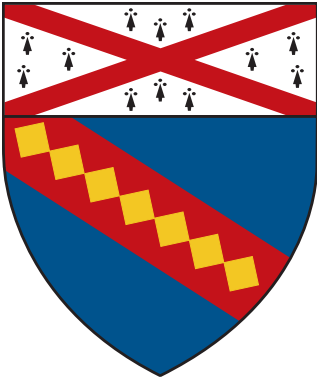


# School of Public Health

## 2024-2025



**BULLETIN OF YALE UNIVERSITY**  
*Series 120 Number 5 July 15, 2024*

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# School of Public Health

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# ACADEMIC AND GRADING CALENDARS

## ACADEMIC CALENDAR

### Summer Term 2024

June 3	M	Online orientation site for on-campus M.P.H. programs becomes available
June 12	W	Year-2 summer intensive begins for Executive M.P.H. students
June 15	SA	Year-2 summer intensive ends for Executive M.P.H. students
June 18	T	Online orientation events for Executive M.P.H. students begin
July 1	M	On-campus orientation for Advanced Professional M.P.H. and Accelerated M.B.A./M.P.H. students
July 2	T	Summer-session classes begin for Executive M.P.H., Advanced Professional M.P.H., and Accelerated M.B.A./M.P.H. students
July 4	TH	Independence Day; classes do not meet
July 5	F	T/Th summer-session classes meet for Executive M.P.H., Advanced Professional M.P.H., and Accelerated M.B.A./M.P.H. students
July 8	M	Last day to change Executive M.P.H. summer electives
Aug. 15	TH	Classes end for Executive M.P.H., Advanced Professional M.P.H., and Accelerated M.B.A./M.P.H. summer session

### Fall Term 2024

July 10–19	W–F	School of Management course-preference selection for fall-term Health Care Management program
Aug. 5	M	Self-service opens for fall-2024 course registration
Aug. 9	F	Course-registration deadline for fall 2024 term
Aug. 21–27	W–T	On-campus orientation sessions for incoming two-year M.P.H. students
Aug. 28	W	Fall-term classes begin
Aug. 30	F	Friday classes do not meet; Monday classes meet instead
Sept. 2	M	Labor Day; classes do not meet
Sept. 6	F	Last day to add a full-term or fall-1 course Exemption deadline
Sept. 13	F	Last day to withdraw from a fall-1 course without the course appearing on the transcript Last day to change auditor status in a fall-1 class
Oct. 9	W	Last day to withdraw from a fall-term course without the course appearing on the transcript Last day to change auditor status in a class
Oct. 11–18	F–F	School of Management course-preference selection for spring-term Health Care Management program
Oct. 15	T	October recess begins, 11 p.m.
Oct. 16	W	Fall on-site intensive session for Executive M.P.H. program begins
Oct. 19	SA	Fall on-site intensive session for Executive M.P.H. program ends
Oct. 21	M	Classes resume

Oct. 30	W	Last day to add a fall-2 course
Nov. 11	M	Self-service opens for spring-2025 course registration
Nov. 13	W	Last day to withdraw from a fall-2 course without the course appearing on the transcript Last day to change auditor status in a fall-2 class
Nov. 15	F	Course-registration deadline for spring 2025 term
Nov. 22	F	November recess begins, 6 p.m.
Dec. 2	M	Classes resume
Dec. 6	F	Classes end, 6 p.m. Last day to withdraw from a fall-term course
Dec. 9	M	Reading period begins <sup>1</sup>
Dec. 12	TH	Final examinations begin
Dec. 18	W	Final examinations end; winter recess begins

<sup>1</sup> Some classes may meet during the reading period.

## Spring Term 2025

Oct. 11–18	W–F	School of Management course-preference selection for Health Care Management program
Nov. 11	M	Self-service opens for course registration
Nov. 15	F	Course registration deadline
Jan. 13	M	Spring-term classes begin
Jan. 20	M	Martin Luther King, Jr. Day; classes do not meet
Jan. 24	F	Friday classes do not meet; Monday classes meet instead
Jan. 29	W	Last day to add a full-term or spring-1 course Exemption deadline
Feb. 13	TH	Last day to withdraw from a spring-1 course without the course appearing on the transcript Last day to change auditor status in a spring-1 class
Mar. 7	F	Last day to withdraw from a spring-term course without the course appearing on the transcript Last day to change auditor status in a class Spring recess begins, 6 p.m.
Mar. 24	M	Classes resume
Apr. 7	M	Last day to add a spring-2 course
Apr. 14	M	Last day to withdraw from a spring-2 course without the course appearing on the transcript Last day to change auditor status in a spring-2 class Self-service opens for summer registration for second-year Executive M.P.H. students
Apr. 18	F	Self-service closes for summer registration for second-year Executive M.P.H. students
Apr. 25	F	Last day to withdraw from a spring-term course Classes end, 6 p.m.
Apr. 28	M	Reading period begins <sup>1</sup>
May 1	TH	Final examinations begin



May 7	W	Final examinations end
May 19	M	University Commencement

<sup>1</sup> Some classes may meet during the reading period.

## **GRADING CALENDAR**

2024

Aug. 30	F	Final grades due for Executive M.P.H., Advanced Professional M.P.H., and Accelerated M.B.A./M.P.H. summer session
Oct. 1	T	Final grades due for summer internships

2025

Jan. 6	M	Final fall-term grades due for all students
May 1	TH	Final thesis grades due
May 12	M	Final grades due for all graduating students
May 30	F	Final grades due for all returning students

# THE PRESIDENT AND FELLOWS OF YALE UNIVERSITY

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Maryana Iskander, B.A., M.Sc., J.D., Round Rock, Texas (*June 2029*)

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Felicia Norwood, B.A., M.A., J.D., Indianapolis, Indiana (*June 2030*)

Joshua Linder Steiner, B.A., M.St., New York, New York (*June 2030*)

David Li Ming Sze, B.A., M.B.A., Hillsborough, California (*June 2030*)

Marta Lourdes Tellado, B.A., Ph.D., New York, New York (*June 2028*)

David Anthony Thomas, B.A., M.A., M.A., Ph.D., Atlanta, Georgia (*June 2027*)

Neal Steven Wolin, B.A., M.Sc., J.D., Washington, D.C. (*June 2029*)

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

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Erol Fikrig, M.D., Professor (Internal Medicine)  
Durland Fish, Ph.D., Professor Emeritus  
Gerald H. Friedland, M.D., Senior Research Scientist (Internal Medicine)  
Alison P. Galvani, Ph.D., Professor  
Gregg Gonsalves, Ph.D., Associate Professor  
Lauretta E. Grau, Ph.D., Research Scientist  
Nathan Grubaugh, Ph.D., Associate Professor  
James L. Hadler, M.P.H., M.D., Professor Adjunct  
James Hassell, Ph.D., M.Sc., Assistant Professor Adjunct  
Robert Hecht, Ph.D., Professor of the Practice  
Robert Heimer, Ph.D., Professor  
Akiko Iwasaki, Ph.D., Professor (Immunobiology)  
Manisha Juthani-Mehta, M.D., Associate Professor (Infectious Diseases)  
Richard Kaslow, M.D., M.P.H., Professor Adjunct  
Achilles Katamba, M.B.Ch.B., D.C.H., M.Sc., Ph.D., Associate Professor Adjunct

Kaveh Khoshnood, M.P.H., Ph.D., Associate Professor  
Albert I. Ko, M.D., Professor  
Nikolay Kolev, Ph.D., Research Scientist  
Peter J. Krause, M.D., Senior Research Scientist  
Margaret Lind, Ph.D., Associate Research Scientist  
I. George Miller, M.D., Professor (Pediatrics)  
Goudarz Molaei, Ph.D., Associate Professor Adjunct  
Ruth Montgomery, Ph.D., Associate Professor (Rheumatology)  
Leonard E. Munstermann, Ph.D., Senior Research Scientist  
Linda M. Niccolai, Ph.D., Professor  
Jean Bosco Ouedraogo, Ph.D., Professor Adjunct  
Abishek Pandey, Ph.D., Research Scientist  
Sunil Parikh, M.D., M.P.H., Associate Professor  
Curtis L. Patton, Ph.D., Professor Emeritus  
Stephanie Perniciaro, Ph.D., M.P.H., Associate Research Scientist  
Melinda M. Pettigrew, Ph.D., Professor Adjunct  
Virginia E. Pitzer, Sc.D., Associate Professor  
Jeffrey Powell, Ph.D., Professor (Ecology and Evolutionary Biology)  
Megan L. Ranney, M.D., M.P.H., Professor  
Mitermayer Reis, M.D., Professor Adjunct  
Nancy H. Ruddle, Ph.D., Professor Emerita  
Saul Rojas Sanchez, Ph.D., Associate Research Scientist  
Nancy Saravia, Ph.D., Professor Adjunct  
Eugene D. Shapiro, M.D., Professor (Pediatrics)  
Tyler Sharp, Ph.D., Assistant Professor Adjunct  
Sheela Shenoj, M.D., Assistant Professor (Infectious Diseases)  
Andre N. Sofair, M.D., Professor (Internal Medicine)  
Lynn E. Sosa, M.D., Assistant Clinical Professor  
Windy Tanner, Ph.D., M.S.P.H., Associate Research Scientist  
Christian Tschudi, Ph.D., Professor  
Sten H. Vermund, M.D., Ph.D., Professor  
Joseph Vinetz, M.D., Professor (Internal Medicine)  
David Vlahov, Ph.D., Professor (Nursing)  
Chantal Vogels, Ph.D., M.Sc., Assistant Professor  
Brian Wahl, Ph.D., Assistant Professor  
Daniel M. Weinberger, Ph.D., Associate Professor  
Brian Weiss, Ph.D., Senior Research Scientist  
Anne Wyllie, Ph.D., Research Scientist  
Inci Yildirim, M.D., Ph.D., Professor (Infectious Diseases)  
Kimberly M. Yousey-Hindes, M.P.H., Lecturer  
Dawn Zimmerman, D.V.M., M.S., Assistant Professor Adjunct

## Health Policy and Management

Rene Almeling, Ph.D., Associate Professor (Sociology)  
Thaoms Balcezak, M.D., Lecturer  
Marna Parke Borgstrom, M.P.H., Lecturer  
Susan H. Busch, Ph.D., Professor  
Marguerite M. Callaway, M.S., M.B.A., Lecturer

Drew Cameron, Ph.D., M.A., Assistant Professor  
Zerrin Cetin, M.P.H., M.B.A., Lecturer  
Teresa Chahine, Sc.D., Lecturer (School of Management)  
Xi Chen, Ph.D., Associate Professor  
Paul D. Cleary, Ph.D., Professor Emeritus  
Zack Cooper, Ph.D., Associate Professor  
Leslie Curry, M.P.H., Ph.D., Professor  
Martha Dale, M.P.H., Lecturer  
Richard D'Aquila, M.P.H., Lecturer  
Henry G. Dove, Ph.D., Lecturer  
David Fiellin, M.D., Professor (General Medicine)  
Howard Forman, M.B.A., M.D., Professor (Radiology and Biomedical Imaging)  
Abigail S. Friedman, Ph.D., Associate Professor  
Shelley D. Geballe, M.P.H., J.D., Professor  
Alan Gerber, Ph.D., Professor (Political Science)  
Laurie Graham, Ph.D., Lecturer  
James Hamblin, M.D., M.P.H., Lecturer  
Jason Hockenberry, Ph.D., Professor  
Sarah M. Horwitz, M.P.H., Ph.D., Associate Professor Emerita  
James F. Jekel, M.P.H., M.D., Professor Emeritus  
Amy C. Justice, M.D., Ph.D., Professor (Internal Medicine)  
Edward H. Kaplan, Ph.D., Professor (School of Management)  
Aaeon Kesselheim, M.D., J.D., Lecturer  
Marissa King, Ph.D., Professor (School of Management)  
Martin Klein, Ph.D., M.P.H., Lecturer  
Harlan M. Krumholz, M.D., Professor (Internal Medicine)  
Mary Alice Lee, M.S.N., Ph.D., Lecturer  
Lowell S. Levin, M.P.H., Ed.D., Professor Emeritus  
Erika L. Linnander, M.P.H., M.B.A., Lecturer  
Jeannie Mantopoulos, M.P.H., Lecturer  
Zahirah McNatt, M.H.S.A., Lecturer  
Chimaeze D. Ndumele, Ph.D., Associate Professor  
Ingrid M. Nembhard, Ph.D., Associate Professor Adjunct  
A. David Paltiel, Ph.D., Professor  
Edieal J. Pinker, Ph.D., Professor (School of Management)  
Erika M. Rogan, Ph.D., Lecturer  
Robert A. Rosenheck, M.D., Professor (Psychiatry)  
Joseph Ross, M.D., Professor (Internal Medicine)  
Mark J. Schlesinger, Ph.D., Professor  
Jason L. Schwartz, Ph.D., Associate Professor  
Fiona Scott-Morton, Ph.D., Professor (School of Management)  
Jody L. Sindelar, Ph.D., Professor Emerita  
Richard Skolnik, M.P.A., Lecturer  
Michael Skonieczny, M.P.A., Lecturer  
Jonathan P. Smith, M.P.H., Lecturer  
Stephanie Spangler, M.D., Lecturer  
Richard Stahl, M.D., M.B.A., Lecturer  
Jamie Tam, Ph.D., Assistant Professor

Prathibha Varkey, M.B.B.S., M.P.H., M.B.A., M.H.P.E., Professor (General Medicine)  
Jacob Wallace, Ph.D., Assistant Professor  
Rex Wong, D.P.T., Lecturer  
Reza Yaesoubi, Ph.D., Associate Professor

## Social and Behavioral Sciences

Jasmine Abrams, Ph.D., Research Scientist  
Rene Almeling, Ph.D., Associate Professor (Sociology)  
Marie Brault, Ph.D., Assistant Professor Adjunct  
Chelsey Carter, Ph.D., Assistant Professor  
Danielle Chiamonte, Ph.D., Associate Research Scientist  
Shayna Cunningham, Ph.D., Assistant Professor Adjunct  
Cindy Crusto, Ph.D., Professor (Psychiatry)  
Kathleen Duffany, Ph.D., Assistant Professor  
Jennifer Edelman, Ph.D., Associate Professor (Internal Medicine)  
Lynn Fiellin, M.D., Professor (Child Study Center)  
Joyonna Gamble-George, Ph.D., Associate Research Scientist  
Derrick Gordon, Ph.D., Associate Professor (Psychiatry)  
Ashley Hagaman, Ph.D., Assistant Professor  
Amber Hromi-Fiedler, Ph.D., Research Scientist  
Jeannette R. Ickovics, Ph.D., Professor  
LaDrea Ingram, Ed.D., Associate Research Scientist  
Marcia Inhorn, Ph.D., Professor (Anthropology)  
Skyler Jackson, Ph.D., Assistant Professor  
Olivia Kachingwe, Ph.D., Assistant Professor  
Danya E. Keene, Ph.D., Associate Professor  
Chandra Kelsey, M.P.H., Lecturer  
Trace S. Kershaw, M.P.H., Ph.D., Professor  
Suchitra Krishnan-Sarin, Ph.D., Professor (Psychiatry)  
Becca R. Levy, Ph.D., Professor  
Sarah Lowe, Ph.D., Associate Professor  
Ryan McNeil, Ph.D., Assistant Professor (General Medicine)  
Alice M. Miller, J.D., Assistant Professor  
Joan Monin, Ph.D., Associate Professor  
Susan Nappi, M.P.H., Lecturer  
LaRon Nelson, Ph.D., Associate Professor (Nursing)  
Marcella Nunez-Smith, M.D., Associate Professor (Internal Medicine)  
Ijeoma Opara, Ph.D., Associate Professor  
John E. Pachankis, Ph.D., Professor  
Catherine Panter-Brick, Ph.D., Professor (Anthropology)  
Rafael Pérez-Escamilla, Ph.D., Professor  
Robert Pietrzak, Ph.D., Professor (Psychiatry)  
Angelo Pinto, J.D, Lecturer  
Raquel Ramos, Ph.D., Associate Professor (Nursing)  
Yusuf Ransome, Ph.D., Associate Professor  
Arjee Restar, Ph.D., Assistant Professor Adjunct  
Peter Salovey, Ph.D., Professor (Psychology)  
Christine Simon, Sc.M., Sc.D., Associate Research Scientist

Denise Stevens, Ph.D., Lecturer  
Tami Sullivan, Ph.D., Associate Professor (Psychiatry)  
Tamara Taggart, Ph.D., Assistant Professor Adjunct  
Jacob K. Tebes, Ph.D., Professor (Psychiatry)  
Yetsa Tuakli-Wosornu, M.D., M.P.H., Assistant Professor Adjunct  
Emily Wang, M.D., Professor (General Medicine)  
Peng (Katie) Wang, Ph.D., Associate Professor  
Sitara Weerakoon, Ph.D., Associate Research Scientist  
Marney White, Ph.D., Professor

# A MESSAGE FROM THE DEAN

Welcome to the Yale School of Public Health!

You are joining our school at a time when the world – and the field of public health – is at the very cusp of change. The demand for a next generation of diverse, methodologically rigorous, innovative public health leaders has never been more evident. There is no better place to understand and prepare to meet these challenges than here – and no time more important than now.

You are also starting the year at an important moment in YSPH's history. As you know, we assume full independence (for the first time in our 109-year history) on July 1, 2024. This is tremendous, and you are part of history by being here, now.

To help us engage with the incredible opportunity in front of us, I've identified four pillars that will guide our work:

**Inclusivity:** within our school, across campus, and through the inclusion of community voices and experience.

**Innovation and Entrepreneurship:** joining our impetus to create change, with an awareness of what is needed to make that change sustainable.

**Communication:** the scholarship and practice of translating ideas into actions that resonate in families and communities across the globe.

**Data-Driven Leadership:** the ultimate measure of our success, using data to create impact.

Through the four pillars, we are transforming the way the world thinks about, and acts upon, health problems and creating a new paradigm for what the study and practice of public health looks like in the world. And this year, we'll be releasing a new strategic plan to outline exactly how we will get there. We look forward to your input into the work ahead.

Over the course of your time at Yale, along with our superb faculty, staff, and fellow students, you will become adept at measuring and defining health problems; gain experience in designing and implementing equitable, effective policies and practices; and importantly, develop comfort in communicating the value of this work. You will have the opportunity to explore course topics ranging from health justice to health policy, to digital health, to modeling, to social entrepreneurship, and beyond. And you will get to apply this learning to real world problems for the communities that matter most to you. Whether you care about child and maternal health, mental health, the effect of structural racism on health, the cost of health care, global humanitarian emergencies, or any of a host of other topics, you will have the chance to translate science into action in and out of the classroom.

The Yale campus is highly integrated, permitting students to access the talent of Yale faculty in thirteen other graduate and professional schools. Our YSPH students regularly take classes at, and work with students and faculty at other Yale schools (such

as management, law, divinity, architecture, and more). At YSPH, we believe that any public health issue can be remedied when great minds collaborate across disciplines.

We have a network of 6949 YSPH alumni in fifty states and seventy-eight countries. Many academic, industry, and public health leaders have gone to YSPH. Our academic programs, internships opportunities, and placement statistics of our graduates are among the best in the country. You will have the chance to interact with these alumni and many other public health luminaries in our network during your time at YSPH and beyond.

As a YSPH student, you will acquire the tools you will need to describe, and then, more importantly, to create and implement systems solutions to the world's pressing health problems. Your peers and instructors will match your enthusiasm and your commitment to methodological rigor, allowing you to step into the next stage of your career ready to create change.

Enjoy the bulletin! I look forward to hearing what you are taking, what you are learning, and, most of all, how you are using scientific knowledge to create a healthier world.

Dr. Megan L. Ranney, M.D., M.P.H.  
*Dean, Yale School of Public Health*

# MISSION

## MISSION

We catalyze health for all through innovative and collaborative science, learning, and action.

## VALUES

**Justice** We commit to advancing health equity and social justice and to working for equal access for all persons to wellness, health, and opportunity, focusing on the structurally marginalized communities within society.

**Community** We commit to working with and being accountable to the communities we serve by building authentic and sustainable partnerships.

**Inclusion** We commit to cultivating a respectful and accessible environment that embraces diversity of thought, being, and experience in a manner that advances public health.

**Innovation** We commit to discovering, developing, and implementing creative, data-informed, and adaptable solutions to tackle the world's most pressing public health issues.

**Leadership** We commit to leading with humility and compassion and to fostering the next generation of public health leadership.



# 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.

In February 2022, Yale University announced that the Yale School of Public Health would be transformed into an independent, self-supporting professional school, effective July 1, 2024.

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. The school 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 several 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, applied practice experiences, 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 and research 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.

**The Two-Year M.P.H. Program** This is the traditional path of study for students enrolled in the M.P.H. degree program. Students in this program 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. For more information, see the chapter Traditional Two-Year M.P.H. Program.

**The Advanced Professional M.P.H. Program** This eleven-month program is available for individuals with a doctoral-level degree in a field related to public health; with a master's degree and at least two years of relevant work experience; with a bachelor's degree and at least five years of relevant work experience; and students who have completed their third year in an accredited medical, dental, or podiatric school in the United States. 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. For more information, see the chapter Advanced Professional M.P.H. Program.

**The B.A.-B.S./M.P.H. Select Program** Yale College students interested in the field of public health have 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. Students in the program select from the same department/programs as those in the two-year M.P.H. program described above. For more information, see the chapter B.A.-B.S./M.P.H. Select Program.

**The Accelerated M.B.A./M.P.H. Program in Health Care Management** This program 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. For more information, see the chapter Accelerated M.B.A./M.P.H. Program in Health Care Management.

**The Executive M.P.H. Program** This two-year, part-time program that combines online education with in-person management and leadership skills. The program is available to individuals with a doctoral-level degree in a field related to public health; with a master's degree and at least two years of relevant work experience; and with a bachelor's degree and at least four years of relevant work experience. Students may select up to two of four tracks during enrollment: Health Informatics, Environmental Health Sciences, Applied Analytic Methods and Epidemiology, or Critical Topics in Public Health. For more information, see the chapter Executive M.P.H. Program.

**The Climate Change and Health Concentration** This concentration works 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. For more information, see Climate Change and Health Concentration in the chapter Traditional Two-Year M.P.H. Program.

**The Global Health Concentration** This 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. For more information, see Global Health Concentration in the chapter Traditional Two-Year M.P.H. Program.

**The Implementation Science Track** This track focuses on a novel interdisciplinary field for developing and applying methods and strategies to improve the delivery of proven health interventions in routine clinical and public health practice. Implementation science employs a diverse set of tools to produce generalizable knowledge about intervention delivery to make public health programs more effective, efficient, and equitable. For more information, see Implementation Science Track in the chapter Traditional Two-Year M.P.H. Program.

**The Maternal and Child Health Promotion Track** A cutting-edge promotion education program that takes a multidisciplinary approach to implementing evidence-based practices to improve maternal and child health outcomes, this track trains students on the importance and application of implementation science to maternal and child health promotion. 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. For more information, see Maternal and Child Health Promotion Track in the chapter Traditional Two-Year M.P.H. Program.

**The Public Health Modeling Concentration** This concentration provides rigorous training in systems thinking. Students are 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 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 is recorded on the transcript when the student graduates. For more information, see Public Health Modeling Concentration in the chapter Traditional Two-Year M.P.H. Program.

**The U.S. Health Justice Concentration** This 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. For more information, see U.S. Health Justice Concentration in the chapter Traditional Two-Year M.P.H. Program.

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, if required) within five years of matriculation. A thesis is not required for students in Biostatistics, Health Policy, or Health Care Management. Students in Social and Behavioral Sciences have a choice between the capstone course and the thesis course.

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 for all programs, except the Advanced Professional Program. Requirements for the one-year Advanced Professional Program must be completed within three years of matriculation.

Because the Executive M.P.H. Program is a two-year, part-time program and its courses are designed to be completed in sequence, students may not take fewer courses per semester than outlined in the standard plan of study, pending exceptional circumstances and approval of the associate dean and program director.

# TRADITIONAL TWO-YEAR M.P.H. PROGRAM

## Core Curriculum

Students in the traditional two-year M.P.H. program are required to complete 20 course units, which include the core curriculum (below), departmental/program/track/concentration 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.

EPH 100	Professional Skills Series	0
EPH 101	Professional Skills Series	0
EPH 505	Biostatistics in Public Health <sup>1</sup>	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: Ethics and Practice	1
EPH 521	Summer Internship - APE <sup>2</sup>	0
EPH 525	Thesis <sup>3</sup>	2

<sup>1</sup> Not required for BIS.

<sup>2</sup> If the internship does not fulfill the APE requirement, students will be registered for the internship course EPH 520, Summer Internship (non-APE), and subsequently must fulfill their APE through a practicum course or by completing a preapproved volunteer experience.

<sup>3</sup> HP and HCM complete a capstone course rather than the thesis course. BIS and SBS students may take a capstone course or the thesis course.

## 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 588	Health Justice Practicum	1
EPH 500	Public Health Practicum	1
EPH 501	U.S. Health Justice Concentration Practicum	1
EPH 521	Summer Internship - APE	0
EPH 555	Clinic in Climate Justice and Public Health	1
HPM 555	Health Policy or Health Care Management Practicum	1
HPM 556	Advanced Health Policy Practicum	1
SBS 562	Inclusive Design for the Built Environment: Participatory Design	1

<sup>1</sup> With the exception of those in the Advanced Professional M.P.H. program, the Executive 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 ten to twelve weeks and no less than eight 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

The core curriculum of the M.P.H. program focuses on competencies in evidence-based approaches to public health (1–4), public health and health care systems (5–6), planning and management to promote health (7–11), policy in public health (12–15), leadership (16–17), communication (18–20), interprofessional practice (21), and systems thinking (22). Upon completing the core curriculum, the student will be able to:

1. Apply epidemiological methods to the breadth of settings and situations in public health practice.
2. Select quantitative and qualitative data collection methods appropriate for a given public health context.
3. Analyze quantitative and qualitative data using biostatistics, informatics, computer-based programming and software, as appropriate.
4. Interpret results of data analysis for public health research, policy, or practice.
5. Compare the organization, structure, and function of health care, public health, and regulatory systems across national and international settings.
6. 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.
7. Assess population needs, assets, and capacities that affect communities' health.
8. Apply awareness of cultural values and practices to the design or implementation of public health policies or programs.
9. Design a population-based policy, program, project, or intervention.
10. Explain basic principles and tools of budget and resource management.
11. Select methods to evaluate public health programs.
12. Discuss multiple dimensions of the policy-making process, including the roles of ethics and evidence.
13. Propose strategies to identify stakeholders and build coalitions and partnerships for influencing public health outcomes.
14. Advocate for political, social, or economic policies and programs that will improve health in diverse populations.
15. Evaluate policies for their impact on public health and health equity.
16. Apply principles of leadership, governance, and management, which include creating a vision, empowering others, fostering collaboration, and guiding decision-making.

17. Apply negotiation and mediation skills to address organizational or community challenges.
18. Select communication strategies for different audiences and sectors.
19. Communicate audience-appropriate public health content, both in writing and through oral presentation.
20. Describe the importance of cultural competence in communicating public health content.
21. Perform effectively on interprofessional teams.
22. Apply systems-thinking tools to a public health issue.

## Biostatistics Department

Shuangge Ma, 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

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
S&DS 541	Probability Theory <sup>1</sup>	1
S&DS 542	Theory of Statistics <sup>1</sup>	1

One of the following:

BIS 681	Statistical Practice II	1
EPH 525	Thesis	2

<sup>1</sup> Course offered in the Graduate School of Arts and Sciences.

### COMPETENCIES

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 the 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

## Chronic Disease Epidemiology Department

Xiaomei Ma, Ph.D., Interim 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.

All M.P.H. CDE students require documentation of an integrated learning experience component with guidance from the department chair and academic advisers. To fulfill this requirement, students take one of the following courses *in the second year* and complete the Integrated Learning Experience Form accordingly: CDE 572, CDE 617, CDE 650, CDE 535, SBS 574, EMD 625, or EPH 525.

## DEPARTMENTAL REQUIREMENTS

BIS 505	Biostatistics in Public Health II	1
CDE 516	Principles of Epidemiology II <sup>1</sup>	1
CDE 525	Seminar in Chronic Disease Epidemiology <sup>1</sup>	0
CDE 526	Seminar in Chronic Disease Epidemiology <sup>1</sup>	0
CDE 534	Applied Analytic Methods in Epidemiology <sup>1</sup>	1

<sup>1</sup> 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

One of the following (completed in second year):

CDE 535	Epidemiology of Heart Disease and Stroke	1
CDE 572	Obesity Prevention and Lifestyle Interventions	1
CDE 617	Developing a Research Proposal	1
CDE 650	Introduction to Evidence-Based Medicine and Health Care	1
EMD 625	How to Develop, Write, and Evaluate an NIH Proposal	1
EPH 525	Thesis	2
SBS 574	Developing a Health Promotion and Disease Prevention Intervention	1

**Electives** Chronic disease epidemiology students must take *two* additional CDE elective courses and are strongly advised to take a third additional CDE course as one of their remaining general electives.

## COMPETENCIES

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

- Create and manipulate data sets and variables to evaluate epidemiologic associations
- Conduct and interpret a multivariable linear regression analysis to evaluate epidemiologic associations
- Conduct and interpret a multivariable logistic regression analysis to evaluate epidemiologic associations
- Understand the application and interpretation of survival analysis in epidemiologic studies
- Understand the principles of meta-analysis and interpret a meta-analysis study

## 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 the Environmental.

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

EHS 503	Public Health Toxicology	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:

EHS 560	Methods in Climate Epidemiology	1
EHS/CDE 566	Causal Inference Methods in Public Health Research	1

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

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

Michael Cappello, 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

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 (<https://ysph.yale.edu/mysph/curriculum/mph/emd/electives>) in collaboration with their adviser.

