years of study. First-year students are encouraged to focus their efforts on course work and in most instances are not permitted to serve as Teaching Fellows. First-year students may be allowed to serve as Teaching Fellows if they have been awarded advanced standing. Advanced standing is only available to students who have completed previous graduate study at Yale (e.g., M.S. or M.P.H. programs). If a student has been awarded one year of advanced standing, he/she will be allowed to teach in both the fall and spring terms of the first year. If a student has been awarded one term of advanced standing, he/she will only be allowed to teach during the spring term of the first year.

All doctoral students are required to complete 40 hours (four Level 2 assignments at 10 hours/week or an equivalent combination) as a Teaching Assistant. Graduate research assistantship opportunities may take the place of teaching in the third year of study. Furthermore, a waiver of 10 hours is possible if the student is working as a Project Assistant (generally no more than 10 hours per week and with prior approval of the DGS). By year four, all students are expected to be engaged in full-time research activities.

DEGREE REQUIREMENTS

There are five divisions in EPH in which doctoral students may choose a specialty. Requirements for each division vary and are outlined below under Divisional Requirements. In addition, all candidates for the Ph.D. degree must conform to the requirements of the Graduate School of Arts and Sciences.

Required Course Work

The normal requirement for the degree of Doctor of Philosophy is typically four to five years of graduate study. Generally, the first two years are devoted primarily to course work. Each student must satisfactorily complete a minimum of ten courses or their equivalent and must satisfy the individual divisional requirements (see below for course requirements in each division). Courses such as Dissertation Research, preparing for Qualifying Examinations, or Seminar do not count toward the course requirements. All EPH doctoral students are required to participate in a course that exposes students to

both practical and theoretical issues in research ethics. This ethics course is in addition to the minimum required courses. The Graduate School requires that Ph.D. students achieve a grade of Honors in at least two doctoral-level courses. EPH Ph.D. students must also have an overall High Pass average.

Qualifying Examinations

The required qualifying examinations are usually taken at the end of the second year of study. In order to meet the different divisional needs, each division has developed a qualifying examination format. Details about the qualifying examination structure are given in each divisional program description below. The qualifying examinations serve to demonstrate that the candidate has mastered the background and the research tools required for dissertation research. The qualifying examinations are usually scheduled in June, and all examinations must be scheduled within a two-week period. Students who have not completed the qualifying examinations with an average grade of High Pass by the end of their second year will not be permitted to register for the third year.

Prospectus Guidelines

Before the end of the spring term of the third year, the Graduate School requires each student to submit a Dissertation Prospectus, a written summary of the planned nature and scope of the dissertation research, together with a provisional title for the dissertation. It is strongly recommended that students begin working with their advisers on this process early in the third year. Ideally students should submit the names of Dissertation Advisory Committee (DAC) members during the fall term of the third year and then submit the prospectus during the spring term of the third year. Students must have both the committee members and prospectus approved by the end of the third year (May).

Students first submit to the EPH Doctoral Committee the names of their proposed DAC members. The DAC consists of at least three members including the chairperson, who is the thesis adviser. Two members are expected to be EPH Graduate School faculty, and one member may be from another department, but is expected to have a Graduate School appointment. EPH encourages participation of faculty members from other departments. An additional committee member may be selected from outside the University if he/she is a recognized authority in the area of the dissertation. A *curriculum vitae* must be provided in support of this additional member. The student should also submit a brief (one-page) proposal/description of the research plan and rationale for each committee member. The proposed DAC members must sign the one-page proposal/description stating that they have agreed to serve on the committee. Once the EPH Doctoral Committee approves the student's DAC, the student should work with his/her committee to develop the prospectus.

The purpose of the prospectus is to formalize an understanding among the student, the DAC, and the EPH Doctoral Committee regarding the scholarship of a proposed dissertation project and to certify their collective willingness to collaborate in seeing the dissertation project to a successful completion. The prospectus should:

- Provide a detailed description of a research plan, including title, topic, background, significance, study questions, analytic plan, and methods.

- Establish a consensus among the student, the DAC, and the EPH Doctoral Committee that the research plan meets the requisite standards of originality, scope, significance, and virtuosity.
- Certify that the student is, in the eyes of the DAC and the EPH Doctoral Committee, qualified to see the proposed research plan to successful completion.
- Formalize the DAC's willingness to work with the student to see the proposed research plan to successful completion.

This document should be written in clear, plain English with minimal jargon, abbreviations, or colloquialisms. The prospectus should be a *maximum* of twenty pages (double-spaced). All diagrams, figures, and tables must be included within the twenty-page limit. References are not part of the page limit. Be succinct, as a prospectus that does not comply with the twenty-page limit will be returned without review. If a student already has a publication based on the proposed research, an appendix or a link to the publication can be included.

The format of the thesis proposal (prospectus) handed to the DAC for discussion and approval should conform to the following requirements:

1. Title of proposed thesis (can be a working title)
2. Abstract (one page): succinctly describe the content and scope of the prospectus by highlighting the major points covered.
3. Specific aims: a concise statement of the general problem under study and the explicit goals of the project.
4. Background and significance: This section should place the research project in context and describe the proposed research in a manner intelligible to a non-specialist. This should include a brief, but critical, evaluation of the relevant literature and a description of how the student's research project will advance knowledge in the field.
5. Proposed research plan: Outline the research project envisioned at this time and indicate the plan to attain the overall goals of the project. Include preliminary data, if available. Acknowledge pitfalls and limitations of the research, and if possible suggest alternative strategies.
6. References: Should be included at the end (not included in the page limit).

The prospectus submitted to the EPH Doctoral Committee should be the version of the proposal approved by the student's DAC. The prospectus must be submitted to the EPH Doctoral Committee together with the Submission of Dissertation Prospectus form.

The EPH Doctoral Committee will review the prospectus and may request changes to either the prospectus or the DAC. Once the EPH Doctoral Committee has approved the prospectus, it will be submitted to the Graduate School registrar.

Regular face-to-face meetings with the entire DAC are invaluable and are expected throughout the student's research. The DAC is expected to meet as a group at least twice each year, and more frequently, if necessary. Since dissertation progress reports are due at the close of the spring term, it is advised that one of the meetings be scheduled in March or April. In doing so, the thesis adviser, student, and DGS will have current information on the student's progress for use in completing the Dissertation Progress Report online. The student schedules the meetings of the DAC. The chairperson of the

DAC (i.e., the thesis adviser), produces a summary report outlining progress and plan for the coming year. The document is to be distributed to the other committee member for comments. The student and the DGS are to receive a copy of the document from the DAC chairperson.

Because the prospectus is required fairly early in the dissertation research, the content of a thesis may change over time, and thus the student should not feel bound by what is submitted. However, major changes to the direction of research described in the prospectus should be discussed with the DAC and approved by the EPH Doctoral Committee.

Admission to Candidacy

After all pre-dissertation requirements are successfully completed (course requirements, Honors requirement, overall High Pass average, qualifying examinations, dissertation prospectus), the student will be admitted to candidacy for the Ph.D. degree. These requirements are typically met in three years. Customarily, students who have not been admitted to candidacy will not be permitted to register for the fourth year. Exceptions must be approved in advance by the DGS and the Graduate School associate dean. In the term following admission to candidacy for the Ph.D. degree, the student will automatically receive the M.Phil. degree.

THE THESIS/DISSERTATION

The Ph.D. thesis in EPH should be of publishable quality and represent a substantial contribution to knowledge. The Graduate School policy in regard to the dissertation is as follows:

The dissertation should demonstrate the student's mastery of relevant resources and methods and should make an original contribution to knowledge in the field. The originality of a dissertation may consist of the discovery of significant new information or principles of organization, the achievement of a new synthesis, the development of new methods or theories, or the application of established methods to new materials.

Normally, it is expected that a dissertation will have a single topic, however broadly defined, and that all parts of the dissertation will be interrelated. This does not mean that sections of the dissertation cannot constitute essentially discrete units. Dissertations in the physical and biological sciences, for example, often present the results of several independent but related experiments. Given the diverse nature of the fields in which dissertations are written and the wide variety of topics that are explored, it is impossible to designate an ideal length for the dissertation. Clearly, however, a long dissertation is not necessarily a better one. The value of a dissertation ultimately depends on the quality of its thought and the clarity of its exposition. In consultation with their faculty advisers and the director of graduate studies, students should give serious thought to the scale of proposed dissertation topics. There should be a reasonable expectation that the project can be completed in two to three years.

The dissertation may be presented as a single monograph as a major publication or as (typically) a minimum of three first-authored scientific papers. One or more of the

papers should be published, accepted for publication, or be in submission. The collected paper option does not imply that any combination of papers would be acceptable. For example, three papers related to background material (review papers), or three papers that reported associations of three unrelated exposures, or three papers of the same exposure but reporting different outcomes would not be acceptable. *Rather it is expected that the papers represent a cohesive, coherent, and integrated body of work.* For example, one paper might be a systematic review of the topic, another might develop a new methodological approach, and the third might apply those new methods to an area of current public health interest. In the collected paper option, the final thesis should include introductory and discussion chapters to summarize and integrate the published papers.

The student's DAC will determine whether the standards for a Ph.D. thesis have been met and the thesis is ready for submission to the readers. Students should submit the entire dissertation to the DAC at least four weeks prior to the submission deadline (October 1 for December graduation and March 15 for May graduation). This allows ample time for the DAC to review the dissertation and either approve it for submission or recommend revisions prior to submission. It is imperative that all members of the DAC approve the dissertation prior to submission; therefore it is the student's responsibility to ensure that the committee has enough time to review it. Students should plan to have a committee meeting approximately two to three months prior to the submission deadline to inform the committee of their expected timeline and receive input from the committee regarding the feasibility of meeting this deadline.

There will be a minimum of three readers, one of whom is from EPH, two with Graduate School appointments, and one who is typically an authority in the dissertation research from outside the University. The selection of Yale faculty readers should include at least one senior faculty member. All readers must be recognized authorities in the area of the dissertation. The outside reader must submit a *curriculum vitae* for review by the EPH Doctoral Committee. Members of the Dissertation Advisory Committee are not eligible to serve as readers. The Graduate School sends a copy of the dissertation and a reader's report form to each reader.

When the completed readers' reports are received by the Graduate School and the department, they are reviewed by the DGS and the EPH Doctoral Committee prior to making a departmental recommendation to the Graduate School that the degree be awarded. The DAC may be asked to comment on the readers' reports before recommendations are made to the Graduate School.

Oral Presentation of the Doctoral Dissertation

Doctoral dissertations originating in EPH must be presented in a public seminar. This presentation is scheduled after the submission of the dissertation to the readers and preferably prior to the receipt and consideration of the readers' reports. At least one member of the DAC and at least one member of the EPH Doctoral Committee are expected to attend the presentation. It is expected to be presented during the academic term in which the dissertation was submitted and must be widely advertised within EPH.

DIVISIONAL REQUIREMENTS

The specific requirements with regard to courses, comprehensive examinations, and admission to candidacy set by EPH divisions are described below.

Biostatistics

Biostatistics involves the development and application of sound statistical and mathematical principles to research in the health sciences. Because original theoretical research in biostatistics flows from medical research, it is essential that the foundations of methodological development be firmly grounded in sound principles of statistical inference and a thorough knowledge of the substantive area that provides the source of the medical questions being addressed. Thus, the division of Biostatistics encourages excellent methodological work that is motivated by sound science that includes but is not limited to active collaborations with other investigators.

Research collaborations for biostatisticians take place both within and across divisions in EPH, as well as with other departments in the School of Medicine and the University at large. Areas of current research include development of general methods that have wide applicability across different areas of health research, as well as more specific techniques for dealing with the underlying processes that give rise to the data of interest. A broad range of health topics addressed by students in this division include chronic diseases such as cancer, genetic epidemiology, clinical research, and mathematical models for infectious diseases.

Graduates of the doctoral program in Biostatistics are employed in universities throughout the country, as well as in such dedicated research institutions as the National Institutes of Health. In addition, graduates have pursued careers in the pharmaceutical industry in which they are actively involved in the evaluation of new therapeutic strategies.

REQUIRED COURSE WORK

Students in the division of Biostatistics prepare for their qualifying examination by taking the courses listed below. Course waivers must be recommended by the academic adviser and approved by the division head and DGS.

<i>Course number</i>	<i>Course title</i>	<i>Course units</i>
BIS 525a and b	Seminar in Biostatistics	0
BIS 623a	Applied Regression Analysis	1
BIS 625a	Categorical Data Analysis	1
BIS 628b	Longitudinal Data Analysis	1
*BIS 630b	Applied Survival Analysis	0.5
*BIS 632b	Design and Analysis of Epidemiologic Studies	0.5
BIS 643a	Theory of Survival Analysis and Its Applications	1
BIS 646b	Nonparametric Statistical Methods and Their Applications	1
BIS 651b	Spatial Statistics	1
BIS 691b	Theory of Generalized Linear Models	1
BIS 695c	Summer Rotation in Statistical Research	1

†STAT 541a	Probability Theory	1
†STAT 542b	Theory of Statistics	1
†STAT 610a	Statistical Inference	1
†STAT 612a	Linear Models	1

*These are half-term courses.

†These courses are offered in the Graduate School of Arts and Sciences.

Under the guidance of the academic adviser, students choose three courses in their applied area. The applied area consists of an intended area of methodological research applied to such areas as epidemiology, genetics, microbiology, or health policy. For example, the courses required for students taking an epidemiology examination are: CDE 508a, Principles of Epidemiology I; CDE 516b, Principles of Epidemiology II; and CDE 619a, Advanced Epidemiologic Research Methods.

QUALIFYING EXAMINATIONS

The examination includes both an in-class and a take-home portion on biostatistics, an in-class portion on statistical theory, and a third exam in a specialty area. One faculty member is responsible for coordinating this examination, and the examination content is developed by the overall faculty. The specialty area examination is usually developed by an expert in the field following discussions with the candidate and the BIS faculty adviser.

RESEARCH EXPERIENCE

In a number of courses, students gain actual experience with various aspects of research including preparation of a research grant, questionnaire design, preparation of a database for analysis, and analysis and interpretation of real data. In addition, doctoral students can gain research experience by working with faculty members on ongoing research studies prior to initiating dissertation research, which includes but is not limited to BIS 695. During the summer following each year of course work, candidates are required to take a lab rotation that is approved by the division.

THE DISSERTATION

The division of Biostatistics strives for doctoral dissertations that have a strong methodological component motivated by an important health question. Hence, the dissertation should include a methodological advance or a substantial modification of an existing method motivated by a set of data collected to address an important health question. The dissertation must also include the application of the proposed methodology to real data. A fairly routine application of widely available statistical methodology is not acceptable as a dissertation topic. Candidates are expected not only to show a thorough knowledge of the posed health question, but also to demonstrate quantitative skills necessary for the creation and application of novel statistical tools.

Chronic Disease Epidemiology

Epidemiology is the study of disease in populations. Such populations may be groups of people in certain geographic areas, people with a common disease, or people with some suspected risk factor. The division of Chronic Disease Epidemiology (CDE) has

traditionally focused on either chronic or noninfectious diseases although in recent years the artificiality of this distinction has become obvious and the view has been broadened. A recent thesis, for example concerned the perinatal transmission of HIV/AIDS, and others have examined the viral etiology of cancer.

The division is perhaps best known for its doctoral programs in the epidemiology of aging, cancer, perinatal diseases, genomics, and psychosocial disorders. However, students in the division often work on projects with other divisions within EPH, other departments in the School of Medicine, and other schools within the University. Thus there are numerous opportunities for creating an experientially rich doctoral program.

Graduates from the division's doctoral program are found on the faculties of universities throughout the world, at the highest levels of federal and international research programs, in numerous private and public foundations and institutions, and in leadership positions at many multinational corporations.

REQUIRED COURSE WORK

Students in this division are expected to complete the following courses or their equivalents:

<i>Course number</i>	<i>Course title</i>	<i>Course units</i>
BIS 505a	Introduction to Statistical Thinking I	1
BIS 505b	Introduction to Statistical Thinking II	1
BIS 540a	Fundamentals of Clinical Trials	1
BIS 623a	Applied Regression Analysis	1
BIS 625a	Categorical Data Analysis	1
*BIS 630b	Applied Survival Analysis	0.5
*BIS 632b	Design and Analysis of Epidemiologic Studies	0.5
CDE/EMD 508a	Principles of Epidemiology I	1
CDE 516b	Principles of Epidemiology II	1
CDE 523b	Measurement Issues in Chronic Disease	
	Epidemiology	1
CDE 534b	Approaches to Data Management and Analysis of	
	Epidemiologic Data	1
CDE 617b	Developing a Research Protocol	1
CDE 619a	Advanced Epidemiologic Research Methods	1

Topic areas In order to ensure that students gain a broad knowledge regarding epidemiology, students take a minimum of four topic area courses in addition to those in their specialty area such as:

CDE 518b	Introduction to Pharmacoepidemiology	1
CDE/EHS 520b	Chronic Disease Genetics and Genomics	1
CDE 531a	Health and Aging	1
CDE 532b	Epidemiology of Cancer	1
CDE 533b	Topics in Perinatal Epidemiology	1
CDE 535b	Epidemiology of Heart Disease and Stroke	1
CDE 545b	Health Disparities by Race and Social Class	1
CDE 562a	Nutrition and Chronic Disease	1

CDE 630a	Molecular Epidemiology of Chronic Disease	1
CDE 650a	Introduction to Evidence-Based Medicine and Health Care	1
EHS 507a	Environmental Epidemiology	1
EHS 545b	Introduction to Environmental Genetics	1
EHS 553b	Epidemiological Methods in Injury Control	1

*These are half-term courses

QUALIFYING EXAMINATIONS

The qualifying examinations in CDE entail a three-part system emphasizing Biostatistics, Epidemiologic Methods, and the student's chosen specialty area.

The examination covering epidemiological methods includes both an in-class and a take-home portion. One faculty member is responsible for coordinating this examination, and the examination content is developed by the overall faculty. The specialty area examination is usually prepared in a tutorial with one or more faculty members.

RESEARCH EXPERIENCE

In a number of courses, students gain actual experience with various aspects of research including preparation of a research grant, questionnaire design, preparation of a database for analysis, and analysis and interpretation of real data. In addition, doctoral students can gain research experience by working with faculty members on ongoing research studies prior to initiating dissertation research.

THE DISSERTATION

For the doctoral dissertation, some candidates will design and develop their own research protocol, collect the data, and conduct appropriate analyses. However, epidemiologic studies are often large, time-consuming, and expensive enterprises that often cannot be realistically completed within the time frame expected for a doctoral dissertation. Consequently, some dissertations often result from "piggy-backing" the dissertation research onto a larger study being conducted by a faculty member. If a student has previously documented experience with data collection, the doctoral dissertation may emphasize the statistical analysis of a data set in such a way as to address a new hypothesis. However the thesis is constructed, the division requires that the research makes a significant contribution to new knowledge in the field of epidemiology. Many dissertations are presented as three or more completed or published manuscripts based on the dissertation research.

Environmental Health Sciences

The Environmental Health Sciences (EHS) doctoral program focuses on how the environmental agents – physical, chemical, and biological – affect human health, considered within the general framework of epidemiology and public health. Students are skilled in research, assessment, and evaluation of the impact of environmental stressors; they identify potentially adverse environmental agents, assess their exposures, determine their impact on health, and estimate the consequent risk. The Ph.D. emphasizes the preparation of students for scholarly careers in research and teaching.

REQUIRED COURSE WORK

The student's academic adviser determines which core background requirements have been satisfied by previous course work, and which courses, if any, the student has to complete successfully. Subsequently, the student and his/her academic adviser form a plan for the student's course work.

Students typically complete the equivalent to all the EHS divisional course requirements for the EHS specialization area:

<i>Course number</i>	<i>Course title</i>	<i>Course units</i>
BIS 505a	Introduction to Statistical Thinking I	1
BIS 505b	Introduction to Statistical Thinking II	1
CDE/EMD 508a	Principles of Epidemiology I	1
EHS/CDE 502a	Physiology for Public Health	1
EHS 503a	Introduction to Toxicology	1
EHS 507a	Environmental Epidemiology	1
EHS 508b	Assessing Exposures to Environmental Stressors	1

In addition to the above required courses, students elect courses from the more specialized areas of environmental health (occupational health, risk assessment, etc.).

Students who select Environmental Epidemiology as their area of specialization are required to take the following courses:

BIS 623a	Applied Regression Analysis	1
BIS 625a	Categorical Data Analysis	1
CDE 516b	Principles of Epidemiology II	1
CDE 617b	Developing a Research Protocol	1
EHS 545b	Introduction to Environmental Genetics	1
EHS 580b	Environmental Hormones and Human Health	1

Students who select specialization in an area other than Environmental Epidemiology, together with the academic adviser, will identify the specialization area and determine the selection of courses required. These courses may come from other graduate programs in the department, as well as from programs in other parts of the University. Students are particularly encouraged to seek additional courses in such subjects as chemistry, cellular and molecular physiology, engineering, forestry, medicine, pharmacology, and physics.

QUALIFYING EXAMINATIONS

The qualifying examinations in this division test the student's knowledge in three areas – a specialty and two other areas based upon the student's specialty. The majority of students select Environmental Epidemiology as their area of specialization, and then have Chronic Disease Epidemiology and Biostatistics as the additional areas covered in the comprehensive examinations. Specialization in other basic biomedical sciences or departments of the University is also possible.

RESEARCH REQUIREMENTS

During the second term of the first year and the first term of the second year, students work with their academic adviser to participate in ongoing research activities, thereby

gaining an opportunity to learn hands-on techniques in subject areas within environmental health sciences.

THE DISSERTATION

The dissertation for the Ph.D. degree must make an original contribution to the field.

Epidemiology of Microbial Diseases

The goals for doctoral students in the division of Epidemiology of Microbial Diseases (EMD) are to obtain a current theoretical and practical base of epidemiological and microbiological principles, to master research methods, and to apply these skills to investigations of the biology of infectious organisms of public health importance, their transmission, and the epidemiology of the diseases they cause. The approach is multidisciplinary. It includes in-depth ecological, pathogenic, clinical, cellular, immunological, and molecular aspects of infectious diseases, their causative agents, vertebrate hosts, and vectors.

REQUIRED COURSE WORK

Courses in biostatistics, epidemiology, and microbiology are strongly recommended. The specific courses recommended depend on the background of individual students and their stated research interests. An individual program that includes courses, seminars, and laboratory rotations is developed by the student and his/her faculty academic adviser. Student progress is reviewed at the end of each academic year.

The following courses are ones that are appropriate for Ph.D. students in EMD. However, other courses in EPH or in other departments may also be appropriate.

