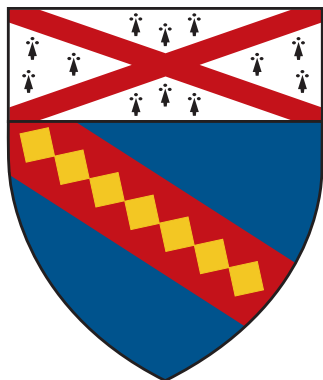


School of Public Health

2020–2021



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The University reserves the right to amend or supplement the information published in this bulletin at any time, including but not limited to withdrawing or modifying the courses of instruction or changing the instructors.

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School of Public Health

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ACADEMIC AND GRADING CALENDARS

Academic Calendar

The following dates are subject to change as the University makes decisions regarding the 2020–2021 academic calendar. Changes will be posted on the School of Public Health's website.

Summer Term 2020

July 1	W	Online orientation for Advanced Professional M.P.H. and Accelerated M.B.A./M.P.H. students
July 2	TH	Online classes begin for Advanced Professional M.P.H. and Accelerated M.B.A./M.P.H. summer session
Aug. 14	F	Classes end for Advanced Professional M.P.H. and Accelerated M.B.A./M.P.H. summer session

Fall Term 2020

Aug. 10	M	OCS opens for preregistration
Aug. 21	F	OCS closes; preliminary schedule due for all M.P.H. students
Aug. 24–28	M–F	Schedule review and adjustment with advisers
Aug. 31	M	Fall term classes begin; add/drop period begins
Sept. 4	F	Add/drop period ends; course registration and exemption deadline
Sept. 7	M	Labor Day. Classes meet
Oct. 14	W	Last day to withdraw from a fall-term course without the course appearing on the transcript
Nov. 20	F	In-person classes end; November recess begins, 6 p.m.
Nov. 30	M	Classes resume remotely
Dec. 4	F	Last day to withdraw from a fall-term course Classes end, 6 p.m.
Dec. 7	M	Reading period begins ¹
Dec. 11	F	Final examinations begin
Dec. 18	F	Final examinations end; winter recess begins

¹ Some classes may meet during the reading period.

Spring Term 2021

All spring 2021 dates are forthcoming.

Grading Calendar

Aug. 28	F	Final grades due for Advanced Professional M.P.H. and Accelerated M.B.A./M.P.H. summer session
Jan. 11	M	Final fall-term grades due for all students
May 1	SA	Final thesis grades due

May 17	M	Final grades due for all graduating students
June 4	F	Final grades due for all returning students

THE PRESIDENT AND FELLOWS OF YALE UNIVERSITY

President

Peter Salovey, A.B., A.M., Ph.D.

Fellows

His Excellency the Governor of Connecticut, *ex officio*

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

Joshua Bekenstein, B.A., M.B.A., Wayland, Massachusetts

Michael J. Cavanagh, B.A., J.D., Philadelphia, Pennsylvania

Charles Waterhouse Goodyear IV, B.S., M.B.A., New Orleans, Louisiana

Catharine Bond Hill, B.A., B.A., M.A., Ph.D., Bronx, New York

William Earl Kennard, B.A., J.D., Charleston, South Carolina

Reiko Ann Miura-Ko, B.S., Ph.D., Menlo Park, California (*June 2025*)

Carlos Roberto Moreno, B.A., J.D., Los Angeles, California (*June 2026*)

Gina Marie Raimondo, A.B., D.Phil., J.D., Los Angeles, California

Emmett John Rice, Jr., B.A., M.B.A., Bethesda, Maryland

Eve Hart Rice, B.A., M.D., Bedford, New York (*June 2021*)

Joshua Linder Steiner, B.A., M.St., New York, New York

David Li Ming Sze, B.A., M.B.A., Hillsborough, California

Annette Thomas, S.B., Ph.D., Cambridge, England (*June 2022*)

Kathleen Elizabeth Walsh, B.A., M.P.H., Boston, Massachusetts (*June 2023*)

Michael James Warren, B.A., B.A., Washington, D.C. (*June 2024*)

Lei Zhang, B.A., M.A., M.B.A., Hong Kong, China

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Vice President for Global Strategy

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Vice President for Facilities and Campus Development

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Vice President for Communications

Nathaniel Westgate Nickerson, B.A.

SCHOOL OF PUBLIC HEALTH ADMINISTRATION AND FACULTY

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Director of Medical Studies

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Melinda L. Irwin, Ph.D., Associate Dean, Research

Robert Kanoff, B.S., Assistant Dean, Finance and Administration

Martin Klein, M.P.H., Ph.D., Senior Adviser to the Dean

Melinda M. Pettigrew, Ph.D., Senior Associate Dean, Academic Affairs

Elizabeth Claus, M.D., Ph.D., Director of Medical Research

Jennifer Farkas, B.A., Director of Financial Aid

Mary Keefe, B.A., Director of Admissions

Kaveh Khoshnood, M.P.H., Ph.D., Director of Undergraduate Studies

Susan Nappi, M.P.H., Executive Director of the Office of Public Health Practice

Rafael Pérez-Escamilla, Ph.D., Director of the Office of Public Health Practice

Heidi Richard, M.A., Chief of Staff

Felicia Spencer, M.A., Director of the Career Management Center

Michelle Sweeney, Human Resources Generalist

Christian Tschudi, Ph.D., Director of Graduate Studies

Alyson Zeitlin, B.A., Director of Faculty and Staff Affairs

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Eugenia Buta, Ph.D., Associate Research Scientist

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Maria Ciarleglio, Ph.D., Associate Professor

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 Yusuf Ransome, Ph.D., Assistant Professor
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 Raja Staggers-Hakim, Ph.D., Lecturer
 Tamara Taggart, Ph.D., Assistant Professor Adjunct
 Jacob K. Tebes, Ph.D., Professor (Psychiatry)

Peng (Katie) Wang, Ph.D., Assistant Professor

Marney White, Ph.D., Associate Professor

A MESSAGE FROM THE DEAN

On behalf of the faculty, staff, and your student peers, I welcome you warmly to the Yale School of Public Health (YSPH), one of the first to be established in the United States more than a century ago, and among the first to be accredited. While the science and practice of health promotion and disease prevention have evolved, people in the United States and around the world are still faced with last century's basic public health challenges, such as access to clean water and health care, safe communities, and emerging infectious diseases: the historic and devastating COVID-19 pandemic continues to expand even as I write this (April 2020). Serious, growing, and often neglected challenges include the health consequences of global warming, population pressures, refugee health, mental health, and epidemics of addiction, obesity/diabetes, gun violence, and others. Political discord across the globe further inhibits a functional policy and legal response to many of these prevention challenges.

You have chosen the public health field to make the world a healthier place to live for current and future generations. Your reasons to join Yale vary, but you will all share a world-class education, both in-person and online. Explore the YSPH centers and institutes in innovative social entrepreneurship, global health, public health modeling, child and environmental health, climate change and health, and many others. Challenge our faculty and staff with your ideas and your questions. Strive for excellence in your work and your contributions. Join us in promoting social justice, health equity, diversity, and sustainability.

Public health is inherently interdisciplinary. Yale University is a laboratory for innovation in your studies and projects. You often can fulfill requirements with a graduate-level course of interest to you that is nested in another Yale school (e.g., Law, the Environment, Management, and the Graduate School of Arts and Sciences). We encourage your exploration of Yale's academic opportunities and its interdisciplinary centers. Our local and global internships, often nurtured through our alumni, offer an incredible array of opportunities. We want to help you bridge boundaries and support your experience in both physical and virtual classrooms and in the field. The faculty, staff, and administrative leaders look forward to working with you. We are a school because of you and we are here for you.

Sten H. Vermund

Dean, Yale School of Public Health

Anna M.R. Lauder Professor of Public Health (Epidemiology of Microbial Diseases)

Professor of Pediatrics, Yale School of Medicine

MISSION

The School of Public Health at Yale University provides leadership to protect and improve the health of the public. Through innovative education, research, policy analysis, and practice that draw upon interdisciplinary scholarship from across the graduate and professional programs at Yale, the School serves local, national, and international communities with its knowledge and expertise. We foster health equity, social justice, and respectful discourse to enrich our teaching and scholarship, as well as empower the communities that we serve.

HISTORY OF THE YALE SCHOOL OF 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 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.

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 for thirty years. 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 his health surveys—prepared in collaboration with other members of the faculty and students—led to considerable improvements in public health organization across the country. 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, which later became the Master of Public Health degree. From the beginning, Winslow sought to build bridges between the Department of Public Health, the Sheffield Scientific School, and the Graduate School of Arts and Sciences 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 nonmedical program that by 1925 graduated eighteen students with a Certificate in Public Health, ten with a Ph.D., and four with a Dr.P.H. 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. In 1964 the new department moved into its own building, the Laboratory of Epidemiology and Public Health (LEPH), which was designed by Philip Johnson and continues as its primary location for research and teaching.

Concurrent with the move into LEPH, the Rockefeller Foundation bequeathed its arbovirus research unit, including its scientists and research staff, to Yale. The arrival of virologists Wilbur Downs, Nobel Prize winner Max Theiler, Jordi Casals, Sonja Buckley, and others began a rapid expansion of public health at Yale. Their groundbreaking work on tropical diseases set the stage for a division of international health that focused on basic health care and delivery in underserved populations.

Meanwhile, as public health successes in infectious disease control (polio, measles, etc.) were changing medical demands nationally, the School also broadened its focus to address the growing burden of chronic diseases such as cardiovascular disease, cancer, and issues surrounding aging. During these years, the Master of Public Health curriculum was also reorganized into four divisions (biostatistics, epidemiology, hospital administration, and environmental health).

In the late 1960s and early 1970s, health policy and the psychosocial and behavioral determinants of health gained focus as academic specialties. Today, faculty and students also bring expertise in genomics, mathematical modeling, behavioral economics, and innovative technologies to the field, the bench, and the classroom to address evolving public health challenges and advance health promotion in the era of globalization.

More than a century after Winslow's appointment, Public Health 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 a school at 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, the Graduate School, and six of Yale's professional schools.

MASTER OF PUBLIC HEALTH

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 tailor their course of study.

Individualized programs are shaped by 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.

M.P.H. students focus their studies in one of the following departments: Biostatistics, Chronic Disease Epidemiology, Environmental Health Sciences, Epidemiology of Microbial Diseases, Health Policy and Management, or Social and Behavioral Sciences. In addition, students may focus their studies in programs in the Health Policy Program (HP) or the Health Care Management Program (HCM). Students select their department/program at the time of application. Students *cannot* pursue an M.P.H. in more than one department/program while enrolled at YSPH.

The Advanced Professional M.P.H. Program is available for individuals with doctoral-level degrees in a field related to public health and for medical students. Students in the AP Program apply to one of six tracks: Applied Biostatistics and Epidemiology; Health Policy; Social and Behavioral Sciences; Global Health; Preventive Medicine; and Occupational and Environmental Medicine.

The B.A.-B.S./M.P.H. Select Program 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-degree program.

The Accelerated M.B.A./M.P.H. Program in Health Care Management enables students to earn an M.B.A. degree from the Yale School of Management and an M.P.H. degree from the Yale School of Public Health in a twenty-two-month integrated program.

The Climate Change and Health Concentration (CCHC) will work to address the severe shortage of public health professionals with the educational background needed to address climate change as a public health issue. Students must fulfill the requirements of their respective departments or programs, in addition to the concentration requirements. Successful completion of the concentration will be recorded on the transcript when the student graduates.

The Global Health Concentration emphasizes a multidisciplinary, problem-solving approach to global health issues that encourages creativity and innovation while fostering a global perspective. Students in the Global Health Concentration may complete this concentration while they satisfy the requirements of their respective

department/division/program. Successful completion of the concentration will be recorded on the transcript when the student graduates.

The Public Health Modeling Concentration provides rigorous training in systems thinking. Students will be trained to focus on the explicit portrayal of real-world processes—their “physics,” their interactions, and their dynamics—to generate evidence about how those processes might behave under different specifications. Students will learn to integrate the mechanistic modeling approaches needed to describe underlying systems with the inferential methods necessary to motivate and inform model structure and parameterization. Successful completion of the concentration will be recorded on the transcript when the student graduates.

The Regulatory Affairs Track prepares students for future roles in the area of quality control and regulatory affairs. This track operates within the existing YSPH academic structure. Students complete all of the core and departmental requirements as well as the required courses for the track. Successful completion of the track will be recorded on the transcript when the student graduates.

The U.S. Health Justice Concentration prepares students to analyze and address systems and processes that perpetuate health injustice in the United States. Students may complete this concentration while they satisfy the requirements of their respective department/division/program. Successful completion of the concentration will be recorded on the transcript when the student graduates.

All M.P.H. students are urged to develop programs of study that include courses from other departments within YSPH and throughout the University in order to 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.

Students in the traditional two-year M.P.H. program are required to complete 20 course units, which include the core curriculum, departmental/program requirements, and electives both within YSPH and in other schools at the University (with the permission of the academic adviser). 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. A thesis is not required for students in Biostatistics, Health Policy, or Health Care Management.

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.

Core Curriculum for the Traditional Two-Year M.P.H. Degree Program

EPH 100	Professional Skills Series	0
EPH 101	Professional Skills Series	0
EPH 505	Biostatistics in Public Health ¹	1

EPH 507	Social Justice and Health Equity	1
EPH 508	Foundations of Epidemiology and Public Health	1
EPH 510	Health Policy and Health Care Systems	1
EPH 513	Major Health Threats: Determinants and Solutions	1
EPH 515	Ethics and Public Health: An Introduction	0
EPH 520	Summer Internship	0
EPH 525	Thesis ²	2

¹ Not required for BIS.

² Not required for BIS, HP, or HCM.

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 several options for satisfying this requirement:

EMD/SBS 584	Advanced Global Health Justice Practicum: Fieldwork	1
EMD/SBS 596	Health Justice Practicum and Fieldwork	2
EPH 500	Public Health Practicum	1
EPH 520	Summer Internship ¹	0
EPH 542	Practice-Based Community Health Research	1
EPH 555	Clinic in Climate Justice, Climate Policy, Law, and Public Health	1
HPM 555	Health Policy or Health Care Management Practicum	1
SBS 541	Community Health Program Evaluation	1

¹ With the exception of those in the Advanced Professional M.P.H. program and the Accelerated M.B.A./M.P.H. program, all M.P.H. students *must* complete a summer internship, typically 10–12 weeks and no less than 8 weeks in duration. The summer internship may be used to complete the practice requirement for the M.P.H. degree with prior approval from the Office of Public Health Practice.

COMPETENCIES OF THE CORE CURRICULUM

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

- Apply epidemiological methods to the breadth of settings and situations in public health practice.
- Select quantitative and qualitative data collection methods appropriate for a given public health context.
- Analyze quantitative and qualitative data using biostatistics, informatics, computer-based programming and software, as appropriate.
- Interpret results of data analysis for public health research, policy, or practice.
- Compare the organization, structure, and function of health care, public health, and regulatory systems across national and international settings.

- Discuss the means by which structural bias, social inequities, and racism undermine health and create challenges to achieving health equity at organizational, community, and societal levels.
- Assess population needs, assets, and capacities that affect communities' health.
- Apply awareness of cultural values and practices to the design or implementation of public health policies or programs.
- Design a population-based policy, program, project, or intervention.
- Explain basic principles and tools of budget and resource management.
- Select methods to evaluate public health programs.
- Discuss multiple dimensions of the policy-making process, including the roles of ethics and evidence.
- Propose strategies to identify stakeholders and build coalitions and partnerships for influencing public health outcomes.
- Advocate for political, social, or economic policies and programs that will improve health in diverse populations.
- Evaluate policies for their impact on public health and health equity.
- Apply principles of leadership, governance, and management, which include creating a vision, empowering others, fostering collaboration, and guiding decision-making.
- Apply negotiation and mediation skills to address organizational or community challenges.
- Select communication strategies for different audiences and sectors.
- Communicate audience-appropriate public health content, both in writing and through oral presentation.
- Describe the importance of cultural competence in communicating public health content.
- Perform effectively on interprofessional teams.
- Apply systems-thinking tools to a public health issue.

M.P.H. Departments, Programs, Tracks, and Concentrations

BIostatISTICS DEPARTMENT

Hongyu Zhao, Ph.D., Chair

Biostatistics is a scientific discipline that focuses on developing new statistical methodology and theory to address important questions in the biological and health sciences, including study designs, data collection and analysis, as well as result interpretation. In addition to independent methodological and theoretical developments, the faculty in the Department of Biostatistics are involved in a wide variety of collaborative research efforts throughout the University, including at the School of Public Health and the School of Medicine. We bring these innovations into practice through active participation in many disciplines at Yale and beyond. Our students are well prepared for positions in public/governmental and nonprofit

agencies, medical centers, and various industries, as well as for doctoral studies in biostatistics and related fields.

Departmental Requirements for the M.P.H. in Biostatistics

BIS 525	Seminar in Biostatistics and Journal Club	0
BIS 526	Seminar in Biostatistics and Journal Club	0
BIS 623	Advanced Regression Models	1
BIS 628	Longitudinal and Multilevel Data Analysis	1
BIS 630	Applied Survival Analysis	1
BIS 678	Statistical Practice I	1
BIS 679	Advanced Statistical Programming in SAS and R	1
BIS 681	Statistical Practice II	1
S&DS 541	Probability Theory ¹	1
S&DS 542	Theory of Statistics ¹	1

¹ These courses are offered in the Graduate School of Arts and Sciences.

The thesis (EPH 525) is not required in Biostatistics.

Competencies for the M.P.H. in Biostatistics

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

- Derive and apply the fundamentals of mathematical statistics (e.g., probability concepts, random variables, probability distributions, statistical inference).
- Calculate required sample size and statistical power for basic study designs.
- Apply the fundamentals of statistical analysis to make relevant inferences using the appropriate analytic tools.
- Design computer programs for study management (i.e., creating suitable data sets for statistical analyses), statistical analysis, and presentation of data using statistical programming languages (e.g., SAS, R).
- Produce and present audience-appropriate statistical summaries describing research in health science through oral presentations and written communications.

REGULATORY AFFAIRS TRACK

Robert W. Makuch, Ph.D., Director

Every drug, medical device, diagnostic test, and food sold in the United States and other countries throughout the world must meet rigorous standards that are intended to insure that all products satisfy a set of safety and performance objectives. Scientists must possess the knowledge and expertise to create and implement high-quality systems as well as understand the environment encompassing regulatory compliance. Other essential skills include project management and leadership, scientific tools that allow for proper risk assessment and risk management strategies, and the ability to clearly communicate the regulatory decisions made.

The Regulatory Affairs Track is an interdisciplinary program that may be combined with any departmental concentration. Four courses are required. The track covers a wide array of regulatory affairs topics, including complex issues involving food and drug law, ethics, clinical trials, epidemiology, risk analysis, and adverse event reporting requirements and systems.

The Regulatory Affairs Track is directed by Professor Robert Makuch, who has extensive experience working with pharmaceutical companies and government agencies on regulatory affairs issues. The track includes a focus on global regulatory similarities and differences among countries, including China, where Professor Makuch has led more than twenty intensive training programs for senior delegations of the Chinese Food and Drug Administration since 2008, involving outside experts from industry and regulatory agencies.

Requirements for the M.P.H. in the Regulatory Affairs Track

BIS 540	Fundamentals of Clinical Trials	1
BIS 575	Introduction to Regulatory Affairs	1
Two of the following:		
BIS 561	Advanced Topics and Case Studies in Multicenter Clinical Trials	1
CDE 650	Introduction to Evidence-Based Medicine and Health Care	1
EHS 511	Principles of Risk Assessment	1
HPM 570	Cost-Effectiveness Analysis and Decision-Making	1
HPM 588	Public Health Law	1
HPM 595	Food and Drug Administration Law	1

Competencies for the Regulatory Affairs Track

Upon completion of the track, the student will be able to:

- Utilize the best scientific and ethical standards to insure that food, pharmaceutical, and medical and diagnostic devices meet quality and regulatory standards.
- Develop/use leadership and management skills for conducting/overseeing research and clinical studies that are required by regulatory agencies.
- Develop processes that insure clear and consistent decisions to the public and to regulatory agencies.
- Assess/develop risk management strategies that can be used to get new products to the market swiftly, while assuring the consumer and regulatory bodies that efficacy and safety have been preserved.

CHRONIC DISEASE EPIDEMIOLOGY DEPARTMENT

Judith H. Lichtman, M.P.H., Ph.D., Chair

Epidemiology is the study of the frequency, distribution, and causes of diseases in human populations. Chronic Disease Epidemiology (CDE) aims to enhance understanding about the determinants of chronic diseases in populations and how to intervene most effectively to reduce morbidity and mortality due to chronic diseases. CDE strives to advance public health by promoting a research-based approach to

the prevention and management of chronic disease. By focusing on the health of populations, as opposed to individuals, CDE utilizes places (neighborhoods, cities, states, countries), institutions (schools, housing developments, correctional facilities, workplaces), and health care facilities (newborn nurseries, nursing homes, public health clinics, hospitals) as its laboratories.

CDE students learn how to identify the types of data needed, choose appropriate data collection methods, collect the data, and analyze the data appropriately so that the whole research effort leads to the improvement of the health of populations. The CDE curriculum emphasizes critical thinking, based on thorough knowledge of research methods, and its application to the scientific literature, to the development of research protocols, and to the design, implementation, and analysis of epidemiologic investigations. A 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 of increased susceptibility to or early onset of disease. Students learn the role of these methodologies throughout the program through course work, seminars, and practicum experiences.

Students learn about the role of epidemiology in a broad range of public health and medical areas, including the fields of aging, cancer, cardiovascular disease, global health, molecular and genetic epidemiology, perinatal and reproductive epidemiology, and psychosocial epidemiology, all areas in which the CDE department 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; the Yale Program on Aging; and the Center for Interdisciplinary Research on AIDS. M.P.H. graduates of the CDE department find employment in a variety of research, public health practice, and advocacy settings, including academic institutions; public health agencies at the international, national, state, and local levels; the pharmaceutical industry; charitable foundations; and a variety of other nonprofit organizations. For example, graduates may obtain positions in such federal agencies as the National Institutes of Health (NIH) or the Centers for Disease Control and Prevention (CDC). Nonprofit agencies, such as cancer or heart associations, also recruit graduates to participate in or direct community health programs. Private industries, including pharmaceutical companies, find the quantitative skills of CDE graduates useful in monitoring drug safety and in conducting clinical research. Many CDE graduates subsequently pursue doctoral degrees in public health or other professional or academic fields.

Departmental Requirements for the M.P.H. in Chronic Disease Epidemiology

BIS 505	Biostatistics in Public Health II	1
CDE 516	Principles of Epidemiology II ¹	1
CDE 525	Seminar in Chronic Disease Epidemiology ¹	0
CDE 526	Seminar in Chronic Disease Epidemiology ¹	0

CDE 534	Applied Analytic Methods in Epidemiology ¹	1
EPH 525	Thesis	2

¹ Must be completed in the first year.

One of the following:

BIS 540	Fundamentals of Clinical Trials	1
BIS 621	Regression Models for Public Health	1
BIS 623	Advanced Regression Models	1
BIS 628	Longitudinal and Multilevel Data Analysis	1
BIS 630	Applied Survival Analysis	1
BIS 639	Descriptive Analysis of Public Health Data	1
CDE 634	Advanced Applied Analytic Methods in Epidemiology and Public Health	1

One of the following:

CDE 532	Epidemiology of Cancer	1
CDE 535	Epidemiology of Heart Disease and Stroke	1
CDE 562	Nutrition and Chronic Disease	1
EHS/CDE 502	Physiology for Public Health	1

Chronic Disease Epidemiology students are advised to take *two* additional CDE elective courses.

Competencies for the M.P.H. in Chronic Disease Epidemiology

The following competencies for the M.P.H. in Chronic Disease Epidemiology are currently under review and will be updated in fall 2020.

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 health promotion and disease prevention to prevent and control chronic diseases.
- Synthesize information from a variety of epidemiologic and related studies.
- Design and carry out epidemiologic studies at an intermediate level.
- 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 pathophysiology of selected chronic diseases.
- Identify, interpret, and use routinely collected data on disease occurrence.

- Review, critique, and evaluate epidemiologic reports and research articles at an intermediate level.

ENVIRONMENTAL HEALTH SCIENCES DEPARTMENT

Vasilis Vasiliou, Ph.D., Chair

People are exposed to a wide range of biological, chemical, and physical environmental stressors at home, work, and school as they go about their daily activities, such as working, commuting, eating, drinking, and exercising. An estimated 30 percent of the global burden of disease is attributable to environmental exposures that could be prevented. The Department of Environmental Health Sciences (EHS) equips students with interdisciplinary training to recognize and assess the impact of environmental hazards on human health and to identify solutions to reduce exposures to those hazards and prevent diseases in the population.

Students in EHS can select an emphasis in Environmental Exposure Science and Epidemiology, Environmental Toxicology, or Risk Assessment. Within these emphasized areas, there is flexibility for students to design, with their adviser, a program to meet individual needs. Students can take advantage of the wide variety of courses relevant to environmental health offered by the department and throughout the University, particularly those in the School of Forestry & Environmental Studies.

M.P.H. graduates of the EHS department find employment in city, state, and federal government agencies; environmental consulting firms; nongovernmental organizations; pharmaceutical companies; and private sector companies in the area of environmental or occupational health and safety. They also take research positions in academic organizations and government agencies. In addition, many students go on to pursue their Ph.D. and independent research careers.

Departmental Requirements for the M.P.H. in Environmental Health Sciences

EHS 503	Public Health Toxicology	1
EHS 507	Environmental Epidemiology	1
EHS 508	Environmental and Occupational Exposure Science	1
EHS 511	Principles of Risk Assessment	1
EHS 525	Seminar and Journal Club in Environmental Health (2 terms)	0
EHS 526	Seminar and Journal Club in Environmental Health (2 terms)	0
EPH 525	Thesis	2

One of the following:

BIS 505	Biostatistics in Public Health II	1
CDE 534	Applied Analytic Methods in Epidemiology	1

Note: Students may apply for exemptions from these requirements based on previous course work, at the discretion of the course instructor.

Competencies 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:

- Describe the mechanisms of toxicity of biological, chemical, physical, and social stressors in the residential and workplace environments.
- Evaluate the scientific merit and feasibility of different environmental epidemiologic study designs.
- Design an environmental epidemiologic study.
- Evaluate the scientific merit and feasibility of environmental and occupational exposure assessment approaches.
- Design an environmental or occupational exposure study.
- Produce a human health risk assessment using information from epidemiological, exposure, toxicological, and risk assessment studies on an environmental health issue.

EPIDEMIOLOGY OF MICROBIAL DISEASES DEPARTMENT

Albert I. Ko, M.D., Chair

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 Department 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 department'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. The problem of, and solutions for, infectious diseases in low- and middle-income countries are considered extensively.

Nearly half of EMD graduates in the M.P.H. program enter public health practice 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.

Departmental Requirements for the M.P.H. in Epidemiology of Microbial Diseases

EMD 517	Principles of Infectious Diseases I	1
EMD 518	Principles of Infectious Diseases II	1
EMD 525	Seminar in Epidemiology of Microbial Diseases	0
EMD 526	Seminar in Epidemiology of Microbial Diseases	0
EPH 525	Thesis	2

One of the following:

BIS 505	Biostatistics in Public Health II	1
CDE 534	Applied Analytic Methods in Epidemiology	1

One of the following:

CDE 516	Principles of Epidemiology II	1
EMD 553	Transmission Dynamic Models for Understanding Infectious Diseases	1

Students are required to choose at least three additional EMD courses from the list of approved EMD electives (<http://publichealth.yale.edu/emd/curriculum/mph/curriculum.aspx>) in collaboration with their adviser.

Competencies 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:

- Describe the epidemiology and burden of major infectious diseases of humans worldwide.
- Describe host-related factors, including behavioral, genetic, and immunologic factors, that affect transmission and maintenance of pathogens in human populations.
- Describe pathogen-related factors that affect transmission and disease progression.
- Describe environmental and ecological factors that affect the emergence and transmission of zoonoses into human populations.
- Interpret and apply quantitative data to identify factors that influence infectious disease transmission and project disease risk in the future.
- Discuss approaches for the prevention and control of infectious diseases.
- Evaluate data and studies on the etiology, detection, prevention, or control of infectious diseases.

HEALTH POLICY AND MANAGEMENT DEPARTMENT

Mark J. Schlesinger, Ph.D., Interim Chair

The goal of the Department of Health Policy and Management (HPM) is to address the critical issues in improving public health, especially the health of high-risk and vulnerable populations. The department offers two M.P.H. programs: Health Policy and Health Care Management.

Health Policy Program

Mark J. Schlesinger, Ph.D., Interim Chair

The specific objectives of the Health Policy program are: (1) to provide its students with a basic foundation of knowledge in public health and health policy, and (2) to teach concepts, principles, and scientific skills necessary for health services policy development and evaluation and health management. The Health Policy program – within the Department of Health Policy and Management – aims to have students develop an understanding of the importance of data and research as policy and management tools. Students are taught to anticipate future needs relative to expanding technology, changing patterns of community health, and emerging societal and programmatic needs.

The program provides a unified approach to policy. 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 program 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 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 in health policy, and they may also specialize in particular substantive areas (e.g., addiction, health economics, vulnerable populations, global health, consumer decision-making, or public health modeling). Students are required to take an integrative seminar in health policy.

Graduates of the program in Health Policy 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.

DEPARTMENTAL REQUIREMENTS FOR THE M.P.H. IN HEALTH POLICY

HPM 514	Health Politics, Governance, and Policy	1
HPM 560	Health Economics and U.S. Health Policy	1
HPM 583	Methods in Health Services Research	1
HPM 586	Microeconomics for Health Policy and Health Management	1

HPM 597	Capstone Course in Health Policy	1
HPM 697	Health Policy Leadership Seminar	0

One of the following:

HPM 570	Cost-Effectiveness Analysis and Decision-Making	1
HPM 588	Public Health Law	1

The thesis (EPH 525) is not required in HPM.

COMPETENCIES FOR THE M.P.H. IN HEALTH POLICY

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

- Identify the presence and drivers of key market failures affecting health and health care and propose concrete policy changes or market mechanisms to counteract resulting inefficiencies.
- Apply concepts from microeconomics to analyze trade-offs related to contemporary issues in U.S. health policy.
- Critique empirical research intended to evaluate the causal impact of health policies and health system reforms.
- Develop reform proposals for enhancing the delivery of health services that are politically sustainable and that recognize the relative strengths and weaknesses of market-based vs. regulatory or legal interventions.
- Compose concise policy memos that synthesize evidence and propose policy responses.

Health Care Management Program

Howard Forman, M.D., Director

Claire Masters, M.H.P., Program Manager

Future health care managers will be involved in a wide range of settings, including hospitals, health systems, pharmaceutical and biotechnology companies, health maintenance organizations, managed care companies, insurance companies, and consulting. The Health Care Management program – within the Department of Health Policy and Management – was designed with the realization that both management training and public health training are needed to adequately prepare future leaders in health care management. The program is offered in conjunction with the Yale School of Management (SOM). The management courses at SOM, combined with HPM offerings and an integrative course in the second year, give students an excellent foundation for work in the field.

DEPARTMENTAL REQUIREMENTS FOR THE M.P.H. IN HEALTH CARE MANAGEMENT

HPM/MGT 502	Foundations of Accounting and Valuation ¹	1
HPM 583	Methods in Health Services Research	1
HPM 586	Microeconomics for Health Policy and Health Management	1
HPM 688	Managing Health Care in Complex Systems	1
HPM/MGT 698	Health Care Policy, Finance, and Economics ¹	1

HPM 699	Colloquium in Health Care Leadership	0
HPM 700	Colloquium in Health Care Leadership	0.5
MGT 525	Competitive Strategy ¹	1
MGT 856	Managing Marketing Programs ¹	0.5
MGT 879	Healthcare Operations ¹	0.5
MGT 887	Negotiations ¹	0.5

One of the following:

HPM 536	Narratives in Health Media on the Social Internet	0.5
HPM 595	Food and Drug Administration Law	1
MGT 657	Creating Healthcare and Life Science Ventures ¹	0.5
MGT 663	The Life Science Industry ¹	0.5

One of the following:

HPM/MGT 631	Public Health Entrepreneurship and Intrapreneurship ¹	0.5
MGT 527	Strategic Management of Nonprofit Organizations ¹	1
MGT 612	Introduction to Social Entrepreneurship ¹	1
MGT 621	Managing Social Enterprises ¹	1
MGT 801	Impact Measurement & Financial Reporting in the Social Sector ¹	0.5

¹ These courses are offered in the School of Management.

COMPETENCIES FOR THE M.P.H. IN HEALTH CARE MANAGEMENT

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

- Evaluate health care financing, regulatory, and delivery systems.
- Conduct financial analyses, including reading and analyzing financial statements.
- Utilize statistical analysis skills to conduct health systems and policy research.
- Apply management problem-solving skills to improve functioning of organizations and agencies in health systems.
- Apply operations management concepts to address organizational performance issues in health service organizations.

SOCIAL AND BEHAVIORAL SCIENCES DEPARTMENT

Trace S. Kershaw, Ph.D., Chair

The Social and Behavioral Sciences (SBS) department aims to understand and improve health equity and social justice, both domestically and globally. SBS provides instruction in the theory and methods of the social and behavioral sciences that emphasize individual, interpersonal, community, and structural influences on health, illness, and recovery. The primary emphases are focused on (1) understanding the psychosocial, behavioral, community, and societal influences on health in the general population, with a focus on those who are disadvantaged; and (2) creating multilevel interventions that eliminate barriers to health, from infancy to old age. The SBS curriculum takes an interdisciplinary approach and focuses on integrating methods

from epidemiology and the social sciences, training scientists with a broad skill set that allows them to answer a host of complex research questions. The department has numerous research strengths including in HIV/AIDS, aging health, community-engaged health research, maternal-child health, mental health, health equity and disparities, and stigma prevention and health. In addition, SBS students will conduct a thesis that draws on a topic and methods related to the social and behavioral sciences.

Departmental Requirements for the M.P.H. in Social and Behavioral Sciences

EPH 525	Thesis	2
SBS 525	Seminar in Social and Behavioral Sciences	0
SBS 526	Seminar in Social and Behavioral Sciences	0
SBS 541	Community Health Program Evaluation	1
SBS 574	Developing a Health Promotion and Disease Prevention Intervention	1

One of the following:

SBS 580	Qualitative Research Methods in Public Health	1
SBS 676	Questionnaire Development	1

One of the following:

BIS 505	Biostatistics in Public Health II	1
CDE 516	Principles of Epidemiology II	1
CDE 534	Applied Analytic Methods in Epidemiology	1

Remaining elective courses may include any course in social and behavioral sciences from across the University at level 300 or above, with approval of course instructor and YSPH faculty adviser.

Competencies 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:

- Understand health from multiple levels, including the individual, the social group, and society (e.g., understand a broad ecological model of health).
- Develop interventions to address health inequalities and promote health equity.
- Apply social and behavioral theory in the design and implementation of prevention interventions aimed toward improving health.
- Evaluate health promotion interventions.
- Apply ethical principles to the collection of social and behavioral health data.

PUBLIC HEALTH MODELING CONCENTRATION

A. David Paltiel, Ph.D., Director

Ted Cohen, D.P.H., M.D., M.P.H., Director

Students in the traditional two-year M.P.H. program may complete this concentration while they satisfy the requirements of their respective departments or programs.

The Public Health Modeling Concentration (PHMC) provides rigorous training in *systems thinking*: the explicit portrayal of real-world processes—their “physics,” their interactions, and their dynamics—that leave populations vulnerable to risk and disease. The concentration will train students to generate evidence about how those processes might behave under different specifications, with or without intervention. Modeling serves as a practical means of assembling the existing evidence base about mechanisms and conducting formal assessments in situations where financial, logistical, temporal, and/or ethical obstacles may conspire against the implementation and study of those mechanisms in real life.

Requirements for the M.P.H. Public Health Modeling Concentration

EPH 520	Summer Internship (a substantive modeling component is required)	0
EPH 580	Seminar for Modeling in Public Health	0
EPH 581	Seminar for Modeling in Public Health	0
One of the following:		
EMD 553	Transmission Dynamic Models for Understanding Infectious Diseases	1
HPM 570	Cost-Effectiveness Analysis and Decision-Making	1
One of the following:		
BIS 534	Stochastic Models and Inference for the Biomedical and Social Sciences	1
EMD 538	Quantitative Methods for Infectious Disease Epidemiology	1
HPM 573	Advanced Topics in Modeling Health Care Decisions	1
One more of the above five courses		1
One additional elective course chosen from a preapproved list or by approval of the concentration committee ¹		1

¹ A list of preapproved elective courses is available on the Public Health Modeling Concentration website: <http://publichealth.yale.edu/modeling>.

Competencies for the M.P.H. Public Health Modeling Concentration

Each student in the Public Health Modeling Concentration will master the core curriculum competencies and the competencies for the student’s department/program. In addition, upon receiving an M.P.H. degree in the Public Health Modeling Concentration, the student will be able to:

- Identify questions in public health policy and practice that may be amenable to model-based approaches.

- Demonstrate that modeling is advantageous in describing the processes that drive transmission and control of infectious diseases.
- Apply stochastic and deterministic modeling approaches, including computational methods for simulation and data analysis.
- Review, critique, and interpret the findings of model-based public health research and peer-reviewed literature.
- Apply public health modeling concepts, principles, and methodologies obtained through formal course work in a practice-based setting.

GLOBAL HEALTH CONCENTRATION

Rafael Pérez-Escamilla, Ph.D., Director

Students in the traditional two-year M.P.H., Advanced Professional M.P.H., and B.A.-B.S./M.P.H. programs may complete this concentration while they satisfy the requirements of their respective departments or programs.

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

All students in the GHC will complete five global health course units and a global health-focused internship. The internship must be conducted in a low- to middle-income country during the summer between the first and second years of the M.P.H. program. If students have already had 10–12 weeks of previous global health experience, they can do an internship based in the United States or another high-income country as long as it is pertinent to global health; otherwise, they must do an internship abroad. This alternative option must be approved by the GHC office prior to the start of the internship. All YSPH students conducting an international internship must complete the International Pre-Departure Preparation Workshop held in the spring term of their first year. Students are strongly encouraged to write a global health-related thesis (as determined by their department/program).

Requirements for the M.P.H. Global Health Concentration

EMD/HPM 566	Critical Issues in Global Health (taken in first year)	1
EPH 520	Summer Internship (must be global health-related in a low- to middle-income country)	0
EPH 557	Evidence-Based Decision-Making in Global Health	1
EPH 591	Global Health Seminar (taken in first year)	0
Three elective global health courses selected from at least two of the five perspectives on public health ¹		3

- ¹ The five perspectives on public health are (1) biomedicine, (2) epidemiology, (3) psychosocial/social and behavioral/anthropology, (4) development/political economy, and (5) ethics/history/humanities. A list of courses offered in each of the five areas is available on the GHC website: <https://publichealth.yale.edu/global>. Please note that all courses listed may not be offered each term. Students pursuing the GHC may also propose courses not listed here as potential GHC electives. In this case, students must complete the required approval form, which is available on the GHC website. Requests must be approved before the YSPH course registration deadline. Upon receiving the form, the YSPH GHC program will let the student know if the course meets GHC elective requirements.

Competencies for the M.P.H. Global Health Concentration

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

- Describe the global burden of disease patterns across world regions and population characteristics.
- Analyze the roles, relationships, and resources influencing global health governance and infrastructure.
- Propose sustainable, evidence-based solutions to address key global health challenges across the life course.
- Apply ethical approaches in global health research and practice.
- Apply monitoring and evaluation techniques to global health programs, policies, or outcomes.
- Display skills in applying research to global health policy and practice.

CLIMATE CHANGE AND HEALTH CONCENTRATION

Robert Dubrow, M.D., Ph.D., Director

The Climate Change and Health Concentration (CCHC) will work to address the severe shortage of public health professionals with the educational background needed to address climate change as a public health issue.

The study of climate change and health is multidisciplinary and should interest students from all YSPH departments. Climate change is an environmental exposure (Department of Environmental Health Sciences) that can affect both infectious (Department of Epidemiology of Microbial Diseases) and chronic (Department of Chronic Disease Epidemiology) diseases. Research about the relationship between climate change and health can involve sophisticated modeling (Department of Biostatistics and others). Behavioral change, mental health, and social justice are major concerns (Department of Social and Behavioral Sciences). Finally, health management expertise is needed to develop mitigation and adaptation strategies, and climate change involves thorny policy issues (Department of Health Policy and Management).

All students in the CCHC will complete three required YSPH courses; two elective courses from a list of approved courses provided by the CCHC administrator; and two

terms of a climate change and health seminar. Students are encouraged to complete a thesis with a substantive focus on climate change and health; the CCHC executive committee and affiliated faculty will be available to advise interested students on choosing thesis topics. Students are also encouraged to complete a summer internship related to climate change and health; the CCHC will develop a listing of summer internship opportunities for interested students and will also offer competitive funding.

Requirements for the M.P.H. Climate Change and Health Concentration

EHS 547	Climate Change and Public Health	1
EHS 560	Methods in Climate Change and Health Research	1
EPH 555	Clinic in Climate Justice, Climate Policy, Law, and Public Health	1
EPH 570	Seminar in Climate Change and Health	0
EPH 571	Seminar in Climate Change and Health	0
Two elective courses selected from a list of approved courses ¹		2

¹ A list of approved courses is available from the CCCH administrator. Students may petition the CCCH executive committee to place additional electives on the approved list.

Competencies for the M.P.H. Climate Change and Health Concentration

Each student in the Climate Change and Health Concentration will master the core curriculum competencies and the competencies for the student's department/program. In addition, upon receiving an M.P.H. degree in the Climate Change and Health Concentration, the student will be able to:

- Describe how the climate has changed, explain the role of greenhouse gases in climate change, and describe how the climate is predicted to change in the future.
- Describe how climate change adversely impacts population health, with differing vulnerability across population subgroups.
- Explain how adaptation and mitigation strategies can reduce adverse health impacts of climate change and can generate substantial non-climate health benefits in a just and equitable manner.
- Apply basic methods used in climate change and health research.
- Apply knowledge and skills learned in the classroom to an applied public health research or public health practice project focused on climate change and health.
- Explain and value the relationship among climate change, sustainability, public health, and justice.

U.S. HEALTH JUSTICE CONCENTRATION

Danya Keene, Ph.D., Director

This cross-departmental YSPH concentration will prepare students to analyze and address systems and processes that perpetuate health injustice in the United States.

