Master's Guidelines

MPH and MS Programs in Epidemiology

Department of Epidemiology

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COLUMBIA UNIVERSITY | MAILMAN SCHOOL of PUBLIC HEALTH EPIDEMIOLOGY

Dear Master's students,

Welcome to the Department of Epidemiology! We are delighted to welcome the current cohort of trainees, and are deeply committed to assuring that each one of you has an optimal educational experience in the Department of Epidemiology.

Our Master's degree offerings are designed to prepare students for careers in a wide array of public health research and service settings. Our students are provided the skills to design, conduct, interpret and apply research into the causes, prevention, and control of human disease towards the ultimate goal of improving the public's health. The curriculum emphasizes mastery of methods of epidemiological research and is enriched by additional courses on a wide range of important injury and disease outcomes, such as AIDS, tuberculosis, and cancer, and on factors that may be important in disease causation, such as genetics, nutrition, and influence of the social and physical environment.

A quick overview of the information presented in this guide:

- In **Section I** we list the four Master's degree offerings in the Department of Epidemiology, with brief descriptions of each. These descriptions reference specific components of the overall Master's program, including coursework, certificate, practicum, and thesis.
- In **Section II** we describe components of the Master's program, and include a snapshot of how these program components correspond to each of the four degree offerings. Section II provides a listing of the 21 certificate programs open to Epidemiology students, with links to the corresponding webpages that describe course requirements for Epidemiology students.
- **Section III** provides information about the key sources of support and advice for Master's students and describes resources and activities designed to optimize your educational experience in the Department.

It is our sincere hope that these guidelines will enable you to have an optimal educational experience in the Department of Epidemiology. As such, we welcome and encourage any suggestions for their improvement.

My very best wishes,

Anne Paxton, DrPH, MPH, MIA
Associate Professor of Epidemiology
and Population and Family Health at CUMC,
Director, Master's Program in Epidemiology

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Section I

Master's degree offerings in the Department of Epidemiology

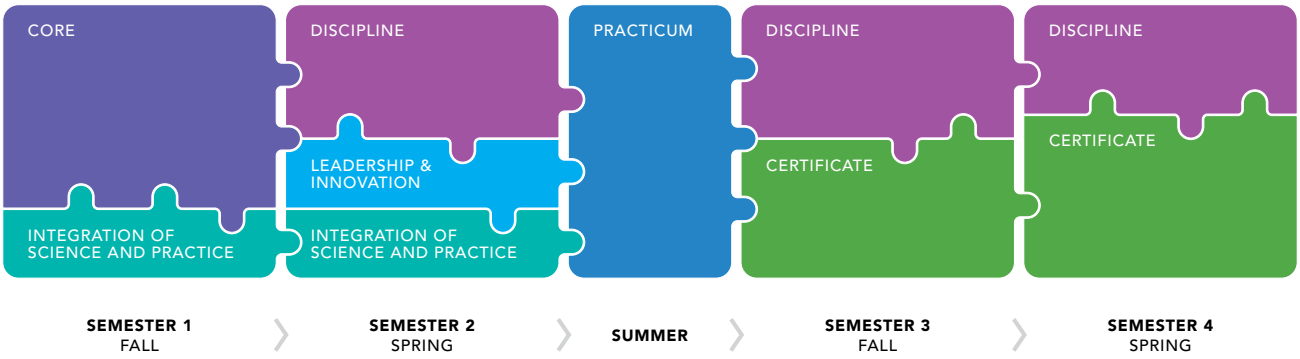
The Department of Epidemiology offers four Master's degree programs:

1. Columbia Master of Public Health (MPH) in Epidemiology
2. Accelerated MPH in Epidemiology
3. Master of Science (MS) in Epidemiology
4. Executive MS in Epidemiology

1 The Columbia MPH Program in Epidemiology

Completed in: 2 years
Includes: Certificate in one of 21 school-wide programs

The Columbia MPH program offers an integrated interdisciplinary school-wide curriculum in which students select one of 21+ Certificates that provides a secondary area of expertise in addition to students' departmental focus, in this case, Epidemiology. Students take the interdisciplinary core courses in the fall semester of their first year, and the bulk of the methods sequence (Epidemiology and Biostatistics) courses in the spring semester. With the exception of students undertaking the Global Health Certificate, most students will undertake a practicum during the summer between years one and two. Most of the certificate courses are taken in the second year, during which time the students will also write a Master's thesis that brings together skills and approaches from the Epidemiology methods and content from the Certificate.



2

The Accelerated MPH in Epidemiology

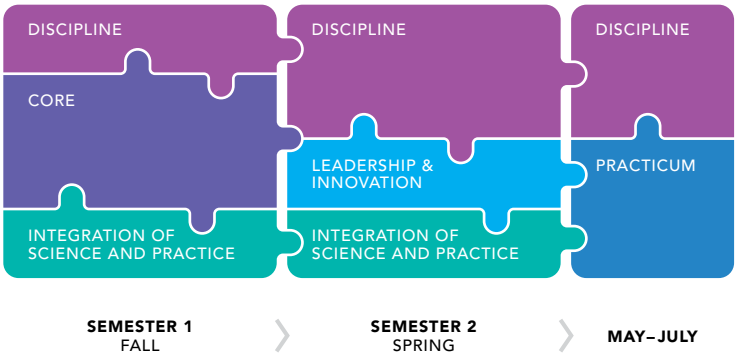
Completed in: 1 year

The Accelerated MPH is designed for highly motivated professionals seeking to enhance their careers with a degree in public health. The curriculum is similar to the two year MPH but completed at a faster, more demanding pace and without a certificate. The curriculum provides the broad, systemic understanding, critical thinking skills, and leadership training needed to tackle today's complex public health problems and work effectively with a variety of professional settings.

Candidates for the Accelerated MPH will have one of these qualifications:

- A doctoral degree (such as an MD, DDS, PhD, JD, DNSc, EdD, etc.)
- A nearly completed doctoral degree (within 24 months of completion)
- A Master's degree (such as an MS, MA, MBA, MSN) and at least 5 years related work experience

Students take the integrated core courses and one substantive epidemiology course in the fall semester. In the spring semester students complete the ISP, take Leadership and Innovation, the methods sequence (with the exception of Epi III), and two additional substantive epidemiology courses. Epidemiology III will be completed in the first summer session. Students will undertake a practicum of at least 140 hours which can be completed as their schedule allows—either part time or full time during spring or summer following their fall matriculation in order to complete all degree requirements in one year. Accelerated students write an abstract and prepare a poster which will be displayed at Epi Master's Student Day in October. The accelerated student is invited to be in attendance, but this is not a requirement. Given the time constraints of the degree, a Master's thesis is not required. The degree is conferred in mid-October.