<i>Course number</i>	<i>Course title</i>	<i>Course units</i>
*CBIO 602a	Molecular Cell Biology	1
EMD 548b	Remote Sensing: Observing the Earth from Space	1
EMD 550b	Vector Biology	1
EMD 642a	Roles of Microorganisms in the Living World	1
EMD 680a	Molecular and Cellular Processes of Parasitic Eukaryotes	1
EMD 684b	Advanced Topics in Molecular Parasitology	1
†MBIO 685b	Molecular Mechanisms of Microbial Pathogenesis	1
†E&EB 665a	Landscape Ecology	1
*GENE 705a	Molecular Genetics of Prokaryotes	1
*GENE 734a	Molecular Biology of Animal Viruses	1
†IBIO 539b	Advanced Immunology Seminar	1
†MCDB 530a	Biology of the Immune System	1
*PATH 650b	Cellular and Molecular Biology of Cancer	1

*These courses are offered in the School of Medicine.

†These courses are offered in the Graduate School of Arts and Sciences.

QUALIFYING EXAMINATION

EMD has adopted an oral and written qualifying examination format. Components of the examination include the following: (1) readings with committee members on selected

topics; these readings may require review and integration of course work, laboratory rotations, research seminars, and published literature; and (2) research proposals in two areas, one on the proposed dissertation topic and the other in an area distinct from the proposed dissertation topic. The research topics are selected by the examining committee from the student's suggestions, and submitted within a prescribed time frame in written form. The examination takes the form of questions from members of the committee based on readings and an oral defense of both research proposals.

Detailed information regarding the EMD program is available from the EMD representative to the Doctoral Committee or the coordinator of graduate student affairs.

RESEARCH REQUIREMENTS

Laboratory training is required of all students during both the first and second terms of their first year and during the summer between their first and second years. Each term involves a different investigator. These are offered as formal courses, and there will be a brief presentation to the division at the end of each rotation. Each term is graded. Investigators act as tutors and monitor the progress of the work, although students are given a certain amount of independence in their work. Laboratory work is defined broadly, including experiments in the more traditional wet laboratory setting, as well as work in the field and on the computer.

Health Policy and Administration

The doctoral program in health services research and health policy analysis is designed to educate individuals to apply knowledge derived from public health and social sciences (biostatistics, epidemiology, and microeconomics) and to creatively extend such knowledge. Individuals with advanced preparation in health services research and health policy analysis prepare for research, teaching, or policy careers in both the public and the private sector. The program seeks to educate individuals to engage in activities on the forefront of (1) health services research, (2) organizational theory and management, (3) policy formulation and analysis, and (4) economic theory and its application to health programs.

REQUIRED COURSE WORK

Students in the division of Health Policy and Administration (HPA) become prepared for their qualifying examinations in the areas of biostatistics and health services research. Students will choose one area of depth within health services research and work directly with specific faculty to gain knowledge and expertise in this area of depth. The areas of depth students will choose from are Political and Policy Analysis; Economic Theory and Application; and Organizational Theory and Management. Students will complete the following course work or the equivalent of the topic areas covered in these courses. This course listing represents a suggested program of study. With the approval of the faculty adviser, alternative courses that better suit the needs of the student may satisfy the course work requirement. The divisional representative to the Doctoral Committee in conjunction with the student's adviser is responsible for determining if core course requirements have been satisfied by previous course work or alternative courses. If so, the student should apply for a course waiver through the Graduate School.

Biostatistics/Statistics and Methods (minimum of 4 courses)

<i>Course number</i>	<i>Course title</i>	<i>Course units</i>
BIS 623a	Applied Regression Analysis	1
BIS 625a	Categorical Data Analysis	1
BIS 628b	Longitudinal Data Analysis	1
*PLSC 503b	Qualitative Methods [or equivalent EPH course]	1
*PLSC 504b	Advanced Qualitative Methods	1

Health Services Research/Policy (minimum of 4 courses)

Note: HPA 600 and HPA 617 required for all students

HPA 510a	Health Policy and Health Systems	1
HPA 514b	Health Politics and Policy	1
HPA 529a	Advanced Applications in Policy Analysis	1
HPA 561b	Capstone Course in Health Management	1
HPA 570a	Cost-Effectiveness Analysis and Decision Making	1
HPA 580a	Leadership, Organizational Behavior, and Improvement in Health Care	1
HPA 587b	Health Care Economics	1
HPA 597b	Capstone Course in Health Policy	1
HPA 617a and b	Colloquium in Health Services Research I & II	

Area of depth (minimum of 4 courses)

Students will take courses relevant to the area of depth chosen. Courses will be chosen based on student’s specific interest and approved by the student’s adviser. Areas of depth to choose from are Political and Policy Analysis; Economic Theory and Application; and Organizational Theory and Management.

Area of depth readings (optional; 1 course based on area of depth chosen)

HPA 610a	Readings in Organizational Theory and Management	1
HPA 620a	Readings in Political and Policy Analysis	1
HPA 630a	Readings in Economic Theory and Application	1

Individualized readings (required)

HPA 640b	Directed Readings (based on area of depth)	
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*These courses are offered in the Graduate School of Arts and Sciences.

Additionally, all Ph.D. students are required to take EPH 600, Research Ethics and Responsibility, during their first two years of study.

QUALIFYING EXAMINATIONS

The division of HPA requires four areas of qualifying examinations: biostatistics, health services research, an area of depth exam, and an individualized exam specific to the student’s specific area of depth/research and readings.

RESEARCH REQUIREMENTS

All students are expected to develop their research skills through interaction with HPA faculty around ongoing faculty research. Advanced doctoral students (post qualifying exam) are encouraged to assume regular teaching assignments during their third year.

M.D./PH.D. PROGRAM REQUIREMENTS

All M.D./Ph.D. students must meet with the Director of Graduate Studies in Epidemiology and Public Health as soon as they affiliate with EPH. Students in this program are expected to meet the guidelines listed below in the timeframe outlined. The DGS must approve any variations to these requirements.

Teaching

One term of teaching as a TA 2 (10 hours/week) will be required. If students teach beyond this requirement, they can be compensated. If a student has served as a teaching assistant elsewhere on campus, this experience may be counted toward the requirement. Divisional approval is required to waive the teaching requirement based on previous Yale teaching experience.

Rotations/Internships

Students should do two four-week rotations/internships with potential advisers in EPH. These short-term research projects can be either in a lab or working with a specific faculty member. The purpose of these rotations/internships is to learn lab technique and/or to allow the student time to determine if the faculty member's research directions are compatible with his/her research interests. These rotations/internships are usually done during the summer between the first and second year of Medical School course work. In some cases students may need to defer this until the summer after the second year after taking certain courses and/or completing readings so that he/she possesses the background necessary for a successful rotation/internship.

Required Course Work

M.D./Ph.D. students are generally expected to take the same courses as traditional Ph.D. students. Divisional requirements may vary; therefore, students should confer with the DGS and/or their Ph.D. adviser.

Timeline for Qualifying Exam

Students generally will take Medical School courses years 1 and 2, then EPH doctoral course work years 3 and 4 (all or part of year 3). The qualifying exam is generally taken in the summer following the fourth year.

Prospectus Timeline

Students are encouraged to develop their prospectus during their third and fourth years of study, while taking courses in EPH. Upon completion of the qualifying exam, students should focus entirely on completion of the prospectus, which should be submitted no later than six months after the completion of the qualifying exams.

Course Descriptions

Courses designated “a” meet in the fall term only.

Courses designated “b” meet in the spring term only.

Courses designated “a and b” are yearlong courses.

Courses designated “c” meet in the summer term.

Bracketed courses are not offered in the current academic year.

BIOSTATISTICS

BIS 505a, Introduction to Statistical Thinking I This course provides an introduction to the use of statistics in the fields of epidemiology and public health. Topics include descriptive statistics, probability distributions, parameter estimation, and hypothesis testing, as well as an introduction to sampling and simple linear regression. Statistical analysis using the Statistical Analysis Systems (SAS) software on the PC is introduced. E. Claus

BIS 505b, Introduction to Statistical Thinking II This continuation of BIS 505a covers multiple regression, analysis of variance, nonparametric tests, survival analysis, poisson regression, and logistic regression. The course concludes with a review of commonly used statistical methods. As in the first term, the Statistical Analysis Systems (SAS) software package is used for statistical analysis. Prerequisite: BIS 505a. D. Zelterman

BIS 511a, GIS Applications in Epidemiology and Public Health The study of epidemiology often seeks to determine associations between exposure risk and disease that are spatially dependent. Geographic information systems (GIS) are modern computer-based tools for the capture, storage, analysis, and display of spatial information. GIS technologies are just beginning to be used for public health planning and decision making. Public health applications of GIS provide cost-effective methods for evaluation interventions and modeling future trends, and also provide a visual tool for data exploration. This class teaches the technical and design aspects of implementing a GIS project in public health and provides students with basic tools for using GIS. Examples are given to introduce a variety of applications in the field of epidemiology. T. Holford

BIS 515c, Accelerated Biostatistics This course provides a comprehensive introduction to the use of statistics in the fields of epidemiology, public health, and clinical research. Students gain experience conducting and interpreting a broad range of statistical analyses. Topics include descriptive statistics, probability distributions, parameter estimation, hypothesis testing, sampling, analysis of variance, nonparametric tests, and linear regression. Through weekly computer laboratory sessions, students become familiar with the SAS statistical software package. Not open to students in the traditional two-year M.P.H. program. A. Molinaro

BIS 525a and b, Seminar in Biostatistics Faculty and invited speakers present and discuss current research. Z. Wang

[BIS 538b, Survey Sampling: Methods and Management]

BIS 540a, Fundamentals of Clinical Trials This course addresses issues related to the design, conduct, and analysis of clinical trials. Topics include protocol development, examination and selection of appropriate experimental design, methods of randomization, sample size determination, appropriate methods of data analysis including time-to-event (possibly censored) data, and interim monitoring and ethical issues. Prerequisite: BIS 505a or equivalent and second-year status. R. Makuch

BIS 561b, Advanced Topics and Case Studies in Multicenter Clinical Trials This course addresses advanced issues related to the design, conduct, monitoring, and analysis of multicenter randomized clinical trials. Topics include organizational, regulatory, and human rights issues; an overview of design strategies; advanced topics in sample size estimation and monitoring; data management and quality assurance procedures; cost-effectiveness and quality of life; and case studies of vaccine trials, factorial trials, primary and secondary prevention trials, large simple trials, strategy trials, and cost-effectiveness. The case studies include many of the classical and landmark clinical trials, such as the polio vaccine field trial, Physicians Health Study, and the trials of AZT for the treatment of AIDS. Prerequisite: BIS 505a. P. Peduzzi

BIS 623a, Applied Regression Analysis This course covers linear regression, estimation, and testing hypotheses in multivariate regression, regression diagnostics, analysis of variance, and adjusting for covariates. Emphasis is on the application of methods. SAS software is used throughout the course. Prerequisite: BIS 505b or equivalent. H. Zhang

BIS 625a, Categorical Data Analysis This course presents methods for analyzing categorical data in public health, epidemiology, and medicine. Topics include discrete distributions, log-linear models, and logistic regression. Emphasis is placed on the application of the methods and the interpretation of results by applying the techniques to a variety of data sets. Prerequisite: BIS 505b. D. Zelterman

BIS 628b, Longitudinal Data Analysis This course covers methods for analyzing data in which repeated measures have been obtained for individuals over time. Different methods are discussed to handle both continuous and discrete longitudinal response data. Both subject-specific and population averaged approaches are covered (with particular reference to capturing the heterogeneity between different individuals). Some of the approaches covered include linear, nonlinear, and generalized mixed effects models, as well as generalized estimating equations. The course also covers exploratory methods, approaches for handling missing data, and possibly transition models and advanced topics such as multivariate longitudinal responses, nonparametric longitudinal responses, the joint consideration of longitudinal and survival data, and the joint consideration of longitudinal and spatial data. Emphasis is placed on applying the methods, understanding underlying assumptions, and interpreting results. Both SAS and S-Plus software are used throughout the course. Prerequisites: BIS 623b and BIS 625a. H. Lin

BIS 630b, Applied Survival Analysis This half-term course demonstrates statistical methods for analyzing and interpreting time to failure data. The techniques described include the construction and analysis of failure rates, survival curves, significant tests for comparing survival curves, and semi-parametric models for the analysis of time to failure data including the proportional hazards model. Skills for using statistical software

to perform the calculation are developed. In addition, study design is covered, including sample size and power calculations. Prerequisites: BIS 505a and BIS 505b; BIS 623b or BIS 625a. R. Makuch

BIS 631a, Topics in Genetic Epidemiology This course discusses the role of human genetics in epidemiology and public health, focusing on the epidemiology of Mendelian disorders and the genetic and environmental contributions to common, complex familial traits. Topics of discussion include (1) study designs for assessing the importance of genetic factors (population-based as well as family-based designs such as high-risk pedigrees and twin studies), (2) methods for determining mode of inheritance, and (3) the identification and mapping of genes through linkage analyses, candidate-gene approaches, genome-wide association studies, and admixture mapping. Applications of these approaches to clinical medicine are presented. Prerequisites: BIS 505a and BIS 505b (or equivalent) as well as course work in basic genetics. E. Claus, H. Zhao, K. Kidd

BIS 632b, Design and Analysis of Epidemiologic Studies This half-term course considers methods for analyzing the association of one or more factors with disease. Topics include the analysis of cohort studies, case-control studies, and vital rates. The analysis of matched data is also discussed. Emphasis is placed on the application and interpretation of the techniques. Issues of study design are also covered. Prerequisites: BIS 505a and BIS 505b; BIS 623b or BIS 625a. T. Holford

[BIS 643a, Theory of Survival Analysis and Its Applications]

[BIS 645a, Statistical Methods in Human Genetics]

BIS 646b, Nonparametric Statistical Methods and Their Applications Nonparametric statistical procedures including recursive partitioning techniques, splines, bootstrap, and other sample reuse methods are introduced. Some of the supporting theory for these methods is proven rigorously, but some is described heuristically. Advantages and disadvantages of these methods are illustrated by medical and epidemiological studies. Students may be required to compare these methods with parametric methods when analyzing data sets. Familiarity with basic statistical theory and computer languages is assumed. Prerequisites: STAT 541a and STAT 542b. Y. Guan

BIS 651b, Spatial Statistics Statistical methods for the analysis of spatial data that arise from health studies are developed in order to account for spatially correlated outcomes. Techniques to be discussed include methodology for continuous responses such as inverse distance weighting and Kriging. Bayesian models for smoothing disease risk maps are derived. Environmental exposure models are developed. In addition, spatial/temporal models are discussed that allow the analysis of both sources of correlation. Techniques are illustrated using data from ongoing studies. Prerequisite: STAT 541a and STAT 542b. Offered every other year. T. Holford

BIS 691b, Theory of Generalized Linear Models This course considers a class of statistical models that generalize the linear model through the link functions of response mean. Major varieties of GLMs including models for Gaussian, Gamma, binomial, un/ordered polynomial, and Poisson responses are discussed. Goodness of fit of the models and overdispersion are considered. Extensions to correlated responses are examined through

the approaches of quasi-likelihood and generalized estimating equation. The course covers both theoretical and applied aspects of data analytic issues arising from practice. Prerequisites: STAT 542b, BIS 623b, and some knowledge of matrix calculation. S. Ma

BIS 695c, Summer Rotation in Statistical Research The purpose of this course is to provide students with the opportunity of gaining practical experience in the analysis and the development of biostatistical methods as part of a health sciences research team including medicine, public health, pharmaceutical industry, or health care delivery. This experience in a research laboratory provides a basis for developing a dissertation proposal that has practical significance for addressing important scientific questions. Students work with a biostatistics faculty mentor to select a suitable placement for the rotation, and a one-page description of the plans will be submitted to the head of the Biostatistics Division at least three weeks prior to starting the program, for approval by the biostatistical faculty within two weeks. Upon completion of the rotation, a written report of the work must be submitted to the head of the Biostatistics Division no later than October 1, and an oral presentation given during the fall term. Prerequisites: completion of one semester of the Ph.D. program. T. Holford

CHRONIC DISEASE EPIDEMIOLOGY

CDE 502a/EHS 502a, Physiology for Public Health The objective of this course is to provide a comprehensive working knowledge of the primary physiologic and metabolic systems that respond to environmental stressors. A major emphasis of this course is to analyze potential health consequences of these stressors: examining vulnerabilities affected by age, chronic disease, and sedentary lifestyle, as well as protection afforded by healthy lifestyle factors. C. Yeckel

CDE 505a, Social and Behavioral Influences on Health This course provides students with an introduction to social and behavioral science issues that influence patterns of health and health care delivery. The focus is on the integration of biomedical, social, psychological, and behavioral factors that must be taken into consideration when public health initiatives are developed and implemented. This course emphasizes the integration of research from the social and behavioral sciences with epidemiology and biomedical sciences. J. Ickovics

CDE 508a/EMD 508a, Principles of Epidemiology I This course presents an introduction to epidemiologic concepts and methods. Topics include causation, measurement of disease rates, epidemic investigation, cohort studies, clinical trials, case-control studies, ecological studies, bias and confounding, effect modification, random variation and statistical significance, and screening. The course utilizes a wide variety of case studies from both chronic and infectious disease epidemiology. L. Niccolai

CDE 515c, Accelerated Epidemiology This course provides a comprehensive introduction to epidemiologic concepts and methods. Topics include measurement of disease occurrence, descriptive epidemiology, randomized controlled trials, cohort studies, case-control studies, cross-sectional studies, ecologic studies, screening principles, reliability and validity, bias, confounding, and effect modification. After completing this course, students are able to calculate and interpret epidemiologic parameters, identify the

strengths and weaknesses of various study designs, and apply the principles and methods of epidemiology to the design and analysis of new studies. Not open to students in the traditional two-year M.P.H. program. M. Desai

CDE 516b, Principles of Epidemiology II This is an intermediate-level course on epidemiologic principles and quantitative methods used in epidemiologic studies. Topics covered at the introductory level are revisited and covered in more depth and breadth, with an emphasis on quantitative issues involved in the design, analysis, and interpretation of epidemiologic studies. Certain new concepts and areas of studies are also introduced. Through readings, lectures, and problem sets, students are expected to (1) develop an increased understanding of epidemiologic principles and methods; (2) identify strengths and pitfalls in the design, analysis, and interpretation of epidemiologic studies in the literature; (3) improve relevant quantitative skills; and (4) master epidemiologic methods to a degree necessary to initiate their own research projects and analyses. Prerequisites: CDE 508a and BIS 505a. M. Desai

[CDE 518b, Introduction to Pharmacoepidemiology]

[CDE 520b/EHS 520b, Chronic Disease Genetics and Genomics]

[CDE 522a/PSYC 123a, The Psychology, Biology, and Politics of Food]

CDE 523b, Measurement Issues in Chronic Disease Epidemiology This course addresses the measurement issues in chronic disease epidemiology from a practical perspective. The first part of the course covers the use and limitations of currently available techniques for measuring exposure to a number of etiologic factors such as diet, alcohol, tobacco, physical activity, psychological stress, and environmental/occupational exposures. The latter part of the course focuses on the measurement of outcome for some of the major chronic diseases, along with some practical considerations involved in conducting chronic disease epidemiology research. Prerequisite: CDE/EMD 508a. S. Mayne

CDE 525a and b, Seminar in Chronic Disease Epidemiology/Social and Behavioral Sciences This is a bi-weekly seminar series in which first-year Chronic Disease Epidemiology students, including those in the Social and Behavioral Sciences Program, are introduced to research activities of the division's faculty members. Attendance is required for first-year students. Meets every other week. J. Hoh

CDE 531a, Health and Aging Since 1900, the number of individuals aged sixty-five and older has tripled and life expectancy has increased by about thirty years. The course examines some of the health issues related to this growing segment of the population. Class discussions address such questions as: How does the aging process differ between cultures? What kind of interventions can best reduce morbidity in old age? How can health policy adapt to the aging populations? This course integrates psychosocial and biomedical approaches to the study of aging. B. Levy

CDE 532b, Epidemiology of Cancer This course applies epidemiologic methods to the study of cancer etiology and prevention. Introductory sessions cover cancer biology, carcinogenesis, cancer incidence and mortality rates in the United States, and international variation in cancer rates. The course then focuses on risk factors for cancer (including tobacco, alcohol, diet, radiation, and occupation) and on major cancer sites (including

colon, breast, and prostate). Emphasis is placed on critical reading of the literature. Prerequisite: CDE/EMD 508a. B. Cartmel

[CDE 533b, Topics in Perinatal Epidemiology]

CDE 534b, Approaches to Data Management and Analysis of Epidemiologic Data This course provides students with basic skills of data management and data analysis. The SAS statistical program is used. Main topics include using SAS data sets, data manipulation, bivariate and multivariable analyses. Using existing data sets, students test their own hypotheses and develop a research project. Emphasis is placed on the practical application of the skills learned. The course is a useful preparation for the summer internship and for thesis data analysis. Prerequisites: BIS 505a, CDE/emd 508a, and students must have taken or must currently be taking BIS 505b and CDE 516b. M. Desai

[CDE 535b, Epidemiology of Heart Disease and Stroke]

CDE 541a, Community Health Program Evaluation This course develops students' skills in designing program evaluations for public health programs, including non-governmental and governmental agencies in the United States and abroad. Students learn about different types of summative and formative evaluation models and tools for assessment. The course content is based on an ecological framework, principles of public health ethics, a philosophy of problem-based learning, and critiques of evaluation case studies. Students write evaluation plans for a specific existing public health program. Students may also work as a team with a local community health agency reviewing their evaluation plans and providing guidance on developing a program evaluation plan for one of the agency's public health programs. D. Stevens

CDE 543a/EMD 543a, Global Aspects of Food and Nutrition This course is designed to develop students' awareness of the complex web of factors that lead to malnutrition and to enable a basic understanding of the major diseases of malnutrition, including diseases of both undernutrition and overnutrition. The course covers nutritional assessment tools; the cultural, economic, agricultural, and policy context within which malnutrition exists; and approaches to reducing malnutrition. D. Humphries

CDE 545b, Health Disparities by Race and Social Class: Application to Chronic Disease Epidemiology The United States Public Health Service states that "eliminating health disparities" is one of two overarching goals for the national health promotion/disease prevention agenda. This course explores disparities in the chronic diseases that contribute disproportionately to ill health, resource utilization, reduced quality of life, and mortality. While many of these outcomes are observed in adulthood, the risk factors that contribute to these outcomes, as well as their underlying social determinants, are generally at work much earlier in the disease course. Taking a life course perspective as we explore disparities across the spectrum of chronic diseases, we focus on differences in health between diverse racial/ethnic and/or socioeconomic groups, primarily in the U.S. The primary focus of this course is on understanding the determinants and consequences of health disparities, learning to think critically about disparities research, and thinking creatively about elimination strategies. A sound foundation in epidemiological methods and a working knowledge of the major chronic diseases are required. Prerequisites: CDE 508a and CDE 505a (or CDE 571b). B. Jones