## COMPETENCIES

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

Jason Hockenberry, Ph.D., 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

Jason Hockenberry, Ph.D., 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

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

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., Associate Director

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

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
MGT 502	Foundations of Accounting & Valuation <sup>1</sup>	4
MGT 525	Competitive Strategy <sup>1</sup>	4
MGT 698	Healthcare Policy, Finance, and Economics <sup>1</sup>	4
MGT 699	Colloquium Healthcare Leadership (2 terms, yearlong sequence) <sup>1</sup>	1
MGT 856	Managing Marketing Programs <sup>1</sup>	2
MGT 879	Healthcare Operations <sup>1</sup>	2
MGT 887	Negotiations <sup>1</sup>	2

One of the following:

BIS/SBS 640	User-Centered Design of Digital Health Tools	1
HPM 548	Pharmaceutical Industry and Public Policy	1
HPM 595	Food and Drug Administration Law	1
MGT 654	Data-Driven Value Creation in Healthcare and Life Sciences <sup>1</sup>	2
MGT 657	Creating Healthcare and Life Science Ventures <sup>1</sup>	2
MGT 663	Innov, Invt, & New Frontiers in Med <sup>1</sup>	2
MGT 668	Narratives in Health <sup>1</sup>	2
MGT 995	Sustainable Innovation in Healthcare <sup>1</sup>	2

One of the following:

MGT 527	Strategic Management of Nonprofit Organizations <sup>1</sup>	4
HPM/MGT 631	Public Health Entrepreneurship and Intrapreneurship	0.5
MGT 612/SBS 512	Introduction to Social Entrepreneurship <sup>1</sup>	4
MGT 621	Managing Social Enterprises <sup>1</sup>	2
MGT 864	Behavioral Science & Social Good <sup>1</sup>	2

<sup>1</sup> Course offered in the School of Management.

## Competencies

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 social justice, and stigma prevention and health.

### DEPARTMENTAL REQUIREMENTS

SBS 525	Seminar in Social and Behavioral Sciences	0
SBS 526	Seminar in Social and Behavioral Sciences	0
SBS 529	Foundations of Behavior Change	1

One of the following:

EPH 525	Thesis	2
SBS 574	Developing a Health Promotion and Disease Prevention Intervention	1

One of the following:

SBS 541	Community Health Program Evaluation	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 (10–11 course units) 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

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

- Describe the consequence of understanding 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

## Climate Change and Health Concentration

Daniel Carrión, Ph.D., Director

The Climate Change and Health Concentration (CCHC) works 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).

### CONCENTRATION REQUIREMENTS

EHS 547	Climate Change and Public Health	1
EPH 570	Seminar in Climate Change and Health	0
EPH 571	Seminar in Climate Change and Health	0

One of the following:

EHS 544	Climate Equity and Health Policy Methods	1
EHS 560	Methods in Climate Epidemiology	1

One of the following:

EPH 521	Summer Internship - APE	0
EPH 555	Clinic in Climate Justice and Public Health	1

**Also Required** Students must take two elective courses from a list of approved courses available from the CCHC administrator. One elective should focus on developing research or applied skills, while the other should explore topics on the social and/or

environmental drivers or impacts of climate change. Students may petition the CCHC executive committee to place additional electives on the approved list.

**Recommended, but not Required** Students are encouraged to complete a thesis with a substantive focus on climate change and health; the CCHC executive committee and affiliated faculty are 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.

## COMPETENCIES

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, public health, and justice

## 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).

## CONCENTRATION REQUIREMENTS

EPH 521	Summer Internship - APE	0
EPH 591	Global Health Seminar (taken in first year)	0
EPH 595	Global Health Foundations: Principles and Applications	1
<b>And one of the following capstone courses:</b>		
EPH 557	Evidence-Based Decision-Making in Global Health	1
HPM 575	Evaluation of Global Health Policies and Programs <sup>2</sup>	1

<sup>1</sup> The internship must be global health-related in a low- to middle-income country

<sup>2</sup> HPM 575 can be taken as an elective if EPH 557 is taken as capstone.

Students must also take three elective global health courses selected from at least two of the seven perspectives on public health. The seven perspectives on public health are: (1) biomedicine, (2) epidemiology, (3) psychosocial/social and behavioral/anthropology, (4) development/political economy, (5) ethics/history/humanities, (6) implementation science, and (7) environmental health sciences. A list of courses offered in each of the seven areas is available on the GHC website: <https://ysph.yale.edu/myysph/curriculum/mpg/ghc/electives>. 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 Campus Groups page. Requests must be approved before the YSPH add/drop deadline. Upon receiving the form, the YSPH GHC program will let the student know if the course meets GHC elective requirements.

## COMPETENCIES

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 the United States' role in global health governance and infrastructure
- Propose sustainable, evidence-based solutions to address key global health challenges
- 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

# Implementation Science Track

Luke Davis, M.D., Director

Donna Spiegelman, Sc.D., Director

Implementation science has recently emerged as a novel interdisciplinary field for developing and applying methods and strategies to improve the delivery of proven health interventions in routine clinical and public health practice. Implementation science employs a diverse set of tools to produce generalizable knowledge about intervention delivery to make public health programs more effective, efficient, and equitable. The coursework of the Implementation Science Track complements the training offered in all departments and at all levels at the School of Public Health, allowing trainees to acquire core competencies in the four areas described in detail below. This track prepares graduates for high-impact careers in implementation research and practice, areas with rapidly growing demand in the U.S. and globally.

Teaching implementation science aligns well with the School of Public Health's mission to bridge research, learning, and practice. The proposed curriculum builds on the Master's in Public Health core curriculum, which introduces foundational concepts for the Implementation Science Track, including Biostatistics in Public Health (EPH 505), Social Justice and Health Equity (EPH 507), Foundations of Epidemiology for Public Health (EPH 508), Health Policy and Health Care Systems (EPH 510), and Major Health Threats (EPH 513). The track also capitalizes on the implementation science expertise at the Center for Methods in Implementation Science (CMIPS) and in other parts of the school by integrating existing courses as electives.

## TRACK REQUIREMENTS

- 1) Fulfillment of all degree and departmental requirements
- 2) Successful completion of at least five and a half courses within the distribution requirements below. Courses taken for credit in the track may include classes required for the degree or by the student's home academic department
- 3) Completion of a thesis incorporating implementation science (optional but encouraged)

## Core Courses

CDE 553	Implementation Science to Address Chronic Diseases: Global Health Case Studies	.5
EMD 533	Implementation Science	1

## Elective Courses

At least one course in the quantitative methods cluster

BIS 628	Longitudinal and Multilevel Data Analysis	1
BIS 630	Applied Survival Analysis	1
CDE 516	Principles of Epidemiology II	1
CDE 566	Causal Inference Methods in Public Health Research	1
CDE 582	Health Outcomes Research: Matching the Right Research Question to the Right Data	1

EMD 582	Political Epidemiology	1
S&DS 563	Multivariate Statistical Methods for the Social Sciences	1

At least one course in the qualitative and mixed methods cluster

SBS 574	Developing a Health Promotion and Disease Prevention Intervention	1
SBS 580	Qualitative Research Methods in Public Health	1
SBS 593	Community-Based Participatory Research in Public Health	1

At least one course in the evidence synthesis, program evaluation, and economic evaluation cluster

CDE 650	Introduction to Evidence-Based Medicine and Health Care	1
EPH 557	Evidence-Based Decision-Making in Global Health	1
HPM 570	Cost-Effectiveness Analysis and Decision-Making	1
HPM 575	Evaluation of Global Health Policies and Programs	1
HPM 583	Methods in Health Services Research	1

## COMPETENCIES

### Implementation Science Methods Competencies

1. Define implementation science
2. Explain the principal methodological approaches used in the field to promote the uptake and sustained, high-quality delivery of proven health interventions in routine practice
3. Use implementation science to develop and critique an implementation science project proposal or manuscript
4. Discuss key evidence-based interventions for noncommunicable disease prevention, screening, and treatment and the barriers and facilitators to their uptake, implementation, and sustainability

### Quantitative Methods Competencies

1. Apply and critically assess the use of quantitative methods to estimate the impact of health interventions, implementation strategies, and policies
2. Recognize mechanisms and contextual factors that mediate and moderate the impact of health interventions, implementation strategies, and policies

### Qualitative and Mixed Methods Competencies

1. Use qualitative and mixed methods to plan or evaluate an implementation science problem or question
2. Critically assess the use of qualitative and mixed methods to elicit the experiences and perspectives of shareholders participating in planning, delivering, and receiving health interventions, implementation strategies, and policies

### Evidence Synthesis, Program Evaluation, and Economic Evaluation Competencies

1. Apply methods from evidence synthesis, program evaluation, and economic evaluation for planning, evaluating, and disseminating health interventions, implementation strategies, and policies
2. Critically assess evidence synthesis, program evaluation, and economic evaluation for planning, evaluating, and disseminating health interventions, implementation strategies, and policies

## Maternal and Child Health Promotion Track

Rafael Pérez-Escamilla, Ph.D., Co-Director

Amber Hromi-Fiedler, Ph.D., M.P.H., Co-Director

The first one thousand days are a critical window for infant growth and development. Promoting optimal nutrition, health, and care through the implementation of high-quality, evidence-based interventions during this time has the immense potential to improve immediate and long-term maternal, infant, and child outcomes. Given the complexity of health systems, achieving high quality and adhering to the fidelity of evidence-based interventions require innovative training approaches.

The Maternal and Child Health Promotion (MCHP) Track is a cutting-edge promotion education program that takes a multidisciplinary approach to implementing evidence-based practices to improve maternal and child health outcomes. This track trains students on the importance and application of implementation science to maternal and child health promotion. Students will complete three courses and an internship or practicum to receive applied experience within this area.

### TRACK REQUIREMENTS

Students pursuing the MCHP Track must fulfill the requirements of their respective departments or programs. MCHP Track students are also expected to do an internship or practice experience (EPH 521) focused on a project relevant to maternal-child public health program design, implementation, and/or evaluation, to be approved by the MCHP faculty executive committee. In order to ensure that internships completed during the summer of the first and second years satisfy the requirements of the track, students are strongly encouraged to declare their interest in the second term of year one.

Students in the MCHP Track are strongly encouraged to focus their master's thesis (if applicable) on a maternal and child health promotion issue as determined by their department/program.

In addition to EPH 521, the MCHP Track requires the student to complete the following three courses:

EMD 533	Implementation Science	1
HPM 542	Health of Women and Children	1
SBS 594	Maternal-Child Public Health Nutrition	1

For additional training in MCHP, students may take the following recommended courses as electives; they are *not* required for the track: BIS 505, BIS 628,

CDE 516, CDE 534, CDE 566/EHS 566, CDE 572, CDE 588, HPM 575, SBS 541, SBS 560, SBS 574, or SBS 580.

Once the track requirements have been met, upon graduation, the track will be listed under the student’s major on the transcript.

## COMPETENCIES

Each student in the MCHP Track 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 MCHP Track, the student will be able to:

- Understand implementation science theory and frameworks, in particular as they apply to MCHP programs
- Demonstrate knowledge of the range of evidence-based interventions currently available or under consideration to promote improved maternal and child health outcomes, including their strengths, weaknesses, and contexts
- Be able to propose sustainable, evidence-based solutions to address key maternal and child health challenges
- Be able to evaluate the quality and fidelity of MCHP interventions
- Apply knowledge and skills learned in the classroom to an applied MCHP project

## Public Health Modeling Concentration

Virginia Pitzer, Sc.D., Director

Daniel Weinberger, Ph.D., 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.

## CONCENTRATION REQUIREMENTS

EPH 521	Summer Internship - APE	o
EPH 580	Seminar for Modeling in Public Health <sup>2</sup>	o
EPH 581	Seminar for Modeling in Public Health <sup>2</sup>	o

<sup>1</sup> A substantive modeling component is required of the internship.

<sup>2</sup> Two terms of Seminar for Modeling in Public Health (EPH 580/EPH 581) are required in a student’s first two years in the M.P.H. program; but they need not be taken consecutively, and students may satisfy the requirement by taking two terms of EPH 580 or two terms of EPH 581.



Two of the following:

BIS 567	Bayesian Statistics	1
EMD 538	Quantitative Methods for Infectious Disease Epidemiology	1
EMD 539	Introduction to the Analysis and Interpretation of Public Health Surveillance Data	1
EMD 553	Transmission Dynamic Models for Understanding Infectious Diseases	1
HPM 570	Cost-Effectiveness Analysis and Decision-Making	1
HPM 573	Advanced Topics in Modeling Health Care Decisions	1
S&DS 538	Probability and Statistics	1

Two additional electives courses chosen from a preapproved list or by approval of the concentration committee <sup>1</sup> 2

<sup>1</sup> A list of preapproved elective courses is available online at <https://ysph.yale.edu/myysph/curriculum/mph/modeling/electives>.

## COMPETENCIES

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
- Implement computer code to numerically analyze the behavior of models

## U.S. Health Justice Concentration

Danya Keene, Ph.D., Director

This cross-departmental YSPH concentration prepares students to analyze and address systems and processes that perpetuate health injustice in the United States. Students 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 also develop organizing, advocacy, and policy skills that prepare them to advance health justice. Finally, students develop tools to analyze public health research methods, discourse, and practice using a health justice framework.

Though not limited to Connecticut, the concentration emphasizes 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.

## CONCENTRATION REQUIREMENTS

SBS 590	Advocacy and Activism	1
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One of the following courses:

SBS 592	Biomedical Justice: Public Health Critiques and Praxis	1
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SBS 593	Community-Based Participatory Research in Public Health	1
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One of the following applied practice experiences: <sup>1</sup>

EPH 501	U.S. Health Justice Concentration Practicum	1
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EPH 521	Summer Internship - APE	0
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HPM 555	Health Policy or Health Care Management Practicum	1
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HPM 556	Advanced Health Policy Practicum	1
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SBS 562	Inclusive Design for the Built Environment: Participatory Design	1
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<sup>1</sup> 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:

ARCH 3272	Exhibitionism: Politics of Display <sup>2</sup>	3
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CDE 545	Health Disparities by Race and Social Class: Application to Chronic Disease Epidemiology	1
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CDE 570	Humanities, Arts, and Public Health	1
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EMD 584	Advanced Global Health Justice Practicum: Fieldwork	1
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ENV 649	Food Systems: The Implications of Unequal Access <sup>3</sup>	3
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ENV 846	Perspectives on Environmental Injustices <sup>3</sup>	3
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HIST 479	Sickness and Health in African American History <sup>4</sup>	1
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HSHM 406	Healthcare for the Urban Underserved <sup>4</sup>	1
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HSHM 424	Citizenship, Race, and Public Health in U.S. History	1
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HSHM 436	Health and Incarceration in U.S. History <sup>4</sup>	1
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HSHM 465	Reproductive Health, Gender & Power in the U.S. <sup>4</sup>	1
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HSHM 475	Race and Disease in American Medicine <sup>4</sup>	1
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SBS 531	Health and Aging	1
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SBS 560	Sexual and Reproductive Health	1
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SBS 570	LGBTQ Population Health	1
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SBS 581	Stigma and Health	1
SBS 587	Harm Reduction and Drug Policy Reform	1

<sup>2</sup> This course is offered in the School of Architecture.

<sup>3</sup> This course is offered in the School of the Environment.

<sup>4</sup> 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	Western Lands and Communities Field Clinic: Research to Practice <sup>3</sup>	3
EPH 555	Clinic in Climate Justice 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

<sup>3</sup> This course is offered in the School of the Environment.

## COMPETENCIES

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.

All tracks – with the exception of Occupational and Environmental Medicine for Yale OEM Fellows – require documentation of an integrated learning experience component with guidance from the program director. To complete this requirement, students take one of the following courses and complete the Integrated Learning Experience Form to document their experience, available on the myYSPH website at <https://ysph.yale.edu/myysph/students/mph/forms-and-systems>: HPM 597, SBS 574, CDE 617, EPH 608, or EPH 557.

## CURRICULUM

- Applied Biostatistics and Epidemiology Track
- Social and Behavioral Sciences Track
- Health Policy Track
- Global Health Track

- Preventive Medicine Track
- Occupational and Environmental Medicine Track (Yale OEM Fellows)
- Occupational and Environmental Medicine Track (Eleven-Month Students)
- Competencies

## 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: Ethics and Practice	1
SBS 505	Accelerated Social and Behavioral Foundations of Health	1

One of the following:

EMD/SBS 584	Advanced Global Health Justice Practicum: Fieldwork	1
EMD/SBS 588	Health Justice Practicum	1
EPH 500	Public Health Practicum	1
EPH 555	Clinic in Climate Justice and Public Health	1
HPM 555	Health Policy or Health Care Management Practicum	1
HPM 556	Advanced Health Policy Practicum	1

### TRACK REQUIREMENTS

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

AMTH 361	Data Analysis	1
BIS 540	Fundamentals of Clinical Trials	1
BIS 560	Introduction to Health Informatics	1
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 633	Population and Public Health Informatics	1
EHS 568	Introduction to GIS for Public Health	1
EHS 569	Advanced GIS Workshop	1
EMD 553	Transmission Dynamic Models for Understanding Infectious Diseases	1
ENAS 523	Data and Clinical Decision-Making	1
PLSC 349	Visualization of Political and Social Data	0
S&DS 530/ENV 757	Data Exploration and Analysis	1
S&DS 563	Multivariate Statistical Methods for the Social Sciences <sup>1</sup>	1

One of the following capstone courses:

CDE 617	Developing a Research Proposal	1
EPH 557	Evidence-Based Decision-Making in Global Health	1
HPM 597	Capstone Course in Health Policy	1
SBS 574	Developing a Health Promotion and Disease Prevention Intervention	1

Two additional biostatistics and/or epidemiology courses 2

Three elective courses 3

## 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: Ethics and Practice	1
SBS 505	Accelerated Social and Behavioral Foundations of Health	1

One of the following:

EMD/SBS 584	Advanced Global Health Justice Practicum: Fieldwork	1
EMD/SBS 588	Health Justice Practicum	1
EPH 500	Public Health Practicum	1
EPH 555	Clinic in Climate Justice and Public Health	1
HPM 555	Health Policy or Health Care Management Practicum	1
HPM 556	Advanced Health Policy Practicum	1

### TRACK REQUIREMENTS

CDE 534	Applied Analytic Methods in Epidemiology	1
SBS 529	Foundations of Behavior Change	1

One of the following:

SBS/BIS 640	User-Centered Design of Digital Health Tools	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 560	Sexual and Reproductive Health	1
SBS 562	Inclusive Design for the Built Environment: Participatory Design	1

SBS 570	LGBTQ Population Health	1
SBS 573	Social and Cultural Factors in Mental Health and Illness	1
SBS 577	Health Communication and the Media	1
SBS 581	Stigma and 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 557	Evidence-Based Decision-Making in Global Health	1
HPM 597	Capstone Course in Health Policy	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: Ethics and Practice	1
SBS 505	Accelerated Social and Behavioral Foundations of Health	1

One of the following:

EMD/SBS 584	Advanced Global Health Justice Practicum: Fieldwork	1
EMD/SBS 588	Health Justice Practicum	1
EPH 500	Public Health Practicum	1
EPH 555	Clinic in Climate Justice and Public Health	1
HPM 555	Health Policy or Health Care Management Practicum	1
HPM 556	Advanced Health Policy Practicum	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:

CDE 617	Developing a Research Proposal	1
EPH 557	Evidence-Based Decision-Making in Global Health	1
HPM 597	Capstone Course in Health Policy	1
SBS 574	Developing a Health Promotion and Disease Prevention Intervention	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: Ethics and Practice	1
SBS 505	Accelerated Social and Behavioral Foundations of Health	1

One of the following:

EMD/SBS 584	Advanced Global Health Justice Practicum: Fieldwork	1
EMD/SBS 588	Health Justice Practicum	1
EPH 500	Public Health Practicum	1
EPH 555	Clinic in Climate Justice and Public Health	1
HPM 555	Health Policy or Health Care Management Practicum	1
HPM 556	Advanced Health Policy Practicum	1

### TRACK REQUIREMENTS

EPH 557	Evidence-Based Decision-Making in Global Health	1
EPH 591	Global Health Seminar	0
EPH 595	Global Health Foundations: Principles and Applications	1

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 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: Ethics and Practice	1
SBS 505	Accelerated Social and Behavioral Foundations of Health	1

One of the following:

EMD/SBS 584	Advanced Global Health Justice Practicum: Fieldwork	1
EMD/SBS 588	Health Justice Practicum	1
EPH 500	Public Health Practicum	1



EPH 555	Clinic in Climate Justice and Public Health	1
HPM 555	Health Policy or Health Care Management Practicum	1
HPM 556	Advanced Health Policy Practicum	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 551	Global Noncommunicable Disease	1
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
EMD 533	Implementation Science	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

One of the following capstone courses:

CDE 617	Developing a Research Proposal	1
EPH 557	Evidence-Based Decision-Making in Global Health	1
HPM 597	Capstone Course in Health Policy	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: Ethics and Practice	1

One of the following:

EMD/SBS 584	Advanced Global Health Justice Practicum: Fieldwork	1
EMD/SBS 588	Health Justice Practicum	1
EPH 500	Public Health Practicum	1
EPH 555	Clinic in Climate Justice and Public Health	1
HPM 555	Health Policy or Health Care Management Practicum	1
HPM 556	Advanced Health Policy Practicum	1

#### TRACK REQUIREMENTS

CDE 534	Applied Analytic Methods in Epidemiology	1
EHS 508	Environmental and Occupational Exposure Science	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

### Occupational and Environmental Medicine Track (Eleven-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: Ethics and Practice	1
SBS 505	Accelerated Social and Behavioral Foundations of Health	1

One of the following:

EMD/SBS 584	Advanced Global Health Justice Practicum: Fieldwork	1
EMD/SBS 588	Health Justice Practicum	1
EPH 500	Public Health Practicum	1
EPH 555	Clinic in Climate Justice and Public Health	1
HPM 555	Health Policy or Health Care Management Practicum	1
HPM 556	Advanced Health Policy Practicum	1

#### TRACK REQUIREMENTS

CDE 534	Applied Analytic Methods in Epidemiology	1
EHS 508	Environmental and Occupational Exposure Science	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 557	Evidence-Based Decision-Making in Global Health	1
HPM 597	Capstone Course in Health Policy	1
SBS 574	Developing a Health Promotion and Disease Prevention Intervention	1

## Competencies

### CORE CURRICULUM

The core curriculum of the M.P.H. program focuses on competencies in evidence-based approaches to public health (1–4), public health and health care systems (5–6), planning and management to promote health (7–11), policy in public health (12–15), leadership (16–17), communication (18–20), interprofessional practice (21), and systems thinking (22). Upon completing the core curriculum, the student will be able to:

1. Apply epidemiological methods to the breadth of settings and situations in public health practice
2. Select quantitative and qualitative data collection methods appropriate for a given public health context
3. Analyze quantitative and qualitative data using biostatistics, informatics, computer-based programming and software, as appropriate
4. Interpret results of data analysis for public health research, policy, or practice
5. Compare the organization, structure, and function of health care, public health, and regulatory systems across national and international settings
6. 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
7. Assess population needs, assets, and capacities that affect communities' health
8. Apply awareness of cultural values and practices to the design or implementation of public health policies or programs
9. Design a population-based policy, program, project, or intervention
10. Explain basic principles and tools of budget and resource management
11. Select methods to evaluate public health programs
12. Discuss multiple dimensions of the policy-making process, including the roles of ethics and evidence
13. Propose strategies to identify stakeholders and build coalitions and partnerships for influencing public health outcomes

14. Advocate for political, social, or economic policies and programs that will improve health in diverse populations
15. Evaluate policies for their impact on public health and health equity
16. Apply principles of leadership, governance, and management, which include creating a vision, empowering others, fostering collaboration, and guiding decision-making
17. Apply negotiation and mediation skills to address organizational or community challenges
18. Select communication strategies for different audiences and sectors
19. Communicate audience-appropriate public health content, both in writing and through oral presentation
20. Describe the importance of cultural competence in communicating public health content
21. Perform effectively on interprofessional teams
22. Apply systems-thinking tools to a public health issue

#### **APPLIED BIOSTATISTICS AND 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:

- Create and manipulate data sets and variables to evaluate epidemiologic associations
- Conduct and interpret a multivariable linear regression analysis to evaluate epidemiologic associations
- Conduct and interpret a multivariable logistic regression analysis to evaluate epidemiologic associations
- Conduct and interpret a multivariable survival analysis to evaluate epidemiologic associations
- Conduct and interpret a multivariable ordinal logistic regression analysis to evaluate epidemiologic associations

#### **SOCIAL AND 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:

- Create and manipulate data sets and variables to evaluate epidemiologic associations
- Conduct and interpret a multivariable linear regression analysis to evaluate epidemiologic associations
- Conduct and interpret a multivariable logistic regression analysis to evaluate epidemiologic associations
- Evaluate health promotion interventions
- Apply ethical principles to the collection of social and behavioral health data

### 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:

- 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
- 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
- Identify questions in public health policy and practice that may be amenable to model-based approaches
- Apply stochastic and deterministic modeling approaches, including computational methods for simulation and data analysis

### 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 global burden of disease patterns across world regions and population characteristics
- Analyze the roles, relationships and resources influencing the United States role in global health governance and infrastructure
- Propose sustainable, evidence-based solutions to address key global health challenges
- 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

### 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:

- Create and manipulate data sets and variables to evaluate epidemiologic associations
- Conduct and interpret a multivariable linear regression analysis to evaluate epidemiologic associations
- Conduct and interpret a multivariable logistic regression analysis to evaluate epidemiologic associations

- Identify questions in public health policy and practice that may be amenable to model-based approaches
- Apply stochastic and deterministic modeling approaches, including computational methods for simulation and data analysis

#### OCCUPATIONAL AND 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:

- Describe the occupational and environmental contributions to disease and injury, and apply safety and prevention methodology to identified hazards
- Identify the principal study designs in OEM epidemiology and critically interpret and apply the literature to clinical scenarios
- Evaluate the appropriate method of testing an exposure and interpret both environmental exposure and biomonitoring data to assess environmental exposures
- Create and manipulate data sets and variables to evaluate epidemiologic associations
- Conduct and interpret a multivariable linear regression analysis to evaluate epidemiologic associations

# EXECUTIVE M.P.H. PROGRAM

Abigail Friedman, Ph.D., Director

The two-year, part-time, Executive M.P.H. Program combines online education with in-person management and leadership to provide training to:

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

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.

Students have the option of selecting up to two of four tracks to complete during their time in the program: Health Informatics, Environmental Health Sciences, Applied Analytic Methods and Epidemiology, or the Critical Topics in Public Health Track.\* Students with no tracks elected will complete all non-core course credits through their elective coursework. Students may take on-site courses to meet elective requirements, noting any prerequisites and/or faculty permissions, if they can meet attendance requirements. The program begins with courses in a summer term followed by two years of part-time study that combines online courses and three on-site intensives. Students must maintain residency in one of the three countries of eligibility in order to maintain enrollment in the program: United States, Mexico, or Canada.

## PROGRAM REQUIREMENTS

### Core Requirements

EPH 528E	Everyday Leadership	.5
EPH 529E	Executive Communication Skills for Public Health and Healthcare	.5
EPH 530E	Design Thinking in Public Health Systems	.5
EPH 533E	Foundations of Behavior Change	1
EPH 534E	Foundations of Epidemiology and Public Health	1
EPH 535E	Biostatistics in Public Health	1
EPH 536E	Evidence-Based Decision-Making in Public Health	1
EPH 537E	Frontiers of Public Health	1
EPH 538E	Health Policy and Health Care Systems	1
EPH 539E	Ethics in Public Health	.5

EPH 540E	Executive M.P.H. Capstone	1
EPH 541E	Executive M.P.H. Capstone	1

## Track Requirements

### HEALTH INFORMATICS TRACK

BIS 542E	Introduction to Health Informatics	1
BIS 543E	Topics in Biomedical Informatics and Data Science	1
BIS 544E	Computational Methods for Informatics	1

### ENVIRONMENTAL HEALTH SCIENCES TRACK

EHS 540E	Environmental Exposure Assessment	1
EHS 541E	Toxicity of Environmental Chemicals and Green Chemistry Solutions	1
EHS 542E	Risk Assessment and Policy	1

### CRITICAL TOPICS IN PUBLIC HEALTH TRACK\*

EMD 542E	Introduction to Public Health Modeling	1
HPM 541E	Leading Healthcare Transformation	1
SBS 540E	Monitoring and Evaluation in Public Health: Principles and Applications	1
SBS 577	Health Communication and the Media	1

### APPLIED ANALYTIC METHODS AND EPIDEMIOLOGY TRACK

CDE 540E	Principles of Epidemiology II	1
CDE 541E	Applied Analytic Methods in Epidemiology	1
CDE 543E	Systematic Reviews and Meta-analyses: Methodology of Synthesizing Evidence	1

\*The Critical Topics in Public Health Track will remain available to classes entering in summer 2024 or earlier. The track will be discontinued for all future classes.

