

The Epidemiology and Biostatistics of Aging

CENTER ON AGING AND HEALTH

2010

MISSION AND GOALS

In 1990, 12.5% of the U.S. population, or 31 million persons, were over the age of 65, compared to 4% in 1900. It is anticipated that the proportion of the population that is in this oldest age group will continue to increase to 20% by the years 2020-2025. Similar aging of the population is occurring worldwide. The prevalence of chronic disease, multiple diseases, frailty and disability rises dramatically with age after 65, as does the resulting need for health services. These aging-associated health concerns have great impact on the individual, family members and caregivers, and society as a whole.

Given these substantial health-related issues of an aging population, it is a national imperative that we determine how to prevent or delay the morbidity and disability currently associated with aging. Such a goal will be met through leading-edge research conducted by multidisciplinary teams trained to evaluate the multidimensional factors that affect health and quality of life for older adults. Essential leaders and members of such teams include quantitative public health scientists and professionals; their expertise is key in the design, conduct and analysis of the population-based studies that can determine the causes of adverse health outcomes and successful preventive approaches. Specific training and expertise in the gerontologic content and methodology for prevention in older populations is needed to help meet these goals.

This program offers such training in the methodology and conduct of significant clinical and population-based research in older adults and the special expertise in gerontologic issues essential to this. Training in a program which includes numerous investigators actively involved in multidisciplinary research can provide experience in the successful conduct of the collaborative work essential in studies of health in older adults and the mentoring that leads to career dedication to these issues. The specific mission of this training grant is to prepare epidemiologists and biostatisticians who will be both leaders and essential members of the multidisciplinary research needed to define models of healthy, productive aging and the prevention and interventions that will accomplish this.

Our educational goal has three complementary parts. First, preparing epidemiologists and biostatisticians to work on the challenging problems of designing and analyzing studies capable of delineating risk factors when there are both multifactorial risk factors and multidimensional outcomes, and of determining when our interventions in such a setting are effective. Second, training in the epidemiology of aging and gerontologic issues, so that this knowledge can be applied to development of the next generation of hypotheses and statistical methods in aging research. Overall, this program will prepare trainees to use such methods and results to their fullest potential through understanding content, issues and methods specific to aging and health, and through experience in interdisciplinary collaboration on these issues.

EXPECTED COMPETENCIES OF TRAINEES

Trainees must gain firm grounding in gerontology and the health-related issues associated with aging, so as to participate in defining the objectives for the health status of our aging population in the 21st century. A set of core competencies has been established and will be met through

coursework, research leading to a dissertation, mentorship, participation in seminars and research in progress sessions, as well as other meetings. The core competencies are:

- Expert grounding in biostatistics and epidemiology of aging and in gerontology
- Development of core competencies:
 - knowledge of special methodologic and content issues in chronic disease epidemiology as it applies to older populations
 - measurement and analysis of complex gerontologic outcomes such as physical and cognitive function, disability, frailty and falls, and identification of new outcomes that could improve our understanding and measurement of health status in older populations
 - measurement and analysis of multiple risk factors for critical health outcomes, including chronic diseases and their risk factors, comorbidity, and genetic and molecular characteristics that may underlie health outcomes
 - methods for design and conduct of studies, and knowledge essential to successful recruitment, data collection and retention of older populations in such studies, including large scale prospective studies
 - longitudinal and survival analysis, with special expertise in analysis of multidimensional gerontologic outcomes and definition of trajectories of higher risk subpopulations of older adults
 - criteria and methodology of preventive health care, future arenas for development of prevention and health promotion and applications to subsets of older populations
 - health services research for aging populations
 - understanding of social, demographic, economic and health care policy dimensions associated with the issues of aging
- Development of expertise necessary for a long-term career in research on aging

To achieve these objectives, trainees will engage in the following components:

- a one-year sequence of courses on human aging and health care issues for aging populations, in addition to departmental requirements in epidemiology and biostatistics. This training provides eligibility for a certificate in Gerontology from the Interdepartmental training program in Gerontology

- participation in field experience or practica on conduct of population-based studies of older adults and on clinical geriatric medical care
- a research experience under the direction of faculty mentors that results in a publishable thesis or for non-degree candidates, publishable manuscripts
- participation with faculty mentors and other trainees in Research-in-Progress meetings on aging research
- participation in the Johns Hopkins Interdepartmental Seminar on Aging Series

The central focus of this training grant is to train epidemiologists and biostatisticians jointly in an integrated program. Productive interaction between these two disciplines is crucial to successful research on aging populations. This conclusion is based in large part on the experience of the faculty who participate in this training program that mutual understanding among investigators of health goals, their import, underlying complexity, and methodology improves the import of studies of aging populations. The core investigators - and many affiliated faculty - have extensive histories of collaboration in aging-related research. A central aspect of this training program is, therefore, development of a common knowledge base in gerontology, grounding of all trainees in both the epidemiology of aging and basic biostatistical and epidemiologic methods and their application to aging research, and pursuit of mutually understood gerontologic health goals. Then, the needed interactions between Epidemiology and Biostatistics can be actively developed with trainees.

Established in 1917 and 1919 respectively, the Departments of Biostatistics and Epidemiology at the Johns Hopkins University School of Hygiene and Public Health are the oldest autonomous academic departments of their kind in the world. The Departments have included faculty of the stature of Wade Hampton Frost, Raymond Pearl, Abraham Lilienfeld, Lowell Reed, William Cochran, and Jerry Cornfield, all luminaries in quantitative sciences for public health. Today, the departments remain among the most productive in both research and training of masters, doctoral, and postdoctoral students.

