



HARVARD
SCHOOL OF PUBLIC HEALTH

Department of Global Health
and Population

**GUIDE TO THE
DEGREE PROGRAMS**

**For Students Entering
September 2013**

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THE DEPARTMENT RESERVES THE RIGHT TO MAKE CHANGES TO THESE REQUIREMENTS

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MISSION STATEMENT

The [Department of Global Health and Population](#) seeks to advance and impart knowledge concerning the myriad determinants and consequences of global health and population change.

I. ACADEMIC BACKGROUND

The Department of Population Sciences was established in 1962 and is one of nine academic departments in the Harvard School of Public Health. In the Fall of 1991, the Department was officially renamed Population and International Health to reflect more accurately the Department's activities and course offerings. More recently, in Spring 2008, the Department's name was again changed. Its new name, Global Health and Population is reflective of the broadening challenges in public health.

The Department of Global Health and Population offers two degree programs, a two-year Master of Science (SM) and a doctoral degree (SD, DPH). Doctoral majors have been developed to guide and focus student interest and are currently offered in the following three areas: Population and Reproductive Health, Health Systems, and Economics. The Department's faculty have extensive experience and special competence in: policy and economic analysis, the monitoring and evaluation of health and family planning interventions, interdisciplinary studies in demography-epidemiology-anthropology, longitudinal and community-based survey methodology, women's reproductive health, applied cross-cultural mental health research; resilience and protective processes in children exposed to violence/war; child health and human rights, environmental change and health; malaria transmission and control; spatial methods applied to social sciences; Amazon frontier expansion; ecological approaches to human health, health and human rights, law, HIV/AIDS, humanitarian crises and disaster response. More detailed information is available on the web pages of the Department and of individual faculty: <http://www.hsph.harvard.edu/ghp/>

The Department has an international student body and its faculty includes specialists from diverse disciplines. Most faculty members have had policy and practical field experience in several regions of the world, and many members of the Department speak two or more languages. All faculty members combine technical competence in a particular discipline with overseas work experience and active participation in international research and training activities.

In addition to the customary research and educational activities, this Department contributes to several special programs in Global Health and Population, detailed below:

Concentrations

Concentration in Maternal and Child Health/Children, Youth and Families

The MCH/CYF concentration works in conjunction with four academic departments, including the departments of Social and Behavioral Sciences, Nutrition, Epidemiology, and Global Health and Population. Coursework is developed within the concentration to afford students exposure both to expertise in MCH/CYF and to more specialized knowledge relating to the areas of interest within their chosen department. U.S. citizens and green card holders are eligible for federally funded

tuition support. Those interested in obtaining this funding will be asked to submit a separate application to the faculty in MCH/CYF. More information is available at: <http://www.hsph.harvard.edu/mch-cyf-concentration/>. For more specific information, contact: Patricia Lavoie at tlavoie@hsph.harvard.edu

Nutrition and Global Health Concentration. Offered for the first time this fall, the new *Nutrition and Global Health* concentration builds upon a strong base of ongoing research, teaching, collaborative work, and training in nutrition and global health at HSPH. The concentration takes an interdisciplinary approach to teaching and conducting research about nutrition, its effect on human and economic development, nutrition in humanitarian crisis situations, and the dynamic interplay between the epidemiologic, nutritional, and demographic transitions around the globe. Areas of focus include: Nutrition and Infectious Disease; Nutrition and Maternal and Child Health; Nutrition, Non-communicable Diseases and Aging; Nutrition, Health and Wealth; Nutrition and Health Systems; and Nutrition and Humanitarian Emergencies. The concentration is dedicated to interdisciplinary research that stresses integrative problem solving and evaluation approaches to global health challenges, with a focus on lower- and middle-income countries. Students will be responsible for fulfilling the masters or doctoral degree requirements of their respective departments, in addition to the requirements of the Concentration. *Nutrition and Global Health* students will be required to complete the 13.75 required core credits and are encouraged to take at least 5 elective credits in a course/courses suited to their specific interests. In addition there is a master's thesis/doctoral paper requirement. For more information about the concentration please contact Allison Gallant at agallant@hsph.harvard.edu or visit <http://www.hsph.harvard.edu/global-health-and-population/students/nutrition-and-global-health/>

Interdisciplinary Concentration in Humanitarian Studies, Ethics and Human Rights.

Harvard School of Public Health will offer, for the first time in academic year 2013/14, an interdisciplinary concentration in Humanitarian Studies, Ethics, and Human Rights (HuSEHR). The concentration provides an organized program of study that focuses on the normative underpinnings and practice of humanitarian response and human rights. The curriculum covers a broad range of areas including civilian protection, international humanitarian law, human rights, disaster response, coordinated aid, crisis dynamics, sector-based assistance, health and human security of internally displaced people, geopolitical context, monitoring and evaluation, strategic planning, situation analysis, ethics and standards. Upon successful completion of the concentration, students will be prepared to assume research, leadership and managerial roles within the humanitarian and human rights global community. HuSEHR is managed through the Humanitarian Academy at Harvard (<http://hah.harvard.edu>), a University-wide project based at the Harvard School of Public Health. Further information on coursework, eligibility and other aspects is available at <http://www.hsph.harvard.edu/husehr>. Questions can be directed to hah@harvard.edu

Interdisciplinary Program on Women, Gender, and Health (WGH). This interdisciplinary concentration is geared toward students who desire careers in research, teaching, and programs related to women, gender, and health. Addressing issues of women, gender, and health (WGH) requires the study of the health of women and girls – and men and boys – throughout the life course; gender, gender equality, and biology must be understood as important and interacting determinants of well-being and disease. Areas of study also include gender and gender inequality in relation to individuals' treatment by and participation in health and medical care systems; the physical, economic, and social conditions in which individuals live; and their ability to promote

the health of their families, their communities, and themselves. Inherent in these studies is the protection of human rights as fundamental to health and the recognition of diversity and inequality among women – and men – in relation to race/ethnicity, nationality, class, sexuality, and age. As the concentration does not offer a degree, prospective students must apply to a degree program in one of the participating departments. Students must fulfill the requirements of the home department, which issues the degree, and the requirements of the concentration, which include core courses in women, gender, and health; gender analysis; and women’s health. More information is available at <http://www.hsph.harvard.edu/women-gender-and-health/>

Research Programs and Initiatives housed within GHP:

Harvard China Initiative was founded in 2006 with the aim of helping China advance health and social development through high impact programs in education, research and policy forums. China Initiative has two leadership development classes for China’s senior health executives. To date, more than 400 health policy makers and senior executives in charge of China’s health and social sector development have graduated from here. China Initiative has been conducting the variety of research projects on China. The on-going researches include “Professionalism Development” and “Mobile Health Intervention Project”. It also hosts biweekly research seminars and supports WinterSession field study course in China. Following two successful Social Development Forum in 2007 and 2009, China Initiative held the inaugural Harvard America-China Health Summit in 2011, attended by more than 700 participants. More information is available at: <http://www.hsph.harvard.edu/china-initiative/>.

The Harvard Humanitarian Initiative (HHI) is a university-wide center involving multiple entities within the Harvard community that provide expertise in public health, medicine, social science, management, and other disciplines to promote evidence-based approaches to humanitarian assistance. The mission of the Initiative is to relieve human suffering in war and disaster by advancing the science and practice of humanitarian response worldwide. HHI has 35 faculty collaborators as well as a network of fellows and students with an interest in research, policy development, education and training in the humanitarian arena. In 2012, the HHI launched the **Humanitarian Academy at Harvard**. The Humanitarian Academy at Harvard is the first global center of its kind – dedicated to educating and training current and future generations of humanitarian leaders in the areas of human rights, disaster response, humanitarian service delivery, crisis leadership, and other dimensions of thinking and acting in acute settings affecting large populations. The Academy distinguishes itself as a leader in humanitarian education in several important capacities:

- An **integrated and encompassing approach to educating** that connects undergraduate offerings, graduate courses, certificate programs and professional education
- Faculty members that are viewed as **academic visionaries and standard-bearers in the field**
- A focus on **experiential / hands-on learning**
- Curriculum based on **evidence and experience** in the application of norms and science to achieve best practice in humanitarian response.

HHI is also home to the **The Program on Humanitarian Policy and Conflict Research (HPCR)**. HPCR is a research and policy program that provides technical assistance and information support for international organizations engaged in humanitarian action and conflict

transformation. The Program was established in August 2000 as a collaborative effort of the Harvard School of Public Health, the Executive Office of the United Nations Secretary-General, and the Swiss Federal Department of Foreign Affairs. The Program services international organizations, in particular the United Nations, with innovative and coherent policy inputs on humanitarian law, human security, and conflict management. Special attention is devoted to the role of new information technologies in the policymaking work of governments and international organizations. Situated in one of the world's most dynamic academic and policy environments, HPCR applies its unique access and resources to address new policy challenges. While valuing fluidity and entrepreneurial approaches, the Program assesses success in terms of measurable impact.

For more information on the HHI, the Academy, and HPCR please visit: <http://hhi.harvard.edu/>

[International Health Systems Program \(IHSP\)](http://www.hsph.harvard.edu/ihsp) is a multidisciplinary team of teaching faculty, research scholars, and technical experts working to improve health care systems in developing countries through research, training, and technical assistance. IHSP's leading work has been research and analysis of the design, implementation, and impact of decentralization, social and community health insurance, human resources reforms, and public private partnerships in low and middle income countries. The program also focuses on analysis and advice on political processes of reform, strategies to enhance social capital, research on the organization and management of health care delivery systems, especially for implementation and scale up of proven interventions and strategic planning for human resources in health. IHSP also has developed courses and research into financing, payments and HIV/AIDS programs in China and India. IHSP has recently been awarded a 4-year program to strengthen health policy development, leadership and management capacity for the Department of Health in South Africa, working in partnership with the University of Pretoria, the University of Fort Hare and South Africa Partners Inc. The program provides opportunities for faculty and students to work on projects in low and middle income countries sponsored by the World Bank, USAID, DFID, WHO, and the Global Fund for HIV/AIDS, TB and Malaria. IHSP's training and education program currently offers three two week executive training courses each year on decentralization and management, human resources strategic planning, and quality improvement. IHSP also participates in the Harvard/World Bank Flagship Course on Health Reform and Sustainable Financing. More information is available at <http://www.hsph.harvard.edu/ihsp>

[Program on the Global Demography of Aging \(PGDA\)](http://www.hsph.harvard.edu/pgda/) is funded by the National Institute on Aging at the National Institutes of Health to carry out research on themes related to global aging and health, with an emphasis on issues in the developing world. The program has five themes: the measurement of health, the socioeconomic determinants of healthy aging, health care for the elderly, migration, and the macroeconomic consequences of aging. The PGDA supports seminars and workshops and has a working paper series. It also provides resources to assist research in aging by funding pilot projects and postdoctoral fellowships. More information is available at <http://www.hsph.harvard.edu/pgda/>

[The Program on Human Rights in Development \(PHRD\)](http://www.hsph.harvard.edu/phrd/index.html) is concerned with the realization of human rights in the context of poverty reduction and development strategies. Through teaching, research and publications, PHRD seeks to deepen understanding of the economic, legal, political, and ethical issues involved in integrating human rights into policies and programs of development. More information is available at <http://www.hsph.harvard.edu/phrd/index.html>

The Takemi Program in International Health offers postdoctoral fellowships for professionals and scholars from around the world for research and advanced, interdisciplinary training on critical issues of international health, especially those related to developing countries. The program addresses problems of mobilizing, allocating, and managing scarce resources to improve health, and of designing strategies for disease control and health promotion. Takemi Fellows are typically mid to senior level health professionals who spend the year working on a particular research topic. The program does not provide funding. Applicants are encouraged to identify their own sources of funding for the fellowship. More information is available at <http://www.hsph.harvard.edu/research/takemi>

Women and Health Initiative In the Summer of 2010, the Harvard School of Public Health launched the Dean's Women and Health Initiative (W&HI) to advance a unique agenda simultaneously focused on women's health needs and women's critical roles as both formal and informal participants in healthcare systems (women *and* health). The Initiative draws on resources and expertise from across the Harvard School of Public Health and the broader Harvard community to develop interdisciplinary perspectives and innovative solutions to the challenges women face in the public health arena. The W&HI engages with global partners including governments, foundations, private industry, multi-lateral agencies, non-governmental organizations, and committed individuals to develop and promote this broad-based agenda. The W&HI's flagship project, the Maternal Health Task Force, improves global maternal health policies and programs by expanding access to critical knowledge, evidence and information; providing a neutral space for scientific debate and consensus building; strengthening the capacity of developing country professionals, and expanding the knowledge base on how to improve and evaluate the content and quality of maternal health care. More information is available at <http://www.hsph.harvard.edu/women-and-health-initiative/>.

Affiliated Centers

The François-Xavier Bagnoud Center for Health and Human Rights at Harvard University (FXB Center) is an interdisciplinary center that works to protect and promote the rights and wellbeing of children in extreme circumstances worldwide. Founded in 1992 through a gift from the Association François-Xavier Bagnoud, the FXB Center aims to build a conceptual and empirical basis for realizing rights inherent in protection of children and empowerment of adolescents and youth trapped throughout the world in grave poverty and deprivation, harsh oppression, major disaster, and war. Through the lens of health and human rights, the Center's faculty conduct research; teach and supervise students and engage faculty throughout the University; periodically convene leading academics, policy makers, and practitioners to address pressing research or policy issues; and work generally to develop and promote evidence-based policy that has positive impact on the rights and wellbeing of children, adolescents, and their families globally. More information is available at: www.harvardfxbcenter.org

The Harvard Center for Population and Development Studies (HCPDS) Founded in 1964 by HSPH Dean Jack Snyder and founding director Roger Revelle, the HCPDS has continued to spearhead interdisciplinary research focused primarily on population change, socioeconomic development, and public health. The Center supports an analytic and research platform that enables practitioners to work and report on large scale population based studies with rich depth and demographic data. It connects numerous research centers across campus and around the

world, thus creating a "community" that fosters collaboration and integration of intellectual capital. It trains students at all levels to become leaders in population health by close collaboration and by way of the latest technologies in the selection, design, development, management, and dissemination of data. Finally, the Center organizes and supports numerous conferences, symposia, and seminars as a means to disseminating research and partnering with other educational institutions and community organizations. <http://www.hsph.harvard.edu/centers-institutes/population-development/>

MASTER OF SCIENCE PROGRAM

Mission Statement

The mission of this degree program is to prepare the next generation of leaders for health and population policy, research and practice around the world in order to advance global health and reduce the burden of disease, especially in the world's most vulnerable populations.

Goals/Objectives

The program's graduates contribute to the improvement of global health and the resolution of population problems. Graduates have the analytical and technical skills to address health and population problems at home and abroad from a range of disciplinary perspectives. They build a set of advanced competencies covering conceptual approaches, theory and practical applications, problem solving and analysis, as well as a wide range of quantitative and qualitative methods. Graduates pursue a range of careers in leadership and engagement with global health issues in national and international government agencies, NGOs and the private sector, as well as applied research, policy analysis, and health education.

