Master of Health Science – Advanced Health Sciences Research (MHS-AHSR)

Welcome Package

Summer/Fall 2024

Class of 2026

Jennifer Afranie-Sakyi, MD
Clinical Fellow
Internal Medicine

*Sofia Grigoria Athanasopoulou,
MD
Fellow
Pediatrics

*Ami Belmont, MD
Instructor
Rheumatology

*Alina Bischin, MD
Fellow
Pulmonary

*Xiao Wang, MD
Fellow
Internal Medicine

Donald Wright, MD, MHS
Research Fellow
Yale Medicine

*MHS-AHSR Candidate

Program Leadership:

Cary Gross, MD,
Program Director
Cary.gross@yale.edu

Ilana Richman, MD, MHS
Co-Program Director
Ilana.richman@yale.edu

Chelsea Gubbins
Program Coordinator
Chelsea.gubbins@yale.edu

Program Goals:
- Provide rigorous training for future independent investigators and educational leaders.
- Promoting diversity within the physician-scientist workforce.
- Enhance Opportunities for physicians interested in outcomes and effectiveness research.

Program Benefits:
- Trains future leaders in translational research focused on clinical outcomes, effectiveness, quality, and equity.
- Provides coursework that partially fulfills MHS degree requirements.
- Equips trainees with skills to conduct relevant research and drive healthcare improvements.
- Prepares clinician researchers to forge partnerships, identify research questions, and produce actionable evidence.
- Offers a curriculum for MHS candidates focused on outcomes research, community engagement, health policy, and health care redesign.
- Collaborates with the National Clinician Scholar Program, fostering a diverse learning community.

MHS-AHSR Specific Skills:
- Identifying critical research questions
- Master methods needed for conducting clinically and policy-relevant research
- Using evidence to drive meaningful change in health and healthcare
- Develop a nuanced understanding of drivers of health disparities, including structural racism
- Forging meaningful partnerships with stakeholders
- Generate reliable and actionable evidence
- Foster communication and leadership skills

Curriculum Overview:

Degree: Master of Health Science

Program Length: 2 years (6 semesters – fall, spring, and summer)

The Advanced Health Science Research (AHSR) curriculum offers MHS candidates an exceptional opportunity to focus on outcomes and effectiveness research, emphasizing community engagement, health policy, and clinical outcomes studies. Delivered in conjunction with the National Clinician Scholar Program (NCSP), AHSR fellows participate in some of the same courses, fostering a diverse learning community. The coursework demands a substantial time commitment, particularly in the first year. For example, the biostatistics class involves 24 hours of in-class time during the summer and over 60 hours throughout the academic year, with other courses also requiring substantial commitments to in-person classwork as well as out of class tasks. These in-person classes can partially fulfill MHS degree requirements, and participants should discuss this option with their home clinical departments.

This is a two-year program requiring a 70%-time commitment, which must be approved by your department chair or division chief in writing. If a participant is unable to complete the degree in two years, approval of an extension is required by the Yale MHS Degree Program and the Track Academic Director.

Please see the summer calendar below.

Sample Outline of Required Coursework: MHS Advanced Health Services Research	Year 1 Summer	Year 1 Fall	Year 1 Spring	Year 2 Summer	Year 2 Fall	Year 2 Spring
NCSP Biostatistics	X	X	X			
NCSP Quantitative and Qualitative Research Methods	X	X	X			
NCSP Health Policy and Management	X	X	X			
NCSP Foundations of Community Engaged Research	X	X	X			
MHS Research in Progress Series		X	X		X	X
Mentored Thesis Research Project	X	X	X	X	X	X

Course Descriptions:

Biostatistics
Course Directors: Laura Cramer, PhD;
Maureen Canavan, PhD; Marney White,PhD

This comprehensive course in Biostatistics is designed to cultivate expertise in both theoretical concepts and practical applications. Throughout the year-long program, participants will develop the skills needed to employ statistical analyses for diverse data sets and research studies. These include descriptive statistics, bivariate comparisons, multivariable analyses encompassing linear and logistic regression, survival analysis, and specialized topics such as hierarchical modeling, Poisson regression, repeated measures, and time series analyses, weighting and complex survey design, as well as difference-in-differences, propensity score and instrumental variables analyses. By the course's conclusion, participants will be adept at not only conducting bivariate and multivariable statistical analyses but also critiquing and interpreting statistical methods frequently used in the medical journal literature.