PROGRAM COMPETENCIES

Competency	Learning Opportunity	Measured By
Knowledge of special methodologic and content issues in aging research, including:		
Public health import of aging populations worldwide: social, demographic economic and health care policy dimensions	Epidemiology of Aging Health issues for an Aging Population Demography of Aging Health Care Systems for An Aging Population	Course exams Written comprehensive and oral exams
Special issues and methods in chronic disease epidemiology and prevention as they apply to aging populations	Epidemiology of Aging Health Issues of an Aging Population Biology of Aging Seminars on Aging Special content epidemiology courses	Course exams Written comprehensive and oral exams
Special issues and methods for psychosocial risk factors associated with aging	Psychosocial aspects of aging Statistics for psychosocial Research I and II Seminars on Aging	Course exams Written comprehensive and oral exams
Methods for measurement and analysis of complex gerontologic outcomes, trajectories in subpopulations, and dynamic, comorbid risk factors	Epidemiology of Aging Statistics for psychosocial Research I and II Longitudinal and Survival Analysis Seminars on Aging	Course exams Written comprehensive and oral exams Mentored research
Operational conduct of studies in older populations: recruitment, data collection, retention, special populations, proxies, cognitive and sensory deficits	Epidemiology of Aging Practicum on the Operational Conduct of Studies in Older Adults Practicum on Medical Care for Older Adults Seminars on Aging	Course exams Written comprehensive and oral exams Mentored research
Knowledge of and critical review of current literature in epidemiology of aging and analytic issues	Epidemiology of Aging Seminars on Aging Journal Clubs: Welch Center and chronic disease epidemiology Biostatistics Grand Rounds	Course exams Written comprehensive and oral exams Mentored research
Translation of epidemiologic findings to improved screening, health promotion and treatment of older populations	Epidemiology of Aging Clinical Epidemiology Practicum on Medical Care For Older Adults Health Care Systems for an Aging Population Design and Conduct of Clinical Trials Seminars on Aging Genetics courses Seminars on Risk	Course exams Written comprehensive and oral exams Mentored research

CORE FACULTY

The Johns Hopkins Health Institutions, including the Schools of Public Health, Medicine, and Nursing and the Johns Hopkins Health System, provide a learning environment to produce outstanding epidemiologists and biostatisticians with a focus on problems of an aging society. This training grant is designed to focus the many strengths and activities that are in place on an integrated training program of epidemiologists and biostatisticians in the health-related problems of aging. There is a core group of 28 faculty epidemiologists and biostatisticians who will work closely and regularly with each other and the trainees to guide the training program. In addition, there are a number of other outstanding faculty working in aging-related research who are highly interested in being secondary mentors for our trainees. There is also an Advisory Committee representing expertise in Epidemiology, conduct of training grants, Molecular Epidemiology, Geriatrics, Rehabilitation Medicine, Health Policy, and Public Health broadly.

Core Faculty

NAME, DEGREE(S)	PRIMARY APPOINTMENT (JOINT APPOINTMENT)	AGING INTERESTS
Karen Bandeen-Roche, PhD Director	Hurley Dorrier Professor and Chair, Biostatistics	Longitudinal analysis of complex measurements (latent variable models, multivariate analysis, assessing stability of measurement), Multivariate disease-onset analysis; measuring and tracking disease, disability and frailty over time.
Terri Beaty, PhD	Professor, Epidemiology (Oncology)	Genetics of lipoprotein disorders; assessing genetic component of diseases among elderly using novel statistical methods; genetic epidemiologic methods for diseases associated with aging.
Charles Boulton, MD, MPH, MBA	Professor, Health Policy and Management; Director, Lipitz Center for Integrated Health Care	Health Policy and Management; health services research; geriatrics; post-acute care; outcomes research; interdisciplinary care
Cynthia Boyd, MD, MPH	Assistant Professor, Medicine (Health Policy and Management)	Prevention and progression of disability among older adults; clinical care of comorbid chronically ill and frail older adults
Frederick Brancati, MD, MHS	Professor, Medicine (Epidemiology)	Diabetes mellitus; obesity & minority health; diabetes and disability in older adults.
Michelle Carlson, PhD Associate Director	Associate Professor, Mental Health (Epidemiology)	Cognitive aging, activity and frailty; physical activity and function; cognitive neuropsychology of aging; prevention of dementia.
Paulo Chaves, MD, PhD Associate Director	Assistant Professor, Medicine (Epidemiology)	Hemoglobin levels and all-cause mortality in disabled elderly women
Kay Dickersin, PhD	Director, Center for Clinical Trials, Epidemiology	Clinical trials and evidence synthesis
Daniele Fallin, PhD Associate Director	Associate Professor, Epidemiology/Biostatistics	genetic epidemiology; Alzheimer's disease; aging populations; muscle strength and frailty
Luigi Ferrucci, MD, PhD	Senior Investigator; Chief, Longitudinal Studies Section, NIA	causal pathways leading to progressive physical and cognitive decline in older persons
Constantine Frangakis, PhD	Professor, Biostatistics	Models of causal inference; estimation of the effect of a risk factor or new treatment when there is only partial compliance and drop-outs in epidemiologic and clinical prospective studies.
Gary Gerstenblith, MD	Professor, Medicine Director, Geriatric Cardiology	Geriatric Cardiology
Thomas Glass, PhD Co-Director	Associate Professor, Epidemiology	Psychosocial factors and health and functioning in late-life; psychosocial intervention; behavioral factors in stroke.
Eliseo Guallar, MD, PhD	Professor, Epidemiology	Cardiovascular Disease Epidemiology; Clinical Epidemiology; Epidemiological Methods
Judith Kasper, PhD	Professor, Health Policy and Management	Health services research on elderly populations; conduct of large-scale prospective studies; health policy in long-term care.
Thomas Louis, PhD	Professor, Biostatistics	Risk assessment; clinical and observational investigations; health and public policy; environmental equity/justice
Constantine Lyketsos, PhD	Professor and Chair, Psychiatry (Epidemiology, Mental Health)	Epidemiology of Dementia
Naresh Punjabi, MD	Associate Professor, Pulmonary Medicine (Epidemiology)	Epidemiology of pulmonary disease in older populations and resulting disability
George Rebok, PhD	Professor, Mental Health	Cognitive psychology of aging; prevention of cognitive decline.