CDE 562a, Nutrition and Chronic Disease This course provides students with a scientific basis for understanding the role of nutrition and specific nutrients in the etiology, prevention, and management of chronic diseases. Nutrition and cancer are particularly emphasized. Other topics addressed include cardiovascular diseases, osteoporosis, obesity, diabetes mellitus, and aging. Prerequisites: biology, biochemistry, and physiology helpful. S. Mayne

[CDE 570a, Epidemiology of Psychiatric Disorders]

CDE 571b, Psychosocial and Behavioral Epidemiology This course provides a systematic overview of psychosocial and behavioral influences on health, illness, and recovery. The factors of interest that influence health include: individual stable characteristics (e.g., traits), characteristics of the primary social environment (e.g., family, friends), settings defined by social roles (e.g., work), and broader contextual factors reflecting social structural variables (e.g., social class). The interplay of the foregoing factors of interest with biomedical and clinical variables constitutes a central theme. T. Lewis

CDE 572a, Preventive Interventions: Theory, Methods, and Evaluation This course reviews the theory, methods, and evaluation of health promotion and disease prevention interventions conducted in multiple settings. Topics of promotion and prevention include physical activity, nutrition, obesity, cancer, cancer screening, cardiovascular disease, diabetes, smoking, alcohol and substance abuse, HIV and STDs, condom and contraception use, adolescent pregnancy, and psychiatric and mental health problems. The course combines didactic presentations, discussion, and critiques of health promotion and disease prevention interventions by students. This course is intended to increase the student's skills in evaluating health promotion and disease prevention interventions, at both the individual and community levels. Prerequisite: CDE 505a. M. Irwin

CDE 574b, Developing a Health Promotion and Disease Prevention Intervention This course is intended to be a practical "how to" application of concepts and methods learned in CDE 572a. The primary objective of this course is to gain experience in intervention research by developing a health promotion and disease prevention intervention. Students choose a health problem (e.g., physical inactivity, smoking, HIV risk) and develop an intervention focused on favorably changing the determinants and behavior that influence the health problem. The course emphasizes transferring concepts from the abstract to the concrete. Students develop an intervention manual consisting of actual intervention materials, and methods that specifically outline how the intervention will be designed, conducted, evaluated, and disseminated. Throughout the course, students participate in a peer review process to evaluate and give feedback for each section of the intervention manual. Prerequisite: CDE 572a. T. Kershaw

[CDE 575b, Religion, Health, and Society]

CDE 588a, Geography of Health and Disease in the Global Context This course deals with the interconnection of the global political economy, local social structures, constructions of meanings, and health. We examine these relations using theoretical approaches and case studies. This class also emphasizes geospatial research methods and how one can apply these medical geography methods in the workplace. Also included is a discussion

of the relation of disease and national security, the U.S. public health structure in a global perspective, and social justice issues. C. Pope

CDE 591b, Epidemiology and Control of Disease in Low- and Middle-Income Countries This course provides an overview of the main diseases affecting lower- and middle-income countries. Students use the basic concepts and tools presented in Principles of Epidemiology (CDE 508) to describe the major causes of morbidity and mortality in developing countries (including both infectious and chronic diseases, maternal and reproductive health concerns, and environmental developments), how these have changed as the Global South goes through the epidemiological transition, and the different interventions that have been implemented to address these issues. The course uses a series of case studies from a variety of regions to explore common themes in disease control, as well as highlight global health disparities and the need to adapt strategies to local needs. J. Gupta

CDE 617b, Developing a Research Protocol The objective of this course is to develop a research protocol from hypothesis formation to appropriate study design. Review of relevant background literature, consideration of appropriate statistical techniques, provision of adequate personnel and environment, and understanding of strengths and weaknesses of the proposed study are included. Students are divided into groups with each group responsible for developing a research protocol suitable for submission as a grant proposal to NIH. Special attention is given to writing techniques and style. Prerequisites: CDE 516b (can be taken concurrently), doctoral status, or permission of instructor. R. Dubrow

CDE 619a, Advanced Epidemiologic Research Methods This advanced course focuses on quantitative issues and techniques relevant to the design and analysis of observational epidemiologic studies. Starting with formal definitions of the commonly used epidemiologic parameters, and assuming a working knowledge of ANOVA and linear regression, the course covers analyses based on various related types of regression, e.g., logistic, Poisson, Cox, etc. The GLIM and PECAN computer programs are described and used throughout. Students analyze and discuss data sets of generally increasing complexity. Prerequisites: BIS 505a, 505b, doctoral status, or permission of the instructor. H. Risch

CDE 630a, Molecular Epidemiology of Chronic Disease The course provides an in-depth overview of issues addressed in molecular epidemiology and its application in cancer research. Subjects covered in the course include basic biochemistry and molecular biology, biological mechanisms related to molecular epidemiology research, principles of molecular and biochemical analysis, biotechnologies and laboratory methods used in molecular epidemiology, and interpretation of study results. The course emphasizes the development of abilities to design and conduct molecular epidemiology research and to critically evaluate findings in the literature. Prerequisite: CDE/EMD 508a or permission of the instructor. (Biochemistry and cell and molecular biology are helpful, but not required). H. Yu

CDE 650a, Introduction to Evidence-Based Medicine and Health Care Evidence-based medicine and health care use best current evidence in addressing clinical or public health questions. This course introduces principles of evidence-based practice in formulating

clinical or public health questions, systematically searching for evidence, and applying it to the question. Types of questions considered include examining the comparative effectiveness of clinical and public health interventions, etiology, diagnostic testing, and prognosis. Particular consideration is given to the methodology of synthesizing evidence in a systematic review. Also addressed is the role of evidence in informing economic analysis of health care programs, clinical decision analysis, and clinical practice guidelines. Using a problem-based approach, students contribute actively to the classes and small-group sessions. Students complete a systematic review in their own field of interest using Cochrane Collaboration methodology. Prerequisites: students must have passed or be concurrently taking CDE 516b, or obtain permission of the instructor. M. Bracken

CDE 660b, Doctoral Seminar in Epidemiology In this seminar, doctoral students present and discuss recently published articles which have strong relevance to the methodological conduct of epidemiological research, or which make significant advances to the content area of specific disease etiology, prevention, prognosis, diagnosis, and treatment. In addition, faculty present their ongoing research and scholarship, and more advanced students share their prospectus and preliminary results for comment and feedback from course participants. Prerequisite: doctoral status.

ENVIRONMENTAL HEALTH SCIENCES

EHS 502a/CDE 502a, Physiology for Public Health The objective of this course is to provide a comprehensive working knowledge of the primary physiologic and metabolic systems that respond to environmental stressors. A major emphasis of this course is to analyze potential health consequences of these stressors: examining vulnerabilities affected by age, chronic disease, and sedentary lifestyle, as well as protection afforded by healthy lifestyle factors. C. Yeckel

EHS 503a, Introduction to Toxicology This course examines factors that affect the toxicity of foreign substances. The absorption, distribution, excretion, and metabolism of foreign compounds are discussed. Introductory lectures in cell biology, teratology, chemical carcinogenesis, dose-response relationship, and behavioral toxicology are included. J. Borak, C. Fields

EHS 505b, Introduction to Industrial Hygiene Students are introduced to the practice of industrial hygiene: the recognition, evaluation, and control of health hazards in the workplace. A systematic approach to identifying hazards in the workplace is presented, and students are asked to exercise these techniques in at least one industrial worksite. Topics include regulation of health and safety in the workplace, air sampling and interpretation of sampling results, and approaches to reducing place exposures. J. Sparer

EHS 507a, Environmental Epidemiology Environmental epidemiology can provide insight about the association between environmental exposures of a population and adverse health outcomes. The potentials and the limitations of environmental epidemiology are explored as they are inherent in the design of suitable studies and as they manifest themselves in actual studies that have been conducted. The analysis and interpretation of such studies, as well as the consequences for the design and conduct of proposed studies, are examined. Prerequisite: CDE/EMD 508a or permission of the instructor. T. Zheng

EHS 508b, Assessing Exposures to Environmental Stressors This course examines human exposure to environmental stressors as it applies to environmental epidemiology and risk assessment. Indirect and direct methods of assessing exposures are reviewed and case studies are presented. B. Leaderer

EHS 510a, Contemporary Issues in Environmental Health This course is an overview of environmental health from local to global, focusing on contemporary issues. The course prepares students to more fully understand and address environmental health issues by integrating necessary skills from exposure assessment, epidemiology, chemistry, physics, toxicology, and risk assessment. Students use these tools to study current topics, including air and water pollution, climate change, energy and biofuels, occupational health, children's health, environmental justice, and pesticide use, among other topics. Students actively engage with the course materials through class participation, debate, review of environment-related current events, and critical thinking assignments. This course provides an introductory foundation in environmental health for all professional master's degree candidates, whether or not specializing in environmental health. K. McCarty, M. Stowe

EHS 511b, Applied Risk Assessment I Applied environmental risk assessment consists of the effective integration in a specific situation of what is known about pollution sources and their characteristics, about human exposures, about the entry and absorption of pollutants, and about the adverse health effects associated with dosage exposure. In any actual situation there are uncertainties in all of the elements to be integrated. This course emphasizes methodologies in use and the limitations that inevitably constrain the process. A number of applied risk assessments are analyzed. J. Borak

[CDE 520b/EHS 520b, **Chronic Disease Genetics and Genomics**]

EHS 525a, Seminar in Environmental Health Students are introduced to a wide variety of research topics, policy topics, and applications in environmental health. Faculty members, public health professionals, and students make brief oral presentations and engage in related dialogues. The seminar is designed to help students develop topics for their M.P.H. theses. Second-year students have the opportunity to receive feedback on their developing research. Y. Zhang

[EHS 532a, **Indoor Climate**]

EHS 545b, Introduction to Environmental Genetics This course aims at understanding the role of interactions between genetic susceptibility and environmental exposures in human disease development. The molecular basis of human genetics and genetic variations are described. Biological responses to environmental exposures are also discussed, as well as biomarkers for detecting environmental exposures, biological effects, and genetic susceptibility. Human cancer and asthma are used as two examples to illustrate genetic approaches to environmental disease. Finally, the role of gene environment interaction in human disease is addressed in the context of human evolutionary history. The course includes formal lectures, article discussions, and short research essay. Y. Zhu

[EHS 553b, **Epidemiological Methods in Injury Control**]

EHS 575a and b, Introduction to Occupational and Environmental Medicine This year-long course presents a broad overview of the principles of occupational and environmental medicine. In the fall term the major diseases of environmental origin are presented. In the spring term the major hazards—chemical, physical, and biologic—and the settings in which they occur are examined. J. Mobo [F], M. Russi [Sp]

EHS 580b, Environmental Hormones and Human Health This course provides students a scientific orientation of environmental hormones and human health. The course introduces the basic concepts for four different types of hormones, including endogenous hormones, natural environmental hormones, pharmaceutical hormones, and environmental endocrine disruptors. The course discusses the current understanding of the relationship between hormones and human health, with emphasis on the methodology of studying the relationship between environmental hormones and environmental endocrine disruptors and human cancer risk. Prerequisites: EMD/CDE 508a and BIS 505a. Y. Zhang

EHS 585b/FE&S 96004b, The Environment and Human Health This course provides an overview of the critical relationships between the environment and human health. The class explores the interaction between health and different parts of the environmental system, including water, indoor and outdoor air, agriculture, and food. Other topics include environmental justice, case studies of environmental health disasters, risk, urbanization, health in the workplace, and links between climate change and health. M. Bell

EPIDEMIOLOGY OF MICROBIAL DISEASES

EMD 508a/CDE 508a, Principles of Epidemiology I This course presents an introduction to epidemiologic concepts and methods. Topics include causation, measurement of disease rates, epidemic investigation, cohort studies, clinical trials, case-control studies, ecological studies, bias and confounding, effect modification, random variation and statistical significance, and screening. The course utilizes a wide variety of case studies from both chronic and infectious disease epidemiology. L. Niccolai

EMD 512a, Immunology for Epidemiologists This course is designed to introduce students to the fundamentals of immunology including antigens, antibodies, methods for detecting antibodies, cells of the immune system, products of such cells, and immune mechanisms. Experience is gained in the analysis of primary research papers with relevance to immunologic aspects of epidemiologic studies. Prerequisite: two terms of college biology. P. Krause

EMD 525a and b, Seminar in Epidemiology of Microbial Diseases This is a weekly seminar series offered by EMD faculty in the fall term. The presentations describe the ongoing research activities in faculty laboratories as well as in EMD affiliated centers. The talks introduce the division's research activities as well as associated resources in the area. Attendance is required for first-year students. M. Pettigrew

EMD 530b, Hospital Epidemiology The history, descriptive epidemiology, surveillance methods, risk analysis methods, and economics of nosocomial infections are outlined in this introductory course. In-depth explorations of host, agent, and environmental factors

influencing typical nosocomial illnesses in pediatric and adult services are reviewed by clinical faculty. Descriptive and analytical epidemiological methods are emphasized. L. Dembry

EMD 536b, Investigation of Disease Outbreaks This course provides students with the basic skills and perspectives necessary to investigate acute disease outbreaks. The emphasis is on the use of epidemiology to investigate outbreaks of infectious diseases, although the methods are not limited and can be applied to outbreaks of noninfectious diseases as well. Through this course, it is hoped that students will gain a better appreciation of epidemiology as the science of public health, and the use of epidemiology to guide public health interventions and the development of public health policy. M. Cartter, R. Marcus

[EMD 541a, Infectious Disease: Epidemiology, Prevention, and Control]

EMD 542b, Biology and Epidemiology of Infectious Agents This course explores the basic biology of infectious agents. Through a theme-based, integrated approach, students learn about the developmental, cellular, and molecular biology of bacteria, viruses, and eukaryotic parasites of public health importance. Emphasis is placed on transmission, host-pathogen interactions, and mechanisms of virulence. Prerequisite: EMD 512a. M. Pettigrew

EMD 543a/CDE 543a, Global Aspects of Food and Nutrition This course is designed to develop students' awareness of the complex web of factors that lead to malnutrition and to enable a basic understanding of the major diseases of malnutrition, including diseases of both undernutrition and overnutrition. The course covers nutritional assessment tools; the cultural, economic, agricultural, and policy context within which malnutrition exists; and approaches to reducing malnutrition. D. Humphries

EMD 548b/G&G 562b/F&ES 77001b, Remote Sensing: Observing the Earth from Space Course topics include the spectrum of electromagnetic radiation, satellite-borne radiometers, data transmission and storage, computer image analysis, and merging satellite imagery with GIS in their applications to weather and climate, oceanography, surficial geology, ecology and epidemiology, forestry, agriculture, and watershed management. Preference to students in F&ES, Geology and Geophysics, Archaeology, Anthropology, and Studies in the Environment. Prerequisites: college-level physics or chemistry, two courses in geology and natural science of the environment or equivalents, and computer literacy. R. Smith, X. Lee, M. J. Ashton

EMD 550b/682b, Vector Biology Insects transmit many emerging and re-emerging human and agriculture-related diseases. These insect-borne diseases have a directly negative impact on public health especially in the developing world, and can cause further indirect devastation by significantly reducing agricultural productivity and nutrient availability and exacerbate poverty and deepen disparities. This course introduces students to the major groups of important arthropod disease vectors and the pathogens they transmit. Lectures cover aspects of the ecology and physiology of arthropod vectors as they relate to pathogen transmission and disease control strategies. A major focus of the course is on evaluating the insect-based disease intervention methods. Current research

trends are presented and critically evaluated. Prerequisites: biology, chemistry, microbiology, or permission of the instructors. S. Aksoy, B. Weiss

EMD 557b/NURS 713b, Public Health Issues in HIV/AIDS An introductory, broad-based survey course for students of all levels interested in the epidemiology of HIV/AIDS. The course covers virology, clinical issues, natural history of infection, laboratory testing, transmission, and prevention of HIV/AIDS. The course, designed to give students a general, comprehensive understanding of HIV/AIDS issues, is targeted to students beginning work in public health or HIV/AIDS, or for those who wish to expand their specialized knowledge base regarding HIV/AIDS. Regular attendance at the Yale AIDS Colloquium Series (YACS) and written synopses are required. Permission of instructor required for Yale College students. K. Khoshnood

[EMD 560b, **Epidemiologic Methods in STD/HIV Research**]

EMD 563a or b, Laboratory and Field Studies in Infectious Diseases The student gains hands-on training in laboratory or epidemiologic research techniques. The term is spent working with EMD faculty in a single laboratory or epidemiology research group. Students choosing to work in the laboratory gain experience in molecular biology, basic immunology, parasitology, virology, bacteriology, or vector biology. Students may also choose to work on a non-laboratory-based epidemiology research project. These students gain experience in epidemiologic methods including study design, field data collection including human cases, vectors, and environmental parameters, data analysis, and epidemiological modeling. Prerequisite: permission of the instructor. M. Pettigrew

[EMD 565a, **Modeling the Epidemiology of Infectious Diseases**]

EMD 572a, Ecology and Epidemiology of Vector-Borne and Zoonotic Diseases Diseases transmitted to humans by arthropods (vector-borne) or animal reservoirs (zoonotic) constitute the majority of globally (re)emerging infectious diseases. The purpose of this course is to explore factors underlying the risk to humans of acquiring vector-borne and zoonotic diseases (VBZD) like malaria, dengue, West Nile virus, Lyme disease, rabies, hantavirus, etc. Students learn how human risk for these diseases can be described and predicted by understanding the ecology of vectors and reservoirs and the factors allowing for maintenance and transmission of pathogens. The course utilizes a combination of lectures, discussion of primary literature, practical exercises on risk mapping, and guest speakers. M. Diuk-Wasser

EMD 583b, Public Health Surveillance This course is intended to provide students with a strong foundation in public health surveillance of both infectious and noninfectious disease. The course teaches the theory and practice of surveillance, supported by many examples of surveillance systems from the developing world. The class builds on and reinforces basic epidemiological concepts. Students are given the opportunity to design and evaluate a surveillance system. A. Durante

[EMD 642a/GENE 642a/MBIO 642a/MCDB 642a, **Roles of Microorganisms in the Living World**]

EMD 670a and b, Advanced Research Laboratories This course is required for all EMD Ph.D. students and is taken for three terms. The course offers experience in directed

research and reading in selected research laboratories. The first two terms must be taken in the first year of the doctoral program, and the third term is normally taken in the summer after the first year. Prerequisite: doctoral status. C. Tschudi

EMD 680a/MBIO 680a, Molecular and Cellular Processes of Parasitic Eukaryotes An introductory graduate-level topic-based course in modern parasitology. For each topic there is an introductory lecture followed by a journal club-like discussion session of two relevant papers selected from the literature. This course provides an introduction to basic biological concepts of parasitic eukaryotes causing diseases in humans. Topics include strategies used by parasitic eukaryotes to establish infections in the host and approaches to disease control, through either chemotherapy or vaccines. In addition, emphasis is placed on evaluating the quality and limitation of scientific publications and developing skills in scientific communication. Permission of instructor is required. D. McMahon-Pratt, C. Tschudi

[EMD 684b/MBIO 684b, **Advanced Topics in Molecular Parasitology**]

EMD 695/E&EB 960, Studies in Evolutionary Medicine This two-term course begins in January. Students learn the major principles of evolutionary biology and apply them to issues in medical research and practice by presenting and discussing original papers from the current research literature. Such issues include lactose and alcohol tolerance; the Hygiene Hypotheses and autoimmune disease; human genetic variation in drug response and pathogen resistance; spontaneous abortions, immune genes, and mate choice; parental conflicts over reproductive investment mediated by genetic imprinting; life history tradeoffs and the evolution of aging; the evolution of virulence and drug resistance in pathogens; the evolutionary genetics of humans and their pathogens; the ecology and evolution of disease; the evolutionary origin of diseases; and the emergence of new diseases. Students develop a research proposal based on one of their own questions in spring term, spend the summer on a research project related to their research proposal, and write a paper based on the results of their research in fall term. Credit and grades are awarded for each term. Only students who have engaged in summer research projects may enroll in the fall term. Admission is by competitive application only. Forms are available on the E&EB department Web site. S. Stearns, D. Fish, A. Galvani, P. Turner

HEALTH POLICY AND ADMINISTRATION

HPA 510a, Health Policy and Health Systems This course provides an introduction to the making and understanding of health policy. The various goals of policy making and the alternative means of achieving those goals are examined. Health issues are placed in the context of broader social goals and values. The current performance of the health care system is assessed, with particular emphasis on shifting needs, rising costs, and changing institutional arrangements. The course provides an overview of the important actors in the health care and political systems and introduces students to methods for understanding their behavior. Students apply these methods to a set of concrete policy issues. M. Schlesinger

[HPA 512b, **Health in Conflict**]

HPA 514b, Health Politics and Policy This course is designed to familiarize students with the various processes by which governmental health policy is made in the United States, and with current policy debates. One focus of the course is to understand the politics underlying the successes and failures of health policy making during the course of the twentieth century. This includes a discussion of the relevant governmental institutions, political actors, the major national programs that have been established, and how political actors use resources and set their strategies. K. Mattocks

HPA 515c, Accelerated Health Politics and Policy This course is designed to provide an understanding of the key political dimensions of the health-policy-making process in the United States. We examine the role of government institutions and political actors in developing and implementing health policy. Past and present health care debates are used to illustrate concepts discussed in class. Students acquire an understanding of the process in which health policies are considered, and gain practical experience developing political strategies and conducting policy analyses to influence public policy debates. Not open to students in the traditional two-year M.P.H. program. K. Mattocks

[HPA 520b, Mental Health Policy in the U.S.]