The training is divided into three distinct parts:

Summer (5 intensive weeks, 15 hours): The summer term will cover the core methods and concepts of biostatistics, forming the foundation for the rest of the year. Class sessions (Zoom meetings) will be 2 hours long twice per week and will include review and clarification of new material as well as interactive Stata exercises and lab assignments. Lectures, which include the basic math and intuition behind each method/concept, are pre-recorded in segments up to an hour to allow for asynchronous viewing prior to class time. Students are expected to review and be prepared before each session. This will allow more time for discussion and class activities to practice concepts. A quiz accompanies each class session to assess progress and areas for clarification; a lab accompanies each class session to apply concepts using Stata.

Fall (10 weeks, 30 hours): During the fall term, students will learn linear and logistic regression in depth and use the tools learned thus far to answer substantive questions. Students will also learn how to calculate power and deal with missing data. Classes meet for 2 hours approximately every week and labs meet for 2 hours approximately every other week. Labs are designed to refine and advance data management skills while practicing the application of statistical concepts. Quizzes and homework are used to assess weekly progress and identify areas in need of clarification.

Spring (15 weeks, ~40 hours): During the spring term, students will apply statistical modeling techniques with exposure to an array of advanced topics including methods for analyzing categorical dependent variables, quasi-experimental designs, and panel/correlated data as well as risk model development and validation, psychometrics and exploratory factor analysis, and survey weighting schemes. Classes will meet for 2 hours once a week with labs covering most topics. See updated spring Assessments include regular lab applications, homework, and quizzes to assess progress and reinforce concepts.

Successful completion of the course requires that students will attend classes and labs and submit all assigned homework, quizzes and labs.

Foundations of Community-Engaged Research
Course Directors: Sakinah Suttiratana, PhD;
Kimberly Sue, MD, PhD

This course orients participants to the theoretical components and practical skills required to conduct community-engaged research. Crafted as a gateway to theoretical insights and practical skills in patient-centered care research and implementation science, participants navigate a multidisciplinary course content. Throughout the program, participants explore nuances of social determinants of health and how they influence health for people and populations, forge collaborative ties with community stakeholders, test participatory ways to use data analysis techniques, and actively link health research and science with community development and support. With a focus on program management skills, evaluation designs, and stakeholder-engaged research principles, this course offers a holistic understanding and application of research methodologies including the complexities of troubleshooting research projects where diverse parties claim interest. Students are exposed to community-engaged project design, theoretical orientations to working with community leaders and impacted populations, methodologies, instrument design, ethical issues that can arise while conducting community based participatory research, as well as evaluation and dissemination skills.

This course orients participants to the theoretical components and practical skills required to conduct community-engaged research with a diversity of perspectives, power, and investments. Given the growing interest in patient-centered care research and implementation science, this course offers a foundation and orientation to that field of practice.

The course is intended for 16-20 students. The class primarily meets during the designated class time; however, the cadence, meeting time and location vary over the year. The course meets weekly July-mid August; with approximately 5 additional sessions in the fall. Class time is supplemented with community meetings and walking tours. Some of the sessions in the community are optional and designated as such on the syllabus. The course requires in-class discussion, in-class interactive activities, and preparation outside of class time.