The overall objectives of the two-year Master of Science degree program are:

- (i) to provide training in public health to qualified health professionals and to other individuals whose prior training and experience prepares them to play a leadership role in public health;
- (ii) to adapt SM2 training to the diverse backgrounds and anticipated future careers of students;
- (iii) to award the SM2 degree to individuals who have acquired a particular depth of knowledge in public health sciences and who have demonstrated the following capacities to: understand the distribution of major determinants of health in populations relevant to the candidate's anticipated career course, effectively contribute to the management of health services, analyze risks and devise strategies for a healthier environment, a safer workplace, and fewer injuries, identify ways in which changes in behavior and social structures may affect the health of populations;
- (iv) to lead students to achieve these capacities in a setting that demands that they query, learn, persuade, and communicate in active interchange with their peers, with faculty, and with practitioners outside the school.

Competencies

Graduates acquire a solid and up-to-date understanding of the major issues in population and global health; the tools to examine evidence related to program effectiveness, priority setting, and decision making; and insights into the practical aspects of undertaking population health

interventions around the world, including a perspective on the economic, social, political, cultural, and ethical considerations that bear on these issues. Upon satisfactory completion of the SM2 degree, graduates are able to: demonstrate knowledge and understanding of theory and practice in core global health areas (e.g. demography, economics, epidemiology, ethics, gender analysis, human rights, law, politics, policy, and statistics);

- Synthesize and integrate specialized knowledge and skills in one or more areas of global health and population, based on advanced course work and independent study
- Identify global health problems and apply appropriate interventions with particular attention to low resource settings
- Demonstrate competence in the five core disciplines of public health: *Introductory Biostatistics; Epidemiology; Environmental Health Sciences; Health Services Administration; Social and Behavioral Sciences*
- Demonstrate competence in ethics in accordance with the established school-wide list of recommended competencies in this area
- Identify and apply appropriate quantitative methods to the analysis of international, national, regional, or local contemporary problems of public health

Educational Approach

The distinctiveness of this education in global health and population is the strong accent on engagement with contemporary public health issues achieved through coursework and connections with the faculty, all of whom have active global health and population research programs. This training combines an academic education in key disciplinary areas with problem solving, practical experience and a final thesis. Throughout the program, students are encouraged to engage with faculty on their research projects, to organize and participate in seminars that promote discussion with members of the HSPH community, and to complete WinterSession courses and a summer internship.

The two-year, 80-credit degree program comprises a core curriculum of courses required by the School and the Department (about half the total credits) together with electives. The course work emphasizes the acquisition of skills and concepts necessary to address a range of global population health issues. Of the necessary 80 credits, the required core courses make up roughly half, allowing considerable flexibility for students to tailor their own degree programs; 60 credits must be letter-grade credits, including a 5-credit required thesis. The remainder of the credits may be taken pass/fail.

The Department provides a detailed coursework schedule for the two years (see pages eight and nine). In the first year of study, students focus on the core courses required by the School and the Department. The Foundations course on global health and population, GHP 272, offered in the first semester, is taken by all students and provides a common platform for the more advanced work that follows. There are approximately 30 required credits in the first year of study, including school-wide requirements; courses in demography, population health measurement and risk factors, and ethics; and applied courses in politics and economics. In the summer after the first two semesters of instruction, students are expected to develop their ability to apply their skills and knowledge to contemporary problems in global health by undertaking an internship in the United

States or abroad. Students often use this internship and the opportunities it provides to gather information for their thesis. In the WinterSession (January each year), many students join one of the faculty-directed field courses, which in recent years have included work in India, Bangladesh, Indonesia, China, Chile, Brazil, Nepal and Tanzania.

The second year involves a combination of course work and independent study, some linked to the thesis. Individual contracts for independent study with faculty members in the school or the university are encouraged in this second year of study. Many students choose to take courses in other Harvard faculties such as the Harvard Kennedy School or the Graduate School of Arts and Sciences. Since students have fewer required courses in the second year, they can specialize in areas of their choice. As an initial guideline, the GHP faculty has identified five Areas of Interest (AOIs) aimed to help students concentrate in specific areas. The intent is to direct students to sets of elective courses that collectively will build skills in the specific AOI of their choice. These AOI are fully described in a separate document, but summaries of the aims of each and associated faculty are provided below. The courses listed under each AOI *are not required*; instead, the lists are meant to serve as a guide to both students and advisors in selecting appropriate electives.

Note that the degree may also be used as a first step towards doctoral training. Details can be provided by members of the Department's doctoral committee or by your advisor. Some graduates have begun careers with foundations and research organizations, while others work directly for international health and development agencies, for companies, and for non-profit and non-governmental organizations in the United States and worldwide

Admission Criteria

On entry, applicants must hold a bachelor's degree or equivalent in a relevant discipline. Many entering students already hold advanced degrees in medicine or a social science discipline. The admissions committee looks for candidates with strong quantitative skills (as demonstrated, for example, by good performance, or a minimum grade of B⁺, in college-level calculus or statistics courses), strong written communication skills (for example good performance in courses requiring expository writing), and for those with relevant prior working experience in global health.

Additional Information

Procedures, deadlines, and test requirements for admission to this program, as well as information on financial assistance, are fully explained in the School Catalogue (Official Register of Harvard University). This information may be obtained from the **Admissions Office, Harvard School of Public Health, 677 Huntington Avenue, Boston, Massachusetts 02115 (Telephone 617-432-1031)** or by visiting the website at: <http://www.hsph.harvard.edu/administrative-offices/admissions/>

**Master of Science Program (80 credits) in Global Health and Population
Degree Requirements – 2013/14**

DEPARTMENTAL REQUIREMENTS	Credits	Year when course should be taken
• GHP 272 Fall: Foundations of Global Health and Population (Practice Course)	5.0	1
• <i>GHP 220 Fall 2: Introduction to Demographic Methods</i>	2.5	<i>Not offered 2013/14</i>
• GHP 506 Spring 1: Measuring Population Health	2.5	1
• GHP 507 Spring 1: Population Health Risk Factors	2.5	1
• GHP 269 Spring 2: Applied Politics and Economics I	2.5	1
• GHP 299 Spring: Masters Thesis (Culminating Experience)	5.0	2
• Ethics – see below for choices	2.5	1 or 2
• Economics – see below for choices	2.5	1 or 2
• Intermediate-level biostatistics – see below for choices	10.0	1 and/or 2
Ethics Choices (Select 2.5 credits)		YEAR 1 OR 2
• ID 250 Fall 1: Ethical Basis of the Practice of Public Health	2.5	
• ID 250 Spring 1: Ethical Basis of the Practice of Public Health	2.5	
• ID 292 Spring 2: Justice and Resource Allocation	2.5	
• ID 513 Spring 1: Ethics and Health Disparities	2.5	
• GHP 293 Fall 2: Individual and Social Responsibility for Health	2.5	
Economics Choices (Select a minimum of 2.5 credits)		YEAR 1 OR 2
• HPM 206 Fall: Economic Analysis	5.0	
• ECON 2020a Fall: Microeconomic Theory I	5.0	
• GHP 230 Fall 2: Intro to Economics with Applications to Health and Development	2.5	
• GHP 225 Fall: Population, Health and Development	5.0	
Intermediate-level Biostatistics Choices (Select 10.0 credits)		YEAR 1, 2 OR COMBO
• BIO 210 Fall/Spring: Analysis of Rates and Proportions	5.0	
• BIO 211 Fall: Regression and Analysis of Variance in Experimental Research	5.0	
• BIO 212 Spring: Survey Research Methods in Community Health	2.5	
• BIO 222 Fall: Basics of Statistical Inference	5.0	
• BIO 223 Spring: Applied Survival Analysis	5.0	
• BIO 226 Spring: Applied Longitudinal Analysis	5.0	
• BIO 287 Spring 1: Public Health Surveillance	2.5	
• BIO 507 Summer: Introduction to Quantitative Methods for Monitoring and Evaluation	2.5	
• GHP 525 Fall: Econometrics of Health Policy	5.0	
• SBS 263* Spring: Multilevel Statistical Methods	5.0	
• GSE S-052* Spring: Applied Data Analysis	5.0	
• GSE S-030* Spring: Intermediate Statistics: Applied Regression and Data Analysis	5.0	

* Students considering applying to the GHP doctoral program should note that these courses will not meet the School's requirements for intermediate-level biostatistics.

CORE REQUIREMENTS	Credits	Year when course should be taken
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Students have the following choice to fulfill the introductory Biostatistics and introductory Epidemiology requirements: Please select one Biostatistics course (5.0 credits) **and** one Epidemiology course (2.5 credits) from the two lists below for **OR**, select the single combined course, ID 200 which is 7.25 credits.

Introductory Biostatistics (Select 5.0 credits)		YEAR 1
• BIO 200 Fall: Principles of Biostatistics	5.0	
• BIO 201 Fall: Intro to Statistical Methods	5.0	

Epidemiology (Select 2.5 credits)		YEAR 1
• EPI 500 Fall 1: Fundamentals of Epidemiology	2.5	
• EPI 201** Fall 1: Introduction to Epidemiology	2.5	
• EPI 202** Fall 2: Elements of Epidemiologic Research	2.5	

OR

Combined Epidemiology and Biostatistics Course (7.5 credits)	YEAR 1
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ID 200 is a new 7.5 credit course that will fulfill the above biostatistics and epidemiology core requirements. This course is not intended for students considering applying to the GHP Doctoral Program (SD). Those interested in the doctoral program should take BIO 200 or BIO 201 and EPI 201 and EPI 202.

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| • ID 200 Fall: Principles of Biostatics and Epidemiology | 7.5 |
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Environmental Health (Select 2.5 credits)		YEAR 1 OR 2
• EH 201 Fall 2: Introduction to Environmental Health	2.5	
• EH 202 Spring 1: Principles of Environmental Health	2.5	
• EH 278 Spring 2: Human Health and Global Environment Change	2.5	

Health Services Administration		YEAR 1
• GHP 269 Spring 2: Applied Politics and Economics	2.5	

Social and Behavioral Science (Select 2.5 credits)		YEAR 1 OR 2
• SBS 201 Fall 1: Society and Health	2.5	
• SBS 281 Fall 2: Principles of Social and Behavioral Research	2.5	
• SHDH 207 Spring 2: Race, Ethnicity and Health	2.5	<i>Not offered 2013/14</i>

** *EPI 201 and EPI 202 are strongly recommended for students considering applying to the GHP doctoral program.*

Total required Departmental and Core Credits for Year 1 and Year 2: 47.5 or 50.0.

Total credits needed for degree is 80 credits of which 60 must be letter grade.

PLEASE NOTE: All Departmental and Core Credits must be taken for either a letter grade or Pass/Fail. Audited courses do not count towards total credits.

FIELD EXPERIENCE

The field practicum in Global Health and Population is designed to provide an opportunity for students to engage in a variety of public health issues as a team member in a public health setting under the supervision of both their faculty advisor and a field preceptor. An important purpose of the field experience is to develop the leadership skills needed to implement change. Students will be given the opportunity to see some of the challenges confronted by public health professionals on a routine basis. The field experience provides a public health setting in which students may integrate and apply the skills and knowledge acquired through their coursework. Next, we provide guidelines for the field experience.

Guidelines for Summer Public Health Field Experience/Practicum

During the summer between the first and second years, students may undertake an internship for hands on experience, and to integrate the skills that they have learned from courses. Students who do not participate in a summer internship will have to fulfill the field experience requirement during the academic year in consultation with their advisor and the SM2 Committee. This experience must meet the same criteria as those fulfilling the requirement during the summer. Many of the students use the summer experience to develop their Master's thesis.

Objectives: The Public Health Field Experience in Global Health and Population is designed to enable students to:

- integrate and apply the skills and knowledge acquired through coursework to a public health issue in the field
- develop the interpersonal skills necessary to be an effective team member within an organization
- further develop oral and written communication skills
- work on a public health issue within a professional network

Placements: Students must provide the following information to the GHP Education Office by Monday, April 7, 2014:

- Proof of an acceptable Field Experience:
 - Description of the field activity
 - Location
 - Length (must be a **minimum** of 6 weeks @ 30 hours per week)
 - Letter/Email from the individual who will supervise/work with you during this period
- Signed letter from your Faculty Advisor indicating their approval of this activity (he/she may simply co-sign the letter/email from the field supervisor)
- Submit a budget. Please be sure to include anything provided by the host institution/organization, (i.e., housing, stipend, specific expenses, etc.) or other sources.

All materials should be placed in an envelope and submitted to the Education Office (Anjane Jaimungal or Barbara Heil) by Monday, April 7, 2014. Incomplete materials will be returned.

Reporting: Students are required to write a 3-5 page report of their summer activity. This report must be submitted electronically as an email attachment to the Education Office (Anjane Jaimungal ajaimung@hsph.harvard.edu). This report is due on Friday, September 19, 2014. The following components should be included:

- Description of your internship – activities, responsibilities, and outcomes
- The name, title and contact information of your supervisor as well as a complete address of the organization/group with whom you are working
- Indicate whether or not you plan to incorporate your field experience in your Masters' Thesis, if so, explain how
- Indicate if you would recommend this internship to future students

At the conclusion of the internship, preceptors are asked to provide a written assessment on the student. At a minimum, the assessment should address the following points and provide a brief commentary on each:

- Was the student prepared to fulfill the tasks required? If not, what training was missing?
- Was the student reliable and committed?
- Did the student contribute as a team member and work well in a group setting?
- Did the student demonstrate any leadership skills?
- Were the expected tasks completed?
- Would you consider hiring this student in the future?
- In your opinion, does this student show overall promise as a public health professional?

Preceptors will be asked to email their assessments to the department's Education Office, Attn: Barbara Heil bheil@hsph.harvard.edu. These will be reviewed by both the student's academic advisor and the SM2 Committee. The advisor will also discuss the assessment with the student.

All students are required to:

- Consult with their faculty advisor and check Office of Human Research Administration (OHRA) Guidelines <http://www.hsph.harvard.edu/ohra/> to assess if OHRA approval for the field experience activity is required.
- Register on line for the International SOS Travel Assistance Program at <http://vpf-web.harvard.edu/rmas/isos.html>

Some recent examples of internships/summer work:

- Health risk management in a changing climate with Red Cross, Tanzania
- Worked with Innovations for Poverty Action (IPA) in Ghana
- Collected data on eye health, sanitation and hygiene, family planning, HIV/AIDS, and malaria with Uganda Village Project (UVP).
- Worked with Innovations for Poverty Action (IPA) in Zambia with Zambia Early Childhood Development Project (ZECDP)
- Evaluation of community-based Surveillance Program for Avian influenza in Vietnam
- Worked with Neovita, a multi-site clinical trial examining the effect of neonatal vitamin A supplementation on child mortality in Tanzania
- How do perceptions of mental illness impact one's treatment in Ethiopia

- Improving maternal health care in Nairobi, Kenya
- Worked with Nepal Family Health Project II
- Quality improvement strategy for maternity and pediatric services at Kayanza Provincial Hospital, Burundi through MSH
- “Healthy Cities. Wealthy Cities” The determinants of child health and immunization status in an Indian Urban Slum in Mumbai, India
- Data collection and Relevant Research: A Summer with the Women’s Health Study of Accra, Ghana
- Health Policy Initiative/Abt Associates Inc. on reproductive health and HIV prevention
- Measuring health-related quality of life (QoL) of Type II Diabetes Mellitus and other projects
- Assessment of abortion in Mexico city
- Sexual and reproductive health needs assessment for migrant agricultural worker
- Social determinants of health in the Eastern Mediterranean Region (EMR)
- Retrain interviewers and data entry staff for collection of data in Rwanda for Monitoring and Evaluation team at FXB, Geneva
- Evaluating TB DOTS at the BHU Level in the District of Lahore, Pakistan
- Addressing the persistent high neonatal mortality in Nepal, in collaboration with Morang Innovative Neonatal Intervention (MINI)

Areas of Interest

The SM2 degree program has been designed as a unitary program without specific concentrations or majors. In the past, students have expressed interest in having guidance from department faculty about specific areas of focus in which they have interest. The Department has identified the following five Areas of Interest (AOI).