## COMPETENCIES

Upon completing the Executive M.P.H. Program, the student will be able to:

- Develop solutions for complex health challenges through user-centered design principles and practices
- Propose managerial approaches to address organizational challenges
- Evaluate different types of evidence to propose sustainable, evidence-based solutions to address key public health challenges
- Compare and contrast multiple perspectives on an important public health problem
- Justify the use of appropriate epidemiological and biostatistical methods to draw inferences from public health data



# JOINT-DEGREE PROGRAMS

- Accelerated M.B.A./M.P.H. Program in Health Care Management
- B.A.-B.S./M.P.H. Select Program
- Joint-Degree Programs with Other Yale Schools

## 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

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: Ethics and Practice	1
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
MGT 698	Healthcare Policy, Finance, and Economics	4
MGT 699	ColloquiumHealthcareLeadership (2 terms)	1

1 to 2 electives at YSPH 1-2

One Global Health Leadership elective <sup>1</sup> 1

<sup>1</sup> Chosen from the Global Health Concentration list on the YSPH website: <https://ysph.yale.edu/myysph/curriculum/ MPH/ghc/electives/>.

One of the following:

BIS/SBS 640	User-Centered Design of Digital Health Tools	1
HPM 548	Pharmaceutical Industry and Public Policy	1
HPM 595	Food and Drug Administration Law	1
MGT 654	Data-Driven Value Creation in Healthcare and Life Sciences	2
MGT 657	Creating Healthcare and Life Science Ventures	2
MGT 663	Innov, Invt, & New Frontiers in Med	2
MGT 668	Narratives in Health	2
MGT 995	Sustainable Innovation in Healthcare	2

One of the following:

EMD/SBS 588	Health Justice Practicum	1
EPH 500	Public Health Practicum	1
EPH 501	U.S. Health Justice Concentration Practicum	1
EPH 521	Summer Internship - APE	0
EPH 555	Clinic in Climate Justice and Public Health	1
HPM 555	Health Policy or Health Care Management Practicum <sup>1</sup>	1
HPM 556	Advanced Health Policy Practicum	1

<sup>1</sup> 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

### Core Curriculum

The core curriculum of the M.P.H. program focuses on competencies in evidence-based approaches to public health (1–4), public health and health care systems (5–6), planning and management to promote health (7–11), policy in public health (12–15), leadership (16–17), communication (18–20), interprofessional practice (21), and systems thinking (22). Upon completing the core curriculum, the student will be able to:

1. Apply epidemiological methods to the breadth of settings and situations in public health practice
2. Select quantitative and qualitative data collection methods appropriate for a given public health context
3. Analyze quantitative and qualitative data using biostatistics, informatics, computer-based programming and software, as appropriate
4. Interpret results of data analysis for public health research, policy, or practice
5. Compare the organization, structure, and function of health care, public health, and regulatory systems across national and international settings
6. 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
7. Assess population needs, assets, and capacities that affect communities' health
8. Apply awareness of cultural values and practices to the design or implementation of public health policies or programs
9. Design a population-based policy, program, project, or intervention
10. Explain basic principles and tools of budget and resource management
11. Select methods to evaluate public health programs
12. Discuss multiple dimensions of the policy-making process, including the roles of ethics and evidence
13. Propose strategies to identify stakeholders and build coalitions and partnerships for influencing public health outcomes
14. Advocate for political, social, or economic policies and programs that will improve health in diverse populations
15. Evaluate policies for their impact on public health and health equity
16. Apply principles of leadership, governance, and management, which include creating a vision, empowering others, fostering collaboration, and guiding decision-making
17. Apply negotiation and mediation skills to address organizational or community challenges
18. Select communication strategies for different audiences and sectors

19. Communicate audience-appropriate public health content, both in writing and through oral presentation
20. Describe the importance of cultural competence in communicating public health content
21. Perform effectively on interprofessional teams
22. Apply systems-thinking tools to a public health issue

## 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;
- critique empirical research intended to evaluate the causal impact of health policies and health system reforms;
- 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; and
- identify questions in public health policy and practice that may be amenable to model-based approaches.

## 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 101	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: Ethics and Practice

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), U.S. Health Justice Concentration (USHJC), or Climate Change and Health Concentration (CCHC) electives. Like any M.P.H. student, Yale College students are eligible to take courses from the approved lists of these electives. (See these concentrations' curriculum guidelines in the chapter Traditional Two-Year M.P.H. Program.) 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://ysph.yale.edu/myysph/students/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://ysph.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 <https://ysph.yale.edu/myysph/curriculum/joint/ba-bs>.

## Joint-Degree Programs with Other Yale Schools

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 International and Development Economics and the MacMillan Center for International and Area Studies

**Jackson School of Global Affairs** M.P.P./M.P.H.

**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.

# INTERNATIONAL DUAL-DEGREE PROGRAMS

## 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 <https://ysph.yale.edu>.

## Tsinghua University M.A./M.P.H. Dual-Degree Program

The Tsinghua University M.A./M.P.H. Dual-Degree Program in public health gives master's degree students in healthcare management from Tsinghua University the opportunity to enroll in the YSPH Advanced Professional Masters of Public Health program and earn an M.A. from Tsinghua University and an M.P.H. from the Yale School of Public Health (YSPH) in a three-year joint program.

As participants in the dual-degree program, students will complete their first academic year at Tsinghua University. The second year of the program will take place at YSPH. The third and final year will take place at Tsinghua University. After the successful completion of all program requirements at Yale, students will receive an M.P.H. degree from Yale at the end of their second academic year of the program. After successful completion of all Tsinghua University requirements (after the third and final year of the program), students will receive a M.A. degree in Public Policy and Management from Tsinghua University.

This program is only open to full-time students in Tsinghua University's Master of Arts (Healthcare Management Concentration) program who plan to apply to the Yale School of Public Health's Advanced Professional M.P.H. program. Applications must be submitted to the YSPH via its online application system. Interested students will undergo an internal selection process at Tsinghua University in or around November of their first year at Tsinghua University. Applicants must be in the top of their student cohort.

A total of 16 course units is required for the Yale M.P.H. degree.

Further information about this program may be obtained online at <https://ysph.yale.edu> or from the Office of Student Affairs, 47 College St., Suite 108, New Haven, CT 06510; 203.785.6260.

## Yale-NUS College Concurrent-Degree Program

*The Yale-NUS College Concurrent-Degree Program in public health is no longer accepting new students.*

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 <https://ysph.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 <https://ysph.yale.edu>.

# 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, data science, statistical genetics, and mathematical models for infectious diseases. Students have a choice of three pathways: the *Biostatistics Standard Pathway*, the *Biostatistics Implementation and Prevention Science Methods Pathway*, and the *Biostatistics Data Science 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 for the Standard Pathway and the Implementation and Prevention Sciences Pathway. Sixteen required and elective courses must be completed for the Data Science Pathway. These requirements exclude the Seminar, BIS 525/BIS 526; the Summer Internship, BIS 695; EPH 100; and EPH 101. *Note:* Half-term courses cannot count as an elective unless an additional half-term course is taken, and the Biostatistics faculty have approved both courses as an elective.

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 All Pathways

(or substitutions approved by the student's adviser and the DGS)

BIS 525	Seminar in Biostatistics and Journal Club <sup>1</sup>	0
BIS 526	Seminar in Biostatistics and Journal Club <sup>1</sup>	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 695	Summer Internship in Biostatistics <sup>1</sup>	0
EPH 100	Professional Skills Series <sup>1</sup>	0
EPH 101	Professional Skills Series <sup>1</sup>	0
EPH 509	Fundamentals of Epidemiology	1
EPH 608	Frontiers of Public Health <sup>2</sup>	1
S&DS 541	Probability Theory <sup>3</sup>	1
or S&DS 551	Stochastic Processes	
or S&DS 600	Advanced Probability	
S&DS 542	Theory of Statistics <sup>3</sup>	1
or S&DS 610	Statistical Inference	

<sup>1</sup> Course does not count toward the fifteen required courses.

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

<sup>3</sup> Course offered in the Graduate School of Arts and Sciences.

### Additional Required Courses: Standard Pathway

BIS 679	Advanced Statistical Programming in SAS and R	1
BIS 681	Statistical Practice II <sup>1</sup>	1
or BIS 649	Master's Thesis Research	
or BIS 650	Master's Thesis Research	

**Electives** Five courses are *required*. A minimum of two must be from the biostatistics list. The additional three electives can be taken from either list of approved electives below.

#### Biostatistics Electives

BIS 536	Measurement Error and Missing Data	1
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BIS 537	Statistical Methods for Causal Inference	1
BIS 540	Fundamentals of Clinical Trials	1
BIS 550/CB&B 750	Topics in Biomedical Informatics and Data Science	1
BIS 555	Machine Learning with Biomedical Data	1
BIS 560	Introduction to Health Informatics	1
BIS 567	Bayesian Statistics	1
BIS 568	Applied Artificial Intelligence in Healthcare	1
BIS 620	Data Science Software Systems	1
BIS 629	Advanced Methods for Implementation and Prevention Science	1
BIS 631	Advanced Topics in Causal Inference Methods	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
BIS 640	User-Centered Design of Digital Health Tools	1
BIS 643	Theory of Survival Analysis <sup>2</sup>	1
BIS 645	Statistical Methods in Human Genetics	1
BIS 646	Nonparametric Statistical Methods and Their Applications	1
BIS 662	Computational Statistics	1
BIS 691	Theory of Generalized Linear Models	1
BIS 692	Statistical Methods in Computational Biology	1

Additional electives must be approved by the Standard Pathway director.

M.S. Biostatistics (Standard Pathway) students are required to complete a two-semester capstone experience in the second year. This requirement can be fulfilled by:

- taking two semesters of the capstone course: BIS 678 (fall) and BIS 681 (spring) or
- taking the fall semester capstone course, BIS 678, and completing a thesis. The thesis is a yearlong project. Students who plan to complete a thesis should register for BIS 649 (fall; 1 credit) and BIS 650 (spring; 1 credit).

All students who complete a thesis are required to present their research during a public seminar to the Biostatistics faculty and students in order to graduate.

<sup>2</sup> Cannot fulfill elective if substituted for BIS 630.

#### Additional Electives

CDE 566	Causal Inference Methods in Public Health Research	1
CDE 634	Advanced Applied Analytic Methods in Epidemiology and Public Health	1
CPSC 540	Database Design and Implementation <sup>1</sup>	1
CPSC 546	Data and Information Visualization <sup>1</sup>	1
CPSC 552/CB&B 663	Deep Learning Theory and Applications <sup>1</sup>	1
CPSC 570	Artificial Intelligence <sup>1</sup>	1
CPSC 577	Natural Language Processing <sup>1</sup>	1
CPSC 582	Current Topics in Applied Machine Learning <sup>1</sup>	1

CPSC 583	Deep Learning on Graph-Structured Data <sup>1</sup>	1
CPSC 640	Topics in Numerical Computation <sup>1</sup>	1
CPSC 670	Topics in Natural Language Processing <sup>1</sup>	1
CPSC 677	Advanced Natural Language Processing <sup>1</sup>	1
CPSC 680	Trustworthy Deep Learning <sup>1</sup>	1
CPSC/CB&B/ MB&B/MCDB 752	Biomedical Data Science: Mining and Modeling <sup>1</sup>	1
ECON 554	Econometrics V	1
EMD 553	Transmission Dynamic Models for Understanding Infectious Diseases	1
ENAS 912	Biomedical Image Processing and Analysis	1
HPM 573	Advanced Topics in Modeling Health Care Decisions	1
HPM 583	Methods in Health Services Research	1
INP/PSYC 558	Computational Methods in Human Neuroscience <sup>1</sup>	1
INP 599	Statistics and Data Analysis in Neuroscience <sup>1</sup>	1
MGT 803	Decision Making with Data <sup>2</sup>	2
S&DS 517	Applied Machine Learning and Causal Inference <sup>1</sup>	1
S&DS 551	Stochastic Processes <sup>1</sup>	1
S&DS 562	Computational Tools for Data Science <sup>1</sup>	1
S&DS 563/ENV 758	Multivariate Statistical Methods for the Social Sciences <sup>1</sup>	1
S&DS 565	Introductory Machine Learning <sup>1</sup>	1
S&DS 569	Numerical Linear Algebra: Deterministic and Randomized Algorithms <sup>1</sup>	1
S&DS 580	Neural Data Analysis	1
S&DS 600	Advanced Probability <sup>1</sup>	1
S&DS 610	Statistical Inference <sup>1</sup>	1
S&DS 611	Selected Topics in Statistical Decision Theory <sup>1</sup>	1
S&DS 612	Linear Models <sup>1,3</sup>	1
S&DS 618	Asymptotic Statistics	1
S&DS 625	Statistical Case Studies <sup>1</sup>	1
S&DS 631	Optimization and Computation <sup>1</sup>	1
S&DS 632	Advanced Optimization Techniques <sup>1</sup>	1
S&DS 661	Data Analysis <sup>1</sup>	1
S&DS 662	Statistical Computing <sup>3</sup>	1
S&DS 663	Computational Mathematics Situational Awareness and Survival Skills <sup>1</sup>	1
S&DS 664	Information Theory <sup>1</sup>	1
S&DS 665	Intermediate Machine Learning <sup>1</sup>	1
S&DS 674/ENV 781	Applied Spatial Statistics <sup>1</sup>	1
S&DS 685	Theory of Reinforcement Learning <sup>1</sup>	1
Additional electives must be approved by the Standard Pathway director.		

<sup>1</sup> Course offered in the Graduate School of Arts and Sciences.

<sup>2</sup> Course offered in the School of Management

<sup>3</sup> Cannot fulfill elective credit if substituted for BIS 623.

### *Additional Required Courses: Implementation and Prevention Science Methods Pathway*

BIS 629	Advanced Methods for Implementation and Prevention Science	1
BIS 679	Advanced Statistical Programming in SAS and R	1
BIS 681	Statistical Practice II <sup>1</sup>	1
or BIS 649	Master's Thesis Research	
or BIS 650	Master's Thesis Research	
EMD 533	Implementation Science	1

<sup>1</sup> M.S. Biostatistics (Implementation Science Pathway) students are required to complete a two-semester capstone experience in the second year. This requirement can be fulfilled by:

- taking two semesters of the capstone course: BIS 678 (fall) and BIS 681 (spring); or
- taking the fall semester capstone course, BIS 678, and completing a thesis. The thesis is a yearlong project. Students who plan to complete a thesis should register for BIS 649 (fall; 1 credit) and BIS 650 (spring; 1 credit).

Students in this pathway are strongly encouraged to complete a thesis. All students who complete a thesis are required to present their research during a public seminar to the Biostatistics faculty and students in order to graduate.

At least 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 <sup>1</sup>	1
HPM 575	Evaluation of Global Health Policies and Programs	1
HPM 586	Microeconomics for Health Policy and Health Management	1
HPM 587	Advanced Health Economics	1
MGT 611	Policy Modeling <sup>1</sup>	4
SBS 541	Community Health Program Evaluation <sup>1</sup>	1
SBS 574	Developing a Health Promotion and Disease Prevention Intervention	1

SBS 580	Qualitative Research Methods in Public Health <sup>1</sup>	1
S&DS 565	Introductory Machine Learning <sup>2</sup>	1
Alternative electives must be approved by the Implementation Science Pathway director.		

<sup>1</sup> Course is highly recommended

<sup>2</sup> Course offered in the Graduate School of Arts and Sciences.

## Additional Required Courses: Data Science Pathway

BIS 620	Data Science Software Systems	1
BIS 687	Data Science Capstone <sup>1</sup>	1

<sup>1</sup> M.S. Biostatistics (Data Science Pathway) students are required to complete a two-semester capstone experience in the second year. This requirement can be fulfilled by:

- taking two semesters of the capstone course: BIS 678 (fall) and BIS 687 (spring) or
- taking the fall semester capstone course, BIS 678, and completing a thesis. The thesis is a yearlong project. Students who plan to complete a thesis should register for BIS 649 (fall; 1 credit) and BIS 650 (spring; 1 credit).

All students who complete a thesis are required to present their research during a public seminar to the Biostatistics faculty and students in order to graduate.

Two of the following biostatistics, computer science, and statistical methods courses

BIS 536	Measurement Error and Missing Data	1
BIS 537	Statistical Methods for Causal Inference	1
BIS 540	Fundamentals of Clinical Trials	1
BIS 550/CB&B 750	Topics in Biomedical Informatics and Data Science	1
BIS 555	Machine Learning with Biomedical Data	1
BIS 567	Bayesian Statistics	1
BIS 629	Advanced Methods for Implementation and Prevention Science	1
BIS 634	Computational Methods for Informatics	1
BIS 645	Statistical Methods in Human Genetics	1
BIS 646	Nonparametric Statistical Methods and Their Applications	1
BIS 662	Computational Statistics	1
BIS 692/S&DS 645	Statistical Methods in Computational Biology	1
CB&B 562	Modeling Biological Systems II <sup>1</sup>	1
CB&B 752	Biomedical Data Science: Mining and Modeling <sup>1</sup>	1
CPSC 519	Full Stack Web Programming <sup>1</sup>	1
CPSC 526	Building Distributed Systems <sup>1</sup>	1
CPSC 539	Software Engineering <sup>1</sup>	1
CPSC 565	Theory of Distributed Systems <sup>1</sup>	1
CPSC 577	Natural Language Processing <sup>1</sup>	1
CPSC 588	AI Foundation Models <sup>1</sup>	1



CPSC 640	Topics in Numerical Computation <sup>1</sup>	1
CPSC 642	Modern Challenges in Statistics: A Computational Perspective	1
EMD 553	Transmission Dynamic Models for Understanding Infectious Diseases	1
HPM 573	Advanced Topics in Modeling Health Care Decisions	1
S&DS 541	Probability Theory <sup>1,4</sup>	1
S&DS 551	Stochastic Processes <sup>1,5</sup>	1
S&DS 611	Selected Topics in Statistical Decision Theory <sup>1</sup>	1
S&DS 625	Statistical Case Studies <sup>1</sup>	1
S&DS 661	Data Analysis <sup>1</sup>	1
S&DS 664	Information Theory <sup>1</sup>	1
Additional electives must be approved by the Data Science Pathway director.		

One of the following Machine Learning courses:

BIS 555	Machine Learning with Biomedical Data <sup>2</sup>	1
BIS 568	Applied Artificial Intelligence in Healthcare	1
BIS 634	Computational Methods for Informatics <sup>2</sup>	1
BIS 662	Computational Statistics <sup>2</sup>	1
BIS 691	Theory of Generalized Linear Models	1
CB&B 555/ AMTH 553/CPSC 553	Unsupervised Learning for Big Data <sup>1</sup>	1
CB&B 663/ AMTH 552/CPSC 552	Deep Learning Theory and Applications <sup>1</sup>	1
CPSC 569	Randomized Algorithms <sup>1</sup>	1
CPSC 583	Deep Learning on Graph-Structured Data <sup>1</sup>	1
CPSC 644	Geometric and Topological Methods in Machine Learning <sup>1</sup>	1
CPSC 670	Topics in Natural Language Processing <sup>1</sup>	1
S&DS 517	Applied Machine Learning and Causal Inference <sup>1</sup>	1
S&DS 562	Computational Tools for Data Science <sup>1</sup>	1
S&DS 565	Introductory Machine Learning <sup>1</sup>	1
S&DS 569	Numerical Linear Algebra: Deterministic and Randomized Algorithms <sup>1</sup>	1
S&DS 631	Optimization and Computation <sup>1</sup>	1
S&DS 632	Advanced Optimization Techniques <sup>1</sup>	1
S&DS 665	Intermediate Machine Learning <sup>1</sup>	1
S&DS 674/ENV 781	Applied Spatial Statistics <sup>1</sup>	1
S&DS 684	Statistical Inference on Graphs <sup>1</sup>	1
S&DS 685	Theory of Reinforcement Learning <sup>1</sup>	1

S&DS 686	High-Dimensional Phenomena in Statistics and Learning <sup>1</sup>	1
Additional electives must be approved by the Data Science Pathway director.		
One of the following Database courses:		
BIS 550/CB&B 750	Topics in Biomedical Informatics and Data Science <sup>2</sup>	1
BIS 638	Clinical Database Management Systems and Ontologies	1
BIS 679	Advanced Statistical Programming in SAS and R	1
CPSC 537	Database Systems <sup>1</sup>	1
MGT 656	Management of Software Development <sup>3</sup>	4
MGT 660	Advanced Management of Software Development <sup>3</sup>	4
Additional electives must be approved by the Data Science Pathway director.		

<sup>1</sup> Course offered in the Graduate School of Arts and Sciences

<sup>2</sup> This course can only be counted to fulfill the requirement of one category; it cannot be counted twice

<sup>3</sup> Course offered at the School of Management

<sup>4</sup> Cannot fulfill elective if taken as a requirement

<sup>5</sup> Cannot fulfill elective if taken as a substitute for S&DS 541

Two additional electives are required from the biostatistics, machine learning, or database list. Other courses from Public Health or other departments must be approved by the Data Science Pathway director.

## COMPETENCIES

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

- Select from a variety of analytical tools to test statistical hypotheses, interpret results of statistical analyses, and use these results to make relevant inferences from data
- Design efficient computer programs for study management, statistical analysis, as well as presentation using R, SAS, and other programming languages
- Demonstrate oral and written communication and presentation skills to effectively communicate and disseminate results to professional 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). 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 <sup>1</sup>	0
CDE 526	Seminar in Chronic Disease Epidemiology <sup>1</sup>	0
CDE 617	Developing a Research Proposal <sup>2</sup>	1
or CDE 600	Independent Study or Directed Readings	
or EMD 625	How to Develop, Write, and Evaluate an NIH Proposal	
EPH 508	Foundations of Epidemiology and Public Health	1
EPH 608	Frontiers of Public Health <sup>3</sup>	1

<sup>1</sup> Course does not count toward the ten required courses.

<sup>2</sup> In the capstone courses CDE 617 or EMD 625, the student is required to develop a grant application that is deemed reasonably competitive by the instructor. An alternative to one of these capstone courses, is an individualized tutorial (CDE 600), in which the student completes a manuscript that is suitable for submission for publication in a relevant journal.

<sup>3</sup> 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 575	Introduction to Regulatory Affairs	1
BIS 621	Regression Models for Public Health	1
BIS 630	Applied Survival Analysis	1
BIS 633	Population and Public Health Informatics	1
S&DS 530	Data Exploration and Analysis <sup>1</sup>	1
S&DS 563	Multivariate Statistical Methods for the Social Sciences <sup>1</sup>	1

<sup>1</sup> Course 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 582	Health Outcomes Research: Matching the Right Research Question to the Right Data	1
CDE 588	Perinatal Epidemiology	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

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

- Evaluate the scientific merit and feasibility of epidemiologic study designs
- Review and evaluate epidemiologic reports and research articles
- Analyze data and draw appropriate inferences from epidemiologic studies
- Write an epidemiologic research proposal

## 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 a 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 the year-long Seminar, EMD 525/EMD 526), including satisfactory completion of the capstone course. There are two capstone course options:

**Option 1** Students may elect to enroll in 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, and effective grant writing and grantsmanship. 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 substitutions approved by the student's adviser and the DGS)

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 <sup>1</sup>	0
EMD 526	Seminar in Epidemiology of Microbial Diseases <sup>1</sup>	0
EMD 538	Quantitative Methods for Infectious Disease Epidemiology	1
EMD 553	Transmission Dynamic Models for Understanding Infectious Diseases	1
or EMD 539	Introduction to the Analysis and Interpretation of Public Health Surveillance Data	
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 608	Frontiers of Public Health <sup>2</sup>	1

<sup>1</sup> These courses do not count toward the ten required courses.<sup>2</sup> 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 (approved by the student's adviser and the DGS).

**Required Courses: Clinical Specialization**

(or substitutions approved by the student's adviser and the DGS)

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 <sup>1</sup>	0
EMD 526	Seminar in Epidemiology of Microbial Diseases <sup>1</sup>	0
EMD 530	Health Care Epidemiology: Improving Health Care Quality through Infection Prevention	1
or EMD 536	Outbreak Investigations: Principles and Practice	
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
or EMD 563	Laboratory and Field Studies in Infectious Diseases	

EPH 505	Biostatistics in Public Health	1
EPH 508	Foundations of Epidemiology and Public Health	1
EPH 608	Frontiers of Public Health (EPH 600 no longer required for MS students ) <sup>2</sup>	1

<sup>1</sup> These courses do not count toward the ten required courses.

<sup>2</sup> 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 (approved by the student's adviser and the DGS).

Suggested electives for both specializations include:

EMD 531	Genomic Epidemiology of Infectious Diseases	1
EMD 537	Water, Sanitation, and Global Health	1
EMD 541	Health in Humanitarian Crises	1
EMD 546	Vaccines and Vaccine-Preventable Diseases	1
EMD 580	Reforming Health Systems: Using Data to Improve Health in Low- and Middle-Income Countries	1
EMD 582	Political Epidemiology	1

Alternate electives must be approved in consultation with the student's adviser and the DGS.

## COMPETENCIES

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

- 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 (quantitative specialization only)
- Design observational and/or experimental studies to study the relationship between host, microbial, or environmental factors on the occurrence or control of infectious diseases (clinical specialization only)

## 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. Students whose native language is not English must take and submit scores from the TOEFL or IELTS examination. Part-time enrollment is not permitted.

## DEGREE REQUIREMENTS

The Health Informatics concentration consists of a total of fourteen courses: eight required courses, four electives, and satisfactory completion and presentation of a yearlong, two-course 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 550	Topics in Biomedical Informatics and Data Science	1
BIS 560	Introduction to Health Informatics	1
BIS 562	Clinical Decision Support	1
or BIS 640	User-Centered Design of Digital Health Tools	
BIS 633	Population and Public Health Informatics	1
BIS 634	Computational Methods for Informatics	1
BIS 638	Clinical Database Management Systems and Ontologies	1
BIS 685	Capstone in Health Informatics	1
BIS 686	Capstone in Health Informatics	1
EPH 508	Foundations of Epidemiology and Public Health	1
or EPH 509	Fundamentals of Epidemiology	
EPH 608	Frontiers of Public Health <sup>1</sup>	1

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

MS Suggested Electives in Informatics, Statistics and Data Science (4 course units)

BIS 540	Fundamentals of Clinical Trials	1
BIS 567	Bayesian Statistics	1



BIS 568	Applied Artificial Intelligence in Healthcare	1
BIS 620	Data Science Software Systems	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 662	Computational Statistics	1
BIS 691	Theory of Generalized Linear Models	1
BIS 692	Statistical Methods in Computational Biology	1
CB&B 555	Unsupervised Learning for Big Data <sup>1</sup>	1
CB&B 567	Topics in Deep Learning: Methods and Biomedical Applications <sup>1</sup>	1
CB&B 663	Deep Learning Theory and Applications <sup>1</sup>	1
CDE 534	Applied Analytic Methods in Epidemiology	1
CDE 566	Causal Inference Methods in Public Health Research	1
CPSC 540	Database Design and Implementation <sup>1</sup>	1
CPSC 546	Data and Information Visualization <sup>1</sup>	1
CPSC 564	Algorithms and their Societal Implications <sup>1</sup>	1
CPSC 577	Natural Language Processing <sup>1</sup>	1
CPSC 581	Introduction to Machine Learning <sup>1</sup>	1
CPSC 582	Current Topics in Applied Machine Learning <sup>1</sup>	1
CPSC 583	Deep Learning on Graph-Structured Data <sup>1</sup>	1
CPSC 670	Topics in Natural Language Processing <sup>1</sup>	1
EMD 533	Implementation Science	1
EMD 553	Transmission Dynamic Models for Understanding Infectious Diseases	1
ENAS 544	Fundamentals of Medical Imaging	1
EPH 510	Health Policy and Health Care Systems	1
HPM 559	Big Data, Privacy, and Public Health Ethics	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
IMED 625	Principles of Clinical Research <sup>1</sup>	1
INP 560	R Stats for Neuroscience	1
MGT 534	Personal Leadership <sup>2</sup>	4
MGT 612	Introduction to Social Entrepreneurship <sup>2</sup>	4
MGT 656	Management of Software Development <sup>2</sup>	4
S&DS 517	Applied Machine Learning and Causal Inference <sup>1</sup>	1
S&DS 530	Data Exploration and Analysis <sup>1</sup>	1
S&DS 562	Computational Tools for Data Science <sup>1</sup>	1
S&DS 563	Multivariate Statistical Methods for the Social Sciences <sup>1</sup>	1

S&DS 565	Introductory Machine Learning <sup>1</sup>	1
S&DS 583	Time Series with R/Python <sup>1</sup>	1
S&DS 610	Statistical Inference <sup>1</sup>	1
S&DS 663	Computational Mathematics Situational Awareness and Survival Skills <sup>1</sup>	1
S&DS 664	Information Theory <sup>1</sup>	1

<sup>1</sup> Course offered in the Graduate School of Arts and Sciences.

<sup>2</sup> Course offered in the School of Management.

In addition, in the second year of the program, students are required to complete an independent capstone project (BIS 685/BIS 686) 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

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. Seven 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 COURSEWORK

Generally, the first two years are devoted primarily to coursework. 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 and 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, and significance; and
- 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 or an AHRQ R36 proposal may submit the Specific Aims and Research Strategy of the proposal, and students who have written an NSF Graduate Research Fellowship proposal may submit the respective sections of the proposal.*

1. Title of proposed dissertation (can be a working title).
2. Specific aims (one page, may be single-spaced): 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 Dissertation Prospectus Approval form (or emails from each DAC member acknowledging that they provided input and approved the prospectus).

The GSEC will review the prospectus and may request changes to either the DAC or the prospectus.