HPA 529a, Advanced Applications in Policy Analysis This course is designed to develop students' ability to conduct a sequenced approach to policy analysis, including identifying and critically analyzing policy options. In doing so, students apply principles of economics, politics, ethics, and research design. A main focus of the course is on writing effective policy analyses for national and/or state policy. Prerequisite: HPA 510a and HPA 514b. P. Keenan

[HPA 533b, Aging and Health Policy]

[HPA 538a, Regulation and Public Health Policy]

HPA 542b, Health of Women and Children The focus of this course is women's and children's health and health care in the United States. Emerging health issues and related health policy are presented and discussed in terms of epidemiology, including racial/ethnic disparities and effects of poverty; utilization and financing of children's health care; and existing programs and public policies that facilitate access to care. Data sources and data needs are identified. Topics may include history of MCH programs and policy, Medicaid and SCHIP, low birth weight and infant mortality, maternal mortality, reproductive health, breast and cervical cancer screening, pediatric oral health, pediatric asthma, childhood obesity, adolescent health care and teen pregnancy, children with special health care needs, childhood injuries and injury prevention. Students are expected to critically evaluate the public health implications of selected conditions and the effect of public policy on availability, accessibility, acceptability of services and accountability in health care for women and children. M. A. Lee

[HPA 544a, Public Law and Public Health: The Law, the Individual, and the State]

HPA 545a, Health Care Disparities This course explores what constitutes and explains a disparity in health care. Emphasis is placed on studying the history of disparities in the United States in order to understand the current state of disparities, and on evaluating the

effectiveness of ongoing strategies to eliminate them, such as increasing insurance coverage and the delivery of culturally competent health care. The course also examines sociological models that explain disparities in health care and requires students to evaluate and expand on these models. Prerequisites: HPA 510a, HPA 514a, CDE 505a. S. Geballe

HPA 547a, Law and Ethics of Health Care Organizations This course is a survey of legal topics important to the management of health care organizations. It is designed to acquaint the future health care manager with the basic legal issues that daily affect the provision of health care services. The course examines the relationships among the parties involved in the delivery of health care; the law of business organizations, including that of corporations and partnerships; the legal constraints that affect health care organizations, including state and federal regulatory laws, labor relations, and antitrust doctrines; and doctrines particularly applicable to managed care organizations. The course also considers a variety of emerging legal issues in the health care field. T. Ruger

HPA 555a and b, Health Management Practicum This course is one of the options available to HPA students to fulfill the practicum requirement for the M.P.H. degree. The Health Management Practicum is a project-based learning experience. Students work 8–10 hours per week for one or two terms. Designed to parallel the Doctor-Patient Encounter class offered to medical students in which students are paired with practicing physicians, the Health Management Practicum allows students to focus on current issues confronting a hospital department while working under the guidance of a departmental administrator. Permission of the instructor is required. S. Busch

HPA 560b, Health Care Finance and Delivery This course introduces students to the organization and operation of the American health care system. The course examines systems of health care delivery and finance and recent trends in their organization, including the growth of managed care. The course seeks to provide students with an understanding of the existing structure of the system and to provide them with conceptual frameworks. H. Forman

HPA 561b, Capstone Course in Health Management This course presents a range of management issues in health services delivery. The course integrates the tools of accounting, finance, marketing, organizational behavior, operations research, and strategic planning in the context of health systems management. Influences and constraints related to the political and regulatory environment are explored. E. Bradley

[HPA 562b, **Managing Performance Improvement in Health Care Delivery Organizations**]

[HPA 564a, **Integrated Clinical/Financial Information Management**]

[HPA 570a, **Cost-Effectiveness Analysis and Decision Making**]

HPA 580a, Leadership, Organizational Behavior, and Improvement in Health Care This course is designed to provide participants with an understanding of leadership and organizational behavior within health care organizations (HCOs). It is expected that participants become skilled at identifying the forces that challenge the effective management of HCOs at multiple levels – individual, group, and organization. Moreover, students become skilled at developing and analyzing efforts to improve HCOs' performance. By

the conclusion of the course, participants are versed in seminal and contemporary theories and perspectives related to leadership, organizational behavior, and performance improvement in health care. Additionally, they are familiar with recent improvement initiatives by premier health care organizations. Through case studies, readings, in-class exercises, and class discussions, participants learn analytic frameworks, concepts, tools, and skills necessary for leading and managing organizational learning, innovation, and overall performance improvements in health care organizations. The first eight weeks of the course focus on leadership and organizational behavior; the last five weeks focus on performance improvement in health care. This course lasts for one term; however, first-year HMP students participate in the first eight weeks only. I. Nembhard

HPA 583b, Methods in Health Services Research This course introduces students to both quantitative and qualitative methods for research in health services. Topics include research objectives and hypotheses formulation, study design, sampling techniques, measurement, data analysis, results presentation, and discussion. Students synthesize these skills in the final paper. Prerequisite: BIS 505a. A. Epstein

[HPA 585a, Comparative Health Care Systems]

HPA 586b, Microeconomics for Health Care Professionals This course introduces students to microeconomics. Emphasis is placed on topics in microeconomics of particular relevance to the health care sector. Attention is paid to issues of equity and distribution, uncertainty and attitudes toward risk, and alternatives to price competition. This course is designed for students with minimal previous exposure to economics. J. Fletcher

HPA 587b, Health Care Economics This course applies the principles learned in Microeconomics for Health Care Professionals (HPA 586b) to the health of individuals, to health care institutions and markets, as well as to health care policy. The economic aspects of health behaviors, hospital markets, cost-benefit analysis, regulation, and the market for physician services are covered. Prerequisite: microeconomics or permission of the instructor. S. Busch

HPA 588b, Health and Human Rights This course provides a basic understanding of human rights core principles and practices while concentrating on the complex linkage between health and human rights. The course emphasizes the implications of human rights for public health practitioners and introduces them to the framework and methodologies for analysis of human rights and public health interactions. Students are expected to become familiar with a human rights impact assessment tool and use it throughout the course. Such topics as women's rights, children's rights, AIDS and human rights, violence, and health literacy are explored. Prerequisite: second-year M.P.H. status and GHD 519b or permission of the instructor. M. Bochenek, M. Mollmann

HPA 590b, Addiction, Economics, and Public Policy Smoking, alcoholism, and use of illicit drugs are addictions that are increasingly studied by economists. Overeating resulting in obesity can also be viewed as an addiction. This class studies economic and policy issues relating to these four addictions. Specifically, the class covers (1) models of substance use including rational addiction and behavioral economics, (2) alternative views on whether, why, and how to intervene in personal decisions, (3) facts and findings from the literature on each addiction, and (4) policies related to each. Policy issues include

supply and demand sides of illicit drugs; how to prevent drug-related crime; taxes on alcohol, cigarettes, and soda; treatment effectiveness; legal interventions such as the case against the tobacco companies; the role of public information and private marketing; and paying people for good habits. Prerequisite: micro-economics. J. Sindelar

HPA 591b, Global Health Systems This course is designed to familiarize students with the context of global health work. This includes gaining an understanding of the evolution through tropical medicine, international health, and global health, as well as the political, social, economic, and cultural forces influencing distribution of disease burden and global health decision making. The course acquaints students with the existing global health architecture, highlighting the roles and interactions of different global health stakeholders. In addition, the course reviews various alternatives for health care organization, delivery, regulation, and financing at both the national and the international levels. Finally, the course sheds light on a variety of policy development and management challenges faced in health systems of low- and middle-income countries, and explores strategies to overcome these. A. Adhvaryu

HPA 592b, Strategic Topics in Global Health This course defines and applies a set of core principles regarding development and implementation of grand strategy and problem solving in global health. Students come to understand and apply principles of grand strategy and strategic problem solving, which are taught at both a conceptual and a practical level as applied to common problems in global health. Students develop expertise in political and policy analysis as well as organizational theory and leadership skills that are central to addressing global health issues in low- and middle-income countries. E. Bradley, L. Curry, M. Skonieczny

HPA 593b, Global Responsibilities for Global Health Rights This course examines the possibility of applying the new emergent “global responsibilities for global health rights” paradigm to comprehensive primary health care. It is divided into three parts. The first part introduces students to the health development and medical relief paradigms, how and why the global response to the HIV/AIDs epidemic emerged as a mixed development-relief paradigm, and the paradoxes this newly emergent paradigm creates. The second part introduces students to social human rights and the right to health in particular, and the third part examines practical solutions to apply the newly emergent paradigm to comprehensive primary health care. G. Ooms

HPA 594b, Qualitative and Mixed Methods Qualitative and mixed methods offer unique contributions to health and health services research, and there has been an exponential increase in publication of studies using these methods in peer-reviewed scientific journals. However, the quality and credibility of this research are highly variable. This course seeks to enhance the student’s capacity to design, conduct, and publish scientifically sound qualitative and mixed methods health and health services research. Students examine ways to choose methods best suited for a particular research question, strategies for design and analysis, issues of validity and credibility, and effective writing for scientific journals and policymakers. L. Curry

HPA 595b, Economic, Social, and Political Dimensions of Development This course provides a framework for understanding social, economic, and political dimensions of

development and examines how these dimensions impact individuals, groups, and communities, particularly disadvantaged and at-risk populations. The course explores how social, economic, and political forces and frameworks shape social justice, institutions, and policy and analysis in developing and transitioning economies. The course explores a range of issues, trends, and forces within each of the three dimensions of development and their relationship to health and well-being. The focus is primarily international, with perspectives and examples from developing and transitioning economies. J. Ruger

HPA 597b, Capstone Course in Health Policy This course is designed as the capstone educational experience for students concentrating in health policy. It integrates previous course work in health policy and public health and facilitates students' transition from the academic setting into the world of professional policy analysis. Students practice different approaches to policy formulation, policy analysis, and policy implementation. As part of their course assignments, students use various strategies to frame policy debates to promote desired outcomes. There is extensive work on improving oral and written presentation skills pertinent to current, applied policy dilemmas. Prerequisite: HPA 510a or equivalent. M. Schlesinger

[**HPA 598a, Medicaid/SCHIP – Increasing Access to Care for Low-Income Children and Families**]

HPA 599b, Global Health Ethics, Politics, and Economics Global health inequalities are wide and growing. Such inequalities pose ethical challenges for the global health community, especially international and domestic health and development institutions. This course features a series of distinguished visitors from academia as well as a few important representatives of international organizations (WHO, World Intellectual Property Organization, World Bank), foundations (Bill and Melinda Gates Foundation), politics, the pharmaceutical and biotechnology industries, and/or the investor community. T. Pogge, J. Ruger

HPA 600, Health Service Research Readings Required for all first-year HPA doctoral students. Three nine-week sessions. Organizational behavior and theory (OBT) is the first reading area; political and policy analysis is covered during the second nine-week period; and the final reading area is economic theory and applications. This yearlong course is graded Sat/Unsat, and the grade is given in the spring term. Faculty

HPA 610a, Readings in Organizational Theory and Management In-depth readings, discussion, and analysis of topics specific to organizational theory and management. Optional for Ph.D. students choosing this area of depth. This course is graded Sat/Unsat. By arrangement with faculty

HPA 617a, Colloquium in Health Services Research I This seminar focuses on the analysis of current issues in health policy and on state-of-the-art methodological issues in health services research. The format includes guest speakers and presentations by EPH as well as other faculty and graduate students of ongoing research projects. Students participate in critical discussions of the issues that arise in both types of sessions. Prerequisite: doctoral status or permission of the instructor. Faculty

HPA 617b, Colloquium in Health Services Research II This seminar includes in-depth discussions of major policy concerns in the health and health care of vulnerable populations such as the poor, young, old, and disabled. The seminar also includes student presentations of their own research. Prerequisite: doctoral status or permission of the instructor. Faculty

HPA 620a, Readings in Political and Policy Analysis In-depth readings, discussion, and analysis of topics specific to political and policy analysis. Optional for Ph.D. students choosing this area of depth. This course is graded Sat/Unsat. By arrangement with faculty

HPA 630a, Readings in Economic Theory and Application In-depth readings, discussion, and analysis of topics specific to economic theory and application. Optional for Ph.D. students choosing this area of depth. This course is graded Sat/Unsat. By arrangement with faculty

HPA 640b, Directed Readings Required for HPA Ph.D. students, in preparation for qualifying exams. Readings in area of depth arranged with specific faculty in related research area. This course is graded Sat/Unsat. By arrangement with faculty

[HPA 650a, Colloquium on Mental Health Services Research I]

[HPA 650b, Colloquium on Mental Health Services Research II]

EPIDEMIOLOGY AND PUBLIC HEALTH

EPH 500b, Public Health Practicum The Public Health Practicum course is one of the options available to students to fulfill the practicum requirement for the M.P.H. degree. The course design combines experiential learning and guided classroom discussion. Students are assigned to a field placement in an appropriate setting that affords the opportunity to apply public health concepts and competencies learned in the classroom through a practice experience that is relevant to the student's areas of specialization. Emphasis is placed on situating students in community-based organizations and other public health service settings such as local or state health departments, where they can work on authentic public health problems and issues. This course provides a means for students to gain exposure to the mission and activities of diverse public health organizations and thus may help to inform their decisions about professional work pursuits upon completion of the M.P.H. degree. This course is open to second-year M.P.H. students only. E. O'Keefe

EPH 515b, Seminar on Introduction to Research Ethics This three-session seminar introduces students to historical roots of human subjects research and to U.S. and international regulations and guidelines for conducting ethical human subjects research. Case studies are used to demonstrate some of the ethical challenges in public health research. Students are also introduced to the functions and procedures of the Yale School of Medicine Human Investigation Committee. Finally, students complete Web-based trainings on the responsible conduct of research. K. Khoshnood

EPH 520c, Summer Internship The Internship is a degree requirement that is completed in the summer between the first and second academic years. Students work with their faculty advisers and the Office of Career Services to identify suitable placements, which

include medical care facilities, community agencies, research projects, laboratories, and other sites engaged in public health activities. The internship experience often serves as a basis for the M.P.H. thesis. The internship is displayed on the transcript with a grade of “S” (Satisfactory) upon completion. A course unit is not given for the summer internship.

All students *must* complete a Summer Internship with the exception of those in the Advanced Professional M.P.H. Program. The Summer Internship may be used to complete the Public Health Practice requirement with prior approval from the Office of Community Health.

EPH 525b, Thesis The thesis (2 course units) is typically a yearlong project that is completed in the second academic year and is the culmination of the student’s educational experience at YSPH. It is frequently a report of a small research project performed independently by the student. Students work with faculty advisers in designing their project and in writing the thesis. Detailed guidelines for the thesis are outlined in Appendix II.

The thesis is not a requirement for students in the Health Management, Health Policy, or Advanced Professional M.P.H. programs (except for those in the Occupational and Environmental Medicine track).

EPH 542b, Community Health Program Planning This course is one of the options available to students to fulfill the practicum requirement for the M.P.H. degree. The course develops students’ skills in conducting community assessments and planning and designing public health programs. The course content is based on an ecological framework, principles of public health ethics, and a philosophy of problem-based learning. Using case studies, students examine both U.S. and developing country projects and assessments and critique them for relevance and future application. Students write individual program plans for a specific public health problem. Through this exercise and related assignments throughout the term, students develop skills in strategic planning; developing project workplans, logic models, and logical frameworks; and writing budgets. In addition, students work on a practicum assignment or community project with three to five other students at a local agency and work on a project as described in the agency proposal. D. Humphries

EPH 591a and b, Global Health Seminar This course provides a space for discussion and critical thought about current topics in global health. Invited speakers come together with faculty, staff, and students (from YSPH and beyond) during each session to analyze current global health challenges, existing initiatives to address them, and potential alternative approaches. Topics range from sharing lessons learned from specific programs to broader issues such as the interrelation of globalization and health. The seminar represents an opportunity for students to reflect on the hard questions of global health practice. Through these types of discussions, we hope to encourage students to understand health and their role as public health practitioners more holistically, and to begin the difficult work of developing their professional values. M. Skonieczny

EPH 600b, Research Ethics and Responsibility This course seeks to introduce major concepts in the ethical conduct of research and some of the personal and professional issues that researchers encounter in their work. Sessions are run in a seminar/discussion format. Prerequisite: doctoral student or postdoctoral status only. C. Tschudi

Tuition, Expenses, and Financial Aid

The standard student budget for M.P.H. students for the academic year 2009–2010 is as follows:

Tuition	\$31,900
Student Activity Fee	150
Books and Supplies	1,725
Yale Hospitalization/Specialty Coverage	1,864
Room and Board	11,800
Personal and Transportation	3,295
Total Budget	<hr/> \$50,835

TUITION RATES

Full-Time

Matriculated students who are enrolled in the M.P.H. program and are taking 4 or more course units in a term are considered full-time and must pay two full years of tuition (four terms).

Part-Time

Matriculated students taking fewer than 4 course units in a term are considered part-time students. Part-time students pay tuition on a per-course basis (\$3,000 per course).

Advanced Professional M.P.H. Program

Students enrolled in the Advanced Professional M.P.H. Program pay two and one-half semesters of tuition. A half-semester's tuition (\$8,000) is charged for the summer session and full tuition is charged for the fall and spring terms.

Non-matriculated students who enroll in the summer session pay the per-course unit rate of \$3,000 per course unit.

Joint-Degree Students

Joint-degree students with the schools of Forestry & Environmental Studies, Law, Divinity, Management, the Physician's Associate Program, Nursing, the Center for International and Area Studies, and International Development Economics in the Graduate School, pay three terms of tuition to YSPH.

Joint M.D./M.P.H. students in the Advanced Professional Program pay one-half the annual tuition at the Yale School of Medicine.

Yale Faculty and Staff

Yale faculty and staff members that are taking individual courses for credit will be charged tuition on a per-course basis (\$3,000 per course unit). Yale faculty and staff that have matriculated in the M.P.H. program pay the appropriate tuition rate (full-time or part-time).

Auditors

Auditors not affiliated with Yale University pay tuition on a per course basis (\$3,000 per course unit), and are required to receive the permission of the instructor as well as the permission of the registrar.

Individuals affiliated with Yale (but not currently paying tuition at Yale) will be charged 50 percent of the per-course unit rate to audit a course. Permission of the registrar and the course instructor is required.

M.S. in Biostatistics Students

M.S. students are required to pay two full years of tuition to the Graduate School of Arts and Sciences and should refer to the bulletin of the Graduate School.

Ph.D. Students

Ph.D. students should refer to the bulletin of the Graduate School of Arts and Sciences for information about tuition and fees.

TUITION REBATE AND REFUND POLICY

On the basis of the federal regulations governing the return of federal student aid (Title IV) funds for withdrawn students, the rebate and refund of tuition is subject to the following policy.

1. For purposes of determining the refund of federal student aid funds, any student who withdraws from YSPH during the first 60 percent of the term will be subject to a pro rata schedule that will be used to determine the amount of Title IV funds a student has earned at the time of withdrawal. A student who withdraws after the 60 percent point has earned 100 percent of the Title IV funds. In 2009–2010, the last days for refunding federal student aid funds will be October 29, 2009 in the fall term and March 28, 2010 in the spring term.
2. For purposes of determining the refund of institutional aid funds and for students who have not received financial aid:
 - a. 100 percent of tuition will be rebated for withdrawals that occur on or before the end of the first 10 percent of the term (September 11, 2009 in the fall term and January 20, 2010 in the spring term).
 - b. A rebate of one-half (50 percent) of tuition will be granted for withdrawals that occur after the first 10 percent but on or before the last day of the first quarter of the term (September 26, 2009 in the fall term and February 4, 2010 in the spring term).
 - c. A rebate of one-quarter (25 percent) of tuition will be granted for withdrawals that occur after the first quarter of a term but on or before the day of midterm (October 21, 2009 in the fall term and March 2, 2010 in the spring term).
 - d. Students who withdraw for any reason after midterm will not receive a rebate of any portion of tuition.
3. In the event of a student's death on or before the tenth day of a term, the tuition will be canceled in full. Should death occur after the tenth day of a term, the bursar will adjust the tuition on a pro rata basis.

4. If the student has received student loans or other forms of financial aid, rebates will be refunded in the order prescribed by federal regulations; namely, first to the Unsubsidized Federal Stafford and/or Subsidized Federal Stafford loans, if any; then to Federal Perkins loan; Federal Graduate Plus Loan; next to any other federal, state, private, or institutional scholarships and loans; and, finally, any remaining balance to the student.
5. Loan recipients (Stafford, Perkins, or Yale Student Loans) who withdraw are required to have an exit interview before leaving Yale. Students will be notified by mail of the process.

Tuition Rebate and Refund Policy for Advanced Professional M.P.H. Program (Summer Session)

If the student withdraws during the first week of the program, 100 percent of the tuition will be refunded.

Withdrawal during week 2 of the program will result in a 50 percent refund of tuition.

Withdrawal between weeks 2 and 4 will result in 25 percent tuition refund.

Tuition will not be refunded for withdrawals after week 4 of the summer session.

STUDENT ACCOUNTS AND BILLS

Student accounts, billing, and related services are administered through the Office of Student Financial Services, which is located at 246 Church Street. The telephone number is 203.432.2700.

Bills

Yale University's official means of communicating monthly financial account statements is electronically through the University's Internet-based system for electronic billing and payment, Yale University eBill-ePay.

Student account statements are prepared and made available twelve times a year at the beginning of each month. Payment is due in full by 4 p.m. Eastern Standard Time on the first business day of the following month. E-mail notifications that the account statement is available on the University eBill-ePay Web site (www.yale.edu/sis/ebep) are sent to all students who have activated their official Yale e-mail accounts and to all student-designated authorized payers. It is imperative that all students activate and monitor their Yale e-mail accounts on an ongoing basis.

Bills for tuition, room, and board are available to the student during the first week of July, due and payable by August 1 for the fall term; and during the first week of November, due and payable by December 1 for the spring term. The Office of Student Financial Services will impose a late charge if any part of the term bill, less Yale-administered loans and scholarships that have been applied for on a timely basis, is not paid when due. The late charge will be imposed as follows:

<i>If fall-term payment in full is not received</i>	<i>Late charge</i>
by August 1	\$110
by September 1	\$220
by October 1	\$330
<i>If spring-term payment in full is not received</i>	<i>Late charge</i>
by December 1	\$110
by January 2	\$220
by February 1	\$330

Nonpayment of bills and failure to complete and submit financial aid application packages on a timely basis may result in the student's involuntary withdrawal from the University.

No degrees will be conferred and no transcripts will be furnished until all bills due the University are paid in full. In addition, transcripts will not be furnished to any student or former student who is in default on the payment of a student loan.

The University may withhold registration and certain University privileges from students who have not paid their term bills or made satisfactory payment arrangements by the day of registration. To avoid delay at registration, students must ensure that payments reach Student Financial Services by the due dates.

Charge for Rejected Payments

A processing charge of \$25 will be assessed for payments rejected for any reason by the bank on which they were drawn. In addition, the following penalties may apply if a payment is rejected:

1. If the payment was for a term bill, a \$110 late fee will be charged for the period the bill was unpaid.
2. If the payment was for a term bill to permit registration, the student's registration may be revoked.
3. If the payment was given to settle an unpaid balance in order to receive a diploma, the University may refer the account to an attorney for collection.

Yale University eBill-ePay

There are a variety of options offered for making payments. Yale University eBill-ePay is the preferred means for payment of bills. It can be found at www.yale.edu/sis/ebep/. Electronic payments are easy and convenient—no checks to write, no stamps, no envelopes, no hassle. Payments are immediately posted to the student's account. There is no charge to use this service. Bank information is password protected and secure, and there is a printable confirmation receipt. Payments can be made twenty-four hours a day, seven days a week, up to 4 p.m. Eastern Standard Time on the due date to avoid late fees. (The eBill-ePay system will not be available when the system is undergoing upgrade, maintenance, or repair.) Students can authorize up to three authorized payers to make payments electronically from their own computers to the student's account using Yale's system.