3

The MS in Epidemiology

Completed in: 2 years

The Master of Science (MS) in Epidemiology is a research degree, usually undertaken by individuals who hold another graduate or professional degree in a related discipline such as MD, DDS, DO, MSN, or PhD. Occasionally an individual without an advanced degree undertakes the MS if they have two or more years of relevant experience, preferably in health research. The program is designed to provide trainees with a command of major concepts and techniques in epidemiology as well as a solid foundation in biostatistics. Students learn the skills necessary to develop testable hypotheses and design research projects, from clinical trials to broad population studies. Graduates of the program often go on to become independent researchers.

While the competencies achieved through the MS program are the same as those for students enrolled in the MPH program, MS students concentrate on research methodology specific to the discipline of epidemiology, are exempted from the practicum and have fewer required courses to take. MS students will complete a Master's thesis.

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The Executive MS in Epidemiology

Completed in: 20 months (one three-day weekend per month)

The Executive MS in Epidemiology (cuexecmsepi.org) is designed to provide working professionals with the additional knowledge, skills, and credentials needed to advance in their current position or turn their career in a new direction. Executive MS students are highly motivated professionals who work in health departments, academic settings, pharmaceutical companies, hospitals, and other healthcare settings in the US and abroad. With a weekend class schedule, the program is tailored to accommodate the professional and family obligations of our students. Classes are held one 3-day weekend (Friday-Sunday) per month for 20 months. Faculty advisors are available by appointment for in-person meetings or via phone or email.

Like our standard MS, the Executive MS provides trainees with a command of major concepts and techniques in epidemiology as well as a solid foundation in biostatistics. Students will learn the skills necessary to develop testable hypotheses and design research projects, from clinical trials to broad population studies. Executive MS students are exempt from the practicum requirement, but they will complete a Master's thesis.

Executive MS students enroll in a compressed, one semester thesis class (P9421) offered one full day per month. Exec thesis class is composed of a combination of lecture and workshops with individualized help and is augmented by weekly virtual office hours. Short periodic meetings during the fall semester assist Exec students in locating a thesis reader, a data set, and with obtaining Columbia University human subjects (IRB) approval as needed so that they are ready for class in January. The final thesis product is formatted as a publishable paper suitable for journal submission in their respective field.

Although it is not required, students are welcomed and strongly encouraged to attend as many departmental seminars as possible over the two years.

Part-time MPH in Epidemiology

A small number of MPH students choose to undertake the program part time. Below is a semester breakdown of the Core requirements required in the part-time program, as well as Integration of Science and Practice and Leadership courses that make up the MPH shared curriculum. Additionally, here is some information regarding the timing of these requirements:

Daily/Weekly Schedule for Part-time Students

First semester part-time students at Mailman are scheduled for class beginning at 2:30 PM and ending at 7 PM most days of the week (Cohort 4). During the first three weeks of the semester, part time students are scheduled for classes during this full block. However, there will be several periods during the semester when students may have only one or two courses, and will be coming to campus a small portion of that time, beginning at 4 PM. However, there is variability in the Friday schedule as well. Fridays are the days when small group recitations are scheduled, but these sessions will not occur every week.

1ST YEAR PART-TIME CORE REQUIREMENTS: FALL SEMESTER	
FOUNDATIONS OF PUBLIC HEALTH	1.5
RESEARCH METHODS AND APPLICATIONS	4.5
DETERMINANTS OF HEALTH	3.0
PUBLIC HEALTH INVERVENTIONS	4.5
TOTAL	**10.5**

2ND YEAR PART-TIME CORE REQUIREMENTS: FALL SEMESTER	
GLOBAL AND DEVELOPMENTAL PERSPECTIVES	1.5
HEALTH SYSTEMS	3.0
INTEGRATION OF SCIENCE AND PRACTICE (PART 1)	1.5
TOTAL	**6.0**

2ND YEAR PART-TIME CORE REQUIREMENTS: SPRING SEMESTER	
INTEGRATION OF SCIENCE AND PRACTICE (PART 2)	3.0
LEADERSHIP	1.5
TOTAL	**4.5**

Section II

The elements of the Master's degree, explained

1 Snapshot of degree requirements

The table below provides a snapshot of the requirements for each degree, and the pages that follow provide more detail about each element depicted in the table.

DEGREE	INTERDISCIPLINARY CORE	METHODS SEQUENCE	ADDITIONAL REQUIRED COURSES	THESIS	PRACTICUM
COLUMBIA MPH	Yes	Yes	Certificate courses	Yes	Yes
ACCELERATED MPH	Yes	Yes	3 Substantive Epidemiology courses	No	Yes
MS	No, MS students take introductory epidemiology and biostatistics courses	Yes	2 Substantive Epidemiology courses and 1 elective	Yes	No
EXECUTIVE MS	No, MS students take introductory epidemiology and biostatistics courses	Yes	3 Advanced methods courses	Yes	No

2 A note about advising in the Department of Epidemiology

Incoming Epidemiology Master's students are all assigned a faculty advisor. Students are strongly encouraged to set up an introductory meeting with their advisor in the first month of their first semester, and to follow up with additional meetings in the first semester or early in the second. Faculty advisors can help students articulate career goals that can be beneficial in focusing their interests for the practicum and thesis. The faculty advisor can be a resource in finding a practicum, a thesis reader, and/or a dataset related to the topic the student wants to address.

3

The interdisciplinary core

The interdisciplinary core includes courses taken during the fall semester of the first year that fall within six groupings called **Studios**. The six studios are Research Methods and Applications, Foundations of Public Health, Public Health Interventions, Global and Developmental Perspectives, Determinants of Health, and Health Systems.

Students are separated into small groups with a faculty member for a discussion-based course entitled **Integration of Science and Practicum**, which spans the entire first year.

Finally, students take, in their spring semester, a course on **Leadership and Innovation**.

4

The methods sequence

Completed in: 3 semesters

The methods sequence is a central feature of all the MPH and MS degrees offered by the Department of Epidemiology. For Epidemiology students, most of the methods sequence is taken in the spring semester of year one, although students take Epidemiology III in the fall of the second year or the summer between years one and two.