Students in the SM2 program find themselves quite busy with coursework and many other exciting opportunities at HSPH and Harvard. We have found that the interest and commitment to these AOI’s is not uniform or constant over time and across classes. To best tailor effort to need and demand, we request the SM2 students to initiate a process of self-organization around these AOIs. Faculty are interested and available to meet with smaller groups of students to provide additional guidance about courses, topics of study and research, key policy issues, and employment prospects with a focus on these AOIs.

To facilitate this process, student groups should form and contact Peter Berman or Barbara Heil to schedule AOI meetings in response to their request.

Area of Interest	Associated GHP Faculty / Instructors (Faculty Focal Point in Bold)
<p>Ethics, Human Rights and Humanitarian Studies The AOI on ethics, human rights and humanitarian studies (EHRHS) introduces students to the application of normative frameworks in the practice of public health, policy formulation and decision-making in each of the three sub-areas. It aims to expand their knowledge and skills to analyze critically trends, dilemmas and broader challenges posed by these sub-areas and to explore how they are related in theory and practice. Finally, it develops practical tools and skills in support of professional and academic careers in these fields.</p>	<p>J. Bhabha T. Betancourt C. Bruderlein R. Cash H. Cranmer N. Daniels G. Greenough J. Leaning R. Levins S. Marks M. VanRooyen D. Wikler A. Yamin</p>
<p>Human Ecology Human health is determined in the complex network of our relations with the rest of nature: renewable and non-renewable resources, food production and consumption, nutrition, <i>climate</i> and pollution. Like all species we select, transform, define, and respond to our environments so that our demography, settlement pattern, and social organization are part of our ecology. The public health ecology cluster prepares students to look at the whole, to see how agriculture affects infectious disease and nutrition, how deforestation affects climate, the ecology of war, the megacity as a new habitat, how aging affects natural selection, and our own interventions alter the ensemble of pathogens, their competitors and predators. They will be able to provide these insights to the work of economic planners, ministries of health and agriculture, health journalism, development NGOs and urban planners.</p>	<p>R. Levins T. Awerbuch M. Castro</p>
<p>Population and Health Measurement This AOI provides students with the technical skills to measure levels, trends and differentials in population and health outcomes. These skills include the theoretical justification for various indicators used to measure population and health, mixed methodologies (quantitative and qualitative) for improving cross-cultural assessment, the mechanics of making necessary calculations, the appropriate interpretation of indicators, the analysis of the effects of socio-economic and behavioral factors on population health and demographic change, and the evaluation of defective or deficient demographic data.</p>	<p>T. Bärnighausen T. Betancourt M. Castro G. Danaei A. Langer R. Levins J. Salomon G. Wyshak</p>

<p>Health Economics and Economic Evaluation</p> <p>This AOI is for students who wish to gain knowledge of and expertise in the economic analysis of issues in global health and population. The skills developed will enable students to undertake economic evaluation of projects in health and population. Students will gain knowledge of the economic theory of behavior and incorporate behavioral responses into program evaluation. They will also learn how changing the provision of health services affects utilization and health related behaviors. They will learn the theory of cost-effectiveness analysis, giving them the methodology to evaluate health programs in terms of disability adjusted life years gained per dollar spent. They will become familiar with empirical approaches to program evaluation for both randomized and non-randomized interventions. The empirical approaches will emphasize the need for analysis of causal inference on program effects even with observational data and non-randomized interventions. Students will gain experience undertaking evaluation of programs as part of the required coursework.</p>	<p>T. Bärnighausen P. Berman D. Bloom T. Bossert D. Canning J. Cohen M. McConnell G. Fink J. Salomon</p>
<p>Health Systems, Policy, and Program Management</p> <p>Competency in this area of interest requires expertise in three essential sub-areas:</p> <ol style="list-style-type: none"> 1. Policy Design 2. Management 3. Evaluation <p><i>Policy Design</i></p> <p>This sub-area focuses on an understanding of the health system concepts and the ways that policy to change health systems (reform or strengthen) are developed, approved and implemented. It emphasizes multi-disciplinary approaches based in economics, political science and ethics in order to develop both theoretical and practical orientations for students to address the processes of health system change</p> <p><i>Management</i></p> <p>Students will have the opportunity to learn practical management skills, such as financial management, operations, marketing, information systems, quality improvement, organizational behavior, and strategy determination. Graduates assume leadership positions in government and non-profit health care organizations that provide direct care and those that pay for and/or regulate health services.</p> <p><i>Evaluation</i></p> <p>This sub-area guides students in qualitative and quantitative aspects of evaluation. The core competencies students who focus on evaluation should develop are: 1) understanding of the fundamentals and language of evaluation, 2) understanding of the existing evidence base on which current evaluations should build, 3) knowledge of measurement issues in impact evaluation, 4) familiarity with various quantitative methods for impact attribution and 5) practical evaluation experience. Graduates assume</p>	<p>T. Bärnighausen P. Berman T. Bossert P. Campbell J. Cohen G. Danaei N. Daniels G. Fink M. Mitchell M. Reich J. Salomon D. Wikler</p>

monitoring and evaluation and general management positions at international consulting agencies (e.g. JSI, MSH), disease-specific groups (e.g. Global Fund, PEPFAR), national and international NGOs, or go on to pursue doctorates in public health. Students can choose whether they want to focus on quantitative skill acquisition, but all students are required to be familiar with both quantitative and qualitative aspects of evaluation.	
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WinterSession

The Department strongly encourages all full-time students to participate in WinterSession activities, whether for-credit or non-credit, on-site or off-site, in accordance with their individual needs and interests. Every student must submit a completed and signed WinterSession Participation Form available from the Education Office.

Course Waivers

Students seeking to waive a school-wide core course should follow the procedure as outlined in the HSPH Student Handbook. For Departmental requirements, waivers will be considered only if a student can demonstrate that the subject matter has been covered to a similar level in a previous course. *A waived course should be replaced by a higher level course in that subject area.* All Department waivers must be accompanied by a letter of support signed by both the course instructor and the student's advisor and will be reviewed by the Chair of the Master of Science Committee. No course substitutions are allowed.

Master's Thesis (Culminating Experience)

The second year usually involves a mix of course work and the *Master's Thesis*. The thesis is intended to allow the student to pursue a single topic in depth and demonstrate analytical and substantive expertise in an area of global health and population. A Master's Thesis is required of all students enrolled in our Department's two-year SM program. Whilst work on the body of the thesis begins in the middle of summer in most cases, the final written version is produced during the student's second year in the program. The thesis serves several purposes:

- It provides an opportunity for the student to work on a problem or issue of particular interest
- It allows the student to apply many of the skills acquired separately in the different courses taken for the degree
- The thesis itself is proof of the student's mastery of certain skills that are important whether the student continues to a research degree or begins professional employment
- It is a useful document that can be shown to employers and supervisors indicating a student's level of achievement in particular areas

The skills and understanding that we expect to see developed in part through the thesis include:

- The capacity to conceptualize a problem and to identify the key questions that need to be addressed

- The ability to reduce these broad questions and issues to a tangible form that can be managed with the resources and item available to the SM student
- A capacity to apply and understand the value of the technical skills acquired in the required and optional courses taken during the two-year period of training
- To develop the beginnings of an independent approach based on the work of others but extending to the development of new conclusions from existing and new evidence
- To be able to place the particular and small-scale work for the thesis in a broader context and to realize how the work can contribute to the development of new knowledge and understanding in the domains of Global Health and Population.

Students are required to register for the thesis (GHP 299) in the Spring of their second year, and the system of grading (see Appendix 2) reflects the importance we attach to each of the elements described above. It is *strongly recommended* that students sign up for an independent study with their thesis advisor during their third semester to begin preparation of the thesis. Detailed guidelines for the thesis are provided in Appendix 2.

Sample of Recent Theses Titles

- The Effect of Education on Teenage Fertility: Evidence from the Education Reform in Ethiopia
- Assessing the Implementation Barriers to the ‘Accelerated Action Plan to Reduce Maternal and Newborn Mortality’ in Liberia
- Barriers to Care for Children at Risk of Drug-Resistant Tuberculosis in Jakarta, Indonesia: A Qualitative Assessment
- Assessing the Quality of Antenatal Care in Post-Conflict Liberia: Predictors and Implications for Improvement
- A Qualitative Analysis of Treatment-Seeking Behaviors and Perceptions of Mental Illness in Jimma, Ethiopia
- Country-Level Spatial Analysis of West Nile Virus in the Contiguous United States: An Eco-Epidemiologic Study of Human Environmental Associations with Disease Distribution
- Risk Factors for Preterm Birth among HIV Positive Women Living in Dar es Salaam, Tanzania
- Vulnerability and Flooding in the Slums of Dhaka, Bangladesh
- Strategies for Impact Evaluation of Complex Global Health Interventions to Ensure Continuous Quality Improvement
- Evaluating the Impact of Human Resources for Health on the Mortality of People Receiving ART in Botswana
- Time Preference Traits in Seeking Care - Determinants of Delayed Care-seeking for Malaria in Ghana and Uganda
- Predictors of Educational Outcomes in Zambian Children: Gender, Culture, and Household Characteristics
- Fertility and Unmet Need for Contraception on Idjwi Island, Democratic Republic of the Congo
- Child Health and Immunization Status in An Unregistered Mumbai Slum
- The Past, The Present, and Future Prospects: Family Planning Programs for Internally Displaced Populations Case Example: Nyarurama Camp, Burundi
- Prevalence of Overweight and Obesity and Perception of Healthy and Desirable Body size in Urban, Ghanaian Women – Findings from the Women’s Health Study of Accra, Wave II
- Relationship Power Dynamics and Socio-Demographic Determinants of Condom Use among Female Sex Partners of Injecting Drug Users in Hanoi, Vietnam
- Comparative Analysis of Factors Associated with Presumed and Confirmed Malaria Infections in Angola and the United Republic of Tanzania

- Responses to A Global Health Assessments Tool (EQ-VAS) between Chinese and English-Speaking Patients of Type II Diabetes Mellitus in Singapore
- Measuring the Realization of Children’s Rights: From the Text to the Tangible in Post-disaster and Developing Countries
- The Cultural, Political, and Economic Context of Water Rights in Punjab: History and Present
- The Political Implications of Inadequate Government-Provided Services in Cairo Slums.
- User Experience and Drivers for Adoption of Ecological Sanitation Toilets in Kisoro and Kabale, Uganda
- Analysis of A Tool Designed for Measurement of a Poverty-Reduction Program in Rwanda and the Contextual Tensions Impacting Technical Performance
- Inequity on the Rise: an Investigation of Child Mortality Trends Across Women in the Punjab Province in Pakistan
- Predictors of Young Infant Survival: An Assessment of a Community-Based Neonatal Health Program in Nepal
- The Influence of Enabling Resources and Predisposing Characteristics on Facility-Based Childbirth in Ghana’s Greater Accra Region
- Effectiveness of Mutual Health Insurance in Protecting Household Catastrophic Health Spending in Rwanda: In the Case of Kibungo Province
- A Comparative Study: Preference-based EQ-5D index Scores for Chronic Diseases in the United States and Korea

Academic Advisor

All students are assigned an Academic Advisor upon their enrollment. The Advisor is responsible for providing guidance and supervision throughout, including approval of the course selection by the student. Assignment of Advisors may be shifted by mutual consent of the student and the assigned Advisor. While solid efforts are made to match students with an appropriate advisor, there are occasions when a change is beneficial. Neither the academic advisor nor the advisee should feel uncomfortable about initiating such a change. To change an academic advisor, the student should speak with the potential new academic advisor to see if he/she is willing to accept another advisee. Once that has been established, they should speak with the current advisor and indicate who their new advisor will be. Finally, the student should prepare an email which indicates the change from one advisor to another. This email should be sent to Anjane Jaimungal ajaimung@hsph.harvard.edu in the department’s Education Office, and must be copied to both the old and new advisors. If the email is only sent to Anjane, the request will be considered incomplete and no change will be made.

In an effort to strengthen the advising component of the Department’s Master of Science degree program, the SM2 Committee has prepared a document to clarify the roles and responsibilities of both the academic advisor and the advisee. (Appendix 1). Through this document, the committee has endeavored to present clearly the expectations of each and allow for a better understanding and a more cohesive and productive relationship between both parties.

Application to the Doctoral Program

Those Masters students considering applying to the doctoral program are encouraged to begin discussing their plans with faculty as early as possible. Usually, course credits taken for the Masters

degree may be counted towards the doctoral program. See the doctoral program description for full details. Application to the doctoral program is highly competitive.

Career Guidance and Internship Opportunities

Masters degree students find employment in a wide variety of professional capacities within the broad areas of population and global health. GHP faculty have strong links with the bilateral and multi-lateral health and development agencies, and with national and international non-governmental and private voluntary organizations. Professional positions of all kinds are largely identified through networking, and public health is not an exception to this rule. The search should start as soon as possible after a student arrives at the HSPH, and it needs to begin with clarity about the type of position to be sought. Often students seeking graduate degrees are making substantial career shifts, and therefore entering relatively uncharted territory. Informational interviews with individuals in the field, including HSPH graduates, will be helpful at this stage. Those interviews can clarify those work characteristics to be sought and avoided, as well as any academic or other requirements.

Advisors should be helpful during this initial process, as students' career goals and academic paths are mapped out. Their relative utility during the more specific searches for internships and jobs will depend upon a number of factors including their (faculty members) own educational background, experience and interests. Students are encouraged to complement discussions with advisors by holding additional conversations with other GHP and HSPH faculty, especially those with matching interests and connections.

Students should also make use of the HSPH Career Services Office, which is supported by the school especially for this purpose. Staff in this office can help with overall planning of the job or interview search process, CV development, and interview preparation. These staff members have limited resources available in the international arena. Information about potential positions with multilateral assistance agencies and consulting firms, are most likely to be successfully addressed by GHP faculty.

Students should be aware, from the outset of graduate study that responsibility for a successful search result rests with them. This is an active, rather than a passive endeavor. The HSPH and the Department of Global Health and Population cannot and will not provide or guarantee a suitable position upon graduation. HSPH faculty and staff can be extremely helpful, as indicated above but their roles are limited. Successful students will take ownership for their job and internship searches and act upon the guidance provided.

Careers and Positions of Recent Graduates

Recent graduates have chosen a variety of career paths. Some students continue into a doctoral program at Harvard or elsewhere on completion of the master's degree; their eventual aim is usually to work as researchers in academic institutions. Others have begun careers with foundations (The Population Council, Catholic Relief Services, March of Dimes amongst others), whilst others have worked directly for international health and development agencies such as USAID, UN bodies including the World Bank, and companies and non-profit and non-governmental organizations in the US and worldwide such as JSI Inc., BRAC, and SEWA (India). Career advice and opportunities are offered in a number of ways through job postings, a School-wide annual career fair and networking through the faculty.

