Welcome from the Chair 1
Strategic Vision for Epidemiology 2
The Unit Structure in Epidemiology 4
Welcome from the Chair

Dear Epidemiology trainee,

Welcome to the Department of Epidemiology!

We have assembled this Student Handbook to ensure that you enter fully into the rich life of the Epidemiology community as quickly as possible and that your education and development proceed smoothly from start to finish.

In these pages you will find information about our intellectual structure and our public health vision, and hear from recent graduates who share their training experiences to demonstrate the full range of possibilities open to you. You will get a snapshot of our array of communications and social media outlets, and an invitation to play an active role in them. You will learn about the EPIC Fund, to which you can apply for funding to cover ancillary research and training opportunities. You will hear from the Offices of Student Affairs and Career Services about what they offer and how to take advantage of their services. Perhaps most critical, you will find both the Master’s and Doctoral Guidelines, which provide comprehensive information about degree requirements, course offerings, school and university polices, the master’s practicum and thesis, and the doctoral dissertation. A directory of our faculty, complete with research area and contact information is included for quick reference, as well as a brief guide to what the campus and the city have to offer.

There is always a lot happening in the department — seminars, grand rounds, symposia, poster sessions, social events, and more — and you will get the most out of it if you participate as much as possible. To keep tabs on news and events, follow the department on Facebook (facebook.com/cuepidemiology) and Twitter (@cuepidemiology) and check our events calendar at epi-events.org.

I hope that the information in the Handbook will help you to optimize your educational experience in the department. I look forward to seeing and speaking with all of you over the course of your time with us.

Once again, a warm welcome to our community.

Charles Branas, PhD
Gelman Professor and Chair
Department of Epidemiology
Strategic Vision for Epidemiology

The Columbia University Mailman School Department of Epidemiology is one of the oldest and most distinguished departments of epidemiology in the world. Building on a core of excellence in scholarship and teaching, the department seeks to continue innovating and evolving to better meet emerging challenges in a changing world.

With that in mind this document aims to clearly articulate a strategic direction for the department, serving as the intellectual scaffolding on which department activities, from research, through education, and translation of our scholarship, can build. This is not intended to be a ‘final document’, but rather a ‘living document’, to be updated, and improved with the passage of time.

Scholarship

We are committed to understanding the cells-to-society determinants of global population health. In keeping with the goals of an epidemiology of consequence we explicitly intend our work to inform prevention efforts that improve the health of populations. We are interested in putting our science to work in the public arena, translating findings to policy and implementation scale-up.

We are dedicated to developing new and novel methods, and will adopt methods from other disciplines that can fruitfully inform our quantitative population health science. We are willing to embrace a broad range of approaches and to build partnerships with complementary disciplines to achieve these ends.

We aspire to explore and allow new ways of thinking to flourish, to catalyze cross and inter-disciplinary work, and to articulate frameworks that comprehensively explain the production of health and can galvanize effective population health practice.

Education

We aim to innovate in education and to foster an environment of educational excellence. We aim to engage in the teaching of epidemiologic science to a diverse body of students, to use multiple educational modalities, and to create the spaces for the continuing exchange of ideas that promote the field and its reach. We are committed to training students who will be leaders in quantitative population health science and in public health practice. We aim for our students to learn practical skills and to be prepared for a lifelong engagement in knowledge discovery, translation, and implementation.

We aspire to an inter-disciplinary education for our students, grounded in the basic skills of epidemiologic science but encouraging the embrace of complementary quantitative methods that can help answer key population health questions. Our education is embedded within a model of experiential learning and active mentorship that flexibly encourages students to function at their maximum capacity.
Translation

We aim to identify the causes of population health so that we may improve population health. To that end the department aspires to translate scholarship to implementation in an effort to contribute to the creation of conditions that make people healthier. We aim to make our scholarship accessible so that it may inform and influence the health sciences, the public health conversation, and the production of population health.

We are committed to translating our science to the broadest audience possible, including public health stakeholders and non-traditional actors who have the capacity to influence the health of populations. To this end we aim to solicit input from thinkers from diverse spheres of influence, to form strategic partnerships, and to catalyze advances in policy and practice that improve public health.
The Unit Structure in Epidemiology

The department is organized into eight units. The units serve as catalysts for scientific discussion among faculty and trainees through a structured program of formal interaction that encourages the development of innovative projects and programs. All doctoral students are assigned to a unit, and all master’s students are encouraged to join a unit and attend unit events.