Dan Scharfstein, ScD	Professor, Biostatistics	Biostatistics, Causal inference; Longitudinal data analysis; Survival analysis; Missing data; Group sequential clinical trials; Semiparametric models
Richard Semba, MD	Professor, International Health; Molecular Microbiology and Immunology	Relationship of nutrition to immunity and infection among older women
Moyses Szklo, MD, MPH	Professor, Epidemiology (Cardiology)	Observational cardiovascular disease (CVD) epidemiology in aging populations including natural history and assessment of risk factors for CVD; relationship of estrogen replacement and cognitive function in middle-aged and older adult women.
Ravi Varadhan, PhD Associate Director	Assistant Professor, Medicine (Biostatistics)	Geriatric Medicine and Gerontology; competing risks in observational studies of elderly
Jeremy Walston, MD	Professor, Medicine	Biology of aging; molecular biology of frailty and sarcopenia; geriatric medicine.
Carlos Weiss, MD, MHS Associate Director	Assistant Professor, Medicine	Geriatric Medicine and Gerontology; Energy metabolism, mobility disability and frailty
Sheila West, PhD	Professor, Ophthalmology	Risk factors for ocular pathology in older persons; prevention of late-life visual disease, including dietary and sunlight exposure recommendations; impact of vision on older persons' functioning; improving access to vision services in nursing homes.
Qian-Li Xue, PhD Associate Director	Assistant Professor, Medicine (Epidemiology/Biostatistics)	Epidemiology; Epidemiological design; latent variable; longitudinal data; measurement error; missing data; multivariate categorical data
Scott Zeger, PhD	Professor, Biostatistics (Epidemiology)	Regression methods for study trajectories in multivariate outcomes among older adults; design and analysis of longitudinal observational studies of aging.

Affiliated Faculty

NAME	PRIMARY APPOINTMENT (JOINT APPOINTMENT)	AGING INTERESTS
Emily Agree, PhD	Associate Professor, Population, Family and Reproductive Health	Demography of aging; disability trends.
Marilyn Albert, PhD	Professor, Neurology, Psychiatry and Behavioral Sciences	Cognitive change with age; disease-related changes of cognition (focus on Alzheimer's Disease); relationship of cognitive change to brain structure and function
Jerilyn Allen, ScD, MS	Professor, Associate Dean for Research, School of Nursing (Health, Behavior and Society)	Cardiovascular risk factors, prevention, and lifestyle modification in persons with or at high risk for the development of cardiovascular disease
Lawrence Appel, MD, MPH	Professor, Medicine (Epidemiology, International Health)	Clinical trials, dietary approaches in prevention of hypertension and cardiovascular disease.
Jason Brandt, PhD	Professor, Psychiatry	Psychometrics; neuropsychology; dementia.
Lynda Burton, PhD	Associate Professor (adjunct), Health Policy and Management	Gerontology; prevention for older adults; health issues of caregiving.
Brian Caffo, PhD, MS	Assistant Professor, Biostatistics	Biostatistics, MCMC, Monte Carlo, the EM algorithm, GLMMs, exact conditional analysis, multilevel models, medical image analysis, fMRI, MRI, SPECT, PET
David Celentano, PhD	Professor and Chair, Epidemiology (Environmental Health Sciences, International Health, Health, Behavior and Society)	epidemiology, international health, HIV, AIDS, STDs, behavior, Asia, HIV/AIDS prevention, Thailand, India, Vietnam
Aravinda Chakravarti, PhD	Professor and Director, Institute of Genetic Medicine	Molecular basis of complex disease; Genomics; Genetic epidemiology; Population genetics
Pierre Coulombe, PhD	Professor and Chair, Biochemistry and Molecular Biology	Structural and signaling roles of keratin cytoskeletal assemblies; Epithelial differentiation and homeostasis in health and disease
Josef Coresh, MD, PhD	Professor, Epidemiology (Medicine, Biostatistics)	Cardiovascular risk among patients with mild to end-stage renal disease; genetic epidemiology of diabetes and lipid disorders.
William Eaton, PhD	Professor and Chair, Mental Hygiene	Psychiatric epidemiology in older adults
Daniel Ford, MD, MPH	Director, ICTR; Professor, Medicine (Epidemiology, Health, Policy and Management)	Depression and cardiovascular disease; psychosocial factors; health care delivery; implementation of prevention guidelines.
David Friedman, MD	Professor, Ophthalmology	Age-related Macular Degeneration; eye disease in the elderly
Steven Goodman, MD, PhD	Professor, Oncology, Biostatistics, Epidemiology, Pediatrics	Biostatistics, Epidemiology, Clinical trials, Research ethics, Statistical and causal inference.
Martha Hill, RN, PhD	Dean, School of Nursing (Medicine)	Hypertension; Community outreach and nursing research.
Rafael Irizarry, PhD	Professor, Biostatistics	Quantitative methods and software for