Here is a sample of positions taken by some of our recent graduates:

EMPLOYER	POSITION
Malaria Research Analyst	Clinton Health Access Initiative (CHAI), Uganda
University of California – San Diego	Study Coordinator/Nutritionist
Harvard University	Postdoctoral Research Fellow
Izumi Foundation	Program Director
Global Health Delivery Project, Brigham and Women's Hospital and Harvard University	Senior Analyst
John Snow, Inc.	Technical Advisor
The Perihelion Group	Owner
SUPPORT	Program Advisor, Asia Region
Newport Beach Clinical Research Associates, Inc.	Clinical Research Coordinator
The World Bank	Education Economist
Nouna Health Research Center, Burkina Faso Ministry of Health/University of Heidelberg	Health Systems Researcher/Project Supervisor
The Children's Nutrition Program of Haiti	Emergency Response Manager
National Institutes of Health, Department of Health and Human Services	International Public Health Analyst, Presidential Management Fellow
BasicNeeds	Transition Manager
State of Alaska, Division of Public Health	Research Analyst
Harvard School of Public Health	Consultant
National Institutes of Health	Research Associate
Academy for Educational Development	Senior Technical Officer
Johns Hopkins University	Research Assistant
World Vision	Program Management Officer
Boston Medical Center	Research Associate
University of California – San Francisco, Global Health Program	Program Analyst
Harvard University	Teaching Fellow/RA
Boston University Center for Global Health & Development	Program Manager
The World Bank	Impact Evaluation Specialist
Harvard School of Public Health	Research Assistant/Project Manager/Program Coordinator

Student Guidance

The department's Masters Committee holds regular meetings with 1st and 2nd year students aimed at clarifying requirements and at providing guidance in varied activities and program requirements. The meetings are often scheduled during lunch time, in order to avoid conflict with scheduled classes, and guarantee maximum attendance.

Topics discussed with 1st year students include:

- Summer internship – suggestions on how to search for opportunities (e.g., consultation of past summer internship reports, available through GHP’s Education Office), guidance on available funding, clarification on how to take advantage of the internship for thesis development, and discussion on human subjects (one meeting in the Fall, and one early Spring)
- Human subjects – depending on demand, a thorough discussion on human subjects with guidelines on how to secure ethical approval prior to embarking on a summer project
- Independent study - discussion of the various types of independent studies that may be useful for students to engage in during the fall semester of their second year to help them prepare for the thesis in the spring. These may include literature searches or, for those with a clearer idea of what they want to do, they may begin some of the writing; these meetings would be held during the spring semester

Topics discussed with 2nd year students include:

- Independent Study – students are again encouraged to consider an independent study during the fall to help prepare for their thesis work in the spring
- Summer internship – feedback on the work conducted during the summer and discuss the possibility of using this experience as a basis for their thesis; students are required to submit their summer internship reports to the department’s Education Office (one meeting early Fall)
- Thesis – discussion regarding the selection of topic, data, advisor, and second reader; advice on how to establish clear agreements with advisors regarding the frequency of meetings to discuss thesis progress; and advice on how to establish clear agreements with second reader on how much effort he/she is willing to invest in meetings and draft reviews (one meeting on the Fall, and one early Spring)

Regular email communications are regularly sent to both cohorts of students through the department’s Education Office. These include reminders of deadlines, internship and job opportunities, thesis award information and responses to any questions concerning procedures or process.

Departmental Master of Science Committee, 2013-14:

Chair: Peter Berman – pberman@hsph.harvard.edu

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Laura Vaughan, ljv743@mail.harvard.edu
Hui (Sophie) Wang, huw023@mail.harvard.edu
Gretchen Williams, gwilliam@hsph.harvard.edu

III. DOCTORAL PROGRAM

This section presents the Doctor of Science (SD) degree program in the Department of Global Health and Population of the Harvard School of Public Health. Procedures, deadlines, and test requirements for admission to this program, as well as information on financial assistance, are fully explained in the School Catalogue (Official Register of Harvard University). This information may be obtained from the *Admissions Office, Harvard School of Public Health, 677 Huntington Avenue, Boston, Massachusetts 02115 (Telephone 617-432-1031)* or by visiting the website at (<http://www.hsph.harvard.edu/admissions.html>)

The doctoral program is open to those with an outstanding academic record, usually in the Masters program or equivalent from another university or similar institution. The Doctor of Science degree is intended for persons holding a bachelor's or master's degree in physical, natural, or social sciences. After admission, both doctoral degrees in the Department have identical course, dissertation, and examination requirements.

Admission to the doctoral program in Global Health and Population is limited to outstanding applicants. Applicants should show they have the academic background required for the program, in particular evidence of the ability to master the quantitative material in the courses should be presented. Candidates should demonstrate a genuine interest in the field for which they are applying. Relevant research experience or experience of health and population issues in an international context, particularly in a developing country, is important. It is also useful for applicants to indicate how their proposed area of research fits with the expertise of the faculty in the department. In their statement, applicants should go into some detail on their research interests. Many applicants have already undertaken related research projects and a short summary of these, with methods and results may be included. In terms of planned research, a discussion of possible specific research questions is more helpful than a broad statement of a research area. Applicants may identify members of the department with whom they would be particularly interested in working.

A number of students from the two-year SM degree in Global Health and Population are usually admitted to the doctoral program each year. Courses taken in the two-year SM degree may count towards the requirements for the doctoral program and by taking appropriate courses students can substantially reduce the time required to complete the doctoral program once they enter. The doctoral committee looks with favor on SD applicants from the SM degree program. Students entering or undertaking the SM degree considering applying for the doctoral program in the future, should contact the chair of the doctoral committee early in their program to discuss appropriate course selection.

Doctoral students are encouraged to seek appropriate faculty guidance in participating in the various activities of the Department as part of their degree programs. The Departmental guidelines provide general recommendations. Specific requirements for each major are outlined in this document. Adaptations and alterations of Departmental requirements are not encouraged and are possible only with the written recommendation of the Academic Advisor in consultation with the head of the major, and the approval of the Chair of the Doctoral Committee, Professor Joshua Salomon

School-Wide Degree Requirements

To earn a doctoral degree, the student must demonstrate, through course work and examination, detailed knowledge and understanding of one major field within the Department and two minor fields, one of which may also be within the Department. A second minor field is required in a complementary disciplinary area either within the Department or in another department of the School or University. Some examples of the other minors include those offered by the Departments of Biostatistics, Epidemiology, Immunology and Infectious Disease, Nutrition, or Society, Human Development and Health. A major field consists of 20 or more credits and each minor field consists of at least 10 credits. Only letter grades of B- or better may be counted towards these credits. The student also must demonstrate general knowledge and understanding regarding the fields of population sciences and international health, with a particular focus on problems of developing countries. The student must also prepare and defend a doctoral dissertation representing original research.

Students entering the doctoral program from a HSPH Harvard masters program may receive credits for course work completed during the masters program.

Some students arrive with considerable research experience and may move rapidly to completion of the degree, while others must design, collect, analyze, and write-up entirely new dissertation work. The pace of progress depends largely on the student's individual plan, which is designed in collaboration with the Academic Advisor and dissertation committee, and follows the school's timetable.

Throughout the student's study program, the School-wide Committee on Admissions and Degrees (CAD) will monitor performance in course work and in meeting degree requirements for completion within a maximum period of five years. Upon request by the student, leave of absences during the program may be granted. Under such approved circumstances, the leave period would not be counted against the five-year time limit. In cases of unacceptable performance, the student may be required to withdraw. *Students may not request a leave of absence for the purpose of pursuing another degree.*

A most useful document for doctoral students is the Harvard School of Public Health Student Handbook available on-line at <http://www.hsph.harvard.edu/registrar/handbook/index.shtml>. This handbook outlines the various stages of the doctoral program, and provides detailed information on forms, committees and procedures for each stage of a student's doctoral studies. It should be consulted by both students and advisors on a regular basis.

**Please note that all forms requiring the Chairman's signature
should be submitted through the Education Office.**

Outlined below is the doctoral student timetable over the standard five-year period.

DATE:	PROGRESS DUE:
End of 2 nd Semester	Submission of Prospective Program Sit Paper One of the Departmental Written Qualifying Exam
End of 4 th Semester	Sit Paper Two of the Departmental Written Qualifying Exam
End of 5 th Semester	Submission of Final Program (includes nominations of faculty for Oral Qualifying Exam)
End of 5 th Semester	Submission of Oral Qualifying Examination Scheduling Form
End of 6 th Semester	Satisfactory completion of Oral Qualifying Examination Submission of Nominations for Research Committee (one month after successful completion of Oral Examination)
Dissertation Research	Progress Report - at least every six months until thesis is completed (target is a maximum of 2 years)
Thesis Submission to Outside Reader	Six weeks prior to intended date of defense
Degree Completion	Thesis presentation and public defense End of 5 th year for full-time students End of 7 th year for part-time students

Full details on the School's procedures for the constitution of the Oral Examination Committee and the Research Committee can be found in the 2013-14 HSPH student handbook.

Departmental Requirements

To provide more focus and depth in key areas of Global Health and Population, the Department has identified three areas from which students may form majors for doctoral training. All doctoral students must select from one of the three majors currently offered by the Department. These are:

- Population and Reproductive Health
- Health Systems
- Economics

Advanced competence in each field requires more than the minimum of 20 credits. Students should consult with their advisor about additional advanced courses in their field of study that are appropriate.

Selection of minor fields are decided in consultation with the Academic Advisor or, in the case of the Health Systems major, the two minors are required. Courses taken in prior graduate programs

may be accorded credit equivalency on the Prospective/Final program as recommended by the Academic Advisor and approved by the Department and CAD.

In addition to its core course, the Department runs a weekly *Doctoral Research Seminar*, the goals of which are: (1) to help students meet important milestones for advancing their dissertation research; (2) to give students an opportunity to gain practical experience in presenting their research, and to receive constructive feedback on works in progress; (3) to encourage interactions between students and faculty in different tracks and cross-fertilization of ideas, concepts and methods; (4) to provide a forum for students to learn more about the work of their peers; and (5) to contribute to the community of scholarship in the Department by promoting lively discussions among students and faculty around a broad range of topics in global health in population.

Beginning this academic year, 2013/2014, the GHP Doctoral Research Seminar is now a requirement, and must be taken for credit, for all GHP doctoral students who have completed both Paper I and II of the Written Qualifying Exam (WQE). In most cases, this applies to students in the 3rd year and beyond. Exceptions to this may be those coming into the doctoral program from the SM2 program. Those required to take the seminar for credit must register for two separate independent studies, one in the Fall and one in the Spring. Each independent study is for 1.25 credits and the grading is P/F only. Both of these independent studies are under Prof. Joshua Salomon.

In addition to the school requirements, and the Department's core requirement, a separate set of specific course requirements for each major has been developed and is listed in the corresponding section. These requirements may involve courses offered through other Departments and through other Harvard Schools. They are designed to prepare candidates with doctoral level knowledge in theory, analysis and research methods in a particular area as well as providing candidates with a broad-based education in global health.

Since the doctoral program requires first-year courses that have a strong math component, previous cohorts of students have found it helpful to have a short math refresher before the beginning of the semester to help ease the transition to these classes. For these reasons, students without a strong mathematical background are encouraged to enroll in Part I of a Math Camp offered through the Harvard Kennedy School of Government and the Faculty of Arts and Sciences. The math review is designed to help strengthen a student's math skills and is completely optional. The course is roughly divided in two parts. The first part of the course provides a refresher on calculus, basic probability, and linear algebra. The second part of the refresher covers more advanced topics in constrained optimization and statistics. Information on dates and costs are provided to individuals upon receiving confirmation of their plans to matriculate.

WinterSession

The Department strongly encourages all full-time students to participate in WinterSession activities, whether for-credit or non-credit, on-site or off-site, in accordance with their individual needs and interests. Every student must submit a completed and signed WinterSession Form to the Education Office.

Course Waivers

Students seeking to waive a school-wide core course should follow the procedure as outlined in the HSPH Student Handbook. For Departmental and major specific requirements, waivers will be considered only if a student can demonstrate that the subject matter has been covered to a similar level in a previous course. All Department waivers must be accompanied by a letter of support signed by both the course instructor and the student's advisor and will be reviewed by the Chair of the Doctoral Committee. No course substitutions are allowed.

Written Qualifying Exam, Oral Exam, and Research Committee

Written Qualifying Examination for Doctoral Students

Upon completion of the requisite course work, the Department requires that all doctoral students sit a Written Qualifying Examination (WQE) consisting of two papers before advancing to the Oral Qualifying Examination. The first paper consists of a written examination while the second involves the submission of a research paper. The intention is that students complete both parts of the Written Qualifying Examination by their fourth semester of study. Students will normally take the first paper at the end of two semesters of study and submit the second paper at the end of four semesters of study. Students with a Master of Science degree from the Department may take both parts of the examination by their second semester of study for the doctoral degree. Paper I of the Written Qualifying Examination will ordinarily be offered **once** per year in May. Any re-sits for Paper I will be taken the following May. Paper II will have a deadline in June with a deadline of resubmission in the case of failure of November 1st of the same year.

Aims of Written Qualifying Examination

The principal aim of the Written Qualifying Examination is to ensure that the student is adequately prepared for a period of independent research. The examination is intended to test the candidate's general knowledge in Global Health and Population and the capacity to deal with the kinds of questions that are likely to occur in the course of writing the doctoral dissertation. Passing the examination indicates that the Department judges that the student is ready to embark on a course of independent research culminating in the submission of a doctoral thesis. Introduction of the Written Qualifying Examination should allow the Oral Examination Committee to focus more sharply on the student's research program. The WQE seeks to:

- a. test a student's overall capacity to put together separate things learned in the core course;
- b. provide questions designed to solicit responses requiring the combination of different bodies of knowledge;
- c. design questions that are of the type one is faced with when they begin research (larger questions);
- d. to solicit answers to these questions that indicate that the student is at a level of comprehension where they are ready to both manage independent research and demonstrate training and mind-set of independence;
- e. provides the student with the opportunity to show ability to process information rather than simply repeating what was learned in a particular lecture and apply it to a larger question in which they may articulate their opinion or view.
- f. give the student the opportunity to show they are capable of carrying out a piece of independent research.

Structure of the Examination

The examination consists of two papers. Each is described below. The Written Qualifying Examination is **pass-fail only**. If the student fails a paper there will be an opportunity for a re-sit but each paper can be attempted at most twice.

Paper I shall be a 4-hour closed book examination to be taken in the Department and shall consist of two sections. **Section A** shall consist of 2 compulsory questions which will be general in nature, both of which the student **must** answer. **Section B** shall consist of 4 questions from which the **student must select 2**. All of the questions on Paper I shall reflect general knowledge acquired through the departmental core doctoral course required of *all* GHP doctoral students regardless of their departmental major.

Organization and Grading of Paper I

The subject matter in Paper I will reflect the syllabus and extended reading list of the department's core doctoral course required for all GHP doctoral students. The course instructors shall write the questions in consultation with the Doctoral Committee.

Each student will be issued an anonymous code. Each exam script will bear this anonymous code. The code key will be kept solely in the Education Office.

Each question in the examination will be graded by two Faculty. For Paper I, the doctoral committee will identify graders and at least one of the graders must be a member of the doctoral committee. The Education Office will be responsible for sending a series of reminders to the graders prior to the date of the examination. One of the two Faculty graders may be a member of another department.

Once the examination has been taken, answers will be circulated to all the graders through the Education Office. Graders will have **one month** from the day of the examination to grade the exam and return the students' answers, grade sheets, and comments to the Education Office. The Education Office will record the grades.