Chronic Disease Epidemiology

Unit leader: Mary Beth Terry, PhD

Research in the chronic disease epidemiology unit addresses the etiology, prevention, distribution, natural history, and treatment outcomes of chronic health disorders, including cancer (particularly breast, colon, lung, prostate, ovary and pancreas), cardiovascular disease, diabetes, gastrointestinal and pulmonary disease, and obesity.

Research within this unit extends from our local Northern Manhattan community to US and international cohorts. Our faculty have expertise across a range of epidemiologic study designs including follow-up, family-based, and population-based studies. Our studies integrate approaches across many different disciplines and specialties including molecular epidemiology, lifecourse epidemiology, social epidemiology, and health outcomes.

Our unit maintains and continues to expand innovative collaborative research and training programs. Primary Columbia collaborators include the Herbert Irving Comprehensive Cancer Center; the departments of Environmental Health Sciences, Sociomedical Sciences, Biostatistics, Medicine, Neurology, Urology, and Psychology; and the School of Dental Medicine. We benefit greatly by drawing on expertise from many of our faculty in the unit who share appointments in other departments across Columbia University Medical Center.

The unit holds a monthly seminar, sponsors a highly popular certificate in chronic disease epidemiology for MPH students, and teaches several courses open to the department.

Environmental Epidemiology

Unit leader: Pam Factor-Litvak, PhD

Research in environmental epidemiology encompasses exogenous risk factors and health outcomes. Exogenous risk factors broadly include environmental contaminants (particularly exposure to endocrine disrupting chemicals, pesticides heavy metals, etc), the built environment (such as building, housing, and land use), and social factors (such as psychosocial stress). A wide variety of outcomes are studied including neurodevelopmental outcomes, cardiovascular and metabolic outcomes (including obesity), neurological disorders (especially essential tremor and amyotrophic lateral sclerosis), traumatic and injury outcomes, and psychiatric disorders.

Research within environmental epidemiology spans from studies in the local Washington Heights community to studies in the US, and studies abroad. Several faculty are heavily involved with international birth cohorts in Norway, Israel, Brazil and other countries. Other faculty are actively conducting intervention and community-based field trials in cities in the US and other countries. Studies integrate traditional epidemiologic study designs with studies of biomarkers, geographi-
cal information systems, social epidemiologic methods, life course methods, and implementation science.

As environmental epidemiology is inherently multidisciplinary, faculty have collaborations with other departments within the Mailman School of Public Health, the Columbia University Medical Center and throughout the world. Major collaborations include with the Departments of Biostatistics, Environmental Health Sciences, Population and Family Health, Neurology, Obstetrics and Gynecology, Pediatrics, Medicine, and Psychiatry and with faculty within the Institute for Human Nutrition.

The Department of Epidemiology, jointly with the Department of Environmental Health Sciences, sponsors a bimonthly seminar series, Environmental Epidemiology Connections. While primarily a journal club, the seminar also provides a forum for students and post-doctoral fellows to present research ideas to a receptive audience with constructive feedback in moving ahead early research ideas with the greatest scientific merit.

Infectious Disease Epidemiology

Unit leader: Wafaa El-Sadr, MD, MPH, MPA

Infectious diseases continue to have a substantial impact on the health of communities around the world. From the global HIV and tuberculosis (TB) epidemics, to the threat of resistant bacteria, to the challenge of emerging and newly identified pathogens. All compel the need for new methods to detect such pathogens, to understand their pathogenesis, and to devise effective interventions for their prevention and control.

Emerging molecular methods are critical for future efforts. Traditional case control and cohort studies will be necessary to define the role of such pathogens in disease causality. In addition, a deepening of the understanding of the complexity of factors that determine risk and susceptibility to various infectious diseases is necessary for the design of appropriate interventions. Moreover, exciting opportunities exist at the interface of communicable and non-communicable diseases, offering new and expanding research agendas.

The infectious disease epidemiology unit encompasses domestic and global work on the epidemiology of emerging and re-emerging infections, global infectious disease threats, disease surveillance, disease detection, development of vaccines and other prevention methods, clinical trials, and the role of infectious pathogens in the pathogenesis of chronic non-communicable diseases (such as cancer and cardiovascular disease). The focus is broad, ranging from the search for novel pathogens using advanced molecular techniques to longitudinal population based studies to define transmission dynamics and spectrum of disease and survival. Approaches are employed in an interdisciplinary fashion to define etiology, pathogenesis, transmission, and prevention/treatment potentials.