We use case exercises to explore topics and techniques that have contemporary relevance to community engaged research, e.g., outlining partnership agreements, evaluating an intervention, incorporating non-researcher insights. Course exercises utilize both independent and collaborative approaches to develop the following skills: defining the range of community engaged research; considering the outcomes and impacts of medical research at the population level, examining how community perspectives might contribute to research questions and interventions; understanding the complexities, challenges, and limitations of community engaged research, and understanding how to implement a community engaged research plan even in a new setting.

Health Policy and the Healthcare Ecosystem
Course Director: Joe Ross, MD, MHS

This introductory course in the Health Policy and the Healthcare Ecosystem (HPHE) is designed to cultivate a working knowledge of both theoretical concepts and practical applications to equip students with the policy knowledge and understanding to ensure that their research efforts are targeted to have the greatest potential relevance and impact for patients and on health systems. The curriculum provides exposure to the fundamental principles and practices in health care policy, financing, and delivery, as well as health care management. Specifically, the HPHE course covers: a) the fundamentals of health economics and US health care delivery and financing, including both public and private sectors; b) US health care policy development, analysis, and evaluation, with a focus on the clinician-researcher's role, at the federal, state and local levels; and c) topics in health care management. The HPHE course content is taught in a seminar format using lectures, case studies, and interactive discussions, all supplemented with relevant readings (both textbook and journal articles).

The course is intended for 8-15 students but could accommodate as many as 20. Sessions are focused on specific topics in lecture format, but class discussion is actively encouraged. Typically, there are 16-18 HPHE sessions scheduled over a 6-month period from July through December, as we retain some flexibility to add sessions if the class discussion requires. Sessions are scheduled approximately weekly over the Summer and then every other week through the Fall (and into early Winter if needed). Preparation outside of class is required, with recommended textbook chapter readings and journal articles.

Clinical and Health Services Research Methods
Course Directors: Shelli Feder PhD; Cary Gross, MD

This research methodologies course incorporates quantitative and qualitative approaches. Participants learn to design diverse clinical and health services research studies, covering study design, sampling, data collection, and analysis. Summer sessions focus on quantitative methods, fall for qualitative, and advanced topics in spring.

The summer course is an intensive, program that provides a comprehensive overview of concepts and methods in clinical epidemiology. 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.

The qualitative content provides a comprehensive overview of the theoretical and practical concepts and methods for conducting qualitative research in public health, nursing, and medicine. The course aspires to introduce scholars to various epistemological, philosophical, and ethical considerations that are involved with qualitative research methods. Additionally, scholars gain practical knowledge of strategies and techniques that are needed to conduct qualitative research. Topics include qualitative designs, mixed methods, theories and frameworks, sampling, rigor, data coding and analysis, data saturation, ethical considerations, writing for publication, and writing for grants and other products.

Yale MHS -AHSR Summer Schedule

July 2024

Monday	Tuesday	Wednesday	Thursday	Friday
1	2	3 1:30-3:30 Quantitative Research Methods	4 **No Class - Holiday**	5
8 10:30-12:00 Health Policy and the Healthcare Ecosystem 1:30-3:30 Quantitative Research Methods	9 10:00-12:00 Biostatistics	10 1:30-3:30 Quantitative Research Methods	11 10:00-12:00 Biostatistics 3:30-5:00 Community Based Participatory Research	12 10:30-12:00 Health Policy and the Healthcare Ecosystem
15 1:30-3:30 Quantitative Research Methods	16 10:00-12:00 Biostatistics 6:00-8:00 Community Based Participatory Research Walking Tour	17 1:30-3:30 Quantitative Research Methods	18 10:00-12:00 Biostatistics 3:30-5:00 Community Based Participatory Research	19 10:30-12:00 Health Policy and the Healthcare Ecosystem
22 10:30-12:00 Health Policy and the Healthcare Ecosystem 1:30-3:30 Quantitative Research Methods	23 10:00-12:00 Biostatistics 6:00-8:00 Community Based Participatory Research Walking Tour	24 1:30-3:30 Quantitative Research Methods	25 10:00-12:00 Biostatistics 3:30-5:00 Community Based Participatory Research	26 10:30-12:00 Health Policy and the Healthcare Ecosystem
29 10:30-12:00 Health Policy and the Healthcare Ecosystem 1:30-3:30 Quantitative Research Methods	30 10:00-12:00 Biostatistics	31 1:30-3:30 Quantitative Research Methods		