Use of the student's own bank payment service is not authorized by the University because it has no direct link to the student's Yale account. Payments made through such

services arrive without proper account identification and always require manual processing that results in delayed crediting of the student's account, late fees, and anxiety. Students should use Yale eBill-ePay to pay online. For those who choose to pay by check, remittance advice with mailing instructions is available on the Web site.

Yale Payment Plan

The Yale Payment Plan (YPP) is a payment service that allows students and their families to pay tuition, room, and board in ten equal monthly installments throughout the year based on individual family budget requirements. It is administered by the University's Office of Student Financial Services. The cost to enroll in the YPP is \$100 per contract. The deadline for enrollment is June 19. For additional information, please contact Student Financial Services at 203.432.2700 and select "Press 3" from the Main Menu. The enrollment form can be found online in the Yale Payment Plan section of the Student Accounts Web site: www.yale.edu/sfas/financial/accounts.html#payment.

FINANCIAL AID POLICIES FOR M.P.H. STUDENTS

The YSPH Student Financial Aid Office is located in the Office of Student Affairs, 47 College Street. Karen Wellman, Director of Financial Aid, can be reached at 203.785.5417 or karen.wellman@yale.edu. The financial aid policies at YSPH are designed to assist all students as equitably as possible. Financial aid awards are determined annually based on the estimated cost of attendance for the year in which aid is awarded. Continuing students are required to reapply for aid for their second year. The estimated student budget includes all projected costs related to academic and living expenses. The budget does not include expenses related to maintaining an automobile.

Though YSPH awards a limited number of merit scholarships, the majority of Yale financial aid is awarded on the basis of demonstrated financial need. Loans are first awarded, and, depending upon the remaining need, students may receive a need-based grant from YSPH.

Federal Veterans Education Benefits

The M.P.H. program is approved for Federal Veterans Education benefits under the GI Bill. To check your eligibility for benefits, visit the Web site www.gibill.va.gov. To be enrolled, see the registrar.

Loans

For 2009–2010, all U.S. citizens or permanent residents of the United States may be eligible to borrow up to \$33,000 from the Stafford loan program. This amount may vary depending on what other financial aid a student may be receiving. Stafford loans generally have a ten-year repayment period beginning six months after a student graduates or drops below half-time enrollment.

Eligibility

Students who are matriculated in the M.P.H. program and are registered for 3 or more course units per term are eligible to apply for financial aid.

International Students

International students are not eligible to receive financial aid from the YSPH or the federal loan programs.

Reporting Outside Resources

Additional financial support in the form of loans, scholarships, fellowships, additional family support, or employment of any type must be reported to the Financial Aid Office. Any such changes may result in a proportional reduction in the financial aid awarded.

Academic Policies

FACULTY ADVISERS

Each student is assigned a faculty adviser upon entering the M.P.H. program. It is the responsibility of the student and the faculty adviser to work together to select courses, monitor academic progress, and develop career plans.

COURSE REGISTRATION

The beginning of each term is considered a “shopping period” in which students attend classes they are interested in taking. All students must complete the online registration by September 15 in the fall term and January 19 in the spring term to avoid a \$50 late fee. At the end of the shopping period, all registrations are considered final. *Note: Courses cannot be added after the registration deadline without permission of the registrar.* See below for information on withdrawing from courses.

Students are encouraged to enroll in courses in other Yale schools if there is space available and if the instructor agrees. Students must receive written permission from the registrar of the Law School and the School of Management for any courses taken at those schools.

One course unit is awarded for any full-term course (not seminars or colloquia) taken in the Graduate School or another professional school. Credit is not granted for courses that are taken on a pass/fail or credit/no credit basis. All courses taken outside of YSPH must be graded (H, HP, P) in order to receive a course unit. Courses taken at Yale College (undergraduate) must be 300 series or above in order to receive a course unit toward the M.P.H. degree.

Note: M.P.H. students are not eligible to “audit” classes at YSPH.

COURSE WITHDRAWAL

Students may withdraw from a course with the approval of their academic adviser. Students may withdraw from a course until midterm (October 23 in the fall term; March 5 in the spring term) without the course appearing on the transcript. From midterm until the last day of classes (December 4, fall term; April 23, spring term) a student may withdraw from a course; however, the course will appear on the transcript with a letter grade of “W.”

First-year students are not allowed to withdraw from Introduction to Statistical Thinking I and II (BIS 505a or b) or Principles of Epidemiology I (CDE/EMD 508a).

EXEMPTION FROM REQUIRED COURSES

Students who feel they have previously covered the material being presented in a required course (not an elective) can request a “course exemption” directly from the course instructor. The instructor must sign the Course Exemption Form (available online or in the Office of Student Affairs) and the student must submit it at the time of registration. Exempted courses will be listed on the transcript with a grade of “Q.” Exempted courses cannot be used to satisfy the course unit requirement for the M.P.H. degree.

GRADING SYSTEM

The YSPH grading system is designed to foster an atmosphere of cooperative learning. Consequently, YSPH does not compute the grade point average (GPA) or class rank of its students. Students are graded only to provide them with a formal evaluation of their understanding of the concepts presented in their courses.

All YSPH courses are graded Honors (H), High Pass (HP), Pass (P), or Fail (F). The Internship and seminars receive a grade of Satisfactory (S) upon successful completion. The grade of “Q” indicates courses for which a student has received an exemption.

1. A grade of Honors should be assigned for performance that is distinguished. This reflects contributions that go beyond the requirements for the course, either in terms of the creativity of their application, the complexity of the settings in which the ideas are applied, or their ability to build on the methods and ideas taught in the class.
2. A grade of High Pass should be assigned for students who have demonstrated a proficiency in the use of class material. Students earning this grade not only understand the material that was taught but can also deploy it in constructive ways for new problems.
3. A grade of Pass should be assigned for students who have demonstrated an understanding of the class material. They must be able to accurately describe ideas and methods and identify contexts in which they are appropriately used. Passing grades indicate that students are capable of performing competently in this domain as public health professionals.
4. A grade of Fail should be assigned to students who cannot demonstrate an acceptable understanding of the core ideas, methods, or other class material and thus lack competence in this domain of public health.

The instructor for each course will determine the specific performance criteria that correspond to each of these tiers of academic achievement. Consequently, quantitative thresholds for particular grades may vary from one course to the next and in some courses may depend on factors (e.g., class participation) that are not readily quantified.

A failure in any course remains on the student’s transcript. If the course is retaken, it is listed again on the transcript with the new grade.

In very rare cases, students may receive a grade of Incomplete (I). This designation is not a permanent grade and must be finalized at a later date. If the instructor agrees to give a grade of Incomplete, the instructor notifies the student and the registrar of the date by which all course requirements must be completed. The time limit for completion may not exceed one term. In cases where the student does not complete the course requirements by the agreed-upon date, the grade of “I” is changed to a grade of “F.”

The transcript is a permanent record. Grade changes may only be made if the instructor reports to the registrar that a clerical or computational error has resulted in an inaccurate grade. The University considers an instructor’s evaluation of the quality of a student’s work to be final. Disputes about a course grade that are alleged to result from discrimination based on race, sex, religion, national or ethnic origin, or handicap are resolved through the University’s student grievance procedures.

TUTORIAL SUPPORT

Students experiencing academic difficulty should seek prompt assistance. Students should first discuss the problem with the course instructor. Course instructors can suggest that a student's academic difficulties be addressed by a course's teaching assistant (TA). If after working with the TA the student continues to experience difficulty, the course instructor can recommend that specific tutorial assistance be provided to the student. The instructor should contact the associate dean for student affairs to arrange tutorial assistance.

All M.P.H. student transcripts are reviewed by the associate dean for student affairs at the end of each term. Advisers receive a copy of each advisee's transcript both as an early warning of academic difficulty and as an aid to planning course load and selection.

ACADEMIC STANDARDS

Students in the M.P.H. program must pass all core course and divisional requirements. Any student who fails a required course must retake it and pass it. The Committee on Academic Progress will review the academic performance of a student whose record in any term shows significant decline, or if there is a reason for concern about the overall quality of a student's work.

Any student in the Advanced Professional M.P.H. program who receives a failing grade in the summer session will be withdrawn from the program.

Academic Probation

The Committee on Academic Progress will place students whose academic work is unsatisfactory on Academic Probation. The committee will take into account the personal situation of the student, but a failing grade in any course will normally result in Academic Probation. Students who receive failing grades in two or more courses during a term, or who receive a second failing grade after being placed on Academic Probation, may be dismissed from the M.P.H. program.

CHANGE OF DIVISION

Divisional changes may be requested during the *first* academic year. Students who wish to change divisions must complete the "Change of Division" form, which requires the signature of both division heads and both academic advisers. Students must be sure to fulfill all course requirements for the new division. Change of Division forms are available either online (<http://publichealth.yale.edu/student/registrar.html>) or in the Office of Student Affairs.

Note: Because of the number of requirements and the sequencing of courses, students may not switch into the Health Management Program after the second week of the first term. Also, students may not switch into the Health Policy Division after the second week of their second term.

OTHER CHANGES AND APPEALS IN EDUCATIONAL PROGRAM

Other significant changes in a student's educational program should be discussed with the student's academic adviser, and requested in writing to the Committee on Academic Progress. Appeals resulting from decisions made by the Committee on Academic Progress must be addressed to the dean of Public Health, with the description of the basis for appeal. Appeals are heard by the Committee of Permanent Officers, whose decision is final.

Administrative Policies

STUDENT RECORDS

A permanent file is created for each student upon enrollment at YSPH. This file contains the student's application, acceptance letter, registration forms, and academic transcripts, as well as copies of all correspondence to the student. Access to this file is governed by the Family Educational Rights and Privacy Act of 1974, also known as the Buckley Amendment, and by the Yale University Policy Statement on Student Records. When a student graduates, his/her file is stored for five years. After that, files are transferred to the Yale University Archives for permanent storage.

Official student records for currently enrolled students are housed in the registrar's office. Under the Buckley Amendment, student records are accessible to faculty members, deans, and staff members who have a legitimate educational interest in review of the records. Students may review all parts of their records except parental financial information (unless the student's parents have explicitly permitted such access) and confidential letters of recommendation.

Unless a student has requested in writing that the University not release "directory information" about him or her, the University may release the following directory information: name, address, telephone number, program, dates of attendance, and degrees received.

LEAVE OF ABSENCE

Students who wish or need to interrupt their study temporarily may request a leave of absence. There are two types of leave, personal (including maternity leave) and medical, as described below.

The general policies that apply to both types of leave are as follows:

1. All leaves of absence must be approved by the associate dean for student affairs (Anne Pistell). Medical leaves also require the recommendation of a Yale Health Plan (YHP) physician, or treating physician, as described below.
2. Students in the two-year M.P.H. program may be on leave for a maximum of one year. Students in the Advanced Professional program or the B.A./B.S. Select Program may be on leave for a maximum of one term. Leaves of absence for students in one-year programs are not renewable.
3. Students who fail to register for the term following the end of the approved leave will be considered to have withdrawn from the program.
4. Students on leave may complete, by the appropriate deadline for the term in which the course was taken, outstanding work in courses for which they have been granted approved incompletes. They may not, however, fulfill any other degree requirements during the time on leave.
5. Students on leave do not have to file a formal application for readmission. However, they must notify the registrar in writing of their intention to return.
6. Students on a leave of absence are not eligible for financial aid, including loans, or for the use of University facilities normally available to registered students. Students granted a leave may continue to be enrolled in the Yale Health Plan by purchasing

coverage through the Student Affiliate Coverage Plan. In order to secure continuous YHP coverage, enrollment in this plan must be requested prior to the beginning of the term in which the student will be on leave or, if the leave commences during the term, within thirty days of the date when the leave is granted. Coverage is not automatic; enrollment forms are available from the Member Services department of the Yale Health Service, 17 Hillhouse Avenue, 203.432.0246.

Personal Leave of Absence

A student who is current with his or her degree requirements and who wishes to interrupt study temporarily because of personal exigencies may request a personal leave of absence. Personal leaves cannot be granted retroactively.

Medical Leave of Absence

A student who must interrupt study temporarily because of illness or injury may be granted a medical leave of absence with the approval of the associate dean for student affairs, on the written recommendation of a physician. Final decisions concerning requests for medical leaves will be communicated to students from the associated dean in writing.

YSPH reserves the right to place a student on a medical leave of absence when, on the recommendation of the director of the University Health Services or the chief of the Division of Mental Hygiene, or treating physician, the associate dean determines that the student is a danger to self or others because of a serious medical problem.

The general policies governing all leaves of absence are described above. A student who is making satisfactory progress toward his or her degree requirements is eligible for a medical leave any time after matriculation. Students who are placed on a medical leave during any term will have their tuition adjusted according to the same schedule used for withdrawals. Before re-registering, a student on medical leave must secure written permission to return from the treating physician.

WITHDRAWAL FROM THE M.P.H. PROGRAM

A student who wishes to withdraw from the M.P.H. program must inform the associate dean for student affairs in writing and contact the Financial Aid Office. The student must also return his/her identification card and building keys to the registrar. Students wishing to reenter the program after withdrawing must reapply through the regular admissions process.

HUMAN INVESTIGATION SAFEGUARDS

All work by faculty or students undertaken anywhere that involves human subjects in ways subject to federal or Yale guidelines must be approved by the Human Investigation Committee (HIC) at Yale. Failure to obtain HIC clearance may result in dismissal from the University. Both faculty and students should be aware that these are not pro forma requirements but serious in intent, as well as consequences, if there is failure to comply.

Consultation is available during the academic year and during the summer months. Unless their work is done entirely in a laboratory with no human subject involvement, students should assume that their work does require HIC approval. It is safer to submit the forms and be informed that HIC approval is not needed, than not to submit them and later be told that they were required. Most student research receives expedited review, but some projects are reviewed by the entire HIC, a procedure taking several weeks. Thus, students are advised to submit their HIC protocols at the earliest possible time.

The student's faculty adviser and the faculty or student YSPH representatives on the HIC can assist the student in preparing an HIC protocol. Many student research projects involving human subjects also require written informed consent. Students should make sure that all informed consent procedures and forms have been approved by the HIC. Arrangements may be made for review by mail for those students outside the New Haven area.

ADDITIONAL POLICIES

Additional University policies are kept on file in the Office of Student Affairs and are available for student reference. These policies include the Policy on Freedom of Expression, the Equal Opportunity Statement, the Sexual Harassment Policy, and the Yale University AIDS Policy.

University Resources and Services

A GLOBAL UNIVERSITY

In a speech entitled “The Global University,” Yale President Richard C. Levin declared that as Yale enters its fourth century, its goal is to become a truly global university—educating leaders and advancing the frontiers of knowledge not simply for the United States, but for the entire world:

“The globalization of the University is in part an evolutionary development. Yale has drawn students from outside the United States for nearly two centuries, and international issues have been represented in its curriculum for the past hundred years and more. But creating the global university is also a revolutionary development—signaling distinct changes in the substance of teaching and research, the demographic characteristics of students, the scope and breadth of external collaborations, and the engagement of the University with new audiences.”

Yale University’s goals and strategies for internationalization are described in a report entitled “The Internationalization of Yale: The Emerging Framework,” which is available online at www.world.yale.edu/pdf/Internationalization_of_Yale.pdf.

International activity is coordinated by several University-wide organizations in addition to the efforts within the individual schools and programs.

Launched in 2003–2004, the Office of International Affairs supports the international activities of all schools, departments, offices, centers, and organizations at Yale; promotes Yale and its faculty to international audiences; and works to increase the visibility of Yale’s international activities around the globe. (www.yale.edu/oia)

The Office of International Students and Scholars is a resource on immigration matters and hosts orientation programs and social activities for the University’s international community. See description in this bulletin and www.oiss.yale.edu.

The Whitney and Betty MacMillan Center for International and Area Studies is the University’s principal agency for encouraging and coordinating teaching and research on international affairs, societies, and cultures. See description in this bulletin and www.yale.edu/macmillan.

The Yale Center for the Study of Globalization draws on the intellectual resources of the Yale community, scholars from other universities, and experts from around the world to support teaching and research on the many facets of globalization, and to enrich debate through workshops, conferences, and public programs. See description in this bulletin and www.ycsg.yale.edu.

The Yale World Fellows Program hosts eighteen emerging leaders from outside the United States each year for an intensive semester of individualized research, weekly seminars, leadership training, and regular interactions with the Yale community. (www.yale.edu/worldfellows)

For additional information, the “Yale and the World” Web site offers a compilation of resources for international students, scholars, and other Yale affiliates interested in the University’s global initiatives. (www.world.yale.edu)

HEALTH SERVICES FOR YSPH STUDENTS

Yale University Health Services (YUHS) is located on campus at 17 Hillhouse Avenue. YUHS offers a wide variety of health care services for students and other members of the Yale community. Services include student medicine, gynecology, mental health, pediatrics, pharmacy, laboratory, radiology, a seventeen-bed inpatient care facility (ICF), a round-the-clock urgent care clinic, and such specialty services as allergy, dermatology, orthopedics, and a travel clinic. YUHS also includes the Yale Health Plan (YHP), a health coverage option that coordinates and provides payment for the services outlined above, as well as for emergency treatment, off-site specialty services, inpatient hospital care, and other ancillary services. YUHS's services are detailed in the *YHP Student Handbook*, available through the YHP Member Services Department, 203.432.0246, or on the YHP Web site at www.yale.edu/yhp.

Eligibility for Services

All full-time Yale degree-candidate students who are paying at least half tuition are enrolled automatically for YHP Basic Coverage. YHP Basic Coverage is offered at no charge and includes preventive health and medical services in the departments of Student Medicine, Internal Medicine, Gynecology, Health Education, and Mental Health & Counseling. In addition, treatment for urgent medical problems can be obtained twenty-four hours a day through Urgent Care.

Students on leave of absence or on extended study and paying less than half tuition are not eligible for YHP Basic Coverage but may enroll in YHP Student Affiliate Coverage. Students enrolled in the Division of Special Registration as nondegree special students or visiting scholars are not eligible for YHP Basic Coverage but may enroll in the YHP Billed Associates Plan and pay a monthly premium. Associates must register for a minimum of one term within the first thirty days of affiliation with the University.

Students not eligible for YHP Basic Coverage may also use the services on a fee-for-service basis. Students who wish to be seen fee-for-service must register with the YHP Member Services Department. Enrollment applications for the YHP Student Affiliate Coverage, Billed Associates Plan, or Fee-for-Service Program are available from the YHP Member Services Department.

All students are welcome to use specialty and ancillary services at YUHS. Upon referral, YHP will cover the cost of these services if the student is a member of YHP Hospitalization/Specialty Coverage (see below). If the student has an alternate insurance plan, YHP will assist in submitting the claims for specialty and ancillary services to the other plan and will bill through the Office of Student Financial Services for noncovered charges and services.

Health Coverage Enrollment

The University also requires all students eligible for YHP Basic Coverage to have adequate hospital insurance coverage. Students may choose YHP Hospitalization/Specialty Coverage or elect to waive the plan if they have other hospitalization coverage, such as coverage through a spouse or parent. The waiver must be renewed annually, and it is the student's responsibility to confirm receipt of the waiver form by the University's deadlines noted below.

YHP HOSPITALIZATION/SPECIALTY COVERAGE

For a detailed explanation of this plan, see the *YHP Student Handbook*, which is available online at www.yale.edu/yhp/pdf/studenthb.pdf.

Students are automatically enrolled and charged a fee each term on their Student Financial Services bill for YHP Hospitalization/Specialty Coverage. Students with no break in coverage who are enrolled during both the fall and spring terms are billed each term and are covered from August 1 through July 31. For students entering Yale for the first time, readmitted students, and students returning from a leave of absence who have not been covered during their leave, YHP Hospitalization/Specialty Coverage begins on the day the dormitories officially open. A student who is enrolled for the fall term only is covered for services through January 31; a student enrolled for the spring term only is covered for services through July 31.

Waiving the YHP Hospitalization/Specialty Coverage Students are permitted to waive YHP Hospitalization/Specialty Coverage by completing an online waiver form at www.yhpstudentwaiver.yale.edu that demonstrates proof of alternate coverage. It is the student's responsibility to report any changes in alternate insurance coverage to the YHP Member Services Department. Students are encouraged to review their present coverage and compare its benefits to those available under the YHP. The waiver form must be filed annually and must be received by September 15 for the full year or fall term or by January 31 for the spring term only.

Revoking the waiver Students who waive YHP Hospitalization/Specialty Coverage but later wish to be covered must complete and send a form voiding their waiver to the YHP Member Services Department by September 15 for the full year or fall term, or by January 31 for the spring term only. Students who wish to revoke their waiver during the term may do so, provided they show proof of loss of the alternate insurance plan and enroll within thirty days of the loss of this coverage. YHP premiums will not be prorated.

YHP STUDENT TWO-PERSON AND FAMILY PLANS

A student may enroll his or her lawfully married spouse or same-gender domestic partner and/or legally dependent child(ren) under the age of nineteen in one of two student dependent plans: the Two-Person Plan or the Student Family Plan. These plans include services described in both the YHP Basic Coverage and the YHP Hospitalization/Specialty Coverage. YHP Prescription Plus Coverage may be added at an additional cost. Coverage is not automatic and enrollment is by application. Applications are available from the YHP Member Services Department or can be downloaded from the YUHS Web site (www.yale.edu/yhp) and must be renewed annually. Applications must be received by September 15 for full-year or fall-term coverage, or by January 31 for spring-term coverage only.

YHP STUDENT AFFILIATE COVERAGE

Students on leave of absence or extended study, students paying less than half tuition, or students enrolled in the Eli Whitney Program prior to September 2007 may enroll in YHP Student Affiliate Coverage, which includes services described in both the YHP Basic and the YHP Hospitalization/Specialty Coverage. Prescription Plus Coverage may also be

added for an additional cost. Applications are available from the YHP Member Services Department or can be downloaded from the YUHS Web site (www.yale.edu/yhp) and must be received by September 15 for full-year or fall-term coverage, or by January 31 for spring-term coverage only.

YHP PRESCRIPTION PLUS COVERAGE

This plan has been designed for Yale students who purchase YHP Hospitalization/Specialty Coverage and student dependents who are enrolled in either the Two-Person Plan, the Student Family Plan, or Student Affiliate Coverage. YHP Prescription Plus Coverage provides protection for some types of medical expenses not covered under YHP Hospitalization/Specialty Coverage. Students are billed for this plan and may waive this coverage. The online waiver (www.yhpstudentwaiver.yale.edu) must be filed annually and must be received by September 15 for the full year or fall term or by January 31 for the spring term only. For a detailed explanation, please refer to the *YHP Student Handbook*.