		genomics and epigenetics; focus on microarrays and second generation sequencing
Lisa Jacobson, PhD	Associate Professor, Epidemiology	HIV and AIDS
Michael Klag, MD, MPH	Dean, Johns Hopkins Bloomberg School of Public Health; Professor, Medicine (Epidemiology, Health Policy and Management)	Epidemiology and prevention of high blood pressure; stroke epidemiology; race and socioeconomic status in cardiovascular disease.
Bryan Lau, PhD	Assistant Professor, Medicine (Epidemiology)	HIV/AIDS, epidemiologic methods, cohort studies, biomarkers
Thomas LaVeist, PhD	Professor, Health Policy and Management (Sociology)	Health policy and health services research.
Bruce Leff, MD	Professor, Medicine (Health Policy and Management)	Primary care of older adults with chronic illness; Development, evaluation, and dissemination of novel models of care for older adults
David Levine, MD, ScD, MPH	Professor, Medicine (Health Policy and Management)	Community health; behavioral sciences.
Curtis Meinert, PhD	Professor, Epidemiology (Biostatistics)	Design, operation and analysis of clinical trials; meta analysis; ethics of human research.
Jeffrey Palmer, MD	Professional Chair, Physical Medicine and Rehabilitation	Rehabilitation of older adults; neural control of mastication and swallowing
Roger Peng, PhD	Assistant Professor, Biostatistics	Environmental biostatistics, point processes, air pollution, reproducible research
Peter Rabins, MD	Professor, Psychiatry	Geriatric mental health disorders.
Jodi Segal, MD MPH	Associate Professor (Medicine)	Clinical epidemiology of thrombosis and blood disorders; pharmaco-epidemiology
A. Richey Sharrett, PhD	Professor (Adjunct), Epidemiology	Epidemiology; arteriosclerosis; ARIC; MESA; cognitive impairment
Eleanor Simonsick, PhD	Associate Professor Of Medicine (Part Time); Senior Staff Scientist, Epidemiologist, Intramural Research Program, National Institute on Aging	Mobility, exercise capacity, energy expenditure in older adults
Adam Spira, PhD	Assistant Professor, Mental Health	Late-life sleep disturbances and psychopathology as predictive cognitive and functional outcomes among elders; interventions to improve cognitive and functional outcomes in older adults
Sarah Szanton, PhD, MSN, CRNP	Assistant Professor, School of Nursing	Health disparities in older adults
Elizabeth Tanner, PhD,	Associate Professor, School of Nursing	Chronic illness; late-life depression
Mei-Cheng Wang, PhD	Professor, Biostatistics	Survival analysis
Albert Wu, MD, PhD	Professor, Health, Policy and Management (Epidemiology, International Health)	Patient Safety, Disclosure, Quality of Life, Comparative Effectiveness Research, Adherence
Barry Zirkon, PhD	Professor, Biochemistry and Molecular Biology	Molecular markers of aging.

EPIDEMIOLOGY AND BIostatISTICS OF AGING TRAINING PROGRAM PERSONNEL

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ELIGIBILITY AND APPLICATION REQUIREMENTS

Qualified candidates must follow the admissions procedures of the Bloomberg School of Public Health (BSPH) and submit appropriate application materials as specified to the BSPH Admissions Office. Information on the application process can be obtained from the Admissions Office (<http://www.jhsph.edu/Admissions> or 410-955-3543). Postdoctoral application information can be found here: <http://www.jhsph.edu/GER/Postdocs.html>)

Eligible Candidates for the EBA Training Program:

Pre- and Post-doctoral candidates are eligible to apply for training and funding under this program if:

- Pre-doctoral candidates are accepted into either the Epidemiology or Biostatistics Ph.D. program in the BSPH
- Post-doctoral candidates are accepted into the BSPH post-doctoral fellowship program (in either Epidemiology or Biostatistics)
- Candidates are United States citizens or have U.S. Permanent Residence

Application to the Training Program:

Eligible candidates should send*:

- A letter of intent (*a brief letter or email that states your intent to apply*)
- Statement of career objectives/research goals (2-3 pages) (*please see description of what to include in this statement on the following page*)
- Curriculum Vitae
- 3 letters of recommendation
- Proof of U.S. citizenship/permanent residence
- Official Transcripts (for postdoctoral applicants, only transcripts for PhD/MD program are required)

To: Brian Buta
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**Please note: A copy of the candidate's application to the School of Public Health would be acceptable as long as it includes the above listed items. The applicant must personally request from the Admissions Office that a sealed and confidential copy be delivered to Brian Buta at the address above.*

Statement of objectives:

For post-doctoral applicants, the statement should address career development plans for the fellowship, including a) the skills, knowledge or certifications the applicant seeks to obtain; b) expected effects on career goals; and c) potential mentors at Johns Hopkins. For pre-doctoral candidates, the letter should describe career goals. In both cases, applicants are also encouraged to describe why they are interested in research about aging or the health of older adults.

DEGREE REQUIREMENTS

Doctor of Philosophy Degree (Ph.D.) in Epidemiology or Biostatistics

Residence:

One consecutive full-time year of residence is required at the time of matriculation. In order to fulfill the residence requirement, students are required to register for 16 credits for four consecutive terms. A doctoral student may not be registered for part-time or non-resident status until the residency requirement has been met.

Comprehensive Examination:

For students in the Department of Biostatistics, comprehensive examinations covering course material are taken at the end of the first and second years. For students in the Department of Epidemiology, an examination covering the general principles of epidemiology and the area of clinical epidemiology is given in late May or early June for two days from 9 a.m. to 5 p.m. each day (Examination dates determined by student vote). By the time of the exam, the student should have completed at least one full year of a residence, Epidemiology 340.601, 602, 603, 627, the required Epidemiology coursework by program area of the Epidemiology of Aging, and a Biostatistics sequence.