When a grade difference of three grades or more exists on a question between two graders, e.g. A- to B-, the graders will be asked to consult with each other and reconsider their marks and comments. Each grader may revise their grade in the light of this consultation or keep it as is.

Examination answers, grades and comments are then considered by the doctoral committee. No conflict of interest will arise from normal academic links between committee members and the students under consideration (e.g. advising and instructing). The committee reviews the overall standard of the answers to all the questions and the marks and comments given by examiner. The committee ensures that graders comments are sufficiently detailed to provide assistance to students. The committee computes an agreed mark for each question by averaging the graders' marks.

The agreed marks for each question are averaged for each paper. The pass mark for the examination is B+ (3.3). Average marks of 3.25 and above are rounded up to 3.3 (B+). The committee confirms the pass or fail of each of the two papers of the WQE separately by a vote of a

majority of the committee. The students receive only the pass or fail decision, and not the actual average grade.

If any pass or fail is not confirmed by the doctoral committee, the committee may either:

a) Return the examination to the graders for reconsideration. Revised grades and comments are then considered again by the doctoral committee.

b) Appoint one or more additional graders for each question. These graders will mark the questions and provide comments independently of the original graders. The doctoral committee will then reconsider all of the grades and comments, weighting them equally to recalculate agreed marks for each question.

After the result has been confirmed by the doctoral committee, the anonymous code will be unblinded. Students will be informed by the doctoral committee of the result of the examination. Students and their advisors will also be given the written comments on each question, but not the grade.

The Advisor will then meet with the student to discuss the results of the examination. At this point, if a student has failed either or both papers of the examination, the Advisor and the student must outline a plan through tutorials and any additional course work to prepare the student to re-sit the Paper failed. This plan must be in writing and a copy provided to both the Doctoral Committee and the Education Office for the student's file. **All re-sits are taken in May of the following year.**

Paper II is a research paper. It is intended to help students better prepare for the development of their orals proposal and may, in some instances, be further developed as part of their actual proposal.

Paper II Deadlines

Doctoral students are required to submit a research paper by the end of the second year (4th semester) as Paper II of the WQE. For those students starting the program in Fall 2013, the submission deadline for paper II is June 12, 2015. Students who have previously completed the SM2 program in GHP may submit their research paper at the end of their first year. In this case the submission deadline is June 13, 2014.

Submission

- Submission of title and collaborating faculty to the Doctoral Committee.

The proposed title and the list of collaborating faculty should be agreed upon with the student's advisor and then submitted electronically to Barbara Heil for review and approval by the department doctoral committee. Collaborators must be faculty members within Harvard University. For students taking Paper II of the exam in 2012/2013, the deadline for submitting the title for approval is **Friday, November 1, 2013**. A revised title may be submitted by **Wednesday, February 5, 2014**. Any faculty who will be directly advising the student on the paper should be named along with the proposed title.

- Submission of paper. The paper should be submitted electronically to Barbara Heil by 5:00 PM (Boston time) on June 13th.

- Penalty for late submission. Papers submitted up to 48 hours late will be accepted but with a grading penalty. There will be a loss of one grade for each day it is late.
 1. The clock starts for day one at 5:01 PM on June 13th with the highest grade possible being A-.
 2. The clock starts for day two at 5:01 PM on June 14th with the highest grade possible being B+.
 3. Effective 5:01 PM on June 15th the paper will not be accepted and the student will be deemed to have failed the examination.

Work on paper II

It may be that work on the paper takes place as part of a larger project involving other people. In this case the student should attach an explanation of authorship making clear their contribution to the work. The contribution of the student in this case should be consistent with being the first author. The student should write the first draft of the paper. A detailed timeline, including conduct of research information and deadlines, as well as 2 mini presentation dates will be distributed separately.

Content of paper II

The paper should be in a format that makes it ready for submission for a journal. The paper is limited to a maximum of 6000 words. Papers may be shorter if a journal with a more strict word limit is being targeted. An appendix (no word limit) may be attached setting out details not included in the actual paper.

There are no rules on the structure of the paper but most will have the following sections

- Introduction: Pose an interesting question
- Literature Review: Survey the literature on your topic and describe how your research adds to it
- Methods/Data: Formulate your hypothesis and describe your data
- Results: Present your results with the help of tables and graphs
- Discussion: Critique your method and discuss policy implications
- Conclusion: Summarize what you have done and pose questions for further research

NOTE: *With papers that involve statistical analysis, the student must submit electronically a file containing the computer code that was used to perform the analysis.*

Grading

Based on the proposed title the doctoral committee will assign two graders neither of whom will have been involved in advising the student on the paper. The graders will independently grade the paper. Graders will have until Friday, August 1st, 2014 to grade the exams. An average mark of B+ is required to pass. A passing grade will indicate that in the opinion of the examiners the papers shows that the student has acquired the skills necessary to successfully undertake research in the field. When a grade difference of three grades or more exists on a question between two graders, the graders will be asked to consult with each other and reconsider their marks and comments. Each grader may revise their grade in the light of this consultation or keep it as is.

The doctoral committee confirms the pass or fail of Paper II. If any pass or fail is not confirmed by the doctoral committee, the committee may either:

- a) Return the paper to the graders for reconsideration. Revised grades and comments are then considered again by the doctoral committee.
- b) Appoint one or more additional graders to review the paper. These graders will mark the paper independently of the original graders. The doctoral committee will then consider all of the grades and comments, weighting them equally to recalculate the marks for each question.

After the results have been confirmed by the doctoral committee, students and their advisors will be informed. The graders' comments will be provided to both the student and their advisor. They will schedule a meeting to discuss these.

Resubmission of Paper II

Students who have deemed to fail Paper II of the WQE may resubmit. The resubmission date is November 1st for each year. The resubmission should be submitted electronically to Barbara Heil by 5:00 PM (Boston time) on November 1st. No paper will be submitted after that time and the student will be deemed to have failed the examination for a second and final time.

Distinction

The committee will vote on whether a student should be awarded a distinction for overall performance on the WQE. A distinction normally requires an average mark in excess of 3.85 on both papers.

Outcome

A maximum of two attempts are allowed for each part of the examination. After failing either part of the exam twice, the Advisor and the Department Doctoral Committee may recommend that the student petition for a change in degree status to a Master of Science degree, if appropriate, otherwise the student must withdraw from the doctoral program.

Upon successfully passing the Written Qualifying Exam, the student should immediately meet with their academic advisor to establish their final program, nominate their orals committee and begin preparing their orals proposal in anticipation of the Oral Qualifying Exam.

No student may have non-resident status to begin thesis research until they have passed BOTH the WRITTEN QUALIFYING EXAM and the ORAL QUALIFYING EXAM, have an approved research committee in place, have a meeting with their research committee and submit a signed progress report to the Registrar's Office.

Approval of Orals and Research Committees

The signature of the Department Chair is required for both the Oral Examining Committee and the Research Committee forms. The Department Chair will sign such forms only upon the recommendation of the Department's Doctoral Committee. This procedure has been established as a safeguard to ensure that the proposed committee membership will satisfactorily support the research planned by the student.

Along with the forms, students should submit a 2-3 page proposal/abstract of their planned work, a bibliography, and briefly indicate how the expertise of the individuals nominated for membership will contribute and support the proposed research. These materials should be e-mailed to Barbara Heil in the Education Office for circulation to the Doctoral Committee. Any changes in membership to these committees should follow the same process. See sample proposal in **Appendix 3**.

Oral Qualifying Exam:

The Oral Examination should be taken NO LATER THAN the end of the 6th semester. Upon successful completion of the WQE, a student should submit their final program, which includes the nomination of their Oral Qualifying Examination Committee. The student should immediately begin writing an orals proposal which should continually be reviewed and revised in consultation with the Orals Committee members. The final proposal is then given to the Orals Committee prior to scheduling the exam. Please consult the *HSPH Student Handbook* for the specific steps and forms required.

The orals proposal is basically a work plan, or calendar of activities for the next two year period. In this proposal, a student should:

- a. present a question
- b. defend why this question is worthy of scholarly research and of public health relevance
- c. demonstrate an understanding of existing related research
- d. establish that the proposed research is methodologically sound and explain the methods and data you will be using (survey, secondary data, etc.)
- e. present some preliminary analysis to demonstrate these methods

The above points are presented in a proposal to the Orals Committee.

The Committee's role in the oral examination is to basically give their approval for a two-year program of independent research and writing. Their responsibility is to check the feasibility of the proposal by asking the following questions:

- a) is it the right question – is this something worth looking into;
- b) is there a clear and feasible plan of activities that will answer this question;
- c) is the proposal route correct and appropriate;
- d) as a whole, is the work plan manageable in terms of time, money and other resources.

Finally, this exam demonstrates the capacity to produce something. Specifically, it seeks to answer the question, will this plan produce a thesis. ***Within one month of successfully passing the Oral Qualifying Exam, the student must nominate and confirm a Research Committee.*** Rules governing this process may be found in the HSPH Student Handbook

Research Committee:

Within one month after the successful completion of the Oral Qualifying Examination, a student must submit the nominations for membership of their Research Committee. Students should first obtain departmental approval of the Research Committee following the same process as outlined in **Appendix 3**. If there are no changes in membership from the Orals Committee to the Research Committee, simply email this information to Barbara Heil in the Education Office. While the Research Advisor must be a member of GHP, the others may be from other departments and/or outside of HSPH (see student handbook for the rules governing committee selection). The role of the Research Committee is to oversee the student's progress towards completion of their thesis. Students are required to meet with their committee every six months and then submit a progress report. Nominations for the Research Committee must be submitted and approved by CAD and the student must convene a meeting with the committee before they may begin any overseas research on a non-residency status.

Outside Readers

Beginning in September 1997, the Department implemented a system of Outside Readers for all doctoral theses in the Department. The principal reasons for this decision were to improve the quality of our doctoral dissertations and to ensure that our theses were on a par with theses presented in other major universities.

All students in the doctoral program are ***required*** to have an Outside Reader for their thesis. **Appendix 4** outlines the necessary steps to be followed when a doctoral student is nearing their thesis defense and is ready to identify an Outside Reader. The Department agreed that the Outside Reader would not be an external *examiner* able to referee the thesis as in some universities but an external *advisor* to the Research Committee and the student.

Non-Resident Status

A minimum of two years full-time residency is required for the degree. Residence accumulated in a related master degree program at the School may be used toward satisfying this requirement.

When dissertation research is to be performed away from the Boston area, students must apply for non-resident status. Before the Committee on Admissions and Degrees (CAD) grants non-resident doctoral status, students must first pass both the Departmental Written Qualifying Exam and the Oral Qualifying Examination. They must also establish their Research Committee, and this Committee must meet with the student to appraise the dissertation plan. Agreement must be reached, and the CAD must approve a written petition ***before the departure of the student.*** No student may be Non-resident until all these conditions have been met.

After the completion of the above steps, the Research Committee will use the following criteria for approving non-resident status:

- (1) acceptability and feasibility of the proposed research plan;
- (2) timing and scope of the periodic written reports required (including at least one Progress Report every six months);
- (3) adequate arrangements for direct supervision of the student; and
- (4) the minimum time the student will spend back at the School prior to the thesis defense.

Non-resident status is customarily granted one year at a time. Extensions beyond one year require the submission of acceptable and timely Progress Reports.

Joint Degrees

Students may obtain a joint SD in Global Health and Population and in another HSPH department by satisfying the requirements of both departments. In such cases, the student elects two Major fields (one in each Department) and one Minor field. The Oral Qualifying Examination is taken after all requirements (including the WQE) in both departments have been satisfied. Students interested in such a program should consult with the Chairs of the Departmental Doctoral Committees in both departments.

The Department *expects* candidates to be in residence during the semester preceding their defense; many Advisors and Research Committees will insist on their presence during the semester before submission.

Departmental Doctoral Committee, 2013-14:

Joshua Salomon, (Committee Chair and Joint Head of Reproductive Health Major) – jsalomon@hsph.harvard.edu

Till Bärnighausen, Joint Head (Population and Reproductive Health Major) – tbaernig@hsph.harvard.edu

David Canning, (Head of Economics Major) – dcanning@hsph.harvard.edu

Günther Fink, (Economics Major) – gfink@hsph.harvard.edu

Michael Reich (Head of Health Systems Major) – reich@hsph.harvard.edu

Wafaie Fawzi (Department Chair) – mina@hsph.harvard.edu

IV. DOCTORAL MAJORS

Doctoral Major in Population and Reproductive Health
Joint Head, Prof. Joshua Salomon, jsalomon@hsph.harvard.edu
Joint Head, Prof. Till Bärnighausen, tbaernig@hsph.harvard.edu

Assessments of levels, patterns and trends in population health are essential for identifying priorities, monitoring progress, and establishing and evaluating effective health policies. One key component in these assessments is an understanding of the growth, structure and change of human populations (demography), including measurement of mortality and causes of death, along with broader assessments of health and functioning, informed by analyses rooted in the disciplines of epidemiology and biostatistics. Global, regional, national and subnational analyses, attempting to partition the factors determining population health, require competence in several cognate areas including the capacity to translate census, survey and routine health statistics into summary assessments for both priority-setting and action. Another key component of the major is the use of population-based demographic and health data to investigate the causal impacts on population health and demographic composition of health interventions, such as interventions to fight HIV, tuberculosis, or malaria, or primary healthcare and universal coverage reforms. Such analyses require skills in the use of individual-, household-, and community-level data and an understanding of causal inference and evaluation methods. For women and health, an important part of the analyses is to measure the contribution of sex and reproduction to the burden of disease in those of reproductive age and beyond.

The major in Population and Reproductive Health is designed to provide the foundation for work on population health around the world. This concentration shows how demographic analysis is an essential tool for the measurement of mortality and fertility. The required coursework illustrates the way in which models and well-established demographic estimation techniques can be applied to new challenges in burden of disease assessments. Since much of the work requires analysis of large-scale survey, surveillance systems, census and routinely collected health data, some recommended courses explain the major methods in data collection and analysis, especially in Africa. Examination of the causes of death and morbidity are based on combinations of demographic and epidemiological principles. Although the training is primarily quantitative, an understanding of the value of qualitative and ethnographic approaches is encouraged. These methods are valuable in understanding culturally specific valuations of ill health and the interpretation of local variations in health-related behavior including those related to sex and reproduction.

On completion of this major, students are expected to have the skills and conceptual understanding to develop their own research plans in a number of areas, mainly focusing on population and reproductive health issues in low income countries. Doctoral students with this major have recently written dissertations on HIV/AIDS and infertility in Tanzania; religion and its role in determining the sexual behavior of Ghanaian adolescents, infertility in China and Chad, male and female fertility in The Gambia; longitudinal studies of child growth and development in rural Africa; the causes and consequences of induced abortion in Mexico and Ghana; family planning promotion and its effect on rural fertility in The Gambia; domestic violence as a public health issue in Jordan; abortion in Accra, Ghana; and the contribution of primary health care to child survival in Africa.

Test Scores:

All applicants are required to submit official GRE scores. The median scores of our admitted students are:

GRE Test	Current Score	Scores Prior to August 2011
Quantitative Reasoning	156	740
Verbal Reasoning	160	600
Analytical Writing	4.5	

Applicants whose native language is not English are required to take the Test of English as a Foreign Language (TOEFL). Most admitted students score a minimum score as noted below.

TOEFL	Paper-Based	Computer-Based	Internet-Based
	620	260	105

The Admissions Committee values competitive test scores but also recognizes that this is only one indication of a candidate's abilities. Some applicants with lower test scores may be admitted on other outstanding qualifications.