Weekly meetings with the chair of the DAC are recommended. Regular face-to-face meetings of the full DAC are invaluable and are required throughout the student's research toward the thesis. The DAC is expected to meet at least twice each year (or more frequently, if necessary) to discuss the progress from the last six months and discuss the plan for the next six months. 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 months. The document is distributed to the student and the DGS for review and comments.

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 DGS.

### 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 Public Health 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. 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, but can constitute essentially discrete units. Beyond this principle, the faculty will apply the prevailing intellectual standards and scholarly practices within their fields in advising students with regard to the suitable scope, length, and structure of the dissertation, including what constitutes an original contribution to that field.

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 Public Health 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 and research institutes such as the National Institute of Health, where they engage in biomedical and statistical research and education. In addition, graduates have pursued careers in the pharmaceutical industry, in which they make critical contributions to therapeutic developments. Graduates are also employed in fields such as technology and finance, where they are involved in data science developments and applications.

## Required Coursework

Ph.D. students in Biostatistics have the choice of two pathways: the Biostatistics Standard Pathway and the Biostatistics Implementation and Prevention Science Methods Pathway. Students in the Standard Pathway are required to take a minimum of sixteen courses, and students in the Implementation and Prevention Science Methods Pathway are required to take a minimum of fifteen courses (not including BIS 525, BIS 526, BIS 699, and EPH 600). Course substitutions must be identified and approved by the student's adviser and 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 <sup>1</sup>	0
BIS 526	Seminar in Biostatistics and Journal Club <sup>1</sup>	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 691	Theory of Generalized Linear Models	1
BIS 699	Summer Internship in Biostatistical Research <sup>1</sup>	0
EPH 508	Foundations of Epidemiology and Public Health <sup>2</sup>	1
EPH 600	Research Ethics and Responsibility <sup>1</sup>	0
EPH 608	Frontiers of Public Health <sup>2</sup>	1
S&DS 610	Statistical Inference <sup>3</sup>	1

<sup>1</sup> Courses do not count toward the total number of courses required (fifteen for Implementation and Prevention Science Methods Pathway students and sixteen for Standard Pathway students)

<sup>2</sup> Students entering the program with an M.P.H. degree may be exempt. Students granted an exemption must take an alternate course to replace EPH 608.

<sup>3</sup> Course offered in the Graduate School of Arts and Sciences



In consultation with their academic adviser students in the Standard Pathway will choose a minimum of eight additional electives that will best prepare them for dissertation work.

Students in the 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.

Recommended electives for the Implementation and Prevention Science Methods pathway are:

BIS 536	Measurement Error and Missing Data	1
BIS 567	Bayesian Statistics	1
BIS 646	Nonparametric Statistical Methods and Their Applications	1
BIS 662	Computational Statistics	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 <sup>1</sup>	1
HPM 575	Evaluation of Global Health Policies and Programs	1
HPM 586	Microeconomics for Health Policy and Health Management	1
HPM 587	Advanced Health Economics	1
MGT 611	Policy Modeling <sup>1,2</sup>	4
SBS 541	Community Health Program Evaluation	1
SBS 574	Developing a Health Promotion and Disease Prevention Intervention <sup>1</sup>	1
SBS 580	Qualitative Research Methods in Public Health <sup>1</sup>	1
S&DS 541	Probability Theory <sup>1,3</sup>	1
S&DS 565	Introductory Machine Learning <sup>3</sup>	1
or S&DS 665	Intermediate Machine Learning	
S&DS 600	Advanced Probability <sup>3</sup>	1

<sup>1</sup> This course is strongly recommended.

<sup>2</sup> Course is offered by the School of Management

<sup>3</sup> Course 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

Through both required and elective courses, students gain actual experience with various aspects of research, including literature review, development of research questions, experimental design, data collection and management, data analysis and interpretation, and preparation of a manuscript and grant. 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 699. During the summer following the first year of coursework, candidates are required to take a research rotation (BIS 699) 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

Doctoral students in Chronic Disease Epidemiology use primarily quantitative research methods to identify risk factors for chronic diseases in populations. The department is best known for research in the epidemiology of cancer, heart disease and stroke, aging, life course epidemiology (including perinatal and pediatric epidemiology), and genetics. Collaboration is key in epidemiology. Thus, students in the department often work on projects with other departments within YSPH, within the Schools of Medicine and Nursing, and across Yale University, resulting in numerous opportunities for creating an experientially rich doctoral experience. All candidates must become proficient in statistical analysis, research methods, and the application of epidemiology to the field in which they have special interest.

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 Coursework

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 substitutions must be identified and approved by the student's adviser and 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 566	Causal Inference Methods in Public Health Research	1
CDE 610	Applied Area Readings for Qualifying Exams	1
CDE 617	Developing a Research Proposal <sup>1</sup>	1
or EMD 625	How to Develop, Write, and Evaluate an NIH Proposal	
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 <sup>3</sup>	1
EPH 600	Research Ethics and Responsibility <sup>2</sup>	0
EPH 608	Frontiers of Public Health <sup>3</sup>	1

<sup>1</sup> CDE 617 (or EMD 625) 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.

<sup>2</sup> This course does not count toward the minimum of seventeen courses.

<sup>3</sup> Students entering the program with an M.P.H. degree may be exempt. Students granted an exemption must take an alternate course to replace EPH 608.

In consultation with their academic adviser, students choose three 600-level course units in biostatistics (or equivalent substitutions approved by the student's adviser). For example, S&DS 563, Multivariate Statistical Methods for the Social Sciences, may serve as an option for these three courses.

Students 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. Faculty members, chosen by the department chair, are responsible for coordinating this examination, and the examination content is developed by the overall faculty. Students are required to take a biostatistics exam but will receive an exemption from this exam if they receive grades of HP or Honors in the three required quantitative courses. The specialty area examination (CDE 610) is prepared in a tutorial with one or more faculty members. Students are required to prepare a short overview of their prospectus as a deliverable for this area (CDE 610) with their faculty mentor(s). Students are expected to submit this at the end of the spring term in the year they are taking qualifying examinations.

## 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.

Students must complete a minimum of thirteen courses (not including EHS 525, EHS 526, and EPH 600). Course substitutions must be identified and approved by the student’s adviser and the DGS.

## Required Coursework

### CORE REQUIREMENTS

CDE 617	Developing a Research Proposal	1
or EMD 625	How to Develop, Write, and Evaluate an NIH Proposal	
EHS 503	Public Health Toxicology	1
EHS 508	Environmental and Occupational Exposure Science	1
EHS 525	Seminar and Journal Club in Environmental Health <sup>1</sup>	0
EHS 526	Seminar and Journal Club in Environmental Health <sup>1</sup>	0
EHS 560	Methods in Climate Epidemiology	1
or EHS 566	Causal Inference Methods in Public Health Research	
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 <sup>2</sup>	1
EPH 600	Research Ethics and Responsibility <sup>1</sup>	0
EPH 608	Frontiers of Public Health <sup>2</sup>	1

<sup>1</sup> These courses do not count toward the minimum of thirteen courses.

<sup>2</sup> Students entering the doctoral program with an M.P.H. degree may be exempt. Students granted an exemption must take an alternate course to replace EPH 608.

Suggested electives (minimum of four required)

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
EHS/CDE 502	Physiology for Public Health	1
EHS 511	Principles of Risk Assessment	1
EHS 530	Our Air, Our Health	1
EHS/EMD 537	Water, Sanitation, and Global Health	1
EHS 547	Climate Change and Public Health	1
EHS/CDE 563	Biomarkers of Exposure, Effect, and Susceptibility in the Epidemiology of Noncommunicable Disease	1
EHS 567	Fundamentals of Green Chemistry and Green Engineering	1
EHS 568	Introduction to GIS for Public Health	1
EHS 569	Advanced GIS Workshop	1
EHS 581	Public Health Emergencies: Disaster Planning and Response	1
ENV 755	Modeling Geographic Space <sup>1</sup>	3
ENV 756	Modeling Geographic Objects <sup>1</sup>	3

<sup>1</sup> These courses are offered in the School of the Environment.

## 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. 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 spring term. In consultation with the student's academic adviser, an additional rotation may be offered during the summer between the first and second year. Research rotations will be available for both "dry" (i.e., statistical analysis) and "wet" (i.e., bench) laboratory research. 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 required 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 Coursework

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. 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 coursework in epidemiology (EPH 508 or CDE 516), in the breadth of public health (EPH 608) and in research proposal development (EMD 625 or CDE 617). EPH 608 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 coursework in epidemiology.

Students are required to take a minimum of ten courses (not including EPH 600). Course substitutions must be identified and approved by the student's adviser and the DGS.

#### CORE REQUIREMENTS

EMD 625 or CDE 617	How to Develop, Write, and Evaluate an NIH Proposal Developing a Research Proposal	1
EMD 670	Advanced Research Laboratories	1
EMD 671	Advanced Research Laboratories	1
EMD 672	Advanced Research Laboratories	1
EPH 508 or CDE 516	Foundations of Epidemiology and Public Health <sup>1</sup> Principles of Epidemiology II	1
EPH 600	Research Ethics and Responsibility <sup>2</sup>	0
EPH 608	Frontiers of Public Health <sup>1</sup>	1

<sup>1</sup> Students entering the program with an M.P.H. or relevant graduate degree may be exempt. Students granted an exemption must take an alternate course to replace EPH 608.

<sup>2</sup> 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, in consultation with the student's adviser, other courses in YSPH or in other departments may also be appropriate.

BIS 537	Statistical Methods for Causal Inference	1
BIS 567	Bayesian Statistics	1
CDE/EHS 566	Causal Inference Methods in Public Health Research	1
EHS 568	Introduction to GIS for Public Health	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 the Analysis and Interpretation of Public Health Surveillance Data	1
EMD 546	Vaccines and Vaccine-Preventable Diseases	1
EMD 550	Epidemiology and Control of Vector Borne Diseases	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
HPM 570	Cost-Effectiveness Analysis and Decision-Making	1
S&DS 530	Data Exploration and Analysis <sup>1</sup>	1

S&DS 538	Probability and Statistics <sup>1</sup>	1
S&DS 563	Multivariate Statistical Methods for the Social Sciences <sup>1</sup>	1

<sup>1</sup> These courses are 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 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.

## 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). 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.

## Coursework

Students are required to complete the following coursework (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 coursework 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 coursework 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 <sup>1</sup> (ALL STUDENTS)

EPH 508	Foundations of Epidemiology and Public Health <sup>2</sup>	1
EPH 600	Research Ethics and Responsibility <sup>3</sup>	0
EPH 608	Frontiers of Public Health <sup>2</sup>	1
HPM 600	Independent Study or Directed Readings <sup>1</sup>	2
HPM 610	Applied Area Readings	1
HPM 617	Colloquium in Health Services Research <sup>3</sup>	0
HPM 618	Colloquium in Health Services Research <sup>3</sup>	0

<sup>1</sup> Students must enroll in two distinct Independent Study courses (HPM 600).

<sup>2</sup> Students entering the program with an M.P.H. degree may be exempt. Students granted an exemption must take an alternate course to replace EPH 608.

<sup>3</sup> 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 <sup>1</sup>	1
ECON 558	Econometrics <sup>1</sup>	1

HPM 583	Methods in Health Services Research	1
MGMT 737	Applied Empirical Methods <sup>1</sup>	1
PLSC 500	Foundations of Statistical Inference <sup>1</sup>	1
PLSC 503	Theory and Practice of Quantitative Methods <sup>1</sup>	1
S&DS 563	Multivariate Statistical Methods for the Social Sciences <sup>1</sup>	1
S&DS 565	Introductory Machine Learning <sup>1</sup>	1
SBS 580	Qualitative Research Methods in Public Health	1
SOCY 580	Introduction to Methods in Quantitative Sociology <sup>1</sup>	1
SOCY 581	Intermediate Methods in Quantitative Sociology <sup>1</sup>	1
SOCY 582	Statistics III: Advanced Quantitative Analysis for Social Scientists <sup>1</sup>	1

<sup>1</sup> Course offered in the Graduate School of Arts and Sciences.

### Health Policy and Management

Minimum of two 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 570	Cost-Effectiveness Analysis and Decision-Making	1
HPM 573	Advanced Topics in Modeling Health Care Decisions	1
HPM 587	Advanced Health Economics	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

Four courses are required. These must include the following:

ECON 545	Microeconomics <sup>1</sup>	1
ECON 558	Econometrics <sup>1,2</sup>	1

<sup>1</sup> Course offered in the Graduate School of Arts and Sciences.

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

Students are required to take courses (or their equivalents) in graduate level microeconomics (i.e., ECON 545, Microeconomics and ECON 558, Econometrics, listed above) and a year-long sequence in econometrics, selected in consultation with the student's adviser (this will count towards the required Methods and Statistics courses). 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 <sup>1</sup>	1
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PSYC 553	Behavioral Decision-Making I: Choice <sup>1</sup>	1
<b>Industrial Organization</b>		
ECON 600	Industrial Organization I <sup>1</sup>	1
ECON 601	Industrial Organization II <sup>1</sup>	1
<b>Labor Economics</b>		
ECON 630	Labor Economics <sup>1</sup>	1
ECON 631	Labor Economics <sup>1</sup>	1
<b>Public Finance</b>		
ECON 556	Topics in Empirical Economics and Public Policy <sup>1</sup>	1
ECON 680	Public Finance I <sup>1</sup>	1
ECON 681	Public Finance II <sup>1</sup>	1

<sup>1</sup> Course 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 <sup>1</sup>	1
PLSC 801	Political Preferences and American Political Behavior <sup>1</sup>	1
PLSC 803	American Politics III: Institutions <sup>1</sup>	1

<sup>1</sup> Course offered in the Graduate School of Arts and Sciences.

Students will also choose one additional elective that will best prepare them for their dissertation research.

## **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 coursework.

## **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. Students will have the opportunity to follow the Maternal Child Health Promotion Pathway within SBS (or follow the traditional SBS curriculum). 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 Coursework

Students in SBS or the Maternal Child Health Promotion Pathway are expected to complete a minimum of fifteen courses (not including EPH 600) from the following courses or their equivalents. Course substitutions must be identified and approved by the student's adviser and 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.

#### CORE REQUIREMENTS (ALL STUDENTS)

CDE 617	Developing a Research Proposal <sup>1</sup>	1
or EMD 625	How to Develop, Write, and Evaluate an NIH Proposal	
EPH 508	Foundations of Epidemiology and Public Health <sup>3</sup>	1
EPH 600	Research Ethics and Responsibility <sup>2</sup>	0
EPH 608	Frontiers of Public Health <sup>3</sup>	1
SBS 574	Developing a Health Promotion and Disease Prevention Intervention	1
or SBS 541	Community Health Program Evaluation	
or SBS 593	Community-Based Participatory Research in Public Health	
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

<sup>1</sup> CDE 617 or EMD 625 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.

<sup>2</sup> This course does not count toward the minimum of fifteen courses.

<sup>3</sup> Students entering the program with an M.P.H. degree may be exempt. Students granted an exemption must take an alternate course to replace EPH 608.

In consultation with their dissertation adviser, SBS students (not in the Maternal and Child Health Promotion Pathway) will choose three 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, and CDE 516, Principles of Epidemiology II, also qualify as statistics or methods courses), as well as five additional electives that will best prepare them for their dissertation research.

### **Maternal and Child Health (MCH) Promotion Pathway**

Students that choose this pathway will be required to take the following three courses in addition to the core requirements listed for all SBS students.

EMD 533	Implementation Science	1
HPM 542	Health of Women and Children	1
SBS 594	Maternal-Child Public Health Nutrition	1

MCH Promotion Pathway students are required to take three electives from this list and two additional electives chosen in consultation with their adviser:

BIS 505	Biostatistics in Public Health II	1
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
CDE 516	Principles of Epidemiology II	1
CDE 566	Causal Inference Methods in Public Health Research	1
or EMD 582	Political Epidemiology	
EPH 505	Biostatistics in Public Health	1
HPM 575	Evaluation of Global Health Policies and Programs	1
S&DS 563	Multivariate Statistical Methods for the Social Sciences	1

## **Qualifying Examination**

The qualifying examinations in SBS have two primary components: (1) A written draft of the dissertation prospectus (2) an oral presentation of the proposal. The expected timeline for SBS Qualifying exams ranges from the end of the spring term in the second year to the end of the spring term in the third year. Students will submit their written dissertation prospectus to the SBS Chair and a date for the oral presentation will be scheduled approximately three weeks after the student submits to the SBS Chair.

Detailed information regarding the SBS Qualifying Examinations can be obtained from the GSEC Departmental Representative.

## **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 coursework 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 Public Health. 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 COURSEWORK

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

## BIostatistics

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

- Conduct independent research in the theory and/or application of biostatistics.
- Utilize critical thinking to select from a variety of analytical and computational tools to test statistical hypotheses, interpret results of statistical analyses, and use these results to make relevant inferences from data.
- Demonstrate teaching and presentation skills to effectively communicate biostatistics theory and applications across a wide range of complex biomedical or public health problems.

## Chronic Disease Epidemiology

Upon receiving a Ph.D. in Public Health in the Department of Chronic Disease Epidemiology, the student will be able to:

- Discuss and critically evaluate epidemiologic reports and research articles.
- Teach content material for a course in the student's broad discipline.
- Design and write an original research proposal in the student's discipline.
- Apply at an advanced level the research methodology of the student's specific research area.

## Environmental Health Sciences

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

- Critique and evaluate the merit of environmental exposure methods.
- Form a hypothesis and synthesize testable aims to tackle an environmental health issue.

- Apply appropriate epidemiological design and statistical methods to analyze the link between environmental exposures and health impacts.

## **EPIDEMIOLOGY OF MICROBIAL DISEASES**

Upon receiving a Ph.D. in Public Health in the Department of Epidemiology of Microbial Diseases, the student will be able to:

- Conduct quantitative analyses of epidemiological data.
- Apply the research methodology of the student's broader discipline to a specific research project within the student's area of interest.
- Formulate an epidemiologic research question that addresses a gap in the literature.

## **HEALTH POLICY AND MANAGEMENT**

Upon receiving a Ph.D. in Public Health in the Department of Health Policy and Management, the student will be able to:

- Analyze the health policy and management challenges that affect the delivery, quality, and costs of care for individuals and populations.
- Critically evaluate past and current research in health policy and management.
- Apply economic or political science theory and statistical methods to the analysis of relevant research questions in health policy and management.

## **SOCIAL AND BEHAVIORAL SCIENCES**

Upon receiving a Ph.D. in Public Health in the Department of Social and Behavioral Sciences, the student will be able to:

- Analyze how culture, social inequities, and biology influence health across the lifespan.
- Understand and conduct qualitative analyses that best answer research problems.
- Understand and conduct quantitative analyses that best answer research problems.

# **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).

# **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 two terms at the TF level 10 or 20, typically during years two and three. 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 both the student's advisor and the



DGS. In the rare instances this exception is approved, the student will only be allowed to serve at the TF-10 level.

# 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** Lee Kennedy-Shaffer

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. Not open to auditors. 2 Course cr

### **BIS 525a and BIS 526b, Seminar in Biostatistics and Journal Club** Staff

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 534, Stochastic Models and Inference for the Biomedical and Social Sciences ]**

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. 1 Course cr

**BIS 536b, 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. Prerequisites: 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 540b, Fundamentals of Clinical Trials** Tassos Kyriakides

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 542E, Introduction to Health Informatics ]**

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. Open only to students enrolled in the Executive Online M.P.H. Program. Not open to auditors. 1 Course cr

**BIS 543Eb, 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 interoperation 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. Open only to students enrolled in the Executive Online M.P.H. Program. Not open to auditors.

**BIS 544Ea, 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. Open only to students enrolled in the Executive Online M.P.H. Program. Not open to auditors.

**BIS 550b, Topics in Biomedical Informatics and Data Science** Samah Jarad

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 basic 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 interoperation 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** Leying 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 560a, Introduction to Health Informatics** Andrew Taylor

Health Informatics is a diverse and varied field. This course is designed to provide a general introduction to health informatics. Students will gain foundational knowledge in clinical information systems, health data standards, electronic health records and data security/privacy issues, among other areas. Students will survey a variety of informatics subfields including research, laboratory/precision medicine, imaging, and artificial intelligence. A particular focus for the course will be conceptual underpinnings that generalized well to all informatics disciplines. Permission of the instructor required.

**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 568b, Applied Artificial Intelligence in Healthcare** Andrew Taylor and Wade Schulz

Recent advances in machine learning (ML) offer tremendous promise to improve the care of patients. However, few ML applications are currently deployed within healthcare institutions and even fewer provide real value. This course is designed to empower students to overcome common pitfalls in bringing ML to the bedside and aims to provide a holistic approach to the complexities and nuances of ML in the healthcare space. The class focuses on key steps of model development and implementation centered on real-world applications. Students apply what they learn from the lectures, assignments, and readings to identify salient healthcare problems and tackle their solutions through end-to-end data engineering pipelines. Students are expected to be proficient in programming (R, Python, or Julia preferred) and have some prior experience in machine learning including data preprocessing (e.g., Python-Pandas, R-Tidyverse) and the development and validation of ML models (e.g. logistic regression, random forest, XGBoost). Otherwise, permission of the instructor is required.

**[ BIS 575, Introduction to Regulatory Affairs ]**

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. 1 Course cr

**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 M.S. and Ph.D. students only.

**BIS 610a or b, 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 620, Data Science Software Systems ]**

This course focuses on the principles of software engineering needed to be an effective informatician and data scientist. It provides the fundamentals needed to create extensible systems for processing, visualizing, and analyzing data along with providing principles for reproducibility and communication in R and Python. Prerequisite: BIS 679 or its equivalent, or permission of the instructor. 1 Course cr

**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. Not open to auditors.

**BIS 623a, Advanced Regression Models** Heping Zhang

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. Prerequisite: BIS 623 or equivalent.

**BIS 629a, Advanced Methods for Implementation and Prevention Science** Donna Spiegelman

The course presents methods for the design and analysis of studies arising in the implementation and prevention science space. These studies 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. Through the provision of student PASS licenses, competency in the use of this leading software for study design is acquired. Prerequisites: S&DS 541 and S&DS 542 or equivalents, or permission of the instructor.

**BIS 630b, Applied Survival Analysis** Yuan Huang

Survival analysis is a critical field in statistics for analyzing time-to-event (survival) data which are commonly encountered in clinical and medical research. Survival data typically involve various forms of censoring and truncation, necessitating specialized developments in analytical approaches. This practical course covers fundamental concepts, descriptive analysis, testing procedures, and modeling techniques, including nonparametric, parametric, and semi-parametric approaches. The course structure

begins with an introduction to classical survival analysis techniques early in the semester. As the course progresses, students will delve into contemporary models in later modules. Throughout the curriculum, the course places a strong emphasis on practical application, equipping students with the skills to analyze and implement these methods using R. It also incorporates case studies, journal readings, discussions, and encourages active student engagement. Prerequisites: BIS 505 and BIS 623 or equivalent, and college-level calculus, or permission of instructors. Not open to auditors.

**BIS 631b, Advanced Topics in Causal Inference Methods** Laura Forastiere

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.

**BIS 633a, Population and Public Health Informatics** Brian Coleman

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 and George Hauser

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. Prerequisite: CPSC 223 or permission of the instructors. The general expectation to obtain instructor permission is that students have basic command of the Python programming language sufficient to pass CPSC 223 or the equivalent.

**BIS 640b / SBS 640b, User-Centered Design of Digital Health Tools** Terika McCall

This course combines needs assessment methods, user-centered design principles, and an agile approach to designing digital health tools for consumers. The class environment is designed to model that of a health tech start-up. Students are expected to apply what they learn from the lectures and readings to identify a pain point (i.e., a problem or need faced by a prospective user) and solicit input from intended users to design a prototype of the digital health tool. Solutions are presented in class to receive feedback on the design and to iteratively refine a prototype in order to create a minimum viable product. Prerequisite: BIS 560/CB&B 740, SBS 574, or permission of the instructor.

**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. Not open to auditors.

**BIS 645a, Statistical Methods in Human Genetics** Hongyu Zhao

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.

**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. Not open to auditors.

**BIS 649a and BIS 650b, Master's Thesis Research** Shuangge Ma

Students work with a faculty adviser to design and conduct a study, write the thesis, and present the results. Detailed guidelines for the thesis are outlined in Appendix II of the YSPH Bulletin. To meet the capstone requirement for the MS degree, the thesis may be selected in lieu of Statistical Practice II (spring term). Students selecting the thesis must take Statistical Practice I (fall term).

**BIS 662b, Computational Statistics** Forrest Crawford

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 678a, Statistical Practice I** Lisa Calvocoressi, Peter Peduzzi, Denise Esserman, Kendra Plourde, and James Dziura

This is the first semester of the yearlong capstone course for biostatistics M.P.H. and M.S. students. The course, which prepares students to transition from the classroom to the real-world practice of biostatistics, assumes a strong foundation in statistical analysis and knowledge of epidemiological methods. The course augments that knowledge with topics frequently encountered in practice (e.g., calculating sample size, handling missing data), and it provides opportunities to apply that knowledge to real world study design and analysis. Throughout, we encourage students to bring a “big picture” perspective to their work by considering the study’s research question, aims, and hypotheses, which provide the framework for designing the study and planning and conducting appropriate statistical analyses. Moreover, as biostatisticians must be able to clearly communicate their findings to fellow statisticians and non-statisticians, this course provides multiple opportunities for students to present their work orally and in writing. As in statistical practice, there are opportunities for problem-solving and

decision-making at the individual and group level. This course is required of all second-year biostatistics M.P.H. students and M.S. students (standard, data science, and implementation science pathways). Prerequisites: SAS programming skills; BIS 621 or BIS 623 and instructor approval are required. BIS 628 and BIS 630 are recommended.

**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. Not open to auditors.

**BIS 681b, Statistical Practice II** Peter Peduzzi, Denise Esserman, Kendra Plourde, Lisa Calvocoressi, and James Dziura

This is the second semester of the yearlong capstone course designed to prepare students to transition from the classroom to the real-world practice of biostatistics. This term, students will apply knowledge and skills acquired in Statistical Practice I, and throughout the master's program, to design a complex real-world study, analyze the data, and present and appropriately interpret the results. Mirroring the collaborative research environment in which biostatistics students are likely to practice, the projects are team-based, giving students the opportunity to develop teamwork and project management skills, in addition to problem solving and decision-making skills. Through presentations throughout the term, and a final written report that is the culmination of the semester's work, students will gain additional practice communicating their work to statisticians and non-statisticians. This course OR the thesis is required of second year biostatistics MPH students and biostatistics MS standard pathway students. Prerequisite: BIS 678; open to second-year Biostatistics M.P.H., M.S., and doctoral students, or by permission of the instructors.

**BIS 685a and BIS 686b, Capstone in Health Informatics** Pamela Hoffman, Kei-Hoi Cheung, David Chartash, and Hamada Altalib

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. Not open to auditors.

**[ BIS 687, Data Science Capstone ]**

This course prepares students to transition from the classroom to the real-world practice at the intersection of biostatistics and data science. Students develop a holistic solution to an analytical problem by proposing study aims, hypotheses, and system design and then develop a robust, reproducible solution addressing said hypotheses. Moreover, as biostatisticians must be able to clearly communicate their findings to fellow statisticians and the domain experts with whom they collaborate, this course

provides multiple opportunities for students to present their work orally and in writing. As in statistical practice, there are opportunities for problem-solving and decision-making at the individual and group level. Prerequisite: BIS 678. 1 Course cr

**BIS 691b, Theory of Generalized Linear Models** Zuoheng 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 692, Statistical Methods in Computational Biology ]**

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. 1 Course cr

**BIS 695a or b, Summer Internship in Biostatistics** Shuangge Ma

The summer internship in biostatistics for M.S. students provides a hands-on, real-world experience in support of the student's educational and career goals. It is strongly encouraged that students seek out an internship with a public health or biomedical focus. The internship requires a full-time (thirty to forty hours per week) for ten to twelve weeks in the summer following the first year of the program. Students need to develop a work plan in conjunction with their internship supervisor and the student's faculty adviser must obtain approve the plan. The student and internship supervisor must also complete a post-internship evaluation. First-year M.S. Health Informatics students choosing to participate in a summer internship should also enroll in this course. Prerequisite: completion of one year of the M.S. program or permission of the instructor. 0 Course cr

**BIS 699a or b, Summer Internship in Biostatistical Research** Shuangge Ma

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 proposal that has practical significance for addressing important scientific questions. Students work with a biostatistics or health informatics faculty mentor to select a suitable placement for the summer intern, and a one-page description of the plans is submitted to the instructor at least three weeks prior to starting the program, for approval within two weeks. The internship must be full-time: thirty-five to forty hours per week for ten to twelve 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. 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. Not open to auditors.

### **[ 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** Leah Ferrucci

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. Not open to auditors.

### **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** Staff

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. Not open to auditors.

**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 538b, Soda Politics: How the Soft Drink Industry Profoundly Influences Social Policy around the World** Neal Baer

The story of soda is a remarkable tale of how a product that has no nutritional value and costs pennies to make came to be a mammoth profit leader through ingenious advertising, lobbying, and marketing. We explore soda's profound impact on health, the economy, the environment, philanthropy, and advertising and read the most recent studies on its contribution to the obesity epidemic. We also delve into who the players are in the politics of soda—the public health officials, lobbyists, health activists, advertising agencies, lawmakers, taxpayers, and academic researchers—and discuss what role, if any, the government should play in controlling access to soda in schools, hospitals, and other governmental institutions, and whether taxing soda is at odds with freedom of choice in the marketplace. Prerequisite: some facility with reading scientific journal articles and analyzing statistics is necessary. ½ Course cr

**[ CDE 540E, Principles of Epidemiology II ]**

This is an intermediate-level course on epidemiologic principles and methods. 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. Open only to students enrolled in the Executive Online M.P.H. Program. Not open to auditors. 1 Course cr

**CDE 541Ea, Applied Analytic Methods in Epidemiology** Josefa Martinez

Students are given 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. Open only to students enrolled in the Executive Online M.P.H. Program. Not open to auditors.