Students will examine how historical and current systems of privilege and power, related to race, class, gender, sexual orientation, and other identities, create unequal burdens on health that are avoidable and unjust. Students will also develop organizing, advocacy, and policy skills that prepare them to advance health justice. Finally, students will develop tools to analyze public health research methods, discourse, and practice using a health justice framework.

Though not limited to Connecticut, the concentration will emphasize local health needs and will involve sustained partnerships with local organizations that are working to advance health justice. The concentration has the following components described in detail below: (1) a required core course in health activism and advocacy; (2) a required critical public health analysis course; (3) two additional course selected from a menu of course options to meet additional learning objectives; and (4) a practicum or summer internship in health justice with a partner organization.

Requirements for the M.P.H. U.S. Health Justice Concentration

SBS 590	Advocacy and Activism	1
SBS 592	Critical Public Health Analysis	1

One of the following applied practice experiences: ¹

EPH 500	Public Health Practicum	1
EPH 520	Summer Internship	0

¹ Students must complete a summer internship and/or practicum with a partner organization. Students completing the practicum will work with a partner organization under the supervision of a YSPH faculty member (Danya Keene, Trace Kershaw, or Tekisha Everette).

One course that critically analyzes the roles of history, power, and privilege in creating and maintaining health inequities, selected from the following approved courses:

EMD 584	Advanced Global Health Justice Practicum: Fieldwork	1
ENV 846	Perspectives on Environmental Injustices ²	1
HIST 479	Sickness and Health in African American History ³	1
HSHM 406	Healthcare for the Urban Poor ³	1
HSHM 436	Health and Incarceration in U.S. History ³	1
HSHM 465	Reproductive Health, Gender & Power in the U.S. ³	1
HSHM 475	Race and Disease in American Medicine ³	1
SBS 570	LGBTQ Population Health	1
SBS 581	Stigma and Health	1

² This course is offered in the School of the Environment.

³ These courses are offered in Yale College.

One course that discusses how systems of government and law affect health equity at the local, state, and national level, selected from the following approved courses:

EMD 582	Political Epidemiology	1
ENV 975	Environmental Justice: Research & Practice at the Intersection of Civil Rights & the Environment ²	1
EPH 555	Clinic in Climate Justice, Climate Policy, Law, and Public Health	1
HPM 514	Health Politics, Governance, and Policy	1
HPM 588	Public Health Law	1
SBS 585	Sexuality, Gender, Health, and Human Rights	1

² This course is offered in the School of the Environment.

Competencies for the M.P.H. U.S. Health Justice Concentration

Each student in the U.S. Health Justice Concentration will master the core curriculum competencies and the competencies for the student's department/program. In addition, upon receiving an M.P.H. degree in the U.S. Health Justice Concentration, the student will be able to:

- Develop community organizing and health advocacy strategies to advance health equity.
- Analyze the national, state, and local regulatory environment as leverage points to impact policy change that advances health equity.
- Analyze the ways that power, privilege, and history shape the creation and interpretation of public health knowledge and practice.
- Employ multiple sources of evidence (e.g., narrative and epidemiological data) and a critical justice lens to construct persuasive arguments that advance health equity.
- Reflect on how their own positionality, subjectivity, power, and privilege shape their engagement in public health practice and advocacy.

Advanced Professional M.P.H. Program

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

The eleven-month Advanced Professional M.P.H. Program provides rigorous public health training to:

1. individuals with a doctoral-level (or international equivalent) degree in a field related to public health (e.g., physicians, dentists, veterinarians, attorneys, and those with a doctorate in the biological, behavioral, or social sciences);
2. individuals with a master's degree and at least two years of relevant work experience;
3. individuals with a bachelor's degree and at least five years of relevant work experience; and

4. students who have completed their third year in an accredited medical, dental, or podiatric school in the United States.

The program is designed for mature individuals with clear goals in public health.

Students can enter the program to gain skills in the public health sciences and to prepare for careers in a variety of settings, including academia; local, national, or international public health agencies; industry; and nonprofit foundations and research organizations. Physicians in preventive medicine, occupational and environmental medicine, and aerospace 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, Global Health, Preventive Medicine, or Occupational and Environmental Medicine. The program begins with an intensive seven-week summer session (July–August), followed by two full-time terms of study. After completing the seven-week summer session, students may choose to complete the remainder of the program on a part-time basis; however, all requirements must be completed within three years of the date of matriculation.

CURRICULUM FOR THE ADVANCED PROFESSIONAL M.P.H. PROGRAM

Applied Biostatistics and Epidemiology Track

CORE REQUIREMENTS

BIS 515	Accelerated Biostatistics	2
CDE 515	Accelerated Epidemiology	1
EPH 510	Health Policy and Health Care Systems	1
EPH 513	Major Health Threats: Determinants and Solutions	1
EPH 515	Ethics and Public Health: An Introduction	0
SBS 505	Accelerated Social and Behavioral Foundations of Health	1

One of the following:

EMD/SBS 596	Health Justice Practicum and Fieldwork	2
EPH 500	Public Health Practicum	1
EPH 542	Practice-Based Community Health Research	1
EPH 555	Clinic in Climate Justice, Climate Policy, Law, and Public Health	1
HPM 555	Health Policy or Health Care Management Practicum	1
SBS 541	Community Health Program Evaluation	1

TRACK REQUIREMENTS

CDE 534	Applied Analytic Methods in Epidemiology	1
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Two of the following:

BIS 621	Regression Models for Public Health	1
or BIS 623	Advanced Regression Models	
BIS 628	Longitudinal and Multilevel Data Analysis	1

BIS 630	Applied Survival Analysis	1
BIS 639	Descriptive Analysis of Public Health Data	1
S&DS 563	Multivariate Statistical Methods for the Social Sciences ¹	1

¹ This course is offered in the Graduate School of Arts and Sciences.

Two additional biostatistics and/or epidemiology courses	2
Three elective courses	3

One of the following capstone courses:

CDE 617	Developing a Research Proposal	1
EPH 608	Frontiers of Public Health	1
SBS 574	Developing a Health Promotion and Disease Prevention Intervention	1

Social and Behavioral Sciences Track

CORE REQUIREMENTS

BIS 515	Accelerated Biostatistics	2
CDE 515	Accelerated Epidemiology	1
EPH 510	Health Policy and Health Care Systems	1
EPH 513	Major Health Threats: Determinants and Solutions	1
EPH 515	Ethics and Public Health: An Introduction	0
SBS 505	Accelerated Social and Behavioral Foundations of Health	1

One of the following:

EMD/SBS 596	Health Justice Practicum and Fieldwork	2
EPH 500	Public Health Practicum	1
EPH 542	Practice-Based Community Health Research	1
EPH 555	Clinic in Climate Justice, Climate Policy, Law, and Public Health	1
HPM 555	Health Policy or Health Care Management Practicum	1

TRACK REQUIREMENTS

CDE 534	Applied Analytic Methods in Epidemiology	1
SBS 541	Community Health Program Evaluation	1

One of the following:

SBS 580	Qualitative Research Methods in Public Health	1
SBS 676	Questionnaire Development	1

Two of the following (or permission of academic adviser to substitute):

CDE 545	Health Disparities by Race and Social Class: Application to Chronic Disease Epidemiology	1
CDE 572	Obesity Prevention and Lifestyle Interventions	1
HPM 545	Health Disparities	1

SBS 531	Health and Aging	1
SBS 537	Social and Interpersonal Influences on Health	1
SBS 568	Public Health Communication	1
SBS 570	LGBTQ Population Health	1
SBS 573	Social and Cultural Factors in Mental Health and Illness	1
SBS 581	Stigma and Health	1
SBS 583	Sexual and Reproductive Health	1
SBS 585	Sexuality, Gender, Health, and Human Rights	1
SBS 594	Maternal-Child Public Health Nutrition	1

Three elective courses 3

One of the following capstone courses:

CDE 617	Developing a Research Proposal	1
EPH 608	Frontiers of Public Health	1
SBS 574	Developing a Health Promotion and Disease Prevention Intervention	1

Health Policy Track

CORE REQUIREMENTS

BIS 515	Accelerated Biostatistics	2
CDE 515	Accelerated Epidemiology	1
EPH 510	Health Policy and Health Care Systems	1
EPH 513	Major Health Threats: Determinants and Solutions	1
EPH 515	Ethics and Public Health: An Introduction	0
SBS 505	Accelerated Social and Behavioral Foundations of Health	1

One of the following:

EMD/SBS 596	Health Justice Practicum and Fieldwork	2
EPH 500	Public Health Practicum	1
EPH 542	Practice-Based Community Health Research	1
EPH 555	Clinic in Climate Justice, Climate Policy, Law, and Public Health	1
HPM 555	Health Policy or Health Care Management Practicum	1
SBS 541	Community Health Program Evaluation	1

TRACK REQUIREMENTS

HPM 514	Health Politics, Governance, and Policy	1
HPM 570	Cost-Effectiveness Analysis and Decision-Making	1
HPM 583	Methods in Health Services Research	1
HPM 586	Microeconomics for Health Policy and Health Management	1
One additional Health Policy and Management course		1
Three elective courses		3

One of the following capstone courses:

HPM 597	Capstone Course in Health Policy	1
HPM 688	Managing Health Care in Complex Systems	1

Global Health Track

CORE REQUIREMENTS

BIS 515	Accelerated Biostatistics	2
CDE 515	Accelerated Epidemiology	1
EPH 510	Health Policy and Health Care Systems	1
EPH 513	Major Health Threats: Determinants and Solutions	1
EPH 515	Ethics and Public Health: An Introduction	0
SBS 505	Accelerated Social and Behavioral Foundations of Health	1

One of the following:

EMD/SBS 596	Health Justice Practicum and Fieldwork	2
EPH 500	Public Health Practicum	1
EPH 542	Practice-Based Community Health Research	1
EPH 555	Clinic in Climate Justice, Climate Policy, Law, and Public Health	1
HPM 555	Health Policy or Health Care Management Practicum	1
SBS 541	Community Health Program Evaluation	1

TRACK REQUIREMENTS

EMD/HPM 566	Critical Issues in Global Health	1
EPH 557	Evidence-Based Decision-Making in Global Health	1
EPH 591	Global Health Seminar	0

One of the following:

CDE 534	Applied Analytic Methods in Epidemiology	1
HPM 583	Methods in Health Services Research	1

Three Global Health courses from at least two of the five perspectives on public health (list of courses published each fall) 3

Three elective courses 3

Preventive Medicine Track

CORE REQUIREMENTS

BIS 515	Accelerated Biostatistics	2
CDE 515	Accelerated Epidemiology	1
EPH 510	Health Policy and Health Care Systems	1
EPH 513	Major Health Threats: Determinants and Solutions	1
EPH 515	Ethics and Public Health: An Introduction	0
SBS 505	Accelerated Social and Behavioral Foundations of Health	1

One of the following:

EMD/SBS 596	Health Justice Practicum and Fieldwork	2
EPH 500	Public Health Practicum	1
EPH 542	Practice-Based Community Health Research	1
EPH 555	Clinic in Climate Justice, Climate Policy, Law, and Public Health	1
HPM 555	Health Policy or Health Care Management Practicum	1
SBS 541	Community Health Program Evaluation	1

TRACK REQUIREMENTS

CDE 534	Applied Analytic Methods in Epidemiology	1
EHS 575	Introduction to Occupational and Environmental Medicine	1
HPM 570	Cost-Effectiveness Analysis and Decision-Making	1

One of the following:

CDE 562	Nutrition and Chronic Disease	1
CDE 572	Obesity Prevention and Lifestyle Interventions	1
SBS 594	Maternal-Child Public Health Nutrition	1

One of the following:

BIS 540	Fundamentals of Clinical Trials	1
CDE 650	Introduction to Evidence-Based Medicine and Health Care	1
SBS 580	Qualitative Research Methods in Public Health	1
SBS 676	Questionnaire Development	1

One of the following:

EHS 503	Public Health Toxicology	1
EHS 508	Environmental and Occupational Exposure Science	1
EHS 511	Principles of Risk Assessment	1
EHS 573	Epidemiological Issues in Occupational and Environmental Medicine	1

Two elective courses		2
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One of the following capstone courses:

CDE 617	Developing a Research Proposal	1
EPH 608	Frontiers of Public Health	1
SBS 574	Developing a Health Promotion and Disease Prevention Intervention	1

Occupational and Environmental Medicine Track (Yale OEM Fellows)

CORE REQUIREMENTS

EPH 505	Biostatistics in Public Health	1
EPH 507	Social Justice and Health Equity	1

EPH 508	Foundations of Epidemiology and Public Health	1
EPH 510	Health Policy and Health Care Systems	1
EPH 513	Major Health Threats: Determinants and Solutions	1
EPH 515	Ethics and Public Health: An Introduction	0

TRACK REQUIREMENTS

CDE 534	Applied Analytic Methods in Epidemiology	1
EHS 508	Environmental and Occupational Exposure Science	1
EHS 511	Principles of Risk Assessment	1
EHS 573	Epidemiological Issues in Occupational and Environmental Medicine	1
EHS 575	Introduction to Occupational and Environmental Medicine	1
EPH 525	Thesis	2

Four elective courses		4
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Note: Yale 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.

Occupational and Environmental Medicine Track (11-Month Students)

CORE REQUIREMENTS

BIS 515	Accelerated Biostatistics	2
CDE 515	Accelerated Epidemiology	1
EPH 510	Health Policy and Health Care Systems	1
EPH 513	Major Health Threats: Determinants and Solutions	1
EPH 515	Ethics and Public Health: An Introduction	0
SBS 505	Accelerated Social and Behavioral Foundations of Health	1

One of the following:

EMD/SBS 596	Health Justice Practicum and Fieldwork	2
EPH 500	Public Health Practicum	1
EPH 542	Practice-Based Community Health Research	1
EPH 555	Clinic in Climate Justice, Climate Policy, Law, and Public Health	1
HPM 555	Health Policy or Health Care Management Practicum	1
SBS 541	Community Health Program Evaluation	1

TRACK REQUIREMENTS

EHS 503	Public Health Toxicology	1
EHS 508	Environmental and Occupational Exposure Science	1
EHS 511	Principles of Risk Assessment	1

EHS 573	Epidemiological Issues in Occupational and Environmental Medicine	1
EHS 575	Introduction to Occupational and Environmental Medicine	1
Four elective courses		4
One of the following capstone courses:		
CDE 617	Developing a Research Proposal	1
EPH 608	Frontiers of Public Health	1
SBS 574	Developing a Health Promotion and Disease Prevention Intervention	1

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

The following competencies for the Advanced Professional M.P.H. program are currently under review and will be updated in fall 2020.

CORE CURRICULUM

Upon completing the core curriculum of the Advanced Professional 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.

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, social group, community, 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.

HEALTH POLICY TRACK

Upon receiving an M.P.H. degree in the Advanced Professional M.P.H. Program, with a concentration in Health Policy, 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.
- 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 management skills.
- Work with and incorporate the perspectives of culturally diverse groups.

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.

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.

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 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.

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.

A total of 18 course units is required for the M.P.H. degree. Students in the B.A.-B.S./M.P.H. program affiliate with one of seven departments or programs at the School of Public Health. Their primary adviser comes from this department/program, and their specific requirements within the five-year program are defined by this affiliation. Several course requirements can be taken while a senior at Yale College, with the remaining requirements satisfied during the one-year enrollment at the School of Public Health.

In their four years of Yale College enrollment, students complete a standard Yale College major, which consists of at least 36 course credits, 32 of which must be Yale College undergraduate approved courses credits. Two of those Yale College courses may be counted as electives toward the M.P.H. degree requirements. These electives must be on the School of Public Health's list of approved courses.

The remaining 4 course credits of the 36 required for a Yale College degree are typically taken at YSPH in order to fulfill the M.P.H. degree requirements. Students may take additional YSPH courses while at Yale College, as long as they complete the required 32 undergraduate courses.

Students accepted into the B.A.-B.S./M.P.H. program typically take four or more of the following YSPH courses during their senior year:

EPH 100	Professional Skills Series
EPH 505	Biostatistics in Public Health
EPH 507	Social Justice and Health Equity
EPH 508	Foundations of Epidemiology and Public Health
EPH 510	Health Policy and Health Care Systems
EPH 513	Major Health Threats: Determinants and Solutions
EPH 515	Ethics and Public Health: An Introduction

Students who follow this pattern will take 6 course units per term during their fifth year. However, most students are able to reduce the course load in the fifth year by receiving credit for additional course units while they are at Yale College. There are several ways they may be able to do this:

- Take additional YSPH courses. Students may have received advance placement credit or have satisfied most of the requirements for their Yale College major, and consequently may have more flexibility in their schedule. As mentioned, Yale College students may take additional YSPH courses while at Yale College, as long as they complete the required 32 undergraduate courses. They simply will not get credit on their Yale College transcript if they have already taken four graduate-level courses. They should work with their college dean on any logistics surrounding this.
- Take cross-listed courses. YSPH cross-lists several courses with Yale College. A student taking a cross-listed course should register for the Yale College course number. That way it will not count as one of the student's graduate and professional school courses, but YSPH can count it as a YSPH course and give the student an additional Yale College elective.
- Take Yale College courses as Global Health Concentration (GHC) electives. Like any M.P.H. student, Yale College students are eligible to take courses from the approved list of Global Health electives. (See the Global Health Concentration curriculum guidelines.) Many of these courses are taught on the central campus.

Before beginning their fifth year at YSPH, students complete a public health internship during the summer between the fourth and fifth years of the B.A.-B.S./M.P.H. program. Information about the summer internship is available at <https://publichealth.yale.edu/myysph/students/mph/practice>.

Students are in full-time residence at the School of Public Health during their fifth year in the program, during which time they complete the remaining required courses and the master's thesis. In order to complete the program and fulfill YSPH's residency requirements, students must take at least 10 course units during their fifth year in the program. Information on each department's degree requirements is available at <https://publichealth.yale.edu/myysph/curriculum/mph>.

Yale College students may apply to YSPH for the joint program in the fall term of their junior year. Candidates for admission must present evidence of a commitment to public health, as well as quantitative skills. In addition, a year of college-level mathematics and a year of science and social science are strongly preferred, although some of these expectations can be completed after applying to the program. Additional expectations may apply to particular departments or programs. Applicants must complete YSPH application forms and submit transcripts, SAT scores, two letters of recommendation (at least one from an instructor in a Yale course), and a personal statement. Approval by the dean of the student's residential college is also required.

Financial aid, if provided during the fifth year, will come from YSPH. The School 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 online at <https://publichealth.yale.edu/myysph/curriculum/joint/ba-bs>.

Shanghai Jiao Tong B.S./M.P.H. Dual-Degree Program

The Shanghai Jiao Tong B.S./M.P.H. Dual-Degree Program in public health gives undergraduate students interested in the field of public health the opportunity to earn a B.S. degree from the Shanghai Jiao Tong University (SJTU) and an M.P.H. degree from the Yale School of Public Health (YSPH) in a five-year joint program.

As participants in the dual-degree program, students will complete their first three academic years at SJTU (including potential study-abroad opportunities that are part of the regular SJTU curriculum). The fourth and fifth academic years of the program will take place at YSPH. After the successful completion of all SJTU requirements (including all requirements for course credits and graduation thesis), students will receive a B.S. degree from SJTU at the end of their fourth academic year; and after successful completion of all program requirements at Yale, students will receive an M.P.H. degree from Yale at the end of their fifth academic year.

SJTU students wishing to apply to the dual-degree program will become eligible to do so in the third year of their academic program at SJTU. Applicants must be in the top of their student cohort (e.g., the third-year class of which they are a member) at SJTU. SJTU students may apply to the dual-degree program between October 1 and November 1 of the third year of their academic program. Students must notify the registry at SJTU of their intent to apply to the program. A committee at SJTU will preselect at most twenty of the most qualified applicants and notify Yale of the intent of those students to apply. Applications must be submitted to the YSPH via its online

application system. The registry at SJTU must also be notified of the intent to apply. Students may apply for a concentration in Biostatistics, Chronic Disease Epidemiology, Environmental Health Sciences, Epidemiology of Microbial Diseases, Health Care Management, Health Policy, or Social and Behavioral Sciences.

SJTU students admitted to the program will spend the entire fourth and fifth years of the program in residence at YSPH taking prescribed classes. A total of 20 course units is required for the Yale M.P.H. degree. Students admitted to the program will also participate in a public health-related internship during the summer between the end of the fourth academic year and the start of the fifth academic year. The internship must be approved by the YSPH Office of Public Health Practice.

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 online at <http://publichealth.yale.edu>.

Yale-NUS College Concurrent-Degree Program

The Yale-NUS College Concurrent-Degree Program in public health gives undergraduate students interested in the field of public health the opportunity to earn a bachelor's degree from Yale-NUS College (Yale-NUS) and an M.P.H. degree from the Yale School of Public Health (YSPH) in a five-year joint program.

As part of the concurrent-degree program, students will complete their first three academic years at Yale-NUS (including potential study-abroad opportunities that are part of the regular Yale-NUS curriculum). The first term of the fourth academic year will then take place at YSPH. In order to satisfy each student's bachelor's degree requirements, the second term of the fourth academic year will take place at Yale-NUS in Singapore. The entire fifth academic year will take place at YSPH. After successful completion of both programs' requirements, students will receive a B.A. or B.S. degree from Yale-NUS and an M.P.H. degree from the Yale School of Public Health.

Yale-NUS students wishing to apply to the concurrent-degree program will become eligible to do so in the third year of their academic program at Yale-NUS. Applicants must be among the top students in their cohort (e.g., the third-year class of which they are a member) at Yale-NUS. Yale-NUS students may apply to the concurrent-degree program between October 1 and November 1 of the third year of their academic program at Yale-NUS. Applications must be submitted to YSPH via its online application system. The registry at Yale-NUS must also be notified of the intent to apply. Students must apply for a concentration in Biostatistics, Chronic Disease Epidemiology, Environmental Health Sciences, Epidemiology of Microbial Diseases, Health Policy, or Social and Behavioral Sciences. Yale-NUS students admitted to the concurrent-degree program will not be eligible to apply for a concentration in Health Care Management.

The first term of the fourth academic year will be spent at YSPH taking 4 credits and beginning work on a capstone project (e.g., senior thesis). The second term of the fourth academic year will be spent at Yale-NUS, where the student will complete a capstone project, take two approved public health-related modules at Yale-NUS or the National University of Singapore, and take one elective/major module. The entire fifth year of the program will be spent in residence at YSPH taking prescribed classes. A total

of 18 course units is required for the M.P.H. degree. Students may, with prior approval, count two courses in their major (e.g., Life Sciences, Mathematics, Computer Science, etc.) or selective electives at Yale-NUS toward the M.P.H. degree requirements of the concurrent-degree program.

As part of the program, Yale-NUS students admitted to the concurrent-degree program will participate in a public health-related internship during the summer between the end of the fourth academic year and the start of the fifth academic year. The internship must be approved by the YSPH Office of Public Health Practice. Students who are not U.S. citizens must complete the internship outside of the United States.

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 online at <http://publichealth.yale.edu>.

Zhejiang University B.S./M.P.H. Dual-Degree Program

The Zhejiang University B.S./M.P.H. Dual-Degree Program in public health gives undergraduate students interested in the field of public health the opportunity to earn a B.S. degree from Zhejiang University (ZJU) and an M.P.H. degree from the Yale School of Public Health (YSPH) in a five-year joint program.

As participants in the dual-degree program, students will complete their first three academic years at ZJU (including potential study-abroad opportunities that are part of the regular ZJU curriculum). The fourth and fifth academic years of the program will take place at YSPH. After the successful completion of all ZJU requirements (including all requirements for course credits and graduation thesis), students will receive a B.S. degree from ZJU at the end of their fourth academic year; and after successful completion of all program requirements at Yale, students will receive an M.P.H. degree from Yale at the end of their fifth academic year.

ZJU students wishing to apply to the dual-degree program will become eligible to do so in the third year of their academic program at ZJU. Applicants must be in the top of their student cohort (e.g., the third-year class of which they are a member) at ZJU. ZJU students may apply to the dual-degree program before December 15 of the third year of their academic program. Students must notify the registry at ZJU of their intent to apply to the program. A committee at ZJU will preselect at most twenty of the most qualified applicants and notify Yale of the intent of those students to apply. Applications must be submitted to the YSPH via its online application system. The registry at ZJU must also be notified of the intent to apply. Students may apply for a concentration in Biostatistics, Chronic Disease Epidemiology, Environmental Health Sciences, Epidemiology of Microbial Diseases, Health Care Management, Health Policy, or Social and Behavioral Sciences.

ZJU students admitted to the program will spend the entire fourth and fifth years of the program in residence at YSPH taking prescribed classes. A total of 20 course units is required for the Yale M.P.H. degree. Students admitted to the program will also participate in a public health-related internship during the summer between the end of

the fourth academic year and the start of the fifth academic year. The internship must be approved by the YSPH Office of Public Health Practice.

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 online at <http://publichealth.yale.edu>.

Accelerated M.B.A./M.P.H. Program in Health Care Management

The Accelerated M.B.A./M.P.H. Program in Health Care Management enables students to earn an M.B.A. degree from the Yale School of Management (SOM) and an M.P.H. degree from the Yale School of Public Health (YSPH) in a twenty-two-month integrated program. The program is designed to provide future health care leaders with the interdisciplinary training and perspective needed to address complex and multidimensional industry challenges.

Students begin the program with an intensive summer session at YSPH, where they complete M.P.H. core courses in Biostatistics, Epidemiology, and Social and Behavioral Sciences. The first year is spent at SOM, and students take courses at both schools during the final year.

CURRICULUM FOR THE ACCELERATED M.B.A./M.P.H. IN HEALTH CARE MANAGEMENT

In this program, students complete a minimum of 14 course units at YSPH and 52 course units at SOM, which include 34.5 units of core requirements and 17.5 elective course units.

Yale School of Public Health

CORE REQUIREMENTS

BIS 515	Accelerated Biostatistics	2
CDE 515	Accelerated Epidemiology	1
EPH 100	Professional Skills Series	0
EPH 510	Health Policy and Health Care Systems	1
EPH 513	Major Health Threats: Determinants and Solutions	1
EPH 515	Ethics and Public Health: An Introduction	0
SBS 505	Accelerated Social and Behavioral Foundations of Health	1

HEALTH CARE MANAGEMENT REQUIREMENTS

HPM 570	Cost-Effectiveness Analysis and Decision-Making	1
HPM 583	Methods in Health Services Research	1
HPM 688	Managing Health Care in Complex Systems	1
HPM 698	Health Care Policy, Finance, and Economics	1
HPM 699	Colloquium in Health Care Leadership	0
HPM 700	Colloquium in Health Care Leadership	0.5

1 to 2 electives at YSPH

1–2

One of the following global health courses: ¹

CDE 551	Global Noncommunicable Disease	1
EMD/HPM 566	Critical Issues in Global Health	1
EMD/HPM 580	Reforming Health Systems: Using Data to Improve Health in Low- and Middle-Income Countries	1
HPM 576	Comparative Health Care Systems	1

¹ Students may select an alternative global health course from the Global Health Concentration course list.

One of the following:

HPM 536	Narratives in Health Media on the Social Internet	0.5
HPM 595	Food and Drug Administration Law	1
MGT 657	Creating Healthcare and Life Science Ventures	0.5
MGT 663	The Life Science Industry	0.5

One of the following:

EMD/SBS 596	Health Justice Practicum and Fieldwork	2
EPH 500	Public Health Practicum	1
EPH 520	Summer Internship	0
EPH 542	Practice-Based Community Health Research	1
EPH 555	Clinic in Climate Justice, Climate Policy, Law, and Public Health	1
HPM 555	Health Policy or Health Care Management Practicum ¹	1
SBS 541	Community Health Program Evaluation	1

¹ Specifically, students must complete the Health Care Management Practicum.

Yale School of Management

CORE REQUIREMENTS

MGT 401	Managing Groups & Teams	1
MGT 402	Basics of Accounting	2
MGT 403	Probability Modeling & Statistics	2
MGT 404	Basics of Economics	2.5
MGT 405	Modeling Managerial Decisions	2
MGT 408	Introduction to Negotiation	1
MGT 410	Competitor	2
MGT 411	Customer	2
MGT 412	Investor	2
MGT 413	State & Society	2
MGT 417	Power & Politics	2
MGT 418	Global Virtual Teams	2

MGT 420	The Workforce	2
MGT 421	Innovator	2
MGT 422	Operations Engine	2
MGT 423	Sourcing & Managing Funds	2
MGT 425	The Global Macroeconomy	2
MGT 430	The Executive	2
International Experience (during spring break)		0

COMPETENCIES FOR THE ACCELERATED M.B.A./M.P.H. IN HEALTH CARE MANAGEMENT

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.

Health Care Management Program

Upon receiving an M.P.H. degree in the Accelerated M.B.A./M.P.H. Program in Health Care Management, the student will be able to:

- Evaluate health care financing, regulatory, and delivery systems.
- Conduct financial analyses, including reading and analyzing financial statements.
- Utilize statistical analysis skills to conduct health systems and policy research.
- Apply management problem-solving skills to improve functioning of organizations and agencies in health systems.

- Apply operations management concepts to address organizational performance issues in health service organizations.

Other Joint-Degree Programs

In addition to the joint-degree programs previously discussed, the Yale School of Public Health offers the following joint-degree programs in collaboration with the Yale Graduate School of Arts and Sciences and other Yale professional schools:

Divinity M.Div./M.P.H. and M.A.R./M.P.H.

Environment M.F./M.P.H., M.F.S./M.P.H., M.E.Sc./M.P.H., M.E.M./M.P.H.

Graduate School of Arts and Sciences M.A./M.P.H. with the Jackson Institute for Global Affairs; International and Development Economics; and the MacMillan Center for International and Area Studies

Law J.D./M.P.H.

Management M.B.A./M.P.H.

Medicine M.D./M.P.H. (please see the Advanced Professional M.P.H.) and M.M.Sc./M.P.H. with the Physician Associate Program

Nursing M.S.N./M.P.H.

Joint-degree candidates must apply to and be accepted by each school. Students should contact admissions offices at both schools to learn about admission requirements and deadlines. Joint-degree students must fulfill degree requirements for both programs. YSPH students are typically required to complete a minimum of 15 course units toward the M.P.H. degree. Advisers from the respective schools will assist students with mapping curriculum. For specific degree requirement information, students should contact the YSPH registrar.

MASTER OF SCIENCE IN PUBLIC HEALTH

The Master of Science (M.S.) degree program in Public Health is designed with an emphasis on mastering the skills in individual specialty areas within public health. Concentrations are currently offered in Biostatistics, Chronic Disease Epidemiology, Epidemiology of Infectious Diseases, and Health Informatics. The length of study leading to the M.S. degree is two years full-time for the Biostatistics and Health Informatics concentrations and one year full-time for the Chronic Disease Epidemiology and Epidemiology of Infectious Diseases concentrations. Part-time students in the Biostatistics and Chronic Disease Epidemiology concentrations must complete the degree within five years of matriculation. Part-time students in the Epidemiology of Infectious Diseases concentration may take up to two years to complete the degree. Part-time enrollment in the Health Informatics concentration is not permitted.

The M.S. in Public Health is offered through the School's affiliation with the Graduate School of Arts and Sciences. The Graduate Studies Executive Committee (GSEC) and the director of graduate studies (DGS) are responsible for overseeing the progress of M.S. students.

Biostatistics Concentration (BIS)

The M.S. with a concentration in Biostatistics is a two-year program that provides training in clinical trials, epidemiologic methodology, implementation science, statistical genetics, and mathematical models for infectious diseases. Students have a choice of two pathways: the *Biostatistics Standard Pathway* and the *Biostatistics Implementation and Prevention Science Methods Pathway*. 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. Part-time enrollment is permitted.

DEGREE REQUIREMENTS

The Biostatistics concentration requires the completion of fifteen required and elective courses (excluding the Seminar, BIS 525/BIS 526; the Summer Internship, BIS 695; EPH 100, and EPH 600).

The Graduate School requires an overall grade average of High Pass, including grades of Honors in at least two full-term graduate courses for students enrolled in a two-year program. In order to maintain the minimum average of High Pass, each grade of Pass on the student's transcript must be balanced by one grade of Honors. Each grade of Fail must be balanced by two grades of Honors. If a student retakes a course in which the student has received a failing grade, only the newer grade will be considered in calculating this average. The initial grade of Fail, however, will remain on the student's transcript. A grade awarded at the conclusion of a full-year course in which no grade is awarded at the end of the first term would be counted twice in calculating this average.

CURRICULUM

Required Courses for Both Pathways

Or approved substitutions.

BIS 525	Seminar in Biostatistics and Journal Club ¹	0
BIS 526	Seminar in Biostatistics and Journal Club ¹	0
BIS 623	Advanced Regression Models	1
or S&DS 612	Linear Models	
BIS 628	Longitudinal and Multilevel Data Analysis	1
BIS 630	Applied Survival Analysis	1
or BIS 643	Theory of Survival Analysis	
BIS 678	Statistical Practice I	1
BIS 679	Advanced Statistical Programming in SAS and R	1
BIS 681	Statistical Practice II	1
BIS 695	Summer Internship in Biostatistical Research ¹	0
EPH 100	Professional Skills Series ¹	0
EPH 508	Foundations of Epidemiology and Public Health ²	1
EPH 600	Research Ethics and Responsibility ¹	0
EPH 608	Frontiers of Public Health ²	1
S&DS 541	Probability Theory ³	1
or S&DS 551	Stochastic Processes	
or S&DS 600	Advanced Probability	
S&DS 542	Theory of Statistics ³	1
or S&DS 610	Statistical Inference	

¹ These courses do not count toward the fifteen required courses.

² Students entering the program with an M.P.H. or relevant graduate degree may be exempt.

³ These courses are offered in the Graduate School of Arts and Sciences.

Additional Required Courses: Standard Pathway

Two of the following:

BIS 557	Computational Statistics	1
BIS 567	Bayesian Statistics	1
BIS 643	Theory of Survival Analysis ¹	1
BIS 646	Nonparametric Statistical Methods and Their Applications	1
BIS 691	Theory of Generalized Linear Models	1

¹ Cannot fulfill elective credit if substituted for BIS 630.

Three electives in Statistics and Data Science. Suggested electives are:

S&DS 555	Introductory Machine Learning ¹	1
S&DS 563	Multivariate Statistical Methods for the Social Sciences ¹	1

S&DS 565	Applied Data Mining and Machine Learning ¹	1
S&DS 612	Linear Models ^{1,2}	1
Any other 600-level S&DS course ¹		

¹ These courses are offered in the Graduate School of Arts and Sciences.

² Cannot fulfill elective credit if substituted for BIS 623.

Students wishing to complete a thesis may enroll in BIS 649/BIS 650, Master's Thesis Research. This would be an additional requirement and cannot replace any of the required courses noted above. All students who complete a thesis will be required to present their research during a public seminar to the Biostatistics faculty and students in order to graduate.

Additional Required Courses: Implementation and Prevention Science Methods Pathway

BIS 629	Advanced Methods for Implementation and Prevention Science	1
EMD 533	Implementation Science	1

One of the following:

BIS 536	Measurement Error and Missing Data	1
BIS 537	Statistical Methods for Causal Inference	1
BIS 631	Advanced Topics in Causal Inference Methods	1

At least two of the following:

CDE 516	Principles of Epidemiology II	1
CDE 534	Applied Analytic Methods in Epidemiology	1
EMD 538	Quantitative Methods for Infectious Disease Epidemiology	1
HPM 570	Cost-Effectiveness Analysis and Decision-Making ¹	1
HPM 586	Microeconomics for Health Policy and Health Management	1
HPM 587	Advanced Health Economics	1
HPM 611	Policy Modeling ¹	1
SBS 541	Community Health Program Evaluation ¹	1
SBS 574	Developing a Health Promotion and Disease Prevention Intervention	1
SBS 580	Qualitative Research Methods in Public Health	1
SBS 676	Questionnaire Development	1
S&DS 565	Applied Data Mining and Machine Learning ²	1

¹ These courses are highly recommended for the Implementation and Prevention Science Methods Pathway.

² This course is offered by the Graduate School of Arts and Sciences.

A master's thesis is strongly recommended in place of BIS 681 and one elective. All students who complete a thesis will be required to present their research during a public seminar to the Biostatistics faculty and students in order to graduate.

COMPETENCIES

The following competencies for the M.S. with a concentration in Biostatistics are currently under review and will be updated in fall 2020.

Upon receiving an M.S. in the Biostatistics concentration of Public Health, 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.

Chronic Disease Epidemiology Concentration (CDE)

There is a high demand for well-trained graduates in chronic disease epidemiology. The M.S. with a concentration in Chronic Disease Epidemiology is a one-year program that 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. Part-time enrollment is permitted.

DEGREE REQUIREMENTS

The Chronic Disease Epidemiology concentration consists of required and elective course work and satisfactory completion of the capstone experience. A total of ten courses is required (excluding the Seminar, CDE 525/CDE 526; and EPH 600). It is expected that this program will be completed during a single academic year when a student enrolls full-time. Students with an M.P.H. or relevant graduate degree 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.

The Graduate School requires an overall grade average of High Pass, including a grade of Honors in at least one full-term graduate course for students enrolled in a one-year program. In order to maintain the minimum average of High Pass, each grade of Pass on the student's transcript must be balanced by one grade of Honors. Each grade of Fail must be balanced by two grades of Honors. If a student retakes a course in which the student has received a failing grade, only the newer grade will be considered in calculating this average. The initial grade of Fail, however, will remain on the student's transcript. A grade awarded at the conclusion of a full-year course in which no grade is awarded at the end of the first term would be counted twice in calculating this average.

CURRICULUM

Required Courses

Or approved substitutions.

CDE 516	Principles of Epidemiology II	1
CDE 525	Seminar in Chronic Disease Epidemiology ¹	0
CDE 526	Seminar in Chronic Disease Epidemiology ¹	0
CDE 617	Developing a Research Proposal ²	1
or CDE 600	Independent Study or Directed Readings	
EPH 508	Foundations of Epidemiology and Public Health	1
EPH 600	Research Ethics and Responsibility ¹	0
EPH 608	Frontiers of Public Health ³	1

¹ These courses do not count toward the ten required courses.

² In the capstone course CDE 617, the student is required to develop a grant application that is deemed reasonably competitive by the instructor. An alternative to this capstone course is an individualized tutorial (CDE 600), in which the student completes a manuscript that is suitable for submission for publication in a relevant journal.

³ Students entering the program with an M.P.H. or relevant graduate degree may be exempt.

Three quantitative courses from the following (or approved substitutions):

BIS 536	Measurement Error and Missing Data	1
BIS 537	Statistical Methods for Causal Inference	1
BIS 621	Regression Models for Public Health	1
BIS 628	Longitudinal and Multilevel Data Analysis	1
BIS 630	Applied Survival Analysis	1
S&DS 563	Multivariate Statistical Methods for the Social Sciences ¹	1

¹ This course is offered in the Graduate School of Arts and Sciences.

Two elective courses in Chronic Disease Epidemiology. Suggested electives are:

CDE 502	Physiology for Public Health	1
CDE 532	Epidemiology of Cancer	1
CDE 534	Applied Analytic Methods in Epidemiology	1
CDE 535	Epidemiology of Heart Disease and Stroke	1
CDE 545	Health Disparities by Race and Social Class: Application to Chronic Disease Epidemiology	1
CDE 551	Global Noncommunicable Disease	1
CDE 562	Nutrition and Chronic Disease	1
CDE 572	Obesity Prevention and Lifestyle Interventions	1
CDE 597	Genetic Concepts in Public Health	1
CDE 650	Introduction to Evidence-Based Medicine and Health Care	1

Students must complete one additional elective, chosen in consultation with their adviser.

COMPETENCIES

The following competencies for the M.S. with a concentration in Chronic Disease Epidemiology are currently under review and will be updated in fall 2020.

Upon receiving an M.S. in the Chronic Disease Epidemiology concentration of Public Health, 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 epidemiologic studies at an intermediate level.
- 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 epidemiologic research proposal or a publishable epidemiologic article.
- Identify, interpret, and use routinely collected data on disease occurrence.
- Review, critique, and evaluate epidemiologic reports and research articles at an intermediate level.

Epidemiology of Infectious Diseases Concentration (EID)

The M.S. with a concentration in Epidemiology of Infectious Diseases will benefit clinical fellows seeking formal research training in infectious disease epidemiology methods. The program is designed for students with sufficient quantitative background who are seeking to gain additional skills and research experience in order to work in mentored research positions or prepare/improve their competitiveness for doctoral training related to the study of communicable diseases.

This one-year program (full-time) offers two areas of specialization: a quantitative area aims to provide quantitatively focused research training in the epidemiology of infectious diseases, focusing on the analysis of communicable disease data as well as modeling and simulation; and a clinical area aims to provide research training for clinicians and clinical trainees interested in furthering their research expertise. Students may choose to complete the program in two years (part-time).

Applicants to the quantitative area of specialization will have at least an undergraduate degree and sufficient background in mathematics/statistics to take advanced biostatistics courses without taking introductory biostatistics courses.

Applicants to the clinical area of specialization will typically have a graduate degree from a clinical program or currently be enrolled in a clinical degree-granting program.

DEGREE REQUIREMENTS

The Epidemiology of Infectious Diseases concentration requires a total of ten courses (excluding EPH 600 and the yearlong Seminar, EMD 525/EMD 526), including satisfactory completion of the capstone course. There are two capstone course options:

Option 1 We will offer a new course: EMD 625, How to Develop, Write, and Evaluate an NIH Proposal. Students in this course will develop an NIH-style research proposal focusing on a topic related to infectious disease epidemiology. This course will be taken by students in the final term of their M.S. program. Students will meet as a group for cross-cutting didactic sessions on reading RFAs, NIH peer review and scoring, effective grant writing and grantsmanship, and budget construction. Students will work one-on-one outside of these sessions with faculty mentors to construct their grant proposals over the course of the term. They will work with other students in the course to refine their projects and will do an oral presentation of their proposal at the final capstone course symposium at the end of the term.

Option 2 Students may elect to enroll in EMD 563, Laboratory and Field Studies in Infectious Diseases. This course provides students with hands-on training in laboratory or epidemiological research techniques. Students will work one-on-one with faculty members on existing or new projects. Students choosing this option will write up and present their findings at the final capstone course symposium at the end of their final term.

The Graduate School requires an overall grade average of High Pass, including a grade of Honors in at least one full-term graduate course for students enrolled in a one-year program. In order to maintain the minimum average of High Pass, each grade of Pass

on the student's transcript must be balanced by one grade of Honors. Each grade of Fail must be balanced by two grades of Honors. If a student retakes a course in which the student has received a failing grade, only the newer grade will be considered in calculating this average. The initial grade of Fail, however, will remain on the student's transcript. A grade awarded at the conclusion of a full-year course in which no grade is awarded at the end of the first term would be counted twice in calculating this average.