The methods sequence consists of a series of essential epidemiology and biostatistics methodology courses that provide an increasingly honed understanding of the tools and skills required to function as an epidemiologist. Students are discouraged from taking more than 15 credits during this semester of methods coursework. Students wishing to add a course to this demanding load should speak with their faculty advisor about the feasibility of taking additional credits. Students may consider taking a course pass fail as long as it is not required for the school, department or certificate.

The methods sequence includes the courses listed below:

- P6031 Research Methods and Applications in the integrated core (MPH students) **OR** — P6400 Epi I: Principles of Epidemiology (MS and Executive MS students)
- P6031 Research Methods and Applications in the integrated core (MPH students) **OR** — P6103 Biostats I: Introduction to Biostatistics (MS and Executive MS students)
- P8438 Epi II: Design and Conduct of Observational Epidemiology
- P8400 Epi III: Applied Epidemiologic Analysis
- P8120 Analysis of Categorical Data
- P8483 Applications of Epidemiologic Research Methods I

Recommended:

- P8100 Applied Regression

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Additional course requirements

Master's students in each degree program have additional course requirements beyond the methods sequence.

- Students enrolled in the **Columbia MPH** are also working toward a certificate. Each certificate has its own set of required courses and students must follow the certificate guidelines to know which courses are required. Certificate course information is provided later in these Guidelines.
- Students in the **Accelerated MPH** take three substantive epidemiology courses chosen from the list below.
- Students in the standard **MS** program take two substantive epidemiology courses and an elective course from any department across the Mailman School. All substantive courses offered within the Department of Epidemiology are listed on the following page.
- Students in the **Executive MS** program take three advanced methods courses in addition to the standard methods sequence:
  - P8100 Applied Regression
  - P8485 Presentation and Visualization of Epidemiological Data
  - P9400 Critical Thinking in Epidemiology

Substantive Courses

The substantive epidemiology courses listed below are available for students to take as electives or, in some cases, as required courses (for particular certificates). The courses focus on the epidemiology of specific diseases or issues in or aspects of epidemiology. For course descriptions, please visit: mailman.columbia.edu/people/current-students/academics/course-directory

- P8301 Gene Environment Interactions in Human Development [EHS]
- P8307 Molecular Epidemiology [taught through the EHS Department]
- P8401 Pharmaco-epidemiology
- P8403 Nutritional Epidemiology
- P8404 Epidemiology and Genetics of Aging
- P8405 Genetics in Epidemiology
- P8406 Infectious Disease Epidemiology
- P8407 Epidemiology of Aging
- P8410 Reading Seminar for Psychiatric Epidemiology I
- P8414 Cancer Epidemiology
- P8415 Chronic Disease Epidemiology
- P8417 Selected Problems in Measurement
- P8419 Neurobiology and Genetics of Psychiatric Disorders
- P8421 Clinical Psychiatry for Epidemiology and Public Health
- P8422 Perinatal Epidemiology
- P8430 Public Health Surveillance
- P8432 Environmental Epidemiology
- P8440 Epidemiology of Cardiovascular Diseases
- P8441 Global Chronic Cardiovascular Disease Prevention
- P8442 Epidemiology and Control of Tuberculosis
- P8445 Current and Emerging Issues in Injury and Violence
- P8448 Methods in Injury Epidemiology and Prevention
- P8450 Clinical Epidemiology
- P8453 Lifecourse Epidemiology II
- P8465 Epidemiology of HIV and AIDS
- P8469 Epidemiology of Malaria
- P8470 Epidemiology of Alcohol and Drug Problems
- P8471 Social Epidemiology
- P8475 Topics in Emerging Infectious Diseases
- P8477 Epidemic Modeling for Infectious Disease Epidemiology
- P8486 Applying Epidemiologic Methods to CAM
- P8488 Epidemiologic Research Topics in Developing Countries
- P8489 Epidemiology of the Mental Health Impact of Trauma, Violence, and Loss in the Global South
- P8493 Lifecourse Epidemiology
- P8499 Field Methods in Epidemiology
- P8679 Investigative Methods in Humanitarian Emergencies [Population and Family Health]
- P8825 Global Chronic Disease
- P9415 Epidemiology of Drug Abuse in a Community Sample
- P9493 Topics in the Epidemiology of Neurological Disorders

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Certificate programs

Every student in the two-year Columbia MPH program enrolls in a certificate program which provides training in a focused area of expertise—in addition to the student's departmental discipline—and leads to a Columbia University approved credential. The certificate programs have been developed in consultation with public health employers and other key stakeholders and reflect today's most sought-after skills and knowledge.

Detailed information on all certificate programs is available online. Students taking the Columbia MPH within the Department of Epidemiology are able to select a certificate from 21 school-wide certificate programs listed below. You can also find requirements and sample coursework for each certificate using the Certificate Requirements Database.

- Advanced Epidemiology
- Applied Biostatistics
- Child, Youth, and Family Health
- Climate and Health
- Comparative Effectiveness Outcomes Research
- Environmental Health Policy
- Epidemiology of Chronic Disease
- Global Health
- Health Communication
- Health and Human Rights
- Health of an Aging Society
- Health Policy and Practice
- History, Ethics, and Law
- Infectious Disease Epidemiology
- Injury Prevention and Control
- Molecular Epidemiology
- Public Health and Humanitarian Assistance
- Public Health Research Methods
- Sexuality, Sexual, and Reproductive Health
- Social Determinants of Health
- Toxicology

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The practicum

MPH students in the Department of Epidemiology undertake an epidemiologically-relevant practicum (mailman.columbia.edu/people/current-students/academics/practicum/epidemiology-practicum) in a public health setting where they receive a hands-on mentored experience. Students choose between practicum opportunities in New York City, in institutions throughout the United States, as well as in settings overseas. Although most two year MPH students enrolled in a certificate program select a practicum related to their certificate area, this is not required.

The standard epidemiology practicum is the equivalent of two months of full-time work (at least 280 hours). Accelerated and dual degree students undertake a practicum that is a minimum of 140 hours. The majority of students undertake their practicum during the summer between their first and second years, although there are exceptions. Epidemiology MPH students in the Global Health Certificate are required to undertake a six-month practicum in an overseas setting, usually from July through December.