Eligibility Changes

Withdrawal A student who withdraws from the University during the first ten days of the term will be refunded the premium paid for YHP Hospitalization/Specialty Coverage and/or YHP Prescription Plus Coverage. The student will not be eligible for any YHP benefits, and the student's YHP membership will be terminated retroactive to the beginning of the term. The medical record will be reviewed, and any services rendered and/or claims paid will be billed to the student on a fee-for-service basis. At all other times, a student who withdraws from the University will be covered by YHP for thirty days following the date of withdrawal or to the last day of the term, whichever comes first. Premiums will not be prorated or refunded. Students who withdraw are not eligible to enroll in YHP Student Affiliate Coverage.

Leaves of absence Students who are granted a leave of absence are eligible to purchase YHP Student Affiliate Coverage during the term(s) of the leave. If the leave occurs during the term, YHP Hospitalization/Specialty Coverage will end on the date the leave is granted and students may enroll in YHP Student Affiliate Coverage. Students must enroll in Affiliate Coverage prior to the beginning of the term during which the leave is taken or within thirty days of the start of the leave. Premiums paid for YHP Hospitalization/Specialty Coverage will be applied toward the cost of Affiliate Coverage. Coverage is not automatic and enrollment forms are available at the YHP Member Services Department or can be downloaded from the YUHS Web site (www.yale.edu/yhp). Premiums will not be prorated or refunded.

Extended study or reduced tuition Students who are granted extended study status or pay less than half tuition are not eligible for YHP Hospitalization/Specialty Coverage and YHP Prescription Plus Coverage. They may purchase YHP Student Affiliate Coverage during the term(s) of extended study. This plan includes services described in both the YHP Basic and the YHP Hospitalization/Specialty Coverage. Coverage is not automatic and enrollment forms are available at the YHP Member Services Department or can be downloaded from the YUHS Web site (www.yale.edu/yhp). Students must complete

an enrollment application for the plan prior to September 15 for the full year or fall term, or by January 31 for the spring term only.

For a full description of the services and benefits provided by YHP, please refer to the *YHP Student Handbook*, available from the YHP Member Services Department, 203.432.0246, 17 Hillhouse Avenue, PO Box 208237, New Haven CT 06520-8237.

Required Immunizations

Measles (rubeola) and German measles (rubella) All students who were born after December 31, 1956, are required to provide proof of immunization against measles (rubeola) and German measles (rubella). Connecticut state law requires two doses of measles vaccine. The first dose must have been given after January 1, 1969, *and* after the student's first birthday. The second dose must have been given after January 1, 1980. These doses must be at least 30 days apart. Connecticut state law requires proof of one dose of rubella vaccine administered after January 1, 1969, *and* after the student's first birthday. The law applies to all students unless they present (a) a certificate from a physician stating that such immunization is contraindicated, (b) a statement that such immunization would be contrary to the student's religious beliefs, or (c) documentation of a positive blood titer for measles and rubella.

Meningococcus (meningitis) All students living in on-campus housing must be vaccinated against meningococcal disease. The vaccine must have been received after January 1, 2005. Students who are not compliant with this law will not be permitted to register for classes or move into the dormitories for the fall term, 2009. Please note that the State of Connecticut does not require this vaccine for students who intend to reside off campus.

In addition to University requirements, all School of Public Health students must also meet immunization requirements of the various hospitals in which they will work. Yale-New Haven Hospital requires that, before beginning any clinical work, all students with negative serology be successfully vaccinated against hepatitis B and must ascertain that students are immune to polio, mumps, rubeola, rubella, and varicella. Those refusing the hepatitis B vaccine must do so in writing at the time of matriculation. Students must show evidence that they have received a tetanus toxoid or tetanus-diphtheria booster within the past ten years. They must also show evidence of a PPD within the past year, or a chest X-ray for individuals known to be PPD positive.

Note: Students who have not met these requirements prior to arrival at Yale University must receive the immunizations from YHP and will be charged accordingly.

Any students who will be traveling abroad should make an appointment in the Travel Clinic at YUHS at least six to eight weeks prior to departure. In addition, those who are working in areas where they might encounter blood or fluid exposure must contact the Student Medicine Department (203.432.0312) at YHP. Such students will be given a seven-day supply of antiretroviral medication at no charge. They will also receive instructions about how to handle possible exposure.

RESIDENCE AND DINING FACILITIES

Edward S. Harkness Memorial Hall

Harkness Hall, located only steps away from the School of Medicine and Yale–New Haven Hospital, houses students from the Schools of Medicine, Nursing, and Public Health and from the Physician Associate program. Residents of Harkness Hall live in a secure building with recently renovated single rooms, and they have access to many amenities including computer network access in all units. Yale administrative offices occupy the first through third floors of the building. The great advantages of living in Harkness Hall are its close proximity to classes, and the opportunity it provides in bringing together students from the various medical-related fields in a relaxed social setting.

Accommodations include single rooms with sinks, a limited number of two-room suites, a popular dining hall, television lounges, kitchenettes, and other recreational rooms. All dormitory rooms are furnished, and all rooms must be single occupancy. Dormitory room rental rates are \$5,000 to \$7,000 during the 2009–2010 academic year (August 20, 2009, to May 30, 2010). Rent includes Ethernet hook-up, cable television, and all utilities except telephone. A Marigolds meal plan is mandatory for all residents of Harkness Hall.

The first floor houses a dining and lounge area, known as Marigolds, which is open to the Yale community and provides both intimate and large gathering spaces for socializing, reading, watching television, and other activities. A Steinway baby-grand piano is also available for residents. The building contains limited resident storage including a bike storage area, an exercise/weight room, a billiard room, and a laundry room. The Class of 1958 Fitness Center, which opened during the 1999–2000 school year, contains a wide assortment of cardiovascular and weight training equipment. All residents of Harkness dorm as well as medical, public health, physician associate, and nursing students are welcome to use this center, where student ID card scanners provide access. There is no fee for Harkness residents. All medical center program students can use the gym on a fee basis. All users are required to register for gym membership.

For information about Edward S. Harkness Memorial Hall, contact the Graduate Housing Office at 203.432.2167; or the Web site, www.yale.edu/gradhousing/Dorms/harkness.html. For information about other Yale graduate residences, consult the Graduate Housing Office's Web site at www.yale.edu/gradhousing.

Dining Services

Marigolds, located at the School of Medicine, is the popular student dining area and gathering place in Edward S. Harkness Hall. Marigolds, which is open from 7:30 a.m. until 7 p.m., Monday through Friday, offers continental and hot breakfast, lunch, and dinner. A late-night coffee bar is slated to open in the fall. Dining hours are shortened during summer and vacation periods. Faculty members, students, and staff are welcome to dine at the dining hall on an à la carte basis.

Students living in Harkness dormitory are required to participate in a meal plan. The rate for the 2009–2010 academic year is \$2,788 per year for dormitory residents. The meal plan is a debit-balance system allowing students to spend their board points

anytime that the dining room is open. Students on this plan can transfer a meal into any Yale University Dining Services location, seven days a week. Pricing is à la carte.

RESOURCE OFFICE ON DISABILITIES

The Resource Office on Disabilities facilitates accommodations for undergraduate and graduate and professional school students with disabilities who register with and have appropriate documentation on file in the Resource Office. Early planning is critical. Documentation may be submitted to the Resource Office even though a specific accommodation request is not anticipated at the time of registration. It is recommended that matriculating students in need of disability-related accommodations at Yale University contact the Resource Office by June 5. Special requests for University housing need to be made in the housing application. Returning students must contact the Resource Office at the beginning of each term to arrange for course and exam accommodations.

The Resource Office also provides assistance to students with temporary disabilities. General informational inquiries are welcome from students and members of the Yale community and from the public. The mailing address is Resource Office on Disabilities, Yale University, PO Box 208305, New Haven CT 06520-8305. The Resource Office is located at 35 Broadway (rear entrance), Room 222. Office hours are Monday through Friday, 8:30 a.m. to 4:30 p.m. Voice callers may reach staff at 203.432.2324; TTY/TDD callers at 203.432.8250. The Resource Office may also be reached by e-mail (judith.york@yale.edu) or through its Web site (www.yale.edu/rod).

OFFICE OF INTERNATIONAL STUDENTS AND SCHOLARS

The Office of International Students and Scholars (OISS) coordinates services and support for Yale's international students, faculty, staff, and their dependents. OISS assists members of the Yale international community with all matters of special concern to them and serves as a source of referral to other university offices and departments. OISS staff provide assistance with employment, immigration, personal and cultural adjustment, and family and financial matters, as well as serve as a source of general information about living at Yale and in New Haven. In addition, as Yale University's representative for immigration concerns, OISS provides information and assistance to students, staff, and faculty on how to obtain and maintain legal status in the United States, issues the visa documents needed to request entry into the U.S. under Yale's immigration sponsorship, and processes requests for extensions of authorized periods of stay, school transfers, and employment authorization. All international students and scholars must register with OISS as soon as they arrive at Yale, at which time OISS will provide information about orientation activities for newly arrived students, scholars, and family members. OISS programs, like the international coffee hours, Community Friends hosting program, daily English conversation groups and conversation partners program, U.S. culture workshops, and receptions for newly arrived graduate students, postdocs, and visiting scholars, provide an opportunity to meet members of Yale's international community and become acquainted with the many resources of Yale University and New Haven. OISS

welcomes volunteers from the Yale community to serve as hosts and as English conversation partners. Interested individuals should contact OISS at 203.432.2305.

OISS maintains an extensive Web site (www.oiss.yale.edu) with useful information for students and scholars prior to and upon arrival in New Haven. As U.S. immigration regulations are complex and change rather frequently, we urge international students and scholars to visit the office and check the Web site for the most recent updates.

International students, scholars, and their families and partners can connect with OISS and the international community at Yale by subscribing to the following e-mail lists. OISS-L is the OISS electronic newsletter for Yale's international community. *YaleInternational E-Group* is an interactive list through which over 3,000 international students and scholars connect to find roommates, rent apartments, sell cars and household goods, find companions, and keep each other informed about events in the area. Spouses and partners of international students and scholars will want to get involved with the organization called International Spouses and Partners at Yale (ISPY), which organizes a variety of programs for the spouse and partner community. The *ISPY E-Group* is an interactive list of over 300 members to connect spouses, partners, and families at Yale. To subscribe to any list, send a message to oiss@yale.edu.

Housed in the International Center for Yale Students and Scholars at 421 Temple Street, the Office of International Students and Scholars is open Monday through Friday from 8:30 a.m. to 5 p.m., except Tuesday, when the office is open from 10 a.m. to 5 p.m.; tel. 203.432.2305.

INTERNATIONAL CENTER FOR YALE STUDENTS AND SCHOLARS

The International Center for Yale Students and Scholars, located at 421 Temple Street, across the street from Helen Hadley Hall, offers a central location for programs that both support the international community and promote cross-cultural understanding on campus. The center, home to OISS, provides a welcoming venue for students and scholars who want to peruse resource materials, check their e-mail, and meet up with a friend or colleague. Open until 9 p.m. on weekdays during the academic year, the center also provides office and meeting space for student groups, and a space for events organized by both student groups and University departments. In addition, the center has nine library carrels that can be reserved by academic departments for short-term international visitors. For more information about the International Center, call 432.2305 or visit the center at 421 Temple Street.

SECURITY AND TRANSPORTATION

As with most universities in urban settings, the security of people and property is an important concern at Yale. Security is available in the Medical Center twenty-four hours a day, seven days a week. Special buses and escort services are available during evening hours. In addition, there are a number of telephones strategically located throughout the Medical Center which are connected to the Yale Police Communication Center. They are visible on campus by "blue light" that hangs above them. Security can be reached at 785.5555.

There are a number of shuttles which provide transportation to a variety of locations and are free with a Yale ID. Schedules for all shuttles are available at the SHM Security Desk, 333 Cedar Street, and in the ID & Parking Office, SHM IE41. Information on CT Transit bus and Metro-North and Shoreline East train services is also available at the ID & Parking Office.

The *Yale Daytime Shuttle* provides transportation around the University on a fixed route Monday through Friday, 7.20 a.m. to 6 p.m. This bus is operated by the Yale Parking Services, 155 Whitney Avenue, 432.9790, www.yale.edu/parkingandtransit/.

The *Mini-Bus/Night Shuttle* follows a regular route and also responds to on-demand pickups from 6 p.m. to 7.30 a.m. The shuttle also transports to and from the train station upon request. For rides or information call 432.6330.

The *Biomed Express* provides shuttle service Monday through Friday between 333 Cedar Street and Lot 22 on Whitney Avenue. During commuter hours the bus runs directly to the train station and Transit Center Garage, and it will transport to the train station and Transit Center at other times upon request. This bus is operated by the ID & Parking Office. For schedule information, call 785.4202 or see the Web site, www.yale.edu/parkingandtransit/.

The *VA Shuttle* provides shuttle service every fifteen minutes from the VA Hospital in West Haven to 333 Cedar Street, 6 a.m. to 6 p.m., Monday through Friday. This shuttle also stops at Quigley Field. This bus is operated by the ID & Parking Office. For schedule information, call 785.4202.

The *Y-NHH Shuttle* provides service to the train station, Lee High School complex, and other Medical Center buildings Monday through Friday, 5.40 a.m. to 6 p.m. This bus is operated by the Yale-New Haven Hospital Parking Office, 25 Park Street (GEB22), 785.2622.

Medical Transportation

The Yale Transit Service provides special transportation services for disabled students and for students requiring a ride to and from the Yale Health Center, Monday through Friday, 8.30 a.m. to midnight. Call 432.2788.

Yale Police will transport faculty, staff, or students to the University Health Services Center or the Yale-New Haven Hospital emergency room in cases of sudden illness or injury if no other transportation is available and an ambulance is not required.

YSPH Resources for Students

OFFICE OF STUDENT AFFAIRS

47 College Street, 785.6260
Anne Pistell, Associate Dean
Susan Whalen, Director

The Office of Student Affairs offers services and provides resources designed to enhance student life at YSPH. The associate dean has primary responsibility for the m.p.h. program, represents the interests of students to the faculty, and participates in policy decisions for the school. Dean Pistell and Susan Whalen are available to discuss academic, extracurricular, or personal issues with YSPH students. The Office of Student Affairs also coordinates orientation, Commencement, and other student programs, and serves as the administrative liaison with YSPH student organizations. The goal of the office is to ensure that every YSPH student is productively engaged in both academic and non-academic aspects of school life.

OFFICE OF CAREER SERVICES

47 College Street, 785.2827

The Office of Career Services assists students in developing, managing, and implementing career plans and strategies through a number of programs and resources including the following:

Career Counseling

Students are encouraged to make an appointment to meet with Career Services staff to create an effective résumé, hone interviewing skills, and develop job search strategies. Staff can also provide assistance with skills analysis, self-assessment, and goals clarification.

Professional Development Workshops

The Office of Career Services offers a series of workshops designed to prepare the student to successfully handle the various steps in searching for employment. In addition, Career Services offers information sessions for students interested in applying to medical school, law school, and doctoral programs.

Recruiting and Job Information

The Office of Career Services makes a strong effort to attract and respond to a variety of organizations seeking to hire public health professionals. The Yale Public Health Employment Resource, a Web-based recruitment tool, is a centralized source for posting job, internship, fellowship, and funding opportunities. Students can utilize this password-

protected site to access and respond directly to opportunities, post their résumés, and contact employers.

Since each student has a unique career objective, students are expected to supplement the career services resources provided with additional, individualized job search efforts. The Career Services staff is available to assist students in creating effective job search strategies.

Alumni Presentations

Alumni panel discussions are scheduled throughout the year to provide students with an opportunity to meet and interact with YSPH alumni working in a variety of public health settings. These events allow students to explore numerous organizations and the work taking place in them, and to network with individuals who may play a key role in internship and postgraduate job-search success.

Internship

The summer internship between the first and second year is an important learning experience providing students with an opportunity to explore or confirm a particular public health career interest. Students are expected to perform full-time work for ten to twelve weeks in a public health setting. Ultimately, it is each student's responsibility to secure an internship; however, Career Services helps students identify internship opportunities through on-campus recruiting, job postings, and alumni and faculty contacts.

Alumni Network/Alumni Database

YSPH has a strong alumni network, and our alumni routinely assist students in their career path and networking activities. Career Services maintains a database of alumni who have volunteered to help students in career-related matters.

LIBRARY SERVICES

Matthew Wilcox, Librarian, Director of Academic Technology
47 College Street, 785.2835

Students at Yale University have access to one of the largest library collections in the world. YSPH students have privileges that include free interlibrary loan services and access to the extensive collections in all of the Yale libraries. In particular, the Harvey Cushing/John Hay Whitney Medical Library, Seeley G. Mudd Government Document Library, Forestry & Environmental Studies Library, Lillian Goldman Library at Yale Law School, and Social Sciences Library have important print and electronic resources in their collections that address the multidisciplinary information needs of the students in public health.

Throughout the year the librarian offers classes and individual instruction in using electronic resources to YSPH students. Topics include search techniques in a variety of databases, such as Medline/PubMed, TOXNET, or Lexis-Nexis.

OFFICE OF THE REGISTRAR

47 College Street, 785.6260
Susan Whalen, Registrar

The registrar's office prepares course schedules, enrolls and registers students, maintains student records, and monitors academic progress. The following can be obtained from the registrar's office:

- Proof of student status. The registrar can provide a letter attesting to your student status, process loan deferment forms, and validate your ID card at the beginning of each term.
- Information on degree requirements.
- Transcripts. Copies of transcripts must be requested from the registrar's office. Transcript request forms are available in the registrar's office or are available online at <http://info.med.yale.edu/eph/student/registrar.html>. Two days should be allowed for the processing of requests. The cost for an official transcript is \$5 per transcript. By law, the registrar may only release Yale EPH transcripts. Prior transcripts and recommendations included in a student's application to EPH must be obtained from their original source.
- Lockers. The registrar's office issues locker assignments.

OFFICE OF ALUMNI AFFAIRS

135 College Street, 785.6245
Danielle S. Williams, Director

YSPH has a very active alumni network that facilitates the participation of the more than 3,000 alumni in many ways. The Association of Yale Alumni in Public Health (AYAPH) provides a voice for alumni and works to strengthen connections with the School and among the alumni community. The association meets throughout the year, working in collaboration with the Office of Alumni Affairs to promote alumni engagement. The association holds its annual meeting in conjunction with the annual American Public Health Association (APHA) convention. This schedule ensures geographic rotation of AYAPH meetings nationally and facilitates participation of graduates located throughout the U.S.

Alumni weekend each year features a symposium that addresses timely public health issues, and an awards luncheon that recognizes outstanding contributions of our alumni to the field of public health and/or in service to YSPH.

In addition to participation in formal alumni events, graduates of YSPH are an invaluable resource to students in their searches for internships and permanent employment. Alumni are also essential to the practice curriculum through teaching, serving as preceptors, and providing applied research sites for projects and theses.

OFFICE OF COMMUNITY HEALTH

135 College Street, 764.9742
Elaine O'Keefe, Executive Director

The Office of Community Health (OCH) was established in 2008 to enhance public health practice education, applied research, and community-university health partnerships. OCH is a bridge to domestic and international agencies engaged in the public health work, and serves as an on-site resource for students seeking meaningful learning experiences in the world of public health practice. OCH services include aiding M.P.H. students to select appropriate summer internship placements and assuring that they have multiple opportunities to apply theoretical classroom knowledge to genuine public health issues through practice-oriented courses that are offered during the academic year in addition to the summer internship program.

Medical Center Resources for Students

OFFICE OF GOVERNMENT AND COMMUNITY AFFAIRS

Myron Genel, M.D., Associate Dean for Government and Community Affairs
<http://info.med.yale.edu/ysm/govcomm/>

OFFICE OF MULTICULTURAL AFFAIRS

Forrester Lee, M.D., Assistant Dean for Multicultural Affairs
<http://info.med.yale.edu/omca/>

OFFICE OF THE OMBUDSPERSON

Merle Waxman, M.A., Ombudsperson
<http://info.med.yale.edu/owm/ombudsperson.html>

OFFICE FOR WOMEN IN MEDICINE

Merle Waxman, M.A., Director
<http://info.med.yale.edu/owm>

INTERDISCIPLINARY RESEARCH AND SPECIAL PROGRAMS

Cancer Prevention and Control Research Program

Susan T. Mayne, Ph.D., Director

The Cancer Prevention and Control Research Program (CPCRP) at the Yale Cancer Center is a large and diverse program of research being done by more than thirty investigators. The ongoing research is designed to seek new knowledge that aids in the prevention of cancer, and for those patients who already have cancer, ways to reduce the burden of cancer, improve survival, and reduce the risk of second cancers. The research is largely population-based, with the entire state of Connecticut serving as a population laboratory for the researchers.

The CPCRP builds on the scientific resources of the Yale Schools of Medicine, Nursing and Public Health. Researchers in this program come from many different scientific disciplines including epidemiology and public health, biostatistics, cancer nursing, occupational medicine, internal medicine, psychology, psychiatry, surgery, and pediatrics.

The program is enhanced by its link to the Connecticut Tumor Registry, the oldest population-based tumor registry in the United States and an NCI-funded SEER (Surveillance, Epidemiology, and End Results Program) site. The Connecticut Tumor Registry maintains data on all Connecticut residents diagnosed with cancer since 1935. In addition, researchers have access to the YCC Rapid Case Ascertainment Shared Resource,

which identifies patients with newly diagnosed cancer throughout the state on a rapid basis, facilitating research projects.

General themes within the program are:

Lifestyle factors and genetics in the etiology of cancer Research topics within this general category include one or more of the following: (1) nutrition, physical activity, obesity, and cancer; (2) environmental factors and cancer; (3) molecular/genetic factors in cancer; (4) racial disparities and cancer; and (5) cancer biostatistics—methods, development, and application.

Behavioral interventions for cancer prevention and control Research topics within this general category include one or more of the following: (1) cancer prevention/early detection behaviors; (2) secondary prevention interventions in cancer survivors; (3) symptom control/quality of life in cancer patients; and (4) end-of-life care for cancer patients.

The program's major long-term goals are (1) to establish and maintain a center of excellence in research in cancer prevention and control in Connecticut; (2) to search systematically for new knowledge that aids in the prevention and control of cancer; (3) to integrate molecular and biochemical techniques with population-based epidemiologic investigations in cancer prevention and control; and (4) to maintain a prevention program spanning all phases of cancer prevention and control research, with an emphasis on investigations designed to capitalize on its unique resources, including the cancer registry.

For more information contact Susan Mayne at 203.785.6274, susan.mayne@yale.edu.

Center for Interdisciplinary Research on AIDS

Paul Cleary, Ph.D., Director

The Center for Interdisciplinary Research on AIDS (CIRA), funded by the National Institute of Mental Health, provides support for the conduct of research aimed at the prevention of HIV infection and the reduction of the negative consequences of the disease in vulnerable and underserved populations nationally and abroad, as well as research on related legal and policy issues. It also houses several domestic and international training programs in HIV prevention and sponsors a number of different HIV-related conferences and seminar series.