CURRICULUM

Required Courses: Quantitative Specialization

Or approved substitutions.

BIS 623	Advanced Regression Models	1
BIS 630	Applied Survival Analysis	1
EMD 517	Principles of Infectious Diseases I	1
EMD 518	Principles of Infectious Diseases II	1
EMD 525	Seminar in Epidemiology of Microbial Diseases ¹	0
EMD 526	Seminar in Epidemiology of Microbial Diseases ¹	0
EMD 533	Implementation Science	1
or EMD 539	Introduction to Public Health Surveillance	
EMD 538	Quantitative Methods for Infectious Disease Epidemiology	1
EMD 625	How to Develop, Write, and Evaluate an NIH Proposal	1
or EMD 563	Laboratory and Field Studies in Infectious Diseases	
EPH 508	Foundations of Epidemiology and Public Health	1
EPH 600	Research Ethics and Responsibility ¹	0
EPH 608	Frontiers of Public Health ²	1

¹ These courses do not count toward the ten required courses.

² Students entering the program with an M.P.H. or relevant graduate degree may be exempt.

In addition, students must complete one elective course in Epidemiology of Infectious Diseases.

Required Courses: Clinical Specialization

Or approved substitutions.

BIS 505	Biostatistics in Public Health II	1
or CDE 534	Applied Analytic Methods in Epidemiology	
EMD 517	Principles of Infectious Diseases I	1
EMD 518	Principles of Infectious Diseases II	1
EMD 525	Seminar in Epidemiology of Microbial Diseases ¹	0
EMD 526	Seminar in Epidemiology of Microbial Diseases ¹	0
EMD 530	Health Care Epidemiology: Improving Health Care Quality through Infection Prevention	1
or EMD 536	Investigation of Disease Outbreaks	

EMD 567	Tackling the Big Three: Malaria, TB, and HIV in Resource-Limited Settings	1
or EMD 533	Implementation Science	
EMD 625	How to Develop, Write, and Evaluate an NIH Proposal	1
EPH 505	Biostatistics in Public Health	1
EPH 508	Foundations of Epidemiology and Public Health	1
EPH 600	Research Ethics and Responsibility ¹	0
EPH 608	Frontiers of Public Health ²	1

¹ These courses do not count toward the ten required courses.

² Students entering the program with an M.P.H. or relevant graduate degree may be exempt.

In addition, students must complete one elective course in Epidemiology of Infectious Diseases.

COMPETENCIES

The following competencies for the M.S. with a concentration in Epidemiology of Infectious Diseases are currently under review and will be updated in fall 2020.

Upon receiving an M.S. in the Epidemiology of Infectious Diseases concentration of Public Health, the student will be able to:

Quantitative Specialization

- Explain the role of quantitative and qualitative methods and sciences in describing and assessing a population's health (especially in terms of risk/burden of infectious diseases).
- Explain ecological perspective on the connection between human health, animal health, and ecosystem health with respect to microbial threats.
- Analyze datasets that arise in the context of outbreaks, epidemics, and endemic infectious diseases.

Clinical Specialization

- Explain the role of quantitative and qualitative methods and sciences in describing and assessing a population's health (especially in terms of risk/burden of infectious diseases).
- Explain ecological perspective on the connection between human health, animal health, and ecosystem health with respect to microbial threats.
- Design observational and/or experimental studies to study the relationship between host, microbial, or environmental factors on the occurrence or control of infectious diseases.

Health Informatics Concentration (HI)

The M.S. with a concentration in Health Informatics is a two-year program that provides well-rounded training in health informatics, with a balance of core courses from such areas as information sciences, clinical informatics, clinical research informatics, consumer health and population health informatics, and data science,

and more broadly health policy, social and behavioral science, biostatistics, and epidemiology. First-year courses survey the field; the typical second-year courses are more technical and put greater emphasis on mastering the skills in health informatics.

Applicants should typically have an undergraduate degree with a focus in health, computer science, and mathematics/statistics. Applicants must submit scores from either the Medical College Admission Test (MCAT) or the Graduate Record Examinations (GRE) General Test. Students whose native language is not English must take the TOEFL examination. Part-time enrollment is not permitted.

DEGREE REQUIREMENTS

The Health Informatics concentration consists of a total of fourteen courses (excluding EPH 600, Research Ethics and Responsibility): eight required courses, four electives, and satisfactory completion and presentation of a yearlong capstone project. 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 and their adviser prior to enrolling in the substitute courses.

The Graduate School requires an overall grade average of High Pass, including grades of Honors in at least two full-term graduate courses for students enrolled in a two-year program. In order to maintain the minimum average of High Pass, each grade of Pass on the student's transcript must be balanced by one grade of Honors. Each grade of Fail must be balanced by two grades of Honors. If a student retakes a course in which the student has received a failing grade, only the newer grade will be considered in calculating this average. The initial grade of Fail, however, will remain on the student's transcript. A grade awarded at the conclusion of a full-year course in which no grade is awarded at the end of the first term would be counted twice in calculating this average.

CURRICULUM

Required Courses

BIS 562	Clinical Decision Support	1
BIS 633	Population and Public Health Informatics	1
BIS 634	Computational Methods for Informatics	1
BIS 638	Clinical Database Management Systems and Ontologies	1
CB&B 740	Introduction to Health Informatics ¹	1
CB&B 750	Core Topics in Biomedical Informatics ¹	1
EPH 508	Foundations of Epidemiology and Public Health	1
EPH 600	Research Ethics and Responsibility ²	0
EPH 608	Frontiers of Public Health ³	1

¹ These courses are offered in the Graduate School of Arts and Sciences.

² This course does not count toward the fourteen required courses.

³ Students entering the program with an M.P.H. or relevant graduate degree may be exempt.

Suggested electives (four courses are required):

BIS 540	Fundamentals of Clinical Trials	1
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BIS 557	Computational Statistics	1
BIS 567	Bayesian Statistics	1
BIS 621	Regression Models for Public Health	1
BIS 628	Longitudinal and Multilevel Data Analysis	1
BIS 643	Theory of Survival Analysis	1
BIS 679	Advanced Statistical Programming in SAS and R	1
BIS 691	Theory of Generalized Linear Models	1
CB&B 555	Unsupervised Learning for Big Data ¹	1
CB&B 567	Topics in Deep Learning: Methods and Biomedical Applications ¹	1
CB&B 645	Statistical Methods in Computational Biology ¹	1
CDE 566	Causal Inference Methods in Public Health Research	1
CPSC 546	Data and Information Visualization ¹	1
CPSC 564	Topics in Foundations of Machine Learning ¹	1
CPSC 577	Natural Language Processing ¹	1
EMD 533	Implementation Science	1
EPH 510	Health Policy and Health Care Systems	1
HPM 560	Health Economics and U.S. Health Policy	1
HPM 570	Cost-Effectiveness Analysis and Decision-Making	1
IMED 625	Principles of Clinical Research ¹	1
MGT 534	Personal Leadership ²	1
MGT 656	Management of Software Development ²	1
NURS 922	Introduction to Clinical Research Informatics ³	1
S&DS 530	Data Exploration and Analysis ¹	1
S&DS 555	Introductory Machine Learning ¹	1
S&DS 562	Computational Tools for Data Science ¹	1
S&DS 565	Applied Data Mining and Machine Learning ¹	1
S&DS 583	Time Series with R/Python ¹	1
S&DS 584	Applied Graphical Models ¹	1
S&DS 610	Statistical Inference ¹	1
S&DS 663	Computational Mathematics for Data Science ¹	1
S&DS 664	Information Theory ¹	1
S&DS 670	Theory of Deep Learning ¹	1

¹ These courses are offered in the Graduate School of Arts and Sciences.

² These courses are offered in the School of Management.

³ This course is offered in the School of Nursing.

In addition, in the second year of the program, students are required to complete an independent capstone project under the direction of a faculty member. This project may fall into one of the main areas—clinical informatics; clinical research informatics; population health informatics; and implementation of new methods and technology—and may include elements from several of these areas. Students are required to prepare

a carefully written report and make an oral presentation of the work to the faculty and students. A capstone committee consisting of two faculty members and one outside reader will provide guidance to the candidate as to the suitability of the project and will monitor its progress.

COMPETENCIES

The following competencies for the M.S. with a concentration in Health Informatics are currently under review and will be updated in fall 2020.

Upon receiving an M.S. in the Health Informatics concentration of Public Health, the student will be able to:

- Select informatics methods appropriate for a given public health context.
- Compare the health information system structure and function across regional, national, and international settings.
- Assess population informatics needs, assets, and capacities that affect communities' health.
- Propose strategies to identify stakeholders and build coalitions and partnerships for influencing public health informatics.
- Communicate audience-appropriate public health content, both in writing and through oral presentation.
- Apply systems thinking tools to a public health informatics issue.

DOCTORAL DEGREE

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.

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

The primary mission of the doctoral program in 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. 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 School's faculty.

Degree Requirements

There are six departments in Public Health in which doctoral students may choose a specialty: Biostatistics, Chronic Disease Epidemiology, Environmental Health Sciences, Epidemiology of Microbial Diseases, Health Policy and Management, and Social and Behavioral Sciences. Requirements for each department vary and are outlined under Departmental 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

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 departmental requirements (see Departmental Requirements for course requirements in each department). All first-year Public Health doctoral students are required to participate in a course covering both practical and theoretical issues in research ethics (EPH 600); this course is in addition to the minimum required courses. Additionally, all first-year students are required to enroll in EPH 608, Frontiers of Public Health. Students entering the Ph.D. program with an M.P.H. may be exempt from this course as determined by the director of graduate studies (DGS). The Graduate School requires that Ph.D. students achieve a grade of Honors in at least two full-term doctoral-level courses. Additionally students must maintain a High Pass average. (This applies to courses taken after matriculation in the Graduate School and during the nine-month academic year.)

QUALIFYING EXAMINATIONS

The required qualifying examinations are usually taken at the end of the second year of study. In order to meet the different departmental needs, each department has developed a qualifying examination format; details are provided in each departmental program description. 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 during the spring term of the student's second year or in June of that year.

PROSPECTUS GUIDELINES

Before the end of the spring term of the third year, each student must submit a Dissertation Prospectus, i.e., 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 thesis adviser 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 DAC members and the prospectus approved by the end of the third year (May).

The DAC consists of at least three members, including the thesis adviser, who must have a Graduate School appointment and will chair the committee. Two members are expected to be Yale School of Public Health faculty, but participation of faculty members from other departments is encouraged. An additional committee member who is a recognized authority in the area of the dissertation may be selected from outside the University; a supporting *curriculum vitae* must be provided. The student should also submit a one-page specific aims (for the research plan) and a rationale for each committee member. The proposed DAC members must approve the one-page specific aims stating that they have agreed to serve on the committee. The Graduate Studies Executive Committee (GSEC) prefers that students submit this one-page specific aims document for approval prior to developing the prospectus. Once the GSEC approves the student's DAC and specific aims, the student works with the DAC committee to develop the prospectus.

The purpose of the prospectus is to formalize an understanding between the student, the DAC, and the GSEC regarding the scholarship of a proposed dissertation project. The prospectus should:

- Provide a detailed description of the research plan as outlined below, including title, topic, background, significance, study questions, analytic plan, and methods;
- Establish a consensus between the student, the DAC, and the GSEC that the research plan meets the requisite standards of originality, scope, significance, and virtuosity;
- Formalize the DAC's willingness to work with the student to see the proposed research plan to successful completion.

The prospectus should be written in clear, plain English with minimal jargon, abbreviations, or colloquialisms and is limited to a *maximum* of twenty pages (double-spaced). All tables, graphs, figures, diagrams, and charts must be included within the

twenty-page limit. References are not part of the page limit. Be succinct and remember that there is no requirement to use all twenty pages. A prospectus found not to comply with these requirements will be returned without review.

The following format should be used (similar to NIH guidelines):

Please note that students who have written an NIH F30 or F31 proposal may submit the Specific Aims and Research Strategy of the proposal.

1. Title of proposed dissertation (can be a working title).
2. Specific aims (one page): A self-contained description of the project, which should be informative to other persons working in the same or related fields. State concisely the goals of the proposed research and summarize the expected outcome(s), including the impact that the results of the proposed research will exert on the research field(s) involved.
3. Research strategy: Use the following subsections:
 - a. Significance: This section should place the research project in context and describe the proposed research in a manner intelligible to a nonspecialist. This should include a brief but critical evaluation of the relevant literature and a description of how the proposed research project will advance scientific knowledge and/or technical capability in one or more broad fields.
 - b. Innovation: Explain how the application challenges and seeks to shift current research paradigm(s). Describe any novel theoretical concepts, approaches or methodologies, instrumentation, or interventions to be developed or used, and any advantage(s) over existing methodologies, instrumentation, or interventions.
 - c. Approach: Outline the research project envisioned at this time and sketch out the plan to attain the overall goals of the project. Describe the overall strategy, methodology, and analyses to be used. Include preliminary data, if available. Acknowledge pitfalls and limitations of the research, and if possible suggest alternative strategies.
4. References: Should be included at the end (not counted in the page limit).

The prospectus submitted to the GSEC must be the version approved by the student's DAC and must be submitted together with the Submission of Dissertation Prospectus form (or e-mails from each DAC member acknowledging their approval).

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

Weekly meetings with the chair of the DAC are recommended. Regular face-to-face meetings of the full DAC are invaluable and are expected throughout the student's research toward the thesis. The DAC is expected to meet at least twice each year, and more frequently if necessary. Since dissertation progress reports at the Graduate School 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 plans for the coming year. The document is to be distributed to the other committee members for comments. The student and the DGS are to receive a copy of the document from the DAC chair.

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 GSEC.

ADMISSION TO CANDIDACY

After all predissertation requirements are successfully completed (course requirements for the chosen department, grades of Honors in at least two full-term doctoral-level courses, an overall High Pass average, successful completion of the qualifying examination, and approval of the dissertation prospectus by the GSEC), 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. When students advance to candidacy, the registrar's office automatically submits a petition for the awarding of the M.Phil. degree.

The Thesis/Dissertation

The Ph.D. thesis in PH should be of publishable quality and represent a substantial contribution to the advancement of knowledge in a field of scholarship. 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 resulting in 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 and meta-analysis 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 must include introductory and discussion chapters to summarize and integrate the published papers.

The DAC reviews the progress of the dissertation research and decides when the dissertation is ready to be submitted to the readers. This decision is made based on a closed defense of the dissertation. The dissertation defense involves a formal oral presentation to the DAC. (Per the adviser's discretion, other invited faculty may be present.) Upon completion of the closed defense, the chair/adviser of the DAC submits its recommendation to the DGS along with the names of three appropriate readers for GSEC review.

There will be a minimum of three readers, one of whom is at YSPH. The second reader can be from YSPH or another Yale department. Both Yale readers must hold a Graduate School appointment, and at least one should be a senior faculty member. The third reader must be selected from outside the University. All readers must be recognized authorities in the area of the dissertation. The outside reader must submit a curriculum vitae for review by the GSEC. The outside reader should be an individual who has not coauthored a publication(s) with members of the student's DAC and/or the student within the preceding three years. However, this restriction does not apply to mega-multiauthored publications. Members of the DAC are not eligible to serve as readers. After the completed readers' reports are received by the Graduate School, they are reviewed by the DGS prior to making a School of Public Health 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

Doctor of Philosophy (Ph.D.) dissertations in PH must be presented in a public seminar. This presentation is scheduled after the closed defense, after submission of the dissertation to the readers, and preferably prior to the receipt and consideration of the readers' reports. At least one member each of the DAC and GSEC is 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 YSPH.

Departmental Requirements

The specific requirements with regard to courses, qualifying examinations, and admission to candidacy set by Public Health departments 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 Department 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 departments in the School of Public Health, 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 department 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

Ph.D. students in Biostatistics have the choice of two pathways: the *Biostatistics Standard Pathway* and the *Biostatistics Implementation and Prevention Science Methods Pathway*. In each pathway, students are required to take a minimum of sixteen courses (not including BIS 525, BIS 526, BIS 695, and EPH 600). Course waivers must be recommended by the academic adviser and approved by the DGS. Students funded by specific fellowships may be subject to additional requirements and should discuss this with their adviser.

Required courses (or their equivalents) for both pathways are:

BIS 525	Seminar in Biostatistics and Journal Club ¹	0
BIS 526	Seminar in Biostatistics and Journal Club ¹	0
BIS 610	Applied Area Readings for Qualifying Exams	1
BIS 623	Advanced Regression Models	1
or S&DS 612	Linear Models	
BIS 628	Longitudinal and Multilevel Data Analysis	1
BIS 643	Theory of Survival Analysis	1
BIS 678	Statistical Practice I	1
BIS 691	Theory of Generalized Linear Models	1
BIS 695	Summer Internship in Biostatistical Research ¹	0
EPH 508	Foundations of Epidemiology and Public Health	1
EPH 600	Research Ethics and Responsibility ¹	0
EPH 608	Frontiers of Public Health ²	1
S&DS 610	Statistical Inference ³	1

¹ These courses do not count toward the minimum of sixteen courses.

² Students entering the program with an M.P.H. degree may be exempt.

³ This course is offered in the Graduate School of Arts and Sciences.

Students in the *Biostatistics Standard Pathway* will also be required to complete BIS 681, Statistical Practice II. In consultation with their academic adviser, students will choose a minimum of six additional electives that will best prepare them for dissertation work.

Students in the *Biostatistics Implementation and Prevention Science Methods Pathway* will also be required to complete BIS 537, Statistical Methods for Causal Inference; BIS 629, Advanced Methods for Implementation and Prevention Science; BIS 631, Advanced Topics in Causal Inference Methods; and EMD 533, Implementation Science. In consultation with their adviser, students must also choose a minimum of three additional electives. Strongly recommended electives are:

BIS 536	Measurement Error and Missing Data	1
BIS 557	Computational Statistics	1
BIS 567	Bayesian Statistics	1
BIS 646	Nonparametric Statistical Methods and Their Applications	1
CDE 516	Principles of Epidemiology II	1
CDE 534	Applied Analytic Methods in Epidemiology	1
EMD 538	Quantitative Methods for Infectious Disease Epidemiology	1
HPM 570	Cost-Effectiveness Analysis and Decision-Making	1
HPM 586	Microeconomics for Health Policy and Health Management	1
HPM 587	Advanced Health Economics	1
HPM 611	Policy Modeling	1
SBS 541	Community Health Program Evaluation	1
SBS 574	Developing a Health Promotion and Disease Prevention Intervention	1
SBS 580	Qualitative Research Methods in Public Health	1
SBS 676	Questionnaire Development	1
S&DS 541	Probability Theory ¹	1
S&DS 565	Applied Data Mining and Machine Learning ¹	1
S&DS 600	Advanced Probability ¹	1

¹ These courses are offered in the Graduate School of Arts and Sciences.

Qualifying Examination

The qualifying examination has two parts. The first is a written, in-class examination that demonstrates competence with the use of statistical principles to develop methods of application; this exam is divided into two sections: a statistical theory examination and a biostatistics examination. The second involves the critical review of statistical literature, report writing, and oral defense of a specific biomedical topic agreed upon by the candidate and the BIS faculty adviser that will be evaluated by a committee approved by the BIS faculty.

Research Experience

In a number of courses, especially Statistical Practice I (BIS 678) and Statistical Practice II (BIS 681), 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 the first year of course work, candidates are required to take a research rotation that is approved by the department and communicated to the DGS.

The Dissertation

The department 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 Department 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 department is perhaps best known for its doctoral programs in the epidemiology of aging, cancer, perinatal diseases, genomics, HIV/AIDS, and psychosocial disorders. However, students in the department often work on projects with other departments within YSPH, 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 department's doctoral program are found on the faculties of universities throughout the world, at the highest levels of federal and international research programs, and in leadership positions in numerous private and public foundations and institutions.

Required Course Work

Students in the CDE department are expected to complete a minimum of seventeen courses (not including EPH 600) from the following courses or their equivalents. Course waivers must be recommended by the academic adviser and approved by the DGS. Students supported by training grants may be subject to additional requirements

and should discuss whether there are training-specific requirements with the principal investigator of the grant.

CDE 516	Principles of Epidemiology II	1
CDE 534	Applied Analytic Methods in Epidemiology	1
CDE 610	Applied Area Readings for Qualifying Exams	1
CDE 617	Developing a Research Proposal ¹	1
CDE 619	Advanced Epidemiologic Research Methods	1
CDE 650	Introduction to Evidence-Based Medicine and Health Care	1
EHS/CDE 502	Physiology for Public Health	1
EPH 508	Foundations of Epidemiology and Public Health	1
EPH 600	Research Ethics and Responsibility ²	0
EPH 608	Frontiers of Public Health ³	1

¹ CDE 617 is not required of students funded by the Yale AIDS Prevention Training Program. Those students must take an additional elective in order to meet the seventeen-course requirement.

² This course does not count toward the minimum of seventeen courses.

³ Students entering the program with an M.P.H. degree may be exempt.

In consultation with their dissertation adviser, students choose three 600-level course units in Biostatistics (or equivalent substitutions); S&DS 563, Multivariate Statistical Methods for the Social Sciences, may serve as one of these three courses. Students will also choose five additional electives that will best prepare them for their dissertation research.

Qualifying Examination

The qualifying examinations in CDE entail a three-part system emphasizing biostatistics, epidemiological 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 in the term prior to the exam. Students will produce a paper and/or be given an exam for the specialty area.

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 department requires that the research makes a significant contribution to new knowledge in the field of epidemiology.

ENVIRONMENTAL HEALTH SCIENCES

The Environmental Health Sciences (EHS) doctoral program focuses on how 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.

The EHS doctoral program offers two specializations: (1) Environmental Epidemiology & Exposure Science and (2) Environmental & Molecular Toxicology. Students must complete a minimum of thirteen courses (not including EHS 525, EHS 526, and EPH 600).

Required Course Work

CORE REQUIREMENTS (ALL STUDENTS)

EHS 503	Public Health Toxicology	1
EHS 507	Environmental Epidemiology	1
EHS 508	Environmental and Occupational Exposure Science	1
EHS 525	Seminar and Journal Club in Environmental Health ¹	0
EHS 526	Seminar and Journal Club in Environmental Health ¹	0
EHS 545	Molecular Epidemiology	1
EHS 619	Research Rotation	1
EHS 620	Research Rotation	1
EPH 505	Biostatistics in Public Health	1
EPH 508	Foundations of Epidemiology and Public Health	1
EPH 600	Research Ethics and Responsibility ¹	0
EPH 608	Frontiers of Public Health ²	1

¹ These courses do not count toward the minimum of thirteen courses.

² Students entering the doctoral program with an M.P.H. degree may be exempt from EPH 608 and may request waiver of other courses taken during the M.P.H.

ENVIRONMENTAL EPIDEMIOLOGY & EXPOSURE SCIENCE SPECIALIZATION

Suggested electives (minimum of four required), generally taken in the second year:

BIS 505	Biostatistics in Public Health II	1
BIS 623	Advanced Regression Models	1
BIS 628	Longitudinal and Multilevel Data Analysis	1
CDE 516	Principles of Epidemiology II	1
CDE/EHS 520	Case-Based Learning for Genetic and Environmental Diseases	1
CDE 534	Applied Analytic Methods in Epidemiology	1
CDE 617	Developing a Research Proposal	1
EHS/CDE 502	Physiology for Public Health	1
EHS 511	Principles of Risk Assessment	1
EHS 530	Air Pollution and Public Health	1
EHS 531	Meta-research: Evaluating and Synthesizing Research	1
EHS 547	Climate Change and Public Health	1
EHS 560	Methods in Climate Change and Health Research	1
EHS 563	Biomarkers of Exposure, Effect, and Susceptibility in the Epidemiology of Noncommunicable Disease	1
EHS 566	Causal Inference Methods in Public Health Research	1
EHS 568	Introduction to GIS for Public Health	1
ENV 755	Modeling Geographic Space ¹	1
ENV 756	Modeling Geographic Objects ¹	1

¹ These courses are offered in the School of the Environment.

ENVIRONMENTAL & MOLECULAR TOXICOLOGY SPECIALIZATION

Suggested electives (minimum of four required), generally taken in the second year:

BIS 505	Biostatistics in Public Health II	1
CDE/EHS 520	Case-Based Learning for Genetic and Environmental Diseases	1
CDE 617	Developing a Research Proposal	1
EHS/CDE 502	Physiology for Public Health	1
EHS 511	Principles of Risk Assessment	1
EHS 530	Air Pollution and Public Health	1
EHS 531	Meta-research: Evaluating and Synthesizing Research	1
EHS/EMD 537	Water, Sanitation, and Global Health	1
EHS 547	Climate Change and Public Health	1
EHS 560	Methods in Climate Change and Health Research	1
EHS 563	Biomarkers of Exposure, Effect, and Susceptibility in the Epidemiology of Noncommunicable Disease	1
EHS 567	Fundamentals of Green Engineering and Green Chemistry	1

Qualifying Examination

A qualifying examination that will serve as the formal test prior to admission to candidacy for the Ph.D. program will be administered after completion of thirteen

course units and generally before the end of the second year. Accordingly, the student should complete this examination within two years after entering the program. The student's DAC will administer this qualifying examination. The exam consists of an evaluation of a written prospectus and an oral presentation and defense of the research proposal. The proposal will be on the student's thesis project, written in NRSA format. Within two weeks of completing the written segment, the student will present the thesis proposal to the dissertation advisory committee and EHS faculty. The possible outcomes are (a) pass unconditionally, (b) pass conditionally, with further study suggested (or required) in one or more areas, or (c) fail, with or without the option to retake the examination after the areas of concern have been identified and the student has had time to prepare. If a student receives an unconditional pass, the committee should note whether it is an unconditional pass with distinction.

Research Requirements

Two research rotations during the first academic year in EHS laboratories able to accommodate students are required of each student, one in the fall term and one in the second term. In consultation with the student's academic adviser, an additional rotation may be offered during the summer between the first and second years. Research rotations will be available for both "dry" (i.e., statistical analysis) and "wet" (i.e., bench) laboratory research groups. The student will meet with the EHS graduate faculty member at the beginning of the rotation for an explanation of the goals and expectations of a student in the laboratory. The student will become familiar with the research models, approaches, and methods utilized by the research group through interactions with other laboratory/research personnel and from laboratory manuscripts. The student is expected to spend at least fifteen hours per week working in the laboratory or research group and to present a rotation seminar at the end of the rotation period.

In years three and beyond, students are expected to present at least twice a year to their DAC and annually to the rest of the Ph.D. students and faculty in a departmental retreat or during an EHS Doctoral Research-in-Progress seminar.

EPIDEMIOLOGY OF MICROBIAL DISEASES

The goals for doctoral students in the Department 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 and 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 taken depend on the background of individual students and their stated research interests. An individual program that includes courses, seminars, and research rotations is developed by the student and the student's academic adviser. All students are required to complete three distinct research rotations. These are done

in the fall and spring terms and in the summer between the first and second years. Students will be asked to prepare a brief presentation at the end of each rotation. These research rotations (EMD 670, EMD 671, and EMD 672) are graded and account for three of the required ten courses. In addition, students are required to complete course work in epidemiology (EPH 508 or CDE 516) and in breadth of public health (EPH 608). Both courses may be waived if the student enters the program with an M.P.H. degree. Students with prior graduate-level epidemiology courses may be exempt from course work in epidemiology.

Students are required to take a minimum of ten courses (not including EPH 600).

CORE REQUIREMENTS (ALL STUDENTS)

EMD 670	Advanced Research Laboratories	1
EMD 671	Advanced Research Laboratories	1
EMD 672	Advanced Research Laboratories	1
EPH 508	Foundations of Epidemiology and Public Health ¹	1
or CDE 516	Principles of Epidemiology II	
EPH 600	Research Ethics and Responsibility ²	0
EPH 608	Frontiers of Public Health ¹	1

¹ Students entering the program with an M.P.H. or relevant graduate degree may be exempt.

² This course does not count toward the minimum of ten courses.

SUGGESTED COURSES

The following courses are suggested as appropriate for Ph.D. students in EMD. However, other courses in YSPH or in other departments may also be appropriate.

CDE 617	Developing a Research Proposal	1
EMD 531	Genomic Epidemiology of Infectious Diseases	1
EMD 533	Implementation Science	1
EMD 538	Quantitative Methods for Infectious Disease Epidemiology	1
EMD 539	Introduction to Public Health Surveillance	1
EMD 548	Observing Earth from Space	1
EMD 550	Biology of Insect Disease Vectors	1
EMD 553	Transmission Dynamic Models for Understanding Infectious Diseases	1
EMD 567	Tackling the Big Three: Malaria, TB, and HIV in Resource-Limited Settings	1
EMD 582	Political Epidemiology	1
EMD 625	How to Develop, Write, and Evaluate an NIH Proposal	1
HPM 570	Cost-Effectiveness Analysis and Decision-Making	1
MGT 611	Policy Modeling ¹	1
S&DS 538	Probability and Statistics ²	1

¹ This course is offered in the School of Management.

² This course is offered in the Graduate School of Arts and Sciences.

Qualifying Examination

EMD has adopted an oral and written qualifying examination format. The qualifying examination serves as an opportunity for the faculty to evaluate students before their admission to candidacy for the Ph.D. degree. It also serves as a valuable learning experience, where a student has a chance to read critically and in-depth with various faculty members on both the thesis topic and two other topics of interest to the student. The other two topics should ideally be in areas that will expand the dissertation topic to subject matters not covered in the courses. The second component includes writing a research proposal on the proposed dissertation topic. The oral examination takes the form of questions from members of the committee based on the readings and an oral defense of the research proposal.

Detailed information regarding the EMD qualifying examination is available from the EMD representative to the GSEC or the coordinator of graduate student affairs.

Research Requirements

Three research training modules are required of all students, and each term involves a different investigator. These are offered as formal courses (EMD 670, EMD 671, EMD 672), and there will be a brief presentation to the department at the end of each rotation. Each term is graded and recorded on the student's transcript. Investigators act as tutors and monitor the progress of the work, although students are given a certain amount of independence in their work. Rotations are 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 MANAGEMENT

The doctoral program in the Health Policy and Management (HPM) Department emphasizes application of theory and methods to important policy and management topics. It is designed to educate students to apply knowledge derived from public health, social sciences (political science, organizational behavior, and microeconomics), and other areas to crucial public health topics. The program educates students to conduct research on the forefront of health services research; management of health care organizations; policy analysis; and health economic issues. Students are prepared for academic, research, and policy careers in both the public and the private sectors in public health.

Specializations

Disciplinary background and methods are important to meaningful application of theory and methods to key public health topics. Students in HPM will be required to develop expertise in one of the following specializations: Economics; Organizational Theory and Management; or Political and Policy Analysis.

Mentoring and Advising

A hallmark of our program is the low student-to-faculty ratio and the high student and faculty interaction. Students work closely with their adviser and with a number of faculty with common interests, either a specific topic or a policy area. The adviser or set of advisers conducts independent readings with the student in preparation for the dissertation. In addition, students will typically work on research with faculty from both inside the department and from around the University throughout the student's time in the program; these faculty provide an informal network for supplementary mentoring. The student's DAC works closely with the student and has informal as well as formal meetings.

Course Work

Students are required to complete the following course work (or the equivalent in the topic areas covered in these courses). This course listing represents a suggested general program of study, but the specifics of course requirements are adapted to the particular interests and professional aspirations of each student. The standard number of courses taken is sixteen (excluding EPH 600, HPM 617, and HPM 618), with the option of obtaining credits for previous courses. With the approval of the academic adviser and the DGS, alternative courses that better suit the needs of the student may satisfy the course work requirement. The departmental representative to the GSEC, 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. HPM students can only waive up to three of the sixteen courses.

CORE REQUIREMENTS (ALL STUDENTS)

EPH 508	Foundations of Epidemiology and Public Health ¹	1
EPH 600	Research Ethics and Responsibility ²	0
EPH 608	Frontiers of Public Health ¹	1
HPM 610	Applied Area Readings	1
HPM 617	Colloquium in Health Services Research ²	0
HPM 618	Colloquium in Health Services Research ²	0

¹ Students entering the program with an M.P.H. degree may be exempt.

² These courses do not count toward the standard number of sixteen courses.

Methods and Statistics

Minimum of four courses. Suggested courses are:

BIS 623	Advanced Regression Models	1
BIS 628	Longitudinal and Multilevel Data Analysis	1
ECON 556	Topics in Empirical Economics and Public Policy ¹	1
ECON 558	Econometrics ¹	1
HPM 583	Methods in Health Services Research	1
PLSC 500	Quantitative Methods I: Research Design and Data Analysis ¹	1

PLSC 503	Quantitative Methods II: Foundations of Statistical Inference ¹	1
PLSC 504	Advanced Quantitative Methods ¹	1
SBS 580	Qualitative Research Methods in Public Health	1
SOCY 580	Introduction to Methods in Quantitative Sociology ¹	1
SOCY 581	Intermediate Methods in Quantitative Sociology ¹	1
SOCY 582	Statistics III: Advanced Quantitative Analysis for Social Scientists ¹	1
S&DS 563	Multivariate Statistical Methods for the Social Sciences ¹	1
S&DS 565	Applied Data Mining and Machine Learning ¹	1

¹ These courses are offered in the Graduate School of Arts and Sciences.

Health Policy and Management

Minimum of four courses, all with Ph.D. readings. Suggested courses are:

EPH 510	Health Policy and Health Care Systems	1
HPM 514	Health Politics, Governance, and Policy	1
HPM 560	Health Economics and U.S. Health Policy	1
HPM 570	Cost-Effectiveness Analysis and Decision-Making	1
HPM 573	Advanced Topics in Modeling Health Care Decisions	1
HPM 587	Advanced Health Economics	1
HPM 590	Economics, Addiction, and Policy	1
HPM 597	Capstone Course in Health Policy	1
HPM 688	Managing Health Care in Complex Systems	1

AREA OF SPECIALIZATION COURSE REQUIREMENTS

A minimum of four courses, all with Ph.D. readings, are required in the student's area of specialization.

Economics

Required courses (or their equivalents) are:

ECON 545	Microeconomics ¹	1
ECON 558	Econometrics ^{1,2}	1

¹ These courses are offered in the Graduate School of Arts and Sciences.

² ECON 558 may count as a methods/statistics course or as a specialization course, but not both.

In addition, students take two field courses in a concentration area in which they plan to develop expertise. Sets of courses across topics can be selected to meet research interests. Concentration areas and courses (other courses may be substituted in consultation with the student's adviser) are:

Behavioral Economics

MGMT 758	Foundations of Behavioral Economics ¹	1
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PSYC 553	Behavioral Decision-Making I: Choice ¹	1
Industrial Organization		
ECON 600	Industrial Organization I ¹	1
ECON 601	Industrial Organization II ¹	1
Labor Economics		
ECON 630	Labor Economics ¹	1
ECON 631	Labor Economics ¹	1
Public Finance		
ECON 556	Topics in Empirical Economics and Public Policy ¹	1
ECON 680	Public Finance I ¹	1
ECON 681	Public Finance II ¹	1

¹ These courses are offered in the Graduate School of Arts and Sciences.

Organizational Theory and Management

Four courses are required, selected in consultation with the student's adviser.

Political and Policy Analysis

Four courses are required, selected in consultation with the student's adviser. Suggested courses are:

PLSC 800	Introduction to American Politics ¹	1
PLSC 801	Political Preferences and American Political Behavior ¹	1
PLSC 803	American Politics III: Institutions ¹	1

¹ These courses are offered in the Graduate School of Arts and Sciences.

Qualifying Exams

Students take qualifying exams in each of these three areas: (1) health policy and management, (2) empirical analysis and/or statistics, and (3) the student's area of specialization. Typically these are taken in the summer after two years of course work.

Research Requirements

All students are expected to develop their research skills through working with HPM faculty on research. Typically, students will work on a variety of projects with multiple faculty members, beginning during their initial year in the program. Students are expected to attend the departmental research seminar for faculty and are also expected to attend the doctoral research seminar.

Dissertation

Students' doctoral dissertations should have a strong disciplinary base, often with an interdisciplinary approach, applying theory and rigorous methods to a significant public health policy or management topic.

SOCIAL AND BEHAVIORAL SCIENCES

The Social and Behavioral Sciences (SBS) department aims to understand and improve health equity, both domestically and globally. SBS provides instruction in the

theory and methods of the social and behavioral sciences that emphasize individual, interpersonal, community, and structural influences on health, illness, and recovery. The primary emphases are focused on (1) understanding the psychosocial, behavioral, community, and societal influences on health in the general population, with a focus on those who are disadvantaged; and (2) creating multilevel interventions that eliminate barriers to health, from infancy to old age. The SBS curriculum takes an interdisciplinary approach and focuses on integrating methods from epidemiology and the social sciences, training scientists with a broad skill set that allows them to answer a host of complex research questions. The department has numerous research strengths including in HIV/AIDS, aging health, community-engaged health research, maternal child health, mental health, health equity and disparities, and stigma prevention and health.

Required Course Work

Students in the SBS department are expected to complete a minimum of fifteen courses (not including EPH 600) from the following courses or their equivalents. Course waivers must be recommended by the academic adviser and approved by the DGS. Students supported by training grants may be subject to additional requirements and should discuss whether there are training-specific requirements with the principal investigator of the grant.

CDE 534	Applied Analytic Methods in Epidemiology	1
CDE 617	Developing a Research Proposal ¹	1
EPH 508	Foundations of Epidemiology and Public Health	1
EPH 600	Research Ethics and Responsibility ²	0
EPH 608	Frontiers of Public Health ³	1
SBS 580	Qualitative Research Methods in Public Health	1
SBS 610	Applied Area Readings for Qualifying Exams	1
SBS 699	Advanced Topics in Social and Behavioral Sciences	1

¹ CDE 617 is not required of students funded by the Yale AIDS Prevention Training Program. Those students must take an additional elective in order to meet the fifteen-course requirement.

² This course does not count toward the minimum of fifteen courses.

³ Students entering the program with an M.P.H. degree may be exempt.

In consultation with their dissertation adviser, students choose five advanced-level (600 or above) statistics or methods courses from Biostatistics, Psychology, Political Science, Sociology, Anthropology, or Statistics and Data Science (S&DS 563, Multivariate Statistical Methods for the Social Sciences, may serve as one of these three courses), as well as three additional electives that will best prepare them for their dissertation research.

Qualifying Examination

The qualifying examinations in SBS entail a two-part system. The first part will consist of completing a systematic review or meta-analysis as part of SBS 610 related to the student's main area of interest, overseen by the student's dissertation adviser. The

second part consists of an oral exam on the content, theory, and methods outlined in the systematic review/meta-analysis completed in the written part of the qualifying exam. The qualifying exam committee will consist of three faculty who will grade both the written and oral components as Pass/Fail, and cannot include the candidate's dissertation adviser.

Research Experience

Students are strongly encouraged to get involved in research by working with faculty members on ongoing research studies throughout their doctoral work. Further, students will gain research experience during their course work by working on real data. Ideally students should publish one to two papers a year during the doctoral program to develop their research portfolio and to be competitive for academic positions after completion of their doctoral degree.

The Dissertation

SBS uses a three-paper model, where students complete three research papers (of publication quality) on a related topic that demonstrates mastery of content, theory, and methods. In addition, the dissertation will have an introductory chapter that ties the three papers together and a conclusion chapter that summarizes main findings and their research and public health implications. The research papers can involve original data collection, secondary data analysis (using faculty data or national data sets), or some combination of the two.

M.D./Ph.D. Program Requirements

All M.D./Ph.D. students must meet with the director of graduate studies (DGS) in Public Health if they are considering affiliating with PH. Students in this program are expected to meet the guidelines listed below in the time frame outlined. The DGS must approve any variations to these requirements.

TEACHING

One term of teaching is required. If students are approved by the DGS to teach beyond this requirement, they can be compensated. In the rare instance teaching beyond the requirement is approved, the student will only be allowed to serve as a TF10. If a student has served as a teaching fellow elsewhere on campus, this experience may be counted toward the requirement. DGS approval is required to waive the teaching requirement on the basis of previous Yale teaching experience.

ROTATIONS/INTERNSHIPS

Students should do two rotations/internships with potential advisers in Public Health. The purpose of these rotations/internships is to learn research approaches and methodologies and/or to allow the student time to determine if the faculty member's research interests are compatible with the student's 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 requirement until the summer after the second year after taking certain courses and/or completing readings in order to possess 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. Departmental requirements 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 in years one and two. Students can take Public Health courses during this time if scheduling allows. Once affiliated with the Public Health program, students will complete all course requirements for the department. This generally takes a minimum of two terms but can take up to four terms after affiliating with Public Health. The qualifying exam is commonly completed after the fourth term of affiliation with the Ph.D. program in Public Health but can sometimes be done earlier with approval of the Ph.D. adviser and DGS.

PROSPECTUS TIMELINE

Following completion of the qualifying exam, students should focus on the prospectus, which must be approved by the Public Health Graduate Studies Executive Committee (GSEC) before the end of the student's sixth term as an affiliated Ph.D. student in Public Health.

ADMISSION TO CANDIDACY

To be admitted to candidacy, students must: (1) satisfactorily complete the course requirements for their department as outlined in Departmental Requirements, achieve grades of Honors in at least two full-term doctoral-level courses, and achieve an overall High Pass average; (2) obtain an average grade of High Pass on the qualifying exam; and (3) have the dissertation prospectus approved by the GSEC. All M.D./Ph.D. students must be admitted to candidacy before the start of the fourth year in the Ph.D. program (i.e., before the start of the seventh term).

Competencies for the Ph.D. in Public Health

The following competencies for the Ph.D. in Public Health are currently under review and will be updated for each Ph.D. program—Biostatistics, Chronic Disease Epidemiology, Environmental Health Sciences, Epidemiology of Microbial Diseases, Health Policy and Management, and Social and Behavioral Sciences—in fall 2020.

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

- 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.

Academic Advising

Each student is assigned to an academic adviser at the time of matriculation. The academic adviser is available for help with general academic questions, course selections, choosing a dissertation project, and preparation for the qualifying examinations. A student may request a change of academic adviser by writing to the director of graduate studies (DGS). The request must be agreed upon by both the previous and new academic advisers.

Teaching Fellowships

Teaching and research experiences are regarded as an integral aspect of the graduate training program. All doctoral students are required to serve as teaching fellows for a minimum of two terms at the TF level 10 or 20, typically during years two and three. Depending on their funding sources, students may be expected to teach additional terms after they have fulfilled the academic teaching requirement but would not be required to teach more than four terms over the first five years. With the permission of the DGS, the total teaching requirement beyond two terms may be reduced for students who are awarded fellowships supported by outside funding or who serve as graduate research assistants in year three. Other exceptions may be granted after two terms of teaching are completed, with the approval of the DGS. During the first term of teaching, students must attend a training session conducted by the Poorvu Center for Teaching and Learning. First-year students are encouraged to focus their efforts on course work and are not permitted to serve as teaching fellows. A Ph.D. student who has fulfilled the teaching requirement is not permitted to serve as a teaching fellow without special permission from the DGS. In the rare instances this exception is approved, the student will only be allowed to serve as a TF10.