The objective of the practicum experience is to provide an opportunity for students to practice and extend skills acquired through their course work and to develop epidemiology and general public health competencies. Although what constitutes an ideal epidemiology practicum varies by certificate and by a student's long-term career goals, all epidemiology practica should provide the student with exposure to the epidemiology core competencies defined by the Association of Schools of Public Health (ASPH) (aspph.org/educate/models/mph-competency-model). The ASPH Epidemiology core competencies have been grouped, for the purposes of assessment of the suitability of the practicum, into two categories as listed below:

Core Competencies - Category 1:
During the practicum, the student should employ at least two of the following skills:

- Describe a public health problem in terms of magnitude, person, time, and place
- Utilize the basic terminology and definitions of epidemiology
- Calculate basic epidemiology measures
- Evaluate the strengths and limitations of epidemiologic reports
- Draw appropriate inferences from epidemiologic data

Core Competencies - Category 2:
During the practicum, the student should engage in activities that require them to perform at least two of the following:

- Recognize the importance of epidemiology for informing scientific, ethical, economic, and political discussion of health issues
- Identify key sources of data for epidemiologic purposes
- Communicate epidemiologic information to lay and professional audiences
- Comprehend basic ethical and legal principles pertaining to the collection, maintenance, use, and dissemination of epidemiologic data
- Recognize the strengths and limitations of public health screening programs

All MPH students, including accelerated and dual degree students, complete an abstract and poster (or a PowerPoint presentation if invited to give an oral presentation). Epidemiology MPH students who are on campus during the fall semester of the second year (not students in the Global Health Certificate program who will still be overseas) are required to complete an abstract of their practicum experience and participate in the Epidemiology Master's Student Day. Three student abstracts are selected for oral presentation. Students selected for oral presentations prepare a PowerPoint talk but not a poster. All other students prepare a poster using the guidelines available on the Epidemiology Practicum Courseworks site.

Epidemiology MPH students planning to undertake the standard two-month practicum are assisted through the practicum preparation process by Epidemiology faculty members and Practicum Directors, Dr. Joyce Pressley and Dr. Batya Elul. In the fall semester, all students complete certifications in CITI Human Subjects Protection and the Health Insurance Portability and Accountability Act (HIPAA). MPH students also complete a practicum advising survey and attend the Epidemiology practicum seminar series. The seminar series prepares the students for the practicum by introducing them to the overall process, placement options, search strategies and tips for preparing a competitive application and for optimizing their practicum performance. Seminars also address compliance with Columbia University's policies governing student research with human subjects (see Appendix 3). The Global Health Certificate students have their own pre-practicum seminars led by Dr. Anne Paxton in the spring semester of year one. Additional practicum seminars are organized and led by the school on select topics.

There are several processes in place to help students identify a practicum that best suits their professional interests. Students locate practicum opportunities through a variety of sources such as the departmental practicum office, attending Epidemiology Master's Student Day in October, school-wide practicum opportunities, Office of Career Services announcements, and through their own initiatives. At Epidemiology Master's Student Day, students listen to talks, view posters, and speak firsthand with approximately 120 second year epidemiology students who have just completed their practicum experience. After identifying an organization with which to work, and prior to beginning the practicum, students should work with their supervisor at the organization to map out the scope of activities in sufficient detail for assessment of whether the practicum involves the need for institutional review board (IRB) review.

It is the student's responsibility to obtain sufficient information from the practicum site to address questions relating to IRB requirements. This should be done in advance so that there is time for an IRB submission should one be needed. The practicum director may instruct the student to submit an IRB pre-screen or a full IRB protocol. In such cases, it is the student's responsibility to submit the IRB pre-screen or to write the IRB protocol. The practicum cannot begin and the student cannot accrue practicum hours toward this graduation requirement until IRB clearance has been obtained. Upon practicum completion, the student and mentor complete practicum evaluations. Faculty-level practicum advising is available beginning in the fall semester and continuing as needed through completion of the practicum. The practicum can lead students to a thesis topic and dataset, although it is not required that it do so.

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Master's thesis

The Master's thesis in Epidemiology is the culmination of the student's educational experience at Mailman. The thesis is a mentored research and writing project where students work one-on-one with a faculty member of their choice analyzing epidemiology data and writing a paper in the form of a peer-review journal article. The thesis is begun in the fall of the second year and completed by mid-April of the spring semester prior to graduation.

Engaging a thesis reader early is crucial to a successful thesis experience. First readers must have a faculty appointment in Epidemiology. The thesis reader will provide content expertise and assist the student in identifying gaps in the literature, formulating a scientifically important research question and selecting a dataset appropriate for exploring the thesis question. First year students are encouraged to begin thinking about what topic they would like to research for their thesis. Resources available to them to find a thesis reader include their faculty advisor and from course instructors for the thesis courses (Dr. Larkin McReynolds for Columbia MPH with certificate students and Dr. Joyce Pressley for Executive MS students). Accelerated MPH students do not do a thesis. Students use a variety of resources to locate an appropriate dataset to answer the public health question they pose in their thesis: first readers, thesis course instructors, academic advisors, practicum mentors, or their certificate lead. Students are encouraged to have a data set in hand and an agreement with an Epidemiology faculty member that they will be their thesis reader by the beginning of the fall semester of their second year. Students have the option of having a second reader who is frequently someone associated with the practicum or the thesis data. The second reader can be any researcher with a doctoral degree, either from the Columbia community or from outside the institution. The second reader provides additional support and confers with the first reader on the thesis grade. The thesis class, first reader, and second reader (if applicable) jointly determine the thesis grade.

The thesis data set should be from an epidemiologic study large enough to utilize multivariable statistical methods to which the student was exposed during their training. Students often use faculty members' datasets, publicly available datasets, or data from a practicum site if it is suitable for thesis work, although the thesis and practicum do not have to be linked. Columbia University policy on research by students requires that all theses involving human subjects research be submitted for IRB review prior to beginning data analysis.

Columbia MPH with certificate students and MS students (except for the executive MS and Global Health Certificate students) register for a year long, three-credit course (for administrative purposes split into P9419 in the fall and P9420 in the spring) with the grade conferred by the faculty reader and thesis class. Students registered for P9419 will be oriented to the thesis project and provided with detailed instruction on the elements of the thesis and resources available to them throughout the year. Students will find resources on these topics on the Courseworks sites for their respective thesis course. Students receive extensive support in all aspects of the thesis from review of the literature to data analysis and thesis writing from the thesis class, online electronic help topics, workshops, and office. Executive MS students register for only 1 thesis course (P9421) taught in the spring semester that is specifically designed for the academic pace of the executive student. Global Health Certificate students register for P9420 in the spring semester only.