During the first two years, students are expected to complete required coursework, the departmental comprehensive examination, and develop a thesis project under the guidance of their research mentor. The remaining time is devoted to completion of the thesis.

Thesis:

Before commencement of any research, the student with his/her advisor/mentor must complete the Research Commencement Form, which authorizes the student to proceed with thesis development.

Research leading to a dissertation must be based on original research, worthy of publication, and acceptable to their respective Department and to a thesis committee. Students must adhere to protocol and guidelines on thesis development, Departmental and School oral examinations, and final oral examination (thesis defense) set forth by the University.

Master of Health Sciences (MHS) in Epidemiology of Aging (for Post-Doctoral Students)

Residence:

Two years of residence are required. At least one year of residence must be consecutive and full-time. In order to fulfill the residence requirement, students must register for 16 credits for four consecutive terms. Those with pertinent prior training may complete the degree in as little as one calendar year subject to approval of their advisors, the Departmental Admissions and Credentials Committee, and the Department Chairman.

Comprehensive Examination:

A written examination covering the general principles of epidemiology and the area of aging is given in late May or early June for two days from 9 a.m. to 5 p.m. each day (Examination dates determined by student vote). By the time of the exam, the student should have completed at least one full year of a residence, Epidemiology 340.601, 602, 603, 627, the required Epidemiology coursework by program area, and a Biostatistics sequence.

Master's degree candidates must perform satisfactorily on both parts of the examination by earning at least 65% on each part.

For further details on the examination, please refer to the Department of Epidemiology Student Guide and detailed course requirements for the program in the Epidemiology of Aging in this manual.

Thesis Requirement:

MHS Students must complete a satisfactory thesis in his/her area of concentration. The thesis must be approved by two members of the Department's faculty in addition to the student's advisor and research mentor, and should be of sufficient quality to be considered by the Department as acceptable for publication in a recognized journal. Students should be aware that in order to graduate by the end of the second year, all requirements must be completed early, usually April. (Please refer to the Epidemiology Student Guide for further details).

Research mentors should be identified by the third term of the first year.

Post-Doctoral Research in the Epidemiology and Biostatistics of Aging (non-degree seeking)

Research:

This training program provides research opportunities in the epidemiology and biostatistics of aging to non-degree seeking post-doctoral fellows who wish to receive further training in the methodology and conduct of significant clinical and population-based research on aging and older adults. Fellows would conduct independent research under the guidance of a mentor that could lead to presentation at scientific meetings and publishable manuscripts. This special training can also potentially be acquired in coordination with a clinical fellowship training program.

Application procedures:

Please see page 13.

Clinical Perspectives Practicum: Patient Populations of Older Adults

This practicum was developed to help bring the next generation of researchers closer to understanding the spectrum of health and health concerns for older adults, what the important questions are and, thus, doing important research on aging. It also provides opportunity for trainees to be exposed to a wide variety of geriatric care delivery programs, and to see the care provided and understand the different health issues that patients have who are treated in these different programs and the roles of different members of the health care team.

The goals of the clinical practicum are:

1. To inform clinically relevant hypotheses related to study of aging populations.
 - Observation of common prevalent conditions (CHD, arthritis, hearing loss, osteoporosis, diabetes, etc.), risk factors, and sequella
 - Basic medical needs of older patients
 - Differences in presentation of common illnesses in younger vs. older (e.g., depression)
2. To observe heterogeneity among the older population
 - For example, the range of functional ability among people of the same age.
3. To understand issues related to communicating with older persons
 - Barriers such as hearing loss, concentration span
 - Strategies to overcome barriers
4. To define functional and social needs in addition to medical needs of older patients (e.g., transportation, use of aids, support at home, etc.)
 - Complexity of caring for geriatric population
 - Importance of multi-disciplinary approach
5. To network with Geriatric clinical staff (possible linkages for future research)

The following is a list of the participating clinical locations:

Terrace Rehabilitation Unit

Trainees observe geriatric inpatient rounds and also observe patients during their physical therapy, occupational and/or speech therapy sessions.

Hip Fracture/Subacute Unit

Trainees observe rounds on this service to understand the issues involved in post-acute care of hip fracture patients.

Geropsychiatry (geriatric mental health)

Each trainee can accompany a nurse to a senior Baltimore City Housing Site to observe a follow-up psychiatric assessment as part of the PATCH outreach program (Psychiatric Assessment Treatment and Teaching in City Housing), a program which targets the impoverished senior population in Baltimore City. Each trainee does one visit and only one trainee goes at a time.

Primary Care Outpatient Clinic

Each trainee is assigned to an Attending physician or resident to observe either a morning or afternoon primary care outpatient clinic session in the Beecham Center located in the Geriatric Center on the Bayview Campus. Each trainee does one session and only one trainee can go at a time.

Practicum in Operational Conduct of Research in Older Populations

This practicum was developed to give trainees exposure to issues in study implementation and the special issues to be considered in studying older adults.