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 505b, Biostatistics in Public Health II Maria Ciarleglio

This continuation of EPH 505 introduces students to regression-based methods for analyzing public health data. Topics include analysis of variance, linear regression, logistic regression, Poisson regression, survival analysis, and longitudinal regression models. Students develop hands-on R computing skills to perform the analyses discussed. Prerequisite: EPH 505.

[BIS 515, Accelerated Biostatistics]

This intensive seven-week summer 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, rules of probability, probability distributions, parameter estimation, hypothesis testing, sample size estimation, analysis of variance, nonparametric tests, and linear regression. Through computer laboratory sessions, students become familiar with the SAS statistical software package. Enrollment limited to students in the Advanced Professional M.P.H. and Accelerated M.B.A./M.P.H. programs. Auditors are not allowed. 2 Course cr

BIS 525a and BIS 526b, Seminar in Biostatistics and Journal Club Leying Guan and Laura Forastiere

The BIS departmental seminar fosters engagement with innovative statistical researchers outside Yale and exposes students to new ideas in statistical research that they may not encounter in their traditional course work. Topics discussed in seminar talks vary, but a major theme is statistical-methodological innovation in the service of public health. Although no credit or grade is awarded, satisfactory performance will be noted on the student's transcript. 0 Course cr per term

BIS 534a, Stochastic Models and Inference for the Biomedical and Social Sciences Forrest Crawford

This course covers a diverse array of stochastic processes that serve as mechanistic models for processes in biology, medicine, public health, social science, operations, and economics. For each model, we study theoretical properties and simulation with primary emphasis on statistical inference for model parameters from realizations under different observation scenarios. Each topic in the course is illustrated by numerous applications to empirical data. Topics include models for infectious disease dynamics, physiology, evolution/phylogenetics, health care operations, social networks, and collective behavior.

BIS 536a, Measurement Error and Missing Data Xin Zhou

The course presents methods for the analysis of data with measurement error or missing data. This course can be divided into two parts. The first part provides an exposition to the statistical theory and the analytic techniques used for adjusting estimates and inference for covariate measurement error and misclassification. The second part covers data analysis with missing data. Much emphasis is placed on likelihood-based approaches to missing data, for example, the Expectation-Maximization (EM) algorithm and multiple imputation (MI). SAS/R is used for analysis of data. S&DS 541 and S&DS 542 or equivalent, or permission of the instructor. This course is intended for biostatistics graduate students in the second year and above and requires knowledge of, and comfort with, general mathematical statistics. Prior exposure to asymptotic theory, survival analysis, and/or Bayesian statistics is desirable but not required. Some basic statistical programming skills will also be helpful.

BIS 537a, Statistical Methods for Causal Inference Fan Li

This course formally introduces statistical theory and methods that allow rigorous comparisons of treatment strategies for public health and biomedical studies. Although randomization is the gold standard for unbiased treatment comparisons, observational studies are increasingly common for comparative effectiveness research for real-world evidence (RWE). The course addresses complexities in the design and analysis of observational studies for the purpose of comparing treatments. We focus on the treatment effect averaged over a target population as the parameter of scientific interest, and we discuss conditions when the parameter can be interpreted as causal. Modern statistical tools for inferring causality are developed and demonstrated. In the first half of the course, we formalize the comparison of a point treatment in cross-sectional observational studies; and we develop regression, propensity score subclassification, matching, weighting, and hybrid estimators. In the second half, we turn to the more complex time-varying treatments in longitudinal observational studies and introduce methods to account for time-dependent confounding and censoring bias. We explain why traditional regression adjustment fails and discuss the methods of g-computation, sequential stratification, marginal structural models, and structural nested models. Examples are drawn from various biomedical and health-related studies. Prerequisites: S&DS 542 and BIS 623 or their equivalents.

BIS 540a, Fundamentals of Clinical Trials Robert Makuch

This course addresses issues related to the design, conduct, analysis, and interpretation 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, non-inferiority studies, and interim monitoring and ethical issues. Prerequisites: EPH 505 or equivalent, and second-year status.

BIS 550b, Topics in Biomedical Informatics and Data Science Samah Jarad and Kei-Hoi Cheung

The course focuses on providing an introduction to common unifying themes that serve as the foundation for different areas of biomedical informatics, including clinical, neuro-, and genome informatics. The course is designed for students with significant computer experience and course work who plan to build databases and computational tools for use in biomedical research. Emphasis is on understanding basic principles underlying informatics approaches to interoperability among biomedical databases and

software tools, standardized biomedical vocabularies and ontologies, biomedical natural language processing, modeling of biological systems, high-performance computation in biomedicine, and other related topics.

BIS 555a, Machine Learning with Biomedical Data Laying Guan

This course covers many popular topics in machine learning and statistics that are widely used for the exploration of biomedical data. Techniques covered include different linear prediction methods, random forest, boosting, neural networks, and some recent progress on model inference in high dimensions, as well as dimension reduction and clustering. Various examples using biomedical data—e.g., microarray gene expression data, single-cell RNA-Seq data—are provided. The emphasis is on the statistical aspects of different machine-learning methods and their applications to problems in computational biology. Prerequisites: S&DS 542 (or S&DS 612) and BIS 623 (or S&DS 612). This course assumes prior knowledge of statistical inference and regression. It also involves programming, and knowledge of R or Python is required.

BIS 557a, Computational Statistics Michael Kane

This is a course in the theory and practice of statistical computing. The goal is to develop analytical and computational skills that will enable students to solve computational challenges in their own research. The course covers basic mathematical and statistical techniques that statisticians use when analyzing data and models for which there is no ready-made software. Every component of the course covers theoretical concepts, implementation details, and applications to real data or common statistical models that students will encounter in practice. This course is not an introduction to programming, nor is it a survey of software packages for doing statistics; the course covers fundamentals of using the R language, but students are expected to be already familiar with basic concepts in programming.

BIS 560a, Introduction to Health Informatics Andrew Taylor

The course provides an introduction to clinical and translational informatics. Topics include (1) overview of biomedical informatics, (2) design, function, and evaluation of clinical information systems, (3) clinical decision making and practice guidelines, (4) clinical decision support systems, (5) informatics support of clinical research, (6) privacy and confidentiality of clinical data, (7) standards, and (8) topics in translational bioinformatics. Permission of the instructor required.

[BIS 561, 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 coronary artery surgery. Prerequisite: EPH 505. 1 Course cr

BIS 562b, Clinical Decision Support Edward Melnick

Building on BIS 560/CB&B 740, this course provides the purpose, scope, and history of decision support systems within health care. Using a weekly hands-on application of knowledge acquired in the lecture portion of the course, students identify a clinical need

and prototype their own clinical decision support solution. Solutions are then presented in a “shark tank” format to iteratively refine them to yield a final product that is capable of real-world implementation. Prerequisite: BIS 560 or CB&B 740.

BIS 567a, Bayesian Statistics Joshua Warren

Bayesian inference is a method of statistical inference in which prior beliefs for model parameters can be incorporated into an analysis and updated once data are observed. This course is designed to provide an introduction to basic aspects of Bayesian data analysis including conceptual and computational methods. Broad major topics include Bayes’s theorem, prior distributions, posterior distributions, predictive distributions, and Markov chain Monte Carlo sampling methods. We begin by motivating the use of Bayesian methods, discussing prior distribution choices in common single parameter models, and summarizing posterior distributions in these settings. Next, we introduce computational methods needed to study multi-parameter models. R software is most often used. We then apply these methods to more complex modeling settings including linear, generalized linear, and hierarchical models. Discussion of model comparisons and adequacy is also presented.

BIS 575b, Introduction to Regulatory Affairs Robert Makuch

This course provides students with an introduction to regulatory affairs science, as these issues apply to the regulation of food, pharmaceuticals, and medical and diagnostic devices. The course covers a broad range of specialties that focus on issues including legal underpinnings of the regulatory process, compliance, phases of clinical testing and regulatory milestones, clinical trials design and monitoring, quality assurance, post-marketing study design in response to regulatory and other needs, and post-marketing risk management. The complexities of this process require awareness of leadership and change management skills. Topics to be discussed include: (1) the nature and scope of the International Conference on Harmonization, and its guidelines for regulatory affairs in the global environment; (2) drug development, the FDA, and principles of regulatory affairs in this environment; (3) the practice of global regulatory affairs from an industry perspective; (4) description/structure/issues of current special importance to the U.S. FDA; (5) historical background and FDA jurisdiction of food and drug law; (6) the drug development process including specification of the important milestone meetings with the FDA; (7) risk analysis and approaches to its evaluation; (8) use of Bayesian statistics in medical device evaluation, a new approach; (9) use of data monitoring committees and other statistical methods for regulatory compliance; (10) developments in leadership and change management; and (11) food quality assurance including risk analysis/compliance/enforcement. Through course participation, students also have opportunities to meet informally with faculty and outside speakers to explore additional regulatory issues of current interest.

BIS 600a or b, Independent Study or Directed Readings Staff

Independent study or directed readings on a specific research topic agreed upon by faculty and student. By arrangement with faculty. For MS and PhD Students only.

BIS 610b, Applied Area Readings for Qualifying Exams Staff

Required of BIS Ph.D. students, in preparation for qualifying exams. Readings arranged with specific faculty in related research area. By arrangement with faculty.

BIS 621a, Regression Models for Public Health Elizabeth Claus

This course focuses on the applications of regression models and is intended for students who have completed an introductory statistics class but who wish to acquire the additional statistical skills needed for the independent conduct and analysis of study designs frequently seen in public health. Topics include model selection, implementation and interpretation for linear regression with continuous outcomes, logistic regression with binary/multinomial/ordinal outcomes, and proportional hazards regression with survival time outcomes. The class explores advanced topics within these domains including the analysis of (1) blocked and nested study designs, (2) linear contrasts and multiple comparisons, (3) longitudinal data or repeated measures, (4) missing data, and (5) pragmatic clinical trials using propensity scores to reduce selection bias, etc. SAS software is used for analysis of data. Prerequisite: EPH 505 or equivalent.

BIS 623a, Advanced Regression Models Yize Zhao

This course provides a focused examination of the theory and application behind linear regression. Topics include linear regression, estimation, hypothesis testing, regression diagnostics, analysis of variance, adjusting for covariates, transformations, missing data, and generalized linear models. R and SAS software is used for analysis of data. Prerequisites: EPH 505 and BIS 505 or equivalents, algebra, and calculus.

BIS 628b, Longitudinal and Multilevel Data Analysis Veronika Shabanova

This course covers methods for analyzing longitudinal data in which repeated measures have been obtained for subjects over time and for analyzing multilevel data, which can be either hierarchically or nonhierarchically structured, e.g., nested, crossed, and/or clustered. The course teaches the common analytic techniques that can be used to analyze both longitudinal data and multilevel data with both continuous and discrete responses. One defining feature of the data is the correlation among responses over time within the same subject in longitudinal data and/or among different observations within a same cluster in multilevel data, which has to be accommodated in order to make valid inference about the responses. Emphasis is on mixed-effects models and generalized estimating equations (GEE). Rationales on whether population-average research or subject-/cluster-specific inference research may be more appropriate for various study designs and data types are discussed and illustrated. More advanced topics including mixture models, missing data methods, and causal inference are discussed if time allows. Analysis in presence of missing data is incorporated throughout the lectures and the labs. Emphasis is placed on applying the methods, understanding underlying assumptions, and interpreting results for analyzing real data using standard statistical software. Additional material on computational aspects and theoretic aspects of mixed models. R and SAS software is used for analysis of data. Prerequisites: BIS 623 and BIS 625 (can be simultaneously enrolled) or equivalents.

[BIS 629, Advanced Methods for Implementation and Prevention Science]

The course presents methods for the design and analysis of studies arising in the implementation and prevention science space. These studies tend to implement a range of cluster-randomized designs, quasi-experimental designs, and observational designs. This course consists of two parts. The first provides an exposition of the theory and analytic techniques used in the design and analysis of experimental studies arising in implementation and prevention science. The second covers the design and analysis of quasi-experimental and observational studies. SAS/R is used for problem sets.

Prerequisites: S&DS 541 and S&DS 542 or equivalents, or permission of the instructor.

1 Course cr

BIS 630b, Applied Survival Analysis Wei Wei

This 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, hypothesis tests for comparing survival curves, parametric models, and semiparametric models for the analysis of time-to-failure data including the Cox proportional hazards model. Skills for using statistical software to perform the analyses are developed. In addition, study design is covered, including sample size and power calculations. Prerequisites: BIS 505 or equivalent, BIS 623, BIS 625 (can be simultaneously enrolled), and single variable calculus.

[BIS 631, Advanced Topics in Causal Inference Methods]

The evaluation of a public policy program designed to improve the health and well-being of a population requires the use of statistical methods for the estimation of its effects and the knowledge of causal inference tools to attribute the estimated effects to our intervention of interest. When studies are not well designed, several complications may arise. This course covers advanced topics of causal inference in complex settings, known as “irregular designs,” where the common assumptions required for the estimation of causal effects do not hold. Irregular designs include randomized experiments affected by non-compliance, censoring or missing outcomes, and observational studies with unmeasured confounders. We also learn how to deal with other irregular designs, including panel studies with time-invariant unmeasured confounders and regression discontinuity designs where the treatment is assigned based on a cut-off rule on test scores or poverty indexes and hence is affected by the lack of overlap. The second part of the course focuses on ways to go beyond the treatment effect and investigate all the mechanisms that come into play when the intervention is implemented: causal pathways, spillover effects, and heterogeneity. A better understanding of these mechanisms can help us improve the design of our intervention. We first learn statistical methods to disentangle causal pathways through which the intervention has an effect. We then relax the common assumption of independence between units and allow the treatment of one unit to affect the outcome of other units. We present cutting-edge statistical methods to estimate spillover or peer-influence effects in clusters of units or in social networks. The last part of the course deals with identification of heterogeneous treatment effects using standard and machine-learning approaches. Identifying subgroups of individuals for whom the effect is more beneficial can help us design optimal and cost-effective treatment strategies where the treatment is assigned to specific individuals. The course is complemented with interesting examples from the social and health sciences. Prerequisites: S&DS 542 (or S&DS 612) and BIS 623 (or S&DS 612), or waivers for these courses; BIS 679 (or BIS 557), or a waiver for this course; and BIS 537, or exposure in other courses to fundamental concepts of causal inference. Some understanding of Bayesian statistics (taught in BIS 567) is recommended but not required. 1 Course cr

BIS 633a, Population and Public Health Informatics Cynthia Brandt

This is not a programming course or a mathematics course. The course provides an in-depth survey of the data standards, data analysis tools, databases, and information management systems and applications used in clinical population research, disease surveillance, emergency response information systems, and the like. It examines

informatics techniques used on population-level data to improve health and the application of information and computer science and technology to public health practice, research, policy, and decision support. This scientific area focuses on the capture, management, and use of electronic public health data. While these backgrounds are prominent in the field, the purpose of this course is to provide the history and context of the field.

BIS 634a, Computational Methods for Informatics Robert McDougal

This course introduces the key computational methods and concepts necessary for taking an informatics project from start to finish: using APIs to query online resources, reading and writing common biomedical data formats, choosing appropriate data structures for storing and manipulating data, implementing computationally efficient and parallelizable algorithms for analyzing data, and developing appropriate visualizations for communicating health information. The FAIR data-sharing guidelines are discussed. Current issues in big health data are discussed, including successful applications as well as privacy and bias concerns. This course has a significant programming component, and familiarity with programming is assumed. Prerequisite: CPSC 223 or equivalent, or permission of the instructor.

BIS 638a, Clinical Database Management Systems and Ontologies Kei-Hoi Cheung

This course introduces database and ontology in the clinical/public health domain. It reviews how data and information are generated in clinical/public health settings. It introduces different approaches to representing, modeling, managing, querying, and integrating clinical/public health data. In terms of database technologies, the course describes two main approaches—SQL database and non-SQL (NoSQL) database—and shows how these technologies can be used to build electronic health records (EHR), data repositories, and data warehouses. In terms of ontologies, it discusses how ontologies are used in connecting and integrating data with machine-readable knowledge. The course reviews the major theories, methods, and tools for the design and development of databases and ontologies. It also includes clinical/public health use cases demonstrating how databases and ontologies are used to support clinical/public health research.

[BIS 639, Descriptive Analysis of Public Health Data]

The analysis of publicly available health data provides insight into ways of exploring disease etiology, especially when considering temporal and spatial trends in disease rates and corresponding changes that are related to putative etiologic agents. Age-period-cohort models have been an effective analytical strategy for exploring disease trends and generating hypotheses for putative risk factors to be explored using analytical studies. This course introduces methodology for extracting disease rates from public sources and using them to analyze temporal-spatial trends for disease. It also uses survey data on exposure to putative risk factors and results from analytical studies to quantify the extent that known etiology can account for disease trends. This information is also used to assess the impact of public health policy on disease control. Prerequisite: BIS 623 or BIS 625. 1 Course cr

BIS 643b, Theory of Survival Analysis Shuangge Ma

This course presents the statistical theory underlying survival analysis. It covers different models of censoring and the three major approaches to analyzing this type of data: parametric, nonparametric, and semiparametric methods. The application of this

theory through some exemplary data sets is also presented. Offered every other year.
Prerequisites: S&DS 541 and S&DS 542.

[BIS 645, Statistical Methods in Human Genetics]

Probability modeling and statistical methodology for the analysis of human genetics data are presented. Topics include population genetics, single locus and polygenic inheritance, linkage analysis, genome-wide association studies, quantitative trait locus analysis, rare variant analysis, and genetic risk predictions. Offered every other year.
Prerequisites: EPH 505 and BIS 505, or equivalents; and permission of the instructor.

1 Course cr

BIS 646b, Nonparametric Statistical Methods and Their Applications Heping Zhang
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: S&DS 541 and S&DS 542.

[BIS 648, Statistical Methods for Sequence Data Analysis]

The availability of massive amounts of sequencing data has generated both great promises and significant challenges for biological and biomedical researchers. This course focuses on the statistical and computational issues arising from the analysis of these data. Topics to be covered include data pre-processing, allele calling, RNA-seq analysis, ChIP-seq analysis, and metagenomics data analysis. The course combines methodology expositions with real data examples to illustrate the discussed methods.

1 Course cr

BIS 649a and BIS 650b, Master's Thesis Research Hongyu Zhao

The master's thesis is not required of M.S. or M.P.H. students. Students work with faculty advisers in designing their project and writing the thesis. Detailed guidelines for the thesis are outlined in Appendix II of the YSPH Bulletin.

BIS 678a, Statistical Practice I Lisa Calvocoressi, Tassos Kyriakides, James Dziura, Peter Peduzzi, and Denise Esserman

This first term of a yearlong course affords students the opportunity to gain experience and practical knowledge on how to work as a practicing biostatistician. Students learn how to collaborate with an investigator on a clinical problem; design and implement statistical approaches to further clinical research efforts under the supervision of an instructor; and communicate effectively with nonstatistical audiences. There is a strong emphasis on developing effective oral and written communication skills. Prerequisites: BIS 623 and BIS 625; open to second-year Biostatistics doctoral, M.S., and M.P.H. students, or by permission of the instructors.

BIS 679a, Advanced Statistical Programming in SAS and R Elizabeth Claus

This class offers students the chance to build on basic SAS and R programming skills. Half of the term is spent working with SAS learning how to create arrays, format data, merge and subset data from multiple sources, transpose data, and write and work with macros. The second half of the term is spent working with R learning how to

work with data, program functions, write simulation code using loops, and bootstrap. Prerequisites: EPH 505 and basic knowledge of both SAS and R.

BIS 681b, Statistical Practice II Lisa Calvocoressi, Tassos Kyriakides, James Dziura, Peter Peduzzi, and Denise Esserman

This second term of a yearlong course affords students the opportunity to gain experience and practical knowledge on how to work as a practicing biostatistician. Students learn how to collaborate with an investigator on a clinical problem; design and implement statistical approaches to further clinical research efforts under the supervision of an instructor; and communicate effectively with nonstatistical audiences. There is a strong emphasis on developing effective oral and written communication skills. Prerequisite: BIS 678; open to second-year Biostatistics doctoral, M.S., and M.P.H. students, or by permission of the instructors.

BIS 685a and BIS 686b, Capstone in Health Informatics

Building on BIS 560/CB&B 740 and BIS 550/CB&B 750, this course provides the opportunity for master's-level integration of basic informatics theory and practice through the use of modules focusing on the workflow of major health informatics projects. Students have two major projects throughout the course, including a team project where additional reflection on coordination of responsibilities and teamwork is essential. Each student is also able to work on a term-long individual module or choose to individually continue to advance the previous team project. The final projects are meant to show how the student integrates informatics theory, skills, and stakeholder's needs into a final product or project that may be developed into a deliverable for general public use. Prerequisites: BIS 560/CB&B 740 and BIS 550/CB&B 750, or equivalents.

BIS 691b, Theory of Generalized Linear Models Anita Wang

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: S&DS 542, BIS 623, and some knowledge of matrix calculation.

BIS 692b, Statistical Methods in Computational Biology Hongyu Zhao

Introduction to problems, algorithms, and data analysis approaches in computational biology and bioinformatics. We discuss statistical issues arising in analyzing population genetics data, gene expression microarray data, next-generation sequencing data, microbiome data, and network data. Statistical methods include maximum likelihood, EM, Bayesian inference, Markov chain Monte Carlo, and methods of classification and clustering; models include hidden Markov models, Bayesian networks, and graphical models. Offered every other year. Prerequisite: S&DS 538, S&DS 542, or S&DS 661. Prior knowledge of biology is not required, but some interest in the subject and a willingness to carry out calculations using R is assumed.

BIS 695a or b, Summer Internship in Biostatistical Research Hongyu Zhao

The purpose of this course is to provide students with the opportunity of gaining practical experience in the analysis and development of biostatistical methods as part of a health sciences research team including medicine, public health, pharmaceutical

industry, or health care delivery. This experience provides a basis for developing a dissertation thesis proposal that has practical significance for addressing important scientific questions. Students work with a biostatistics faculty mentor to select a suitable placement for the summer intern, and a one-page description of the plans will be submitted to the instructor at least three weeks prior to starting the program, for approval within two weeks. The internship must be full-time: 35–40 hours per week for 10–12 weeks during the summer. Upon completion of the internship, a written report of the work must be submitted to the instructor no later than October 1. Prerequisite: completion of one year of the Ph.D. or M.S. program or permission of the instructor.

o Course cr

Chronic Disease Epidemiology

CDE 502a / EHS 502a, Physiology for Public Health Catherine Yeckel

The objective of this course is to build a comprehensive working knowledge base for each of the primary physiologic systems that respond to acute and chronic environmental stressors, as well as chronic disease states. The course follows the general framework: (1) examine the structural and functional characteristics of given physiological system; (2) explore how both structure and function (within and between physiological systems) work to promote health; (3) explore how necessary features of each system (or integrated systems) are points of vulnerability that can lead to dysfunction and disease. In addition, this course offers the opportunity to examine each physiological system with respect to influences key to public health interest, e.g., age, race/ethnicity, environmental exposures, chronic disease, microbial disease, and lifestyle, including the protection afforded by healthy lifestyle factors.

[CDE 515, Accelerated Epidemiology]

This intensive seven-week summer course provides a comprehensive overview of epidemiologic concepts and methods. Topics include measurements of disease frequency and association, study design (including randomized and non-randomized controlled trials, cohort studies, case-control studies, cross-sectional studies, and 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. 1 Course cr

CDE 516b, Principles of Epidemiology II Yasmmyn Salinas

This is an intermediate-level course on epidemiologic principles and methods. The course covers bias, introduction to multivariable analysis for confounder control and assessment of effect modification, indirect standardization, matching, residual confounding, survival analysis, randomized controlled trials including cluster-randomized trials, multiplicity and subgroup analysis, sample size and power, meta-analysis, screening, genetic association studies, use of biomarkers in epidemiology, and epidemic investigation. Through lectures, class discussion, readings from the peer-reviewed literature in both chronic and infectious disease epidemiology, and homework assignments, students learn to (1) evaluate the scientific merit and feasibility of epidemiologic study designs; (2) review, critique, and evaluate epidemiologic reports and research articles; (3) perform epidemiologic calculations; and (4) draw appropriate

inferences from epidemiologic data, all at the intermediate level. Prerequisites: EPH 505 and EPH 508.

CDE 520b / EHS 520b, Case-Based Learning for Genetic and Environmental Diseases

Josephine Hoh

This course is a gateway to several updated as well as landmark public health stories with insights, analysis, and exclusives, including topics such as epigenetics, development of disease prevention, and personalized medicines. Ethical, political, and economic issues involved in the proper handling of genetic information are also discussed. Lectures are delivered using multimedia methods, including illustrations, cartoons, videos, and smart reads. Students take away the latest developments in tackling the causes of both early- and late-onset diseases; a roundup of key challenges; and skills in the appropriate design of a study, analysis, and interpretation that will be crucial for tackling the disease of their own interest in the future. Active participation in quizzes, writing, sharing personal research and opinions, and presentations are the criteria for the final grade. No prerequisites.

CDE 525a and CDE 526b, Seminar in Chronic Disease Epidemiology Leah Ferrucci

This seminar is conducted once a month and focuses on speakers and topics of particular relevance to CDE students. Students are introduced to research activities of the department's faculty members, with regular presentations by invited researchers and community leaders. The seminar is required of first-year CDE students. Although no credit or grade is awarded, satisfactory performance will be noted on the student's transcript. o Course cr per term

CDE 532b, Epidemiology of Cancer Brenda Cartmel

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, hormonal factors, diet, radiation, and obesity/physical activity) and on major cancer sites (including colon, breast, and prostate). Emphasis is placed on critical reading of the literature. Prerequisite: EPH 508.

CDE 534b, Applied Analytic Methods in Epidemiology Mayur Desai

This computer lab-based course provides students with a comprehensive overview of data management and data analysis techniques. The SAS statistical software program is used. Students learn how to create and manipulate data sets and variables using SAS; identify appropriate statistical tests and modeling approaches to evaluate epidemiologic associations; and perform a broad array of univariate, bivariate, and multivariable analyses using SAS and interpret the results. Prerequisites: EPH 505 and EPH 508; or, for Advanced Professional M.P.H. students, successful completion of EPH 515 or permission of the instructor.

CDE 535b, Epidemiology of Heart Disease and Stroke Judith Lichtman

Heart disease and stroke are among the leading causes of death and disability among industrialized nations. This course introduces students to the major categories of cerebrovascular and cardiovascular disease. Students are challenged to think about how individual diseases contribute to the epidemic of vascular disease in the United States. In this course, students learn basic principles about the rates of disease, risk factors, clinical trial results, and outcomes of heart disease and stroke. Through the analysis of

actual studies, students apply basic epidemiology to critically evaluate current literature and topics in this field. Sessions include a clinical overview of a specific disease or risk factor, as well as highly interactive discussion of a specific epidemiologic topic or principle. Students are encouraged to develop their own solutions to current gaps in the epidemiologic literature.

CDE 545b, Health Disparities by Race and Social Class: Application to Chronic Disease Epidemiology Beth Jones

One of four overarching goals of Healthy People 2020 is to “achieve health equity, eliminate disparities, and improve the health of all groups.” This course explores disparities in the chronic diseases that contribute disproportionately to ill health, resource utilization, reduced quality of life, and mortality. 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 United States. The primary focus of this course is on understanding the determinants and consequences of health disparities, learning to critically evaluate health disparities research, and thinking creatively about elimination strategies.

CDE 550b, Litigational Epidemiology Harvey Risch

A lecture and seminar course on scientific and legal issues for drugs and other manufactured products vis-à-vis their utility and adverse effects in populations. Topics include: pharmacoepidemiology data sources; general and specific causal evidential reasoning; study power and sample size; meta-analysis and reverse meta-analysis; types of pharmacoepidemiologic studies; preapproval and postapproval epidemiology; government and scientific agency reviews; product liability legal theory, Daubert, legal case consulting and depositions; epidemiologists vs attorneys. The course consists of once-weekly two-hour sessions, divided approximately equally into didactic presentations by Dr. Risch and presentations and discussions of assigned readings and other course materials by students. The general learning objectives are for students to understand aspects of epidemiology that apply to the data and analysis of studies of drugs and other products, how those particulars are regarded in the litigation context, and how epidemiologists maintain and defend their commitments to scientific objectivity while representing litigational interests. High-pass or better in EPH 508, CDE 516, EPH 505a, and BIS 505b or their equivalents, or consent of the instructor.

CDE 551b, Global Noncommunicable Disease Nicola Hawley

This course focuses on the contemporary burden of noncommunicable diseases (NCDs), with a particular focus on the health impact of NCDs in low- and middle-income countries. The first part of the course briefly covers the etiology and global distribution of four key NCDs: cardiovascular disease, cancer, chronic respiratory disease, and diabetes. We then discuss the shared behavioral, metabolic, and physiologic risk factors for these diseases and explore how NCDs are associated with economic development, globalization, and the demographic and health transitions. The second half of the course focuses concretely on approaches to NCD intervention, from individual-level approaches to coordinated global action. The last five lectures are by guest speakers offering insight into the successes and challenges of their own intervention attempts.

CDE 562b, Nutrition and Chronic Disease Leah Ferrucci

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. Implications for federal nutrition policy, such as dietary guidelines, dietary supplement regulations, and food labeling, are discussed.

CDE 563b / EHS 563b, Biomarkers of Exposure, Effect, and Susceptibility in the Epidemiology of Noncommunicable Disease Caroline Johnson

This course explores how new biomarker approaches can be applied to understanding the health consequences of environmental exposures and other risk factors. We learn how advances in the measurement of environmental exposures, genes, proteins, metabolites, and the microbiome have strengthened epidemiological associations, and narrowed the gap from correlation to causality. Variability in biomarker performance and susceptibility to disease due to ageing, diet, location, and other factors is discussed, along with methods that are used to evaluate biomarker evidence in epidemiology. Lectures describe chronic noncommunicable diseases of immediate concern to public health such as neurodegenerative diseases (Alzheimer's disease, Parkinson's disease), cancer, cardiovascular diseases, and asthma. We examine seminal publications and the application of techniques that have transformed the understanding of each disease, resulting in improvements to early detection and treatment approaches for these diseases. We also delve into examples of epidemiologic studies that have been carried out on large prospective cohorts, such as the Framingham Heart Study and Nurses' Health Study, and compare and critique methods used to identify biomarkers of disease between the cohorts. To evaluate and foster greater understanding of these areas, students critique journal articles for homework assignments.

CDE 566a / EHS 566a, Causal Inference Methods in Public Health Research

Zeyan Liew

This course introduces the theory and applications of causal inference methods for public health research. The rapid development of both the theoretical frameworks and applications of causal inference methods in recent years provides opportunities to improve the rigor of epidemiological research. The course covers topics such as (i) the principles of causal logic including counterfactuals and probability logic, (ii) epidemiological study designs and sources of biases including misinterpretations of statistics, (iii) applications of causal diagrams in epidemiology, (iv) applications of causal modeling techniques in epidemiological research using real-world and simulated data. Students leave the course with a basic knowledge of causal inference methods to apply in their own research projects and the ability to further explore the causal inference literature. This is an introductory-level course for causal inference methods with a focus on epidemiological research using observational data. Students interested in the theoretical and mathematical basis of causal inference methods should consider taking BIS 537. Prerequisites: EPH 508 and either BIS 505 or CDE 534. Other equivalent classes would require the permission of the instructor. Programming experience is also required.

CDE 567a, Injury and Violence as Public Health Issues Linda Degutis

This course focuses on the contemporary burden of injuries and violence, with an emphasis on models and methods for studying and preventing injuries and violence. The first part of the course focuses on the history of injury and violence epidemiology and prevention, as well as the risk factors for, and distribution of, morbidity and mortality related to injuries and violence in the United States and globally. The

remainder of the course focuses on specific types of injury and violence events, research and interventions to prevent and mitigate injury and violence, linkages between research and practice in the field of injury and violence prevention, as well as policy and legal issues in injury and violence prevention. This course meets primarily online via Zoom video conferencing software, with in-person meetings during weeks 1 and 13.

[CDE 570, Humanities, Arts, and Public Health]

This course challenges students to explore the possibilities, problems, and potential uses of arts and humanities in public health practice. Utilizing the expertise present across Yale University and featuring work of artists from across the country, this primarily U.S.-focused course explores different methodologies for incorporating and assessing the impact of arts in the public health field. Classes meet twice weekly, once for a lecture/discussion and once for an interactive, hands-on workshop or performance. Each of the weekly modules focuses on a central theme and incorporates aspects of methods and assessment alongside creative work. By the end of the course, students are familiar with a variety of projects integrating arts, humanities, and health in the United States; understand the importance of self-reflection and responsible artistic practice; have a basic understanding of the importance of impact assessment; and have designed and evaluated a hands-on creative project. EPH 507 and EPH 508 are recommended but not required. 1 Course cr

CDE 572a, Obesity Prevention and Lifestyle Interventions Melinda Irwin

This course reviews the methods and evaluation of obesity prevention and lifestyle interventions conducted in multiple settings (e.g., individual, family, and community settings, as well as policy-level interventions). Topics include physical activity, nutrition, and weight-loss interventions in various populations (children, adults, those who are healthy, and those with chronic diseases). The course combines didactic presentations, discussion, and a comprehensive review of a particular lifestyle intervention by students. This course is intended to increase the student's skills in evaluating and conducting obesity prevention and lifestyle interventions.

CDE 597a, Genetic Concepts in Public Health Andrew Dewan

The widespread availability of genetic data has resulted in the translation of genetics into a variety of public health settings. At the core of public health genetics is the rapidly growing science of genetic epidemiology, the study of the role of human genetic variation in determining disease risk in families and populations. This course focuses on the design, analysis, and interpretation of genetic epidemiologic studies. Topics covered include Mendelian laws of inheritance; recombination and linkage disequilibrium; types of genetic variation; molecular technologies for detection of genetic variation; study designs and statistical analysis methods used in genetic epidemiologic studies; and the translation of genetic epidemiologic findings into genetic testing and screening programs. The course provides an understanding of the role of the public health sciences of epidemiology and statistics in the study of human genetics, and of the role of genetics in public health. Prerequisite: previous course work in biology or genetics (BIOL 101–104 series for Yale College students) or permission of the instructors.

CDE 600a or b, Independent Study or Directed Readings Staff

Independent study or directed readings on a specific research topic agreed upon by faculty and student. By arrangement with faculty. For MS and PhD Students only.

CDE 610b, Applied Area Readings for Qualifying Exams Staff

Required of CDE Ph.D. students, in preparation for qualifying exams. Readings arranged with specific faculty in related research area. By arrangement with faculty.

CDE 617b, Developing a Research Proposal Xiaomei Ma

Each student develops a research grant proposal independently. This includes the development of a research question, specific aims, study hypotheses, reviewing and summarizing relevant scientific literature, choosing a study design, and developing a data collection and analysis strategy. Students submit drafts of sections of the grant proposal throughout the course and resubmit the revised proposal to the instructor for a final grade. Prerequisite: EPH 505, BIS 505 (can be taken concurrently), CDE 516 (can be taken concurrently), doctoral status, or permission of the instructor. Auditors are not allowed.

CDE 619a, Advanced Epidemiologic Research Methods Harvey Risch

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. Prerequisite: EPH 505, BIS 505, doctoral status, or permission of the instructor.

CDE 634b, Advanced Applied Analytic Methods in Epidemiology and Public Health

Yasmmyn Salinas

This course provides students with the theoretical and analytical tools necessary to address complex research questions in epidemiology and public health. The course focuses on advanced modeling techniques that are gaining in popularity in these fields. The analytic techniques covered include propensity score analysis, quantile regression, principal component analysis, factor analysis, cluster analysis, structural equation modeling, path analysis, case-cohort analysis, and nested-case control analysis. Students learn how to conduct these analyses using the SAS programming software. Students also learn how to interpret and present the results of these methods. *Recommended for students with previous course work in epidemiology and multivariable regression modeling.* Prerequisites: CDE 516 and CDE 534; other equivalent classes require permission of the instructor.

[CDE 650, 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 include examining the comparative effectiveness of clinical and public health interventions, etiology, diagnostic testing, and prognosis. Particular consideration is given to the meta-analytic methodology of synthesizing evidence in a systematic review. Also addressed is the role of evidence in informing economic analysis of health care programs 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. Prerequisite: CDE 516 or permission of the instructor. 1 Course cr

CDE 670a or b, Advanced Field Methods in Public Health Staff

The course offers direct experience in field methods in chronic disease epidemiology for doctoral students and advanced M.P.H. students. Students are expected to actively participate as part of a research team (8–10 hours per week) doing field research in some aspect of chronic disease epidemiology. It is expected that their progress will be directly supervised by the principal investigator of the research project. This course can be taken for one or two terms and may be taken for credit. Prerequisite: arrangement with a faculty member must be made in advance of registration.

Environmental Health Sciences

EHS 500a or b, Independent Study in Environmental Health Sciences

Nicole Deziel

Independent study on a specific research topic agreed upon by both faculty and M.P.H. student. Research projects may be “dry” (i.e., statistical or epidemiologic analysis or “wet” (i.e., laboratory analyses. The student meets with the EHS faculty member at the beginning of the term to discuss goals and expectations and to develop a syllabus. The student becomes familiar with the research models, approaches, and methods utilized by the faculty. The student is expected to spend at least ten hours per week working on their project and to produce a culminating paper at the end of the term.

EHS 502a / CDE 502a, Physiology for Public Health Catherine Yeckel

The objective of this course is to build a comprehensive working knowledge base for each of the primary physiologic systems that respond to acute and chronic environmental stressors, as well as chronic disease states. The course follows the general framework: (1 examine the structural and functional characteristics of given physiological system; (2 explore how both structure and function (within and between physiological systems work to promote health; (3 explore how necessary features of each system (or integrated systems are points of vulnerability that can lead to dysfunction and disease. In addition, this course offers the opportunity to examine each physiological system with respect to influences key to public health interest, e.g., age, race/ethnicity, environmental exposures, chronic disease, microbial disease, and lifestyle, including the protection afforded by healthy lifestyle factors.

EHS 503b, Public Health Toxicology Vasilis Vasilou

This course is designed to serve as a foundation for understanding public health toxicology in the twenty-first century. Although it includes the basic principles of toxicology such as dose response and mechanisms of toxicity and cellular defense, this course introduces new concepts of toxicology such as lifetime exposures, low-level exposure to mixtures, high-throughput screening and computational toxicology, and green chemistry in order to understand fundamental interactions between chemicals and biological systems and possible health outcomes. Through the use of case studies and up-to-date published research, the course provides insights into prevention of mortality and morbidity resulting from environmental exposure to toxic substances, the next-generation risk assessment and regulatory toxicology, and the causes underlying the variability in susceptibility of people to chemicals.

EHS 507a, Environmental Epidemiology Yawei Zhang

This course focuses on application of epidemiology principles and methods to the study of environmental exposures and adverse health outcomes. The major focus on environmental exposures includes both physical and chemical exposures, i.e., environmental chemicals and pesticides, air pollution, radiation, etc. Emphasis is placed on designing population-based studies to investigate environmental issues and human health, critically reviewing literatures and interpreting environmental epidemiologic research data, identifying challenges involved in studying environmental exposures and human health, and analyzing data of environmental exposures and human health. Gene-environment interactions, an essential component when studying environmental hazards in relation to human health, are also addressed and discussed. Prerequisites: EPH 508 and BIS 505, or permission of the instructor.

EHS 508b, Environmental and Occupational Exposure Science Nicole Deziel

This course examines the fundamental and practical aspects of assessing exposures to environmental agents, broadly defined, in the residential, ambient, and workplace environments. The course provides the knowledge and skills to design and conduct exposure assessments, and has a particular focus on applications to environmental epidemiology and risk assessment. Indirect and direct methods of assessing exposures, such as questionnaires, environmental sampling, biological monitoring, and spatial modeling, are reviewed; and case studies and hands-on projects are presented.

EHS 511b, Principles of Risk Assessment Gary Ginsberg

This course introduces students to the nomenclature, concepts, and basic skills of quantitative risk assessment (QRA). The goal is to provide an understanding necessary to read and critically evaluate and perform QRA. Emphasis is on the intellectual and conceptual basis of risk assessment, particularly its dependence on toxicology, epidemiology, and exposure assessment. Quantitation of exposure and dose response provides practical skills and theoretical background, although not detailed in mathematical and model derivations. Specific cases consider the use of risk assessment for setting occupational exposure limits, establishing community exposure limits, and quantifying the hazards of environmental exposures to chemicals in air, drinking water, consumer products, and the built environment.

EHS 520b / CDE 520b, Case-Based Learning for Genetic and Environmental Diseases

Josephine Hoh

This course is a gateway to several updated as well as landmark public health stories with insights, analysis, and exclusives, including topics such as epigenetics, development of disease prevention, and personalized medicines. Ethical, political, and economic issues involved in the proper handling of genetic information are also discussed. Lectures are delivered using multimedia methods, including illustrations, cartoons, videos, and smart reads. Students take away the latest developments in tackling the causes of both early- and late-onset diseases; a roundup of key challenges; and skills in the appropriate design of a study, analysis, and interpretation that will be crucial for tackling the disease of their own interest in the future. Active participation in quizzes, writing, sharing personal research and opinions, and presentations are the criteria for the final grade. No prerequisites.

EHS 525a and EHS 526b, Seminar and Journal Club in Environmental Health

Ying Chen

Students are introduced to a wide variety of research topics, policy topics, and applications in environmental health science. The course consists of seminar presentations and journal club meetings that alternate weekly. The seminar series includes biweekly presentations by EHS faculty and outside experts, followed by a discussion period. The journal club series includes student presentations and discussion on one or two scientific literatures related to the seminar topic of the following week. This course is designed to promote critical thinking regarding current topics in environmental health science as well as to help students develop topics for their theses. Although no credit or grade is awarded, satisfactory performance will be noted on the student's transcript. o Course cr per term

EHS 530a, Air Pollution and Public Health Krystal Pollitt

Exposure to air pollution is a leading contributor to the global disease burden. This course discusses major emission sources, atmospheric transformation and transport, measurement and modeling techniques for human exposure assessment, and the health impacts of air pollutants. Emphasis is placed on students gaining hands-on experience with measurement (e.g., low-cost sensors, passive samplers) and spatial analysis tools (e.g., ArcGIS) for application to research, public health practice, and community engagement. Through a series of laboratory sessions, students quantitatively characterize indoor and outdoor exposure concentrations and learn methods to critically assess data quality. The public health implications of air pollutant exposure are examined through review of recent epidemiological and toxicological research. The course discusses inequitable distribution of air pollutant exposure across the United States in relation to environmental health disparities. The health benefits of air pollutant intervention strategies in developed and developing regions and implications for policy action are also covered.