9 Department sponsored seminars, grand rounds, and symposia

Students are encouraged to attend as many departmental, CUEGR and cluster seminars as possible to obtain a broad understanding of current topics and debates in epidemiology today.

- **Department Seminars** are held monthly and showcase the research and work being done by faculty and students in the Department. Seminars are held on Fridays from 12:00-1:00 p.m. in Hess Commons unless otherwise indicated.
- The **Columbia University Epidemiology Grand Rounds (CUEGRs)** is a monthly lecture series hosting global leaders in epidemiology who share their ground-breaking work with the Department's faculty and students, as well as with the Columbia community at-large. CUEGR lectures present a broad range of topics and foster academic exchange around key issues in epidemiology. In addition, the series helps forge important links between the Department and leading figures and programs in epidemiology throughout the world. All events, which are open to the public, consist of a 60-minute lecture followed by a 30-minute discussion period, in which audience members are encouraged to participate. Moreover, speakers are invited to spend the day at Columbia with ample time to engage faculty and students prior to the lecture. This intimate format maximizes the experience for both guests and Mailman School participants and can include visits with journal clubs and other groups on campus, lunch, etc. CUEGR lectures are held on Wednesday from 4:00-5:30 p.m. in the 8th Floor Auditorium, unless otherwise indicated.
- The Department of Epidemiology is organized into five clusters, each of which has regularly scheduled **Cluster Seminars** for faculty and students. The five clusters are Social Epidemiology, Injury Epidemiology, Psych-Neuro Epidemiology, Infectious Disease Epidemiology and Chronic Disease Epidemiology.

In addition to the regularly scheduled seminars, the Department sponsors several formal, full-day symposia each year. **Columbia University Epidemiology Scientific Symposia (CUESS)** bring the best minds in our field together for a full day of discussions on the most pressing health questions of our time. Students are strongly encouraged to take full advantage of the symposia. Students may also attend the Student Liaison Journal Clubs that are held monthly each semester.

Schedule information on all seminars and symposia is available on the Department of Epidemiology News & Events page (mailman.columbia.edu/become-student/departments/epidemiology/news-events) as well the Mailman School calendar web page (mailman.columbia.edu/public-health-now/events). In addition, all events are announced weekly and updated continuously on our Facebook page (facebook.com/cuepidemiology).

Section III

Resources and special activities for Master's students

1 Questions, concerns, and department resources

In the Department of Epidemiology, the faculty and administrative leaders of the Master's program are available to address the concerns of Master's students, academic or otherwise.

Ms. Liliane Zaretsky
Director of Academic Programs in Epidemiology
Office: Room 728 on the 7th floor of the Allan Rosenfield Building
Phone: 212.305.9410
Email: lz3@cumc.columbia.edu

Dr. Anne Paxton
Director of Master's Program and Chair of Master's Committee
Office: Room 1613 on the 16th floor of the Allan Rosenfield Building
Phone: 212.304.6374
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Dr. Joyce Pressley
Director, Department of Epidemiology Practicum and Executive Thesis Program
Office: Room 812G on the 8th floor of the Allan Rosenfield Building
Phone: 212.342.0421
Email: jp376@cumc.columbia.edu

Dr. Batya Elul
Director, Department of Epidemiology Practicum Program
Office: Room 528 on the 5th floor of the Allan Rosenfield Building
Phone: 646.303.2441
Email: be2124@cumc.columbia.edu

Dr. Larkin McReynolds
Director, Department of Epidemiology Master's Thesis Program
Office: Room 246 on the 2nd floor of the Allan Rosenfield Building
Phone: 646.774.5746
Email: lsm34@cumc.columbia.edu

Student Handbooks

Student handbooks and guidelines — including a PDF copy of these Masters Guidelines — are available for both Masters and Doctoral students as well as Departmental Handbooks. mailman.columbia.edu/people/current-students/academics/student-handbooks

Additional resources outside of the department are listed below:

Office of Student Affairs (OSA)

The OSA assists students as they navigate their academic programs. From orientation to graduation, the office monitors academic progress, assists with registration-related questions, develops co-curricular programming to enhance student life, and assists students who encounter any academic or personal obstacles along the way. mailman.columbia.edu/people/current-students/office-student-affairs.

The Office of Disability Services

The Department of Epidemiology works closely with the Office of Disability Services (ODS) to facilitate equal access for students, including coordination of reasonable accommodations and support services for students with disabilities. ODS works with students with all types of disabilities, including physical, learning, sensory, psychological, AD/HD, and chronic medical conditions. ODS also provides assistance to students with temporary injuries and illnesses. mailman.columbia.edu/people/current-students/student-resources/health-and-wellness/disability-services

The Epidemiology Department is committed to a campus culture that is sensitive and responsive to the needs of students. The department wishes to enable students with disabilities to fully realize their potential, recognizing their abilities and independence while supporting reasonable accommodation, maintaining equal access and preserving their confidentiality, in line with the spirit and provisions of the amended Americans with Disabilities Act.

To register with the Office of Disability Services, students must complete a Graduate Application for Accommodations and Services and submit documentation of their disability. The application and guidelines for disability documentation are available online at health.columbia.edu/disability-services and at the ODS office. Students are encouraged to register with the Office of Disability Services at the time of their matriculation at Columbia University although they may do so later if appropriate. Review of requests for accommodation and disability documentation may take two to three weeks to complete. Students are eligible to receive reasonable accommodations only once the entire registration process is complete. For more information, please contact the Office of Disability Services at 212.854.2388 or disability@columbia.edu.

Center for Student Wellness

The Center for Student Wellness (CSW) works to promote health and enhance learning by addressing health-related barriers to academic success. The Center offers a wide range of services for students in the Health Sciences including counseling and mental health consultation and treatment. The CSW assures confidentiality and does not report the names of visitors to the office and will not act without permission, except in cases of imminent serious risk to individual safety, or if required by law. Located at 107 Bard Hall, the CSW is open Monday through Friday by appointment and also maintains walk-in hours. Services provided by the CSW are free to CUMC students. For more information, call them at 212.304.5564 (email student wellness@columbia.edu) or see their website at cumc.columbia.edu/student-health/center-student-wellness.