Participating Faculty in the Population and Reproductive Health Major

Joshua Salomon (Joint Head of Concentration), jsalomon@hsph.harvard.edu
Till Bärnighausen (Joint Head of Concentration), tbaernig@hsph.harvard.edu
Theresa Betancourt, tstichic@hsph.harvard.edu
David Bloom, dbloom@hsph.harvard.edu
Marcia Castro, mcastro@hsph.harvard.edu
Goodarz Danaei, gdanaei@hsph.harvard.edu
Majid Ezzati (Adjunct), majid.ezzati@imperial.ac.uk
Wafaie Fawzi, mina@hsph.harvard.edu
Ana Langer, alanger@hsph.harvard.edu

Current Student Contacts:

Ryan McBain, rmcbain@hsph.harvard.edu
Mathieu Maheu-Giroux, mmaheugi@hsph.harvard.edu

Alumni Contacts:

Livia Montana, livia_montana@unc.edu
Kathie Dionisio, kathie.dionisio@gmail.com
Jihong Liu, jliu@gwm.sc.edu
Elizabeth Oliveras, elovieras@fhi360.org

Past Theses Titles:

- Leena Merdad, "Investigating New Methods for Estimating Maternal and Child Mortality in the Developing World"

- Carmel Salhi, “Mental Health and Family Context of Arab Youth Affected by Political Conflict”
- Pamela Scorza, “Measurement Non-variance in Cross-Country Depression Estimates in the World Mental Health Surveys”
- Kathie Dionisio, “Biomass Fuels and Air pollution in sub-Saharan Africa: Measurement Studies in Rural and Urban Populations”
- Rifat Hasan, “Determinants of Reproductive Health Behaviors: Evidence on Fertility, Family Planning and Maternal Health”
- Livia Montana, “Estimating Child Mortality in Resource Poor Settings with Insufficient Data”
- Trong Thanh-Hoan (Tony) Ao, “The Biological, Behavioral and Economic Dimensions of Female Bar/Hotel Workers in Northern Tanzania: Implications for HIV and STI Prevention for an At-Risk Population
- Anne Mackay Austin, Maternal and Child Nutrition Trends in Egypt 1995-2005”
- Gaston Sorgho, Social Capital and Health in Nouna District, Burkina Faso
- Goodarz Danaei Population and Individual Level Analysis of Cardiovascular Disease Risk Factors: Total Effects Contribution to Disparities and Intervention Analysis
- Mary Bachman, “Early Child Health and Subsequent Morbidity and Mortality in The Gambia”
- Katherine Beal, "Religiosity and HIV Risk Among Adolescents in Ghana”
- Cari Jo Clark, "Domestic Violence in Jordan: Definition, Prevalence, Reproductive Health Correlates, and Sources of Assistance for Victims"
- Becca Feldman, “Conditional Cash Transfers and Reproductive Behaviors: Evidence from the Oportunidades Program in Rural Mexico”
- Jihong Liu, “Childlessness, Adoption and Children’s Well-Being in China, 1950-1992”
- Elizabeth Oliveras, "Abortion in the Fertility Transition in Accra, Ghana”
- Allison Smith Estelle, “Sexually Transmitted Infections among Rural Women in Nepal: Using Epidemiology and Human Rights to Address an Emerging Epidemic”

Positions of Recent Graduates:

Assistant Professor, Harvard School of Public Health

Senior Technical Officer, Measurement, Learning and Evaluation, Urban Reproductive Health Initiative, Carolina Population Center, UNC-CH

Research Scientist, Environmental Protection Agency

Assistant Professor, Boston University, Department of International Health

Associate Professor, Johns Hopkins University School of Public Health

Senior Monitoring and Evaluation Advisor, Pathfinder International

Assistant Professor, Department of Epidemiology and Biostatistics, Arnold School of Public Health, University of South Carolina

The following courses are required for doctoral students selecting Population and Reproductive Health as their major:

**Course Requirements for a Population and Reproductive Health Major in Global Health
(Total 42.5 credits, including HSPH and GHP Core Requirements)**

HSPH REQUIREMENTS	Credits (17.5)	Year when course should be taken
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EPI 201. Epidemiologic methods	2.5	1
BIO 200. Principles of biostatistics	5.0	1
[If BIO 200 is waived, students <i>must substitute an additional 5.0 credit course</i> from the list below for a total of 15.0 required credits in biostats.]		

Select 10 or 15 credits in intermediate biostatistics, chosen from following:

BIO 210. Analysis of rates and proportions	5.0	1 or 2
BIO 211. Regression and Analysis Variance	5.0	1 or 2
BIO 222. Basics of statistical inference	5.0	1 or 2
BIO 223. Applied survival analysis	5.0	1 or 2
BIO 226. Applied longitudinal analysis	5.0	1 or 2
GHP 525. Econometrics for health policy	5.0	1 or 2

DEPARTMENTAL REQUIREMENT	Credits (5.0)	Year when course should be taken
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GHP 210. Concepts and methods in global health and population	5.0	1
Doctoral Research Seminar – Independent Study (Fall)	1.25	Post WQE
Doctoral Research Seminar – Independent Study (Spring)	1.25	Post WQE

POPULATION AND REPRODUCTIVE HEALTH MAJOR REQUIREMENTS	Credits (20.0)	Year when course should be taken
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GHP 220. Introduction to demographic methods	2.5	<i>Not offered 2013/14</i>
GHP 506. Measuring population health	2.5	1
EPI 202. Elements in epidemiological research	2.5	1

Select 12.5 credits, chosen from the following options:

GHP 231. Sexual and reproductive health	2.5	1 or 2
GHP 255 HIV Interventions: Rationale, Design, and Evaluation	2.5	1 or 2
GHP 534. Introduction to spatial methods	2.5	1 or 2
GHP 504. Applied qualitative methods for global health research	2.5	<i>Not offered 2013/14</i>
GHP 507 Population Health Risk Factors	2.5	1 or 2
GHP 509 Advanced Seminar on Population Health Risk Factors	2.5	1 or 2
GHP 269. Applied politics and economics	2.5	1 or 2
ID 217 Nutrition and Global Health	2.5	1 or 2
BIO 212. Survey research methods in community health	2.5	1 or 2
GHP 228. Quantitative methods in impact evaluation	5.0	1 or 2

Doctoral Major in Health Systems
Head, Prof. Michael Reich, reich@hsph.harvard.edu

Background

Well-designed and properly structured health systems are central to the basic goal of health policy: improving population health equitably and fairly. At the same time, health systems must reduce medical impoverishment and gain patient and citizen satisfaction. Now more than ever, policymakers want to know how to reform health systems to achieve these goals. Many international organizations (including the World Health Organization, World Bank, and the Global Fund to Fight AIDS, TB, and Malaria) have identified health systems strengthening as a key priority in their strategies to improve population health. The Health Systems doctoral program at the Harvard School of Public Health aims to train future leaders in health ministries, academic institutions, international organizations and civil society organizations for the tasks required to understand and strengthen health systems.

The study of health systems begins with an analytical framework. A health system is a means to a set of ends represented by ultimate performance outcomes. The results involve trade-offs between equity and efficiency which are shaped by a society's ethical values and by political processes and actors. The Health Systems program aims to train scholars who can answer questions raised by top policymakers such as how to address equity considerations in health care, how policy components influence performance outcomes, and how political strategies can be designed to improve the political feasibility of policy reforms. This requires a clear understanding of what constitutes a health system, how political economy influences health systems reforms, and how the complex interactions of different components—namely financing, payments, organizational structures and processes, regulations, and persuasion to change behavior—determine system performance and outcomes.

Description

The Health Systems doctoral major provides a comprehensive understanding of the approaches and methods of political economy appropriate for health systems research in the international environment. The major recognizes that professionals in health systems must be capable of doing advanced research and evaluating the quality and approach of research performed by others. To achieve this, students learn the frontier of knowledge about health systems, potential areas of new research, and methods appropriate for advancing knowledge and conducting significant research.

Students are trained to apply knowledge that addresses major health system questions such as:

- What kinds of financing are appropriate for different ethical values and under different economic and social conditions?
- Which payment mechanisms are effective in controlling costs and encouraging provision of services needed for different disease burdens?
- Should countries decentralize or privatize their public health services?
- How can regulation make the private sector more responsive to public needs?

- How do political structures and processes affect opportunities for adoption and implementation of health reforms?

A multidisciplinary approach is used to approach such questions, and is the foundation of the Health Systems major. While economics can provide insights into financing and payment issues, political science can help explain policy choices and consequences as well as assess the feasibility of proposed reforms. In organizational design, political science and economics interact to understand how institutions can be organized and how such organizations respond to incentives. Ethical choices are embedded in all these choices and shape what is appropriate for different settings. To become experts in evidence-based policymaking, Health Systems doctoral students learn an advanced level of quantitative skills and methods in evaluation science, epidemiology and biostatistics, and their application to real-world health system problems.

Building knowledge about interdisciplinary approaches to health systems research is a demanding pursuit, requiring both a deep understanding of disciplinary expertise as well as contextual knowledge of health systems in different national settings. The Health Systems major provides a solid disciplinary base for students, while developing skills in crossing disciplinary boundaries in order to analyze health system problems. The major offers an advanced level of interdisciplinary training in political economy, economics and finance, political science, ethics, and evaluative science, along with a strong foundation of public health skills. Through coursework and applied research, students learn to integrate theories and methods from various disciplines and apply them to analyze critical health system issues.

The Health Systems major is based in the Department of Global Health and Population, and draws on faculty and courses throughout Harvard University. Program faculty are recognized leaders in the field of health systems analysis. Past collaborative work culminated in the book *Getting Health Reform Right* (Roberts et al., Oxford, 2004), which is used for teaching at HSPH as well as at a joint World Bank course entitled the “Flagship Course on Health Sector Reform and Sustainable Financing.” Faculty members have contributed to major research projects evaluating health systems, including financing and payment systems, burden of disease and cost benefit analysis, National Health Accounts, decentralization of health systems, human resources, benchmarks of fairness for health system reform, and political analysis. Faculty members are involved in many international projects supporting health system reform in low- and middle-income countries.

Opportunities for doctoral research include topics such as: how changes in health systems influence national health spending, the impact of decentralization on health care services delivery, the organization and management of human resources, the design and performance of public health institutions, regulation of health care and pharmaceutical products, equity determinants in health and in health systems, the political economy of health reforms, innovative financing methods to improve equity and efficiency of the health system, and consumer responses to characteristics of public and private health care providers.

Admission Requirements

The Admissions Committee considers a number of factors in reviewing each Health Systems doctoral application. Criteria include but are not restricted to: strong academic performance and test scores, international field work and professional experience in health systems, and oral communication and interpersonal skills as documented in letters of support. Admitted students should also demonstrate inquisitiveness, creativity, independent reasoning, motivation and preparedness for a doctoral program. Admission is contingent on exemplary performance and the competition within the applicant pool.

Pre-requisite courses:

Five courses are required prior to admission into the program. They are:

1. Linear Algebra
2. Multivariable Calculus
3. Introduction to Statistics, and
4. Select two of the following areas: *Ethics, Microeconomics, and Political Science*. Take one course in each of the two selected areas.

These completed courses qualify admitted students for the program's advanced academic work.

Test Scores:

All applicants are required to submit official GRE scores. The median scores of our admitted students are:

GRE Test	Current Score	Scores Prior to August 2011
Quantitative Reasoning	158	740
Verbal Reasoning	162	640
Analytical Writing	5.5	

Applicants whose native language is not English are required to take the Test of English as a Foreign Language (TOEFL). Most admitted students score a minimum score as noted below.

TOEFL	Paper-Based	Computer-Based	Internet-Based
	620	260	105

The Admissions Committee values competitive test scores but also recognizes that this is only one indication of a candidate's abilities. Some applicants with lower test scores may be admitted on other outstanding qualifications.

How to apply:

The application for admission into the Health Systems doctoral major is available through the Schools of Public Health Application Service (SOPHAS), www.sophas.org. Prospective students should visit the HSPH admissions website, <http://www.hsph.harvard.edu/administrative-offices/admissions/index.html>, for more information and instructions on the application process.

Prospective students should meet with a Health Systems core faculty member either in person or by phone. Faculty members travel to many countries throughout the year and can meet with promising candidates.

Doctoral Requirements

The study of health systems includes theories and methods from economics, political science and ethics to understand and investigate systemic issues. Moreover, it is grounded in evidence that requires mastery of quantitative and qualitative evaluation methods. Therefore, in addition to HSPH’s required courses in Epidemiology and Biostatistics, the interdisciplinary nature of health systems studies has a series of required courses for doctoral students. They are:

Political Science	GHP 269, Political Economy (Reich)
Economics	Econ 1010a Fall: Microeconomic Theory (FAS) <i>or</i> API 102 D Spring: Economic Analysis of Public Policy (HKS) <i>[Course on Economics of Health Systems: TBD]</i>
Ethics	ID 292, Justice and Resource Allocation (Daniels)
Introduction to Health Systems	GHP 244, Health Reform (Bossert)
Evaluation Science	GHP 525, Econometrics for Health Policy (Fink) GHP 228, Quantitative Methods for Impact Evaluation (Cohen)
Political Economy	GHP 229, Theories and Methods of Health Politics (Reich) GHP 527, Political Economy & Ethics of Health Reform (Bossert)

At the end of this section are the course requirements for a Health Systems major, with a suggested sequence of the required courses for the school (HSPH), department (GHP) and major (HS). The first year courses cover several disciplines and prepare students for advanced doctoral level courses in the second year including the Doctoral Core Seminar (GHP 527). Students choose two minors from the following three disciplinary fields: economics, political science, or evaluation sciences.

Required courses that are not offered by GHP may be modified yearly by the Health Systems Core Faculty depending on changes in offerings by other schools and departments. Students with prior courses that cover topics in required courses may petition for a waiver with the approval of the faculty offering the required course and the student’s advisor. Students are expected to waive out of BIO 200, Principles of Biostatistics, and HPM 206, Economic Analysis.

Students in GHP are required to take a two part Written Qualifying Examination at the end of their first and second years. They must pass both parts independently to proceed in the doctoral program. After passing the Written Qualifying Exam, students will be expected to prepare a dissertation proposal and defend the proposal in an Oral Exam.