Faculty representing thirteen disciplines from seven different graduate and professional schools at the University and scientists from The Institute for Community Research and the Hispanic Health Council participate in the center. CIRA-affiliated projects include research on prevention message framing, prevention interventions in prenatal care settings, microbicides, social network based and structural interventions for drug users, interventions for coping with HIV and trauma, physician-delivered interventions with HIV-positive patients, syringe access issues, the public health impact and cost-effectiveness of HIV interventions, international HIV prevention issues, and risk in migrant workers, men of color who have sex with them, and drug-using women.

For more information contact Kim Blankenship at 203.764.4343, kim.blankenship@yale.edu; or visit the CIRA Web site, <http://cira.med.yale.edu>.

Connecticut Women's Health Project

Jeannette R. Ickovics, Ph.D., Director

Jessica Lewis, L.M.F.T., Associate Director

The Connecticut Women's Health Project (CWHP) has been conducting collaborative, community-based research among women and families with – and at risk for – HIV and other sexually transmitted diseases since 1989. In partnership with community health centers, hospital clinics, public health departments, and other community colleagues, our mission is to serve women and their families through research that informs health care and health policy.

Current projects include (1) a randomized controlled trial (RCT) of a behavioral intervention to reduce HIV/STD risk for young women in a group prenatal care setting; (2) the translation of this RCT to fourteen Community Health Centers in New York City; (3) a prospective longitudinal study of pregnant and non-pregnant adolescent women and their risks of HIV, STDs, and repeat pregnancy; and (4) the development and evaluation of a new form of postpartum primary care for mothers and babies, delivered in a group format. CWHP has been expanding its programs across the United States and internationally, most recently forming partnerships in Haiti and Pretoria, South Africa.

For more information contact Jessica Lewis at jessica.lewis@yale.edu.

John B. Pierce Laboratory

Barry Green, Ph.D., Director

The John B. Pierce Laboratory, founded in 1933, was the first research institute devoted to the scientific study of how heating, ventilation, and sanitation influence human health, comfort, and well-being. The Pierce Laboratory currently brings together under one roof a unique group of internationally recognized researchers having a wide range of scientific backgrounds and expertise, including environmental physiology, neurobiology, experimental psychology, and epidemiology. These researchers investigate the mechanisms by which environmental stimuli affect the ways that organisms, especially humans, control the intake, expenditure, and storage of energy. Topics of special interest include body temperature regulation, metabolism, food intake, obesity, and exercise.

Emerging Infections Program

Robert Heimer, Ph.D., Principal Investigator

James I. Meek, M.P.H., Associate Director

The Connecticut Emerging Infections Program (EIP) is a collaborative effort between the Connecticut Department of Public Health and the Department of Epidemiology and Public Health at the Yale University School of Medicine. The goals of the EIP are to assess the public health impact of emerging infections and to evaluate methods for their prevention and control. EIP projects include (1) Active Bacterial Core (ABC) surveillance: active population-based laboratory surveillance for invasive diseases caused by emerging, vaccine-preventable, and drug-resistant bacterial pathogens including Groups A and B streptococcus, *Haemophilus influenzae*, *Neisseria meningitidis*, and *Streptococcus pneumoniae*; (2) Foodborne Diseases Active Surveillance Network (FoodNet):

active, population-based laboratory surveillance to monitor the incidence of foodborne and waterborne diseases for seven bacterial and two parasitic pathogens: *E. coli* O157 and other Shiga toxin-producing *E. coli* (STEC), *Campylobacter*, *Listeria*, *Salmonella*, *Shigella*, *Yersinia*, *Vibrio*, *Cryptosporidium*, and *Cyclospora*; (3) Respiratory Disease Activity including population-based surveillance for laboratory-confirmed influenza hospitalizations; evaluation of the effectiveness of the trivalent influenza vaccine at preventing hospitalization related to influenza infection in adults and children; population-based surveillance and etiology studies of hospitalized pneumonia (4) Human Papillomavirus Vaccine Impact Monitoring across Connecticut (HPV-IMPACT): statewide, population-based surveillance of HPV related precursors to cervical cancer (CIN_{2/3} & AIS) and evaluation of the impact of the HPV vaccine on development of CIN_{2/3} or AIS; (5) *Clostridium difficile* associated disease (CDAD) surveillance: population-based, laboratory surveillance CDAD in to determine the population-based incidence of CDAD, characterize *C. difficile* strains which are responsible for CDAD with a focus on community onset strains and develop the infrastructure to characterize CDAD among special populations and possible foodborne sources.

Yale-Griffin Prevention Research Center

David L. Katz, M.D., M.P.H., Director

The Yale-Griffin Prevention Research Center (PRC), a collaboration of the Yale School of Public Health and Griffin Hospital, is one of thirty-three centers funded by the CDC. The research efforts of the PRC are intended to raise the standard of health and quality of life in the Lower Naugatuck Valley, and PRC has recently expanded its efforts statewide, focusing specifically in Bridgeport, Hartford, and New Haven. The research is intended to serve as a national model of comprehensive community-based disease prevention and health promotion.

Student Organizations and Committees

STUDENT GOVERNMENT

Student Association of Yale School of Public Health

SAYPH is organized by YSPH students for YSPH students. SAYPH works to enhance the educational experience of each student at YSPH by sponsoring educational and social activities, providing a forum for students' ideas and concerns, and acting as a liaison with the administration. Through SAYPH students get involved in many areas including the following:

- New student orientation.
- Lecture series, films, colloquia, and other programs of interest to the public health community.
- Recruitment of new students to YSPH.
- Community service.
- Social events.
- Commencement activities.

SAYPH is headed by an Executive Committee consisting of a president, a social committee chair, professional development committee chair, community service chair, and communications chair. There are twelve divisional representatives; each division elects one first-year and one second-year student to act as a liaison between students and the faculty and administration. All SAYPH positions are filled by competitive election.

For more information about SAYPH, contact any member of the Executive Committee:

Taffany Hwang, President
Javier Cepeda, Social Chair
Derek McLeaf, Communications Chair
Lesley Park, Community Service Chair
Ji Im, Professional Development Chair

UNIVERSITY COMMITTEES

Graduate Health Advocate Program

Graduate representatives from each graduate and professional school within Yale University participate in the Graduate Health Advocate Program which is sponsored by the Yale University Health Services Health Education Office/AIDS Resource & Counseling Center. The Graduate Health Advocate Program links graduate students at Yale with the resources of the Health Education Office. The program sponsors events such as AIDS Awareness Month and World AIDS Day. In addition to HIV prevention, the program addresses other health issues such as smoking and substance abuse. Programs and activities reflect student concerns and student involvement. Types of activities include conducting ongoing prevention activities, informal/educational displays in school dining halls, and fund raising to benefit local AIDS charities.

Graduate and Professional Student Senate (GPSS)

For information, e-mail gpss@yale.edu or visit www.yale.edu/gpss.

SPECIAL INTEREST GROUPS

American College of Healthcare Executives

The American College of Healthcare Executives (ACHE) is an association of approximately 30,000 health care executives and students. In addition to the resources offered by ACHE to Student Associates, the Yale Health Management ACHE Student Chapter provides a variety of opportunities for the professional development of students interested in a health care management career. Networking events, tours, fund raising, and executive speakers are part of what our members organize throughout the year. Students also attend the ACHE Congress, which brings together approximately 4,000 health care professionals and students every year. Further general information is available at www.ache.org.

Asian Americans in Yale Medicine

Asian Americans in Yale Medicine (AAIYM) is an organization open to all students and faculty in the Yale health care community. Its goal is to address issues relevant to Asian-Americans in the medical field. The group's activities range from fostering mentor relationships between students and faculty to providing services to the Asian community in New Haven.

Multicultural Student Organization

The Multicultural Student Organization (MSO) was founded in 2001 by a group of students interested in promoting professional development, academic scholarship, and networking opportunities for students of color and students who are interested in addressing health issues among communities of color. MSO is committed to raising awareness of the diverse health needs of individuals around the world and acting as a forum to address those needs.

Journal of Health Policy, Law, and Ethics

The Yale *Journal of Health Policy, Law, and Ethics* is a biannual publication of the Yale Law School, School of Medicine, School of Public Health, and School of Nursing. The *Journal* strives to provide a forum for interdisciplinary discussion on topics in health policy, health law, and biomedical ethics. It targets a broad and diverse readership of academicians, professionals, and students in medicine, law, and public health, as well as policy makers and legislators in health care.

Student National Medical Association

The Student National Medical Association (SNMA) was founded in 1964 as a support group for underrepresented minority (African American, Latino, and Native American) medical students. Over the years, it has developed into the largest minority medical student organization, representing more than 2,000 members. Yale is one of SNMA's most

active chapters, with members active at both regional and national levels. SNMA not only provides academic and social support for minority students, but also opportunities for medical students to interact actively with minority communities.

Yale SNMA maintains close contact with other organizations representing minorities at Yale University; a special effort is made to reach out to students at the undergraduate level in the Academic Mentors for Programs in the Sciences, Black Students at Yale, and the Minority Pre-Medical Student Society at Yale.

VOLUNTEER OPPORTUNITIES

Yale Student-Run Free Clinic

The Yale Student-Run Free Clinic is a collaboration with Yale Public Health, Yale School of Medicine, Yale School of Nursing, and the Yale Physician Assistant program. The free clinic will provide a place for New Haven's uninsured to receive primary care while also obtaining wellness education and access to social services. EPH volunteer opportunities include research, social services, health education, and front desk work.

Hillside Family Shelter

Hillside Family Shelter provides temporary housing for families who are homeless. The name "Hillside" was chosen for this shelter, both because it is located on the Hill side of New Haven, and because the goal of the program is to help the families served move up from homelessness and to reach the "top of the hill" and achieve self-sufficiency. Epidemiology and Public Health has adopted the Hillside Family Shelter, and EPH volunteer opportunities include general clean-up, painting, food drive sorting, and holiday event planning. EPH students are also encouraged to develop health promotion materials and conduct health education workshops for the shelter residents.

Yale HealthCORE

Each year, Yale HealthCORE travels to La Isla de Mendez in El Salvador during spring break and conducts a series of public health projects. During the school year group members raise money for the trip and plan the logistics of the project initiatives. This past spring break, HealthCORE instructed children on dental hygiene, anti-smoking, and anti-gang peer pressure; donated medical and dental supplies to the village clinic; ran a series of focus groups on sexual health and practice; and began a water treatment program.

One-Time Service Events

A variety of one-time service events are also available throughout the year. Examples of one-time service events include the Annual Hunger and Homelessness Auction, AIDS Walk New Haven, Relay for Life, Race for the Cure, and Locks of Love. Information on these events is available during the school year. The SAYPH Community Service Committee will also plan service events during the academic year.

Appendix I:

YSPH Public Health Practice Requirement Guidelines

The following guidelines apply to domestic and/or global experiential learning placements that qualify as meeting the M.P.H. practicum requirement including the summer internship and other community agency placements that are part of approved practice courses.

1. Practicum may occur in a wide variety of settings at the local, regional, national, or international level but must be outwardly focused on a public health problem or issue. Acceptable venues would include governmental entities, nongovernmental, and private sector organizations with a public health component such as pharmaceutical companies, hospitals, managed care/health maintenance organizations, and consulting firms.
2. Practicum affords opportunity to participate in the full spectrum of defining, analyzing, and addressing a “real life” public health problem or issue, either directly or through observation, consultation with others working on the problem, participation in relevant meetings or activities, and pertinent reading.
3. Practicum entails one or more of the following roles:
 - Assessment, monitoring, and/or surveillance of population health indicators, social determinants of health, inequities associated with race/ethnicity and socioeconomic status, environmental/occupational hazards and exposures, and other public health issues.
 - Participating in the development and/or execution of applied public health research in the biological, environmental, and social/behavioral realms that has an immediate impact on public health, including translational, evaluation, and epidemiological research efforts that contribute to the evidence-base and efficacy of public health practice.
 - Planning, designing, implementing, and evaluating public health interventions.
 - Developing disease prevention and health promotion, media advocacy, or risk communication materials.
 - Developing, implementing, and evaluating public health laws, regulations, and policy.
 - Participating in administrative/management activities of governmental and non-governmental public health agencies and/or health service delivery systems such as hospitals or community health centers. Activities could include organizational analysis and restructuring processes, strategic and business planning, organizational policy and protocol, financial management, budgeting and reimbursement processes, preparation of internal or external reports, human resources management, workforce development and credentialing, and addressing regulatory compliance issues such as audits and accreditation processes.
 - Supporting the development and goals of public health coalitions through community organizing and advocacy efforts, needs assessments, strategic and participatory community planning, leadership development, and assisting with the

development and implementation of community health improvement plans that respond to local needs and priorities.

4. Practicum integrates public health theory, knowledge, and skills, and applies and reinforces the learning objectives in M.P.H. course work.
5. Practicum aligns with the student's area of specialization.
6. The practicum project and student role are appropriate for the M.P.H. level.
7. The practicum agency and preceptor have requisite population health orientation, public health expertise, and infrastructure to support M.P.H.-level student learning experience.
8. The practicum has deliverables of tangible value to the mission of the placement agency/site.

Appendix II: Thesis Guidelines

TYPES OF THESES

The following seven types of theses are acceptable:

Investigative Thesis

The investigative thesis takes an in-depth look at a specific health problem or topic, describing its public health importance and analyzing it from a disciplined perspective. This thesis should include the following:

1. Definition of the problem;
2. Presentation of the study population and the methods by which data were acquired;
3. Analysis of the results;
4. Discussion of the implications of the results;
5. Recommendations.

Research Study Demonstrating Mastery of Methodology

This type of thesis requires sophisticated analysis and application. Consequently, students should be sure of their readiness to undertake it. This thesis should include the following:

1. Statement of methodological problem;
2. Comparison of available solutions, discussing the advantages and disadvantages of each;
3. Either (a) Choice and application of one of the available solutions, or (b) Development of a new solution with discussion of the advantages and disadvantages of that solution.

Administrative Case Study

An administrative thesis defines, describes, analyzes, and interprets an actual administrative, problem-solving activity undertaken during a student's field work. A variety of standard case study formats may be employed. An administrative case study thesis should be planned in advance with appropriate techniques for systematic observation and recording of data as the project progresses. This thesis usually includes the following:

1. Definition of the problem;
2. Description of setting, structure, function, and relationships;
3. Relationship of student to problem (authority and accountability);
4. Procedural description (case description, process, outcome);
5. Analysis of events with reference to theory;
6. Assessment of the administrative solution.

Program Analysis, Evaluation, or Projection

This type of thesis examines either retrospectively or prospectively some particular health problem. It should include the following:

1. Definition of the problem that the program addresses;
2. Statement of program goals and objectives;

3. Specification of available data such as the following:
 - a. Target population (characteristics, distribution, levels of protection, morbidity);
 - b. Historical information, goals, politics;
 - c. Resources and use of resources (acceptability, accessibility);
 - d. Basis of intervention, data on knowledge, attitudes and practices;
 - e. Cost analysis;
 - f. Specification of further data needs.

Special Project

This type of thesis incorporates a product useful in the teaching or practice of public health such as a curriculum, syllabus, or course for a school program or on-the-job training; specific educational aids (perhaps a computer-assisted learning experience, a programmed instruction course, or a training manual); a movie, videotape, or slide package; a pamphlet for use in health information; a set of formal administrative guidelines to implement a law or administrative decision; or architectural plans for a health facility.

In addition to the product, the student must produce a written analysis that includes the following:

1. A rationale for the product and the anticipated audience/users;
2. Review of relevant literature;
3. Reasons for the selection of the chosen medium/method, including relevant theory;
4. Proposal for method to evaluate the product;
5. Discussion of the limitations of the product.

The special project may require review by the Committee on Academic Progress.

THESIS ADVISERS (READERS)

The type of thesis, choice of topic, and details of methodology are the joint responsibility of the student and the thesis adviser (first reader). The thesis adviser is determined by mutual consent between the reader and the student and may or may not be the student's academic adviser. The thesis adviser must have a faculty appointment in the Yale School of Public Health.

An appropriate panel of readers consists of the thesis adviser (first reader) and another faculty member (second reader). The second reader must have a faculty appointment, preferably at Yale University but not necessarily at YSPH. In some circumstances a faculty member outside of Yale may serve as second reader. In this case, the Committee on Academic Progress must review the C.V. of the non-Yale faculty member.

TIMELINE FOR M.P.H. THESIS

September Divisional Meetings to review specific thesis requirements and timelines

October 15 Thesis Reader Forms (signed by both readers) due to registrar

December 1 Prospectus due to thesis adviser (first reader)

May 1 Deadline for final grades from both readers and submission of electronic copy

ORGANIZATION

The thesis must be assembled as follows:

- A. Title Page (see page 135)
- B. A one-page, double-spaced abstract
The abstract is the final statement on the problem addressed by the thesis and should incorporate the most mature insights attained.
- C. Acknowledgments (if desired)
- D. Table of Contents
- E. List of Tables (if any)
- F. List of Figures (if any)
- G. Body of the Thesis

The following organization of the body of the thesis is recommended:

- 1. Introduction
 - a. Brief statement of specific objectives of the investigation
 - b. Statement of general problem addressed by the thesis
 - c. Elaboration of objectives and/or hypotheses, including the relation to the general problem
- 2. Review of Studies Relevant to the Problem
- 3. Research Design
 - a. Specific research design and method
 - b. Reasons for selection
 - c. Method of analysis, including justification for statistical tests
- 4. Presentation and Analysis of Findings
This is the major portion of the thesis. The significance of the findings should be discussed and an assessment made of their applicability to current theory and practice. Analysis and discussion may be presented together in one chapter or separately in two chapters.
- 5. Conclusions
 - a. Summary of findings
 - b. Limitations of findings and other limitations of the study
 - c. Conclusions based on the study
 - d. Relevant recommendations for program development or further research
- H. References
A list of the pertinent references consulted in preparing the thesis should be included. Any standard and consistent format for presentation of footnotes and references is acceptable.
- I. Appendix or Appendices

ELECTRONIC SUBMISSION OF THESIS

The final, completed version of the thesis must be submitted electronically, by May 1 at 5 p.m., at www.etsadmin.com/publichealthyle.

DEAN'S PRIZE FOR OUTSTANDING THESIS

The Dean's Prize for Outstanding Thesis may be awarded to a small number (maximum of four) of students for extraordinary academic achievement on the M.P.H. thesis. Thesis advisers who recognize a student's work as truly exceptional may nominate the student for this prize. Winners are announced at the YSPH Commencement ceremony.

THESIS PENDING (DELAYED SUBMISSION OF THESIS)

Students who have not received final grades from both readers and submitted their thesis electronically by May 1 will be considered "thesis pending" and will receive a grade of "Incomplete" for the thesis. Students who are "thesis pending" will not be allowed to participate in the Commencement ceremony and will not receive the M.P.H. degree until all requirements are complete.

Students who are "thesis pending" are given one year to complete the thesis without penalty. At the end of the one-year period, the grade of "Incomplete" will be changed to a grade of "F" if the thesis has not been submitted. The student will be required to register for the thesis course and pay the per course tuition charge (\$3,000 per course) in order to submit the completed thesis. All M.P.H. degree requirements including the thesis must be completed within five years of the student's date of matriculation.

TITLE OF THESIS, DOUBLE-SPACED

By
Name of Student

A Thesis Presented to
The Faculty of the Yale School of Public Health
Yale University

In Candidacy for the Degree of
Master of Public Health

2009

PUBLICATION GUIDELINES

The thesis may be published independently. It also may be published under joint or multiple authorship if advisers or agency personnel have contributed significantly to the final product. Significance is interpreted to mean contributions such as expanding theory or techniques of analysis in ways beyond the usual role of an adviser. Supplying the database does not entitle the supplier to authorship. When students work on sponsored research, the thesis adviser and the student should sign a letter of agreement on funding, use of database or materials, deadlines, publication rights, and authorship before work on the thesis begins.

PUBLICATION PROCESS FOR THE M.P.H. THESIS

The following are publication guidelines that are intended to avoid miscommunication and differential expectations of authorship between students and thesis advisers.

1. When the prospectus is submitted, thesis advisers will discuss publication with students, including desire for publication, description of the publication process, possible venues, authors, determination of authorship order, and logistics.
2. If the thesis adviser provides the data, then the adviser should create a written publication/data sharing agreement. The agreement should be signed by both the adviser and the student before work on the thesis is started. The agreement should include at the minimum:
 - Process for order of authorship
 - Timeline for publication and process if timeline is not met
 - Process and expectations of revisions
3. If the thesis adviser does not provide the data, then the thesis adviser should work with the student to draft a similar document to be completed and signed by the student and the primary data source. Guidelines should be consistent with any established policies of the primary data source. This should be done whether or not the thesis adviser is included as an author on the publication.
4. In general, if the manuscript has not been submitted for publication within a year after graduation, the thesis adviser will have the right to prepare the manuscript for publication.

Appendix III: Yale School of Public Health Committee on Academic and Professional Integrity

GUIDING PRINCIPLES

Honesty, professional integrity, and a commitment to the health of the public provide strong foundations for our educational mission at the Yale School of Public Health. We create a community of scholarship through the free and lively exchange of ideas in the classrooms, laboratories, clinics, organizations, and neighborhoods in which we serve. We promote scientific rigor, courage, and compassion to guide us in the work we do—designed to prevent disease and promote health.

The YSPH Code of Academic and Professional Integrity (CAPI) is intended to foster our School's exceptional learning environment and to support conduct that will distinguish our faculty, students, and staff in our lives at YSPH, the University, New Haven, and the broader scientific, policy, and public health communities in which we live and work.

Academic Integrity

The Yale YSPH community, including faculty, students, and staff, supports the highest standards of academic integrity. All academic work—completed individually or in small groups, in the classroom, laboratory, or community—affords an unparalleled opportunity to put forth new and innovative ideas to promote the science and practice of public health.

Faculty will provide clear guidelines for students on the parameters of all course work, including homework assignments, papers and examinations. Students must contact the professor for clarification if there is any question about these guidelines. Students must complete their work independently or in small groups, as per instruction, always striving to put forth their own best ideas to accomplish their goals. Students are strongly encouraged to build on a strong tradition of public health by utilizing the many excellent print and online resources available to stimulate thinking and promote innovation. In so doing, students must also consult guidelines to ensure proper citation of published work.

- Sources online (<http://www.dartmouth.edu/~sources>)
- Citation Guide from *Chicago Manual of Style* (<http://library.osu.edu/sites/guides/chicagogd.html>)

Community Standards

The Yale YSPH community is inclusive in nature, respecting the diverse backgrounds and views of all its members. Faculty, students, staff, and alumni must aspire to standards of conduct that further distinguish the School as a center of professional and personal integrity. We must adhere to ethical guidelines and the highest standards of professional and personal behavior. We abide by the Principles of the Human Relations Code of Conduct, Yale University School of Medicine.