Career Services

It's never too early explore internships and post-graduate career opportunities. The Office of Career Services supports current students, prospective students, and alumni through a wide array of career education services and resources. mailman.columbia.edu/people/current-students/career-services

Ombuds Office

The Ombuds Office is another excellent source for thoughtful and confidential advice regarding difficult challenges that students may encounter, including academic concerns, bureaucratic run-arounds, and interpersonal conflicts. More information can be found at ombuds.columbia.edu.

Student Services for Gender-based and Sexual Misconduct

Student Services for Gender-based and Sexual Misconduct is designed to support students facing inappropriate behavior based on sex and/or gender discrimination that may or may not be sexual in nature. Their website contains information on resources, on policy and on how to get advice. It can be accessed at sexualrespect.columbia.edu and they can be contacted at 212.854.1717.

Please visit the the MSPH Masters Handbook and Doctoral Handbook online (mailman-handbook.com/2014/node/6) for information on additional student resources, as well as the Community Standards and Conduct (mailman.columbia.edu/sites/default/files/pdf/community-standards-and-conduct.pdf).

The Writing Center

Effective written communication is a critical skill for public health researchers, practitioners, and leaders. Furthermore, the style of scientific writing that is the standard in the field of epidemiology can be very unfamiliar and often requires new skill development, even for students entering the program with strong writing skills.

All graduate and undergraduate students at Columbia University are eligible to access an excellent free writing resource, the Writing Center. Located on the Morningside campus, a short subway or a free shuttle ride away, the Center offers workshops and structured appointments in which writing consultants work one-on-one with students. They provide services tailored for graduate students of all disciplines (short papers, long papers, research papers, theses, dissertations, etc.) and also offer specific services to non-native English speakers/writers. You can learn more about the Writing Center at college.columbia.edu/core/uwp/writing-center.

2 The EPIC fund

The EPIC Fund was created using the revenue generated by the Epidemiology and Population Health Summer Institute at Columbia University (EPIC) and other Departmental gifts. It is a funding source for Department trainees pursuing research and training opportunities beyond those covered by their standard tuition. Potential uses for the EPIC fund include but are not limited to:

- travel for conferences; priority will be given to trainees who are presenting findings at professional meetings
- purchase of ebooks, datasets, or samples for a study
- tuition for specific training needs, such as short courses, workshops, and training in software packages or lab techniques
- research related items that will contribute to the trainees' research (for example, data collection)

There are three EPIC funding cycles: applications will be accepted on January 30, May 30, and September 30 each year.

EPIC Fund detailed description
mailman.columbia.edu/sites/default/files/legacy/EPIC_Fund_description.pdf

EPIC Fund application
mailman.columbia.edu/sites/default/files/legacy/EPIC_Fund_application.pdf

3 Epidemiology department socials

The Department of Epidemiology sponsors a number of Socials each year to celebrate holidays, honor achievements, and to bring faculty, staff, and students together in a festive setting. Socials are excellent opportunities for students to mingle with faculty and engage in the life of the Department. Of particular interest is our Master's Student Day held each fall, in which all second-year Master's students whose degree program requires a practicum make an oral or poster presentation on their practicum experiences.

Appendices

School-wide Competencies for the Master's Program

Upon satisfactory completion of the MPH degree, all graduates will be able to demonstrate a broad knowledge and skills base in the core areas of public health, with particular emphasis in a selected field of public health, and will be able to:

- Apply statistical methods of estimation and hypothesis testing and explain the applications of probability and inference, descriptive and inferential methodologies, and correlation and regression for the purpose of analyzing public health research data
- Analyze how environmental contaminants (chemical, physical, and other exposures) interact with biological systems and their effect on human populations for the purpose of evaluating risk reduction strategies
- Apply epidemiologic methods to the measurement of disease rates, prevention of infectious diseases, and the development and evaluation of health programs and policies
- Assess the impact on health policy options of social, political, technological, economic, and cultural forces and apply organizational management techniques to address organizational challenges to providing healthcare
- Examine public health issues and responses from a social and behavioral sciences perspective and explain social, cultural, political, economic, and behavioral determinants of disparities in health status among populations
- Explain the linkages between public health problems and other societal issues (public policy, environmental contexts, health disparities, reproductive health, population shifts, etc.)
- Analyze public health research studies in order to critique analytic methods, evaluation reports, policy papers, and other professional documents to identify strengths, weaknesses and potential impact on public health challenges
- Apply the basic concepts of human biology (immune system, DNA, the neurological system, etc.) to inform understanding of various impacts of illness, the environment, and genetics on human health
- Understand, discuss, and challenge different perspectives on what constitutes scientific inquiry, the norms of science, and the roles of paradigms in shaping the evolution of science in order to apply questions to the limits of validity and interpretability of information and data and explaining sources of uncertainty in scientific results
- Apply a systems approach to identifying and implementing appropriate policy and interventions to addressing the complex molecular, biological, and social system interactions causing disease and other public health problems
- Explain and analyze the linkages between social, historical, cultural, economic and political changes associated with globalization and the key health problems of the early 21st century, including globalization as a key determinant of health and the varied burden of disease across nations
- Understand the essential role that program planning, design, and evaluation plays with improving public health decision-making and practice.
- Interact effectively and collaboratively with both diverse individuals and communities to produce or impact an intended public health outcome
- Effectively lead and communicate a shared vision of the future by championing solutions to organizational and community challenges
- Demonstrate ethical choices, values and professional practices implicit in public health decisions
- Communicate effectively (in oral and written formats) about public health policy, research, findings, and their implications to a variety of audiences
- Demonstrate a breadth and depth of professional knowledge and skills for effective practice in their selected field of study

Epidemiology competencies

Upon satisfactory completion of the Master's degree in the Department of Epidemiology, all graduates will be able to demonstrate knowledge of and skills in Epidemiology in both theory and practice. Essential competencies are listed below:

- Discuss the role of epidemiology within the broader field of public health; and identify and explain its importance and relationship to the fieldsof medicine, social and behavioral sciences, environmental science, and health policy
- Apply evidence-based principles and the scientific knowledge base to critical evaluation and decision-making in public health
- Explain and analyze the distribution and determinants of both chronic and infectious diseases in different populations
- Describe a public health problem in terms of magnitude, person, time, and place
- Identify the principle and limitations of public health screening processes
- Apply principles of disease prevention within populations
- Review epidemiological literature in a defined problem area using advanced bibliographic and informatics resources
- Critique published epidemiological studies as to their strengths and weaknesses
- Create and develop a conceptual framework for research in epidemiological problems
- Apply principles of causal inference to epidemiologic data
- Identify common epidemiologic study designs including ecologic, cross-sectional, cohort, and case-control, and explain their uses for solving epidemiological problems
- Choose a study design appropriate for a particular epidemiological research question
- Implement or observe closely the implementation of one or more epidemiological study designs in the field
- Identify key sources of data for epidemiological study
- Calculate and interpret basic population measures of health and disease occurrence including incidence, prevalence, and survival
- Make appropriate comparisons of disease rates within and between populations
- Distinguish among basic measures of association, including rate ratio, risk ratio, odds ratio, attributable risk, and population attributable risk as they apply to the different study designs
- Identify situations in research studies in which confounding and/or effect modification may affect an observed association, and select and apply the appropriate statistical methods to quantify such effects
- Use appropriate statistical methods for analysis of epidemiological data
- Use standard statistical software packages for epidemiological research
- Communicate epidemiological information to lay and professional audience
- Discuss contemporary issues in epidemiological research in at least three substantive areas, which may be diseases and other health outcomes/ (e.g., AIDS, tuberculosis, cancer, psychiatric disorders) or exposures (e.g., environment, nutrition, genetics)
- Explain the biological and molecular basis of public health
- Incorporate public health biology (the biological and molecular context of public health) into public health practice
- Specify the role of the immune system in population health and describe how behavior alters human biology
- Identify basic ethical and legal principles pertaining to the collection, maintenance, use, and dissemination of epidemiological data
- Identify the ethical, social, and legal issues implied by public health biology
- Identify potential ethical problems in research studies
- Evaluate alternative approaches to solving ethical dilemmas
- Apply the principles underlying ethical treatment of human subjects in research
- Demonstrate transparency, integrity, and honesty in all actions

Human Research Protection Office Students as Researchers Policy

Scope

This Policy applies to all human subjects research and other scholarly activities involving human participants conducted by students at Columbia University ("Columbia") and clarifies which research projects or activities require review by the Columbia Institutional Review Board (IRB) for the protection of human subjects in research.

Effective date: February, 2017; this Policy replaces the Students as Researchers Policy that was effective on March 16, 2012.

Definitions

Research: as defined in 45 CFR 46.102(d) i.e., a systematic investigation designed to develop or contribute to generalizable knowledge. [45 CFR 46(d)

Exempt Research: Research involving Human Subjects that includes only procedures that fall into one or more of the categories of research that have been designated by the U.S. Department of Health and Human Services as exempt from the requirements of the regulations for the protection of human subjects in research. [45 CFR 46.101(b)]

Greater Than Minimal Risk: a risk of harm that is greater than that which the individual would normally experience in the course of his/her daily life or in routine medical or psychological examinations.

Human Subject: as defined in 45 CFR 46.102(f), i.e., a living individual about whom an investigator (whether professional or student) conducting research obtains

- Data through intervention or interaction with the individual; or
- Identifiable private information. [45 CFR 46(f)]

Student Researcher: an individual who is pursuing a degree or course credit at Columbia and, as part of a Columbia course or degree requirement, is either:

- Conducting Research that involves Human Subjects, or
- In order to learn or practice research methodology, is collecting private identifiable data about living individuals, or interacting with them to collect data about them.

Students cannot be Principal Investigators: all students submitting an IRB protocol require a faculty member, usually their advisor, to submit as the PI.

Background

All Research with Human Subjects that is conducted by Columbia faculty, staff or students, or is otherwise conducted under the aegis of Columbia, requires submission of a protocol to a Columbia IRB and prospective IRB approval prior to commencement of research procedures.

Dissertations, theses and honors research projects are considered to be Research. Students conducting these activities may have reached a level of sophistication with respect to research design and conduct that may lead to generalizable results, e.g., those that may inform policy, apply to individuals or groups beyond the subject population, and/or contribute to the professional or scholarly literature on the topic. Publication may be an outcome of such Research, but is not a requirement for a project and

its results to be considered generalizable.

IRB review for dissertations, theses, and honors research projects is required if they involve Human subjects.

Many student projects are not dissertations, theses or honor research activities, but are designed to provide students with an opportunity for service-based learning, e.g. to practice public health skills to improve a program or project of a service organization. In general, these service-based learning opportunities, including but not limited to needs assessments, program design activities, program monitoring and evaluation, quality improvement assessments, and reports of lessons learned, do not constitute Research because the results would not likely be generalizable. Presenting results of these projects in a program report, within the student's department or school, and even possibly in a peer review journal would not ordinarily be considered 'generalizing from the project'; thus this level of discussion or sharing about the student practice experience does not mandate IRB review prior to inception.

Some of the "non-Research" projects have characteristics that may place the individuals about whom data are gathered for the purpose of the project, at Greater Than Minimal Risk. In addition, student investigators as a group have minimal experience in conducting research. Accordingly, these projects require additional scrutiny in order to protect the individuals who are involved as subjects. At Columbia, the IRB has been designated as the appropriate body to review these projects.

Policy

Dissertations, theses and honors research projects constitute Research and when they involve Human Subjects must be reviewed and approved by a Columbia IRB, or an IRB upon which Columbia has chosen to rely through the terms of an IRB Authorization Agreement (Reviewing IRB), prior to commencement of research procedures. Exempt Research at Columbia University Medical Center may also be reviewed by the Administrative Review Committee in the Columbia Human Research Protection Office (HRPO). Other student projects, e.g., introductory research exercises or practicum assignments, must be reviewed and approved by a Columbia IRB or a Reviewing IRB only when they involve Greater Than Minimal Risk.

For projects other than dissertations, theses and honors research projects, the responsibility for determining the level of risk and whether a project requires IRB review rests with the student's faculty advisor and/or department. The HRPO will provide training with respect to making these determinations and will conduct quality assurance audits to evaluate whether determinations that have been made are consistent with this Policy.

Types of risk to which individuals may be exposed that must be considered when evaluating the level of risk for a project include, but are not limited to, physical, psychological, financial and social harm. When project participants are members of vulnerable populations, or are in a subordinate position to, or in a fiduciary relationship with, those conducting the project, the risk level may be increased as a result and additional protective measures may be necessary to avoid elements of coercion or undue influence. Consultation with the HRPO is recommended for these cases.

To facilitate ethical conduct of a student project, whether IRB review is required or not, faculty advisors must ensure that students are appropriately trained and procedures are in place for communication between advisor and student throughout the life of the project. Being familiar with details of the project and incorporating human subject protection requirements into research methodology courses will facilitate this objective.