The research practicum is twofold:

I. Study implementation - trainees gain an understanding of

- Recruitment of a cohort
- Protocol and questionnaire development
- Training of project staff
- Data management and analysis
- Project organizational issues

II. Special issues in studying older adults - trainees gain an understanding of

- Issues in bringing frail older adults to a clinic
- Designing home visits
- Data collection issues in an older population
- Impact of sensory and cognitive development on data collection
- Specific approaches to recruitment and retention

REQUIRED AND RECOMMENDED COURSES

Required Curriculum in Aging and Aging-Related Methodology

Term	Dept	Course #	Course Title	Instructor
1	Biostatistics	140.642	Design of Clinical Experiments	James Tonascia & Scott Zeger
	*Health Policy and Management	309.605	Health Issues for Aging Populations	Bruce Leff & Jennifer Wolff
2	Extrdepartmental	550.860	Research Ethics	Janet DiPietro
3	Biostatistics	140.655	Analysis of Longitudinal Data	Elizabeth Colantuoni
	**Molecular Microbiology & Immunology	260.665	Biologic Basis of Aging	C. Lynne Burek
4	*Epidemiology	340.616	Epidemiology of Aging	Paulo Chaves

*Required course for Certificate in Gerontology Program

** Elective course for Certificate in Gerontology Program.

Optional but Recommended Curriculum

Term	Department	Course #	Course Title	Instructor
1	EPI/Biostat	340.664	Introduction to Genetic Epidemiology	Wen Hong Linda Kao
	Mental Health	330.657	Statistics for Psychosocial Research: Measurement	William Eaton & Qian-Li Xue
	Mental Health	330.802	Seminar on Aging, Cognition, and Neurogenerative Disorders	George Rebok, William Eaton, Peter Zandi, & Michelle Carlson
2	Biostatistics	140.658	Statistics for Psychosocial Research: Structural Models	Qian-Li Xue & Jeannie-Marie Leoutsakos
	Health and Policy Management	309.712	Assessing Health Status and Patient Outcomes	Ellen MacKenzie & Albert Wu
	Epidemiology	340.640	Eye Disease: Epidemiology and Control	Sheila West
	Health Policy and Management	309.715	Advanced Methods in Health Services Research and Evaluation	Judy Kasper & Kitty Chan
	*Health Policy and Management	309.607	Innovations in Health Care for Aging Populations	Charles Boulton
	Epidemiology	340.666	Foundations of Social Epidemiology	David Celentano
	Mental Health	330.802	Seminar on Aging, Cognition, and Neurogenerative Disorders	George Rebok, William Eaton, Peter Zandi, & Michelle Carlson
3	Epidemiology	340.607	Introduction to Cardiovascular Disease Epidemiology	Josef Coresh
	Biostatistics	140.641	Survival Analysis	Mei-Cheng Wang
	Biostatistics	140.640	Statistical Methods for Sample Surveys	Saifuddin Ahmed
	Biostatistics	140.664	Causal Inference in Medicine and Public Health	Elizabeth Stuart & Constantine Frangakis
	Epidemiology	340.705	Advanced Seminar in Social Epidemiology	Thomas Glass
	**Population, Family and Reproductive Health	380.753	Dynamics of Population Aging	Emily Agree
	*Health Policy and Management	309.608	New Frontiers in Gerontology	Charles Boulton
	Mental Health	330.802	Seminar on Aging, Cognition, and Neurogenerative Disorders	George Rebok & Karen Bandeen-Roche

4	Biostatistics	140.665	Experimental and Non-Experimental Design for Estimating Causal Effects	Constantine Frangakis, Elizabeth Stuart, & Michael Rosenblum
	Biostatistics	140.656	Multilevel Statistical Models in Public Health	Elizabeth Colantuoni
	Biostatistics/ Epidemiology	340.840 140.840	Special Studies and Research on Aging	Various
	Epidemiology	340.754	Methodologic Challenges in Epidemiologic Research	Tom Glass & Dani Fallin
	**Health Policy and Management	309.606	Managing Long-Term Care Services for Aging Populations	Paul Willging
	**Mental Health	330.618	Mental Health in Later Life	George Rebok
	Mental Health	330.802	Seminar on Aging, Cognition, and Neurogenerative Disorders	George Rebok & Karen Bandeen-Roche

*Required course for Certificate in Gerontology Program

** Elective course for Certificate in Gerontology Program.

Sample Trainee Curriculum - Epidemiology

Year One

First Quarter

140.651	Methods in Biostatistics I	Caffo	(4 units)
340.751	Epidemiologic Methods 1	Platz	(5 units)
309.605	Health Issues for Aging Populations	Leff	(3 units)
(Other departmental requirements/electives)			

Second Quarter

140.652	Methods in Biostatistics II	Caffo	(4 units)
340.752	Epidemiologic Methods 2	Guallar & Jacobson	(5 units)
340.627	Epidemiology of Infectious Diseases	Nelson	(3 units)
340.706	Methods and Applications of Cohort Studies	Munoz	(2 units)

(Other departmental requirements/electives)

Third Quarter

140.653	Methods in Biostatistics III	Peng	(4 units)
340.753	Epidemiologic Methods 3	Gange & Mehta	(5 units)
260.665	Biologic Basis of Aging	Burek	(3 units)
340.607	Epidemiologic and Preventive Aspects of Cardiovascular Disease	Coresh	(4 units)

(Other departmental requirements/electives)

Fourth Quarter

140.654	Methods in Biostatistics IV	Peng	(4 units)
340.6754	Methodologic Challenges in Epidemiology	Fallin & Glass	(5 units)
340.616	Epidemiology of Aging	Chaves	(3 units)

(Other departmental requirements/electives)

Summer, Year One-Year

First Year Qualifying Examination
Aging Practicum #1

Year Two

First Quarter

140.642	Design of Clinical Experiments	Tonascia & Zeger	(3units)
340.664	Introduction to Genetic Epidemiology	Kao	(3 units)