EHS 531b, Meta-research: Evaluating and Synthesizing Research Joshua Wallach

Over the past few years, there have been growing concerns about a possible “reproducibility crisis” in research. Every year, several million new research papers are published, and in biomedicine alone, the number has been increasing exponentially. The rapid accumulation of scientific studies provides an opportunity to conduct meta-research, which is the field that focuses on performing research on existing research. Meta-research, which cuts across all disciplines and relies on a wide range of methodological approaches, involves studying the methods, reporting, reproducibility, evaluation, and incentives related to research. While individual meta-analyses, which generally involve combining data from multiple studies for specific exposure-outcome relationships, fall under the umbrella of “meta-research,” this course is focused on the methods used to evaluate multiple studies (or meta-analyses) across multiple topics. The overall goals of meta-research are to assess key research characteristics and to determine how to improve research practices and evidentiary standards. This course covers some meta-analytical methodology, similar to CDE 650. However, unlike a traditional “meta-analysis” course, where students complete a systematic review/meta-analysis, this course is designed to accommodate diverse student projects that deal with research methods, reporting, reproducibility, evaluation, and incentives. Overall, the course provides students with the tools to (1) evaluate the quality, validity, and reproducibility of research; and (2) preregister, design, conduct, and

publish a theoretical or empirical meta-research study, following the best open-science practices. Meta-research studies can be conducted across all scientific fields, from preclinical/animal research to the social sciences. Key topics include the philosophy of science; scientific biases and bias assessment; designing and conducting a meta-research project; meta-analytical methodology; database searches; and open-science practices. The class consists of lectures and labs/discussions. Students design a meta-research project in their own field. The goal is to have students work on a project that will be suitable for a thesis and/or eventual publication in a peer-reviewed journal. Prerequisite: one graduate-level biostatistics (e.g., BIS 505) or epidemiology (e.g., EPH 508) course.

EHS 537a / EMD 537a, Water, Sanitation, and Global Health Ying Chen and
Elsio Wunder

Water is essential for life, and yet unsafe water poses threats to human health globally, from the poorest to the wealthiest countries. More than two billion people around the world lack access to clean, safe drinking water, hygiene, and sanitation (WASH). This course focuses on the role of water in human health from a public health perspective. The course provides a broad overview of the important relationships between water quality, human health, and the global burden of waterborne diseases. It discusses the basics of water compartments and the health effects from exposures to pathogenic microbes and toxic chemicals in drinking water. It also covers different sanitation solutions to improve water quality and disease prevention and discusses future challenges and the need for intervention strategies in the new millennium.

EHS 545b, Molecular Epidemiology Yong Zhu

Many diseases are the outcome of a complex interrelationship between multiple genetic, epigenetic, and environmental factors. This course covers basic concepts of human genetics as well as recent discoveries in the field of epigenetics, which are fundamental to understanding how individuals differ in their susceptibility to environmental agents and how these susceptibilities change over time. Current knowledge of molecular approaches to identifying specific genetic variations and epigenetic alterations associated with human diseases are introduced, and their roles in gene-environment interactions and disease development are discussed. The course includes formal lectures, article discussions, and laboratory components, which provide hands-on experiences of some commonly used molecular techniques for detecting genetic and epigenetic changes.

EHS 547b, Climate Change and Public Health Robert Dubrow

This course takes an interdisciplinary approach to examining relationships between climate change and public health. After placing climate change in the context of the Anthropocene and planetary health and exploring the fundamentals of climate change science, the course covers impacts of climate change on public health, including heat waves; occupational heat stress; hurricanes and flooding; tropospheric ozone; wildfires; aeroallergens; vector-borne, foodborne, and waterborne diseases; food insecurity; migration; and violent conflict. The course covers the public health strategies of adaptation (secondary prevention) and mitigation (primary prevention) to reduce adverse health impacts of climate change and discusses the substantial non-climate health benefits of these strategies. Policy, vulnerability, and climate justice considerations are integrated into the course throughout. The course is reading-intensive and makes ample use of case studies. This course should be of interest to

students across Yale School of Public Health and the University. Prerequisites: EPH 508 or HLTH 240 or equivalent, and EPH 505 or equivalent.

EHS 560a, Methods in Climate Change and Health Research Kai Chen

Climate change is recognized as one of the greatest public health challenges of the twenty-first century. This course takes multidisciplinary approaches to identify, assess, quantify, and project public health impacts of climate change and of measures to address climate change. It first introduces the fundamental principles of health impact assessment and gives a brief overview of the public health approaches to address climate change. Then it applies advanced data analysis methodologies in environmental epidemiology, including time-series analysis, spatial epidemiology, and vulnerability assessment, to characterize the present climate-health (exposure-response) relationships and to identify vulnerable populations. This course discusses key concepts of scenario-based climate projections and their applications in projecting future health impacts, evaluating health co-benefits of climate mitigation policies, and assessing climate change adaptation measures. Emphasis is placed on hands-on computer lab exercises with real-data examples and R scripts. Prerequisites: EPH 505 or equivalent; EPH 508 or equivalent; EPH 513; or permission of the instructor.

EHS 563b / CDE 563b, Biomarkers of Exposure, Effect, and Susceptibility in the Epidemiology of Noncommunicable Disease Caroline Johnson

This course explores how new biomarker approaches can be applied to understanding the health consequences of environmental exposures and other risk factors. We learn how advances in the measurement of environmental exposures, genes, proteins, metabolites, and the microbiome have strengthened epidemiological associations, and narrowed the gap from correlation to causality. Variability in biomarker performance and susceptibility to disease due to ageing, diet, location, and other factors is discussed, along with methods that are used to evaluate biomarker evidence in epidemiology. Lectures describe chronic noncommunicable diseases of immediate concern to public health such as neurodegenerative diseases (Alzheimer's disease, Parkinson's disease), cancer, cardiovascular diseases, and asthma. We examine seminal publications and the application of techniques that have transformed the understanding of each disease, resulting in improvements to early detection and treatment approaches for these diseases. We also delve into examples of epidemiologic studies that have been carried out on large prospective cohorts, such as the Framingham Heart Study and Nurses' Health Study, and compare and critique methods used to identify biomarkers of disease between the cohorts. To evaluate and foster greater understanding of these areas, students critique journal articles for homework assignments.

EHS 566a / CDE 566a, Causal Inference Methods in Public Health Research

Zeyan Liew

This course introduces the theory and applications of causal inference methods for public health research. The rapid development of both the theoretical frameworks and applications of causal inference methods in recent years provides opportunities to improve the rigor of epidemiological research. The course covers topics such as (i) the principles of causal logic including counterfactuals and probability logic, (ii) epidemiological study designs and sources of biases including misinterpretations of statistics, (iii) applications of causal diagrams in epidemiology, (iv) applications of

causal modeling techniques in epidemiological research using real-world and simulated data. Students leave the course with a basic knowledge of causal inference methods to apply in their own research projects and the ability to further explore the causal inference literature. This is an introductory-level course for causal inference methods with a focus on epidemiological research using observational data. Students interested in the theoretical and mathematical basis of causal inference methods should consider taking BIS 537. Prerequisites: EPH 508 and either BIS 505 or CDE 534. Other equivalent classes would require the permission of the instructor. Programming experience is also required.

EHS 567b, Fundamentals of Green Engineering and Green Chemistry Paul Anastas

There is a broad desire to ensure that consumer products, manufacturing processes, and material and energy systems are compatible with public health and environmental sustainability. This course provides fundamental knowledge of the frameworks, methods, tools, and techniques of designing for sustainability. Through an understanding of conceptual contracts and application to real-world case studies, students learn the impacts of design on health (including toxic and ecotoxic effects) and the ways to ensure that new products, processes, and systems can be constructed through the principles of green engineering and green chemistry. This course provides the foundation for more advanced investigations in sustainable design; there are no prerequisites.

EHS 568a or b, Introduction to GIS for Public Health Jill Kelly

This course teaches the use of Geographic Information Systems (GIS), a collection of hardware and software tools that allow users to acquire, manipulate, analyze, and display geographic data in its spatial configuration. Students learn both the theory of geospatial analysis and practical applications of GIS in a public health context.

EHS 573b, Epidemiological Issues in Occupational and Environmental Medicine

Mark Russi and Martin Slade

This course explores issues around the detection and characterization of health outcomes from environmental and occupational exposures. Case studies include infectious disease outbreaks, cancer clusters in the general environment and within industrial settings, groundwater contaminations and birth defects, lung diseases and cancers following the World Trade Center attacks, health sequelae in military populations, radon exposures and lung cancers in miners and in the general population, and exposures among marginalized populations. The course is taught in discussion format by occupational and environmental medicine faculty. There is a take-home final examination.

EHS 575a, Introduction to Occupational and Environmental Medicine Carrie Redlich

This course presents a broad overview of the fundamental concepts of occupational and environmental medicine (OEM), including the major workplace and environmental hazards and stressors (chemical, physical, biological, psychosocial), the settings in which they occur, major related illnesses and injuries, and preventive strategies. The key role of exposure assessment, industrial hygiene, ergonomics, epidemiology, toxicology, and regulatory and ethical factors in the recognition and prevention of work and environment-related health effects is incorporated throughout the course. The course includes lectures, workplace site visits, and article discussions. There are no prerequisites.

EHS 581b, Public Health Emergencies: Disaster Planning and Response Yong Zhu

This course focuses on operational aspects of planning and response to domestic and international public health and medical emergencies. Under the National Response Framework, public health and medical components of emergency response are grouped in Emergency Support Function #8 (ESF 8). Many states and local jurisdictions organize their responses similarly. ESF 8 encompasses seventeen core functions. The course primarily emphasizes U.S. domestic scenarios and familiarity with U.S. government guidance documents, but international response analogies and distinctions are included for illustration of some concepts.

EHS 600a or b, Independent Study or Directed Readings Staff

Independent study or directed readings on a specific research topic agreed upon by faculty and student. By arrangement with faculty. For PhD Students only.

EHS 619a and EHS 620b, Research Rotation Caroline Johnson

This course is required of all EHS Ph.D. students during their first academic year. The research rotations are in EHS laboratories that are able to accommodate students. Research rotations are available for both “dry” (i.e., statistical analysis) and “wet” (i.e., bench) laboratory research groups. The student meets with the EHS graduate faculty member at the beginning of the rotation for an explanation of the goals and expectations of a student in the laboratory. The student becomes familiar with the research models, approaches, and methods utilized by the research group through interactions with other laboratory/research personnel and from laboratory manuscripts. The student is expected to spend at least fifteen hours per week working in the laboratory or research group and to present a rotation seminar at the end of the rotation period.

Epidemiology and Public Health

EPH 100a and EPH 101b, Professional Skills Series Felicia Spencer and

William Vance

The Professional Skills Series is intended to prepare M.P.H. students for leadership positions as public health professionals. Material covered includes public speaking, presentation skills, professional writing, negotiation and conflict resolution, and networking and social media. Attendance at all sessions is required (elective for Advanced Professional M.P.H. and Accelerated M.B.A./M.P.H. students), and some homework is a part of the program. Although no credit or grade is awarded, satisfactory performance will be noted on the student's transcript. o Course cr per term

EPH 500b, Public Health Practicum Susan Nappi

This course is one of the options available to students to fulfill the practice 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 students' 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. Open only to second-year M.P.H. students, Advanced Professional M.P.H. students, and Accelerated M.B.A./M.P.H. students.

EPH 505a, Biostatistics in Public Health Michael Wininger

This course provides an introduction to the use of statistics in medicine and public health. Topics include descriptive statistics, probability distributions, parameter estimation, hypothesis testing, analysis of contingency tables, analysis of variance, regression models, and sample size and power considerations. Students develop the skills necessary to perform, present, and interpret statistical analyses using R software.

EPH 507a, Social Justice and Health Equity Danya Keene

This course outlines the social and structural determinants related to health inequities in the United States and globally. Conceptual, theoretical, methodological, and empirical approaches to understanding social justice and health equity are explored, with a focus on health determinants including health care, social class, poverty, oppression and power, stigma and discrimination, and neighborhood and social factors. The course takes a multidisciplinary approach, integrating methods and research from epidemiology, social sciences, and medicine to explore the individual, interpersonal, community, and societal influences that lead to healthy and unhealthy outcomes.

EPH 508a, Foundations of Epidemiology and Public Health Linda Niccolai

This course presents an introduction to epidemiologic definitions, concepts, and methods. Topics include history of epidemiology, descriptive epidemiology, measurement of disease occurrence and association, study design (ecologic, cross-sectional, case-control studies, cohort, and intervention), surveillance, measurement validity and screening, random variation and precision, bias, confounding, effect modification, and causality. The course also teaches skills for quantitative problem solving and for understanding epidemiologic concepts in the published literature.

EPH 510a, Health Policy and Health Care Systems Mark Schlesinger

This course provides an introduction to the making, understanding, and consequences of health policy. The design and performance of the health care system are assessed, with particular attention to the complex and often contested manner in which health care is organized, financed, and delivered in the United States. The course also considers the fundamental concerns—such as cost, access, and quality—that shape the development of health policy and health systems in all countries, and it looks to the health systems of other countries in order to understand the advantages and disadvantages of alternative approaches. An overview of the important actors in the health care and political systems is provided, and students are introduced to methods for understanding the behavior of these policy makers and stakeholders. Health issues are placed in the context of broader social goals and values.

EPH 513b, Major Health Threats: Determinants and Solutions Catherine Yeckel and Krystal Pollitt

This course introduces students to three major health threats: global climate change, antibiotic resistance, and type 2 diabetes mellitus. The goal is to achieve foundational knowledge of environmental factors in population health; ecological perspectives in human, animal, and ecosystem health (one health); biological and genetic factors that affect population health; as well as the impact of globalization on global disease burden. The course's modular format includes mixed lecture, case study, and vignette

approaches. Small, cross-disciplinary groups are used throughout the term to actively apply concepts, hone data interpretation skills, and frame research and health solution projects. Importantly, this group structure is used to implement an overarching leadership skills module to permit conversations, problem solving, and projects for each module. The course culminates in planning, designing, communicating, and pitching innovative solutions to major health threats.

EPH 515a, Ethics and Public Health: An Introduction Kaveh Khoshnood

This four-session seminar introduces students to the ethical implications of public health programs, policies, and research initiatives; their historical roots; and the regulations and guidelines governing human subjects research in the United States and internationally. Case studies are used to demonstrate selected ethical challenges in public health policy, practice, and research. In addition, students learn the functions and procedures of Yale's Human Research Protection Program and complete its web-based training on human subjects research. M.P.H. students are required to take the course during the first year of the program. o Course cr

[EPH 520, 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, the Career Management Center, and the Office of Public Health Practice to identify suitable public health placements such as medical care facilities, community agencies, public health departments, research projects, laboratories, and other sites engaged in public health activities. The internship experience sometimes 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, with the exception of those in the Advanced Professional M.P.H. Program and the Accelerated M.B.A./M.P.H. Program, *must* complete an approved Summer Internship. The Summer Internship may be used to complete the practice requirement for the M.P.H. degree with prior approval from the Office of Public Health Practice. o Course cr

EPH 524a and EPH 525b, Thesis Staff

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 of the YSPH Bulletin. The thesis is not a requirement for students in the Biostatistics, Health Care Management, Health Policy, or Advanced Professional M.P.H. programs (except for those in the Occupational and Environmental Medicine track). 2 Course cr per term

EPH 542b, Practice-Based Community Health Research Debbie Humphries

This course is one of the options available to students to fulfill the practice requirement for the M.P.H. degree. The course develops students' skills in planning and implementing practice-based community health research projects. The course content is based on an ecological framework, principles of community and public health ethics, and a teaching strategy of significant learning experiences and team-based learning. Given the current emphasis on using evidence-based practices in public health, this course helps students develop skills in turning practice activities and data into evidence. Teams of four to six students work on a community-driven research project at a local agency based on proposals submitted by a range of community organizations. Through

this exercise and related assignments throughout the term, students develop skills in planning and implementing practice-based research projects, including developing project timelines, logic models, and program impact theories.

EPH 555a or b, Clinic in Climate Justice, Climate Policy, Law, and Public Health

Robert Dubrow, Laura Bozzi, and Marianne Engelman-Lado

This course, an innovative collaboration between Yale School of Public Health, Yale School of the Environment, and Vermont Law School, includes students from both Yale and Vermont Law School. In the course, interdisciplinary student teams carry out applied projects that incorporate elements of climate justice, climate policy, and/or law with public health. Each team works with a partner organization (e.g., state agency, community organization, other nongovernmental organization) or on an ongoing project of the Yale Center on Climate Change and Health and/or the Vermont Law School Environmental Justice Clinic. A given team may include students from one institution or from both institutions, in which case team members work together remotely. The course affords the opportunity to have a real-world impact by applying concepts and competencies learned in the classroom. This course should be of interest to graduate and professional students across the University and is open to Yale College juniors and seniors. In addition, this course is one of the options available to students to fulfill the practice requirement for the M.P.H. degree at YSPH and the capstone requirement for the M.E.M. degree at the Yale School of the Environment. Enrollment is by application only; check the Yale Center on Climate Change and Health website or the course's Canvas site for more information.

[EPH 556, Health Care Environmental Sustainability Practicum]

If the U.S. health care sector were a nation itself, it would rank thirteenth in the world for greenhouse gas emissions. Health care is an enormous and complex system, in need of environmental health assessment and sustainability science to measure and mitigate pollution and public health damages. Policy and business innovation is also essential to implement pollution preventive efforts while maintaining patient safety and quality care. In this course, interdisciplinary student teams perform applied public health or practice projects related to health care, sustainability science, and public health. Each team works with a clinical (physician or nurse) and/or management mentor from Yale New Haven Hospital or its affiliates, or in collaboration with partners such as the National Health Service Sustainable Development Unit of the United Kingdom. Each group uses the opportunity to apply concepts and competencies learned in the classroom to the field of health care. This course should be of interest to students from the Schools of Public Health, Environment, Management, Medicine, and Nursing. This course is one of the options available to students to fulfill the practice requirement for the M.P.H. degree and the ENV capstone requirement. 1 Course cr

EPH 557b, Evidence-Based Decision-Making in Global Health Kristina Talbert-Slagle

This course is a capstone seminar for M.P.H. students in the Global Health Concentration. Through a mixture of teaching approaches including lecture, large- and small-group discussion, case studies, practicum sessions, and student-led experiential learning, students study and apply principles of evidence-based decision-making in global health to their specific area(s) of interest. Students learn how to define evidence and explore different types of evidence that are and have been used in global health evidence-informed decision-making. By analyzing case studies, students also examine what has and has not been considered evidence in global health decisions, and they

develop critical-thinking approaches to enable evaluation of both the quality and robustness of evidence, as well as potential gaps. By studying the experience of others in the field of global health, students are also able to apply lessons learned from past examples of global health evidence-based decision-making to their own work and interest area(s). The final product for this course is a fifteen-page paper summarizing how the principles and practice of global health evidence-based decision-making apply to each student's interest area. Prerequisites: completion of one year of an M.P.H. program and a global summer M.P.H. internship experience.

EPH 570a and EPH 571b, Seminar in Climate Change and Health Robert Dubrow and Kai Chen

In this two-term, monthly, not-for-credit seminar, students are introduced to a wide variety of topics related to climate change and health. The seminar features talks by Yale faculty, as well as invited speakers from other institutions. Students are expected to read one or two relevant papers in advance of each talk and to articulate questions for the speaker. This course is specifically targeted for students in the Climate Change and Health Concentration but is open to all members of the YSPH and Yale communities. Two terms of this seminar are required of students in the Climate Change and Health Concentration. Although no credit or grade is awarded, satisfactory performance will be noted on the student's transcript. o Course cr per term

EPH 580a and EPH 581b, Seminar for Modeling in Public Health A. Paltiel and Theodore Cohen

This yearlong, monthly seminar is targeted most specifically to students in the Public Health Modeling Concentration but open to all interested members of the Yale community. The seminar features talks by faculty from across Yale University doing modeling-related research, as well as invited speakers from other universities and public health agencies. The objectives are to offer students the opportunity to witness the scope and range of questions in public health policy and practice that may be addressed, understood, and informed using model-based approaches; appreciate the breadth of public health modeling research being conducted around the University and beyond; explore possible collaborations/relationships with other scholars and professionals; review, critique, and evaluate model-based public health research in a structured environment; and form their own opinions regarding the applicability, relevance, and responsible use of modeling methods. Two terms of this no-credit seminar are required of students in the Public Health Modeling Concentration. For each class, one or two readings are circulated/posted on the course website prior to the talk. Students are encouraged to read the articles and articulate questions for the speaker. o Course cr per term

EPH 591a, Global Health Seminar Michael Skonieczny

This weekly seminar exposes students in the health professions to key issues in global health research and practice. The course features faculty from across the health professional schools and other global health experts from around the world. Its collaborative nature provides a rich environment for interdisciplinary dialogue. The goal is for students to attain a good understanding of key issues upon which they may base future research, service, and clinical pursuits in the field of global health. Although no course credit is awarded, satisfactory performance is noted on the student's transcript. o Course cr

EPH 600a, Research Ethics and Responsibility Christian Tschudi

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. o Course cr

EPH 608a or b, Frontiers of Public Health Staff

This course is designed to expose students to the breadth of public health and is required of M.S. and Ph.D. students who do not have prior degrees in public health. It explores the major public health achievements in the last century in order to provide students with a conceptual interdisciplinary framework by which effective interventions are developed and implemented. Case studies and discussions examine the advances across public health disciplines including epidemiology and biostatistics, environmental and behavioral sciences, and health policy and management services that led to these major public health achievements. The course examines global and national trends in the burden of disease and underlying determinants of disease, which pose new challenges; and it covers new approaches that are on the forefront of addressing current and future public health needs.

Epidemiology of Microbial Diseases

EMD 512a, Immunology for Epidemiologists Nancy Ruddle

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.

EMD 517a, Principles of Infectious Diseases I Melinda Pettigrew

This course explores the epidemiology and biology of infectious agents and the diseases they cause. Through a theme-based, integrated approach, students learn about the epidemiology, pathogenesis, prevention, and control of bacteria, viruses, and eukaryotic parasites of public health importance. Emphasis is placed on epidemiological methods, routes of transmission, host-pathogen interactions, and mechanisms of virulence. The course also teaches skills for understanding and evaluating the published literature, specifically through class discussions and oral presentations of assigned readings by students. Topics covered include gastrointestinal, respiratory, and sexually transmitted pathogens.

EMD 518b, Principles of Infectious Diseases II Amy Bei

This course explores the epidemiology and biology of infectious agents and the diseases they cause. Through a theme-based, integrated approach, students learn about the epidemiology, pathogenesis, prevention, and control of bacteria, viruses, and eukaryotic parasites of public health importance. Emphasis is placed on epidemiological methods, routes of transmission, host-pathogen interactions, and mechanisms of virulence. The course also teaches skills for understanding and evaluating the published literature, specifically through class discussions and oral presentations of assigned readings by students. The course builds upon concepts covered in EMD 517 and introduces new topics such as infectious causes of chronic diseases; and vector-borne, zoonotic, and emerging pathogens.

EMD 525a and EMD 526b, Seminar in Epidemiology of Microbial Diseases

Nathan Grubaugh

This is a weekly seminar series offered by EMD faculty. The presentations describe the ongoing research activities in faculty laboratories as well as in EMD-affiliated centers. The talks introduce the department's research activities as well as associated resources in the area. Attendance is required of first-year EMD students. Although no credit or grade is awarded, satisfactory performance will be noted on the student's transcript.

o Course cr per term

EMD 530b, Health Care Epidemiology: Improving Health Care Quality through Infection Prevention Louise-Marie Dembry and David Banach

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.

EMD 531b, Genomic Epidemiology of Infectious Diseases Nathan Grubaugh

This course provides an overview of how we can harness microbial evolution to study epidemiology. During the first part of the course, students learn the basic skills to implement next-generation sequencing and phylogenetic approaches to investigate different stages of infectious disease outbreaks. During the second part, students critically evaluate genomic epidemiology case studies to understand the applications and limitations of genomic data, what aspects can be used to inform outbreak responses, and how the information can be communicated to the public. The course consists of lectures, group discussions, computer exercises, and student presentations.

EMD 533a, Implementation Science J. Lucian (Luke) Davis

Implementation science can be defined as the study of facilitators and barriers to the adoption and integration of evidence-based practices into health care policy and delivery. Examples include comparisons of multiple evidence-based interventions; adaptation of interventions according to population and setting; approaches to scale-up of effective interventions; and development of innovative approaches to improve health care delivery and health. This course explores implementation science using a seminar format; each session begins with a brief presentation of focal topic content followed by critical thinking and dialogue. Students apply the content each week in the development of a potential research project using implementation science in their area of interest and expertise. Throughout the course, faculty and students bring case studies and illustrations from the literature to illustrate key concepts and challenges in the conceptualization and implementation of studies using these methods.

[EMD 535, Urban Sanitation: The United States and Peru]

This interdisciplinary course examines the challenges posed by the growing volumes of human waste (urine, feces, menstrual blood) that are generated daily in cities around the world. Topics to be covered include environmental, engineering, and public health aspects of sanitation; the history of sanitation; innovation in sanitation; sewage reuse; cultural and social considerations; and case studies of different centralized and decentralized solutions. The course is organized around two final projects: (1) a spring-break trip to Lima, Peru, where students will observe firsthand some of the components of this complex sanitation system, and will meet with stakeholders ranging from

government officials to slum-dwellers to nonprofits pursuing innovative sanitation solutions; and (2) a U.S.-based analysis of a comparable sanitation system. Enrollment limited to twelve students each from the School of the Environment, the School of Public Health, and the Department of Chemical & Environmental Engineering. Prerequisite: EHS 537/EMD 537. 1 Course cr

[EMD 536, Investigation of Disease Outbreaks]

This is a course about the investigation of acute disease outbreaks by public health departments in the United States. The focus is on public health practice, not public health research. We expect students to have a basic understanding of epidemiology. Topics include roles and responsibilities of local, state, and national public health agencies; legal framework for conducting outbreak investigations; public health practice vs. research; confidentiality laws and the need to release identifiable health information to prevent new cases of an infectious disease; crisis and emergency risk communication; incident command; and joint investigations with law enforcement. A theme throughout the course: can epidemiology provide information in real time to guide the implementation of control and prevention measures? Offered every other year. Prerequisite: EPH 508. 1 Course cr

EMD 537a / EHS 537a, Water, Sanitation, and Global Health Ying Chen and
Elsio Wunder

Water is essential for life, and yet unsafe water poses threats to human health globally, from the poorest to the wealthiest countries. More than two billion people around the world lack access to clean, safe drinking water, hygiene, and sanitation (WASH). This course focuses on the role of water in human health from a public health perspective. The course provides a broad overview of the important relationships between water quality, human health, and the global burden of waterborne diseases. It discusses the basics of water compartments and the health effects from exposures to pathogenic microbes and toxic chemicals in drinking water. It also covers different sanitation solutions to improve water quality and disease prevention and discusses future challenges and the need for intervention strategies in the new millennium.

EMD 538a, Quantitative Methods for Infectious Disease Epidemiology
Virginia Pitzer

This course provides an overview of statistical and analytical methods that apply specifically to infectious diseases. The assumption of independent outcomes among individuals that underlies most traditional statistical methods often does not apply to infections that can be transmitted from person to person. Therefore, novel methods are often needed to address the unique challenges posed by infectious disease data. Topics include analysis of outbreak data, estimation of vaccine efficacy, time series methods, and Markov models. The course consists of lectures and computer labs in which students gain experience analyzing example problems using a flexible computer programming language (MATLAB).

[EMD 539, Introduction to Public Health Surveillance]

Surveillance is one of the fundamental activities of public health organizations and is critical for understanding disease burden, impacts of interventions, and the detection of unusual events. The first part of the course provides an overview of the types of surveillance systems and their strengths and weakness, sources of data for surveillance, and controversies resulting from surveillance activities. The second part focuses

on methods used to analyze surveillance data, with a particular focus on practical application. There is a focus throughout on the critical evaluation of surveillance data from different sources. 1 Course cr

[EMD 540, Responding to Violent Conflict: Epidemiologic Methods and Public Health Interventions]

In this course we discuss how epidemiological methods are applied to understand specific health consequences of violent conflicts, including infectious diseases, mental health, maternal/child health, and chronic health problems. In addition, we critically examine interventions employed to mitigate these negative consequences and assess the evidentiary basis for their efficacy with the goal of understanding what makes some interventions more successful than others. Throughout the course, we consider inevitable ethical challenges of conducting research in fragile settings and with vulnerable populations who often lack basic services and are suffering human rights violations. 1 Course cr

EMD 548b, Observing Earth from Space Staff

A practical introduction to satellite image analysis of Earth's surface. Topics include the spectrum of electromagnetic radiation, satellite-borne radiometers, data transmission and storage, computer image analysis, the merging of satellite imagery with GIS and applications to weather and climate, oceanography, surficial geology, ecology and epidemiology, forestry, agriculture, archaeology, and watershed management. Prerequisites: college-level physics or chemistry, two courses in geology and natural science of the environment or equivalents, and computer literacy.

[EMD 550, Biology of Insect Disease Vectors]

Insects transmit pathogens that cause many emerging and reemerging human and agriculture-related diseases. Many of these diseases, which are referred to as neglected tropical diseases (NTDs), have a dramatically negative impact on human health in the developing world. Furthermore, they cause indirect devastation by significantly reducing agricultural productivity and nutrient availability, exacerbating poverty and deepening disparities. This course introduces students to the biological interactions that occur between major groups of important disease vectors and the pathogens they transmit. Lectures cover current research trends that relate to the ecology and physiology of insect vectors. Course content focuses on how these aspects of vector biology relate to the development and implementation of innovative and effective disease-control strategies. Offered every other year. Prerequisite: full year of college/university-level biology, or permission of the instructor(s). 1 Course cr

EMD 553b, Transmission Dynamic Models for Understanding Infectious Diseases
Theodore Cohen

This course is an introduction to the use of transmission dynamic models as tools for studying the complex patterns that arise from the interaction between pathogens and hosts. Topics covered include the structure, parameterization, and analysis of simple mathematical models. Questions addressed include: Why do some pathogens fail to spread effectively in a host community while others increase in prevalence before eventual elimination? Why do some infections oscillate in frequency while others occur at relatively constant levels over long periods of time? How is it possible that an intervention could perversely increase the burden of disease in the community, even as it reduces the overall prevalence of infection? The course consists of lectures

and practical exercises in which students gain experience designing and manipulating mathematical models of infectious diseases by hand and with the open-source programming language R. Knowledge of algebra is assumed, and familiarity with basic calculus concepts is helpful. There are no formal prerequisites, but students without any familiarity with infectious diseases are encouraged to contact the instructor before registering. This course is required of students in the Public Health Modeling Concentration.

EMD 563a or b, Laboratory and Field Studies in Infectious Diseases

Christian Tschudi

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. Permission of the instructor required.

EMD 566b / HPM 566b, Critical Issues in Global Health Kaveh Khoshnood

The course focuses on critical challenges to the health of the poor in low- and middle-income countries and pays particular attention to how these health gaps can be addressed in low-cost and highly effective ways. The course covers the architecture, politics, and governance of global health; key trends in approaches to meeting the health needs of the poor in low- and middle-income countries; and how science and technology can be harnessed for this purpose. It examines the burden of disease and the determinants of this burden; covers the leading causes of illnesses, disability, and preventable death from communicable and noncommunicable diseases, with special attention to women and children; and focuses particular attention on key health systems issues and recent efforts to overcome them, especially in low-income settings.

[EMD 567, Tackling the Big Three: Malaria, TB, and HIV in Resource-Limited Settings]

Malaria, tuberculosis, and HIV account for more than five million deaths worldwide each year. This course provides a deep foundation for understanding these pathogens and explores the public health issues that surround these infectious diseases in resource-limited settings. Emphasis is placed on issues in Africa, but contrasts for each disease are provided in the broader developing world. The course is divided into three sections, each focusing in depth on the individual infectious disease as well as discussions of interactions among the three diseases. The sections consist of three to four lectures each on the biology, individual consequences, and community/public health impact of each infectious disease. Discussion of ongoing, field-based research projects involving the diseases is led by relevant faculty (research into practice). The course culminates with a critical discussion of major public health programmatic efforts to tackle these diseases, such as those of PEPFAR, the Bill & Melinda Gates Foundation, the Global Fund, and the Stop TB Partnership. Prerequisite: EMD 518. 1 Course cr

EMD 580a / HPM 580a, Reforming Health Systems: Using Data to Improve Health in Low- and Middle-Income Countries Robert Hecht

Health systems in low- and middle-income countries are in constant flux in the face of myriad pressures and demands. Under such conditions, how can senior country officials and their donor partners make the best decisions to reform health systems to achieve universal health coverage and improve the allocation of resources to maximize health gains, including on scale-up of programs to fight infectious diseases and maternal and child health problems? The course rounds out and reinforces the Yale M.P.H. experience in the Global Health Concentration by providing students with a thorough understanding of health systems and health reforms—their components, dynamics, performance, and impacts—and by imparting the key tools and data sources needed to conceptualize and assess options related to health system reform and resource allocation, and to make coherent and effective policy and financing recommendations. Using these analytical frameworks and techniques, students analyze 6–8 case examples of major country reforms and of the scaling up of national disease control programs and prepare two short policy papers applying what they have learned to real-world health systems challenges.

EMD 582b, Political Epidemiology Gregg Gonsalves

Political epidemiology is the study of the impact of welfare regimes, political institutions, and specific policies on health and health equity. This course emphasizes the last among these—the effects of specific policies—on health outcomes in infectious diseases and other areas of human health and development. The course takes an issues- and methods-based approach, looking at how to evaluate the effects of political determinants of health (e.g., immigration, education, fiscal and environmental policies) through experimental and quasi-experimental methods, as well as various techniques associated with policy modeling (e.g., Markov models, systems dynamics, microsimulation, spatial models). Prerequisites: EPH 505 or a similar introductory course in statistics. S&DS 541, MATH 241, or a similar introductory course in probability is recommended but not required, and a review of probability is offered in the first discussion section.

EMD 584a / SBS 584a, Advanced Global Health Justice Practicum: Fieldwork

Ali Miller, Amy Kapczynski, and Gregg Gonsalves

The course is primarily for students who previously have enrolled in EMD 596/SBS 596; however, new students will be considered. Permission of the instructor required.

EMD 596b / SBS 596b, Health Justice Practicum and Fieldwork Ali Miller,

Amy Kapczynski, and Gregg Gonsalves

This experiential course introduces students to the social and political determinants of health and to techniques to mobilize for health justice. A health justice approach prioritizes processes of power building, particularly with the most marginalized and vulnerable, rather than technocratic or top-down change. The course includes a weekly seminar component and project work. Students undertake projects, typically in interdisciplinary teams with outside partners, commonly on issues related to sexual rights and gender justice, health equity, access to medicines, and structural responses to infectious disease. Projects are selected with an eye toward the development of both public health and legal skills, and students are expected to reflect on how academic and NGO-based advocates can best leverage their position and skills in support of community or grassroots groups. Projects are likely to build on the work of GHJP on

the COVID-19 crisis and also focus on the misuse of the carceral powers of the state, for example via reform of current policing and criminalization of sex work. Students are evaluated by their work product and class participation rather than a final examination. They should be prepared to spend approximately 18 hours per week on the course; they should also be prepared for possible travel (typically during spring break) depending on the project. Resources are available for travel as needed. This course fulfills the YSPH OPHP practicum requirement. Enrollment limited to twelve. Meets according to the Law School calendar. Permission of the instructors required; an application must be submitted to health.justice@yale.edu by 4:30 p.m. on Nov. 1 2 Course cr

EMD 600a or b, Independent Study or Directed Readings Staff

Independent study or directed readings on a specific research topic agreed upon by faculty and student. By arrangement with faculty. For M.S. and Ph.D. students only.

EMD 625b, How to Develop, Write, and Evaluate an NIH Proposal Christian Tschudi

This pragmatic skills-building course aims to provide a mentored, guided structure for developing a significant research project and leads students through the steps of assembling a grant application following the NIH mechanism: either the predoctoral National Research Service Award (NRSA, F31) or the Exploratory/Developmental Research Grant Award (R21). Students are provided detailed information on each aspect of NIH grants: fundamentals of good grant writing, general preparation of grant application (e.g., specific aims, research strategy, analysis of reviews, and strategies of rebuttal and reapplication), identifying study sections, program officers and scientific review officers (SROs), research strategy, and detailed descriptions of the different types of funding mechanisms. Students develop skills to objectively review an NIH grant proposal and write a scientific critique.

EMD 670a and EMD 671b and EMD 672a, Advanced Research Laboratories

Christian Tschudi

This course is required of 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. Open only to doctoral students.

[EMD 680, Advanced Topics in Tropical Parasitic Diseases]

An introductory topic-based course in modern parasitology. For each topic there is an introductory lecture followed by a journal club-like discussion session of relevant papers selected from the literature. The 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, vaccines, or genomics. In addition, emphasis is placed on evaluating the quality and limitation of scientific publications and developing skills in scientific communication. Prerequisite: permission of the instructor. 1 Course cr

Health Policy and Management

HPM 500a or b, Independent Study in Health Policy and Management

Abigail Friedman

Student-initiated directed readings or supervised research under the direction of a Health Policy and Management faculty member. Enrollment requires the development of a term plan approved by a primary faculty mentor and the HPM independent study director. A term plan for directed readings shall include (a) topic and objectives, (b) applicable YSPH or departmental competencies, (c) 13 weeks of readings, (d) a schedule for meetings between the student and supervising faculty mentor, and (e) a description of a culminating written assignment to be completed by the conclusion of the term. A term plan for a research project shall include (a) a project description, (b) weekly benchmarks and activities for 13 weeks, and (c) a description of a final project or other written product to be produced by the conclusion of the term. The student and faculty mentor are expected to meet regularly throughout the term. This course is designed for M.P.H. students but is also open to other students at Yale with approval of a supervising HPM faculty mentor and the HPM independent study director. M.P.H. students may enroll in this course no more than twice for credit; each independent study must meet all requirements described above.

HPM 502a, Foundations of Accounting and Valuation Stanley Garstka

Distinguishing value creation from redistribution is a key problem faced by any economy. Modern accounting practices are focused on this problem, and knowledge of them is extremely useful. Further, value creation activities in a modern society can become complex and abstract, and accounting practices have developed accordingly. While worthy of a lifetime of study, the purpose of this course is to enable the student to gain a foundation upon which a deep understanding of accounting can be built. One cannot have a sensible discussion of accounting as assessing value without having some idea of what value means and how to think about it. Therefore, this course begins by exploring the basic determinants of value and the techniques used to assess it: discounting cash flow and risk/return analysis. These techniques are based on the timing and statistical properties of cash flow. With this introduction, the course then turns to the more fundamental processes of generating cash flow by creating value through the production and delivery of goods or services and then converting that value into cash flows. The basic financial statements, balance sheets, income statements, and cash flow statements as well as the accounting mechanics with which they are built are introduced in this context.

HPM 514a, Health Politics, Governance, and Policy Mark Schlesinger

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.

HPM 536b, Narratives in Health Media on the Social Internet James Hamblin

This course is a study of methods of communication that will equip students to engage with the public to share findings and insights, influence policy, identify problems,

and maximize the effectiveness of their work. While the challenges in health policy demand ever more complex academic study, some 100 million Americans do not know, for example, that the Affordable Care Act is the same thing as Obamacare – much less what the law includes and means. The gap between those driving the conversation and those alienated and excluded from it is growing daily. This severely limits systemic improvements, and even rational discussion of improvement. Traditionally, public health experts have had a limited array of tools at their disposal to engage in public discourse, to reach people outside of their immediate circles of professional contacts, and to inform, hear from, react to, and influence the lives of many. This course is predicated on the idea that science cannot be conceived as a system by which knowledge emanates outward (much less downward) from academia, or it will cease to reach people and affect the world, only exacerbating distrust, division, and claims of elitism. Public health can only exist as an active process of communication between practitioners, researchers, and the public. Trust is built when science happens as a shared endeavor. ½ Course cr

HPM 542b, Health of Women and Children Mary Alice Lee

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.

[HPM 545, Health Disparities]

This seminar explores our nation's striking inequities in morbidity, mortality, and injury (including by race, ethnicity, socioeconomic and immigration status, gender and gender identity, and geography), placing particular focus on the structural and social determinants of these inequities. Through readings drawn from multiple disciplines, it examines such topics as the impacts on health of poverty and inequality in income, wealth, and education; overt and implicit discrimination; residential segregation and concentrated poverty and their associated differential exposures to environmental hazards and health-promoting resources; differential access to, and quality of, health care; and the role of law as a determinant of, and tool to address, health inequities. A variety of community-based interventions to address health inequities are reviewed and critiqued, as are some of the ways law and policy are now being used as a tool to promote health justice. 1 Course cr

HPM 555b, Health Policy or Health Care Management Practicum Staff

This course is one of the options available to HPM students to fulfill the M.P.H. applied practice experience requirement. The practicum is a project-based learning experience in which students work 8–10 hours each week in their placement. The Health Care Management Practicum (section 1) allows students to focus on current

issues confronting a hospital department while working under the guidance of a departmental administrator. Students are required to attend the first week of class to enroll. The Health Policy Practicum (section 2) allows students to work on current state and/or local health policy issues while placed with state and/or local legislative or executive agency policy makers, or with senior staff at a nonprofit health policy or advocacy group. Prerequisite: permission of the instructor.

HPM 556a, Advanced Health Policy Practicum Shelley Geballe

This course is designed for students who wish to deepen their practice-based learning and develop additional research, communication, and advocacy skills through continuing work in a particular practicum placement and/or on a particular health policy topic. Students are placed with state and/or local legislative or executive agency policy makers, or with senior staff at nonprofit health policy or advocacy groups. Prerequisites: completion of HPM 555 and permission of the instructor.

HPM 558b, Quality and Safety in Health Care Organizations Vinita Parkash

This course introduces students to the science and implementation of quality improvement, error reduction, and patient safety initiatives in health care organizations. We discuss how medical errors occur and are ascertained, the current tools used to evaluate quality and safety initiatives, ethical and institutional challenges, and strategies to improve quality and safety from multiple perspectives. The course also gives an overview of policy-level quality improvement initiatives and their impact on quality improvement in health care organizations. Case-based studies are included to encourage discussion of complex topics in real-world settings. In particular, students are asked to consider the challenges created by the different perspectives of patients, health care providers, public health professionals, and risk-management and insurance structures on quality and safety in health care organizations. The class is structured as a mix of didactic lectures and seminar discussions.