**[ CDE 543E, Systematic Reviews and Meta-analyses: Methodology of Synthesizing Evidence ]**

Evidence-based medicine and health care uses best current evidence in addressing clinical or public health questions. This course introduces principles of evidence-based practice in formulating clinical or public health questions, systematically searching for evidence, and applying it to the question. Types of questions considered include: examining the comparative effectiveness and safety of clinical and public health interventions, disease etiology (risk factor analysis), diagnostic testing, and prognosis. Particular consideration is given to the methodology of synthesizing evidence in a systematic review. Also addressed is the role of evidence in informing economic analysis of health care programs, and clinical and public health 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 and software. Open only to students enrolled in the Executive Online M.P.H. Program. Prerequisites: EPH 534E (Foundations of Epidemiology and Public Health). Not open to auditors. 1 Course cr

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

One of four overarching goals of Healthy People 2030 is to “eliminate health disparities, achieve health equity, and attain health literacy to improve the health and well-being of all.” This course explores disparities in the chronic diseases that contribute disproportionately to ill health, resource utilization, reduced quality of life, and mortality. We take a life course perspective as we explore disparities across the spectrum of chronic diseases in the context of history, power and privilege that perpetuate them. Learning to think critically about studies in the field and developing creative ideas for new approaches to research, intervention and policy is a key goal. 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 547b, Global Infectious and Chronic Disease Patterns** Catherine Yeckel

The global burden of disease has been transitioning from communicable to noncommunicable diseases, but both remain major health issues. Accordingly, it is critical to develop perspectives and approaches to address this evolving double burden of disease. While traditionally infectious and chronic diseases have been siloed in public and global health, the emerging health picture is one of a complex relationship not easily teased apart. There is both the potential for co-existence and influence imposed between infectious and chronic diseases. The goal of this course is to examine and critique both the classic separateness and the modern-day complex interconnectedness and co-existence between infectious disease and chronic disease entities, including the role of environmental factors on these global conditions.

**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 553b, Implementation Science to Address Chronic Diseases: Global Health Case Studies** Archana Shrestha

Chronic diseases, including cardiovascular diseases, cancer, diabetes, and obstructive lung disease, cause most premature deaths globally, with most occurring in low- and middle-income countries. Implementation Science takes “what we know” and turns it into “what to do and how” and systematically studies the strategies that enable research uptake into real-world settings. More implementation research is needed to meet the challenges of applying evidence-based interventions with fidelity, sustainability, and scale in different settings. This course provides an overview of the application of implementation science with seven case studies demonstrating how to define evidence-based interventions and implementation strategies; how to select,



adapt, and apply theories/frameworks/models to global settings, how to develop and test implementation strategies, and how to evaluate implementation processes and outcomes. ½ Course cr

**[ CDE 562, Nutrition and Chronic Disease ]**

This course provides students with a scientific basis for understanding the role of nutrition and specific nutrients in the etiology, prevention, and management of chronic diseases. Nutrition and cancer are particularly emphasized. Other topics addressed include cardiovascular diseases, osteoporosis, obesity, diabetes mellitus, and aging. Implications for federal nutrition policy, such as dietary guidelines, dietary supplement regulations, and food labeling, are discussed. Not open to auditors. 1 Course cr

**[ CDE 563, Biomarkers of Exposure, Effect, and Susceptibility in the Epidemiology of Noncommunicable Disease ]**

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. 1 Course cr

**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 (1) the principles of causal logic including counterfactuals and probability logic, (2) epidemiological study designs and sources of biases including misinterpretations of statistics, (3) applications of causal diagrams in epidemiology, (4) 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 and James Dodington

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 570b, Humanities, Arts, and Public Health** Judith Lichtman

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.

**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 582a, Health Outcomes Research: Matching the Right Research Question to the Right Data** Michaela Dinan

The overarching goal is to provide a bridge between previously learned statistical methodologies and public health subject matter (see prerequisites) to knowledge of secondary data resources and the ability to critically formulate and evaluate a research question. The course has been designed with the goal of achieving the following learning objectives: (1) understand types of health outcomes study designs and associated strengths and limitations; (2) know how to critically interpret studies; (3) critically formulate a research question; (4) be familiar with commonly used types of data and associated strengths and limitations; (5) be able to write, communicate, and

incorporate feedback on a research question and analysis plan; (6) be able to evaluate and provide feedback on research questions and analysis plans. Prerequisites: EPH 505, EPH 507, EPH 508, and EPH 510. Not open to auditors.

**[ CDE 588, Perinatal Epidemiology ]**

In this course we explore the epidemiologic field of fertility, pregnancy, and pregnancy-related outcomes for the mother and the offspring. Through lectures and discussions, we focus on particular substantive topics and methodological challenges and opportunities relevant to the perinatal setting. Examples of topics are family planning, maternal pregnancy complications, birth outcomes, and long-term consequences of being born preterm. Important risk factors are covered, with a focus on modifiable risk factors (e.g., smoking and nutrition), key demographics (e.g., age and race/ethnicity), and climate change. For methods, we examine how the use of e.g. negative controls, sibling comparisons and instrumental variables can reduce the numerous biases in this field. Current and landmark studies are discussed and critically reviewed. While students are introduced to basic pregnancy biology along with some public health policy, this course is primarily oriented towards epidemiological research: Students develop the ability to critically appraise the literature in perinatal epidemiology, identify research gaps, and design studies to address these gaps. Prerequisite: EPH 508 - Foundations of Epidemiology and Public Health (or equivalent) 1 Course cr

**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 M.S. and Ph.D. 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 617a, 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. Not open to auditors.

**[ CDE 634, Advanced Applied Analytic Methods in Epidemiology and Public Health ]**

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. 1 Course cr

**CDE 650a, Introduction to Evidence-Based Medicine and Health Care** Shi-Yi Wang

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.

**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. Not open to auditors.

**EHS 503b, Public Health Toxicology** Vasilis Vasiliou

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. Not open to auditors.

**[ EHS 507, Environmental Epidemiology ]**

This course is designed to focus on application of epidemiology principles and methods to study environmental exposures and adverse health outcomes. The major focus of 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 literature 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 are an essential component when studying environmental hazards in relation to human health, which are also addressed and discussed in the class. Prerequisites: EPH 505 and EPH 508, or permission of the instructor. 1 Course cr

**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 530, Our Air, Our Health ]**

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. 1 Course cr

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

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 540Ea, Environmental Exposure Assessment** Nicole Deziel and Krystal Pollitt

Individuals are exposed to a multitude of chemical and physical environmental agents as they move through various microenvironments carrying out their daily activities. Accurate environmental and occupational exposure data are critical for (1) tracking changes in exposures over time, (2) investigating links with adverse health outcomes in epidemiologic analyses, (3) conducting risk assessments, and (4) comparing against regulatory standards. However, quantitative exposure data are difficult to collect, and often surrogate measures are used. This course focuses on providing tools to evaluate air, water, and physical stressors encountered in the indoor, outdoor, and occupational environment. Indirect and direct methods of assessing exposures in environmental and occupational settings are reviewed. Criteria for evaluating the quality of an exposure assessment and exposure data are discussed. The course covers the design of exposure assessment strategies for research and public health practice, the techniques and methods for sampling and analysis, and the interpretation of data. In addition, it incorporates aspects of inequities in environmental exposures (environmental justice). The class consists of lectures, discussions of readings and exposure data, and hands-on exposure monitoring. Open only to students enrolled in the Executive Online M.P.H. Program. Not open to auditors.

**[ EHS 541E, Toxicity of Environmental Chemicals and Green Chemistry Solutions ]**

Students learn the foundation for understanding the role of toxicology in public health protection, with a focus on twenty-first-century techniques and challenges. Students are introduced to basic principles of toxicology (such as dose response, mechanisms of toxicity, and cellular defense) and then move on to advanced topics, such as early life vulnerability, low-level exposure to mixtures, systems biology approaches, green chemistry solutions, and the problems presented by chemicals that are common in consumer products and the built environment. Open only to students enrolled in the Executive Online M.P.H. Program. Not open to auditors. 1 Course cr

**EHS 542Eb, Risk Assessment and Policy** Gary Ginsberg

This course introduces the methodology, interpretation, applications, and communication surrounding the use of risk assessment in public health. Students gain an understanding of how toxicology information on hazard and dose response is

incorporated with exposure information to predict the health risk to a wide variety of populations. Students develop a risk assessment for a real-world exposure issue. Open only to students enrolled in the Executive Online M.P.H. Program.

**EHS 544a, Climate Equity and Health Policy Methods** Suzi Ruhl

Climate change presents threats to human health and well-being, while escalating health inequities. These health impacts can be direct, indirect, and cumulative. Concomitantly, efforts to prevent and respond to climate change can offer beneficial health impacts to vulnerable and disadvantaged populations. This course focuses on policy research methods, offers a policy to practice approach, and is accountable to communities most vulnerable to climate change. As a foundation, the course explores the “face of climate inequity” considering structural biases, social inequities, and racism that undermine health and create challenges for those most vulnerable to climate change. It also increases awareness of cultural values and practices that should be considered in the design, implementation, and evaluation of climate equity and health policies and programs. Further, the framework of the course triangulates rule of law, evidence-based methodologies, and meaningful engagement. It introduces the basic principle of “rule of law” as a means to navigate government policy making with an understanding of administrative law and relevant environmental laws. It builds on this foundation to explore policy methods buttressed by evidence that is based on academic and lived experience expertise. It addresses mapping tools and data analysis accountable to disadvantaged populations. It incorporates consideration of “meaningful engagement” of vulnerable populations, with a special focus on the disproportionate impacts of climate change on the whole health of disadvantaged individuals, families, and communities. Further, key health topics are highlighted through integrative case studies, including climate resiliency and family mental health and health care systems. Innovation at the state and local levels of government are also addressed. Throughout the course, attention is directed to integration of these concepts through applied learning. Prerequisite: EHS 547 or permission of the instructor.

**EHS 547b, Climate Change and Public Health** Daniel Carrion

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, planetary boundaries, and planetary health, and exploring the fundamentals of climate change science, the course covers impacts of climate change on public health, including extreme heat, wildfires, hurricanes and flooding, vector-borne diseases, population displacement, and mental health effects. 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 immediate 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 YSPH and the university. Prerequisite: EPH 508 or HLTH 240 or equivalent, or permission of the instructor. Not open to auditors.

**EHS 560a, Methods in Climate Epidemiology** 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. The 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 and EPH 508 or equivalent; or permission of the instructor. Not open to auditors.

**[ EHS 563, Biomarkers of Exposure, Effect, and Susceptibility in the Epidemiology of Noncommunicable Disease ]**

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. 1 Course cr

**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 (1) the principles of causal logic including counterfactuals and probability logic, (2) epidemiological study designs and sources of biases including misinterpretations of statistics, (3) applications of causal diagrams in epidemiology, (4) 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 Chemistry and Green Engineering** Paul Anastas and Hanno Erythropel

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, 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 569b, Advanced GIS Workshop** Jill Kelly

The course teaches advanced concepts in GIS analysis; techniques for the planning, automation, and reproducibility of GIS workflows; and strategies for communicating results broadly. Students practice a range of technical skills essential for both academic research and practical application in the field of spatial public health. The Python programming language is introduced, with no prior coding experience required. Prerequisite: EHS 568, or equivalent comprehensive introduction to GIS and spatial analysis.

**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 and Linda Cantley

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** Joanne McGovern

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 598a, Environment and Human Health** Michelle Bell

This course provides an overview of the critical relationships between the environment and human health. The class explores the interaction between health and different parts of the environmental system including weather, air pollution, greenspace, environmental justice, and occupational health. Other topics include environmental ethics, exposure assessment, case studies of environmental health disasters, links between climate change and health, and integration of scientific evidence on environmental health. Students learn about current key topics in environmental health and how to critique and understand scientific studies on the environment and human health. The course incorporates lectures and discussion.

**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 Ph.D. students only.

**EHS 619a and EHS 620b, Research Rotation** Kai Chen

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** Staff

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 4 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** Chandra Kelsey and 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. Not open to auditors.

**EPH 501a or b, U.S. Health Justice Concentration Practicum** Danya Keene

This is the practicum course for the U.S. Health Justice Concentration. All students participating in the U.S. Health Justice Concentration complete a practicum. (With additional approval of the Office of Public Health Practice, this course can also be used to meet the Applied Practice Experience requirement for graduation.) This practicum experience addresses the objectives of the concentration and is conducted in partnership with a public health or other community organization. Students who choose to complete the practicum during an academic term enroll in this course (in lieu of EPH 500). Prior to the practicum, students complete a work plan and project description that will be reviewed by a faculty adviser and their preceptor at the partner organization. Possible projects may include evaluation, needs assessment, advocacy, public health communication, and/or service provision. Projects should be focused on understanding and ameliorating social or structural determinants of health inequality. During the practicum, students participate in biweekly group reflection meetings with concentration faculty and other concentration students. Upon completion of the practicum, students produce a minimum of two tangible work products or deliverables. These projects and deliverables must be distinct from the students' thesis work or work completed in other independent study courses. Open only to students in the U.S. Health Justice Concentration. Prerequisite: SBS 590 (may be taken concurrently).

**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** Leah Ferrucci

This course presents an introduction to epidemiologic definitions, concepts, and methods. Topics include history of epidemiology, descriptive epidemiology and burden of disease, measurement of disease frequency and association, study design (ecologic, cross-sectional, case-control studies, cohort, intervention, public health surveillance and programs), selection and information bias, confounding, effect modification, measurement validity and screening, random variation and precision, and causal inference. This course also covers skills for quantitative problem-solving, understanding epidemiologic concepts in the published literature, and key developments and readings in the field of modern epidemiology.

**EPH 509b, Fundamentals of Epidemiology** Linda Niccoli

The purpose of this course is to provide M.S. and Ph.D. students with foundational knowledge in epidemiologic research and approaches for statistical analysis. This course first presents an introduction to the study of epidemiology for public health and the role of biostatistics. Students learn the appropriate calculation and interpretation of basic measures of disease frequency and association. This course introduces the concept of causal inference in epidemiologic research, including theoretical frameworks and analysis approaches to minimizing error due to confounding, effect modification, bias, measurement, and sampling variability. The course introduces each of the main study designs used in epidemiologic research (e.g., randomized trials, cohort and case-control studies) and analysis approaches for causal inference in each design. The course is focused on concepts and approaches, and it includes a strong emphasis on reading the published literature as case studies for critical evaluation. Not open to auditors.

**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: Ethics and Practice** Laura Bothwell

This course helps to prepare students for the complicated work of translating public health theory into practice. We consider how to ethically implement public health research and programs across a range of selected major health threats. We explore ethical principles that guide best practices and deliberative processes and the challenges of negotiating and implementing those principles. Ethics is addressed at social, political, institutional, interpersonal, and individual levels as we seek to cultivate ethical systems of public health delivery and to foster sophisticated independent ethical

reasoning skills as future public health leaders. Enrollment limited to YSPH students. Not open to auditors.

**[ EPH 520, Summer Internship - non-APE ]**

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, typically ten to twelve weeks and no less than eight weeks in duration. While the Summer Internship fulfills the internship requirement for the degree, it does not complete the Applied Practice Experience (APE) requirement. o Course cr

**[ EPH 521, Summer Internship - APE ]**

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, typically ten to twelve weeks and no less than eight weeks in duration. The Summer Internship course also completes the practice requirement for the M.P.H. degree with 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 528E, Everyday Leadership ]**

Leadership encompasses a multi-dimensional set of skills that need to be leveraged based on situation and context. Understanding what leadership is and how to grow these skills requires the capacity to be a constant learner and adapt in the face of new situations and circumstances. This course develops a learner-leader framework for students to maximize their own leadership capacity through experiential learning and application of the course material. Throughout the course (an intensive provided in six

half-day modules), students engage in various learning modalities, including pre-class assignments, lectures, small group discussions, and writing assignments. Open only to students enrolled in the Executive Online M.P.H. Program. Not open to auditors.  
½ Course cr

**[ EPH 529E, Executive Communication Skills for Public Health and Healthcare ]**

This course strengthens a constellation of leadership communication competencies essential for work at the executive level in public health and healthcare contexts. We address strategies for articulating ideas to engage a spectrum of stakeholders and skills for advocating change. The course begins with a scientific examination of the markers of credibility in oral communication, followed by an exploration of the role of culture and diversity in framing suggestions to groups. We consider modes of persuasion as participants build facility in appealing to a variety of decision-making styles, while maintaining personal authenticity. We then examine modes of inquiry as well as team collaboration from strategic and linguistic viewpoints. The course concludes with participants completing a high-stakes presentation tailored for a policy group, a scientific panel, or venture capitalists. Open only to students enrolled in the Executive Online M.P.H. Program. Not open to auditors. ½ Course cr

**EPH 530Ea, Design Thinking in Public Health Systems** Kali Bechtold

Solution-focused problem-solving is an essential competency for public health professionals. This intensive introduces an iterative framework to innovatively solve complex challenges from the perspective of target user groups. Students address complex public health challenges utilizing a design-thinking framework. Students leave the intensive with a firm understanding of how to address complex public health challenges that account for their target user's desires/needs, what is financially viable and sustainable, and what is technically feasible. This is one in a three-part series of intensives for students enrolled in the Executive Online M.P.H. Program. Open only to students enrolled in the Executive Online M.P.H. Program. Not open to auditors.  
½ Course cr

**[ EPH 531E, Strategic Management in Complex Systems ]**

Solving the world's most pressing public health challenges requires strategic management of resources in the context of complexity. This intensive uses case-based teaching and learning in small groups to prepare students to effectively manage human, financial, and political resources to improve implementation of public health programs and strategies. This is one in a three-part series of intensives for students enrolled in the Executive Online M.P.H. Program. Open only to students enrolled in the Executive Online M.P.H. Program. Not open to auditors. ½ Course cr

**[ EPH 532E, Leading Effective Teams ]**

Leadership is commonly described as the process of engaging others to set and achieve a common goal. This intensive prepares students to work in high-functioning interdisciplinary teams in public health, applying a relational approach to leadership. Students explore theories and practices of leadership and followership, working effectively across organizational boundaries and levels of hierarchy, and engaging with diverse organizations in cross-sectoral collaborations to promote public health. Students are exposed to evidence-based approaches to prospective organizational culture change to apply in their own organizations. Theories and principles are demonstrated through experiential learning activities and structured self-reflection.

This is one in a three-part series of intensives for students enrolled in the Executive Online M.P.H. Program. Open only to students enrolled in the Executive Online M.P.H. Program. Not open to auditors. ½ Course cr

**[ EPH 533E, Foundations of Behavior Change ]**

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. Students learn and practice the fundamentals of health behavior change (i.e., behavioral theory) via experiential exercises. Open only to students enrolled in the Executive Online M.P.H. Program. Not open to auditors. 1 Course cr

**EPH 534Ea, Foundations of Epidemiology and Public Health** Carol Oladele

This course introduces the fundamental principles of epidemiology, concepts, and methods of application in public health. Students gain an understanding of the role of epidemiology in investigations of diseases and health events in clinical and public health settings. Topics covered include the history of epidemiology, description of population patterns, study design, measurement of disease frequency, causal inference, measurement, sources of bias, confounding, and effect modification. Students critically evaluate and interpret epidemiologic findings from published literature. Open only to students enrolled in the Executive Online M.P.H. Program. Not open to auditors.

**[ EPH 535E, Biostatistics in Public Health ]**

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. Open only to students enrolled in the Executive Online M.P.H. Program. Not open to auditors. 1 Course cr

**EPH 536Eb, Evidence-Based Decision-Making in Public Health** LaDrea Ingram

This online seminar for M.P.H. students focuses on interdisciplinary, student-driven learning and utilizes a mixture of teaching approaches including lecture, large- and small-group discussion, case studies, and practicum sessions. Students learn how to apply principles of complex systems theory to define evidence, explore different types of evidence and evidence-based decision-making frameworks, and apply their knowledge and public health training to real-world public health decision-making through case study analysis. Through their work in this course, students develop critical thinking approaches to enable evaluation of both the quality and robustness of evidence, as well as potential gaps between theory and practice in evidence-based decision-making in public health. By studying the experience of others in the field of public health, students are able to apply “lessons learned” from past examples of public health decision-making to their own work and interest area(s). The final product for this course is a heavily documented, seven-page paper applying principles and practice of evidence-based decision-making to the student’s area of public health interest. Students develop their final paper throughout the term, receiving feedback from the instructor and their classmates. Open only to students enrolled in the Executive Online M.P.H. Program. Not open to auditors.



**EPH 537Ea, Frontiers of Public Health** Jeannette Ickovics

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. Open only to students enrolled in the Executive Online M.P.H. Program. Not open to auditors.

**EPH 538Eb, Health Policy and Health Care Systems** Jason Hockenberry

This core course for the Executive M.P.H. program 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 compared to other countries. Recorded lectures are made available to set the stage for each week's topic(s), and we meet as a group to discuss the material and apply key concepts to the practice of health policy. The course examines the fundamental concerns – affordability, accessibility, and quality – that shape the development of health policy and health systems. Students are introduced to the key stakeholders, policy makers, institutions, and processes that influence the design and implementation of health policy and health care systems. Health issues are placed in the context of broader social goals and values, including equity; and critical trade-offs to be made while seeking such goals are discussed. To lend some coherence to our explorations, these general concerns are illustrated most consistently with health policies and programs from the United States. However, we draw from examples from other countries during several class sessions to convey how health policy and system issues play out in other nations. Open only to students enrolled in the Executive Online M.P.H. Program. Not open to auditors.

**EPH 539Ea, Ethics in Public Health** Laura Bothwell

The purpose of this condensed course is to familiarize students in the online Executive M.P.H. with critical foundations of public health ethics and to foster sophisticated ethical reasoning so that students may carefully apply and negotiate different ethical principles in relation to current public health challenges. The course examines ethical frameworks across cultures and considers sociohistorical context in relation to ethical constructs and applications. Attention is given to the interplay of race, gender, social inequalities, and marginalized populations when approaching matters of public health ethics. The first part of the course explores core principles of public health ethics; the second part of the course broadly applies these principles to some key areas of the field of public health practice in which ethics are particularly pertinent – infectious disease control, environmental health, social determinants of health, and policies of global health care access. Each session has readings and prerecorded material viewable online that should be completed before class. For each session, we meet for one hour of live discussion and interaction that synthesize and build on the readings and prerecorded

material. Brief written reflections are incorporated into live interactions. A paper in which students evaluate ethical principles in relation to practical professional public health experience is developed and discussed incrementally. Open only to students enrolled in the Executive Online M.P.H. Program. Not open to auditors. ½ Course cr

**EPH 540Ea and EPH 541Eb, Executive M.P.H. Capstone** Debbie Humphries

This course is designed to strengthen students' skills in applied public health practice and integrative work products that are of immediate relevance to public health organizations. The course works with students to help them meet the requirements of the M.P.H. applied practice experience (APE) and the M.P.H. integrative learning experience (ILE). In the first term, students complete work products that strengthen their skills in applied (public) health practice. In the second term, students complete work products that demonstrate their ability to integrate content from the M.P.H. curriculum and effectively demonstrate achievement of selected competencies. For both terms there is a priority on individual and small-group supports, with synchronous class sessions designed to draw on the core M.P.H. curriculum in the context of the capstone projects. Pedagogical content is based on an ecological framework, principles of public health ethics, and a philosophy of problem-based learning. Open only to students enrolled in the Executive Online M.P.H. Program. Not open to auditors.

**EPH 555a, Clinic in Climate Justice and Public Health** Jennifer Wang and Annie Harper

In the course, interdisciplinary student teams carry out applied projects at the intersection of climate justice, law and public policy, and public health. Each team works with a partner organization (e.g., state agency, community organization, other nongovernmental organization) to study, design, and implement a project, typically through community-based participatory research practices. 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 YSE. Students who plan to enroll must complete an application, which will be used to match each student with a clinic project. Check the course's Canvas site or contact the instructor for more information. Prerequisite: EHS 547 or permission of the instructor. Not open to auditors.

**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** Daniel Carrion  
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. Not open to auditors. o Course cr per term

**EPH 580a and EPH 581b, Seminar for Modeling in Public Health** Daniel Weinberger and Virginia Pitzer

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 595b, Global Health Foundations: Principles and Applications** Rafael Perez-Escamilla

Global health is the field of study of distribution and social, economic, and biomedical risk factors for diseases across countries' borders, and how to address them. In this context global health requires interdisciplinary approaches involving social, behavioral, biological, medical, and public health sciences. This case study-based course provides

an introduction to the foundations of global health, emphasizing its colonial origins, prevalent neocolonial approaches, and inequities. Students apply critical-thinking principles to learn to analyze global health challenges and propose equitable solutions from a social justice multidisciplinary perspective based on a “flipped classroom” pedagogical approach. Global health is an exciting and hugely important but complex field that requires critical thinking to understand how to transform its governance and improve the enormous inequities within and across countries worldwide. Prerequisite: EPH 591 or permission of the instructor.

**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. Open to first-year Ph.D. students only. o Course cr

**[ EPH 601, Research Ethics and Responsibilities Refresher ]**

This course reinforces topics covered in EPH 600, including definitions and ethical problems caused by fabrication of data, falsification of results, plagiarism, and other behaviors inconsistent with ethical scientific conduct. Open to Ph.D. and M.D./Ph.D. students only. Prerequisite: EPH 600. o Course cr

**EPH 608a, Frontiers of Public Health** Sten Vermund

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 512b, Immunology for Public Health Professionals** Richard Bungiro

This course provides an introduction to the organization and function of the mammalian immune system. Topics include immune molecules, cells, and organs; innate and adaptive immunity; the molecular basis of antigen recognition; immune cell development, activation, and interaction; immune regulation, dysregulation, and manipulation; methods for analyzing immune responses; responses to infection; and immunologically relevant issues including vaccination, transplantation, autoimmunity, immunodeficiency, and cancer. By the end of the course students understand the major components of the human immune system, the general timeline of an immune response, how immune cells and molecules react to infections, how the science of immunology has developed over time, and the ways that modern medicine uses that knowledge to manipulate the immune response to save lives and improve health. This course is appropriate for any EPH student with a basic knowledge of biology (which is typically – but not exclusively – acquired from a high school or college general biology

course) who wants to expand their knowledge by gaining an understanding of the mammalian immune system. It provides a foundation for and is complementary to numerous other EMD courses in infectious disease, global health and vaccine science.

**EMD 517a, Principles of Infectious Diseases I** Michael Cappello

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** Serap Aksoy and Albert Ko

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. 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 531, Genomic Epidemiology of Infectious Diseases ]**

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. 1 Course cr

**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. Not open to auditors.

**EMD 536b, Outbreak Investigations: Principles and Practice** Albert Ko

Epidemiologists are often called in to investigate outbreaks and epidemics, as exemplified by the key role they served during the COVID-19 pandemic. This course teaches students why and how outbreaks are investigated. They learn how to identify the important epidemiological questions during an outbreak and apply epidemiological tools to achieve answers to these questions. The course builds upon and extends the basic principles in the biology, epidemiology, and transmission dynamics of infectious diseases as they apply to outbreaks and pandemics and why they emerge and recede. Furthermore, we explore the many behind-the-scene facets of an outbreak investigation, which include the key actors in an investigation and the public health response, communication, and decision-making processes. The principles and practice of outbreak investigations are taught through lectures and case studies of real-life examples of outbreaks, including the COVID-19 pandemic. The course is appropriate for all students enrolled in M.P.H., M.S. or doctoral degree programs in public health. Students should have taken or be concurrently taking a basic course in epidemiology (e.g. EPH 508, Foundations of Epidemiology for Public Health) and a basic course in biostatistics (e.g., EPH 505, Biostatistics in Public Health). Basic fluency in analyzing data with statistical software is recommended.

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

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 539b, Introduction to the Analysis and Interpretation of Public Health Surveillance Data** Daniel Weinberger

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.

**EMD 541b, Health in Humanitarian Crises** Kaveh Khoshnood

This course educates students about humanitarian crises and their impact on population health. It provides foundational knowledge and insights about the humanitarian system and public health interventions to mitigate the impact of humanitarian crises on population health.

**[ EMD 542E, Introduction to Public Health Modeling ]**

Public health modeling is a powerful systems-based approach to understand and manage the complex forces that drive the health of populations. In this course students gain understanding of the main applications of different modeling approaches and the types of scientific questions that can be answered using modeling methods; acquire knowledge of key modeling concepts and techniques necessary to understand and interpret scientific literature; and develop skills necessary to critically evaluate the role of assumptions and uncertainty in model validity. Open only to students enrolled in the Executive Online M.P.H. Program. Not open to auditors. 1 Course cr

**EMD 546a, Vaccines and Vaccine-Preventable Diseases** Inci Yildirim

This course develops in-depth understanding of epidemiological, biological, and applied aspects of commonly used vaccines and vaccine preventable diseases (VPDs) of public health importance. The course content is structured to review specific vaccines and VPDs. Where relevant, the course lectures use examples from both developed and developing countries. This course and EPH 510, Health Policy and Health Care Systems, are designed to complement each other. Students interested in a focus on epidemiological, biological, and applied aspects of vaccines and VPDs should take this course whereas students interested in learning more about the making, understanding, and consequences of health policy decisions on vaccines should take EPH 510, Health Policy and Health Care Systems course.