330.657	Statistics for Psychosocial Research I	Eaton / Xue	(4 units)
	(Other departmental requirements/electives)		

Second Quarter

140.658	Statistics for Psychosocial Research II	Xue	(4 units)
550.860	Research Ethics	DiPietro	(1 unit)
340.717	Health Survey Research Methods	Sherman	(4 units)
	(Other departmental requirements/electives)		

Third Quarter

140.641	Survival Analysis	Wang	(3 units)
140.655	Analysis of Longitudinal Data	Colantuoni	(4 units)
340.603	Cohort Studies: Design, Analysis and Applications	Munoz	(4 units)
	(Other departmental requirements/electives)		

Fourth Quarter

140.840	Special Studies in Aging Research	Various	(1 unit)
340.840	Special Studies and Research on Aging	Various	(1 unit)
340.715	Problems in the Design of Epidemiologic Studies	Celentano	(6 units)
	(Other departmental requirements/electives)		

Summer, Year Two

Departmental Oral Examination
 Schoolwide Preliminary Oral Examination
 Aging Practicum #2

Year Three

340.820	Special Studies		
340.821	Thesis Research		
	(Other departmental requirements/electives)		

Year Four

340.820	Thesis Research; Final Thesis Defense		
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Sample Trainee Curriculum - Biostatistics

Year One

First Quarter

140.751	Advanced Methods in Biostatistics I	Irizarry	(3 units)
550.620	Probability Theory I	Fill	(3 units)
340.601	Principles of Epidemiology	Moss	(5 units)
309.605	Health Issues for Aging Populations	Leff	(3 units)

Second Quarter

140.752	Advanced Methods in Biostatistics II	Louis	(3 units)
550.620	Probability Theory I	Fill	(3 units)
340.666	Foundation of Social Epidemiology	Celentano	(3 units)
(Other departmental requirements/electives)			

Third Quarter

140.753	Advanced Methods in Biostatistics III	Louis	(3 units)
550.621	Probability Theory II	Fill	(4 units)
140.673	Introduction to Statistical Theory I	Frangakis	(4 units)
260.665	Biologic Basis of Aging	Burek	(3 units)

Fourth Quarter

140.754	Methods in Biostatistics IV	Liang	(3 units)
550.621	Probability Theory II	Fill	(4 units)
140.674	Introduction to Statistical Theory II	Frangakis	(4 units)
(Consider 340.616 - Epidemiology of Aging)			
(Other departmental requirements/electives)			

Summer, Year One-Year Two

First Year Qualifying Examination
Aging Practicum #1

Year Two - Complex Measurement Focus

First Quarter

140.642	Design of Clinical Experiments	Tonascia & Zeger	(3 units)
140.755	Advanced Methods in Biostatistics V	Crainiceanu & Liang	(4 units)
140.771	Advanced Statistical Theory I	Scharfstein	(3 units)

330.657	Statistics for Psychosocial Research I	Eaton / Xue	(4 units)
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Second Quarter

140.756	Advanced Methods in Biostatistics VI	Crainiceanu	(4 units)
140.772	Advanced Statistical Theory II	Scharfstein	(3 units)
140.658	Statistics for Psychosocial Research II	Xue	(4 units)
550.860	Research Ethics	DiPietro	(1 unit)
(Other departmental requirements/electives)			

Third Quarter

140.664	Causal Inference in Medicine and Public Health	Stuart & Frangakis	(4 units)
140.773	Foundations of Statistics I	Rohde	(3 units)
140.655	Analysis of Longitudinal Data	Colantuoni	(4 units)
(Other departmental requirements/electives)			

Fourth Quarter

140.774	Foundations of Statistics II	Rhode	(3 units)
140.665	Experimental and Non-Experimental Designs for Estimating Causal Effects	Frangakis, Stuart, & Rosenblum	(3 units)
140.840	Special Studies in Aging Research	Various	(1 unit)
(Other departmental requirements/electives)			

Year Two - Genetics Focus

First Quarter

140.755	Advanced Methods in Biostatistics V	Crainiceanu & Liang	(4 units)
140.771	Advanced Statistical Theory I	Scharfstein	(3 units)
340.664	Introduction to Genetic Epidemiology	Kao	(4 units)
(Other departmental requirements/electives)			

Second Quarter

140.756	Advanced Methods in Biostatistics VI	Crainiceanu	(4 units)
140.772	Advanced Statistical Theory II	Scharfstein	(3 units)
340.630	Population Genetics and Genetic Epidemiology	Beaty & Fallin	(4 units)
550.860	Research Ethics	DiPietro	(1 unit)
(Other departmental requirements/electives)			

Third Quarter

140.773	Foundations of Statistics I	Rohde	(3 units)
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140.655	Analysis of Longitudinal Data	Colantuoni	(4 units)
340.331	Methods for Association Analysis in Genetic Epidemiology	Beaty & Liang	(3 units)

(Other departmental requirements/electives)

Fourth Quarter

140.774	Foundations of Statistics II	Rhode	(3 units)
140.840	Special Studies in Aging Research	Staff	(1 unit)
340.332	Methods for Linkage Analysis in Genetic Epidemiology	Klein & Duggal	(3 units)

(Other departmental requirements/electives)

Summer, Year Two-Year Three

Schoolwide Preliminary Oral Examination
Aging Practicum #2

Year Three

140.820	Thesis Research: Biostatistics
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(Other departmental requirements/electives)

Year Four

140.820	Thesis Research; Final Thesis Defense
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**INTERDEPARTMENTAL SEMINAR ON AGING
AND
RESEARCH IN PROGRESS**

Interdepartmental Seminar on Aging Series

Academic departments in the School of Public Health and School of Medicine have established an interdepartmental aging seminar series which is initiated by the Center on Aging and Health. This collaboration provides opportunity for trainees to learn about and better understand the clinical, social and research issues relevant to the older and disabled population.