Principal Faculty Members in the Doctoral Program in Health Systems:

Rifat Atun (from Dec. 2013), ratun@hsph.harvard.edu
Till Bärnighausen, tbaernig@hsph.harvard.edu
Peter Berman, pberman@hsph.harvard.edu
Thomas Bossert, tbossert@hsph.harvard.edu
Jessica Cohen, cohenj@hsph.harvard.edu
Norman Daniels, ndaniels@hsph.harvard.edu
William Hsiao (On Sabbatical 2013-14), hsiao@hsph.harvard.edu
Michael Reich, reich@hsph.harvard.edu
Winnie Yip (Adjunct), wyip@hsph.harvard.edu

Current Student Contacts:

Kristy Lin, hlin@hsph.harvard.edu
Corrina Moucheraud, cmoucher@hsph.harvard.edu

Alumni Contacts:

Nathan Blanchet, nblanchet@resultsfordevelopment.org
Ramesh Govindaraj, rgovindaraj@worldbank.org
Gayle Martin, gmartin@worldbank.org
Joseph Naimoli, jnaimoli@usaid.gov
Amy Nunn, amy_nunn@brown.edu
Ravindra P. Rannan-Eliya, ravi@hpra.lk
David Washburn, david.washburn@va.gov

Past Doctoral Theses:

- Joseph Naimoli, “Theoretical and Empirical Advances in Research on the Implementation of an Integrated Approach to Managing Childhood Illness in Outpatient Facilities in Developing Countries” (2001)
- Gayle Hildegard Martin, “Targeting the Poor: Health Care Access in South Africa” (2003)
- W. Scott Gordon, “Schistosomiasis Treatment and Control in Africa: Who Gets Treated and Who Gets Missed?” (2006)
- Amy Nunn, “The Politics of Life and Death: A Historical Institutional Analysis of Antiretroviral Drug Policy in Brazil” (2007)
- Firas Raad, “The Political Economy of Medical Tourism in Jordan” (2008)
- Yen-Ting (Bradley) Chen, “Strategic Provider Behavior under Global Budget Payment” (2011)
- Farshad Farzadfar, “Can Health Care Delivery Help Manage Major Cardiovascular Risk Factors in the Population? Evidence from Iran” (2011)
- Anna Heard, “Contracting Out Urban Primary Health Care Services: The Bangladesh Urban Primary Health Care Project” (2011)
- David Washburn, “Applying Diffusion Theory to Implementation: An Analysis of Mexico’s Seguro Popular de Salud” (2011)
- Victoria Fan, “Essays on Health Systems and Policy in India” (2011)
- Lingling Zhang, “Geographic Distribution of Human Resources for Health and Choice of Community Practice by Future Physicians in China” (2011)

- Yarlini Balarajan, “Improving Maternal and Child Health in India: Anemia, Antenatal Care, and Health System Performance” (2012)
- Sarah MacCarthy, “Late Testing and Late Enrollment Access to HIV/AIDS Services in Salvador, Brazil” (2012)
- Tomoko Ono, “International Migration of Nurses: Patterns and Consequences-Case Studies of the US and the Philippines” (2012)
- Seemoon Choi, “Pharmaceutical Policy and Behavior Change of Healthcare Facilities in Korea” (2013)
- Zubin Shroff, “The Politics of Publicly Funded Health Insurance in India” (2013)
- Banafsheh Siadat, “The Effect of Health Insurance on Patient and Provider Behavior in Ghana’s Health System” (2013)
- Elif Yavuz, “Effective Malaria Control in Uganda: Examining Aspects of Treatment and Prevention in a New Policy Context” (2013)
- Nathan Blanchet, “Implementing National Health Insurance in Sub-Saharan Africa: Economic and Political Analyses of Ghana’s National Health Insurance Scheme” (2013)

Recent Graduates Job Placements:

Research Officer, Alliance for Health Policy and Systems Research, Geneva
 Senior Research Associate, Applied Analytics Team, Clinton Health Access Initiative
 Senior Program Officer, Results for Development Institute
 Post-Doctoral Fellow, Brown University and University of Southern California
 Junior Economist, Health Division, OECD
 Nutrition Specialist, UNICEF (Knowledge Management Focal Point)
 Chair of Non-Communicable Diseases Research Center, Tehran Univ Medical Sciences
 Research Fellow, Center for Global Health, Washington, D.C.
 Lecturer, London School of Hygiene and Tropical Medicine
 Assistant Professor of Medicine (Research), Brown University
 Pharmaceutical Specialist, World Bank, Washington, D.C.
 Director, Center for Health Policy Research, Sri Lanka
 Health Systems Strengthening Program Officer, PATH
 Postdoctoral Research Fellow & China Initiative Program Coordinator, HSPH
 Health Systems Specialist – Planning, San Francisco VA Medical Center

Course Requirements for a Health Systems Major in Global Health and Population

HSPH REQUIREMENTS	Credits	Year when course should be taken
• EPI 201 Fall 1: Introduction to Epidemiology	2.5	1
<u>Select ONE of the following (5.0 credits):¹</u>		
• BIO 210 Fall/Spring: Analysis of Rates and Proportions	5.0	1
OR		
• BIO 211 Fall: Regression and Analysis of Variance in Experimental Research	5.0	1
OR		
• BIO 222 Fall: Basics of Statistical Inference	5.0	1
OR		
• BIO 230 Probability Theory and Applications	5.0	1

DEPARTMENTAL REQUIREMENTS	Credits	Year when course should be taken
• GHP 210 Fall: Concepts and Methods of Global Health and Population Studies	5.0	1
• Doctoral Research Seminar – Independent Study (Fall)	1.25	Post WQE
• Doctoral Research Seminar – Independent Study (Spring)	1.25	Post WQE

HEALTH SYSTEMS MAJOR REQUIREMENTS	Credits	Year when course should be taken
• GHP 506 Spring 1: Measuring Population Health	2.5	2
• GHP 269 Spring 2: Applied Politics and Economics I	2.5	1
• ID 292 Spring 2: Justice and Resource Allocation	2.5	1
• GHP 525 Fall: Econometrics of Health Policy ²	5.0	1
• GHP 229 Fall: Theories and Methods of Health Politics	5.0	2
• GHP 244 Fall 2: Health Sector Reform: A World Perspective	2.5	1
• GHP 527 Spring: Political Economics & Ethics of Health Reform	5.0	2
• GHP 228 Spring: Quantitative Methods in Impact Evaluation	5.0	2
• GHP xxx Spring 2 [<i>Behavioral Economics and Global Health</i>]	2.5	2
<u>Select ONE of the following:³</u>		
• Econ 1010a Fall: Microeconomic Theory (FAS)	5.0	1
• API 102 D Spring: Economic Analysis of Public Policy (HKS)	5.0	1

Minor field in economics, political science, or evaluation sciences

Each student chooses two minors and must take 10 credits of advanced courses in each.

¹ Students are expected to waive out of BIO 200 Principles of Biostatistics.

² GHP 525 meets the school's requirement for the second of two intermediate biostatistics courses required of doctoral students

³ Students may waive this requirement if they can demonstrate having taken an equivalent course.

Doctoral Major in Economics
Head, Prof. David Canning, dcanning@hsph.harvard.edu

Economic analysis underlies many decisions being made in health care and population policy. The World Health Organization's report on Macroeconomics and Health (2001) has argued the case for investing in health both as an intrinsic good in itself and as an instrument for promoting economic growth. In addition to making the case for more investment, the report also investigates how to choose the most cost effective interventions to improve population health.

The major in economics is designed to give students a strong foundation in microeconomic theory and to develop their skills in applying economic analysis to issues in Global Health and Population. In addition to training in economic theory, developing this major will also involve studying recent empirical economic research on Global Health and Population issues. The rigorous training in this major, together with the interdisciplinary training they receive in other areas, will allow students to proceed to undertake their own research using economic models of behavior.

Examples of research topics that might be pursued following an economics major are: cost benefit analysis of medical interventions, estimating the effect of poverty and social deprivation on health, estimating the value of health as an instrument for increasing labor productivity, modeling the effects of medical care costs on use of services, the effect of government regulation on market structures and private health care provision, the analysis of the effects of health insurance on the access to and supply of health care, the effect of fertility choice and family size on child poverty and health, mechanisms for developing new drugs and treatments.

Doctoral Major in Economics

The major in economics offers a major designed to give students a strong foundation in microeconomic theory and to develop their skills in applying economic analysis to issues in global health and population. In addition to training in economic theory, the major will also involve studying recent empirical economic research on global health and population issues. The rigorous training in this area will allow students to proceed to undertake their own research using economic models of behavior.

Advice for applicants to the economics major of the doctoral program

Most accepted candidates have a strong background in economics, often at the master's level. In addition to population and health economics, knowledge of multivariate calculus, microeconomics, development economics, and econometrics is particularly useful.

Test Scores:

All applicants are required to submit official GRE scores. The median scores of our admitted students are:

GRE Test	Current Score	Scores Prior to August 2011
Quantitative Reasoning	160	760
Verbal Reasoning	165	680
Analytical Writing	5.0	

Applicants whose native language is not English are required to take the Test of English as a Foreign Language (TOEFL). Most admitted students score a minimum score as noted below.

TOEFL	Paper-Based	Computer-Based	Internet-Based
	620	260	105

The Admissions Committee values competitive test scores but also recognizes that this is only one indication of a candidate's abilities. Some applicants with lower test scores may be admitted on other outstanding qualifications. The average admitted applicant has a grade point average of 3.7.

Internal applicants from the Master of Science program are advised to take some of the required courses for doctoral students in the economics major as part of their studies for the SM2 degree. This enables them to proceed to more advanced optional courses in the doctoral program, and to start their research.

Required Courses:

In addition to courses required for all students in the doctoral program students in the economics major are required to take:

ECON 2020a	Microeconomic Theory I (5 credits) Jointly listed at HKS as API-111
ECON 2020b	Microeconomic Theory II (5 credits) Jointly listed at HKS as API-112

Students are also required to take at least 10 credits chosen from:

ECON 2390b	Development Economics I (5 credits)
ECON 2390c	Development Economics II (5 credits)
ECON 2810a	Labor Market Analysis (5 credits)
ECON 2465	Health Economics (5 credits)
PED 101	Economic Development: Theory, Evidence, and Policy (5 credits)

The course GHP525 Econometrics for Health Policy - (5 credits) is also required for the major, and will count towards fulfilling the school requirements for one of two courses in intermediate biostatistics.

Students in the economics major will usually take advanced courses in applied econometrics or statistical methods such as GHP228 Econometric Methods of Impact Evaluation, GHPxxx Behavioral Economics and Global Health, API 208 Program Evaluation, or GOV 2001 Advanced Quantitative Research Methodology. The appropriate courses depend on the student's research interests and should be decided after consultation with their advisor.

Students in the 3rd and higher years who are in residence are recommended to attend:

ECON 2460	Joint BU/Harvard/MIT Health Economics Workshop.
ECON 3390hf	Economic Development Workshop
ECON 2390dhf	Research in Economic Development

Please note that the above ECON courses are offered through the Harvard Kennedy School (HKS) and Faculty of Arts and Sciences (FAS) located in Cambridge.

Students Entering Fall 2013: Course Requirements for an Economics Major in Global Health

HSPH REQUIREMENTS	Credits	(17.5)
EPI 201. Epidemiologic methods	2.5	
BIO 200. Principles of biostatistics ⁴	5.0	
<u>Select 10 credits in intermediate biostatistics, 5 of which must be GHP 525:</u>		
BIO 210. Analysis of rates and proportions	5.0	
BIO 211. Regression and Analysis Variance	5.0	
BIO 222. Basics of statistical inference	5.0	
BIO 223. Applied survival analysis	5.0	
BIO 226. Applied longitudinal analysis	5.0	
GHP 525. <i>Econometrics for health policy</i>	5.0	<i>Required</i>
DEPARTMENTAL REQUIREMENT	Credits	(5.0)
GHP 210. Concepts and methods in global health and population studies	5.0	
Doctoral Research Seminar – Independent Study (Fall)	1.25	Post WQE
Doctoral Research Seminar – Independent Study (Spring)	1.25	Post WQE

Required Courses:

In addition to courses required for all students in the doctoral program students in the economics major are required to take:

ECON 2020a Microeconomic Theory I (5 credits) Jointly listed at HKS as API-111 and HBS as 4010
 ECON 2020b Microeconomic Theory II (5 credits) Jointly listed at HKS as API-112 and HBS as 4011

Students are also required to take at least 10 credits chosen from:

ECON 2390b Development Economics I (5 credits)
 ECON 2390c Development Economics II (5 credits)
 ECON 2810a Labor Market Analysis (5 credits)
 ECON 2465 Health Economics (5 credits)
 PED 101 Economic Development: Theory, Evidence, and Policy (5 credits)

The course GHP525 Econometrics for Health Policy - (5 credits) is also required for the major and will count towards fulfilling the school requirements for two courses of intermediate biostatistics.

Students in the economics major will usually take an advanced course in applied econometrics or statistical methods such as GHP 228 Econometric Methods of Impact Evaluation, GHPxxx Behavioral Economics and Global Health, API 208 Program Evaluation, or GOV 2001 Advanced Quantitative Research Methodology. The appropriate courses depend on the student's research interests and should be decided after consultation with their advisor.

Students in the 3rd and higher years who are in residence are recommended to attend:

ECON 2460 Joint BU/Harvard/MIT Health Economics Workshop.
 ECON 3390hf Economic Development Workshop
 ECON 2390dhf Research in Economic Development

Please note that the above ECON courses are offered through the Harvard Kennedy School (HKS) and Faculty of Arts and Sciences (FAS) located in Cambridge

⁴ In most cases, students are expected to waive out of BIO 200 Principles of Biostatistics

Participating Faculty in the Economics Major:

David Canning, (Head of Major) dcanning@hsph.harvard.edu

David Bloom, dbloom@hsph.harvard.edu

Günther Fink, gfink@hsph.harvard.edu

Margaret McConnell, mmcconne@hsph.harvard.edu

Current Student Contact:

Mahesh Karra, mvk891@mail.harvard.edu

Alumni Contacts:

Tobenna Anekwe, tanekwe@ers.usda.gov

Jacob Bor, jacob.bor@gmail.com

Past Theses Titles:

- Jacob Bor, “Essays on the Economics of HIV/AIDS in Rural South Africa.”
- Hiroaki Matsuura, “Rights, Health Laws, and Health Outcomes”.
- Jeremy Barofsky, “Measuring the Impact and Reasons for Take-Up of Health Insurance in Developing Nations: Evidence from Mexico’s Seguro Popular”.
- Ana Mylena Aguilar Rivera, “The effect of women’s schooling on fertility, its proximate determinants and infant mortality: evidence from compulsory education laws in Latin America.”
- Tobenna Anekwe, “Childhood Vaccination and Human Capital Outcomes in South Africa and India.”
- Shufang Zhang, “The Impact of Public anti-Tobacco Policies on Smoking Behavior Among Older Americans.”
- Diana Bowser, “*Health and Economic Growth in the Mississippi River Delta Region.*”
- Mansour Farahani, “On the Determinants of Mortality: the Effects of Health System Resources.”
- Piya Hanvoravongchai, “Health Workers and the Health System in Thailand.”
- Andrew Mitchell, “Prospective Payment and Hospital Behavior in Taiwan.”
- Till Bärnighausen, “HIV Status and HIV Incidence; Body mass and Blood Pressure, and their Determinants: Findings from a Longitudinal Population-Based HIV Surveillance in Rural South Africa.”
- Aparnaa Somanathan, “Determinants of Use of Pregnancy and Child Health Care in Indonesia.”
- Diana Pinto, “Managed Competition and Quality of Care from the Consumer’s Perspective. Evidence from Health Care Reform in Colombia.”
- Prasanta Mahapatra, “Estimating National Burden of Disease: Sensitivity to Local Data”
- Yoko Akachi, “Childhood Health, Nutrition, and Adult Height in Developing Countries.”
- Iris Boutros, “Social Grants and Child Outcomes in KwaZulu-Natal, South Africa.”