The infectious disease epidemiology unit is home to the faculty of several centers and includes several large-scale projects. Affiliated faculty members play a substantial role in the intellectual life of the unit, conducting collaborative research, organizing interdisciplinary seminars, and providing mentorship to students and junior faculty.

The unit holds a monthly seminar, sponsors a highly popular certificate in infectious disease epidemiology, and teaches several courses open to the department.
Violence and Injury Epidemiology

Unit leader: Guohua Li, MD, DrPH

The Violence and Injury Epidemiology Unit aims to improve population health by reducing the morbidity and mortality from unintentional and intentional injuries.

The newest of the six administrative and intellectual core organizing units in the Department of Epidemiology, the injury unit was catalyzed by the launch of the Center for Injury Epidemiology and Prevention at Columbia, one of 11 injury control research centers funded by the Centers for Disease Control and Prevention (CDC). The unit brings together a group of faculty with diverse expertise in epidemiology, biostatistics, health policy, engineering, emergency medicine, pediatrics, surgery, rehabilitation, and geriatrics to address unintentional and intentional injuries across the life span.

The objectives of the injury unit are to integrate expertise and other resources across academic divisions, facilitate interdisciplinary collaboration, forge diverse partnerships, and accelerate the advancement of science and the translation of scientific discoveries to reduce the incidence and severity of injury at the community, regional, state and national levels.

The unit sponsors an annual conference on translating injury research into effective prevention, a new peer-reviewed open access journal, Injury Epidemiology, in partnership with Springer Science and Business Media, and a certificate in injury prevention and control for MPH students. The unit also hosts two seminar series: a university-level seminar that provides a forum for cross-pollination of ideas and programs between local professionals and academicians, and a monthly unit seminar to advance the scientific discourse on contemporary topics related to injury research and prevention.

Neuroepidemiology Unit

Unit leader: Yian Gu, PhD

The Neuroepidemiology Unit is an intellectual community of faculty and students in the Department of Epidemiology who share an interest in understanding the causes, origins, progression, and consequences of neurological disorders. Our research focuses on a wide range of brain-related disorders, from neurodevelopmental disorders of early life through neurodegenerative disorders of aging. Students have an opportunity to engage with faculty who are leading scholars in the epidemiology of epilepsy, Alzheimer’s disease, cerebrovascular disease, Down syndrome, and other neurological disorders. Much of our work also focuses on understanding the complex genetic contributions to these disorders, including use of family studies and statistical genetic methods to identify specific genetic variations that contribute to risk, and study of the psychosocial impacts of these gene discoveries on affected persons and their families.

Faculty of the Neuroepidemiology Unit have strong affiliations with the Department of Neurology and the Gertude H. Sergievsky Center. The Sergievsky Center was established in 1977 by the prominent epidemiologist Mervyn Susser, with a primary focus on the epidemiology of epilepsy, cerebral palsy, and other neurodevelopmental disorders. Susser led the Center until 1991, when Dr. Richard Mayeux was named the Sergievsky Professor and Director. At that time, the Center’s mission was expanded to include neurological disorders throughout the lifespan. The Center also began to integrate biological markers and genetic analysis with traditional epidemiology to explore the etiology and pathogenesis of diseases of the nervous system.

Within the Department of Epidemiology, we are closely affiliated with the Psychiatric Epidemiology Unit, and this connection is recognized by a series of joint seminars organized by both units together. The unit holds a monthly seminar and teaches several courses open to the Department.
Psychiatric Epidemiology

Unit leader: Ezra Susser, MD, DrPH

The Psychiatric Epidemiology unit is an intellectual community of faculty and students who share a commitment to investigating the causes and consequences of psychiatric disorders. We use this knowledge to develop effective population-wide and clinical interventions. We aspire to use our findings to improve living conditions for people with mental disorders, which are affected not only by the symptoms of their disorders, but by the profound effects of stigma and social exclusion.