**EMD 550a, Epidemiology and Control of Vector Borne Diseases** Serap Aksoy and Brian Weiss

This course offers a trans-disciplinary view of vector-borne diseases (VBDs) transmitted by arthropods to humans. Topics covered introduce VBDs of global public health significance, as well as the epidemiology and biological and ecological drivers that lead to VBD transmission. Lectures cover state-of-the-art topics in vector biology research, with particular attention paid to translational implications for vector control strategies designed to reduce disease. Course content is designed to enable students to increasingly understand how a One Health approach is crucial to advance the control of VBDs.

**[ EMD 553, Transmission Dynamic Models for Understanding Infectious Diseases ]**

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. 1 Course cr

**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 567a, Tackling the Big Three: Malaria, TB, and HIV in Resource-Limited Settings** Sunil Parikh

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.

**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, including those emanating from the current COVID-19 pandemic. Under such conditions, how can senior country officials and their international partners make the best decisions to reform health systems to achieve universal coverage and improve the allocation and use of resources to maximize health gains, including on scale-up of programs to fight infectious diseases and address other health problems? The course provides students with a thorough understanding of health systems, health reforms, and scaling up – their components, performance, and impacts – by teaching the key tools and data sources needed to assess options and make coherent and effective policy and financing choices. Using these frameworks, students analyze case examples of major country reforms and of scaling up of national disease programs (e.g., AIDS treatment, immunization, safe motherhood, mental health services, cardiovascular illness prevention, etc.) and prepare a paper applying what they have learned to real-world health systems challenges. This course is open to all Yale students with interest in the topic. A knowledge of global health, health policy, and health economics and financing is desirable but not required.

**[ EMD 582, Political Epidemiology ]**

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. 1 Course cr

**[ EMD 584, Advanced Global Health Justice Practicum: Fieldwork ]**

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. 1 Course cr

**EMD 588a or b / SBS 588a or b, Health Justice Practicum** Staff

This is an experiential learning course focused on domestic and transnational health justice work. Health justice work focuses on health equity and is committed to addressing the fundamental social causes of disease. It also emphasizes power-building and political economy, instead of viewing health as a technocratic field where issues are

resolved through application of expertise alone. Students work on projects supervised by faculty and in collaboration with outside partners. Projects change according to the needs of our partners and are generally determined at the beginning of each term. Credits vary according to the time commitment required by the projects. The course is designed for public health and law students, but other students may enroll where appropriate given project needs. Permission of the instructors required. The class is designed for students who are also taking, or have taken, EMD 596/SBS 596. In addition to listing this course among experiential course selections, non-Law students should submit a CV and a statement of interest by 4:30 pm on August 12. This course meets according to the Law School calendar and may establish special sessions and makeup sessions to accommodate any difference between schedules on the main campus and in the Law School.

**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. Not open to auditors.

**EMD 670a and EMD 671b and EMD 672a, Advanced Research Laboratories** Virginia Pitzer

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.

## Health Policy and Management

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

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 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 541Ea, Leading Healthcare Transformation** Laurie Graham

Leading transformational change within institutions and organizations is one of the most challenging and critically important endeavors of our time. This course provides real-life examples, experience-based insights, and practical guidance on how to maneuver through the minefields and effect positive disruptive change within health care organizations. Open only to students enrolled in the Executive Online M.P.H. Program. Not open to auditors.

**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. Not open to auditors.

**[ 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 548, Pharmaceutical Industry and Public Policy ]**

This course provides a comprehensive exploration of the multifaceted pharmaceutical industry and the vital policy issues it faces. Although the focus is on firms within the traditional chemical pharmaceutical industry, biotechnology, and medical devices, the course embraces a global perspective, emphasizing the U.S. as the largest and most profitable market. Pharmaceutical Industry and Public Policy is a crucial interdisciplinary course designed not just for health policy students but also for those from various other departments including environmental health and safety and epidemiology of microbial diseases. Whether you're a Ph.D. student delving into the policy implications of your research, or an undergraduate exploring career options, this course offers valuable insights into an industry that impacts all of our lives. The course equips students with the knowledge and understanding to navigate the intersections between health, environmental policy, and the microbial world, all within the context of the global pharmaceutical industry. This makes it an invaluable choice for those considering a career in any sector of the industry or academia or for those simply wishing to understand the complexities and implications of pharmaceutical policy in our increasingly global society. Key issues we will investigate include: substantial investments in research and development and the impact of rapid technological change; the transformative role of biotechnology and genomics in the industry; the complexities of a global marketplace where customers range from governments and private health insurers, to physicians, pharmacists, and individual patients; the extensive government regulation that touches every dimension of the business, from the safety and efficacy of drugs to pricing, manufacturing, and marketing; the continually evolving landscape of mergers, joint ventures, and alliances; and the challenges faced by global products and multinational firms, with a growing tension between differing needs and payment abilities across market segments. 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 Health Care Management Practicum (section 1) enables students to apply their academic and practical knowledge of business and healthcare to challenges and opportunities facing a hospital or other health provider organization under the guidance of a preceptor. The Health Policy Practicum (section 2) places students with legislators, government agencies, and NGOs assisting the placement preceptor in public health policy work. Both are project-based learning experiences in which students each week work between 7-8 hours (section 1) and 8-10 hours (section 2). Check the course Canvas site for details about applying. Prerequisite: permission of the instructor. Not open to auditors.

**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 558, Quality and Safety in Health Care Organizations ]**

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. 1 Course cr

**HPM 559b, Big Data, Privacy, and Public Health Ethics** Jennifer Miller

This course provides an introduction to ethical theory and decision-making applied to real-world cases at the intersection of big data and public health. The first part of the course focuses on patient medical information held by hospitals and health systems – exploring the ethics concerns and public health goals of hospitals sharing these data with technology companies like Google and Amazon, drug companies, and others. The role of informed consent in data sharing, whether patients have a duty to share medical information to benefit others, the ethics of paying people for their data, and whether data should be considered a public good are discussed. The second part centers on pharmaceutical industry data – discussing concerns around demographic inclusion and representation in clinical trial data; the ethics of providing patients access to experimental medicines (with limited efficacy data) outside of trials, particularly during pandemics; whether drug companies have a duty to advance seemingly unprofitable (or less profitable) but medically promising drugs, by sharing data; and companies' post-trial responsibilities for access to medicines from a population health perspective. We wrap up the course exploring the role of venture philanthropy by patient groups in generating clinical trial data and advancing drug development. This includes a discussion on conflicts of interest. The course is intended primarily for M.P.H. students but is open to all Yale students, including undergraduates.

**HPM 560b, Health Economics and U.S. Health Policy** Zack Cooper

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. Not open to auditors.

**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. Not open to auditors.

**HPM 570a, Cost-Effectiveness Analysis and Decision-Making** Tommy Thornhill

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 571a, Designing Health Systems of Tomorrow: Sharp Strategy and Fierce**

**Execution** Zerrin Cetin

Taught from a practitioner perspective, the course draws on real case studies of hospitals across the country to teach strategic planning and critical thinking skills. We utilize case discussions, teamwork, interactive lectures, and other methods of applied learning to illustrate how to build and execute business strategy for the future. Hospital examples ground us in the arc of developing a well thought-out and executable strategic plan. We simulate a boardroom management discussion during our classes to practice synthesis and concise, impactful communication.

**[ HPM 573, Advanced Topics in Modeling Health Care Decisions ]**

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. 1 Course cr

**[ HPM 575, Evaluation of Global Health Policies and Programs ]**

This course provides students with exposure to the methods used to evaluate global health policies and programs. The first half of the course focuses on impact evaluation, a set of tools at the cross-section of public policy, applied economics, and project management. The purpose is to harness current econometric tools to evaluate the causal impact of policies and programs in low- and middle-income countries. The second half of the course explores the principles, fundamental concepts, and application and design of cost analyses as they are applied to health economic evaluations to support the design, implementation, and scaling up of global health interventions. Over the course of the semester, students gain familiarity with the objectives and uses of cost data in global health and learn the appropriate methods and approaches to collect and analyze these data. This course includes a weekly combination of lectures, guest presentations, and class discussions exploring these concepts. In addition to weekly readings, students engage in a series of short lab-based homework assignments designed to provide familiarity with various econometric tools and work in small teams to design an impact evaluation and economic evaluation proposal on a global health program of their

choosing. Students should have completed an introductory class in statistical methods that covered testing the difference between two means and linear regression, and preferably have experience using statistical software such as R or Stata. 1 Course cr

**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, including those emanating from the current COVID-19 pandemic. Under such conditions, how can senior country officials and their international partners make the best decisions to reform health systems to achieve universal coverage and improve the allocation and use of resources to maximize health gains, including on scale-up of programs to fight infectious diseases and address other health problems? The course provides students with a thorough understanding of health systems, health reforms, and scaling up—their components, performance, and impacts—by teaching the key tools and data sources needed to assess options and make coherent and effective policy and financing choices. Using these frameworks, students analyze case examples of major country reforms and of scaling up of national disease programs (e.g., AIDS treatment, immunization, safe motherhood, mental health services, cardiovascular illness prevention, etc.) and prepare a paper applying what they have learned to real-world health systems challenges. This course is open to all Yale students with interest in the topic. A knowledge of global health, health policy, and health economics and financing is desirable but not required.

**HPM 583b, Methods in Health Services Research** Jacob Wallace

This course introduces students to quantitative social science methods—with an emphasis on causal inference—for health services research. The statistical concepts and methods are illustrated using data and examples primarily from the fields of health services research and health economics. The course begins with a refresher on linear regression (with a focus on intuition), progresses to causality and experimental research design, and then finishes with a tour of quasi-experimental techniques common in health services research: matching, difference-in-differences, regression discontinuity, instrumental variables, and synthetic control methods. Students learn to apply these techniques to data in the programming language of their choice (e.g., Stata/R) as well as gain general experience analyzing and visualizing data. Prerequisite: EPH 505.

**HPM 586a, Microeconomics for Health Policy and Health Management** Jason Hockenberry

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** Jason Hockenberry

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 provides an introduction to the multiple ways the law acts as a structural and social determinant of health and health inequity, as well as ways the law can be used as a tool to promote health in individuals and health justice among populations. It is designed specifically for students with no legal training. The course first provides background on the powers and duties of federal, state, and local governments to equitably promote and protect community health, as well as structural constraints on those powers, such as protection of individuals' constitutional rights. Then, using case examples, it focuses on law as a tool to promote population health, including through direct and indirect regulation to alter the information and built environments, through measures to control communicable disease and reduce chronic disease and injury, and through the use of governments' "power of the purse" to fund public health programs and services and influence individual and corporate behavior. Throughout the term, the course examines the role of courts in interpreting law and resolving disputes among branches and levels of government as well as among individuals, businesses, and government. Students gain 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. The course requires active student engagement that often includes working in small groups. Prerequisite: HPM 514 (or current enrollment in HPM 514), or permission of the instructor. Not open to auditors.

**[ 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 592b, Mental Health Care Policy in the US** Susan Busch

This course is designed for students with limited previous exposure to mental health policy. The goals of the course are to provide students with the tools to evaluate alternative mental health policies and to better understand potential effects, sometimes unintended, of government and private policies related to mental health care. By the end of the course students should be able to approach a problem in mental health policy by defining the policy, assessing possible solutions, and making a recommendation. Students are expected to have previously taken an introductory economics course. This requirement can be satisfied by any course in the Yale Economics Department, HPM 586, or an introductory economics course taken at another university. If you are unsure if a course fulfills this requirement, you may email the instructor information about the course you have taken (e.g., syllabus, textbook used, course number, title and description). The goal of this prerequisite is that all students be familiar with the language of economics as several of the readings will consider models commonly used in economics. Not open to auditors.

**HPM 595b, 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.

**HPM 597b, Capstone Course in Health Policy** Jamie Tam

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: Restricted to health policy graduate students in their final year of M.P.H. coursework, unless otherwise permitted by the instructor. Not open to auditors.

**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 Ph.D. students only.

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

Hockenberry

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 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 631b, 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. Not open to auditors. ½ 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** Michael Apkon

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. Not open to auditors.

**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

## 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 thirteen-week work plan and obtain approval from the supervising faculty and course director. Students enrolled in the course are expected to spend approximately ten 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** Trace Kershaw

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. Not open to auditors.

**SBS 531a, Health and Aging** Becca Levy

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.

**SBS 537b, Social and Interpersonal Influences on Health** Joan Monin

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.

**SBS 540Eb, Monitoring and Evaluation in Public Health: Principles and Applications**

Rafael Perez-Escamilla

Lack of proper formative, process, and impact program monitoring and evaluation (M&E) is one of the biggest roadblocks to delivering cost-effective public health programs. This highly interactive course covers M&E principles, concepts, frameworks, and methods. Students apply real-world case studies to learn how M&E can be used in the design, implementation, and maintenance of high-quality and equitable public

health programs on a large scale. Open only to students enrolled in the Executive Online M.P.H. Program. Not open to auditors.

**SBS 541a, 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. Not open to auditors.

**SBS 560b, Sexual and Reproductive Health** Olivia Kachingwe

The purpose of this course is to provide students with a foundational understanding of U.S.-based sexual and reproductive health (SRH) advancements, ongoing challenges, and public health interventions and programs. A myriad of SRH topics will be covered ranging from abortion and reproductive rights to sexual violence. Grounded in health equity, this course illuminates how the reproductive oppression of minorities and vulnerable populations of the past are still pervasive today. The course material pushes students to examine how various determinants of health such as race and socioeconomic status affect access and utilization of SRH services, education, and technologies, which ultimately leads to reproductive health disparities and injustice. Although having a foundational understanding of current SRH challenges is important, this course is also solutions and asset focused. Thus, students explore how and to what extent efforts have been made to mitigate SRH disparities. Using the social-ecological model as a guiding framework, students explore solutions on the individual, interpersonal, community, and societal/political level. The course includes ample discussion, individual presentations, group debates, and discussion board posts.

**SBS 562a, Inclusive Design for the Built Environment: Participatory Design** Joel Sanders

This interdepartmental seminar is a practicum that bridges academic theory and practice, allowing students to learn and apply Participatory Design tools by engaging with an institutional partner on an actual case study project. These engagement practices combine techniques from Public Health (needs assessment, built environment assessment) and Architecture (site assessments, body maps, co-design workshops), geared to obtaining data that measures the impact of the built environment on health and well-being that can inform the design process. At the end of the term, students generate an Inclusive Design Brief, an illustrated report that describes recommendations for addressing the intersecting needs of people of different ages, genders, races, religions and disabilities. Applications should include name, department/school, prior academic or life experiences that prepares you for the class, reasons for taking the class, and how the class will be helpful in the future. Please send application to both [trace.kershaw@yale.edu](mailto:trace.kershaw@yale.edu) and [joel.sanders@yale.edu](mailto:joel.sanders@yale.edu)

**[ SBS 565, Trauma and Health ]**

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.

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 573b, Social and Cultural Factors in Mental Health and Illness** Jeannette Ickovics

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 574b, 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 577, Health Communication and the Media ]**

Inasmuch as they influence and reflect cultural norms, media messages can influence nearly every aspect of human behavior. This class examines the role of various media in educating and influencing health. Beginning with an understanding of the theory and mechanisms of persuasive communication, we aim to integrate key concepts of advertising with public health promotion and risk prevention. Students learn to evaluate public health media campaigns and intervention effectiveness. Students practice developing health education materials using various media (print, video, audio, targeted brief messaging) and develop a proposal for an evidence-based communication campaign. Prerequisites: SBS 529/EPH 533E. Not open to auditors. 1 Course cr

**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** Katie 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 584, Advanced Global Health Justice Practicum: Fieldwork ]**

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. 1 Course cr

**SBS 585a, Sexuality, Gender, Health, and Human Rights** Staff

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 587, 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.

1 Course cr

### **SBS 588a or b / EMD 588a or b, Health Justice Practicum** Staff

This is an experiential learning course focused on domestic and transnational health justice work. Health justice work focuses on health equity and is committed to addressing the fundamental social causes of disease. It also emphasizes power-building and political economy, instead of viewing health as a technocratic field where issues are resolved through application of expertise alone. Students work on projects supervised by faculty and in collaboration with outside partners. Projects change according to the needs of our partners and are generally determined at the beginning of each term. Credits vary according to the time commitment required by the projects. The course is designed for public health and law students, but other students may enroll where appropriate given project needs. Permission of the instructors required. The class is designed for students who are also taking, or have taken, EMD 596/SBS 596. In addition to listing this course among experiential course selections, non-Law students should submit a CV and a statement of interest by 4:30 pm on August 12. This course meets according to the Law School calendar and may establish special sessions and makeup sessions to accommodate any difference between schedules on the main campus and in the Law School.

### **SBS 590b, Advocacy and Activism** Tekisha Everette

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, Biomedical Justice: Public Health Critiques and Praxis ]**

This course provides students with tools to analyze and critique public health methodology, discourse, and practice from a health justice framework. SBS 590 or permission of instructor 1 Course cr

**SBS 593a, Community-Based Participatory Research in Public Health** Ijeoma Opara

The goal of this course is to provide students with an overview of theories, principles, and strategies associated with community-based participatory research (CBPR) in public health. This is an introductory course on CBPR and is intended for graduate students and community practitioners interested in adding CBPR as an effective strategy to understanding and addressing health disparities in public health and ultimately achieving health equity.

**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 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 Ph.D. 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 640b / BIS 640b, User-Centered Design of Digital Health Tools** Terika McCall

This course combines needs assessment methods, user-centered design principles, and an agile approach to designing digital health tools for consumers. The class environment is designed to model that of a health tech start-up. Students are expected to apply what they learn from the lectures and readings to identify a pain point (i.e., a problem or need faced by a prospective user) and solicit input from intended users to design a prototype of the digital health tool. Solutions are presented in class to receive feedback on the design and to iteratively refine a prototype in order to create a minimum viable product. Prerequisite: BIS 560/CB&B 740, SBS 574, or permission of the instructor.

**SBS 670b, 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 676, Questionnaire Development ]**

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). Open only to Public Health students (M.P.H., M.S., Ph.D.). Not open to auditors. 1 Course cr

**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 Ph.D. students only.

# TUITION, EXPENSES, AND FINANCIAL AID

The standard student budget for new M.P.H. students for the nine-month academic year 2024–2025 is as follows:

Tuition	\$53,450
Program Fee	\$550
Books, Course Materials, Supplies, and Equipment	\$1,380
Yale Hospitalization/Specialty Coverage	\$2,894
Living Expenses	\$16,662
Local Transportation	\$235
Miscellaneous and Personal Expenses	\$4,555
Student Loan Fees	\$0
Total Budget	\$79,491

## 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 (\$5,346 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 \$13,365 tuition for the summer module.

### EXECUTIVE M.P.H. PROGRAM

Students enrolled in the Executive M.P.H. Program pay tuition at the part-time rate of \$5,346 per course unit.

## **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 \$13,365 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 – except those in the Accelerated M.B.A./M.P.H. Program – with the Graduate School of Arts and Sciences; the Schools of Divinity, the Environment, Law, Management, and Nursing; the Jackson School of Global Affairs; 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 \$820 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 (\$5,346 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 \$5,346 per course unit. Nonmatriculated individuals affiliated with Yale taking a course for credit pay \$2,673 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 must register and pay fees for classes before the first day of classes each term. (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 2024–2025, the last days for refunding Title IV funds will be October 31, 2024, in the fall term and March 29, 2025, in the spring term.
2. For purposes of determining the refund of institutional aid funds and for students who have not received financial aid:
  - a. 100 percent of tuition will be rebated for withdrawals that occur on or before the end of the first 10 percent of the term: in the fall term, September 7, 2024, for Executive M.P.H. (Year 2) students and September 8, 2024, for all others and in the spring term, January 23, 2025.
  - 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: in the fall term, September 22, 2024, for Executive M.P.H. (Year 2) students and September 23, 2024, for all others and in the spring term, March 3, 2025.
  - 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: in the fall term, October 21, 2024, for Executive M.P.H. (Year 2) students and October 19, 2024, for all others and in the spring term, March 2, 2025.
  - 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.
6. Part-time students who withdraw from course(s) during the term but remain enrolled will be refunded the tuition associated with the course(s) dropped, if

course changes are processed before the withdrawal without a “W” grade deadline on the academic calendar.

## TUITION REBATE AND REFUND POLICY FOR SUMMER SESSION

If the student withdraws by the third class day of the term, 100 percent of the tuition will be refunded.

Withdrawal between the fourth and twelfth class day of the term will result in a 50 percent refund of tuition.

Withdrawal between the thirteenth and twenty-third class day of the term will result in a 25 percent tuition refund.

Tuition will not be refunded for withdrawals after the twenty-third class day of the term in summer session.

## Student Accounts and Billing

Student accounts, billing, and related services are administered through the Office of Student Accounts, located at 246 Church Street. The office’s website is <https://student-accounts.yale.edu>.

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, email reminders to log in to YalePay to review the Student Account activity are sent to all students at their official Yale email address and to all student-designated YalePay proxies. Payment is due by 4 p.m. Eastern Time on the last day of the 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 \(https://student-accounts.yale.edu/understanding-your-bill/your-student-account\)](https://student-accounts.yale.edu/understanding-your-bill/your-student-account).

The Office of Student Accounts 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 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 made to a Student Account in excess of the balance due (net of pending financial aid credits) are not allowed on the Student Account. 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 at any time 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 Office of Student Accounts, 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/paying-your-bill/payment-options>.

A processing charge of \$25 will be assessed for payments rejected for any reason by the bank on which they were drawn. In addition, for every returned ACH payment due to insufficient funds made through YalePay, Flywire will charge a penalty fee of \$30 per occurrence. Furthermore, 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, suspend services and programs, or issue appropriate refunds. Such decisions 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



ysph.financialaid@yale.edu (ysphfinancialaid@yale.edu) or 203.785.5417. 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 at the same rate of pursuit. 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 <https://finaid.yale.edu/graduate-aid/military-benefits>. To be enrolled, see the YSPH registrar.

## **LOANS**

For 2024–2025, all U.S. citizens or permanent residents of the United States may be eligible to borrow \$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 prior borrowing, other financial aid a student may be receiving, and the length of the YSPH academic year. Federal Direct loans generally have ten- to twenty-five-year repayment period options 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 2 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 scholarships. 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 two-year M.P.H. program and the Advanced Professional 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 myYSPH site at <https://ysph.yale.edu/myysph/students/mph/forms-and-systems>. If a student changes departments, their faculty adviser will change accordingly.

Each student in the Executive M.P.H. Program is assigned a track director who will serve as their faculty adviser based on the track they elect upon enrolling in the program. It is the responsibility of the student and the track director to work together to select courses, monitor academic progress, and develop career plans. If a student changes tracks, the track director serving as their faculty adviser will change accordingly. In addition to the track director, the program director is available to advise students upon request.

## Course Registration

Students will be given the opportunity to register for courses and confer with their academic advisers about their schedules before classes start each term. All students must complete the online registration process by the deadline listed on the academic calendar to avoid a \$50 late fee. There are deadlines to add and drop courses after the registration period ends, as noted on the academic calendar.

Courses cannot be added after the deadlines noted on the academic calendar without permission of the faculty adviser, the instructor, and the registrar. See the Course Withdrawal policy for information on withdrawing from courses.

## ADDITIONAL POLICIES

### Two-Year M.P.H. and Advanced Professional M.P.H. Students

#### ELECTIVES

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.

With the exception of EPH 537E, Frontiers of Public Health, which may be taken by M.S. or Ph.D. students for whom the course fulfills a degree requirement, Executive M.P.H. courses are open only to students who are enrolled in the Executive M.P.H. Program.

## INDEPENDENT STUDY COURSES

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 by the registration deadline each term, available on the myYSPH site at <https://ysph.yale.edu/myysph/students/mpH/forms-and-systems>. The form involves approval from both the faculty project adviser within the department and the instructor of the course. Before submitting the form, it is recommended that the student discuss the project with the course instructor. Instructors of record may be found in Yale Course Search (<https://courses.yale.edu>).

## COURSES AT OTHER YALE SCHOOLS

Students are allowed to enroll in courses in other Yale schools if there is space available and if the instructor agrees. It is the responsibility of the student to secure the appropriate permission before they can be registered for a course. Students must receive written permission from the registrar of the Jackson School of Global Affairs, the Law School, or the School of Management for any courses taken at those schools. *Note: An additional course material fee may apply to courses taken outside YSPH. YSPH does not cover the cost of these additional course fees.*

One course unit is awarded for any full-term course (not seminars or colloquia) taken in the graduate school or another professional school. Some courses may be adjusted to half-credit upon review of the syllabi/course expectations by the YSPH registrar during registration period, and students will be notified accordingly.

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. With the exception of relevant language courses, 100-series courses are not eligible for credit toward the degree.

Students are permitted to take a maximum of 2 language credits as electives toward the M.P.H. degree with appropriate permission and approval by the instructor, as well as a review of degree rationale by the student's academic adviser and YSPH registrar.

## MINIMUM AND MAXIMUM COURSE LOAD

Full-time students are expected to maintain a minimum of 4 credits per term. Registration schedules of less than 4 credits will not be approved unless a student has converted to a part-time study plan, in discussion with the YSPH registrar and the student's academic adviser.

Due to the expected workload, schedules of more than 6.5 credits per term will not be approved. A schedule of 7 credits will require written request to the YSPH registrar with rationale for review and approval. *Note: Due to the accelerated nature of the program,*

*Advanced Professional M.P.H. students are not expected to obtain approval for schedules of 7 or 7.5 credits.*

Under no circumstances will schedules of 8 credits or more be approved.

## Executive M.P.H. Students

### ELECTIVES

Students in the Executive M.P.H. Program who choose to complete a single track may meet the remaining credit requirements for the degree by taking electives selected from courses offered in the other tracks. They may also take on-site elective courses if they have faculty permission and meet any prerequisites and attendance requirements.

### CONDITIONAL CREDIT FROM MASTERTRACK CERTIFICATES

Students accepted into the Executive M.P.H. Program who completed one or more Coursera MasterTrack certificates sponsored by YSPH prior to their acceptance may apply up to 2 conditional credits (equivalent to four MasterTrack courses) to the completion of their M.P.H. degree. Conditional credit from MasterTrack courses is not applicable to students who are already enrolled in a YSPH degree-granting program.

### MAXIMUM COURSE LOAD

The Executive M.P.H. Program is intended to be completed over two years of part-time study. Therefore, students must maintain a part-time course load. Consequently, a maximum of 3.5 credits may be completed in a given term to maintain part-time status.

## Nonmatriculated Students

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 three course credits per term and a maximum of four course credits total if taking courses for credit. All course requirements will be completed by the end of the term. Exceptions must be negotiated with the course instructor. *Note:* Courses in the Executive M.P.H. Program are not open to nonmatriculated part-time study.

Part-time nonmatriculated students pay tuition on a per-course basis. 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 four 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.

Yale affiliates participating in Yale fellowship programs may request an exception to the four-course-credit-maximum policy for nonmatriculated students on a case-by-case basis if they have a prior M.P.H. Those who are granted an exception to the policy and then subsequently decide to apply and are admitted to a degree program at YSPH may still only apply four courses from their nondegree study toward the M.P.H. degree.

## Course Withdrawal

For full-term courses, students may withdraw until about halfway through each term without the course appearing on the transcript. 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.” Exact withdrawal deadlines may be referenced on the academic calendar for each year. Eight-week (half-term) courses have separate deadlines given the shortened duration of the term, also listed on the academic calendar.

Two-year M.P.H. students and first-year Advanced Professional M.P.H. students are not allowed to withdraw from the following M.P.H. core courses: EPH 100, EPH 101, EPH 505, EPH 507, EPH 508, EPH 510, and EPH 513. Withdrawal from any of the summer core courses for the Advanced Professional M.P.H. students—BIS 515, CDE 515, or SBS 505—will result in automatic withdrawal from the program.

Executive M.P.H. students are not allowed to withdraw from the M.P.H. core curriculum: EPH 528E, EPH 529E, EPH 530E, EPH 533E, EPH 534E, EPH 535E, EPH 536E, EPH 537E, EPH 538E, EPH 539E, EPH 540E, and EPH 541E. Withdrawal from either of the first year summer courses—EPH 533E and EPH 535E—will result in automatic withdrawal from the program.

Executive M.P.H. students may petition the program director only in extenuating circumstances to postpone EPH 528E, EPH 529E, EPH 530E, or EPH 539E to a future term. It is the discretion of the program director to approve such a request.

## 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 myYSPH site at <https://ysph.yale.edu/myysph/students/mph/forms-and-systems>. Exemption forms must be submitted to the registrar each term by the stated deadline on the academic calendar. Exempted courses will be applied to the student degree audit. Credit is not granted for exempted courses.

Please note the following exceptions:

- No exemptions are allowed for the core courses EPH 507, Social Justice and Health Equity; EPH 513, Major Health Threats: Determinants and Solutions; and EPH 608, Frontiers of Public Health. The unique content of these courses provides students with several of the M.P.H. core curriculum competencies and foundational knowledge topics.
- Exemption from EPH 508, Foundations of Epidemiology and Public Health, will require an exemption exam at the start of the academic year.