[HPM 560, Health Economics and U.S. Health Policy]

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 with conceptual frameworks. 1 Course cr

HPM 564b, Vaccination Policy and Politics Jason Schwartz

This course explores critical topics in vaccination policy in the United States and internationally. It does so by examining the interconnected political, regulatory, social, cultural, ethical, economic, legal, and historical issues that contribute to ongoing debates about the design and implementation of vaccination programs and policies. Students acquire an understanding of the scope and design of contemporary vaccination programs and policies in the United States and worldwide; the policy and political landscapes in which vaccination programs are developed, funded, and implemented; the positions, evidence, and arguments of both proponents and critics of contemporary vaccine policy; and the application of principles and concepts from health policy and policy analysis to the study of vaccination policy.

HPM 566b / EMD 566b, Critical Issues in Global Health Kaveh Khoshnood

The course focuses on critical challenges to the health of the poor in low- and middle-income countries and pays particular attention to how these health gaps can be

addressed in low-cost and highly effective ways. The course covers the architecture, politics, and governance of global health; key trends in approaches to meeting the health needs of the poor in low- and middle-income countries; and how science and technology can be harnessed for this purpose. It examines the burden of disease and the determinants of this burden; covers the leading causes of illnesses, disability, and preventable death from communicable and noncommunicable diseases, with special attention to women and children; and focuses particular attention on key health systems issues and recent efforts to overcome them, especially in low-income settings.

HPM 570a, Cost-Effectiveness Analysis and Decision-Making A. Paltiel

This course introduces students to the methods of decision analysis and cost-effectiveness analysis in health-related technology assessment, resource allocation, and clinical decision-making. The course aims to develop technical competence in the methods used; practical skills in applying these tools to case-based studies of medical decisions and public health choices; and an appreciation of the uses and limitations of these methods at the levels of national policy, health care organizations, and individual patient care.

HPM 573b, Advanced Topics in Modeling Health Care Decisions Reza Yaesoubi

This course develops students' technical competencies in computer simulation modeling and medical decision-making using Python. The course aims to enhance skills in developing and analyzing decision models to guide health care resource allocation, technology assessment, and clinical decision-making. Particular emphasis is placed on using object-oriented programming features of Python to develop efficient, scalable, and transparent simulation models. Students also acquire skills in conducting, presenting, and critically evaluating modeling studies. The course consists of lectures, in-class labs, practical exercises, and a final project through which students gain experience in developing health care decision models. No previous programming experience is required.

HPM 576b, Comparative Health Care Systems Chima Ndumele

This course examines the basic structure of health care systems across countries, with a focus on how system design can impact the provision of care. Health care systems evolve within distinct cultures; consequently, these systems vary substantially in the ways they finance, organize, and deliver care. In spite of these differences, the aims of health care systems worldwide are often quite similar: chiefly, to facilitate access to high-quality care that improves health at a reasonable cost. Over the course of the term we identify themes in how countries organize their health care systems, examine the strengths and weaknesses of various approaches to the payment and delivery of health care, and explore specific examples of ongoing efforts to reform health systems. Recurring concepts include the role of public and private systems in financing and delivering health care, the impact of the local environment on the structure of health care systems, and the effect of health system design on patient and provider behavior.

HPM 580a / EMD 580a, Reforming Health Systems: Using Data to Improve Health in Low- and Middle-Income Countries Robert Hecht

Health systems in low- and middle-income countries are in constant flux in the face of myriad pressures and demands. Under such conditions, how can senior country officials and their donor partners make the best decisions to reform health systems to achieve universal health coverage and improve the allocation of resources to maximize health gains, including on scale-up of programs to fight infectious diseases and maternal

and child health problems? The course rounds out and reinforces the Yale M.P.H. experience in the Global Health Concentration by providing students with a thorough understanding of health systems and health reforms – their components, dynamics, performance, and impacts – and by imparting the key tools and data sources needed to conceptualize and assess options related to health system reform and resource allocation, and to make coherent and effective policy and financing recommendations. Using these analytical frameworks and techniques, students analyze 6–8 case examples of major country reforms and of the scaling up of national disease control programs and prepare two short policy papers applying what they have learned to real-world health systems challenges.

HPM 583b, Methods in Health Services Research Jacob Wallace

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: EPH 505.

HPM 586a, Microeconomics for Health Policy and Health Management

Abigail Friedman

This course introduces students to microeconomics, with an emphasis on topics 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.

HPM 587a, Advanced Health Economics Susan Busch

This course applies the principles learned in HPM 586 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.

HPM 588a, Public Health Law Shelley Geballe

This course focuses on the law as it impacts the health of populations, focusing on the legal powers and duties of federal, state, and local governments to equitably promote and protect the health of their communities, as well as the constitutional constraints on those powers to protect individual rights. It is a course designed specifically for students with no legal training, introducing students to the multiple ways the law acts as a structural and social determinant of health and health inequities as well as how the law can be used as a tool to promote health in individuals and health justice among populations. Tools examined include the use of direct and indirect regulation to alter the information and built environments, control communicable disease, and reduce chronic disease and injury; governments' "power of the purse" – to tax and spend – to fund public health programs and services, and influence individual and corporate behavior; and the role of the courts in interpreting law and resolving disputes among branches and levels of government as well as among individuals, businesses, and government. Students gain some basic proficiency in finding and interpreting primary legal sources, applying the law to public health problems, and identifying ways to most

effectively influence the legislative, administrative, and judicial lawmaking processes. Prerequisite: HPM 514 or permission of the instructor.

[HPM 590, Economics, Addiction, and Policy]

This course aims to enable students to understand and then develop solutions to the public health problems of addictions in the United States and globally. The two problems addressed this year are (1) the opioid crisis; and (2) harmful health behaviors and habits, e.g., use of tobacco, overeating, and alcohol abuse. The first part of the course builds the knowledge base about these problems. In the second part, students actively participate in debates, panels, etc., and in developing and scaling (in theory) solutions. The course focuses on establishing the causes of and then solutions to these behaviors and problems. It covers facts and findings from the literature; analytic methods used in the literature to establish causality and evidence on effectiveness of alternative solutions; rational and behavioral economic models of behaviors; methods to evaluate social impact; and how to scale through government policies, social entrepreneurship, start-ups, and collaborations with foundations or businesses. Solutions are based on analyses of the problems, evidence on the effectiveness of related or parallel solutions, and efforts to innovate and perhaps even “disrupt.” Students must analyze the problem and propose solutions, which could be—but do not have to be—pursued; that is, the proposals can be on paper only, but nonetheless there must be a plan for scaling the project or policy to have important social impacts, at least in theory. Weekly assignments and a final project are required. 1 Course cr

HPM 595a, Food and Drug Administration Law Aaron Kesselheim

The Food and Drug Administration (FDA) is the premier consumer protection agency in the United States, with control over the availability and public discourse about potentially lifesaving therapeutics, foods, supplements, and related consumer products. Its authority has been built in response to public health crises and is constantly under scrutiny from all sides of the political spectrum. The class reviews the history of the FDA's regulation over the health care products market, the noteworthy legislation that has shaped its oversight in this area, Supreme Court and other cases that have impacted its authority, and an introduction to key current controversies related to the FDA that affect health care delivery. (This course does not cover food law.) The enduring theme is how the FDA balances its vital public safety role against countervailing forces of personal autonomy and the rights or interests of consumers, patients, physicians, and corporations. Each class is organized around interactive discussion introducing students to the material, including hypothetical cases that require students to apply the day's lessons and themes in determining legal and policy solutions. Students with high-quality papers will be given specific guidance in submitting them for publication in the peer-reviewed medical/public health/policy literature. A paper of 2,500–4,000 words is required. Enrollment limited to twenty.

HPM 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: EPH 510 or equivalent.

HPM 600a or b, Independent Study or Directed Readings Staff

Independent study or directed readings on a specific research topic agreed upon by faculty and student. By arrangement with faculty. For PhD Students only.

[HPM 601, The Science of Science Communication]

The simple dissemination of valid scientific knowledge does not guarantee it will be recognized by non-experts to whom it is of consequence. The science of science communication is an emerging, multidisciplinary field that investigates the processes that enable ordinary citizens to form beliefs consistent with the best available scientific evidence, the conditions that impede the formation of such beliefs, and the strategies that can be employed to avoid or ameliorate such conditions. This course surveys, and makes a modest attempt to systematize, the growing body of work in this area. Special attention is paid to identifying the distinctive communication dynamics of the diverse contexts in which non-experts engage scientific information, including electoral politics, governmental policy making, and personal health decision-making.

1 Course cr

HPM 610b, Applied Area Readings Staff

Required of HPM Ph.D. students, in preparation for qualifying exams. Readings arranged with specific faculty in related research area. By arrangement with faculty.

HPM 611b, Policy Modeling Edward Kaplan

How can one evaluate the effectiveness of HIV prevention programs? How many drug treatment slots are required to provide treatment on demand? Does capital punishment deter homicide? And what do the above questions have in common? The answer to the last query is simple: these problems and more are considered in Policy Modeling. Building on earlier course work in quantitative analysis and statistics, the course provides an operational framework for exploring the costs and benefits of public policy decisions. The techniques employed include “back of the envelope” probabilistic models, Markov processes, queuing theory, and linear/integer programming. With an eye toward making better decisions, these techniques are applied to a number of important policy problems. In addition to lectures, assigned articles and texts, and short problem sets, students are responsible for completing a take-home midterm exam and a number of cases. In some instances, it will be possible to take a real problem from formulation to solution, and compare your own analysis to what actually happened. Prerequisite: a demonstrated proficiency in quantitative methods.

HPM 617a and HPM 618b, Colloquium in Health Services Research

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 of ongoing research projects by YSPH and other faculty and graduate students. Students participate in critical discussions of the issues that arise in both types of sessions. Prerequisite: doctoral status or permission of the instructor.
o Course cr per term

HPM 620b, Readings in Health Services Research Staff

In-depth readings, discussion, and analysis of topics specific to health policy research. Optional for Ph.D. students choosing this area of depth. By arrangement with faculty.

HPM 621b, Managing Social Enterprise Organizations Kathryn Cooney

This course provides the opportunity to examine, through a set of case studies, key issues related to managing social enterprise organizations. Following initial content reviewing perspectives on the trend of social enterprise, topics covered include industry analysis for organizations with a double or triple bottom line, stakeholder analysis, organizational design (choosing the right organizational legal form), the challenge of integrating interdisciplinary human resources, using metrics for performance management, calculating an SROI (social return on investment), raising capital at different stages of the organizational life cycle, scaling a social innovation/product, and protecting social mission during exits.

HPM 630b, Advanced Readings in Health Services Research Staff

In-depth readings, discussion, and analysis of topics specific to health services research. Optional for Ph.D. students choosing this area of depth. By arrangement with faculty.

HPM 631a, Public Health Entrepreneurship and Intrapreneurship Teresa Chahine

This course aims to familiarize students with the principles and practice of innovation and entrepreneurship in the context of public health, as defined by the well-being of society, focusing on social and environmental determinants of health. We examine a set of public health challenges within the context of the Sustainable Development Goals (SDGs), using a hybrid method combining case studies and assignments. Case studies provide an opportunity to analyze cross-cutting challenges faced by innovators and entrepreneurs in the field of public health. Assignments allow students to dig deeper into specific topic areas within public health innovation and entrepreneurship. The target audience for this course includes graduate and undergraduate students in the M.B.A., M.A.M., M.P.H., and other programs at Yale SOM, the School of Public Health, and across campus. The course is a precursor, but not a prerequisite, for ENV 632/MGT 612, where students design ventures tackling social challenges through new or existing organizations. ½ Course cr

[HPM 644, Applied Quasi-Experimental Analysis for Health Policy]

This course builds on HPM 514 and HPM 583 to develop students' proficiency leveraging quasi-experimental research designs to answer empirical health policy questions. We focus on two quasi-experimental research designs: Difference-in-Differences and Instrumental Variables. Lectures and lab sessions address the practicalities and nuances of implementing these approaches to estimate the causal effects of health policies. Students discuss published work that uses these approaches as a class and with guest researchers, in order to better understand the key strengths and limitations of each approach in context. Each student develops an original paper using one of the covered research designs to consider a concrete health policy question, and presents their work at the end of the term. As the fundamental purpose of health policy research is to inform policy decisions, multiple lectures are devoted to research dissemination, with a particular focus on (1) translating quasi-experimental research results for lay audiences and the media, and (2) identifying and connecting with key stakeholders. Prerequisites: HPM 514 and either HPM 583 or, with permission of the instructor, a similar quantitative course. 1 Course cr

HPM 645b, The Chinese and U.S. Health Systems in Comparative Perspective

Xi Chen

This course aims for an in-depth understanding of the Chinese and American health systems, the two largest health systems in the world. While the two countries are in

very different stages of development, their health systems have much in common, and the recent reform of Chinese health systems has largely followed the United States. This course summarizes principles regarding health systems and reform that may apply to both countries and explains why they are different in other main aspects. The course discusses well-crafted research that adopts appropriate research designs and techniques to evaluate health policies and reform in both countries through lectures, writing referee reports, and designing individual research projects. The course highlights the importance of *causal* inference in evaluating and guiding health policies and reform. Students also learn skills in transforming research findings to policy and propose viable solutions to address key health challenges in China, the United States, and globally when applicable. Prerequisite: familiarity with basic statistics/econometrics. The formal requirement is one term of statistics/econometrics (EPH 505, HPM 583, or a similar course) or permission of the instructor. First-year M.P.H. students are permitted to take this course and HPM 583 (or another methods course) *concurrently*, providing them opportunities to work with health care data companies in funded summer internships.

HPM 688b, Managing Health Care in Complex Systems Leslie Curry

This course serves as a capstone for students in the Health Care Management Program and is intended to prepare students for leadership roles in diverse health care organizations domestically and internationally. Drawing on theories, concepts, and tools from prior course work, students address complex challenges in health care leadership and management to improve functioning of teams, organizations, and agencies in health systems. Students apply principles and practices of grand strategy (e.g., a comprehensive approach to achieving large ends with limited means) to address a consequential problem in health. An interdisciplinary lens is essential. Disciplinary foci include: leadership/management; organizational behavior; finance/accounting/economics; policy and regulations; operations; marketing; negotiations; epidemiology; and research methods including literature reviews. Students engage with the content through in-class exercises, facilitated discussions, readings, cases (from U.S. domestic and international settings), guest experts, working in a team, and written and oral presentations.

HPM 697a, Health Policy Leadership Seminar Shelley Geballe

This seminar introduces students to innovative health policy leaders working in federal, state, and local government, nonprofit policy/advocacy organizations, business, and/or health policy-oriented foundations. The speakers present on a variety of current health policy issues and also reflect on their own career paths. The seminar, required of Health Policy students, meets biweekly at the end of the day with a light dinner served. Although no credit or grade is awarded, satisfactory performance will be noted on the student's transcript. o Course cr

HPM 698b, Health Care Policy, Finance, and Economics Howard Forman

This course teaches students the critical skills for analyzing and working within the health care industry. The first part of the course focuses on the economic and financial drivers of the domestic health care system, including private and public financing and delivery models. In the latter part of the course, students learn about current issues of importance to this \$3 trillion industry. The course is part didactic/part seminar in style, with team projects and presentations as a major component of the grade. Open to M.P.H. students in Health Care Management, SOM students, and others with permission of the instructor.

HPM 699a and HPM 700b, Colloquium in Health Care Leadership Howard Forman

This seminar series, meeting on the medical school campus, introduces students to leading figures in health care: public sector, private sector, and third sector executives and leaders discuss their career paths and current insights into the evolution and revolution in health care delivery and services. The course provides 0 credit in the fall term and 0.5 credit in the spring term for a full year of attendance. Only students who have been attending fall sessions can enroll in the spring. 0 Course cr per term

HPM 995b, Sustainable Innovations in Health Care Gregory Licholai

This course explores the practical issues of managing ongoing innovation in the health care industry through the lens of analyzing how executives meet the need for continuous advancements in quality, technology, and efficiency in the development, marketing, and sales of pharmaceutical products, health technology, and patient service delivery. The course combines case discussion, lectures, seminar-style interactions, and guest executive speakers. Students are expected to actively participate in classroom discussions and prepare for each class by completing assigned readings and discussion questions. One group assignment requires students to work in small teams and prepare a short presentation analyzing innovation at a public company or other health care organization. ½ Course cr

Social and Behavioral Sciences

SBS 500a or b, Independent Study in Social and Behavioral Sciences

Trace Kershaw

This class provides an opportunity for M.P.H. students to work with an SBS faculty member on a supervised independent research study or directed course of readings. Prior to acceptance into this course, students must prepare a 13-week work plan and obtain approval from the supervising faculty and course director. Students enrolled in the course are expected to spend approximately 10 hours per week on proposed course activities and to complete a final project that will be evaluated by the supervising faculty member. Students may enroll in this course up to two times during their M.P.H. program of study.

[SBS 505, Accelerated Social and Behavioral Foundations of Health]

This intensive seven-week summer 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 individual, interpersonal, community, and societal influences 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. Not open to students in the traditional two-year M.P.H. program. 1 Course cr

SBS 525a and SBS 526b, Seminar in Social and Behavioral Sciences Yusuf Ransome and Peng Wang

This seminar is conducted once a month and focuses on speakers and topics of particular relevance to SBS students. Students are introduced to research activities of the department's faculty members, with regular presentations by invited researchers and community leaders. The seminar is required of first-year SBS students. Although no credit or grade is awarded, satisfactory performance will be noted on the student's transcript. 0 Course cr per term

SBS 529a, Foundations of Behavior Change Marney White

This course provides an introduction to behavioral theory as it pertains to health and health care delivery. The focus is on the integration of social, psychological, and behavioral factors that must be considered in developing and implementing best clinical practice and public health initiatives. This course emphasizes the use of empirical evidence from the social and behavioral sciences as the basis of public health practice and policy.

[SBS 531, Health and Aging]

This course explores the ways psychosocial and biological factors influence aging health. Topics include interventions to improve mental and physical health; effects of ageism on health; racial and gender health disparities in later life; and how health policy can best adapt to the growing aging population. Students have the opportunity to engage in discussions and to develop a research proposal on a topic of interest.

1 Course cr

[SBS 537, Social and Interpersonal Influences on Health]

Social relationships, such as friends, family, romantic partners, neighbors, and coworkers, are an important part of our lives. They are the targets of our behaviors, for example, when we help, love, fight, and discriminate against others. They are the basis of our feelings of status and self-esteem and why we experience the majority of our emotions. Importantly, social relationships have strong influences on our mental and physical health. The purpose of this class is to learn about different ways of conceiving of our social environment, and how these social factors can contribute to our mental and physical health. We critically review the literature that examines the associations between social factors and mental and physical health. We address several social concepts, and in each case discuss how they “get under the skin” to influence health.

1 Course cr

SBS 541b, Community Health Program Evaluation Kathleen Duffany

This course develops students' skills in designing program evaluations for public health programs, including nongovernmental 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.

SBS 565b, Trauma and Health Sarah Lowe

The majority of people will be exposed to one or more traumatic events over the course of their lives. Although exposure to trauma is associated with increased risk for myriad adverse consequences for health and well-being, most survivors are resilient and “bounce back” to their pre-trauma levels of functioning. This course engages students in understanding the factors that shape both exposure to traumatic events and the variability in post-trauma outcomes, with a focus on trauma-related mental health conditions. The first half of the course provides foundational information on the assessment and epidemiology of traumatic events; mental and physical health

conditions associated with trauma exposure; biological and sociocultural factors that influence trauma exposure and post-trauma outcomes; and public health and clinical approaches to preventing and mitigating trauma. The second half allows for application of this foundational information to specific trauma types (e.g., sexual violence, disasters), based in part on student interest. Assignments require students to critically evaluate state-of-the-science research on trauma and health; identify and explain an intervention or policy geared toward preventing or mitigating trauma; and synthesize empirical literature on a topic of their choice related to trauma and health.

[SBS 568, Public Health Communication]

This course is an introduction to the theory, design, and implementation of public health communication. All students work as groups on specific projects for various nonprofit and governmental agencies in the New Haven area, helping the organizations solve their real-world communication needs. To the extent possible, students choose the groups and projects they wish to work with. In class, students learn the theories of public health communication as well as specific production techniques such as podcasts, videos, posters, slogans, press releases, and social media. The class time is a highly interactive seminar. The goal is to enhance students' abilities in both communication of science-based public health information in nontechnical language to the general public and response to crises such as disease outbreaks. 1 Course cr

SBS 570b, LGBTQ Population Health John Pachankis

Sexual and gender minority individuals (e.g., those who identify as LGBTQ) represent a key health disparity population in the United States and worldwide, but high-quality evidence of this problem has historically been slow to accumulate. This course engages students in critically examining today's rapidly expanding empirical knowledge regarding sexual and gender minority health by considering challenges to, and opportunities for, conducting this research with methodological rigor. Students consider social and ecological influences on sexual and gender minority health, including migration, community, and neighborhood influences. Social institutions, including religion, school, family, and close relationships, are examined as sources of both stress and support. Given the relevance of individual and collective identity and stress as mechanisms through which stigma impacts sexual and gender minority health, the empirical platform of the course is complemented by intersectionality theory, critical postmodern work on identity fluidity and multiplicity across the life course, and minority stress conceptualizations of health. Students apply lessons learned in the course to evaluating and developing policy and health care interventions for this increasingly visible segment of the global population.

SBS 573a, Social and Cultural Factors in Mental Health and Illness Megan Smith

This course provides an introduction to mental health and illness with a focus on the complex interplay between risk and protective factors and social and cultural influences on mental health status. We examine the role of social and cultural factors in the etiology, course, and treatment of substance misuse; depressive, anxiety, and psychotic disorders; and some of the severe behavioral disorders of childhood. The social consequences of mental illness such as stigma, isolation, and barriers to care are explored, and their impact on access to care and recovery considered. The effectiveness of the current system of services and the role of public health and public health professionals in mental health promotion are discussed.

SBS 574a, Developing a Health Promotion and Disease Prevention Intervention

Trace Kershaw

The primary objective of the 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 behaviors 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 and implemented.

SBS 580b, Qualitative Research Methods in Public Health Ashley Hagaman

This is a course about doing qualitative social research in public health. The course, which has both theoretical and practical components, introduces students to various epistemological, philosophical, and ethical considerations that are involved with qualitative research methods and the practice of social science research more generally. Additionally, students gain hands-on experience with some of the strategies and techniques that are needed to conduct qualitative research.

SBS 581a, Stigma and Health Peng Wang

This course engages students in conceptualizing stigma as a fundamental cause of adverse health. After reviewing conceptual models of stigma, students examine the multiple mechanisms—both structural and individual—through which stigma compromises the health of a large proportion of U.S. and global populations. Given the relevance of identity and stress to the study of stigma and health, the empirical platform of the course is complemented by considering the relevance of conceptual models of identity, intersectionality, and minority stress. The course reviews social/behavioral and epidemiological methods for studying stigma. Students compare individual- and structural-level interventions to reduce both stigma at its source and its downstream impact on individual health. Class content is organized around themes that cut across all stigmatized conditions and identities. However, students devote course assignments to individual stigmas of their choice. Therefore, students can expect to explain stigma as a predicament that affects nearly all individuals at some point in the life course while developing expertise in one or two stigmas that are particularly relevant to their interests.

[SBS 583, Sexual and Reproductive Health]

In this course students critically examine current issues, challenges, and strategies to improve sexual and reproductive health in the United States as well as in a global context. Topics include family planning, STIs/HIV and other infections, infertility and reproductive technologies, maternal mortality and morbidity, reproductive cancers, gender, and social/political/economic factors influencing reproductive health. Interdisciplinary learning is encouraged through active participation in lectures and discussions. The course is designed to prepare students to take on meaningful scholarly, community-based, programmatic, or policy work in the field. 1 Course cr

SBS 584a / EMD 584a, Advanced Global Health Justice Practicum: Fieldwork

Ali Miller, Amy Kapczynski, and Gregg Gonsalves

The course is primarily for students who previously have enrolled in EMD 596/SBS 596; however, new students will be considered. Permission of the instructor required.

SBS 585a, Sexuality, Gender, Health, and Human Rights Ali Miller

This course explores the application of human rights perspectives and practices to issues in regard to sexuality, gender, and health. Through reading, interactive discussion, paper presentation, and occasional outside speakers, students learn the tools and implications of applying rights and law to a range of sexuality and health-related topics. The overall goal is twofold: to engage students in the world of global sexual health and rights policy making as a field of social justice and public health action; and to introduce them to conceptual tools that can inform advocacy and policy formation and evaluation. Class participation, a book review, an OpEd, and a final paper required. Enrollment limited. Permission of the instructor required.

SBS 587b, Harm Reduction and Drug Policy Reform

In this course, students critically engage with issues surrounding harm reduction and drug policy reform, including underlying principles and current debates. Engaging with critical and social ecological approaches to the study of harm reduction and drug policy, this course emphasizes how drug-related harm is shaped by, among other things, racism, gender inequities, and poverty. This course concludes by imagining drug policy futures responsive to the structural violence experienced by people who use drugs. Learning is supported through in-class lectures and discussions, and applied through reflective, research, and applied assignments. This course seeks to prepare students to meaningfully engage with scholarly and applied work in the substance use field.

SBS 590b, Advocacy and Activism

This course is designed to provide students with the theoretical frameworks and the practical applications of community organizing and advocacy as a means of subverting traditional systems of power and advancing health justice. Employing an intersectional lens, students analyze and discuss how they can facilitate collective action for health equity through the exploration of historical and contemporary contexts of political activism among marginalized communities in the United States. The course focuses on the strategic vision for mobilizing individuals directly impacted by public policies to build community power and cultivate political influence. Students learn about theories of social change and various models of community organizing and advocacy; explore the role of coalitions; and discuss the state and local regulatory environment and the potential leverage points available to impact policy change. Throughout the class, students also work to refine their writing and speaking skills, which are integral to advocacy work.

[SBS 592, Critical Public Health Analysis]

This course provides students with tools to analyze and critique public health methodology, discourse, and practice from a health justice framework. 1 Course cr

SBS 594a, Maternal-Child Public Health Nutrition Rafael Perez-Escamilla

This course examines how nutrition knowledge gets translated into evidence-informed maternal-child food and nutrition programs and policies. Using multisectorial and interdisciplinary case-study examples, the course highlights (1) socioeconomic, cultural, public health, and biomedical forces that determine maternal-child nutrition well-being; and (2) how this understanding can help shape effective programs and policies capable of improving food and nutrition security of women and children. Topics include maternal-child nutrition programs, food assistance and conditional cash-

transfer programs, and the Dietary Guidelines for Americans. Prerequisites: EPH 508 and BIS 505, or permission of the instructor.

SBS 596b / EMD 596b, Health Justice Practicum and Fieldwork Ali Miller,

Amy Kapczynski, and Gregg Gonsalves

This experiential course introduces students to the social and political determinants of health and to techniques to mobilize for health justice. A health justice approach prioritizes processes of power building, particularly with the most marginalized and vulnerable, rather than technocratic or top-down change. The course includes a weekly seminar component and project work. Students undertake projects, typically in interdisciplinary teams with outside partners, commonly on issues related to sexual rights and gender justice, health equity, access to medicines, and structural responses to infectious disease. Projects are selected with an eye toward the development of both public health and legal skills, and students are expected to reflect on how academic and NGO-based advocates can best leverage their position and skills in support of community or grassroots groups. Projects are likely to build on the work of GHJP on the COVID-19 crisis and also focus on the misuse of the carceral powers of the state, for example via reform of current policing and criminalization of sex work. Students are evaluated by their work product and class participation rather than a final examination. They should be prepared to spend approximately 18 hours per week on the course; they should also be prepared for possible travel (typically during spring break) depending on the project. Resources are available for travel as needed. This course fulfills the YSPH OPHP practicum requirement. Enrollment limited to twelve. Meets according to the Law School calendar. Permission of the instructors required; an application must be submitted to health.justice@yale.edu by 4:30 p.m. on Nov. 1 2 Course cr

SBS 600a or b, Independent Study or Directed Readings Staff

Independent study or directed readings on a specific research topic agreed upon by faculty and student. By arrangement with faculty. For PhD Students only.

SBS 610b, Applied Area Readings for Qualifying Exams Staff

Required of SBS Ph.D. students, in preparation for qualifying exams. Readings arranged with specific faculty in related research area. By arrangement with faculty.

SBS 670a or b, Advanced Field Methods in Public Health Trace Kershaw

The course offers direct experience in field methods in social and behavioral sciences for doctoral students and advanced M.P.H. students. Students are expected to actively participate as part of a research team (8–10 hours per week) doing field research in some aspect of social and behavioral sciences. It is expected that their progress will be directly supervised by the principal investigator of the research project. This course can be taken for one or two terms and may be taken for credit. Prerequisite: arrangement with a faculty member must be made in advance of registration.

SBS 676b, Questionnaire Development Marney White

This course is designed to direct students through the process of questionnaire selection and development for use in health research. Questionnaires and surveys are used extensively in medical, epidemiological, and public health research. The specific questionnaire utilized has great potential to affect research conclusions. Students learn to critically evaluate existing measures and how to construct questionnaires for use in health research. Topics include constructs and operational definitions, writing and evaluating questionnaire items, item scaling, domain sampling, item wording and

readability, test bias, and item weighting and scoring. Students learn how to evaluate psychometric indicators (e.g., internal consistency, reliability, and validity coefficients). Students are required to construct a questionnaire and are guided through all phases of questionnaire development, including item generation, scaling decisions, survey design, pilot testing, data collection, reliability analysis, and calculation of validity coefficients. The practical learning goal is to generate a publication-level questionnaire to evaluate a unique exposure history or health-related construct. By course end, students are able to critically evaluate existing measures and have the skills necessary to develop psychometrically valid tools for research. Prerequisites: EPH 508 and BIS 505 (may be taken concurrently). For Public Health students only (MPH, MS, PhD).

SBS 699a, Advanced Topics in Social and Behavioral Sciences Trace Kershaw

This course provides an in-depth examination of key areas in the social and behavioral sciences. For each topic, we explore a general overview of the area and noted gaps in the literature, the primary theories driving research in the area, common methods and analytic techniques, and recent research examples. Students explore topics in current and emerging areas of social and behavioral sciences including topics focusing on health care, maternal-child health, reproductive health, mental health, social determinants of health, stigma, obesity, and aging. For PhD students only.

TUITION, EXPENSES, AND FINANCIAL AID

The standard student budget for M.P.H. students for the nine-month academic year 2020–2021 is as follows:

Tuition	\$47,840
Program Fee	525
Course Materials and Copy Fees	1,170
Yale Hospitalization/Specialty Coverage	2,548
Room and Board	16,035
Personal	4,350
Total Budget	\$72,468

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). Students may not shorten the four-term requirement 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. Course unit changes may impact tuition as well as financial aid.

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 (\$4,784 per course unit). Part-time students are encouraged to take at least 2 course units per term. Students enrolled in the M.P.H. program must take at least 2 course units to be eligible for loans and are not eligible for YSPH grants or scholarships while attending part-time. Tuition and fees may be adjusted if a student adds or drops courses.

ADVANCED PROFESSIONAL M.P.H. PROGRAM

Students enrolled in the Advanced Professional M.P.H. Program pay two full terms of tuition and \$11,960 tuition for the summer module.

ACCELERATED M.B.A./M.P.H. PROGRAM IN HEALTH CARE MANAGEMENT

Students enrolled in the Accelerated M.B.A./M.P.H. Program in Health Care Management pay \$11,960 tuition for the summer module and four terms of tuition equivalent to tuition rates at the School of Management.

JOINT-DEGREE STUDENTS

Joint-degree students—excepting those in the Accelerated M.B.A./M.P.H. Program—with the Graduate School of Arts and Sciences (including the M.A./M.P.H. with the Jackson Institute for Global Affairs); the schools of Divinity, Forestry & Environmental

Studies, Law, Management, and Nursing; and the Physician Associate Program in the School of Medicine pay three terms of tuition to YSPH.

Joint M.D./M.P.H. students pay two terms of tuition to YSPH.

CONTINUOUS STUDY

A student in a degree program who has completed all required course work must be registered for continuous study each term of the regular academic year until all remaining requirements have been completed (except in the case of approved Leave of Absence). Students may not register for regular course work while on continuous study status. Students are permitted to be on continuous study for a maximum of two terms. The fee for continuous study is \$712.50 per term for this academic year. Students registered for continuous study are not eligible for financial aid.

YALE FACULTY AND STAFF

Yale faculty and staff members who are taking individual courses for credit will be charged tuition on a per-course basis (\$4,784 per course unit). Yale faculty and staff who have matriculated in the M.P.H. program pay the appropriate tuition rate (full-time or part-time).

NONMATRICULATED STUDENTS AND AUDITORS

Nonmatriculated individuals can audit courses at no charge but must receive the permission of the instructor and the registrar. Individuals auditing a course do not receive transcripts. Nonmatriculated individuals not affiliated with Yale University taking a course for credit pay \$4,784 per course unit. Nonmatriculated individuals affiliated with Yale taking a course for credit pay \$2,392 per course unit. Individuals taking a course for credit can receive transcripts. If a course requires a prerequisite, the student must have completed the prerequisite course work or obtain the permission of the instructor. Nonmatriculated students and auditors follow the same deadlines as matriculated students regarding course registration and withdrawal (see current academic calendar for specific dates).

M.S. 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 Title IV funds, any student who withdraws from YSPH for any reason 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 2020–2021, the last days for refunding Title IV funds will be October 29, 2020, in the fall term and a to-be-determined date in the 2021 spring term, when the School's spring calendar is finalized.*

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 9, 2020, in the fall term and a to-be-determined date in the 2021 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 24, 2020, in the fall term and a to-be-determined date in the 2021 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 20, 2020, in the fall term and a to-be-determined date in the 2021 spring term.*
 - d. Students who withdraw for any reason after midterm will not receive a rebate of any portion of tuition.
3. The death of a student shall cancel charges for tuition as of the date of death, and 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, funds will be returned in the order prescribed by federal regulations; namely, first to Federal Direct Unsubsidized Loans, if any; then to Federal Direct Graduate PLUS Loans; next to any other federal, state, private, or institutional scholarships and loans; and, finally, any remaining balance to the student.
5. Recipients of federal and/or institutional loans who withdraw are required to have an exit interview before leaving Yale. Students leaving Yale receive instructions on completing this process from Yale Student Financial Services.

* All spring-term dates will be posted on the YSPH website as soon as they are available.

TUITION REBATE AND REFUND POLICY FOR SUMMER SESSION

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

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

Withdrawal between weeks two and four will result in a 25 percent tuition refund.

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

Student Accounts and Billing

Student accounts, billing, and related services are administered through the Office of Student Financial Services, which is located at 246 Church Street. The office's website is <http://student-accounts.yale.edu>.

STUDENT ACCOUNT

The Student Account is a record of all the direct charges for a student's Yale education such as tuition, room, board, fees, and other academically related items assessed by offices throughout the University. It is also a record of all payments, financial aid, and other credits applied toward these charges.

Students and student-designated proxies can view all activity posted to their Student Account in real time through the University's online billing and payment system, YalePay (<https://student-accounts.yale.edu/yalepay>). At the beginning of each month, e-mail reminders to log in to YalePay to review the Student Account activity are sent to all students at their official Yale e-mail address and to all student-designated YalePay proxies. Payment is due by 4 p.m. Eastern Time on the first of the following month.

Yale does not mail paper bills or generate monthly statements. Students and their authorized proxies can generate their own account statements in YalePay in pdf form to print or save. The statements can be generated by term or for a date range and can be submitted to employers, 401K plans, 529/College Savings Plans, scholarship agencies, or other organizations for documentation of the charges.

Students can grant others proxy access to YalePay to view student account activity, set up payment plans, and make online payments. For more information, see Proxy Access and Authorization (<http://sfas.yale.edu/proxy-access-and-authorization>).

The Office of Student Financial Services will impose late fees of \$125 per month (up to a total of \$375 per term) 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. Students who have not paid their student account term charges by the due date will also be placed on Financial Hold. The hold will remain until the term charges have been paid in full. While on Financial Hold, the University will not fulfill requests for transcripts or provide diplomas and reserves the right to withhold registration or withdraw the student for financial reasons.

PAYMENT OPTIONS

There are a variety of options offered for making payments toward a student's Student Account. Please note:

- All bills must be paid in U.S. currency.
- Yale does *not* accept credit or debit cards for Student Account payments.
- Payments should not be made to a Student Account that are in excess of the balance due (net of pending financial aid credits). Yale reserves the right to return any overpayments.

Online Payments through YalePay

Yale's recommended method of payment is online through YalePay (<https://student-accounts.yale.edu/yalepay>). Online payments are easy and convenient and can be made by anyone with a U.S. checking or savings account. There is no charge to use this service. Bank information is password-protected and secure, and there is a printable confirmation receipt. Payments are immediately posted to the Student Account, which allows students to make payments 365/24/7 up to 4 p.m. Eastern Time on the due date of the bill, from any location, and avoid late fees.

For those who choose to pay by check, a remittance advice and mailing instructions are available on YalePay. Checks should be made payable to Yale University, in U.S. dollars, and drawn on a U.S. bank. To avoid late fees, please allow for adequate mailing time to ensure that payment is received by 4 p.m. Eastern Time on the due date.

Cash and check payments are also accepted at the Student Financial Services Cashier's Office, located at 246 Church Street. The Cashier's Office is open Monday through Friday from 8:30 a.m. to 4:30 p.m.

Yale University partners with Flywire, a leading provider of international payment solutions, to provide a fast and secure way to make international payments to a Student Account within YalePay. Students and authorized proxies can initiate international payments from the Make Payment tab in YalePay by selecting "International Payment via Flywire" as the payment method, and then selecting the country from which payment will be made to see available payment methods. International payment via Flywire allows students and authorized proxies to save on bank fees and exchange rates, track the payment online from start to finish, and have access to 24/7 multilingual customer support. For more information on making international payments via Flywire, see International Payments Made Easy at <https://student-accounts.yale.edu/sites/default/files/files/Yale%20International%20Payments%20-%20YalePay.pdf>.

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, late fees of \$125 per month will be charged for the period the bill was unpaid, as noted above.
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 PAYMENT PLAN

A Yale Payment Plan provides parents and students with the option to pay education expenses monthly. It is designed to relieve the pressure of lump-sum payments by allowing families to spread payments over a period of months without incurring any interest charges. Participation is optional and elected on a term basis. The cost to sign up is \$50 per term.

Depending on the date of enrollment, students may be eligible for up to five installments for the fall and spring terms. Payment Plan installments will be

automatically deducted on the 5th of each month from the bank account specified when enrolling in the plan. For enrollment deadlines and additional details concerning the Yale Payment Plan, see <https://student-accounts.yale.edu/ypp>.

BILL PAYMENT AND PENDING MILITARY BENEFITS

Yale will not impose any penalty, including the assessment of late fees, the denial of access to classes, libraries, or other facilities, or the requirement that a student borrow additional funds, on any student because of the student's inability to meet their financial obligations to the institution, when the delay is due to the delayed disbursement of funding from VA under chapter 31 or 33.

Yale will permit a student to attend or participate in their course of education during the period beginning on the date on which the student provides to Yale a certificate of eligibility for entitlement to educational assistance under chapter 31 or 33 and ending on the earlier of the following dates: (1) the date on which payment from VA is made to Yale; (2) ninety days after the date Yale certifies tuition and fees following the receipt of the certificate of eligibility.

Interruption or Temporary Suspension of University Services or Programs

Certain events that are beyond the University's control may cause or require the interruption or temporary suspension of some or all services and programs customarily furnished by the University. These events include, but are not limited to, epidemics or other public health emergencies; storms, floods, earthquakes, or other natural disasters; war, terrorism, rioting, or other acts of violence; loss of power, water, or other utility services; and strikes, work stoppages, or job actions. In the face of such events, the University may, at its sole discretion, provide substitute services and programs or appropriate refunds. The decision to suspend services and programs shall be made at the sole discretion of the University.

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. Jen Farkas, Director of Financial Aid, can be reached at 203.785.5417 or jen.farkas@yale.edu. The financial aid policies at YSPH are designed to assist all students as equitably as possible. Financial aid awards are determined based on the estimated cost of attendance for the year in which aid is awarded. Continuing students are required to reapply for loans for their second year if they plan to take them, but are not required to reapply for scholarships. Scholarships will be renewed for the same amount in a student's second year if the student continues to attend full-time. 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.

In determining scholarship eligibility, YSPH primarily considers merit but may also review the FAFSA for U.S. citizens and permanent residents.

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 website <https://benefits.va.gov/gibill>. Additional information about military benefits is available on the Yale website at <http://finaid.yale.edu/costs-affordability/types-aid/military-benefits-and-financial-aid>. To be enrolled, see the YSPH registrar.

LOANS

For 2020–2021, all U.S. citizens or permanent residents of the United States may be eligible to borrow up to \$33,000 from the Federal Direct Unsubsidized loan program and for additional funds through the Federal Direct Graduate Plus loan (with credit approval). This amount may vary depending on what other financial aid a student may be receiving. Federal Direct 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 federal financial aid. Please note that course registration changes may impact financial aid eligibility as well.

INTERNATIONAL STUDENTS

International students may be considered for merit-based scholarships from YSPH but are not eligible for the Federal Direct loan program per federal eligibility requirements.

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, either federal loans or school grants. Students who receive external funding that covers full tuition may not be eligible for YSPH scholarships.

SATISFACTORY ACADEMIC PROGRESS (SAP)

For information on SAP as it affects federal financial aid programs, see Academic Standards in the chapter Academic Policies.

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. For a variety of reasons students may wish to change their faculty adviser. The change of adviser form is available on the Student Resources page, under MPH Program, at <http://myysph.yale.edu/students>.

Course Registration

Students will be given the opportunity to preregister for courses and confer with their academic advisers about their schedules before classes start each term. All students must complete the online preregistration process by the deadline listed on the academic calendar to avoid a \$50 late fee. There will also be an add/drop period during the first week of classes. At the end of the add/drop period, all registrations are considered final. *Note: Courses cannot be added after the add/drop period without permission of the faculty adviser, the instructor, and the registrar.* See below for information on withdrawing from courses.

Many departments require students to take electives toward their M.P.H. degree. Electives used toward degree requirements are to be used to enhance students' public health competencies as they pursue the M.P.H. degree. Thus, electives are typically health-related. Exceptions can be made if students can justify that the elective course content will enhance their public health competencies and public health career goals.