The unit embraces a population-based perspective that takes a “cells to society” (or “eco-epidemiology”) approach to investigate how factors at many levels may dynamically influence psychiatric disorders over the life course. Students benefit from working with faculty who are leading scholars in a wide range of areas, including stress and adversity, neurodevelopmental science and developmental psychopathology, stigma, genetic epidemiology, global mental health, and mental health services research. These opportunities are enhanced by our long collaborative history with other Departments of Columbia University, especially the Department of Psychiatry. Within the Department, our close alignment with the NeuroEpidemiology Unit is especially valuable and is recognized in a series of joint seminars sponsored by both units. Similarly, we are closely aligned with the Substance Abuse Unit of the Department, and with the Environmental Epidemiology Unit. Trainees have the opportunity to work with faculty across all these areas as well as across Departments within the Mailman School of Public Health.

The Psychiatric Epidemiology Training program (PET) and its weekly seminars provide a focal point for intellectual exchange. PET has had ongoing funding from NIMH for about 50 years. We teach a course in Psychiatric Epidemiology as well as courses in related topics such as global mental health, diagnosis, and biological psychiatry.

Trainees in psychiatric epidemiology are likely to interact with those who are in training programs in closely related areas. These include Neuroepidemiology, Substance Use Epidemiology, and Life course environmental epidemiology. They are also likely to interact with trainees in multiple training programs in the New York State Psychiatric Institute, some of which are focused more on neuroscience but also encompass epidemiology.

Social and Spatial Epidemiology

Unit leaders: Lisa Bates, ScD and Andrew Rundle, DrPH

The social epidemiology unit seeks to understand the ways in which social, psychological, political, cultural, and economic circumstances influence our chances for a healthy life. We combine theory from the social sciences with rigorous epidemiological methods so that we can illuminate the connections between social factors and health and use what we find to improve health. Within this broad frame we have a special interest in the connections between social inequalities and health inequalities.

The unit has three aims. First, we aim to produce knowledge about the influence of social circumstances on health with a special emphasis on social inequalities in health. Second, we aim to train and mentor a new generation of scholars and practitioners who have the capacity to conduct rigorous research on the role of social factors in health. Third, we aim to leverage what we learn to improve population health and reduce health inequalities locally, nationally, and across international borders.

Anchored upstream from the more proximal determinants of disease, research in the social epidemiology unit engages collaboratively with the other epidemiology units in the department, so that the full cascade of
influences on health from social conditions to biology can be understood. The social epidemiology unit builds on its connections with the Robert Wood Johnson (RWJ) Health and Society Scholars Program and the Center for the Study of Social Inequalities and Health. The RWJ program facilitates interdisciplinary collaborations between the biological and social sciences and has dramatically increased contacts between researchers at the Mailman School of Public Health and those elsewhere across multiple disciplines. Students benefit from close ties to the Departments of Sociology and Psychology and the School of Social Work. The Center for Social Inequalities and Health provides a rigorous intellectual basis for the study of health inequalities and support for junior faculty interested in this area, sponsors speakers, seminars, and events that highlight the importance of social inequalities for on the production of health inequalities, and keeps members current on critical issues through a lively journal club.

The social epidemiology unit sponsors a monthly unit seminar, a certificate in social determinants of health for MPH students (in collaboration with the Department of Sociomedical Sciences), and offers several courses open to the department.

**Substance Use Epidemiology**

*Unit leader: Silvia Martins, MD, PhD*

Research in the substance abuse epidemiology unit addresses the etiology, prevention, distribution, natural history, and treatment of substance use disorders, including and not limited to alcohol, marijuana and opioids. Faculty in our unit conduct epidemiologic research on the causes, consequences and interventions for substance use and substance use disorders (SUD), with a multi-level, cells-to-society perspective.

Research within this unit extends from local NYC data to work in other cities, the U.S. nationally, and also internationally. Our faculty have expertise across a range of epidemiologic study designs including international, national and local population-based studies, follow-up studies, and randomized controlled field trials. Our studies integrate approaches across many different disciplines and specialties including substance abuse epidemiology, lifecourse epidemiology, social epidemiology, injury epidemiology, and health outcomes.

Our unit maintains and continues to expand innovative collaborative research and a training program. Primary Columbia collaborators include: the departments of Sociomedical Sciences, Biostatistics, Anesthesiology, Psychiatry and the New York State Psychiatric Institute. We benefit greatly by drawing on expertise from many of our faculty in the unit who share appointments in other departments across Columbia University Medical Center.

Unit faculty teach several courses open to the department. The unit’s training program has a weekly faculty/fellow seminar open to all trainees in the department that sparks new interest in the field of substance abuse epidemiology and trains the next generation of leaders in the field.