The departments participating in this series are Epidemiology, Biostatistics, Health Policy and Management, Mental Hygiene, Population Dynamics, and the Department of Geriatrics. Seminars are scheduled approximately twice a month from September through August.

Attendance to all seminars is required of trainees as part of fulfilling the requirements of the training program.

Research in Progress

Trainees are required to participate in a biweekly Research in Progress seminar. The goal of these seminars is to provide trainees the opportunity to hear about current research on gerontologic issues from faculty and fellows in the University affiliated with the training grant. Trainees will also at least annually present their proposals and work as part of fulfilling the requirements of the training program.

Center on Aging and Health

Mission Statement:

The COAH seeks to promote innovations in health promotion and prevention of disease and disability in older adults through research in areas critical to improving the health status of our aging population. It seeks to foster interdisciplinary research and training that is essential to important discoveries for prevention and health promotion and the translation of results to improve the health status of older adults.

With the U.S. and worldwide population rapidly aging, such that 20% of the population will shortly be 65 years and older, discoveries that will improve the health and well-being of those who are living longer are critical to improving the quality of the longer years of life now being lived, and to decreasing health care needs and costs.

CERTIFICATE IN GERONTOLOGY

**JOHNS HOPKINS
CERTIFICATE PROGRAM IN GERONTOLOGY**

Aging is one of the most dynamic sectors of health care and public health. The number of Americans over the age of eighty-five is anticipated to grow by some four hundred percent over the next fifty years. The socio-demographics alone point to its potential for those with an interest in research, policy, improved public health practice or management. The challenges and opportunities accompanying this growth are striking. Aging is also occurring at a global level, with most of the growth of the aging population occurring in the developing world.

The Johns Hopkins Certificate in Gerontology is ideally structured to provide the training necessary to succeed in the field. The University is known for its centers of excellence in aging studies. It offers a rich curriculum with aging-related content and significant research on aging across its medical institutions: the Bloomberg School of Public Health, the School of Nursing, the School of Medicine, and the Johns Hopkins Hospital. The School of Medicine’s Division of Geriatric Medicine and Gerontology is considered one of the best in the country, and the continuum of long-term and chronic care, housed at the University’s Bayview Campus, has been referred to as the most complete in the United States.

Housed in the interdisciplinary Center on Aging and Health (COAH), which bridges aging research across the Schools of Medicine, Nursing, and Public Health, the Certificate in Gerontology brings together the best faculty from multiple departments in a comprehensive curriculum designed to train students to make significant contributions to the field. From basic research to policy analysis, from public health to health care management, the recipient of the Johns Hopkins Certificate in Gerontology is prepared to excel in meeting the challenges posed by the aging of America, and the world.

**REQUIREMENTS FOR THE CERTIFICATE IN GERONTOLOGY
2009-2010**

	1st term	2nd term	3rd term	4th term
Required Sequence →	Health Issues for Aging Populations	Innovations in Health Care for Older Populations	New Frontiers in Gerontology	Epidemiology of Aging
Options → (students select one)	Offered in odd-numbered years, e.g., 2008-2009		Biological Basis of Aging	Mental Health in Later Life
	Offered in even-numbered years, e.g., 2009-2010		Dynamics of Population Aging	
	Offered every year		Managing Long-Term Care Services	

**JOHNS HOPKINS
CERTIFICATE PROGRAM IN GERONTOLOGY**

SPONSORING DEPARTMENTS:	Department of Health Policy and Management (HPM) Department of Epidemiology (Epi)
EDUCATIONAL OBJECTIVES:	<ol style="list-style-type: none"> 1. Increase understanding of the health issues confronting aging populations. 2. Provide health professionals with skills for analyzing and improving the health of an aging population from an interdisciplinary perspective. 3. Foster constructive attitudes and solutions for the challenges of providing excellent health care for aging populations. 4. Demonstrate the relevance and application of public health gerontological research findings to health care.
INTENDED AUDIENCE:	Candidates for masters or doctoral degrees at Johns Hopkins University.
COURSE OF STUDY:	<p>To earn the Certificate, a graduate student must complete satisfactorily four specified gerontology courses and one elective gerontology course.</p> <p>The specified courses are: Health Issues for Aging Populations (309.605), Innovations in Health Care for Aging Populations (309.607), Epidemiology of Aging (340.616), and New Frontiers in Gerontology (309.608).</p> <p>The elective course (3 credits each) must be chosen from: Biological Basis of Aging (260.665), Managing Long-Term Care Services for Aging Populations (309.606), Mental Health in Later Life (330.618), and Dynamics of Population Aging (380.753).</p>
ELIGIBILITY CRITERIA:	<p>Enrollment in a masters or doctoral degree-granting program at JHU.</p> <p>Successful completion of a two-course sequence in epidemiology* (e.g. 340.601/608, 621/622, 691/692 or 751/752) and a two-course sequence in biostatistics* (e.g., 140.611/612, 621/622, or 651/652) before graduation.</p> <p>*These are core courses already required of most master’s candidates in the School of Public Health.</p>
REQUIREMENTS FOR SUCCESSFUL COMPLETION	A minimum of a “B” grade in each of the five required gerontology courses.
FACULTY SPONSORS:	Chad Boulton (HPM) Paul Willging (pwillging@comcast.net)
ADMINISTRATIVE CONTACTS:	Brian Buta (bbuta1@jhmi.edu)

Website / Application Information: <http://commprojects.jhsph.edu/academics/prop.cfm?id=1>