Students may be interested in pursuing independent study courses if they are offered within their department/program. Independent study courses focus on a specific research topic agreed upon by a faculty member within the department and the student. *Independent study course work also must be separate from work for the thesis project.* Students who plan to pursue an independent study course in a given term must complete the independent study request form, available online under MPH Program at <http://myysph.yale.edu/students>.

Students are allowed 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. *Note: An additional course material fee may apply to courses taken outside YSPH.*

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 typically be at the 300-series level or above in order to receive a course unit toward the M.P.H. degree. Some 200-series courses at Yale College may count if approved by the student's faculty adviser.

Nonmatriculated part-time study in the M.P.H. program is available with the course instructor's permission. Nonmatriculated part-time students are individuals who attend classes and participate fully in a course; complete assignments, papers, or examinations; and receive a transcript attesting to completion of the course, credit hours, and a grade. A nonmatriculated student is limited to no more than two courses per term and a maximum of three courses total. All course requirements will be completed by the end of the term. Exceptions must be negotiated with the course instructor.

Part-time nonmatriculated students pay tuition on a per-course basis (\$4,784 per course unit as a non-Yale affiliate; \$2,392 per course unit as a Yale affiliate). In the event a nonmatriculated student is accepted to and enrolls in a degree program at the Yale School of Public Health, the student is permitted to apply the maximum three courses toward the degree. However, there will be no modification in tuition. Taking YSPH courses as a nonmatriculated student does not guarantee acceptance into any program at the Yale School of Public Health.

Course Withdrawal

Students may withdraw from a course with the approval of their faculty adviser. The course change form is available on the Student Resources page, under MPH Program, at <http://myysph.yale.edu/students>. Students may withdraw until about halfway through each term without the course appearing on the transcript; exact withdrawal deadlines may be referenced on the academic calendar for each year. From those dates at the halfway point in the term until the last day of classes, a student may still withdraw from a course; however, the course will appear on the transcript with a letter grade of "W." Please note that students enrolled in an eight-week (half-term) course can withdraw from the course no later than four weeks into the class sessions without the course appearing on the transcript.

First-year students are not allowed to withdraw from the M.P.H. core curriculum: EPH 100, EPH 505, EPH 507, EPH 508, EPH 510, EPH 513, and EPH 515.

Exemption from Required Courses

Students who have previously mastered the material being presented in a required course (not an elective) can request a "course exemption" directly from the course instructor. The request for a course exemption indicates that a student is capable of excelling in all assessments in the selected course. Mastery of course content can be demonstrated by (1) excelling in a graduate-level course with equivalent content within the past five years, or (2) significant life experience related to the course content.

The instructor must sign the course exemption form (available on the Student Resources page, under MPH Program, at <http://myysph.yale.edu/students>). Exemption forms must be submitted to the registrar each term by the stated deadline on the academic calendar. Exempted courses will be listed on the transcript with a grade of "Q" *after the term has ended*. Exempted courses cannot be used to satisfy the course unit requirement for the M.P.H. degree.

Note: There will be no exemptions allowed for the course EPH 513, Major Health Threats: Determinants and Solutions. EPH 513 is an integrated core course, and the cross-disciplinary modular topic areas focus on key public health challenges

(antimicrobial resistance, climate change, and obesity). The unique content provides students with several of the M.P.H. core curriculum competencies and foundational knowledge topics in one term.

Auditing a YSPH Course

An auditor is a student who attends a class to acquire knowledge, but not to earn credits or a grade. Audited courses do not count toward the completion of degree requirements, enrollment certification, financial aid eligibility, or loan deferment purposes. Auditors may change their status in a course by October 16 in the fall term and by March 12 in the spring term. Auditors must attend classes regularly, complete assigned reading, and participate in discussions, but they are excused from examinations and other assignments. If this requirement is not met, the YSPH registrar may, solely upon notice of the instructor of insufficient attendance, delete the course from the student's record. For a student who does elect to audit a course, the letters "AUD" are entered on the transcript in the grade column, and the course does not earn credit.

Auditors are admitted to a course on a space-available basis and with the approval of the instructor. Students remain responsible for paying the applicable tuition and fees for the course.

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, seminars, and colloquia receive a grade of Satisfactory (S) upon successful completion. The grade of "Q" indicates courses for which a student has received a course 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.

It is expected that instructors will require all course assignments, including term papers and exams, to be submitted by the last day of the term. In very rare cases, students may receive a grade of Incomplete (I). The instructor and the associate dean for student affairs will jointly review each case to approve permission for a student to submit work after the end of the term. Permission may be granted because of an incapacitating illness, a serious family emergency, or another matter of comparable import. If the instructor and the associate dean cannot reach a consensus, the matter will be referred to the Committee on Academic Progress for resolution. The instructor and the associate dean will stipulate the date on which the student's late work will be due (this date cannot exceed three months from the last day of the term) and will determine the date on which the instructor is expected to submit a course grade to the registrar. If the student's work has not been completed by the stipulated date, the grade of Incomplete (I) will be converted to a failing grade (F).

Students with a grade of Incomplete will not be allowed to participate in YSPH Commencement activities.

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 in any of the core M.P.H. courses, 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.

Advisers have access to 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 and departmental 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.

Students in the Advanced Professional Program who fail a course in the summer term will be withdrawn from the M.P.H. program and will be required to reapply to the program if they wish to be considered for readmission.

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, will be withdrawn from the M.P.H. program and will be required to reapply to the program if they wish to be considered for readmission. Academic dismissal will be recorded on the student's transcript.

SATISFACTORY ACADEMIC PROGRESS AND PROGRAM COMPLETION

Federal regulations require institutions to monitor each student's progress toward earning a degree within the maximum time frame permitted for the student's degree or course of study. Failure to maintain Satisfactory Academic Progress (SAP) jeopardizes a student's eligibility to receive University or federal financial aid.

All required course work for the M.P.H. program must be completed within five years of the date of matriculation. If the degree program has *not* been completed within five years, the student may request an extension from the Committee on Academic Progress. Extensions will be granted only in rare circumstances, and only for a period of one year for the two-year regular M.P.H. program, and only for a period of one term for the one-year Advanced Professional Program.

In addition, if a student withdraws from courses, resulting in the pursuit of fewer than 4 credits in a single term, the student's total estimated costs and eligibility for financial aid will be recalculated.

Change of Department

Departmental changes may be requested during the spring term of the *first* academic year. Students who wish to change departments must apply in writing to the chair of the requested department to do so. In addition to a written statement about why they want to transfer, students submit a copy of an unofficial YSPH transcript. If the change is approved, the student must submit a change of department form to the Office of Student Affairs. Students must be sure to fulfill all course requirements for the new

department. The change of department form is available on the Student Resources page, under MPH Program, at <http://myysph.yale.edu/students>.

Note: Because of the number of requirements and the sequencing of courses, students may not switch into the Health Care Management Program.

Other Changes and Appeals in Educational Program

Other significant changes in a student's educational program should be discussed with the student's faculty 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.

YSPH Committee on Academic and Professional Integrity (CAPI)

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 (YSPH). 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* 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 School of Public Health 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 insure proper citation of published work.

- Citation Guide from *Chicago Manual of Style*: http://chicagomanualofstyle.org/tools_citationguide.html
- Various citation resources: <https://poorvucenter.yale.edu/writing/using-sources/principles-citing-sources>

Community Standards and Freedom of Expression

The YSPH community is inclusive in nature, respecting the diverse backgrounds and views of all its members. Faculty, students, and staff 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 School of Medicine*:

Yale 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 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.

In its commitment to the protection of free inquiry and expression in the classroom and throughout the school community, YSPH also reflects Yale University's commitment to and policy on freedom of expression as eloquently stated in the Woodward Report (Report of the Committee on Freedom of Expression at Yale, 1974). See <http://studentlife.yale.edu/guidance-regarding-free-expression-and-peaceable-assembly-students-yale>.

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 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 understand that the work I submit must represent my own efforts; that I will conduct myself with dignity, integrity, and honesty in my studies; that I will uphold the directions of my faculty and complete all my work in the spirit it was assigned. I understand I must honestly represent my credentials, abilities, and situation as I further my career as a public health professional.

I agree to be held accountable for maintaining the atmosphere of honesty and professionalism at Yale University and within the greater academic community. In the spirit of my professional development – where I should not tolerate misconduct in my professional setting – I also agree to contact the appropriate faculty member, or the associate dean for student affairs, if I witness a violation of this Code of Academic and Professional Integrity by any of my peers.

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, and I certify that this is my own original work.

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, or electronically sharing files when this is specifically prohibited by the instructor.
2. **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. If the Committee on Academic and Professional Integrity has found that the student purposefully misled the committee during its deliberations, the committee may consider that factor as grounds for imposing a more severe penalty.
- 3. **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.
- 4. **Violation of Yale University rules/functions**
 - 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. Violation of University rules regarding intellectual property.
 - f. Misuse or unauthorized removal of materials in University libraries or laboratories.
 - g. Trespassing on University property to which access is prohibited.
 - h. Theft, misuse of funds, or willful damage to University property.
 - i. Refusal to comply with the direction of University Police Officers or other University officials, including members of faculty, acting in the performance of their duties.
 - j. Interference with the proper operation of safety or security devices, including fire alarms, electronic gates, or sprinkler systems.
- 5. **Illegal activity** Any behavior prohibited by law may be subject to criminal prosecution as well as to a charge by 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.

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 School and University communities. The committee is appointed by the dean and consists of a faculty member from each YSPH department, the associate dean for student affairs,

and three students from each M.P.H. class. The dean will designate one of the faculty members as the committee chair. When members of the committee have become familiar with the details of a specific complaint, the chair will determine if any members shall be excused because of a conflict of interest.

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 has the right to: (a) appear before the committee; (b) examine all written materials being provided to the committee; (c) ask for the recusal of any member of the committee for cause; (d) 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. An adviser is optional. If so desired, a student may select a member of the YSPH community and ask that individual to act as an adviser; an adviser is not appointed by the committee.
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 will then 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. The student may ask the committee to call witnesses who can present relevant information about the facts of the case.
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 and not influenced by the student's personal situation. Any serious infraction of the Code of Academic and Professional Integrity may be grounds for dismissal.
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 change it if the dean believes that a lesser or greater penalty is warranted.
8. Unless remanded by the dean for further review, the finding of an infraction or violation is final, 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.
9. All proceedings 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 who is the subject of the disciplinary proceeding, and, upon the finding of a violation, the student's faculty adviser as well as the director of graduate studies. Students found in violation of the Honor Code or the Code of Academic and Professional Integrity will not be permitted to serve as Teaching Fellows.

Penalties

The following penalties are among those that may be recommended by the committee and imposed by the dean. Any violation of the Honor Code or the Code of Academic and Professional Integrity will result in a penalty, up to and including expulsion. The Yale School of Public Health regards cheating and plagiarism as grievous offenses that strike at the heart of academic integrity, for which the standard penalty will be two terms of suspension.

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. **Disciplinary Probation plus Failure of Course** The student is in official jeopardy, and the student's actions warrant a failure of the course in question. The commission of a second offense while on probation will normally result in suspension or expulsion. Disciplinary probation, and the course failure, will be recorded on the student's transcript.
5. **Suspension plus Failure of Course (for academic violations)** 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, and course failure (if applicable), will be recorded on the student's transcript.
6. **Expulsion plus Failure of Course (for academic violations)** Permanent separation from the University. This penalty, and course failure (if applicable), will be recorded on the student's transcript.

All cases referred to the Committee on Academic and Professional Integrity will be addressed, and a decision made by the committee, regardless of whether the student voluntarily withdraws from the Yale School of Public Health prior to resolution. It will be noted on the student's transcript that the student withdrew with disciplinary charges pending. Students at the Yale School of Public Health on an F1 Student Visa who are suspended or expelled will be subject to the requirements of the F1 Student Visa program administered by the U.S. Government. Such students should consult with the Yale Office of International Students and Scholars to understand the current requirements.

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 on the following two grounds: (1) that the committee made procedural errors in its deliberations; or (2) that substantial new information is available that was not previously available to the committee. 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 School of Public Health *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; updated May 2010, July 2012, May 2015, June 2019

ADMINISTRATIVE POLICIES

Leave of Absence

Students are expected to follow a continuous course of study at the School of Public Health. However, a student who wishes or needs to interrupt study temporarily may request a leave of absence. There are three types of leave—personal, medical, and parental—all of which are described below. The general policies that apply to all types of leave are:

1. Any student who is contemplating a leave of absence should see the associate dean for student affairs to discuss the necessary application procedures.
2. All leaves of absence must be approved by the associate dean for student affairs. Medical leaves also require the written recommendation of a physician on the staff of Yale Health, as described below.
3. A student may be granted a leave of absence for up to two terms. Any leave approved by the associate dean for student affairs will be for a specified period.
4. International students who apply for a leave of absence should consult with OISS regarding their visa status.
5. A student on leave of absence may complete outstanding work in any course for which an extension has been granted. The student may not, however, fulfill any other degree requirements during the time on leave.
6. A student on leave of absence is not eligible for financial aid, including loans; and in most cases, student loans are not deferred during periods of nonenrollment.
7. A student on leave of absence is not eligible for the use of any University facilities normally available to enrolled students.
8. A student on leave of absence may continue to be enrolled in Yale Health by purchasing coverage through the Student Affiliate Coverage plan. In order to secure continuous coverage from Yale Health, 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 the registrar was informed of the leave. Coverage is not automatic; enrollment forms are available from the Member Services Department of Yale Health, 203.432.0246.
9. A student on leave of absence must notify the associate dean for student affairs in writing of the intention to return at least eight weeks prior to the end of the approved leave. In addition, a returning student who wishes to be considered for financial aid must submit appropriate financial aid applications to the School's financial aid office to determine eligibility.
10. A student on leave who does not return at the end of the approved leave, and does not request and receive an extension from the associate dean for student affairs, is automatically dismissed from the School.

Personal leave of absence A student who wishes or needs to interrupt study temporarily because of personal exigencies may request a personal leave of absence. The general policies governing all leaves of absence are described above. A student who is current with degree requirements is eligible for a personal leave after satisfactory completion of

at least one term of study. Personal leaves cannot be granted retroactively and normally will not be approved after the tenth day of a term.

To request a personal leave of absence, the student must apply in writing before the beginning of the term for which the leave is requested, explaining the reasons for the proposed leave and stating both the proposed start and end dates of the leave and the address at which the student can be reached during the period of the leave. If the dean finds the student to be eligible, the leave will be approved. In any case, the student will be informed in writing of the action taken. A student who does not apply for a personal leave of absence, or whose application for a personal leave is denied, and who does not register for any term by the registration deadline, will be considered to have withdrawn from the School.

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 dean, on the written recommendation of a physician on the staff of Yale Health. The general policies governing all leaves of absence are described above. A student who is making satisfactory progress toward degree requirements is eligible for a medical leave any time after matriculation. The final decision concerning a request for a medical leave of absence will be communicated in writing by the dean.

The School of Public Health reserves the right to place a student on a mandatory medical leave of absence when, on recommendation of the director of Yale Health or the chief of the Mental Health and Counseling department, the dean of the School determines that, because of a medical condition, the student is a danger to self or others, the student has seriously disrupted others in the student's residential or academic communities, or the student has refused to cooperate with efforts deemed necessary by Yale Health and the dean to make such determinations. Each case will be assessed individually based on all relevant factors, including, but not limited to, the level of risk presented and the availability of reasonable modifications. Reasonable modifications do not include fundamental alterations to the student's academic, residential, or other relevant communities or programs; in addition, reasonable modifications do not include those that unduly burden University resources.

An appeal of such a leave must be made in writing to the dean of the School no later than seven days from the effective date of the leave.

An incident that gives rise to voluntary or mandatory leave of absence may also result in subsequent disciplinary action.

A student who is placed on medical leave during any term will have tuition adjusted according to the same schedule used for withdrawals (see Tuition Rebate and Refund Policy). Before re-registering, a student on medical leave must secure written permission to return from a Yale Health physician.

Leave of absence for parental responsibilities A student who wishes or needs to interrupt study temporarily for reasons of pregnancy, maternity care, or paternity care may be granted a leave of absence for parental responsibilities. The general policies governing all leaves of absence are described above. A student who is making satisfactory progress toward degree requirements is eligible for parental leave any time after matriculation.

Any student planning to have or care for a child is encouraged to meet with the associate dean for student affairs to discuss leaves and other short-term arrangements. For many students, short-term arrangements rather than a leave of absence are possible. Students living in University housing units are encouraged to review their housing contract and the related policies of the Yale Housing Office before applying for a parental leave of absence. Students granted a parental leave may continue to reside in University housing to the end of the academic term for which the leave was first granted, but no longer.

U.S. Military Leave Readmissions Policy

Students who wish or need to interrupt their studies to perform U.S. military service are subject to a separate U.S. military leave readmissions policy. In the event a student withdraws or takes a leave of absence from Yale School of Public Health to serve in the U.S. military, the student will be entitled to guaranteed readmission under the following conditions:

1. The student must have served in the U.S. Armed Forces for a period of more than thirty consecutive days;
2. The student must give advance written or oral notice of such service to the associate dean for student affairs. In providing the advance notice the student does not need to indicate an intent to return. This advance notice need not come directly from the student, but rather, can be made by an appropriate officer of the U.S. Armed Forces or official of the U.S. Department of Defense. Notice is not required if precluded by military necessity. In all cases, this notice requirement can be fulfilled at the time the student seeks readmission, by submitting an attestation that the student performed the service.
3. The student must not be away from the School to perform U.S. military service for a period exceeding five years (this includes all previous absences to perform U.S. military service but does not include any initial period of obligated service). If a student's time away from the School to perform U.S. military service exceeds five years because the student is unable to obtain release orders through no fault of the student or the student was ordered to or retained on active duty, the student should contact the associate dean for student affairs to determine if the student remains eligible for guaranteed readmission.
4. The student must notify the School within three years of the end of U.S. military service of the intention to return. However, a student who is hospitalized or recovering from an illness or injury incurred in or aggravated during the U.S. military service has up until two years after recovering from the illness or injury to notify the School of the intent to return.
5. The student cannot have received a dishonorable or bad conduct discharge or have been sentenced in a court-martial.

A student who meets all of these conditions will be readmitted for the next term, unless the student requests a later date of readmission. Any student who fails to meet one of these requirements may still be readmitted under the general readmission policy but is not guaranteed readmission.

Upon returning to the School, the student will resume education without repeating completed course work for courses interrupted by U.S. military service. The student will have the same enrolled status last held and with the same academic standing. For the first academic year in which the student returns, the student will be charged the tuition and fees that would have been assessed for the academic year in which the student left the institution. Yale may charge up to the amount of tuition and fees other students are assessed, however, if veteran's education benefits will cover the difference between the amounts currently charged other students and the amount charged for the academic year in which the student left.

In the case of a student who is not prepared to resume studies with the same academic status at the same point where the student left off or who will not be able to complete the program of study, the School will undertake reasonable efforts to help the student become prepared. If after reasonable efforts, the School determines that the student remains unprepared or will be unable to complete the program, or after the School determines that there are no reasonable efforts it can take, the School may deny the student readmission.

Student Grievances

The Yale School of Public Health follows the University's policy that governs any case in which a student has a complaint, including but not limited to a complaint of sexual harassment or a complaint of discrimination on the basis of race, sex, color, religion, national or ethnic origin, disability, or sexual orientation, against a member of the faculty or administration of the complainant's School. Since an instructor's evaluation of the quality of a student's work is final, this procedure does not apply in any dispute about a grade assigned to a student by a member of the faculty, unless it is alleged that the determination of the grade resulted from discrimination as described above. Similarly, this procedure does not apply to any matter inherent in the academic freedom of an instructor, such as, for example, in regard to the syllabus or contents of a course of instruction. It is also not a procedure that may be used when there is a complaint about the quality of a course or the quality of instruction in a course; such concerns may be addressed directly to the department in question. The policy and procedure can be found at <https://equalopportunity.yale.edu/complaint-procedures>. The dean's office at YSPH would make the complaint referral to the dean of the Yale School of Medicine.

Complaints of sexual misconduct, including sexual harassment and sexual assault, may be brought to a Title IX coordinator (for inquiries or informal resolution) or to the University-Wide Committee on Sexual Misconduct (for formal resolution). For more information on the University-Wide Committee on Sexual Misconduct (UWC), see Resources on Sexual Misconduct in the chapter Yale University Resources and Services. UWC procedures can be found at <https://uwc.yale.edu>.

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 the student's 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.

YSPH Alcohol Policy

Any event that hosts more than fifty people and/or is open to persons under twenty-one years of age must adhere to Yale University policy (<https://aod.yalecollege.yale.edu/info-yales-policies>) by ensuring there is a licensed bartender serving alcohol and that food and nonalcoholic beverages are provided.

Additional Policies

Additional University policies are available for student reference on the School's website. These policies include the Policy on Freedom of Expression, the Equal Opportunity Statement, the Sexual Harassment Policy, and the Yale University AIDS Policy.

YALE UNIVERSITY RESOURCES AND SERVICES

A Global University

Global engagement is core to Yale's mission as one of the world's great universities. Yale aspires to:

- Be the university that best prepares students for global citizenship and leadership
- Be a worldwide research leader on matters of global import
- Be the university with the most effective global networks

Yale's engagement beyond the United States dates from its earliest years. The University remains committed to attracting the best and brightest from around the world by offering generous international financial aid packages, conducting programs that introduce and acclimate international students to Yale, and fostering a vibrant campus community.

Yale's globalization is guided by the vice president for global strategy, who is responsible for ensuring that Yale's broader global initiatives serve its academic goals and priorities, and for enhancing Yale's international presence as a leader in liberal arts education and as a world-class research institution. The vice president works closely with academic colleagues in all of the University's schools and provides support and strategic guidance to the many international programs and activities undertaken by Yale faculty, students, and staff.

Teaching and research at Yale benefit from the many collaborations underway with the University's international partners and the global networks forged by Yale across the globe. International activities across all Yale schools include curricular initiatives that enrich classroom experiences from in-depth study of a particular country to broader comparative studies; faculty research and practice on matters of international importance; the development of online courses and expansion of distance learning; and the many fellowships, internships, and opportunities for international collaborative research projects on campus and abroad. Together these efforts serve to enhance Yale's global educational impact and are encompassed in the University's global strategy.

The Office of International Affairs (<https://world.yale.edu/oia>) provides administrative support for the international activities of all schools, departments, 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.

The Office of International Students and Scholars (<https://oiss.yale.edu>) hosts orientation programs and social activities for the University's international community and is a resource for international students and scholars on immigration matters and other aspects of acclimating to life at Yale.

The Yale Alumni Association (<https://alumni.yale.edu>) provides a channel for communication between the alumni and the University and supports alumni organizations and programs around the world.

Additional information may be found on the “Yale and the World” website (<https://world.yale.edu>), including resources for those conducting international activities abroad and links to international initiatives across the University.

Health Services

The Yale Health Center is located on campus at 55 Lock Street. The center is home to Yale Health, a not-for-profit, physician-led health coverage option that offers a wide variety of health care services for students and other members of the Yale community. Services include student health, gynecology, mental health, pediatrics, pharmacy, blood draw, radiology, a seventeen-bed inpatient care unit, a round-the-clock acute care clinic, and specialty services such as allergy, dermatology, orthopedics, and a travel clinic. Yale Health coordinates and provides payment for the services provided at the Yale Health Center, as well as for emergency treatment, off-site specialty services, inpatient hospital care, and other ancillary services. Yale Health’s services are detailed in the *Yale Health Student Handbook*, available through the Yale Health Member Services Department, 203.432.0246, or online at <https://yalehealth.yale.edu/coverage/student-coverage>.

ELIGIBILITY FOR SERVICES

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

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

Students not eligible for Yale Health 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 Member Services Department. Enrollment applications for the Yale Health Student Affiliate Coverage, Billed Associates Plan, or Fee-for-Service Program are available from the Member Services Department.

All students who purchase Yale Health Hospitalization/Specialty Coverage (see below) are welcome to use specialty and ancillary services at Yale Health Center. Upon referral, Yale Health will cover the cost of specialty and ancillary services for these students. Students with an alternate insurance plan should seek specialty services from a provider who accepts their alternate insurance.

HEALTH COVERAGE ENROLLMENT

The University also requires all students eligible for Yale Health Basic Coverage to have adequate hospital insurance coverage. Students may choose Yale Health 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 by the University's deadlines noted below.

Yale Health Hospitalization/Specialty Coverage

For a detailed explanation of this plan, which includes coverage for prescriptions, see the *Yale Health Student Handbook*, available online at <https://yalehealth.yale.edu/coverage/student-coverage>.

Students are automatically enrolled and charged a fee each term on their Student Financial Services bill for Yale Health 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, Yale Health 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 Yale Health Hospitalization/Specialty Coverage Students are permitted to waive Yale Health Hospitalization/Specialty Coverage by completing an online waiver form at <https://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 Member Services Department within thirty days. Students are encouraged to review their present coverage and compare its benefits to those available under Yale Health. 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 Yale Health Hospitalization/Specialty Coverage but later wish to be covered must complete and send a form voiding their waiver to the 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. Yale Health fees will not be prorated.

Yale Health Student Dependent Plans

A student may enroll the student's lawfully married spouse or civil union partner and/or legally dependent child(ren) under the age of twenty-six in one of three student dependent plans: Student + Spouse, Student + Child/Children, or Student Family Plan. These plans include services described in both Yale Health Basic Coverage and Yale Health Hospitalization/Specialty Coverage. Coverage is not automatic, and enrollment is by application. Applications are available from the Member Services Department or can be downloaded from the website (<https://yalehealth.yale.edu/resources/forms>) 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.

Yale Health Student Affiliate Coverage

Students on leave of absence or extended study, students paying less than half tuition, students enrolled in the EMBA program, students enrolled in the PA Online program, or students enrolled in the Eli Whitney Program prior to September 2007 may enroll in Yale Health Student Affiliate Coverage, which includes services described in both Yale Health Basic and Yale Health Hospitalization/Specialty Coverage. Applications are available from the Member Services Department or can be downloaded from the website (<https://yalehealth.yale.edu/resources/forms>) and must be received by September 15 for full-year or fall-term coverage, or by January 31 for spring-term coverage only.

ELIGIBILITY CHANGES

Withdrawal A student who withdraws from the University during the first fifteen days of the term will be refunded the fee paid for Yale Health Hospitalization/Specialty Coverage. The student will not be eligible for any Yale Health benefits, and the student's Yale Health 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. Assistance with identifying and locating alternative sources of medical care may be available from the Care Management Department at Yale Health. At all other times, a student who withdraws from the University will be covered by Yale Health for thirty days following the date of withdrawal. Fees will not be prorated or refunded. Students who withdraw are not eligible to enroll in Yale Health Student Affiliate Coverage. Regardless of enrollment in Yale Health Hospitalization/Specialty Coverage, students who withdraw will have access to services available under Yale Health Basic Coverage (including Student Health, Athletic Medicine, Mental Health & Counseling, and Care Management) during these thirty days to the extent necessary for a coordinated transition of care.

Leaves of absence Students who are granted a leave of absence are eligible to purchase Yale Health Student Affiliate Coverage for the term(s) of the leave. If the leave occurs on or *before* the first day of classes, Yale Health Hospitalization/Specialty Coverage will end retroactive to the start of the coverage period for the term. If the leave occurs anytime after the first day of classes, Yale Health Hospitalization/Specialty Coverage will end on the day the registrar is notified of the leave. In either case, students may enroll in Yale Health Student Affiliate Coverage. Students must enroll in Affiliate Coverage prior to the beginning of the term unless the registrar is notified after the first day of classes, in which case, the coverage must be purchased within thirty days of the date the registrar was notified. Fees paid for Yale Health Hospitalization/Specialty Coverage will be applied toward the cost of Affiliate Coverage. Coverage is not automatic, and enrollment forms are available at the Member Services Department or can be downloaded from the website (<https://yalehealth.yale.edu/resources/forms>). Fees 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 Yale Health Hospitalization/Specialty Coverage. They may purchase Yale Health Student Affiliate Coverage during the

term(s) of extended study. This plan includes services described in both Yale Health Basic and Yale Health Hospitalization/Specialty Coverage. Coverage is not automatic, and enrollment forms are available at the Member Services Department or can be downloaded from the website (<https://yalehealth.yale.edu/resources/forms>). 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 Yale Health, please refer to the *Yale Health Student Handbook*, available from the Member Services Department, 203.432.0246, 55 Lock Street, PO Box 208237, New Haven CT 06520-8237.

REQUIRED IMMUNIZATIONS

Proof of vaccination is a pre-entrance requirement determined by the Connecticut State Department of Public Health. Students who are not compliant with this state regulation will not be permitted to register for classes or move into the dormitories for the fall term, 2020. Please access the Incoming Student Vaccination Record form for graduate and professional students at <https://yalehealth.yale.edu/new-graduate-and-professional-student-forms>. Connecticut state regulation requires that this form be completed and signed, for each student, by a physician, nurse practitioner, or physician's assistant. The form must be completed, independent of any and all health insurance elections or coverage chosen. Once the form has been completed, the information must be entered into the Yale Medicat online system (available after June 20), and all supporting documents must be uploaded to <http://yale.medicatconnect.com>. The final deadline is August 1.

Measles, mumps, rubella, and varicella All students who were born after January 1, 1957, are required to provide proof of immunization against measles (rubeola), mumps, German measles (rubella), and varicella. Connecticut state regulation requires two doses of measles vaccine, two doses of mumps vaccine, two doses of rubella vaccine, and two doses of varicella vaccine. The first dose must have been given on or after January 1, 1980, *and* after the student's first birthday; the second dose must have been given at least thirty (30) days after the first dose. If dates of vaccination are not available, titer results (blood test) demonstrating immunity may be substituted for proof of vaccination. The cost for all vaccinations and/or titers rests with the student, as these vaccinations are considered to be a pre-entrance requirement by the Connecticut State Department of Public Health. Students who are not compliant with this state regulation will not be permitted to register for classes or move into the dormitories for the fall term, 2020.

Quadrivalent meningitis All students living in on-campus dormitory facilities must be vaccinated against meningitis. The only vaccines that will be accepted in satisfaction of the meningitis vaccination requirement are ACWY Vax, Menveo, Nimenrix, Menactra, Mencevax, and Menomune. The vaccine must have been given within five years of the first day of classes at Yale. Students who are not compliant with this state regulation will not be permitted to register for classes or move into the dormitories for the fall term, 2020. The cost for all vaccinations and/or titers rests with the student, as these vaccinations are considered to be a pre-entrance requirement by the Connecticut State Department of Public Health. Please note that the State of Connecticut does not

require this vaccine for students who intend to reside off campus and are over the age of twenty-nine.

TB screening The University requires tuberculosis screening for all incoming students who have lived or traveled outside of the United States within the past year.

Hepatitis B series The University recommends that incoming students receive a series of three Hepatitis B vaccinations. Students may consult their health care provider for further information.

Student Accessibility Services

Student Accessibility Services (SAS) facilitates accommodations for all Yale students with disabilities who choose to register with the office. Registration with SAS is confidential. SAS helps arrange academic, transportation, dietary, and housing accommodations across campus. To qualify as a student with a disability, supporting documentation must be provided. The required first step for a student with a disability is completion of the registration form, which will initiate the process of obtaining disability-related accommodations; see https://yale-accommodate.symplcity.com/public_accommodation.

SAS works with students with temporary disabilities as well. At any time during a term, students with a newly diagnosed disability or recently sustained injury requiring accommodations should register following the above instructions. More information can be found at <https://sas.yale.edu>, including instructions for requesting or renewing accommodations and the guidelines for supporting documentation. You can also reach us by phone at 203.432.2324.

Residence and Dining Facilities

The Yale Housing Office has dormitory and apartment units available for graduate and professional students. Dormitories are single-occupancy and two-bedroom units of varying sizes and prices. They are located across the campus, from Edward S. Harkness Memorial Hall, serving the medical campus, to Helen Hadley Hall and the newly built 272 Elm Street, serving the central/science campus. Unfurnished apartments consisting of efficiencies and one-, two-, and three-bedroom apartments for singles and families are also available. Family housing is available in Whitehall and Esplanade Apartments. The Housing website (<https://housing.yale.edu>) is the venue for graduate housing information and includes dates, procedures, facility descriptions, floor plans, and rates. Applications for the new academic year are available beginning April 20 and can be submitted directly from the website with a Yale NetID.

The Yale Housing Office also manages the Off Campus Living listing service (<http://offcampusliving.yale.edu>; 203.436.9756), which is the exclusive Yale service for providing off-campus rental and sales listings. This secure system allows members of the Yale community to search rental listings, review landlord/property ratings, and search for a roommate in the New Haven area. On-campus housing is limited, and members of the community should consider off-campus options. Yale University discourages the use of Craigslist and other third-party nonsecure websites for off-campus housing searches.

The Yale Housing Office is located in Helen Hadley Hall (HHH) at 420 Temple Street and is open from 9 a.m. to 4 p.m., Monday through Friday; 203.432.2167.

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, the Physician Associate program, and other graduate and professional schools at Yale. Residents of Harkness Hall live in a secure building with single-occupancy bedrooms. 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. For additional information visit <https://housing.yale.edu>.

CAFÉ MED

Café Med, located in Harkness Hall at the School of Medicine, is open from 7:30 a.m. to 7 p.m., Monday through Friday. The menu enhances convenience and choice, with a customizable salad, soup, and rice bar utilizing local and seasonal ingredients; specialty coffees and fresh pastries; a grab-and-go selection of freshly made salads, sandwiches, and entrées; and a daily hot food option. For additional information visit <https://hospitality.yale.edu/retail/cafe-med>.

Resources on Sexual Misconduct

Yale University is committed to maintaining and strengthening an educational, working, and living environment founded on civility and mutual respect. Sexual misconduct is antithetical to the standards and ideals of our community, and it is a violation of Yale policy and the disciplinary regulations of Yale College and the graduate and professional schools.

Sexual misconduct incorporates a range of behaviors including sexual assault, sexual harassment, intimate partner violence, stalking, voyeurism, and any other conduct of a sexual nature that is nonconsensual, or has the purpose or effect of threatening, intimidating, or coercing a person. Violations of Yale's Policy on Teacher-Student Consensual Relations also constitute sexual misconduct. Sexual activity requires consent, which is defined as positive, unambiguous, and voluntary agreement to engage in specific sexual activity throughout a sexual encounter.

Yale aims to eradicate sexual misconduct through education, training, clear policies, and serious consequences for violations of these policies. In addition to being subject to University disciplinary action, many forms of sexual misconduct are prohibited by Connecticut and federal law and may lead to civil liability or criminal prosecution. Yale provides a range of services, resources, and mechanisms for victims of sexual misconduct. The options for undergraduate, graduate, and professional school students are described at <https://smr.yale.edu>.

SHARE: INFORMATION, ADVOCACY, AND SUPPORT

55 Lock Street, Lower Level

Office hours: 9 a.m.–5 p.m., M–F

24/7 hotline: 203.432.2000

<https://sharecenter.yale.edu>

SHARE, the Sexual Harassment and Assault Response and Education Center, has trained counselors available 24/7, including holidays. SHARE is available to members of the Yale community who wish to discuss any current or past experience of sexual misconduct involving themselves or someone they care about. SHARE services are confidential and can be anonymous if desired. SHARE can provide professional help with medical and health issues (including accompanying individuals to the hospital or the police), as well as ongoing counseling and support. SHARE works closely with the University-Wide Committee on Sexual Misconduct, the Title IX coordinators, the Yale Police Department, and other campus resources and can provide assistance with initiating a formal or informal complaint.

If you wish to make use of SHARE's services, you can call the SHARE number (203.432.2000) at any time for a phone consultation or to set up an in-person appointment. You may also drop in on weekdays during regular business hours. Some legal and medical options are time-sensitive, so if you have experienced an assault, we encourage you to call SHARE and/or the Yale Police as soon as possible. Counselors can talk with you over the telephone or meet you in person at Acute Care in the Yale Health Center or at the Yale New Haven Emergency Room. If it is not an acute situation and you would like to contact the SHARE staff during regular business hours, you can contact Jennifer Czincz, the director of SHARE (203.432.0310, jennifer.czincz@yale.edu), Anna Seidner (203.436.8217, anna.seidner@yale.edu), Cristy Cantu (203.432.2610, cristina.cantu@yale.edu), Freda Grant (203.436.0409, freda.grant@yale.edu), or John Criscuolo (203.645.3349, john.criscuolo@yale.edu).

TITLE IX COORDINATORS

203.432.6854

Office hours: 9 a.m. – 5 p.m., M–F

<https://provost.yale.edu/title-ix>

Title IX of the Education Amendments of 1972 protects people from sex discrimination in educational programs and activities at institutions that receive federal financial assistance. Sex discrimination includes sexual harassment, sexual assault, and other forms of sexual misconduct. The University is committed to providing an environment free from discrimination on the basis of sex.

Yale College, the Graduate School of Arts and Sciences, and the professional schools have each designated a deputy Title IX coordinator, reporting to Stephanie Spangler, Deputy Provost for Health Affairs and Academic Integrity and the University Title IX Coordinator. Coordinators respond to and address specific complaints, provide information on and coordinate with the available resources, track and monitor incidents to identify patterns or systemic issues, deliver prevention and educational programming, and address issues relating to gender-based discrimination and sexual misconduct within their respective schools. Coordinators are knowledgeable about, and will provide information on, all options for complaint resolution, and can initiate institutional action when necessary. Discussions with a Title IX coordinator are confidential. In the case of imminent threat to an individual or the community, the coordinator may need to consult with other administrators or take action in the interest of safety. The coordinators also work closely with the SHARE Center, the University-Wide Committee on Sexual Misconduct, and the Yale Police Department.

UNIVERSITY-WIDE COMMITTEE ON SEXUAL MISCONDUCT

203.432.4449

Office hours: 9 a.m.–5 p.m., M–F

<https://uwc.yale.edu>

The University-Wide Committee on Sexual Misconduct (UWC) is an internal disciplinary board for complaints of sexual misconduct available to students, faculty, and staff across the University, as described in the committee's procedures. The UWC provides an accessible, representative, and trained body to fairly and expeditiously address formal complaints of sexual misconduct. UWC members can answer inquiries about procedures and the University definition of sexual misconduct. The UWC is comprised of faculty, administrative, and student representatives from across the University. In UWC cases, investigations are conducted by professional, independent fact finders.

YALE POLICE DEPARTMENT

101 Ashmun Street

24/7 hotline: 203.432.4400

<https://your.yale.edu/community/public-safety/police/sensitive-crimes-support>

The Yale Police Department (YPD) operates 24/7 and is comprised of highly trained, professional officers. The YPD can provide information on available victims' assistance services and also has the capacity to perform full criminal investigations. If you wish to speak with Sergeant Kristina Reech, the Sensitive Crimes & Support coordinator, she can be reached at 203.432.9547 during business hours or via e-mail at kristina.reech@yale.edu. Informational sessions are available with the Sensitive Crimes & Support coordinator to discuss safety planning, available options, etc. The YPD works closely with the New Haven State's Attorney, the SHARE Center, the University's Title IX coordinators, and various other departments within the University. Talking to the YPD does not commit you to submitting evidence or pressing charges; with few exceptions, all decisions about how to proceed are up to you.

Security

Yale Security, a component of Yale Public Safety, maintains a presence throughout the Medical Center area and across the Yale campus on a 24/7 basis, both through uniformed security officers and centrally monitored electronic security systems that include video cameras, electronic access control, intercoms, emergency blue telephones, and intrusion alarm systems.

Yale Security partners with the Yale Police Department by patrolling parking facilities, pedestrian areas, and buildings using marked vehicles, bicycles, three-wheeled Segways, and foot patrols. Security officers are also available to assist with lockouts and perform walking escorts. Safe Rides can be accessed from 6 p.m. to 6 a.m. via the LiveSafe app or by calling Yale Transit at 203.432.6330.

Yale Security can be reached twenty-four hours a day, seven days a week, by calling 203.785.5555. For additional information regarding public safety at Yale, or to request

additional security services for special events, please visit our website at <http://publicsafety.yale.edu>. And please be sure to download the Yale LiveSafe app onto your smartphone. It's a great tool and a great resource.

Cultural Resources and Athletic Facilities

Keep up to date about campus news and events by subscribing to the Yale Today and/or Yale Best of the Week e-newsletters (<https://news.yale.edu/subscribe-enewsletter>), which feature stories, videos, and photos from YaleNews (<http://news.yale.edu>) and other campus websites. Also visit the Yale Calendar of Events (<http://calendar.yale.edu>) and the University's Facebook, Twitter, Instagram, Tumblr, LinkedIn, and YouTube channels.

The Yale Peabody Museum of Natural History, founded in 1866, houses more than thirteen million specimens and objects in ten curatorial divisions: anthropology, botany, entomology, historical scientific instruments, invertebrate paleontology, invertebrate zoology, mineralogy and meteoritics, paleobotany, vertebrate paleontology, and vertebrate zoology. The renowned collections provide crucial keys to the history of Earth and its life-forms, and in some cases are the only remaining traces of animals, plants, and cultures that have disappeared. About 5,000 objects are on public display, including the original "type" specimens—first of its kind—of *Brontosaurus*, *Stegosaurus*, and *Triceratops*.

The Yale University Art Gallery was founded in 1832 as an art museum for Yale and the community. Today it is one of the largest museums in the country, holding more than 250,000 objects and welcoming visitors from around the world. The museum's encyclopedic collection can engage every interest. Galleries showcase artworks from ancient times to the present, including vessels from Tang-dynasty China, early Italian paintings, textiles from Borneo, treasures of American art, masks from Western Africa, modern and contemporary art, ancient sculptures, masterworks by Degas, van Gogh, and Picasso, and more. Spanning one and a half city blocks, the museum features more than 4,000 works on display, multiple classrooms, a rooftop terrace, a sculpture garden, and dramatic views of New Haven and the Yale campus. The gallery's mission is to encourage an understanding of art and its role in society through direct engagement with original works of art. Programs include exhibition tours, lectures, and performances, all free and open to the public. For more information, please visit <https://artgallery.yale.edu>.

The Yale Center for British Art is a public art museum and research institute that houses the largest collection of British art outside the United Kingdom. Presented to the University by Paul Mellon (Yale College, Class of 1929), the collection reflects the development of British art and culture from the Elizabethan period to the present day. Free and open to all. Offers exhibitions and programs, including lectures, concerts, films, symposia, tours, and family events. For more information, please visit <https://britishart.yale.edu>.

There are more than eighty endowed lecture series held at Yale each year on subjects ranging from anatomy to theology, and including virtually all disciplines.