- In order to maintain full-time status for visa purposes during the summer term, international students on a J-1 Student visa or F-1 visa in the Advanced Professional MPH program cannot waive the summer course requirements. Students who are not on J-1 Student visas nor on an F-1 student visa, who are considering part-time study and, therefore, a part-time course load in the summer may discuss their plans on a case-by-case basis with the Program Director
- In the Executive M.P.H. Program, no exemptions are allowed for EPH 528E, Everyday Leadership; EPH 529E, Executive Communication Skills for Public Health and Healthcare; EPH 530E, Design Thinking in Public Health Systems; EPH 537E, Frontiers of Public Health; EPH 539E, Ethics in Public Health; and EPH 540E and EPH 541E, Executive Online M.P.H. Capstone. In the case that a student requests exemptions from any other core course, the onus will be on the student to demonstrate how their life experience or previous graduate-level course work meets the competencies addressed by the course in question.

## 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 according to the course change deadlines on the academic calendar. 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 from the instructor of insufficient attendance, delete the course from the student's record. For a student who elects 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. Not all courses are available for auditing, as indicated in course descriptions. Students are limited to no more than two audit courses per term. Students remain responsible for paying the applicable tuition and fees for the course. Courses in the Executive M.P.H. Program are not open to auditors.

## 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 a way to evaluate academic performance 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/track 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.

The Office of Student Affairs will evaluate SAP for the current student population one week after the grading deadline for the term in question. A student must obtain passing grades in 50 percent of courses toward the M.P.H. degree in order to maintain academic progress toward degree completion.

Students in the Advanced Professional M.P.H. program or the Executive M.P.H. program who fail a course in the summer term of the first year 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.

For students who are pursuing more than one degree at Yale simultaneously (joint degrees), SAP calculations will be performed separately by each school and consider coursework on the respective school's transcript.

### 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.

### FINANCIAL AID SATISFACTORY ACADEMIC PROGRESS

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.



To remain eligible for university or federal financial aid, a student must obtain passing grades in 67 percent of courses toward the MPH degree. Incomplete courses, course withdrawals and audited courses at the time of SAP evaluation will be removed for the calculation. Course withdrawals do not count towards a student's quality points however they do count towards a student's degree completion for financial aid SAP purposes.

All required course work for the M.P.H. program must be completed within five years of the date of matriculation, with the exception of the one-year Advanced Professional program. All required coursework for the one-year Advanced Professional program must be completed within three years of the date of matriculation. If the degree program has not been completed within the appropriate time frame, 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 the Executive 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. If a student withdraws from all courses, a Title IV Withdrawal Calculation will be completed for students who borrowed federal loans.

### **SATISFACTORY ACADEMIC PROGRESS NOTIFICATION & APPEAL**

A student who fails to meet SAP at the end of a term will be notified in writing by the associate dean responsible for academic matters, and the Financial Aid Office will place the student on financial-aid warning until the end of the next term.

During the financial-aid warning term, the student may receive financial aid, despite the determination of not meeting SAP. Students on financial-aid warning who fail to return to SAP by the end of the term will lose their future financial aid eligibility unless they successfully appeal and are placed on financial-aid probation.

A student who has not successfully met SAP by the end of the financial-aid warning term has the right to appeal the loss of financial aid eligibility. Appeals must be submitted to the associate dean's office in writing within two weeks of receiving notice that the student did not meet SAP after a term on financial-aid warning. The appeal must include information about why the student failed to meet SAP, and what has changed, or is expected to change, that will allow the student to meet SAP in the future. The written appeal should be accompanied by documentation that verifies the extenuating circumstances (e.g., death of a relative, an injury or illness of the student, or other special circumstances).

The associate dean's office shall notify the student of the outcome of the appeal within ten business days of receiving it. If the appeal is approved, the student is placed on financial-aid probation until the end of the next term and may receive financial aid during that term. Students on financial-aid probation are required to meet with the associate dean responsible for academic matters to establish an individual academic plan to enable the student to meet SAP at some point in the future, according to specific benchmarks established by the plan.

Students on financial-aid probation who fail to meet SAP by the end of the financial-aid probation term or fail to meet the benchmarks of their individual plans on time will not be eligible for financial aid for the subsequent academic term. Students who are ineligible for financial aid may reestablish eligibility in future terms by meeting SAP.

## Change of Department or Track

For the two-year M.P.H., 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. Department changes are not guaranteed. At minimum, prior to petitioning a chair to change departments, students should confirm that they have the following minimum requirements in their background:

- Chronic Disease Epidemiology: education and experience in science, demonstration of quantitative ability
- Environmental Health Sciences: demonstrated academic ability in related coursework (environmental sciences, basic sciences, math/statistics, and public health); research, professional or volunteer experience and/or activities in environmental health sciences; a statement of purpose that outlines training goals, faculty of interest, and a future career plan
- Epidemiology of Microbial Diseases: demonstrated interest in infectious disease epidemiology, prior coursework in biology or related field, good academic standing, ability to complete all EMD requirements in remaining time in program
- Health Policy: economic background and/or successful completion of HPM 586, Microeconomics for Health Policy and Health Management
- Social and Behavioral Sciences: a passion to investigate and influence social and structural factors (e.g., stigma, housing, poverty, social relationships, norms) to promote health and prevent disease

Because of the number of requirements and the sequencing of courses, students may not switch into the Health Care Management Program, the Biostatistics department, or the Executive M.P.H. Program.

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 myYSPH site at <https://ysph.yale.edu/myysph/students/ MPH/forms-and-systems>.

For the Advanced Professional M.P.H. Program, track changes may be requested during the spring term of the first academic year. Students who wish to change tracks in the Advanced Professional M.P.H. Program must send their request in writing to the program director.

For the Executive M.P.H. Program, students can elect to add up to two tracks during the spring term of their graduation year. A form will be shared at that time for graduating students to indicate their intention to complete tracks by graduation. Students records will be audited and updated accordingly.

## 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 *The Chicago Manual of Style*: [http://chicagomanualofstyle.org/tools\\_citationguide.html](http://chicagomanualofstyle.org/tools_citationguide.html)
- Various citation resources: <https://poorvucenter.yale.edu/writing/using-sources/principles-citing-sources>

Students are expected to follow course-specific instructions as communicated in the syllabus and other verbal or written instructions from the faculty. This includes the use of outside sources such as written materials, media, internet, and generative artificial intelligence systems (i.e., chatbots) in your coursework. If expectations are not explicitly stated, it is the responsibility of the student to seek clarification prior to using outside sources.

## Community Standards and Freedom of Expression

YSPH is an academic community dedicated to the advancement of learning. Its members freely associate themselves with the university and in doing so affirm their commitment to cultivating an environment of tolerance and respect for all members of the community. They pledge to help sustain the intellectual integrity of the university and to uphold its standards of honesty, free expression, and inquiry. They are expected to abide by the regulations of the university, including these Personal Conduct and Academic Integrity Standards. Because students are expected to show good judgment and use common sense at all times, not all kinds of misconduct or behavioral standards are codified here. Students are also expected to obey local, state, and federal laws, and violations of these may be cause for discipline by YSPH. Students are required to report misdemeanor and felony charges to their associate dean.

### FREEDOM OF EXPRESSION

YSPH is committed to the protection of free inquiry and expression in the classroom and throughout the school community. In this, YSPH reflects the 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), which states, in part:

The primary function of a university is to discover and disseminate knowledge by means of research and teaching. To fulfill this function a free interchange of ideas is necessary not only within its walls but with the world beyond as well. It follows that the university must do everything possible to ensure within it the fullest degree of intellectual freedom. The history of intellectual growth and discovery clearly demonstrates the need for unfettered freedom, the right to think the unthinkable, discuss the unmentionable, and challenge the unchallengeable. To curtail free expression strikes twice at intellectual freedom, for whoever deprives another of the right to state unpopular views necessarily also deprives others of the right to listen to those views.

We take a chance, as the First Amendment takes a chance, when we commit ourselves to the idea that the results of free expression are to the general benefit in the long run, however unpleasant they may appear at the time. The validity of such a belief cannot be demonstrated conclusively. It is a belief of recent historical development, even within universities, one embodied in American constitutional doctrine but not widely shared outside the academic world, and denied in theory and in practice by much of the world most of the time.

Because few other institutions in our society have the same central function, few assign such high priority to freedom of expression. Few are expected to. Because

no other kind of institution combines the discovery and dissemination of basic knowledge with teaching, none confronts quite the same problems as a university.

For if a university is a place for knowledge, it is also a special kind of small society. Yet it is not primarily a fellowship, a club, a circle of friends, a replica of the civil society outside it. Without sacrificing its central purpose, it cannot make its primary and dominant value the fostering of friendship, solidarity, harmony, civility, or mutual respect. To be sure, these are important values; other institutions may properly assign them the highest, and not merely a subordinate, priority; and a good university will seek and may in some significant measure attain these ends. But it will never let these values, important as they are, override its central purpose. We value freedom of expression precisely because it provides a forum for the new, the provocative, the disturbing, and the unorthodox. Free speech is a barrier to the tyranny of authoritarian or even majority opinion as to the rightness or wrongness of particular doctrines or thoughts.

If the priority assigned to free expression by the nature of a university is to be maintained in practice, clearly the responsibility for maintaining that priority rests with its members. By voluntarily taking up membership in a university and thereby asserting a claim to its rights and privileges, members also acknowledge the existence of certain obligations upon themselves and their fellows. Above all, every member of the university has an obligation to permit free expression in the university. No member has a right to prevent such expression. Every official of the university, moreover, has a special obligation to foster free expression and to ensure that it is not obstructed.

The strength of these obligations, and the willingness to respect and comply with them, probably depend less on the expectation of punishment for violation than they do on the presence of a widely shared belief in the primacy of free expression. Nonetheless, we believe that the positive obligation to protect and respect free expression shared by all members of the university should be enforced by appropriate formal sanctions, because obstruction of such expression threatens the central function of the university. We further believe that such sanctions should be made explicit, so that potential violators will be aware of the consequences of their intended acts.

In addition to the university's primary obligation to protect free expression there are also ethical responsibilities assumed by each member of the university community, along with the right to enjoy free expression. Though these are much more difficult to state clearly, they are of great importance. If freedom of expression is to serve its purpose and thus the purpose of the university, it should seek to enhance understanding. Shock, hurt, and anger are not consequences to be weighed lightly. No member of the community with a decent respect for others should use, or encourage others to use, slurs and epithets intended to discredit another's race, ethnic group, religion, or sex. It may sometimes be necessary in a university for civility and mutual respect to be superseded by the need to guarantee free expression. The values superseded are nevertheless important, and every member of the university community should consider them in exercising the fundamental right to free expression.

We have considered the opposing argument that behavior which violates these social and ethical considerations should be made subject to formal sanctions, and the argument that such behavior entitles others to prevent speech they might regard as offensive. Our conviction that the central purpose of the university is to foster the free access of knowledge compels us to reject both of these arguments. They assert a right to prevent free expression. They rest upon the assumption that speech can be suppressed by anyone who deems it false or offensive. They deny what Justice Holmes termed “freedom for the thought that we hate.” They make the majority, or any willful minority, the arbiters of truth for all. If expression may be prevented, censored, or punished, because of its content or because of the motives attributed to those who promote it, then it is no longer free. It will be subordinated to other values that we believe to be of lower priority in a university.

The conclusions we draw, then, are these: even when some members of the university community fail to meet their social and ethical responsibilities, the paramount obligation of the university is to protect their right to free expression. This obligation can and should be enforced by appropriate formal sanctions. If the university’s overriding commitment to free expression is to be sustained, secondary social and ethical responsibilities must be left to the informal processes of suasion, example, and argument.

For more information, please visit <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. I have adhered to all relevant policies stated by my course instructor in the syllabus, written instructions or verbally in class.

## Behaviors Subject to Disciplinary Action

Concerns regarding YSPH student conduct that may violate university regulations, academic or nonacademic, shall initially be referred to the committee chair or chair's designee. A report should be made in writing and should detail the conduct in question and provide all available and relevant evidence.

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, the internet, or the use of generative artificial intelligence systems. Any direct quotation must be specifically attributed, other reliance on a reference must also be acknowledged, and the use of generative AI systems must be cited. Inserting artificial intelligence-generated text into an assignment without proper attribution or using AI tools in a manner that was not authorized by your instructor is a breach of academic integrity.
  - 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 based on sex, sexual orientation, gender identity or expression, race

color, national or ethnic origin, religion, age, disability, status as a disabled veteran, veteran of the Vietnam era or other covered veteran, or membership in any other protected classes as set forth in Connecticut and federal law, or use of a teaching position to harass or intimidate another student.

4. **Sexual Misconduct** Any sexual activity for which positive, unambiguous, and voluntary consent has not been given in advance; any sexual activity with someone who is incapable of giving valid consent because, for example, that individual is sleeping or otherwise incapacitated due to alcohol or drugs; any act of sexual harassment, intimate partner violence, or stalking. Sexual misconduct includes nonphysical actions such as digital media stalking, cyberbullying, and nonconsensual recording of a sexual nature. Sexual harassment consists of nonconsensual sexual advances, requests for sexual favors, or other verbal or physical conduct of a sexual nature. For a fuller description of sexual misconduct, sexual consent, and sexual harassment see the Title IX website (<https://titleix.yale.edu>). Sexual misconduct violations shall be addressed by the University-Wide Committee on Sexual Misconduct (UWC) and governed by its procedures.
5. **Violation of Yale University Rules or 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.
  - k. Possession or use of explosives or weapons on university property.
6. **Unlawful Conduct** 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. 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 seven individuals: three YSPH faculty members, the director of academic affairs, and one student from each M.P.H. class. The committee will be selected from a pool that includes a faculty member from each YSPH department, the director of academic affairs, and three students from each M.P.H. class. The dean will designate one of the faculty members as the committee chair. The committee chair must hold the rank of associate with tenure or full professor and will be a non-voting member. The senior administrative assistant is a note-taking committee member and is also a non-voting committee member. For a given hearing, the chair will ensure a quorum of seven individuals including at least two faculty and two students. 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 university community brings a possible violation or infraction to the attention of the committee chair or the director of academic 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 director of academic 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 director of academic 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 may: (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 (approval to be decided by the chair), and (d) be accompanied by a faculty or staff 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 faculty or staff 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 calendar days of receiving notification from the director of academic affairs. The written response should be a statement of reasonable length that comments on the

facts of the allegations of misconduct, the student's involvement in it, and any other matters that the student deems relevant. This written statement is considered part of the formal proceedings of the committee.

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 impose 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 on 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 that describes the charge of misconduct, summarizes the hearing, presents the factual findings, and outlines the committee's conclusions, including the sanction.
8. The committee will inform the student in writing of the result of the hearing and any penalty as soon as possible. The committee's finding of an infraction or violation and the imposed sanction are final and subject to the appeal process outlined below.
9. All proceedings of the Committee on Academic and Professional Integrity are confidential. Proceedings and the final determination will be shared only with relevant personnel on a need-to-know basis. 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.

## Appeal Process

Disciplinary decisions made by the committee are final. However, students may request review of the decisions as described in these procedures. The decision of the committee will remain in effect unless and until changed by the dean of Public Health. A student upon whom a disciplinary penalty has been imposed by the committee may appeal the decision to the dean of Public Health, or the dean's designee, 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 Public Health, or the dean's designee, within five calendar days after the decision of the committee has been issued. The dean, or the dean's designee, will have the discretion to decide how to handle the appeal including whether to send the decision back to the committee for reconsideration.

## Penalties

The following penalties are among those that may be imposed by the committee. Any violation of the Honor Code or the Code of Academic and Professional Integrity will result in a penalty, up to and including expulsion.

**Reprimand** A written statement of censure will remain in the student's file until the student graduates or withdraws.

**Restriction** The student will be denied the use of certain university facilities or of the right to participate in certain activities or to exercise certain privileges.

**Disciplinary Probation** The student is in official jeopardy. Disciplinary probation will be recorded on the student's transcript. The commission of a second offense while on probation will normally result in suspension or expulsion.

**Suspension** The student will be separated from the university for a stated period of time. A suspended student forfeits all privileges of enrollment, including residence, attendance at classes, participation in organized extracurricular activities, and use of university facilities. This penalty will be recorded on the student's transcript.

**Expulsion** Permanent separation from the university. This penalty will be recorded on the student's transcript. An expelled student forfeits all privileges of enrollment, including residence, attendance at classes, participation in organized extracurricular activities, and use of university facilities. This penalty will be recorded on the student's transcript.

**Failure of Course or Assessment for Academic Violations** The committee may recommend that the student's actions warrant a failure of the course or assessment in question.

All cases referred to the Committee on Academic and Professional Integrity will be addressed and a decision will be made by the committee, regardless of whether the student voluntarily withdraws from the Yale School of Public Health prior to resolution. In such case, 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.

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.

# 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. For those students who have not elected the Yale Health Plan, Yale Health will work with the student's primary care provider to provide the recommendation. 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.

If you believe that a student, faculty member, or staff member has engaged in discrimination or harassment other than gender discrimination or sexual misconduct (see <https://dhr.yale.edu/policies-definitions> for more information), you may report your concerns to either:

1. your dean's designee (<http://dhr.yale.edu/discrimination-and-harassment-resource-coordinators>), an administrator at your school who serves as a resource for students with concerns about discrimination or harassment; or
2. the Office of Institutional Equity and Access (<http://oiea.yale.edu>), a university-wide office which assists with dispute resolution and investigates reports of discrimination and harassment.

Both your dean's designee and the OIEA may employ a variety of means to help you to resolve your concerns, including discussing your options with you and providing



support, facilitating a mediated resolution through discussion and engagement, providing training and education, or conducting a factual inquiry or a more formal investigation. If it is not possible to reach a resolution satisfactory to both parties, then:

- a report concerning another student may be referred the student's school for possible disciplinary action;
- a report concerning a staff member may be referred to the staff member's supervisor; or
- a report concerning a faculty member may be referred to the faculty member's dean who will address it according to the Faculty Standards of Conduct and related procedures.

In all cases, the first step for a Yale student seeking to report discrimination or harassment is always the same: contact either your dean's designee or the OIEA. These two resources will work with you to further explain your options and the processes for addressing your concerns.

More information about Student Discrimination and Harassment Reporting and Response can be found at <https://dhr.yale.edu>.

Complaints of sexual misconduct, including sexual harassment and sexual assault, may be brought to a Title IX coordinator or to the University-Wide Committee on Sexual Misconduct (for inquiries or for informal or formal resolution). For more information on the University-Wide Committee on Sexual Misconduct (UWC), see Resources to Address Discrimination and Harassment Concerns, Including 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. Institutional rebate and Federal refund policies may apply. For more information, see the Tuition Rebate and Refund section.

## 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.

## Guidance for Virtual Meetings for Students

The following guidance for virtual (Zoom) meetings should be followed by YSPH students when attending YSPH professional events, classes and activities online.

- YSPH expects students to attend all virtual meetings with their camera on. Attending virtual session with the camera off may result in the student being removed from the session.
- Ensure internet connectivity that is appropriate to maintaining video during Zoom sessions.
- Test your connection before the online meeting. Visit the Yale ITS website at <https://yale.service-now.com/it> or call 203.432.9000 if technical support is needed. If possible, please troubleshoot your internet connection in advance.
- Reach out to your meeting facilitators or instructors if you don't think you can participate during scheduled times due to technical issues.
- Find a clean, quiet space and dress appropriately.
- Stage an appropriate background, such as a simple wall or use virtual backgrounds, such as those found on the myYSPH website (<https://ysph.yale.edu/myysph/branding/templates/virtual-backgrounds>).
- Check to confirm that your full name is appearing appropriately.
- Be aware of lighting and noise.
- Keep mic muted when not speaking.
- Look at your camera when speaking – this will replicate eye contact with your peers.
- Use the “Raise Your Hand” feature when appropriate, as well as the chat option as needed. Note that the chat feature is visible to everyone else in the class, including your professor, and the host of a meeting has the ability to save the chat.
- If possible, choose an environment free from distractions, and avoid multi-tasking during meetings.
- Be respectful and on-time.

# Policy on Recordings

It is expected that Yale community members will engage openly and forthrightly with other community members in the workplace and in educational settings. To this end, the purpose of this policy is to prohibit surreptitious recording and to create standards regarding the recording of participants in classes, university-related meetings, or university events. The policy is intended to foster a spirit of trust and promote the open exchange of viewpoints and ideas within the university community. As used in this policy, “recording” refers to the use of any audio or visual recording device with respect to another person in any format or medium (for example, in-person, telephone, or videoconference).

## PERMITTED RECORDINGS

The university’s authorized personnel may make recordings of university activities in furtherance of the academic and operational needs of the university. The university’s Office of Public Affairs and Communication may also authorize members of the media to record certain university events. Recording at large public events, such as commencement or sporting events, where it is customary for attendees to take photos and videos, is allowed for personal use. Other recordings are subject to the following restrictions and requirements.

## RECORDINGS PERMITTED SUBJECT TO RESTRICTIONS

**Classes** Faculty members may record class and practice sessions after providing notice to students in advance (for example, by notice on the syllabus, on Canvas, or at the first lecture). Students may not record course content, such as lectures, discussions, presentations, critiques, or performances, without advance written permission from the instructor or, in the case of a request for a reasonable accommodation for a disability, from Student Accessibility Services. If permission is granted, the recording must not be shared beyond the class members without the written consent of all participants who were recorded.

**Meetings** Except as authorized by university personnel, participants in meetings in the course of employment or curricular or extracurricular activities may not record such meetings without the permission of all participants or, in the case of a request for a reasonable accommodation for a disability, from the Office of Institutional Equity and Accessibility or Student Accessibility Services. If permission is granted, the recording must not be shared beyond the meeting participants without the written consent of all participants who were recorded.

**University Events** For university events open to Yale community members or to the public, such as lectures or performances, the event sponsor should inform attendees before the event if the event is being recorded. Event sponsors also are responsible for informing attendees whether individual recording by attendees is prohibited.

## PROHIBITION ON SURREPTITIOUS RECORDINGS

Yale community members may not make surreptitious recordings of participants in classes, university-related meetings, or university events. Recording devices may be used only in an overt and conspicuous manner so that it is readily apparent to all participants that a recording is being made.

## Posting and Chalking Policy

This policy is intended to promote the exchange of information and ideas within the university community. Consistent with Yale's policies on free speech, the policy states reasonable time, place, and manner regulations that apply to posting and chalking at the university. Only university community members may post or chalk on Yale's campus absent permission from Yale administration.

### POSTERING

The following rules apply to posters or similar items ("posters"):

**Location** Posters may be placed only on bulletin boards or other spaces that the university or a school has designated for posting. No posters may be placed on other campus spaces (for example, on or hung from windows, on the exterior of any buildings, on campus gates, or walls).

**Format** Unless otherwise indicated in a school's designated posting spaces, posters must conform to the following format requirements. Posters may not exceed eleven inches by seventeen inches. Posters may not be affixed using any damaging materials (for example, glue, staples, or tape). Thumbtacks or pushpins should be used on bulletin boards but may not be used on any interior or exterior woodwork.

**Content** Posters for an event must provide the name, date, time, and location of the event; the name of the sponsoring organization; and the email address or phone number of the organizers. For all posters, the person putting up the poster must clearly print their name and the date on the poster. Only one copy of a poster may be placed in the same designated space at any one time. Posters may not include content that is harassing, threatening, or that violates law or Yale policy.

**Removal** Authorized staff typically remove all posters from bulletin boards and other designated spaces once a week. Staff also may remove posters that do not comply with this policy; no one else (other than the person who posted the poster) may remove, deface, obscure, or destroy existing posters.

### CHALKING

The following rules apply to chalk messages on Yale's campus:

**Location** Chalk may be used only on outdoor walkways that are open to the sky and the weather. Chalk may not be used indoors, on walls or other vertical surfaces, or on covered outdoor areas (e.g., under overhangs or archways).

**Format** Chalk messages must use temporary materials (e.g. only water-soluble chalk may be used, not spray chalk) and may not exceed four feet by four feet. Additionally, not more than one chalk message associated with the same person or organization may be visible from any single point.

**Content** Chalk messages may not include content that is harassing, threatening, or that violates law or Yale policy.

**Removal** Authorized staff may remove chalking that does not comply with this policy, or after one week, or in the normal course of cleaning facilities and grounds.

## Emergency Suspension

The dean of the Yale School of Public Health, or a delegate of the dean, may place a student on an emergency suspension from residence or academic status when (1)

the student has been arrested for or charged with serious criminal behavior by law enforcement authorities or (2) the student allegedly violated a disciplinary rule of YSPH and the student's presence on campus poses a significant risk to the safety or security of members of the community.

Following an individualized risk and safety analysis, the student will be notified in writing of the emergency suspension. A student who is notified of an emergency suspension will have twenty-four hours to respond to the notice. The emergency suspension will not be imposed prior to an opportunity for the student to respond unless circumstances warrant immediate action for the safety and security of members of the community. In such cases, the student will have an opportunity to respond after the emergency suspension has been imposed.

When a student in YSPH is placed on an emergency suspension, the matter will be referred for disciplinary action in accordance with school policy. Such a suspension may remain in effect until disciplinary action has been taken with regard to the student; however, it may be lifted earlier by action of the dean or dean's delegate, or by the disciplinary committee after a preliminary review.

## **Additional Policies**

Additional university policies are available for student reference on the school's website. These policies include the Policy on Freedom of Expression (see also Community Standards and Freedom of Expression under YSPH Committee on Academic and Professional Integrity in the chapter Academic Policies), the Equal Opportunity Statement (see also Equal Opportunity/Title IX in the chapter Yale University Policy Statements), 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 provost 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 provost 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. OIA also coordinates Yale's program for hosting scholars at risk.

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.

## Cultural Resources and Athletic Facilities

Keep up to date about university news and events by subscribing to the Yale Today e-newsletter (<https://news.yale.edu/subscribe-e-newsletter>), YaleNews (<http://news.yale.edu>), the Yale Calendar of Events (<http://calendar.yale.edu>), and the university’s Facebook, Twitter, Instagram, LinkedIn, and YouTube channels.

The Yale Peabody Museum (<https://peabody.yale.edu>), founded in 1866, houses more than fourteen million specimens and objects in ten curatorial divisions. The Museum’s galleries, newly renovated in 2024, display thousands of objects, including the first Brontosaurus, Stegosaurus, and Triceratops specimens ever discovered.

The Yale University Art Gallery (<https://artgallery.yale.edu>) is one of the largest museums in the country, holding nearly 300,000 objects and welcoming visitors from around the world. 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.

The Yale Center for British Art (<https://britishart.yale.edu>) is a museum that houses the largest collection of British art outside the United Kingdom, encompassing works in a range of media from the fifteenth century to the present.

More than five hundred musical events take place at the university during the academic year, presented by the School of Music (<https://music.yale.edu/concerts>), the Morris Steinert Collection of Musical Instruments (<https://music.yale.edu/concerts-events-collection>), and the Institute of Sacred Music (<https://ism.yale.edu/events/upcoming-events>), among others.

For theatergoers, Yale offers a wide range of dramatic productions at such venues as the Yale Repertory Theatre (<https://yalerep.org>); the University Theater and Iseman Theater (<https://drama.yale.edu/productions>); and Yale Cabaret (<https://www.yalecabaret.org>).

The religious and spiritual resources of the university serve all students, faculty, and staff of all faiths. Additional information is available at <http://chaplain.yale.edu>.

The Payne Whitney Gymnasium, one of the most elaborate and extensive indoor athletic facilities in the world, is open to Yale undergraduates and graduate and professional school students 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. 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 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. Information is available at <https://myrec.yale.edu>.

The Yale Outdoor Education Center (OEC) in East Lyme, Connecticut, is open to students, faculty, staff, and alumni. The 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. For more information, visit <https://sportsandrecreation.yale.edu/outdoor-education-center-o>.

Approximately fifty club sports are offered at Yale, organized by the Office of Club Sports and Outdoor Education (<https://sportsandrecreation.yale.edu/club-sports-intramural-sports/club-sports>). Most of the teams are for undergraduates, but a few are available to graduate and professional school students.

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 at <https://myrec.yale.edu>.

## 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 fifteen-bed inpatient care unit, and an acute care clinic with extended hours and telephone triage/guidance from a registered nurse twenty-four hours a day. Additional specialty services such as allergy, dermatology, orthopedics, a travel clinic, and more are available through Yale Health Hospitalization Specialty Coverage. Yale Health's services are detailed in the *Yale Health Student Handbook*, available online at <https://yalehealth.yale.edu/resource/student-handbook> or through the Yale Health Member Services Department, 203.432.0246.

### ELIGIBILITY FOR SERVICES

All full-time Yale degree-candidate students who are paying at least half tuition are enrolled automatically for Yale Health Basic Student Health Services, which 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 or triage for urgent medical problems can be obtained twenty-four hours a day through Acute Care.



Students on leave of absence, on extended study and paying less than half tuition, or enrolled per course per credit, and students enrolled in the Executive M.P.H. (EMPH) program (see below), are not eligible for Yale Health Basic Student Health Services 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 Student Health Services 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 Student Health Services 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.

**Executive M.P.H. Candidates** Students enrolled in the Executive M.P.H. program are not eligible for Yale Health Basic Student Health Services but may enroll in Yale Health Student Affiliate Coverage. This plan includes services described in both Yale Health Basic Student Health Services and Yale Health Hospitalization/Specialty Coverage. Coverage is not automatic; enrollment applications are available directly from the Executive M.P.H. program, and special enrollment deadlines apply (July 15 for full-year or fall-term coverage; January 15 for spring-term coverage only).

## HEALTH COVERAGE ENROLLMENT

The university also requires all students eligible for Yale Health Basic Student Health Services 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/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 first day required to be on campus for program orientation. 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 Student Health Services 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/forms-and-guidelines>) 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, and students enrolled in the EMPH program 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/forms-and-guidelines>) and must be received by September 15 for full-year or fall-term coverage, or by January 31 for spring-term coverage only. For EMPH candidates, applications are available directly from the EMPH program, and special enrollment deadlines apply (July 15 for full-year or fall-term coverage; January 15 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 Student Health Services (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/forms-and-guidelines>). 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/forms-and-guidelines>). 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.