See Appendix A for the question flow for determining whether a student project must be submitted to the IRB for review and Appendix B for Frequently Asked Questions relating to student projects.

Appendix A: Decision flow

Does the activity that the Student Researcher will conduct meet the regulatory definition of Research, i.e., the design of the project is such that it may develop or contribute to generalizable knowledge?

- If yes and
  - Private, identifiable data will be collected about living individuals, submission of a protocol to the IRB is required
  - Data about living individuals will be collected through interaction with them, submission of a protocol to the IRB is required
  - Data will NOT be collected about living individuals, submission of a protocol to the IRB is generally* NOT required
- If no and
  - Data will be collected about living individuals (i.e., private identifiable data, or any data collected through interaction with them) and
    - The activity presents Greater than Minimal Risk to the individuals, submission of a protocol to the IRB is required
    - The activity presents no more than minimal risk to the individuals, submission of a protocol to the IRB is NOT required
  - Data will NOT be collected about living individuals, submission of a protocol to the IRB is not equired

* Exceptions:

1. Genetic testing to which New York State Civil Rights Law Section 79-l, when deidentified human biological samples will be used; the definition of human subject is not met but IRB certification that the samples are deidentified must be obtained.

2. Testing of a medical device, when deidentified biological samples will be used, and study data may be submitted to or held for inspection by FDA as part of an application for a research or marketing permit; the definition of human subject in the FDA medical device (technically, Investigational Device Exemption) regulations includes individuals whose biological samples are being used for research.

Appendix B: Frequently Asked Questions

1. What if, after a practicum project is completed, results are such that they can contribute to the professional or scholarly literature and the student would like to publish them?

A pre-screen should be submitted via the Office of Field Practice, requesting approval to further analyze the existing data and disseminate results. The faculty advisor should be listed as the Principal Investigator and the Student Researcher as a co-investigator. The document sent to OFP for pre-screening purposes should describe the procedures that were used, noting that the project was designed to make a programmatic public health contribution, not to produce generalizable results. Approval of additional analyses that are proposed and dissemination of results is not guaranteed. Analysis to confirm preliminary findings and release results of the analysis may not occur prior to hearing whether or not the student needs to formally submit to the IRB and not prior to IRB approval if required.

2. If a Columbia student will be working on a Columbia IRB-approved study for which a Columbia faculty member is the PI, in a manner that constitutes engagement in that study, is a submission to the IRB required?

Engagement reflects participation beyond administrative activities, e.g., involvement as an investigator, coordinator or research assistant. Activities that indicate engagement include obtaining informed consent, interacting with study participants to collect research data, and having access to identifiable research data about participants. *A modification must be submitted to add the student to the approved protocol.*

Review of the student's activities will be conducted by the Columbia IRB using the appropriate level of review, which is dependent upon the type and risk level of study procedures.

3. If a Columbia student will be working, in a manner that constitutes engagement, on a research project approved by a non-Columbia IRB for which a non-Columbia researcher is the Principal Investigator, is a submission to the Columbia IRB required?

Yes. In some circumstances, a non-Columbia IRB will be the Reviewing IRB for the student's involvement. An IRB Authorization Agreement (IAA) to formalize the reliance must be executed. Certain information is required to be submitted to the Columbia IRB to track the research activity, regardless of which IRB is the Reviewing IRB. A Columbia faculty member must be listed as the Principal Investigator and the student should be listed as a co-investigator. Both the student and the Columbia PI must have satisfied the Columbia research training requirements.

The IRB review conducted at Columbia will be an administrative review, acknowledging the Reviewing IRB's approval and confirming satisfaction of Columbia-specific research requirements, e.g., training. The role of the Columbia Principal Investigator in this situation is to ensure that Columbia requirements (e.g., training, conflict of interest) are met, to confirm that IRB approval from the non-Columbia institution has been obtained and ensure that it remains current during the student's involvement, to serve as a resource when the student has questions or concerns about the research, and to appropriately route concerns or reports of unanticipated problems to the non-Columbia researcher and/or the IRB, should these situations arise. A brief summary of the project in which the student will be involved, and a description of the role of the student, are required in the Rascal IRB submission, and documentation of approval from the non-Columbia IRB must be provided.

4. If a Columbia Student Researcher will be analyzing a de-identified dataset under the mentorship of either a Columbia or non-Columbia advisor, is a submission to the Columbia IRB required?

Analysis of de-identified data does not generally require IRB review because the definition of Human Subject is not usually met, i.e., there is no interaction with the subjects and no private, identifiable information is collected.

A submission to the Columbia IRB is not required provided that all of the following criteria are met:

- The activities in which the student will be involved are limited to analysis of a de-identified dataset;
- The mentor ensures that the student will not have access to identifiers or other information that would enable the student to identify the individuals about whom the data were collected; and
- The Columbia faculty advisor and/or department maintain records of the student's involvement in the project, including documentation that the student's role was limited to analysis of de-identified data.

The same requirements apply when the data are coded, provided that the student is not provided with the key to the code.

In these situations the student is considered a mentee with a limited and defined role. The student is not considered a member of the "research team" that is conducting, has conducted or will conduct the procedures through which the data will be or have been collected. This distinction is important because members of the research team are all considered to have access to identifiable subject data, if at least one member of the team has such access. Research personnel, including students, with access to identifiable subject data must be covered under an appropriate IRB approval.

5. Do federal regulations require IRB review of projects that do not meet the definition of research?

No, the requirement for submission of Greater Than Minimal Risk projects conducted by students, when the project does not meet the regulatory definition of Research, is an institutional policy. It was implemented to safeguard individuals in investigative projects conducted by students, who are in the process of learning and practicing research methodology, and therefore are less experienced.

6. Why is it important to differentiate projects that are or are not subject to federal regulation?

For projects that are not subject to federal regulation, the HRPO has more flexibility. An assessment of regulatory requirements is needed to determine how much flexibility the HRPO has with respect to consent and approval requirements and to consider whether reliance agreements are needed, among other issues.

7. Can IRB Authorization Agreements (IAAs) apply to student research?

Yes, but only when federal regulations, other applicable statutes, or Columbia policies require an IRB submission. The IAA can be for a single project or groups of projects, e.g., all student projects overseen by Department of Health mentors. Note that IAAs generally only improve efficiency when used for projects that do not qualify for exemption or expedited review, or for multiple projects.