More than five hundred musical events take place at the University during the academic year. In addition to recitals by graduate students, the School of Music presents the

Ellington Jazz Series, Faculty Artist Series, Horowitz Piano Series, New Music New Haven, Onepo Chamber Music Series, and Yale in New York, as well as performances by the Yale Opera, Yale Philharmonia, Yale Choral Artists, and various YSM ensembles, along with concerts at the Yale Collection of Musical Instruments. The Norfolk Chamber Music Festival/Yale Summer School of Music presents the New Music Workshop and the Chamber Choir and Choral Conducting Workshop, in addition to the six-week Chamber Music Session. Many of these concerts stream live on the School's website (<https://music.yale.edu>). Additionally, the School presents the Iseman Broadcasts of the Metropolitan Opera Live in HD free to members of the Yale community. Undergraduate organizations include the Yale Bands, Yale Glee Club, Yale Symphony Orchestra, and numerous other singing and instrumental groups. The Department of Music sponsors the Yale Collegium, Yale Baroque Opera Project, productions of new music and opera, and undergraduate recitals. The Institute of Sacred Music presents Great Organ Music at Yale, the Yale Camerata, the Yale Schola Cantorum, and many other special events.

For theatergoers, Yale and New Haven offer a wide range of dramatic productions at such venues as the University Theatre, Yale Repertory Theatre, Yale Cabaret, Yale Residential College Theaters, Off Broadway Theater, Iseman Theater, Whitney Humanities Center, Collective Consciousness Theatre, A Broken Umbrella Theatre, Elm Shakespeare Company, International Festival of Arts and Ideas, Long Wharf Theatre, and Shubert Performing Arts Center.

The Payne Whitney Gymnasium is one of the most elaborate and extensive indoor athletic facilities in the world. This complex includes the 3,100-seat John J. Lee Amphitheater, the site for varsity basketball, volleyball, and gymnastics competitions; the Robert J.H. Kiphuth Exhibition Pool; the Brady Squash Center, a world-class facility with fifteen international-style courts; the Adrian C. Israel Fitness Center, a state-of-the-art exercise and weight-training complex; the Brooks-Dwyer Varsity Strength and Conditioning Center; the Colonel William K. Lanman, Jr. Center, a 30,000-square-foot space for recreational/intramural play and varsity team practice; the Greenberg Brothers Track, an eighth-mile indoor jogging track; the David Paterson Golf Technology Center; and other rooms devoted to fencing, gymnastics, rowing, wrestling, martial arts, general exercise, and dance. Numerous group exercise classes in dance, martial arts, zumba, yoga, pilates, spinning, HIIT and cardio, and sport skills are offered throughout the year. Yale undergraduates and graduate and professional school students may use the gym at no charge throughout the year. Memberships at reasonable fees are available for faculty, employees, postdocs, visiting associates, alumni, and members of the New Haven community. Memberships are also available for spouses and children of all members. Additional information is available at <https://sportsandrecreation.yale.edu>.

During the year, various recreational opportunities are available at the David S. Ingalls Rink, the McNay Family Sailing Center in Branford, the Yale Outdoor Education Center in East Lyme, the Yale Tennis Complex, and the Yale Golf Course. All members of the Yale community and their guests may participate at each of these venues for a modest fee. Up-to-date information on programs, hours, and specific costs is available at <https://sportsandrecreation.yale.edu>.

Approximately fifty club sports are offered at Yale, organized by the Office of Club Sports and Outdoor Education. Most of the teams are for undergraduates, but a few are available to graduate and professional school students. Yale students, faculty, staff, and alumni may use the Yale Outdoor Education Center (OEC), which consists of 1,500 acres surrounding a mile-long lake in East Lyme, Connecticut. The facility includes overnight cabins and campsites, a pavilion and dining hall available for group rental, and a waterfront area with supervised swimming, rowboats, canoes, stand-up paddleboards, and kayaks. Adjacent to the lake, a shaded picnic grove and gazebo are available to visitors. In a more remote area of the facility, hiking trails loop the north end of the property; trail maps and directions are available on-site at the field office. The OEC runs seven days a week from the third week of June through Labor Day. For more information, including mid-September weekend availability, call 203.432.2492 or visit <https://sportsandrecreation.yale.edu>.

Throughout the year, Yale graduate and professional school students have the opportunity to participate in numerous intramural sports activities, including volleyball, soccer, and softball in the fall; basketball and volleyball in the winter; softball, soccer, ultimate, and volleyball in the spring; and softball in the summer. With few exceptions, all academic-year graduate-professional student sports activities are scheduled on weekends, and most sports activities are open to competitive, recreational, and coeducational teams. More information is available from the Intramurals Office in Payne Whitney Gymnasium, 203.432.2487, or online at <https://sportsandrecreation.yale.edu>.

Office of International Students and Scholars

The Office of International Students and Scholars (OISS) coordinates services and support for Yale's nearly 6,000 international students, faculty, staff, and their dependents. OISS staff assist with issues related to employment, immigration, and personal and cultural adjustment, as well as serve as a source of general information about living at Yale and in New Haven. As Yale University's representative for immigration concerns, OISS helps students, faculty, and staff obtain and maintain legal nonimmigrant status in the United States. All international students and scholars must register with OISS as soon as they arrive at Yale; see <http://oiss.yale.edu/coming-to-yale>.

OISS programs, like daily English conversation groups, U.S. culture workshops and discussions, bus trips, and social events, provide an opportunity to meet members of Yale's international community and become acquainted with the many resources of Yale University and New Haven. Spouses and partners of Yale students and scholars will want to get involved with the International Spouses and Partners at Yale (ISPY), which organizes a variety of programs.

The OISS website (<http://oiss.yale.edu>) provides useful information to students and scholars prior to and upon arrival in New Haven, as well as throughout their stay at Yale. International students, scholars, and their families and partners can connect with OISS and the Yale international community virtually through Facebook.

OISS is housed in the International Center for Yale Students and Scholars, which serves as a welcoming venue for students and scholars who want to peruse resource materials,

check their e-mail, grab a cup of coffee, and meet up with a friend or colleague. Open until 9 p.m. on weekdays during the academic year, the center—located at 421 Temple Street, across the street from Helen Hadley Hall—also provides meeting space for student groups and a venue for events organized by both student groups and University departments. For more information about reserving space at the center, go to <http://oiss.yale.edu/about/the-international-center/international-center-room-reservations>. For information about the center, visit <http://oiss.yale.edu/about/international-center>.

YSPH RESOURCES FOR STUDENTS

Office of Student Affairs

47 College Street, 203.785.6260
Frank Grosso, Associate Dean
Stacey Tuttle, Associate Director/Registrar

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 student experience at YSPH, represents the interests of all students to the faculty, and participates in policy decisions for the school. Dean Grosso and Stacey Tuttle 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 nonacademic aspects of school life.

Career Management Center

47 College Street, 203.785.2827, 203.785.4285
Felicia Spencer, Director
Kelly Shay, Associate Director

The YSPH Career Management Center assists students in all phases of developing, managing, and implementing career plans and strategies.

CAREER COUNSELING

The Career Management Center advises students on a wide range of career development issues, including but not limited to creating effective résumés, honing interview skills, exploring summer internship options, and discussing opportunities for post-graduation jobs or study.

PROFESSIONAL SKILLS SERIES

The Career Management Center administers a series of seminars to help prepare students to successfully manage all aspects of a job or internship search as well as equip them with the skills and knowledge to succeed in their chosen career paths. Students are trained in mock interviewing, public speaking, networking with alumni, and business communications.

RECRUITING AND JOB INFORMATION

The Career Management Center works to attract a variety of organizations seeking to hire public health professionals. YSPH uses the career management platform Handshake as a recruitment tool; it is a centralized source for posting job, internship, and fellowship opportunities.

INTERNSHIP

The summer internship between the first and second years is an important learning experience, providing students with an opportunity to apply the public health theory and knowledge learned in their course work in real-world settings and explore or confirm a particular career interest. Students are expected to perform full-time work for typically ten to twelve weeks and no less than eight weeks in a public health setting, domestically or globally. The Career Management Center also helps students identify internship opportunities through on-campus recruiting, job postings, and alumni and faculty contacts.

CAREER TRIPS

The Career Management Center sponsors and organizes career trips to Washington, D.C., and New York City to help introduce students to the broad array of public health opportunities in the public, private, and nonprofit sectors.

Cushing/Whitney Medical Library

333 Cedar Street, 203.785.5359 (circulation desk), 203.737.2963 (public health librarian)
John Gallagher, Director

Kate Nyhan, Research and Education Librarian for Public Health, kate.nyhan@yale.edu

The Harvey Cushing/John Hay Whitney Medical Library provides access to an extensive array of information resources and tools, offers research assistance and expertise, and delivers meaningful services to our users, to support innovation and excellence in biomedical research, patient care, and the development of scholars and future leaders in health care.

CONSULTATIONS AND WORKSHOPS

Students are welcome to meet one-on-one with the public health librarian for advice on their research projects, as consumers of evidence (finding and appraising resources), and as producers of evidence (disseminating theses and publishing articles). Librarians also visit classes, departments, and labs with tailored presentations and hands-on instruction, and collaborate on publications like systematic reviews. Librarians offer regular workshops on such topics as PubMed and other literature databases, literature reviews, systematic reviews, expert searching, research impact, bioinformatics, geographic information systems, citation management, research data management, and more.

- Workshops: <https://library.medicine.yale.edu/classes>
- Video tutorials: <https://library.medicine.yale.edu/tutorials>
- StatLab consultants for advice on statistics and geospatial tools: <https://marx.library.yale.edu/data-gis-statistical-support/statistical-support>

RESOURCES

The Cushing/Whitney Medical Library provides a comprehensive collection of clinical reference tools, databases, evidence-based practice resources, image collections, educational software, and books and journals in support of programs in medicine, nursing, public health, physician associates, bioinformatics, and the basic sciences. Yale students have access to the library's electronic collections from anywhere using VPN

software. The service GetIt@Yale provides fast, free electronic access to chapters and articles through interlibrary loan or scanning. Print books from other Yale libraries and Borrow Direct schools can be delivered to the medical library circulation desk quickly.

- Public Health Information Guide: <https://guides.library.yale.edu/publichealth>
- YSPH Library Orientation Guide: <https://guides.library.yale.edu/ysphorientation>

Bioinformatics support includes free training for and access to Ingenuity Pathway Analysis, MetaCore, Partek Flow, BIOBASE, Qlucore, and more tools for omics analysis.

The special collections of the Medical Historical Library and the Cushing Center – including medical incunabula, rare books, prints, photographs, and objects – support research and education in the history of medicine and public health.

The library lends students chargers, display adapters, clickers, video and audio recording equipment, and laptops, and it provides free subscriptions and support for citation management software.

LIBRARY SPACES AND TECHNOLOGY

Students will find options available for group or individual study space throughout the Medical Library. Individual study carrels and tables are located on all levels of the library. The Morse Reading Room is designated as quiet study space. New this year are a large team-based learning classroom, eight rooms for small group learning and independent study, an expanded studio for video production of learning materials, and an enhanced information commons with plentiful workstations, comfortable seating, and an information desk for help. The new spaces are designed for flexible use and incorporate technologies to support the curriculum and accommodate individual study preferences.

Windows and Mac computers are available in multiple locations, including the 24/7 Computer & Study Space. The computers have productivity software such as Microsoft Office, EndNote, and other tools including desktop publishing software, statistics and GIS software (SAS, SPSS, ArcGIS, etc.), and medical education software. Black-and-white and color printers/copiers/scanners are available. In addition, the library offers two scanning stations (Windows and Mac) in the 24/7 space, which have a variety of applications for graphics and video editing and production. A high-performance workstation with a suite of licensed and open source tools, such as BRB-Array Tools, Cytoscape, and Qlucore, is also available to process, manage, analyze, and visualize data in a variety of formats. Access to this workstation can be reserved by any Yale researcher.

The Cushing Center – an educational and historical collection of brain samples – and a Yale Information Technology Services walk-in center are located on the lower levels.

The library is typically open 7:30 a.m.–12 midnight on weeknights during the fall and spring terms and offers all-hours keycard access to the 24/7 Computer & Study Space.

Office of the Registrar

47 College Street, 203.785.6260
Stacey Tuttle, 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 and process loan deferment forms.
- Information on degree requirements and the registration process.
- Transcripts. Copies of transcripts must be requested from the registrar's office. The transcript request form is available on the Student Resources page, under MPH Program, at <http://myysph.yale.edu/students>. Two business days should be allowed for the processing of requests. There is no charge for an official transcript. By law, the registrar may only release YSPH transcripts. Prior transcripts and recommendations included in a student's application to YSPH must be obtained from their original source.
- Nondisclosure of personal information forms.

Office of Alumni Affairs

47 College Street, Suite 104, 203.785.6245

Cornelia Evans, Senior Director of Development and Alumni Affairs

Katherine Ingram, Assistant Director of Development and Alumni Affairs

Dawn Carroll, Coordinator, Alumni Affairs

The YSPH Office of Alumni Affairs strengthens institutional relationships and develops programs that sustain an active alumni network. The office, in collaboration with the Association of Yale Alumni in Public Health (AYAPH), facilitates the participation of more than 6,000 alumni in the life of the School. This collaboration provides a voice for alumni, strengthens alumni connections with the School, and promotes alumni networking. AYAPH is led by a group of dedicated alumni volunteers who serve on its board of directors.

The office is responsible for a series of annual events and activities that serve to build a sense of community and connectedness to both the School and its future alumni. Examples include:

- Alumni Day, held annually in New Haven, features a symposium on a timely public health issue, as well as an alumni awards dinner that recognizes the outstanding contributions of our alumni to the field of public health and/or in service to YSPH.
- American Public Health Association (APHA) annual meeting is the venue for another popular alumni gathering. With APHA hosting its annual meeting in a different U.S. city each year, the schedule ensures participation of graduates located throughout the United States.
- YSPH Alumni Engagement Program, which includes a Mentoring Program, allows current students to connect with YSPH alumni for résumé review, interview preparation, and career advice.
- Several events throughout the year take advantage of scheduled travel to introduce Dean Vermund and myriad faculty to alumni around the country.

YSPH has a strong alumni network, and in addition to participating in formal alumni events, graduates of YSPH enjoy connecting with current students as mentors, advisers, and colleagues to assist students in their transition to careers as public health professionals. Alumni are also essential to the practice curriculum through teaching, serving as preceptors, and providing applied research sites for projects and theses.

Office of Public Health Practice

135 College Street

Rafael Pérez-Escamilla, Ph.D., Director

Susan Nappi, Executive Director

The Office of Public Health Practice (OPHP) supports the mission of the Yale School of Public Health (YSPH) by fostering sustainable and equitable collaborations among students, faculty, and community partners. OPHP serves as the YSPH nexus for practice-based learning, community programs, and public health workforce training and is a bridge to domestic and international agencies engaged in public health work. The office is an on-site resource for students, faculty, organizations, and public health practitioners seeking training as well as support for the Applied Practice Experience, internship, and practicum courses.

MEDICAL CENTER RESOURCES AND PROGRAMS

Office of Diversity, Inclusion, Community Engagement, and Equity

At YSPH, we aim to foster diversity, equity, and inclusion. To meet the public health challenges of today and tomorrow, we are committed to training a diverse public health workforce that reflects the communities we serve; to addressing health inequities through our teaching, research, and service; and to nurturing a genuine sense of belonging among our students, faculty, staff, and alumni.

We value intellectual curiosity and the free and respectful expression of diverse opinions. Discrimination and harassment in any form have no place at YSPH. There are several resources available if someone encounters or witnesses intolerance, discrimination, or behavior that threatens diversity and inclusion at YSPH:

Mayur Desai is the associate dean for diversity, equity, and inclusion and serves as the dean's designee for student reports of discrimination and harassment at YSPH. See <https://student-dhr.yale.edu/deans-designees>; or e-mail mayur.desai@yale.edu.

In addition, students, faculty, and staff can contact Valarie Stanley, senior director of the Yale Office of Institutional Equity and Access, with any concerns. See <https://oiea.yale.edu>; or e-mail valarie.stanley@yale.edu.

Professor Melinda Pettigrew is the Title IX coordinator for YSPH. See <https://provost.yale.edu/title-ix/coordinators>; or e-mail melinda.pettigrew@yale.edu.

Alyson Zeitlin is the director of faculty and staff affairs at YSPH. She can be reached at 203.785.7373 or alyson.zeitlin@yale.edu.

Merle Waxman is the director of the Office for Women in Medicine at the Yale School of Medicine. See <https://medicine.yale.edu/owm>; or call her confidential telephone number, 203.737.4100.

Office for Women in Medicine

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

Merle Waxman, Director of the Office for Women in Medicine, is the Title IX coordinator for the Yale School of Medicine. She can be contacted at 203.785.4680, 203.737.4100, or merle.waxman@yale.edu. The Title IX coordinator for the Yale School of Public Health is Melinda Pettigrew, Professor of Epidemiology (Microbial Diseases) and Senior Associate Dean for Academic Affairs. She can be contacted at 203.737.7667 or melinda.pettigrew@yale.edu. The deputy Title IX coordinator for the Yale School of Public Health is Stacey Tuttle. She can be contacted at 203.785.3862 or stacey.tuttle@yale.edu.

Interdisciplinary Research and Special Programs

Cancer Prevention and Control Research Program

<http://yalecancercenter.org/research/programs/prevention>

Center for Infectious Disease Modeling and Analysis

<https://publichealth.yale.edu/cidma>

Center for Interdisciplinary Research on AIDS (CIRA)

<http://cira.yale.edu>

Center for Neuroepidemiology and Clinical Neurological Research (CNE²)

<https://medicine.yale.edu/cne2>

Center for Perinatal, Pediatric, and Environmental Epidemiology

<http://publichealth.yale.edu/cppee>

Center on Climate Change and Health

<http://publichealth.yale.edu/climate>

Climate Change at Yale

<https://yibs.yale.edu/climate-change>

Collaborative Center for Statistics in Science

<http://publichealth.yale.edu/c2s2>

Community Alliance for Research and Engagement (CARE)

<https://publichealth.yale.edu/practice/care>

Emerging Infections Program

<http://publichealth.yale.edu/eip>

Equity Research and Innovation Center (ERIC)

<http://medicine.yale.edu/intmed/genmed/eric>

Institution for Social and Policy Studies

<http://isps.yale.edu>

Keck Biotechnology Resource Laboratory

<http://medicine.yale.edu/keck>

John B. Pierce Laboratory

<http://jbpierce.org>

Samoan Obesity, Lifestyle, and Genetic Adaptations Study Group (OLAGA)

<http://publichealth.yale.edu/olaga>

Yale Center for Analytical Sciences

<http://publichealth.yale.edu/ycas>

Yale Global Health Leadership Initiative

<http://publichealth.yale.edu/hpm/ghli>

Yale Institute for Global Health

<http://medicine.yale.edu/yigh>

Yale Claude D. Pepper Older Americans Independence Center

<http://medicine.yale.edu/intmed/geriatrics/peppercenter>

Yale Tobacco Center of Regulatory Science

<http://medicine.yale.edu/psychiatry/tcors>

Yale-Griffin Prevention Research Center

www.yalegriffinprc.org

STUDENT ORGANIZATIONS AND COMMITTEES

Student Government

STUDENT ASSOCIATION OF YALE SCHOOL OF PUBLIC HEALTH (SAYPH)

SAYPH is organized by YSPH students for YSPH students. SAYPH works to enhance the educational experience of each student at the School 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:

- 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
- Distribution of funds to YSPH-affiliated student organizations

SAYPH is headed by an Executive Committee consisting of a president, treasurer, social committee chair, professional development committee chair, community service chair, communications chair, and alumni engagement chair. There are at least two departmental representatives acting as liaisons between students and the faculty and administration.

GRADUATE AND PROFESSIONAL STUDENT SENATE (GPSS)

The Graduate and Professional Student Senate (GPSS or "Yale G&P Senate") is composed of student-elected representatives from each of the thirteen graduate and professional schools at Yale. Any student enrolled in these schools is eligible to run for a senate seat during fall elections. As a governing body, the GPSS advocates for student concerns and advancement within Yale, represents all graduate and professional students to the outside world, and facilitates interaction and collaboration among the schools through social gatherings, academic or professional events, and community service. GPSS meetings occur on alternating Thursdays and are open to the entire graduate and professional school community, as well as representatives from the Yale administration. GPSS also oversees the management of the Graduate and Professional Student Center, located at 204 York Street. The center provides office and event space for GPSS and other student organizations and houses Gryphon's Pub. For more information, please visit <https://gpsenate.yale.edu>.

Special Interest Groups

Students in the School of Public Health participate in a diverse range of special interest groups, from Yale chapters of professional associations to student-run clinics and other public service organizations. For additional information, see Student Activities at <http://myysph.yale.edu/students>.

APPENDIX I: YSPH PRACTICE REQUIREMENT GUIDELINES

All M.P.H. candidates must complete an applied practice experience to integrate classroom learning with real-life experience in a public health work environment, which allows them to learn from professionals in the field. M.P.H. students may fulfill the Public Health Practice Requirement by one of the following means:

1. Completing an appropriate public health summer internship (EPH 520) – the preferred method for fulfilling the applied practice experience requirement, as it offers a sustained and concentrated course of experiential learning;
2. Completing EPH 542, Practice-Based Community Health Research;
3. Completing EPH 500, Public Health Practicum, offered to second-year students and one-year professional students only;
4. Completing EPH 555, Practicum in Climate Change, Sustainability, and Public Health;
5. Completing HPM 555, Health Policy or Health Care Management Practicum;
6. Completing EMD 584/SBS 584, Advanced Global Health Justice Practicum: Fieldwork;
7. Completing EMD 596/SBS 596/LAW 30168, Health Justice Practicum and Fieldwork;
8. Completing SBS 541, Community Health Program Evaluation.

Advanced Professional M.P.H. and Accelerated M.B.A./M.P.H. students are not required to complete a summer internship and must fulfill their applied practice experience requirement during the academic year by taking one of the courses listed above.

In planning your applied practice experience, please refer to the following guidelines, which apply to domestic and/or global experiential learning placements that qualify as meeting the M.P.H. applied practice experience requirement, including the summer internship and other community agency assignments that are part of approved practice courses.

1. The applied practice experience 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 as well as nongovernmental and private-sector organizations with a public health component such as pharmaceutical companies, hospitals, managed care/health maintenance organizations, and consulting firms.
2. The applied practice experience 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. The applied practice experience entails one or more of the following roles:
 - a. 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;

- b. 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;
 - c. Planning, designing, implementing, and evaluating public health interventions;
 - d. Developing disease prevention and health promotion, media advocacy, or risk communication materials;
 - e. Developing, implementing, and evaluating public health laws, regulations, and policy;
 - f. Participating in administrative/management activities of governmental and nongovernmental public health agencies and/or health service delivery systems such as hospitals or community health centers. Activities could include quality improvement, 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;
 - g. 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. The applied practice experience integrates public health theory, knowledge, and skills, and applies and reinforces the competencies in M.P.H. course work.
 - 5. The applied practice experience typically aligns with the student's area of specialization.
 - 6. The applied practice experience project and student role are appropriate for the M.P.H. level.
 - 7. The applied practice experience agency and preceptor have requisite population health orientation, public health expertise, and infrastructure to support M.P.H.-level student learning experience.
 - 8. The applied practice experience has deliverables of tangible value to the mission of the placement agency/site.

APPENDIX II: THESIS GUIDELINES

Types of Theses

The following five 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. This thesis 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

The type of thesis, choice of topic, and details of methodology are the joint responsibility of the student and the primary thesis adviser. The primary thesis adviser is determined by mutual consent between the adviser and the student and may or may not be the student's faculty adviser.

The primary thesis adviser must have a primary or secondary faculty appointment at YSPH. Acceptable appointments are: (1) ladder faculty at the rank of assistant professor and above, and (2) non-ladder faculty at the rank of associate research scientist and above. Students must request approval for primary thesis advisers who have other types of non-ladder faculty appointments at YSPH (e.g., lecturer, instructor, etc.). To request approval, students need to provide the registrar with a copy of the primary thesis adviser's CV along with the thesis adviser form for approval by the Committee

on Academic Progress. Students unsure of whether someone has an appointment at YSPH should consult the comprehensive list of all faculty members, by department, at the front of the YSPH Bulletin.

The secondary thesis adviser should have a faculty appointment at YSPH, Yale University, or another outside academic institution. Students must request approval for secondary thesis advisers whose faculty appointment is outside of Yale or who do not have a faculty appointment at an academic institution. To request approval, students need to provide the registrar with a copy of the secondary thesis adviser's CV along with the thesis adviser form for approval by the Committee on Academic Progress.

Timeline for M.P.H. Thesis

September Departmental meetings to review specific thesis requirements and timelines

October 30 Thesis adviser form due to registrar (signed by both advisers)

November 2 First draft of thesis prospectus due to primary thesis adviser

December 1 Final draft of thesis prospectus due to primary thesis adviser and YSPH registrar (students will not be allowed to register for thesis credits the following term if the prospectus is not submitted)

Mid-March First draft of thesis due to thesis advisers (student should include a summary of major analyses and tables)

April 15 Final thesis to be submitted to thesis advisers for final grading

May 1 Deadline for final grades to be submitted to registrar from thesis advisers and for student submission of electronic copy

Thesis Prospectus

The major assignment during the fall term is the submission of a prospectus to the thesis adviser. The prospectus is designed to help ensure that a student and faculty adviser are explicit about the thesis topic, to promote continued progress during the fall term, and to increase the likelihood of a final high-quality product. Students are strongly encouraged to work on the thesis throughout the second year. These prospectus guidelines, therefore, are a minimum requirement. Furthermore, given a student's ongoing work, the prospectus is considered more of a "progress report."

A first draft of the prospectus is due to the thesis adviser no later than November 2, with the full prospectus due to the thesis adviser and the YSPH registrar on December 1. The prospectus should be completed using the format below. In addition, it is expected that students include proper citations and references when preparing the prospectus. More information regarding proper citing of sources can be found on the YSPH website at <https://publichealth.yale.edu/myysph/students/mp/capi>.

Please note that the preferred thesis for students is one that is in the style and length of a publishable, peer-reviewed paper.

Note: While drafting your prospectus with your advisers, you may have discussions around publication and authorship. Please refer to the Submission and Publication page at <https://publichealth.yale.edu/myysph/students/mp/thesis/submission> for

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

THESIS PROSPECTUS FORMAT

Title

Primary Thesis Adviser

Secondary Thesis Adviser

1. *Specific Aims & Hypotheses.* Clear and succinct statement of the thesis objectives, including primary study hypothesis.
2. *Background & Rationale.* Brief overview of existing literature (3–5 paragraphs is sufficient for the prospectus). Why is this project important? How is it different from existing research?
3. *Methods.* Brief overview of the basic study methodology. If conducting secondary analyses on an existing database, describe the methods of the original study (a–c) along with your plan for analyzing the data (d).
 - a. Study Design (case/control, cohort, observational, cross-sectional, laboratory, other)
 - b. Study Population (who, how many, what information is available/to be collected for population members)
 - c. Sample Size/Power Calculations (is sample size sufficient to address the primary study aim?)
 - d. Data Analysis Plan and Software to be Used
4. *Competencies.* Select three to five M.P.H. core and department-specific competencies that you will master as part of this culminating experience. Briefly describe how this thesis will address these competencies.

Thesis Organization

The thesis must be assembled as follows:

1. Title Page (Title cannot exceed 60 characters)
2. 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.
3. Acknowledgments (if desired)
4. Table of Contents
5. List of Tables (if any)
6. List of Figures (if any)
7. Body of the Thesis

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

- a. Introduction
 - i. Brief statement of specific objectives of the investigation
 - ii. Statement of general problem addressed by the thesis
 - iii. Elaboration of objectives and/or hypotheses, including the relation to the general problem

b. Review of Studies Relevant to the Problem

c. Research Design

- i. Specific research design and method
- ii. Reasons for selection
- iii. Method of analysis, including justification for statistical tests

d. 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.

e. Conclusions

- i. Summary of findings
- ii. Limitations of findings and other limitations of the study
- iii. Conclusions based on the study
- iv. Relevant recommendations for program development or further research

8. 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.

9. Appendix or Appendices

Electronic Submission of Thesis

The final, completed version of the thesis must be submitted electronically, by midnight on May 1, at www.etsadmin.com/publichealthyale.

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 advisers 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. During this time, students in "thesis pending" status must be registered for continuous study each term of the regular academic year until the thesis requirement has been completed (except in the case of an approved Leave of Absence). Students may not register for regular course work while on continuous study status. Students

are permitted to be on continuous study for a maximum of two terms. The fee for continuous study is \$712.50 per term. Students registered for continuous study are not eligible for financial aid.

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 then be required to register for the thesis course and pay the per course unit tuition charge (\$4,784 per course unit) 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.

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.

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 visit <https://admissions.yale.edu>, e-mail student.questions@yale.edu, or call 203.432.9300. Postal correspondence should be directed to Office of Undergraduate Admissions, Yale University, PO Box 208234, New Haven CT 06520-8234.

Graduate School of Arts and Sciences Est. 1847. Courses for college graduates. Master of Advanced Study (M.A.S.), Master of Arts (M.A.), Master of Science (M.S.), Master of Philosophy (M.Phil.), Doctor of Philosophy (Ph.D.).

For additional information, please visit <https://gsas.yale.edu>, e-mail graduate.admissions@yale.edu, or call the Office of Graduate Admissions at 203.432.2771. Postal correspondence should be directed to Office of Graduate Admissions, Yale Graduate School of Arts and Sciences, PO Box 208236, New Haven CT 06520-8236.

School of Medicine Est. 1810. 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. Five-year combined program leading to Doctor of Medicine and Master of Health Science (M.D./M.H.S.). Combined program with the Graduate School of Arts and Sciences leading to Doctor of Medicine and Doctor of Philosophy (M.D./Ph.D.). Master of Medical Science (M.M.Sc.) from the Physician Associate Program and the Physician Assistant Online Program.

For additional information, please visit <https://medicine.yale.edu/education/admissions>, e-mail medical.admissions@yale.edu, or call the Office of Admissions at 203.785.2643. Postal correspondence should be directed to Office of Admissions, Yale School of Medicine, 367 Cedar Street, New Haven CT 06510.

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 visit <https://divinity.yale.edu>, e-mail div.admissions@yale.edu, or call the Admissions Office at 203.432.5360. Postal correspondence should be directed to Admissions Office, Yale Divinity School, 409 Prospect Street, New Haven CT 06511.

Law School Est. 1824. Courses for college graduates. Juris Doctor (J.D.). For additional information, please visit <https://law.yale.edu>, e-mail admissions.law@yale.edu, or call the Admissions Office at 203.432.4995. Postal correspondence should be directed to Admissions Office, Yale Law School, PO Box 208215, New Haven CT 06520-8215.

Graduate Programs: Master of Laws (LL.M.), Doctor of the Science of Law (J.S.D.), Master of Studies in Law (M.S.L.). Doctor of Philosophy (Ph.D.) awarded by the Graduate School of Arts and Sciences. For additional information, please visit <https://law.yale.edu>, e-mail gradpro.law@yale.edu, or call the Graduate Programs Office at 203.432.1696. Postal correspondence should be directed to Graduate Programs, Yale Law School, PO Box 208215, New Haven CT 06520-8215.

School of Engineering & Applied Science Est. 1852. Courses for college graduates. Master of Science (M.S.) and Doctor of Philosophy (Ph.D.) awarded by the Graduate School of Arts and Sciences.

For additional information, please visit <https://seas.yale.edu>, e-mail grad.engineering@yale.edu, or call 203.432.4252. Postal correspondence should be directed to Office of Graduate Studies, Yale School of Engineering & Applied Science, PO Box 208292, New Haven CT 06520-8292.

School of Art Est. 1869. Professional courses for college and art school graduates. Master of Fine Arts (M.F.A.).

For additional information, please visit <http://art.yale.edu>, e-mail artschool.info@yale.edu, or call the Office of Academic Administration at 203.432.2600. Postal correspondence should be directed to Office of Academic Administration, Yale School of Art, PO Box 208339, New Haven CT 06520-8339.

School of Music Est. 1894. Graduate professional studies in performance, composition, and conducting. Certificate in Performance (CERT), Master of Music (M.M.), Master of Musical Arts (M.M.A.), Artist Diploma (A.D.), Doctor of Musical Arts (D.M.A.).

For additional information, please visit <https://music.yale.edu>, e-mail gradmusic.admissions@yale.edu, or call the Office of Admissions at 203.432.4155. Postal correspondence should be directed to Yale School of Music, PO Box 208246, New Haven CT 06520-8246.

School of the Environment 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.) awarded by the Graduate School of Arts and Sciences.

For additional information, please visit <https://environment.yale.edu>, e-mail fesinfo@yale.edu, or call the Office of Admissions at 800.825.0330. Postal correspondence should be directed to Office of Admissions, Yale School of the Environment, 195 Prospect Street, New Haven CT 06511.

School of Public Health Est. 1915. Courses for college graduates. Master of Public Health (M.P.H.). Master of Science (M.S.) and Doctor of Philosophy (Ph.D.) awarded by the Graduate School of Arts and Sciences.

For additional information, please visit <https://publichealth.yale.edu>, e-mail ysph.admissions@yale.edu, or call the Admissions Office at 203.785.2844.

School of Architecture Est. 1916. Courses for college graduates. Professional and post-professional degree: Master of Architecture (M.Arch.); nonprofessional degree: Master

of Environmental Design (M.E.D.). Doctor of Philosophy (Ph.D.) awarded by the Graduate School of Arts and Sciences.

For additional information, please visit <https://www.architecture.yale.edu>, e-mail gradarch.admissions@yale.edu, or call 203.432.2296. Postal correspondence should be directed to the Yale School of Architecture, PO Box 208242, New Haven CT 06520-8242.

School of Nursing Est. 1923. Courses for college graduates. Master of Science in Nursing (M.S.N.), Post Master's Certificate, Doctor of Nursing Practice (D.N.P.). Doctor of Philosophy (Ph.D.) awarded by the Graduate School of Arts and Sciences.

For additional information, please visit <https://nursing.yale.edu> or call 203.785.2389. Postal correspondence should be directed to Yale School of Nursing, Yale University West Campus, PO Box 27399, West Haven CT 06516-0974.

School of Drama Est. 1925. Courses for college graduates and certificate students. Master of Fine Arts (M.F.A.), Certificate in Drama, Doctor of Fine Arts (D.F.A.).

For additional information, please visit <https://drama.yale.edu>, e-mail ysd.admissions@yale.edu, or call the Registrar/Admissions Office at 203.432.1507. Postal correspondence should be directed to Yale School of Drama, PO Box 208325, New Haven CT 06520-8325.

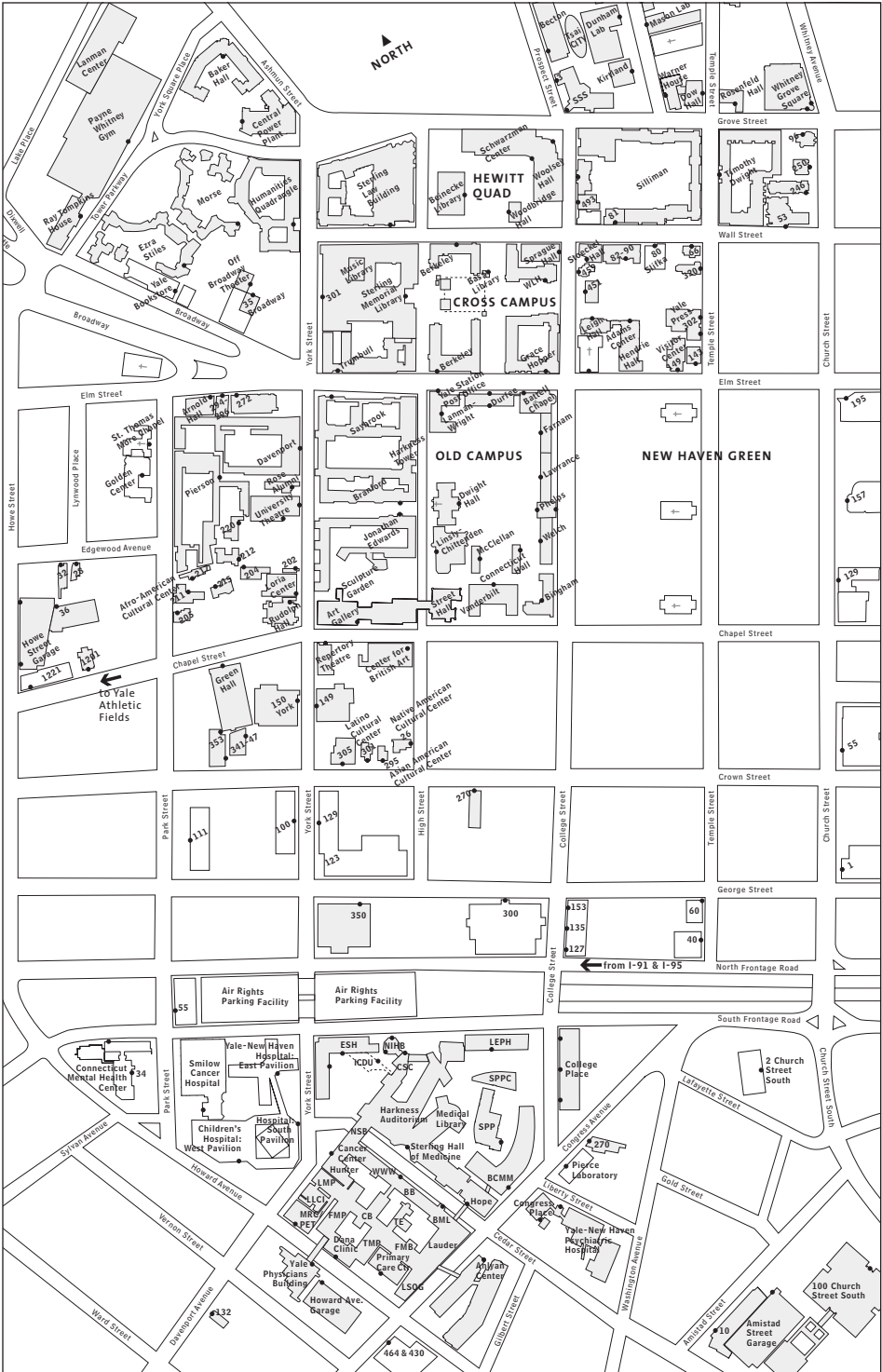
School of Management Est. 1976. Courses for college graduates. Master of Business Administration (M.B.A.), Master of Advanced Management (M.A.M.), Master of Management Studies (M.M.S.). Doctor of Philosophy (Ph.D.) awarded by the Graduate School of Arts and Sciences.

For additional information, please visit <https://som.yale.edu>. Postal correspondence should be directed to Yale School of Management, PO Box 208200, New Haven CT 06520-8200.

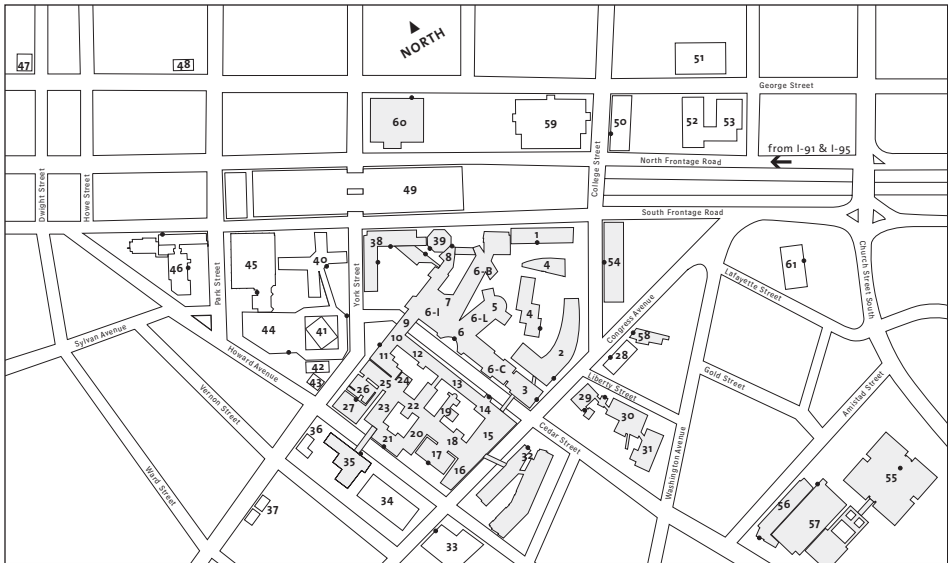
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YALE UNIVERSITY CAMPUS SOUTH & YALE MEDICAL CENTER



YALE MEDICAL CENTER BUILDINGS AND ADDRESSES



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.
30. Yale-New Haven Psychiatric Hospital 2, 184 Liberty St.
31. Yale-New Haven Psychiatric Hospital 3, 184 Liberty St.
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.
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, 35 Park 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
56. 10 Amistad St.
57. **Amistad Garage**
58. 270 Congress Ave.
59. 300 George St.
60. 350 George St.
61. 2 Church St. South

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 protected 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, and protected veterans.

Inquiries concerning these policies may be referred to Valarie Stanley, Senior Director of the Office of Institutional Equity and Access, 221 Whitney Avenue, 4th Floor, 203.432.0849. For additional information, see <https://oiea.yale.edu>.

Title IX of the Education Amendments of 1972 protects people from sex discrimination in educational programs and activities at institutions that receive federal financial assistance. Questions regarding Title IX may be referred to the University's Title IX Coordinator, Stephanie Spangler, at 203.432.4446 or at titleix@yale.edu, or to the U.S. Department of Education, Office for Civil Rights, 8th Floor, 5 Post Office Square, Boston MA 02109-3921; tel. 617.289.0111, fax 617.289.0150, TDD 800.877.8339, or ocr.boston@ed.gov.

In accordance with federal and state law, the University maintains information on security policies and procedures and prepares an annual campus security and fire safety report containing three years' worth of campus crime statistics and security policy statements, fire safety information, and a description of where students, faculty, and staff should go to report crimes. The fire safety section of the annual report contains information on current fire safety practices and any fires that occurred within on-campus student housing facilities. Upon request to the Office of the Vice President for Human Resources and Administration, PO Box 208322, 2 Whitney Avenue, Suite 810, New Haven CT 06520-8322, or by calling the Yale Police Department at 203.432.4400, the University will provide this information to any applicant for admission, or prospective students and employees may visit <http://publicsafety.yale.edu>.

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. The Equity in Athletics Disclosure Act (EADA) report is also available online at <http://ope.ed.gov/athletics>.

For all other information relating to the School of Public Health, please telephone 203.785.6260; consult the website, <https://publichealth.yale.edu>; or write to the Office of Student Affairs, School of Public Health, 47 College Street, Suite 108, New Haven CT 06510.

BULLETIN OF YALE UNIVERSITY
New Haven CT 06520-8227

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