**Per Course Per Credit** Students who are enrolled per course per credit are not eligible for Yale Health Hospitalization/Specialty Coverage. They may purchase Yale Health Student Affiliate Coverage during the term(s) of per course per credit enrollment. 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/forms-and-guidelines>). 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 online at <https://yalehealth.yale.edu/resource/student-handbook> and 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, 2024. Please access the Incoming Student Vaccination Record form for graduate and professional students at <https://yalehealth.yale.edu/new-student-health-requirements>. 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 Vaccine Portal, and all supporting documents must be uploaded to <https://campushealth.yale.edu/welcome-to-health-on-track>. The final deadline is August 1.

**COVID-19** As per recommendations from the Centers for Disease Control and Prevention, vaccination against COVID-19 is strongly encouraged, but not required, for incoming (matriculating) students. Students are asked to submit documentation of prior any primary series vaccinations or bivalent boosters that they have received through the Yale Health website, <http://yalehealth.yale.edu>. Vaccination requirements remain in place for healthcare workers and trainees, including students who work in settings where patient care is provided, or those who work with human research subjects in clinical settings. Those individuals must submit documentation of vaccination with a primary series and one booster (or, for those who have not yet received a primary series, one bivalent dose of vaccine) to the university or seek approval for a medical or religious exemption. Yale will accept any combination of COVID-19 vaccines that have received full approval or Emergency Use Authorization (EUA) by the U.S. Food and Drug Administration (FDA) or have been issued Emergency Use Listing (EUL) by the World Health Organization (WHO). International students who do not have access to WHO or FDA authorized or approved vaccines may be vaccinated at Yale Health on request.

**Influenza** All students are required to have flu vaccination in the fall term when it is made available to them by Yale Health.

**Measles, Mumps, Rubella, and Varicella** All students are required to provide proof of immunization against measles (rubeola), mumps, German measles (rubella), and varicella. Connecticut state regulation requires two doses of MMR (combined measles, mumps, and rubella) vaccine and two doses of varicella vaccine. The first dose must have been given after the student's first birthday; the second dose must have been given at least twenty-eight 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, 2024.

**Quadrivalent Meningitis** All students living in on-campus dormitory facilities (all undergraduate residential colleges and the following graduate dormitories: 254 Prospect Street, 272 Elm Street, 276 Prospect Street, Baker Hall, and Edward S. Harkness Memorial Hall) 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, 2024. 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 on 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. Tuberculosis screening is required for all medical, physician assistant, and nursing students.

**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. Hepatitis B immunity is required for all medical, physician assistant, and nursing students.

## Housing

<https://housing.yale.edu>

[housing@yale.edu](mailto:housing@yale.edu)

203.432.2167

The Yale Graduate 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 254 and 276 Prospect Street and 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 graduate housing website 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 1 and can be submitted directly from the website with a Yale NetID. Room selection for paired roommates begins April 19. Room selection for all others begins April 20.

The Yale Graduate 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 from New Haven landlords. 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.

### 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.

## Identification Cards

Yale University issues identification (ID) cards to faculty, staff, and students. ID cards support the community's safety and security by allowing access to many parts of campus: dining halls and cafés, residential housing, libraries, athletic centers, workspaces, labs, and academic buildings. Cultivating an environment of public safety requires the entire community to work together to ensure appropriate use of our spaces, as well as to foster a sense of belonging for all members of our community.

University policies, regulations, and practice require all students, faculty, and staff to carry their Yale ID card on campus and to show it to university officials on request. Yale ID cards are not transferable. Community members are responsible for their own ID card and should report lost or stolen cards immediately to the Yale ID Center.

Members of the university community may be asked to show identification at various points during their time at Yale. This may include but not be limited to situations such as: where individuals are entering areas with access restrictions, for identification in emergency situations, to record attendance at a particular building or event, or for other academic or work-related reasons related to the safe and effective operation and functioning of Yale's on-campus spaces.

For some members of our community, based on the needs and culture of their program, department, and/or characteristics of their physical spaces, being asked to show an ID card is a regular, even daily, occurrence. However, for others it may be new or infrequent. For some, being asked to produce identification can be experienced negatively, as a contradiction to a sense of belonging or as an affront to dignity. Yale University is committed to enhancing diversity, supporting equity, and promoting an environment that is welcoming, inclusive, and respectful. University officials requesting that a community member show their ID card should remain mindful that the request may raise questions and should be prepared to articulate the reasons for any specific request during the encounter. In addition, individuals requesting identification should also be prepared to present their own identification, if requested.

## Office of International Students and Scholars

<http://oiss.yale.edu>

203.432.2305

The Office of International Students and Scholars (OISS) coordinates services and support for more than 6,300 international students, faculty, staff, and their dependents at Yale. OISS assists international students and scholars with issues related to employment, immigration, personal and cultural adjustment, and serves 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 and scholars obtain and maintain legal nonimmigrant status in the United States.

OISS programs, like daily English conversation groups, the Understanding America series, DEIB workshops, 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) community, which organizes a variety of programs and events.

The OISS website 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 Yale Connect, Facebook, and Instagram.

OISS is a welcoming venue for students and scholars who want to check their email, grab a cup of coffee, and meet up with a friend or colleague. The International Center is OISS's home on Yale campus and is located at 421 Temple Street. The International Center provides meeting space for student groups and a venue for events organized by both student groups and university departments. For more information about our hours, directions, and how to reserve space at OISS, please visit <https://oiss.yale.edu/about/hours-directions-parking>.

## Resources to Address Discrimination, Harassment, and Sexual Misconduct

Yale is a community committed to fostering an environment of diversity, mutual respect, and intellectual discovery in which all members of the community can thrive. Acts of discrimination and harassment are contrary to the community standards and ideals of our university. Staff in the following offices work within the Yale community to promote respect, inclusivity, diversity, and equal opportunity, and are available to talk through situations you have witnessed or experienced, as well as to provide guidance.

When you have concerns or questions related to discrimination or harassment, you have a wide range of choices for support. You can reach out to a discrimination and harassment resource coordinator, or you can talk with others, such as a residential college dean, dean of student affairs, or the Office of Institutional Equity and Accessibility.

If you'd like to talk with someone about sexual misconduct or sex-based discrimination, you can reach out directly to the deputy Title IX coordinator of your school or the Title IX Office. The Title IX website (<https://titleix.yale.edu>) is a helpful resource for additional questions or concerns about sex-based discrimination or sexual misconduct. If an individual is unsure of which resource to contact and wants to explore options for addressing sexual misconduct, the SHARE Center is a good place to start.

## **DISCRIMINATION AND HARASSMENT RESOURCE COORDINATORS**

Office hours: 9 a.m.–5 p.m., M–F

<https://dhr.yale.edu/discrimination-and-harassment-resource-coordinators>

Discrimination and harassment resource coordinators (formerly deans' designees) have been identified by the dean of each college and school as community members with the responsibility to receive concerns and offer advice and guidance related to diversity and inclusion, discrimination and harassment, and equal opportunity. Discrimination and harassment resource coordinators may also help facilitate informal resolution. This may be an individual's best "first step" in discussing a concern related to discrimination, harassment, or retaliation, particularly as discrimination and harassment resource coordinators will be knowledgeable about resources specific to their school or college.

## **OFFICE OF INSTITUTIONAL EQUITY AND ACCESSIBILITY**

Office hours: 9 a.m.–5 p.m., M–F

203.432.0849

<https://oiea.yale.edu>

Any individual who would like to report a concern of discrimination, harassment, and/or retaliation may contact the Office of Institutional Equity and Accessibility (OIEA). OIEA staff are available to discuss concerns, university resources, and options for resolution, including informal resolution. Where appropriate, OIEA staff are also available to conduct investigations into complaints of discrimination, harassment, and/or retaliation. Talking with someone at OIEA about a concern or making a complaint does not automatically launch an investigation. It can, however, be an important step to alerting the university about a concern and getting assistance to resolve it.

## **SHARE: INFORMATION, ADVOCACY, AND SUPPORT**

55 Lock Street, Lower Level

Appointments: 9 a.m.–5 p.m., M–F

24/7 on-call service (for time-sensitive matters): 203.432.2000

<https://sharecenter.yale.edu>

SHARE, the Sexual Harassment and Assault Response and Education Center, has trained counselors available 24/7 via direct hotline, as well as for drop-in hours on weekdays during regular business hours. 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 for students. SHARE works closely with the University-Wide Committee on Sexual Misconduct, the Title IX Office, the Yale Police Department, and other campus resources and can provide assistance with initiating a 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. 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.

## **TITLE IX COORDINATORS**

203.432.6854

Office hours: 9 a.m.–5 p.m., M–F

<https://titleix.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. 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 or gender.

Yale College, the Graduate School of Arts and Sciences, and the professional schools have each designated one or more deputy Title IX coordinators, who work closely with the university Title IX Office and university Title IX Coordinator Elizabeth Conklin. Coordinators respond to and address concerns, provide information on available resources and options, 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 also work with pregnant and parenting individuals to coordinate needed accommodations and to respond to instances of discrimination. Discussions with a deputy Title IX coordinator are private and information is only shared with other university officials on a need-to-know basis. 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 sexual misconduct policy. The UWC is composed of faculty, senior administrators, and graduate and professional students drawn from throughout the university. UWC members are trained to observe strict confidentiality with respect to all information they receive about a case.

## **YALE POLICE DEPARTMENT**

101 Ashmun Street

24/7 hotline: 203.432.4400

<https://your.yale.edu/community/public-safety/yale-police-department>

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 the sensitive crimes and support coordinator, they can be reached at 203.432.9547. Informational sessions are available with the sensitive crimes and 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 remains suspended due to pandemic regulations. Please continue to check the Yale Public Safety website for future service announcements.

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 (<https://your.yale.edu/community/public-safety/stay-safe-campus/livesafe-app>).

## Student Accessibility Services

<https://sas.yale.edu>  
203.432.2324

Student Accessibility Services (SAS) engages in an interactive process with Yale students, including undergraduate, graduate, and professional school students with permanent conditions and/or temporary injuries, to determine reasonable and appropriate accommodations on a case-by-case basis. Students may initiate this process by requesting accommodations through the online accommodation request form available at [https://yale-accommodate.symplicity.com/public\\_accommodation](https://yale-accommodate.symplicity.com/public_accommodation).

Engagement with SAS is confidential, and faculty/staff are notified of approved accommodations on a need-to-know basis only, except when required by law for health and safety reasons. Students may upload supporting documentation regarding their condition and request for accommodations with their accommodation request

form. Documentation guidelines are available at <https://sas.yale.edu/students/documentation-guidelines>.

# YSPH RESOURCES FOR STUDENTS

## Office of Student Affairs

47 College Street, 203.785.6260  
Frank Grosso, Associate Dean  
Stacey Tuttle, Director/Registrar  
Heather Logan, 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, Director Tuttle, and Associate Director Logan 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, Executive Director  
Kelly Shay, Senior Associate Director  
Dina Wulinsky, Associate Director

The YSPH Career Management Center assists students in all phases of developing, managing, and implementing career plans and strategies.

### CAREER COACHING AND COUNSELING

The Career Management Center advises students on a wide range of career development issues, including but not limited to, career exploration and self-assessment, résumé and cover letter creation, interview preparation, the internship and job search process, and negotiation and networking skills.

### PROFESSIONAL SKILLS SERIES

The Career Management Center administers a series of workshops 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 interviewing, public speaking, networking with alumni, and business communications.

### RECRUITING AND JOB INFORMATION

The Career Management Center works to attract a wide variety of health care 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

<https://library.medicine.yale.edu>

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](mailto:kate.nyhan@yale.edu)

Kayla Del Biondo, Simbonis Librarian for Public Health, [kayla.delbiondo@yale.edu](mailto:kayla.delbiondo@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.

### Medical Library Hours

Monday–Thursday: 7:30 a.m.–midnight

Friday: 7:30 a.m.–10 p.m.

Saturday: 10 a.m.–10 p.m.

Sunday: 10 a.m.–midnight

For exceptions and holiday hours, visit <https://library.medicine.yale.edu/about/hours>.

## CONSULTATIONS AND WORKSHOPS

We encourage students and researchers to meet one-on-one with a 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, student organizations, departments, and labs with tailored presentations and hands-on instruction, and collaborate on evidence synthesis publications. Librarians offer free training 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.

- Public Health Library Support
- Workshops

- Video tutorials
- StatLab consultants for advice on statistics and geospatial tools
- Research Data Management Support
- Bioinformatics Support
- Scholarly Communication Support

## RESOURCES

The Cushing/Whitney Medical Library provides a comprehensive collection of ebooks, electronic journals, clinical reference tools, databases, evidence-based practice resources, image collections, educational software, and print books and journals in support of programs in public health as well as medicine, nursing, physician associate training, bioinformatics, and the basic sciences. Access includes over 50,000 electronic books, 23,000 electronic journals, 110 databases, and more than 400,000 print volumes. Its holdings also include all Yale medical student theses, many of which are available online.

- Access online collections anywhere using EZproxy or VPN software
- Free citation management software (Zotero, RefWorks, and EndNote)

Our interlibrary loan service 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, and print books can also be mailed to a student's home address (in the United States).

## LIBRARY SPACES AND TECHNOLOGY

### Technology and Printing

Windows and Mac laptops are available for loan to medical center students needing a computer for short-term use. Additionally, Yale ID holders can borrow digital cameras, camcorders, chargers, and tablets at the Circulation Desk.

Windows and Mac desktop computers are available throughout the medical library, with software such as Microsoft Office, EndNote, Adobe Creative Suite, and statistics and GIS programs (SAS, SPSS, ArcGIS, etc.). Yale researchers have access to black-and-white and color printers and copiers, as well as two scanning stations (Windows and Mac) in the 24/7 room.

A high-performance workstation in the 24/7 room is equipped with a suite of licensed and open source tools, such as BRB-Array Tools, Cytoscape, and Qlucore, and can process, manage, analyze, and visualize data in a variety of formats. Access to this workstation can be reserved by any Yale researcher.

### Library Spaces

There are reservable group and individual study spaces throughout the medical library. Study carrels and tables are located on all levels of the library. The Morse Reading Room and Historical Library Reading Room are designated as quiet study spaces.

- *Medical Historical Library* (<https://library.medicine.yale.edu/historical>) contains one of the world's finest collections of rare medical books, journals, prints, posters, drawings, and photographs, as well as current works in the history of medicine.

- *DEI Resources* (<https://library.medicine.yale.edu/collections/deib-resources>) is a collection of library resources relating to diversity, equity, inclusion, and belonging at Yale.
- *The Cushing Center* (<https://library.medicine.yale.edu/cushingcenter>), located in the Cushing/Whitney Medical Library, houses a unique collection of materials once owned by Dr. Harvey Cushing. The center is the home of the Harvey Cushing Brain Tumor Registry, which consists of approximately 600 brain specimens, glass-plate negatives, and accompanying patient files from the early twentieth century.
- *The Wellness Room* (<https://library.medicine.yale.edu/cushingwhitney-medical-library-wellness-room>), located in the Morse Reading Room, is a space for all Yale and YNHH affiliates to enjoy a quiet moment away from work and study environments.
- *Technology Support Service Center* (<https://library.medicine.yale.edu/services/library-technology/support>) and quiet study booths (<https://library.medicine.yale.edu/news/new-location-privacy-booths>) are located on the E-Level.
- *24/7 Computer and Study Space* is available. When the library is closed, students can enter the 24/7 space through through the stairwell to the left of the main library entrance.

In addition to the Medical Library, students are invited to use other Yale University libraries. Two of the more popular libraries for YSPH students are Marx Library and Sterling Memorial Library. For information about all library study spaces, see <https://web.library.yale.edu/places/to-study>.

## Office of the Registrar

47 College Street, 203.785.6260  
 Stacey Tuttle, Registrar  
 Heather Logan, Associate 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.
- Nondisclosure of personal information forms.
- Transcripts. Copies of transcripts must be requested using the Parchment system, accessible via <http://yub.yale.edu>. Two business days should be allowed for the processing of requests. There is a \$5 fee for an electronic official transcript. Additional fees apply for mailed requests. 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.

## Office of Alumni Affairs

47 College Street, Suite 104, 203.785.6245

Benjamin Zoll, Chief Development Officer

Katherine Ingram, Assistant Director of Development and Alumni Affairs

Dawn Carroll, Coordinator, Alumni Affairs

The YSPH Office of Alumni Affairs strengthens 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 6,900 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 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 the YSPH Mentoring Program, allows current students to connect with YSPH alumni for résumé review, interview preparation, career advice, and gain insights from alumni city representatives.
- Several events throughout the year take advantage of the travel of the dean, faculty, and others to connect with alumni around the country and the world.

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., Faculty Director

Kathleen O'Connor Duffany, Ph.D., Deputy 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. OPHP holds the vision that all experiential learning opportunities at YSPH are anti-racist, equitable, mutually beneficial, focused on health and wellness, and fully



resourced and supported. The office is a resource for YSPH students, faculty, and staff as well as organizations and public health practitioners seeking training and support for the Applied Practice Experience, internship, and practicum courses.

## Office of Diversity, Equity, Inclusion, and Belonging

60 College Street, 203.785.7298  
Mayur Desai, Associate Dean  
Randi McCray, Associate Director

At YSPH, we aim to foster diversity, equity, inclusion, and belonging. 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, inclusion, and belonging 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 email [mayur.desai@yale.edu](mailto:mayur.desai@yale.edu).

In addition, students, faculty, and staff can contact the Yale Office of Institutional Equity and Access with any concerns. See <https://oiea.yale.edu>; or email [equity@yale.edu](mailto:equity@yale.edu).

Kelly Shay is the Title IX coordinator for YSPH. See <https://provost.yale.edu/title-ix/coordinators>; or email [kelly.shay@yale.edu](mailto:kelly.shay@yale.edu).

Alyson Zeitlin is the director of faculty and staff affairs at YSPH. She can be reached at 203.785.7373 or at [alyson.zeitlin@yale.edu](mailto:alyson.zeitlin@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://ysph.yale.edu/cidma/>

**Center for Interdisciplinary Research on AIDS (CIRA)**

<http://cira.yale.edu>

**Center for Neuroepidemiology and Clinical Neurological Research (CNE<sup>2</sup>)**

<https://medicine.yale.edu/cne2>

**Center for Perinatal, Pediatric, and Environmental Epidemiology**

<https://ysph.yale.edu/cppee/>

**Center on Climate Change and Health**

<https://ysph.yale.edu/yale-center-on-climate-change-and-health/>

**Climate Change at Yale**

<https://yibs.yale.edu/climate-change>

**Collaborative Center for Statistics in Science**

<https://ysph.yale.edu/c2s2/>

**Community Alliance for Research and Engagement (CARE)**

<https://www.carenhv.org/>

**Emerging Infections Program**

<https://ysph.yale.edu/emerging-infections-program/>

**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)**

<https://ysph.yale.edu/olaga/>

**Yale Center for Analytical Sciences**

<https://ysph.yale.edu/ycas/>

**Yale Global Health Leadership Initiative**

<https://ysph.yale.edu/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**

<https://yalegriffinprc.griffinhealth.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
- Distribution of funds to M.P.H. students to support conference attendance, case competitions, and professional development opportunities

SAYPH is headed by an Executive Committee consisting of a president, vice president, treasurer, social committee chair, professional development committee chair, community engagement chair, communications chair, and wellness chair. There are at least two departmental representatives acting as liaisons between students and the faculty and administration.

### Graduate and Professional Student Senate

The Graduate and Professional Student Senate (GPSS) 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 Gryphon, a graduate and professional student center, located at 204 York Street. The center provides office and event space for GPSS and other student organization activities, funds student groups, and houses Gryphon's Pub, open nightly. 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 <https://ysph.yale.edu/myysph/students>.

# APPENDIX I: YSPH PRACTICE REQUIREMENT GUIDELINES

All M.P.H. candidates must complete an Applied Practice Experience (APE) to integrate classroom learning with real-life experience in a public health work environment, which allows them to learn from professionals in the field.

The majority of two-year M.P.H. students fulfill the APE requirement by completing a full time, preapproved public health summer internship (EPH 521) that addresses population health. If the internship does not fulfill the APE requirement (EPH 520), students may also fulfill their APE through a practicum course or by completing a preapproved independent project. All students must complete a work plan prior to starting their placements.

The practicum courses that meet the APE include:

- EMD 584/SBS 584/LAW 30184, Advanced Global Health Justice Practicum: Fieldwork
- EMD 588/SBS 588/LAW 30186, Health Justice Practicum
- EPH 500, Public Health Practicum (only offered to second-year students and Advanced Professional M.P.H. students)
- EPH 501, U.S. Health Justice Concentration Practicum (only offered to students in the U.S. Health Justice Concentration)
- EPH 555, Clinic in Climate Justice, Law, and Public Health
- HPM 555, Health Policy or Health Care Management Practicum
- HPM 556, Advanced Health Policy Practicum

SBS 541, Community Health Program Evaluation, may also meet the APE requirement. Students wishing to use this experience to fulfill the APE will submit a work plan as an independent project to the Office of Public Health Practice (OPHP, [ophp@yale.edu](mailto:ophp@yale.edu)) for review at the start of the semester and be expected to complete all check-ins and evaluations in addition to course requirements. This experience, however, will not fulfill the internship requirement.

Those students utilizing an independent project must ensure that it (1) is focused on public health, (2) is preapproved by the Office of Public Health Practice, (3) meets the threshold of a minimum of one hundred hours, (4) involves a preceptor holding a master's level degree or higher, and (5) produces two work products (deliverables) for the site/agency.

Advanced Professional M.P.H. and Accelerated M.B.A./M.P.H. students are not required to complete a summer internship. These students may complete an optional internship to meet the APE requirement by obtaining pre-approval from the Office of Public Health Practice or take a practicum course listed above and submit required documentation.

## Guidelines for APE placements:

1. The APE 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 and include significant community engagement. Acceptable placements would include: governmental, nongovernmental (NGO), and private-sector organizations with a public health component such as pharmaceutical companies, hospitals, managed care/health maintenance organizations, consulting firms, and universities.
2. The APE allows students to apply classroom learning and theories to address public health issues in a professional setting to foster skills and professional development. This experience serves as a means for the student to demonstrate competencies from the core curriculum, department, and chosen concentrations/tracks.
3. The APE 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 approved site/agency will have the infrastructure to support the M.P.H.-level student learning experience and provide a preceptor/site supervisor who has public

health expertise (master’s-level or beyond) or expertise in a related field to oversee the work and provide mentorship.

5. The APE has deliverables of tangible value to the mission of the placement agency/site. These deliverables (at least two) will be required to evaluate mastery of competencies from the student internship experience.



# 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, and
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; and
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; and
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, and
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; and
  - 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; and
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

**March–April (spring, year 1)** Departmental meetings to review specific thesis requirements and timelines

**October 30 (fall, year 2)** Thesis adviser form due to registrar (signed by both advisers)

**November 2 (fall, year 2)** First draft of thesis prospectus due to primary thesis adviser

**December 1 (fall, year 2)** 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 (spring, year 2)** First draft of thesis due to thesis advisers (student should include a summary of major analyses and tables)

**April 15 (spring, year 2)** Final thesis to be submitted to thesis advisers for final grading

**May 1 (spring, year 2)** 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://ysph.yale.edu/myysph/students/mp/ citations>.

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://ysph.yale.edu/myysph/students/mph/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 (three to five 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](http://www.etsadmin.com/publichealthyale).

## Thesis Prizes

### 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.

### OUTSTANDING M.P.H. THESIS PRIZE IN HEALTH EQUITY

This award honors an exceptional thesis by a graduating M.P.H. student whose work has implications for improving the health and well-being of historically marginalized populations or communities. To be eligible, the thesis may address any aspect of health equity, for example, but not limited to: disparities in health behaviors, access to care, quality of care, or outcomes of care; social or structural determinants of health; or novel analytic or methodological approaches to studying health equity or social justice. The primary thesis adviser's nomination should include a clear description of how the thesis addresses health equity.

## WILBUR G. DOWNS, M.D., OUTSTANDING THESIS PRIZE IN INTERNATIONAL HEALTH

This award honors a student for exceptional scholarly achievement on an internationally-focused M.P.H. thesis.

### NOMINATION PROCESS

Students must receive a grade of H (Honors) in order to be nominated for these prizes. Nominations should be submitted to the associate dean of student affairs by the primary adviser after discussion with the secondary adviser, by the thesis grading deadline of May 1. Winners are announced at the YSPH Commencement ceremony.

For questions about the thesis process, please contact the YSPH registrar at [ysph.registrar@yale.edu](mailto:ysph.registrar@yale.edu).

## 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 \$820 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 (\$5,346 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 the process for order of authorship, the timeline for publication and process if timeline is not met, and the 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>, email [student.questions@yale.edu](mailto: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 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>, email [graduate.admissions@yale.edu](mailto: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/edu>, email [medical.admissions@yale.edu](mailto: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>, email [div.admissions@yale.edu](mailto: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>, email [admissions.law@yale.edu](mailto: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>, email [gradpro.law@yale.edu](mailto: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>, email [grad.engineering@yale.edu](mailto: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>, email [artschool.info@yale.edu](mailto: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 and composition. 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>, email [gradmusic.admissions@yale.edu](mailto: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>, email [admissions.yse@yale.edu](mailto:admissions.yse@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, 300 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>, email [ysph.admissions@yale.edu](mailto: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>, email [gradarch.admissions@yale.edu](mailto: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 (P.M.C.), 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 06516-0972.

**David Geffen 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>, email [ysd.admissions@yale.edu](mailto:ysd.admissions@yale.edu), or call the Registrar/Admissions Office at 203.432.1507. Postal correspondence should be directed to David Geffen School of Drama at Yale University, 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.

**Jackson School of Global Affairs** Est. 2022. Courses for college graduates. Master in Public Policy (M.P.P.) and Master of Advanced Study (M.A.S.).

For additional information, please visit <https://jackson.yale.edu>, email [jackson.admissions@yale.edu](mailto:jackson.admissions@yale.edu), or call 203.432.6253.



# YALE UNIVERSITY CAMPUS NORTH

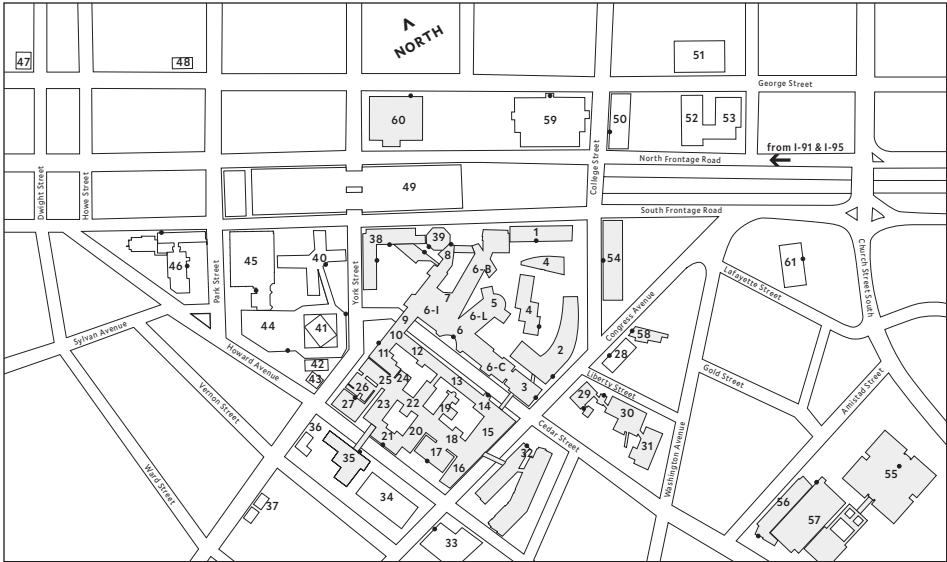


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# YALE UNIVERSITY CAMPUS SOUTH & YALE MEDICAL CENTER



## 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 Memorial 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 affirmative action under law in employment of women, minority group members, individuals with disabilities, and protected veterans. Additionally, in accordance with Yale's Policy Against Discrimination and Harassment (<https://your.yale.edu/policies-procedures/policies/9000-yale-university-policy-against-discrimination-and-harassment>), Yale does not discriminate in admissions, educational programs, or employment against any individual on account of that individual's sex; sexual orientation; gender identity or expression; race; color; national or ethnic origin; religion; age; disability; status as a special disabled veteran, veteran of the Vietnam era, or other covered veteran; or membership in any other protected classes as set forth in Connecticut and federal law.

Inquiries concerning these policies may be referred to the Office of Institutional Equity and Accessibility, 203.432.0849; [equity@yale.edu](mailto:equity@yale.edu). For additional information, please visit <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, Elizabeth Conklin, at 203.432.6854 or at [titleix@yale.edu](mailto: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, TDD 800.877.8339, or [ocr.boston@ed.gov](mailto:ocr.boston@ed.gov). For additional information, including information on Yale's sexual misconduct policies and a list of resources available to Yale community members with concerns about sexual misconduct, please visit <https://titleix.yale.edu>.

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 Yale Police Department at 203.432.4400, the university will provide this information to any applicant for admission, or to prospective students and employees. The report is also posted on Yale's Public Safety website; please visit <http://your.yale.edu/community/public-safety>.

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>.

BULLETIN OF YALE UNIVERSITY  
New Haven CT 06520-8227

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