Yale MHS -AHSR Summer Schedule

August 2024

Monday	Tuesday	Wednesday	Thursday	Friday
			1 10:00-12:00 Biostatistics 3:30-5:00 Community Based Participatory Research	**2** 10:30-12:00 Health Policy and the Healthcare Ecosystem
5 10:30-12:00 Health Policy and the Healthcare Ecosystem 1:30-3:30 Quantitative Research Methods	**6** 10:00-12:00 Biostatistics 6:00-8:00 Community Based Participatory Research Walking Tour	**7** 1:30-3:30 Quantitative Research Methods	**8** 10:00-12:00 Biostatistics 3:30-5:00 Community Based Participatory Research	**9** 10:30-12:00 Health Policy and the Healthcare Ecosystem
12 10:30-12:00 Health Policy and the Healthcare Ecosystem	**13** 10:00-12:00 Biostatistics	**14**	**15** 10:00-12:00 Biostatistics 3:30-5:00 Community Based Participatory Research	**16** 10:30-12:00 Health Policy and the Healthcare Ecosystem
19	**20**	**21**	**22**	**23**
----------------No Classes – Optional Vacation Week---------------				
26	**27**	**28**	**29**	**30**
----------------No Classes – Optional Vacation Week---------------				

Tuition and Application Process

The tuition fee is $16,000 per year, regardless of whether one or all available courses are taken. Course participants are responsible for purchasing the books and software for the courses they take.

The AHSR coursework can partially fulfill the requirements for the MHS degree for individuals working within the context of their departmental master's programs. Participants interested in pursuing an MHS degree should discuss this option with their home clinical departments. The National Clinician Scholars Program does not oversee the MHS degree process for AHSR participants.

Any person interested in these courses must submit their completed application form by April 1st. Spots are limited, and applications will be reviewed on a first-come, first-serve basis. You will be notified by May 15th of your acceptance into the program. Tuition payments must be received by June 15th to secure your spot.

For more information, please email Chelsea Gubbins (Chelsea.Gubbins@yale.edu) regarding the application process. **Yale assesses a 10% fee for payments, full or partial, received outside of departmental funding**.

Individual Learning Plan (ILP):

Upon entry into the MHS-AHSR program, each student works with their mentor to design an ILP. The ILP is tailored based on each student's background, research interests, career goals and mentor's guidance and resources. The ILP process is a two-way interaction between students and mentors. The plan is evaluated constantly and updated as needed. The ILP identifies a research project and laboratory or clinical environment for the student to work in, creates personalized plans, sets expectations and timelines, and provides guidance to student's professional goals.

Master of Health Science – Clinical Investigation (MHS-AHSR)

Individual Learning Plan (ILP)

Student Information		
Name:	Current Degree:	Position Title:
Department/Section:	MHS-AHSR Start Year:	Expected Year of Degree Earned:
Phone:	Email:	Mentors:
Research Project Title:		
Short-Term Career Goals:		
Long-Term Career Goals:		

Framework for Student Evaluation Metrics		
	Year 1	**Year 2**
Required courses taken		
Elective courses taken		
MHS-AHSR research project-related laboratory work effort percentage		
MHS-AHSR research project-related clinical work effort percentage		
Frequency meeting with your primary mentor		
Timeline (Please fill out both Year 1 and Year 2; your plans may change as they develop)		
6-month plan		

12-month plan		
18-month plan		
24-month plan		
Manuscripts/abstract submitted or published (if any)		
Grants submitted (if any)		
Research project related presentations at meetings (include date, title, conference name)		
Other MHS-AHSR related outcomes		
Mentor Meeting Please include dates, attendees, and recommendations		