Yale University School of Medicine is committed to the promotion of personal and professional development of all individuals in its community, and encourages dialogue that will foster the growth, well-being, and dignity of all its members.

In pursuit of these goals, the school is dedicated to maintaining an environment which places the highest priority on collegial relationships, mutual respect, and sensitivity among its students, faculty, staff, and patients. An educational community functions best when there is civility and respect for the dignity and worth of each individual.

It must be ensured that our school is free from discrimination and acts of intolerance such as those based on race, gender, sexual orientation, religion, national origin, ancestry, age, or physical handicap. This commitment remains consonant with the obligation to protect open and wide-ranging public discourse.

The principle of freedom of expression that might otherwise protect even the most offensive public speech does not protect, nor does it even encompass, a right to threaten the dignity and privacy of an individual. Such personally directed behavior will not be tolerated; it is antithetical to academic values, debilitates its victims, compromises the offenders, and undermines the University's fundamental commitment to individual freedom and respect for all its members. Furthermore acts of intolerance may destroy the very atmosphere wherein freedom of expression is otherwise tolerated and cherished.

CODE OF ACADEMIC AND PROFESSIONAL INTEGRITY

Honor Code

The Honor Code explicates the highest ethical standards to which we must hold ourselves, our peers, and our colleagues. Honesty, respect, and trust are hallmarks of the science and practice of public health. They must be nurtured at all times in our classrooms and in our work beyond the classroom. Upon arrival at Yale YSPH, all students will sign an Honor Code that states:

By enrolling in the Yale M.P.H. program, I am accepting the responsibility to promote and uphold the Code of Academic and Professional Integrity. I agree to be held accountable for maintaining the atmosphere of honesty and professionalism at Yale University and within the greater academic community.

Upon completion of all written assignments and examinations, students will sign the following statement:

I have not given, received, or witnessed inappropriate exchange of information on this assignment.

Behaviors Subject to Disciplinary Action

Students at YSPH freely associate themselves with the University, and in doing so affirm their commitment to the University's principles of honesty and academic integrity. They are expected to abide by all University regulations, as well as local, state, and federal laws. The forms of behavior subject to disciplinary action include, but are not limited to:

1. **Cheating and plagiarism** Plagiarism and cheating are understood to include all forms of misrepresentation in academic and professional work, such as:

- a. Failure to acknowledge ideas and phrases used in an essay or assignment that were gained from another writer, including the internet. Any direct quotation must be specifically attributed and any other reliance on a reference must be acknowledged.
 - b. Cheating on examinations, problem sets, and any other form of assignment or test.
 - c. Falsification and/ or fabrication of data, or misrepresentation in any report on research or other work.
 - d. Submission of the same paper in more than one course or as a thesis, unless explicit permission from the instructors has been obtained in advance.
 - e. Use of prepared notes in an examination or communicating with another person during an examination (including take-home examinations) unless specifically authorized by the instructor.
 - f. Use of electronic files belonging to another person.
2. **Assault, coercion, harassment** Assault on, or coercion, harassment, or intimidation of any member of the University community for any reason, including harassment on the basis of race, religion, gender, ethnicity, or sexual orientation; sexual harassment; or use of a teaching position to harass or intimidate another student.
3. **Violation of Yale University rules/function**
- a. Disruption of a legitimate function or activity of the University community, including disruption of classes and meetings, blocking entrances and exits to University buildings, unauthorized occupation of any space on the Yale campus, or preventing the free expression or dissemination of ideas.
 - b. Unauthorized or fraudulent use of University services, equipment, or facilities, such as computer equipment, telephones, or letterhead.
 - c. Misuse, alteration, or fabrication of University credentials or documents, such as an identification card, academic transcript or grade list.
 - d. Violation of University rules for using information technology services and facilities, including computers, the University network, and electronic mail.
 - e. Misuse or unauthorized removal of materials in University libraries or laboratories.
 - f. Trespassing on University property to which access is prohibited.
 - g. Theft, misuse of funds, or willful damage to University property.
4. **Misrepresentation or lying**
- a. Misrepresentation or lying in applications for admission or financial aid.
 - b. Misrepresentation or lying during a formal or informal inquiry by School or University officials.
5. **Illegal activity** Any activity illegal by state or federal statutes is not permitted on or off campus, and will be subject to prosecution outside of the Committee on Academic and Professional Integrity.
- a. Illegal behaviors directed against the University or the University community.
 - b. Possession or use of explosives or weapons on University property.
 - c. Unlawful manufacture, possession, use, or distribution of illicit drugs or alcohol on University property or as part of any University activity.
 - d. Interference with the proper operation of safety or security devices, including fire alarms, electronic gates, or sprinkler systems.

DISCIPLINARY POLICIES AND PROCEDURES

Committee Composition and Charge

The Committee on Academic and Professional Integrity considers instances of academic infractions and other serious violations by YSPH students against the department and University communities. The committee is appointed by the dean and consists of a faculty member from each YSPH division, the associate dean for student affairs, and a student from each M.P.H. class. The dean will designate one of the faculty members as the committee chair.

Process

The committee will collect the facts relevant to each complaint under consideration, make judgments on whether an infraction or violation has been committed, and determine a penalty where appropriate. Although deviations may be taken by the chair when appropriate to a given case, the following steps are customary:

1. The work of the committee normally begins when a member of the YSPH community (faculty, student, or staff) brings a possible violation or infraction to the attention of the committee chair or the associate dean for student affairs. The chair then requests a written statement and copies of any other materials relevant to the complaint. Based on these materials the chair, in consultation with the associate dean for student affairs, will decide whether the offense, if the charge is true, is of sufficient severity to bring to the attention of the committee. If so, the associate dean for student affairs will notify the student who is the subject of the complaint in writing, and provide the student with a list of the committee members and a copy of these procedures. The student will also be informed of his or her rights to (a) appear before the committee; (b) examine all written materials being provided to the committee; (c) be accompanied by a member of the YSPH community who will act as an adviser. In the YSPH Disciplinary Process the student's adviser is not an advocate, but rather a source of support to the student. The adviser may help the student prepare for the meeting of the committee and may accompany the student to the meeting. During the meeting the adviser may quietly suggest questions or issues for the student to raise with the committee, but the adviser does not participate directly in the meeting.
2. The student must respond in writing to the charge of misconduct within three days of receiving notification from the associate dean for student affairs. The written response should be a statement of reasonable length which comments on the facts of the allegations of misconduct, the student's involvement in it, and any other matters that the student deems relevant.
3. The committee will endeavor to conduct its business in such a way as to protect the privacy and personal integrity of all individuals who are involved with the case. In addition, the committee will seek to make its judgments as promptly as is consistent with the need to establish the facts of the case and to come to judgments based on those facts.
4. The hearing will normally take place in a single continuous session, but the chair may call additional sessions if appropriate. The chair will open the meeting by reviewing the charges against the student and the procedures to be followed. The student may

- make a brief opening statement. The committee may direct questions to the student as to the facts of the case, and it is the student's duty to respond truthfully. After responding to the committee's questions, the student may make a brief closing statement.
5. The chair may call additional witnesses as appropriate, including the individual(s) who reported the possible violation.
 6. All committee deliberations will be conducted without the presence of the student or any other person who is not a member of the committee. The committee will consider only evidence that has been presented to it at the hearing. If the committee concludes that an infraction or violation has occurred, it will then recommend an appropriate penalty. The committee's decision on the penalty will be by majority vote, except that any recommendation to suspend or expel a student must be by a two-thirds vote of the committee. Penalties will be set based upon the severity of the infraction.
 7. At the conclusion of its hearing and deliberations, the committee will prepare a report for the YSPH dean which describes the charge of misconduct, summarizes the hearing, presents the factual findings, and outlines the committee's conclusions, including any proposed penalty. The dean will determine whether the committee's conclusion is supported by the evidence. If the dean determines that the conclusion is not supported by the evidence, the dean will remand the decision for further fact finding or deliberation. The dean will also review the proposed penalty and may approve or reduce it if he or she believes that a lesser penalty is warranted.
 8. Unless remanded by the dean for further review, the finding of an infraction or violation is set, as is the penalty upon the dean's concurrence. The dean will inform the student in writing of the result of the hearing and any penalty as soon as possible.

All procedures of the Committee on Academic and Professional Integrity are confidential. Proceedings and the final determination are shared only with members of the committee, the dean, the student directly involved in the infraction and, upon finding of a violation, the student's faculty adviser.

Penalties

The following penalties are among those that may be recommended by the committee and imposed by the dean.

1. **Reprimand** A written statement of censure will remain in the student's file until the student graduates or withdraws.
2. **Restriction** Denial of the use of certain University facilities or of the right to participate in certain activities or to exercise certain privileges.
3. **Disciplinary Probation** The student is in official jeopardy. The commission of a second offense while on probation will normally result in suspension or expulsion. Disciplinary probation will be recorded on the student's transcript.
4. **Suspension** Separation from the University for a stated period of time. A suspended student forfeits all privileges of enrollment including residence, attendance at classes, participation in organized extracurricular activities, and use of University facilities. This penalty will be recorded on the student's transcript.
5. **Expulsion** Permanent separation from the University. This penalty will be recorded on the student's transcript.

Appeal Process

A student upon whom a disciplinary penalty has been imposed by the dean of Public Health will have the right to appeal this decision to the dean of the School of Medicine. A written notice of appeal must be submitted to the dean of the School of Medicine within five business days after the decision of the committee and the dean of Public Health has been received. The procedures by which such an appeal will be considered and decided will be determined by the dean of the School of Medicine. There will normally be no stay of any disciplinary penalty imposed by the dean of Public Health during the appeal process.

IN CONCLUSION

We set forth this Yale YSPH Code of Academic and Professional Integrity to provide guidance and support for professional standards expected from all members of our community. Violations of this code will be taken very seriously, and penalties will be issued to uphold these standards. More importantly, however, is the commitment by faculty, students and staff to promote excellence in education, research and service. By upholding academic honesty and integrity, we have a stable foundation from which to move forward in our work to enrich science and improve the health of the public.

Committee on Academic and Professional Integrity, 2005–2006

The Work of Yale University

The work of Yale University is carried on in the following schools:

Yale College Est. 1701. Courses in humanities, social sciences, natural sciences, mathematical and computer sciences, and engineering. Bachelor of Arts (B.A.), Bachelor of Science (B.S.).

For additional information, please write to the Office of Undergraduate Admissions, Yale University, PO Box 208234, New Haven CT 06520-8234; tel., 203.432.9300; e-mail, student.questions@yale.edu; Web site, www.yale.edu/admit

Graduate School of Arts and Sciences Est. 1847. Courses for college graduates. Master of Arts (M.A.), Master of Engineering (M.Eng.), Master of Science (M.S.), Master of Philosophy (M.Phil.), Doctor of Philosophy (Ph.D.).

For additional information, please visit www.yale.edu/graduateschool, write to graduate.admissions@yale.edu, or call the Office of Graduate Admissions at 203.432.2771. Postal correspondence should be directed to the Office of Graduate Admissions, Yale Graduate School of Arts and Sciences, PO Box 208323, New Haven CT 06520-8323.

School of Medicine Est. 1813. Courses for college graduates and students who have completed requisite training in approved institutions. Doctor of Medicine (M.D.). Postgraduate study in the basic sciences and clinical subjects. Combined program with the Graduate School of Arts and Sciences leading to Doctor of Medicine and Doctor of Philosophy (M.D./Ph.D.). Combined program with the Graduate School of Arts and Sciences leading to Doctor of Medicine and Master of Health Science (M.D./M.H.S.). Courses in public health for qualified students. Master of Public Health (M.P.H.), Master of Medical Science (M.M.Sc.) from the Physician Associate Program.

For additional information, please write to the Director of Admissions, Office of Admissions, Yale School of Medicine, 367 Cedar Street, New Haven CT 06510; tel., 203.785.2643; fax, 203.785.3234; e-mail, medical.admissions@yale.edu; Web site, <http://info.med.yale.edu/education/admissions>

For additional information about the School of Public Health (est. 1915), please write to the Director of Admissions, Yale School of Public Health, PO Box 208034, New Haven CT 06520-8034; e-mail, eph.admissions@yale.edu; Web site, <http://publichealth.yale.edu>

Divinity School Est. 1822. Courses for college graduates. Master of Divinity (M.Div.), Master of Arts in Religion (M.A.R.). Individuals with an M.Div. degree may apply for the program leading to the degree of Master of Sacred Theology (S.T.M.).

For additional information, please write to the Admissions Office, Yale Divinity School, 409 Prospect Street, New Haven CT 06511; tel., 203.432.5360; fax, 203.432.7475; e-mail, divinity.admissions@yale.edu; Web site, www.yale.edu/divinity. Online application, <https://apply.divinity.yale.edu/apply>

Law School Est. 1824. Courses for college graduates. Juris Doctor (J.D.). For additional information, please write to the Admissions Office, Yale Law School, PO Box 208215, New Haven CT 06520-8215; tel., 203.432.4995; e-mail, admissions.law@yale.edu; Web site, www.law.yale.edu

Graduate Programs: Master of Laws (LL.M.), Doctor of the Science of Law (J.S.D.), Master of Studies in Law (M.S.L.). For additional information, please write to Graduate Programs, Yale Law School, PO Box 208215, New Haven CT 06520-8215; tel., 203.432.1696; e-mail, gradpro.law@yale.edu; Web site, www.law.yale.edu

School of Art Est. 1869. Professional courses for college and art school graduates. Master of Fine Arts (M.F.A.).

For additional information, please write to the Office of Academic Affairs, Yale School of Art, PO Box 208339, New Haven CT 06520-8339; tel., 203.432.2600; e-mail, artschool.info@yale.edu; Web site, <http://art.yale.edu>

School of Music Est. 1894. Graduate professional studies in performance, composition, and conducting. Certificate in Performance, Master of Music (M.M.), Master of Musical Arts (M.M.A.), Artist Diploma, Doctor of Musical Arts (D.M.A.).

For additional information, please write to the Yale School of Music, PO Box 208246, New Haven CT 06520-8246; tel., 203.432.4155; fax, 203.432.7448; e-mail, gradmusic.admissions@yale.edu; Web site, www.music.yale.edu

School of Forestry & Environmental Studies Est. 1900. Courses for college graduates. Master of Forestry (M.F.), Master of Forest Science (M.F.S.), Master of Environmental Science (M.E.Sc.), Master of Environmental Management (M.E.M.), Doctor of Philosophy (Ph.D.).

For additional information, please write to the Office of Admissions, Yale School of Forestry & Environmental Studies, 195 Prospect Street, New Haven CT 06511; tel., 800.825.0330; e-mail, fesinfo@yale.edu; Web site, <http://environment.yale.edu>

School of Architecture Est. 1916. Courses for college graduates. Professional degree: Master of Architecture (M.Arch.); nonprofessional degree: Master of Environmental Design (M.E.D.).

For additional information, please write to the Yale School of Architecture, PO Box 208242, New Haven CT 06520-8242; tel., 203.432.2296; e-mail, gradarch.admissions@yale.edu; Web site, www.architecture.yale.edu

School of Nursing Est. 1923. Courses for college graduates. Master of Science in Nursing (M.S.N.), Post Master's Certificate, Doctor of Philosophy (Ph.D.).

For additional information, please write to the Yale School of Nursing, PO Box 9740, New Haven CT 06536-0740; tel., 203.785.2389; Web site, <http://nursing.yale.edu>

School of Drama Est. 1955. Courses for college graduates and certificate students. Master of Fine Arts (M.F.A.), Certificate in Drama, One-year Technical Internship (Certificate), Doctor of Fine Arts (D.F.A.).

For additional information, please write to the Admissions Office, Yale School of Drama, PO Box 208325, New Haven CT 06520-8325; tel., 203.432.1507; e-mail, ysd.admissions@yale.edu; Web site, www.drama.yale.edu

School of Management Est. 1976. Courses for college graduates. Master of Business Administration (M.B.A.).

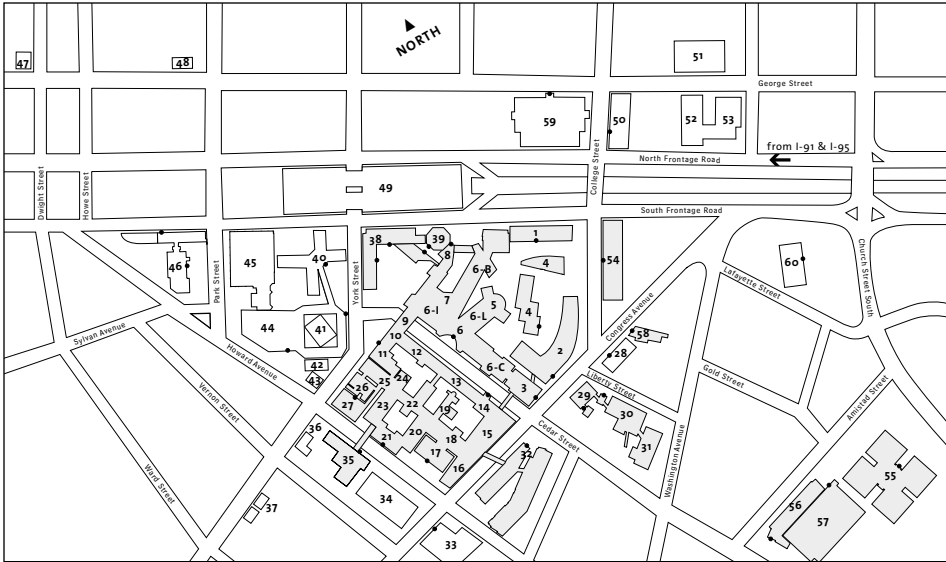
For additional information, please write to the Admissions Office, Yale School of Management, PO Box 208200, New Haven CT 06520-8200; tel., 203.432.5635; fax, 203.432.7004; e-mail, mba.admissions@yale.edu; Web site, <http://mba.yale.edu>

YALE UNIVERSITY CAMPUS NORTH



Continued on next page

YALE MEDICAL CENTER BUILDINGS AND ADDRESSES



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|---|--|
| <ol style="list-style-type: none"> 1. Laboratory of Epidemiology and Public Health, 60 College St. 2. Boyer Center for Molecular Medicine 3. Jane Ellen Hope Building 4. Sterling Power Plant and Sterling Power Plant Co-Gen 5. Harvey Cushing/John Hay Whitney Medical Library 6. Sterling Hall of Medicine, 333 Cedar St.
Wings: B, C, I & L 7. Mary S. Harkness Memorial Auditorium 8. Child Study Center 9. Nathan Smith Building (Bridge) 10. Yale Cancer Center 11. Hunter Building, 15 York St. 12. William Wirt Winchester Building 13. Boardman Building, 330 Cedar St. 14. Brady Memorial Laboratory, 310 Cedar St. 15. Lauder Hall 16. Laboratory for Surgery, Obstetrics and Gynecology 17. Primary Care Center 18. Farnam Memorial Building 19. Tompkins East 20. Tompkins Memorial Pavilion 21. Charles A. Dana Building, 789 Howard Ave. 22. Clinic Building 23. Fitkin Memorial Pavilion 24. Fitkin Amphitheater 25. Laboratory for Medicine and Pediatrics 26. Lippard Laboratory of Clinical Investigation 27. P.E.T. Center 28. John B. Pierce Laboratory, 290 Congress Ave. 29. Congress Place, 301 Cedar St.
The Yale Medical Bookstore, 320 Congress Ave. 30. Yale-New Haven Psychiatric Hospital 2, 184 Liberty St. 31. Yale-New Haven Psychiatric Hospital 3, 184 Liberty St. | <ol style="list-style-type: none"> 32. Anlyan Center for Medical Research and Education, 300 Cedar St. 33. 430 and 464 Congress Ave. and 726 Howard Ave. 34. Howard Ave. Garage 35. Yale Physicians Building, 800 Howard Ave. 36. 110 Davenport Ave. (YNHH Day Care Center) 37. 132–138 Davenport Ave. (Lead Program) 38. Edward S. Harkness Memorial Hall A and D, 367 Cedar St. 39. Neison and Irving Harris Building, Child Study Center, 230 S. Frontage Rd. 40. East Pavilion, 20 York St.
(Yale-New Haven Hospital Main Entrance) 41. South Pavilion, 20 York St. 42. Emergency Services Parking 43. Children's Hospital Parking Garage 44. Children's Hospital (West Pavilion) 45. Smilow Cancer Hospital, 20 York St. 46. Connecticut Mental Health Center 47. Ronald McDonald House, 501 George St. 48. 425 George St. 49. Air Rights Parking Garage 50. 127, 135, and 153 College St. 51. New Haven Hotel, 229 George St. 52. Temple Garage 53. Temple Medical Center, 40–60 Temple St. 54. College Place, 47 College St. 55. Medical Center South, 100 Church St. South
(Yale School of Nursing) 56. 10 Amistad St. 57. Amistad Garage 58. 270 Congress Ave. 59. 300 George St. 60. 2 Church St. South |
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The University is committed to basing judgments concerning the admission, education, and employment of individuals upon their qualifications and abilities and affirmatively seeks to attract to its faculty, staff, and student body qualified persons of diverse backgrounds. In accordance with this policy and as delineated by federal and Connecticut law, Yale does not discriminate in admissions, educational programs, or employment against any individual on account of that individual's sex, race, color, religion, age, disability, status as a special disabled veteran, veteran of the Vietnam era, or other covered veteran, or national or ethnic origin; nor does Yale discriminate on the basis of sexual orientation or gender identity or expression.

University policy is committed to affirmative action under law in employment of women, minority group members, individuals with disabilities, special disabled veterans, veterans of the Vietnam era, and other covered veterans.

Inquiries concerning these policies may be referred to the Office for Equal Opportunity Programs, 104 William L. Harkness Hall, 203.432.0849.

In accordance with both federal and state law, the University maintains information concerning current security policies and procedures and prepares an annual crime report concerning crimes committed within the geographical limits of the University. In addition, in accordance with federal law, the University maintains information concerning current fire safety practices and prepares an annual fire safety report concerning fires occurring in on-campus student housing facilities. Upon request to the Office of the Secretary of the University, PO Box 208230, New Haven CT 06520-8230, 203.432.2310, the University will provide such information to any applicant for admission.

In accordance with federal law, the University prepares an annual report on participation rates, financial support, and other information regarding men's and women's intercollegiate athletic programs. Upon request to the Director of Athletics, PO Box 208216, New Haven CT 06520-8216, 203.432.1414, the University will provide its annual report to any student or prospective student.

For all other information relating to the School of Public Health, please telephone 203.785.6260; consult the Web site, <http://publichealth.yale.edu>; or write to the Office of Student Affairs, School of Public Health, 47 College Street, Suite 108, New Haven CT 06510.

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