Positions of Recent Graduates:

Assistant Professor, Health Economics, Boston University
Postdoctoral Fellow, University of Southern California
Lecturer, Oxford University
Economist, United States Department of Agriculture
Research Specialist, International Health Systems, HSPH
Research Director, HSPH AIDS Initiative
Senior Lecturer in Health Economics, LSH&TM
Research Associate, Global Health and Population, HSPH
Assistant Professor of Global Health, HSPH
Health Economist, World Bank
Associate Professor in Health Economics, Pontificia Universidad Javeriana

APPENDICES

1. **SM2 Advisor/ Advisee Document**
2. **Master of Science Thesis Guidelines**
3. **Sample Justification for Orals/Research
Committee Members**
4. **Outside Reader Procedures**
5. **Departmental Committees**
6. **Department Course Offerings**
7. **Other HSPH Resources**

SM2 Advisor/Advisee Document

For Academic Advisors to SM2 Degree Students in GHP

What is expected of you as an academic advisor:

- Comply with times when faculty attendance is required, these are noted in the HSPH Faculty Handbook.
- Provide clear communication with advisees in advance of when you will be away and indicate who to contact in your absence.
- Be clear about how advisees should reach you and how to go about setting up appointments with you (e.g., email, sign-up sheet, specific office hours, staff assistant).
- Use the appropriate resources available to you to provide advice. These include the HSPH Student Handbook, the Department Degree Program Guide, the Areas of Interest Document and corresponding meetings, the Master of Science Program Checklist, the GHP iSite, and the GHP Webpage.
- Take the time to familiarize yourself with the requirements of the GHP SM2 degree program. In conjunction with your advisees, you are responsible for making sure they take all the requirements in accordance with both the school's and department's time table.
- Be aware of key deadlines (these are often reminded by the Registrar's office and by the GHP Education Office).
- Read and respond to emails from your advisees in a timely fashion.
- You are expected to meet with your advisees *at least* once each quarter.
- Be aware of specific benchmarks in each year of this 2 year program and be prepared to hold additional meetings to discuss these with your advisee as appropriate – internships (year 1), and thesis and jobs/further schooling (year 2).
- Reinforce any expectations of attendance at certain events/seminars/etc that have been made by the SM2 Committee or the Department Chair.
- If you have any type of concerns about your advisee, please contact Andy Eisenmann in the Office for Student Affairs (617) 432-1542 or alert Barbara Heil (617) 432-1179, who can help facilitate your concerns.

Specific Recommendations for Academic advisors of First Year Students

Pre-Orientation:

- Upon receiving the names and email addresses of your advisees from the Education Office in late July, you should be emailing a short note welcoming them to the department, encouraging them to read over the course information sent to them from the GHP Education Office, and let them know that you expect to set up a time to meet with them individually during orientation week to help finalize their schedules and answer other questions they may have.

Orientation:

- Each academic advisor is provided with a sign-up sheet. Please block off any times during which you have prior commitments and then attach it to your office door for students to sign up to see you for ½ hour blocks. This meeting provides an opportunity for you to both answer the student's questions and to lay out your expectations.
- Be clear about the process to follow for obtaining your approval for courses they plan to take, particularly with the new electronic approval system.
- Be specific about the how many times you expect (at a minimum) to meet with your new advisee each term.

Post-Orientation (during 1st year):

- Begin discussing plans for summer internships in October.
- Based on internship selection, encourage them to think about using internship for the basis of their thesis; additionally encourage them to think about possible thesis advisors.
- Depending upon internship, students may need to consult *Human Subjects Committee Guidelines* and obtain the proper approval; should be done well in advance.

Specific Recommendations for Academic advisors of Second Year Students

- At beginning of academic year, discuss what they propose to do for a thesis and who they plan to ask to serve as thesis advisor and second reader.
- At beginning of the academic year, encourage registering for an independent study during Fall 1 or Fall 2 to get a jump start on their thesis.
- Each summer, the Education Office conducts an audit of the course work of our returning SM2 students and an email which lists any missing requirements is sent to each student and their academic advisor. This list should be carefully reviewed with your advisee at the beginning of the year to ensure that they complete all of the program requirements.
- Encourage students to take advantage of resume workshops, 'how to interview' workshops, and career fairs that are sponsored through the School's Career Services Office.
- Early in the year have conversations with them about their post-graduation plans – job or additional schooling? While you are not expected to secure jobs for your advisees, it is important that you get them thinking and planning for post-graduation. For those planning to join the work force, give them some direction such as recommending personal contacts and/or agencies, NGO's, etc., that they should follow-up with; share with them any opportunities that come across your desk or any that may become available in any of your current research.

For SM2 Degree Advisees in GHP

What is expected of you as an advisee:

- You will receive clear communication from your academic advisor in advance of when they will be away and information indicating who to contact in their absence should you have any questions. Upon receiving this notice, you should plan any necessary meetings accordingly.
- Be sure you are clear about how you should reach your academic advisor and how to go about setting up appointments (e.g., email, sign-up sheet, specific office hours, staff assistant).
- Use the appropriate resources available to you to provide advice. These include the HSPH Student Handbook, the Department Degree Program Guide, the Areas of Interest Document and corresponding meetings, the GHP iSite, and the GHP Webpage.
- Take the time to familiarize yourself with the requirements of the GHP SM2 degree program. In conjunction with your academic advisor, you are responsible for making sure that you take all the requirements in accordance with both the school's and department's time table.
- Be aware of key deadlines (reminders are often sent by the Registrar's office and by the GHP Education Office).
- Read and respond to emails from your academic advisor and/or the Education Office in a timely fashion.
- You are expected to meet with your academic advisor *at least* once each quarter, but it is highly recommended that you do more than that.
- Be aware of specific benchmarks in each year of this 2-year program and be prepared to hold additional meetings to discuss these with your academic advisor as appropriate – internships (year 1), and thesis and jobs/further schooling (year 2).
- Have a clear understanding of the expectations of attendance at certain events/seminars/etc, which have been recommended by the SM2 Committee or the Department Chair.
- If you find yourself in a situation where you need any type of help and need to reach out to someone other than your advisor, we encourage you to contact Andy Eisenmann in the Office for Student Affairs (617) 432-1542 or Barbara Heil (617) 432-1179, who can help facilitate on your behalf.

Specific Recommendations for First Year Students

Pre-Orientation:

- In late July you should expect to receive a short welcoming note from the department's Education Office. This note will arrive before the beginning of orientation and will include information on course requirements to help guide you when registration starts in early August. When you arrive in late August for orientation, you will have the opportunity to meet with your academic advisor, fine tune your course schedule, and answer any other questions you may have.

Orientation:

- Each academic advisor is provided with a sign-up sheet. Please be sure to schedule a ½ hour time block to meet with your academic advisor. Use this opportunity to clarify any questions you have about the program, as well as understanding expectations. Gain a clear understanding about the process to follow for obtaining your academic advisor's approval for courses you plan to take, particularly with the electronic approval system.
- Be clear on how many times you should expect (at a minimum) to meet with your academic advisor each term.
- Review and discuss with your advisor the Areas of Interest; understand the potential benefits of selecting an AoI and being an active participant in group discussions.

Post-Orientation (during 1st year):

- Begin discussing plans for summer internships in October. Be sure to take advantage of information provided by the 2nd year students based on their summer internship experiences. Sessions to hear directly from the 2nd year students are scheduled early in the fall and have been very useful to 1st year students in planning their internships. Area of Interest meetings can be a very useful tool in helping to identify internship possibilities as well as the Department website link.
- Based on internship selection, think about using the internship as the basis for your thesis; additionally think about possible thesis advisors.
- Depending upon the type of internship, you may need to consult *Office of Human Research Administration Committee Guidelines* and obtain the proper approval; this should be done well in advance.

Specific Recommendations for Second Year Students

- At beginning of academic year, discuss with your academic advisor what you propose to do for a thesis and who you plan to ask to serve as thesis advisor and second reader.
- At beginning of the academic year, strongly consider registering for an independent study during Fall 1 or Fall 2 to get a jump start on your thesis.
- Each summer, the Education Office conducts an audit of the course work of our returning SM2 students and an email which lists any missing requirements is sent to each student and their academic advisor. This list should be carefully reviewed with your academic advisor at the beginning of the year to ensure that you complete all of the program requirements.
- Take advantage of resume workshops, 'how to interview' workshops, and career fairs that are sponsored through the School's Career Services Office.
- Early in the year have conversations with your academic advisor about your post-graduation plans – job or additional schooling? It is important to understand that it is not the responsibility of your academic advisor to secure a job for you, but he/she will be able to give you some direction such as recommending personal contacts and/or agencies, NGO's, etc. Area of Interest meetings might also serve as a medium to discuss and give direction to specific career paths. It is your responsibility to follow-up on any leads or contacts provided to you. If you are thinking about pursuing the doctoral program in this department, you are encouraged to begin having conversations with the faculty working and supervising doctoral

students in one of the department's majors as identified in the Department Guide. Conversations with current students may also be useful.

Master of Science Thesis Guidelines 2013 – 14

1. Thesis Purpose

The thesis for the two-year Masters students serves several purposes:

- It provides an opportunity for the student to work on a problem or issue of particular interest
- It allows the student to apply many of the skills acquired separately in the different courses taken for the degree
- The thesis itself is proof of the student's mastery of certain skills that are important whether the student continues to a research degree or begins professional employment
- It is a useful document that can be shown to employers and supervisors indicating a student's level of achievement in particular areas

The skills and understanding that we are anxious to see developed in part through the thesis include:

- The capacity to conceptualize a problem and to identify the key questions that need to be addressed;
- The ability to reduce these broad questions and issues to a tangible form that can be managed with the resources and item available to the MS student;
- A capacity to apply and understand the value of the technical skills acquired in the required and optional courses taken during the two-year period of training;
- To develop the beginnings of an independent approach based on the work of others but extending to the development of new conclusions from existing and new evidence;
- To be able to place the particular and small-scale work for the thesis in a broader context and to realize how the work can contribute to the development of new knowledge and understanding in the domains of Global Health and Population.

The system of grading (see below) reflects the importance we attach to each of these elements.

A Masters Thesis is therefore required of all students enrolled in our Department's two-year SM program. Whilst work on the body of the thesis begins in the middle of summer in most cases, the final written version is produced during the student's second year in the program.

We strongly advise that students begin work on sections of the thesis in the Fall Semester since the final version has to be ready by the middle of the Spring semester. This may be done through Independent Studies.

2. Thesis Structure

The thesis should include a statement of the problem and its relevance to public health, followed by sections such as:

- a critical analysis of the literature with the aim of clarifying current knowledge and formulating the questions that will be the subject of the thesis;
- a description of the methods and materials to be used in the analysis of the chosen problems or issues;
- an analysis of the materials that illustrate the student's mastery of the skills acquired in the course work in the School and elsewhere;
- a concluding section that deals with the public health implications of the work.

The best advice is to consult with your advisors for suggestions on which previous theses should be consulted as models for your own work. These are located in the Education Office.

The *title and signature pages* are self-explanatory. Look at previous theses if in doubt. The *preface or foreword*, as is usual in all good books and theses, is the place where you can say a few more personal words about how the study came about, thank your sponsors, mention people who have been especially helpful and generally add relevant non-scientific information that does not fit in the more formal body of the thesis. The *introduction*, by contrast, opens up the issues you are about to address and positions the work in the flow of previous scholarship. The style here is thus more scientific and impersonal.

We are keen to have an *abstract* from you since often we are asked to summarize the work of our SM students and it's much better if you write this summary rather than one of us trying to do it for you. Books generally do not contain abstracts but in the case of your thesis, the best place to place this abstract would be after the table of contents as the list in the Guidelines suggests.

3. Credits and assessment

To these ends, we encourage students and evaluators to think of the thesis as an essential tool in the development of a professional expertise in some part of global health and population. To this end, we have developed a scoring system that is meant to provide readers/assessors and students with a guide to the kind of criteria we will be using to assess the quality of each thesis.

Criterion	Score
Originality of the idea for the thesis	15
Conceptualization of the idea and its translation into manageable terms	15
Mastery of existing materials and knowledge	15
Technical skills including qualitative and quantitative aspects and ability to deal with large amounts of information in different forms	15
Analysis and interpretation	15
Conclusions and implications for theory and practice	15
Presentation and clarity of expression	10
TOTAL	100

The Thesis is taken on an ordinal basis only for a total of 5.0 credits. Students must register for GHP 299 Spring in the second semester of their second year of study.

4. Supervisors, second readers and other faculty

The supervisor for the Thesis may be any faculty member within the Department, **NOT** necessarily the student's academic advisor. The thesis supervisor's role is to act as your technical guide on the project. He/she may suggest that you consult other faculty members as well. Students must meet on a regular basis with their thesis supervisor. The thesis supervisor also serves as the first reader and one of the assessors of the thesis.

The Department also requires a second reader. This person need not be a member of this Department but he or she is expected to hold an appointment in a university, a research institute or a professional organization concerned with global health and population. The second reader is involved in the production of the thesis as well as the overall assessment (see Section 5 below). *If a student wishes to propose a second reader from outside HSPH, the agreement of the Chair of the SM2 Committee is required.* The main criterion used for selection is the proposed second reader's prior experience with the supervision and assessment of masters' theses, and written agreement to serve in this role. The degree of involvement of the second reader can vary according to availability and expertise in the area. It is expected, however, that the second reader shall provide feedback at agreed-upon intervals. Additionally you should plan on three key points of joint communication as a group (thesis supervisor, second reader and yourself): 1) when developing your statement; 2) mid-way in the process; and 3) before the submission deadline of **Monday, April 14th 2014**. These communications may take place in face to face meetings or electronically. Students are encouraged to make use of other faculty for production of sections of the thesis, perhaps using the tutorial contract as a means to ensure full participation in the process.

5. Final Grading

The thesis must have *two* readers, your thesis supervisor, and a second reader, the latter approved by the SM Committee Chair if not with HSPH. Both the thesis supervisor and the second reader will be responsible for grading the thesis. After consultation, they will agree on and submit **one grade** to the Education Office. The thesis must be given to both readers four (4) weeks prior to the end of the period to allow for reading time and revisions. *The four (4) week timetable is strictly followed. Delayed submissions will be penalized. For students graduating in May 2014 a copy of their completed thesis (NOT BOUND) must be given to each of the readers for review no later than Monday, April 14th, 2014.* Please note that these two copies are NOT the FINAL BOUND versions. They are copies to be reviewed and revised by the two readers, returned to the student for finalization, signatures and binding.

6. Tips on Planning

Previous students have found a summer internship to be an excellent way of consolidating skills learned during the first year and of providing both a topic and data for the thesis. We urge you to consider your recent internship experience in terms of your upcoming thesis work. In any case, it is *strongly recommended* that you identify a faculty thesis advisor as soon as possible during the Fall semester of your second year, and register for an independent study so that you can begin working on your thesis and avoid unwelcome pressure later in the year.

Each student **is required** to write a 1-2 page statement outlining the proposed project. This statement must be submitted to your thesis supervisor and second reader for approval. *Signatures and email addresses of both must appear on this statement.* **Once approved, a copy of the statement must be submitted to Barbara Heil in the Education Office for your files.** Without the submission of this statement, a student may not obtain the necessary signature from the SM Committee Chair, Peter Berman, to register for the Thesis in the spring (GHP 299 Spring). A recommended timetable for production of the Thesis is outlined below. Please consult with your Departmental academic advisor or check with the Education Office if you have any questions regarding any of the information contained in these guidelines.

TWO-YEAR SM THESIS TIMETABLE

	Progress	Progress Due
1	Recommended Independent study to prepare	Fall Registration
2	Submit Statement to Supervisor for Approval	Beginning of the Fall 2 period (November)
3	Submit copy of approved statement to B. Heil	End of the Fall 2 period (December)
4	Register for GHP 299 Spring ⁵	Beginning of 4 th Semester
5	<i>FINAL DRAFT</i> given to Thesis Supervisor and Second Reader	Monday, 14 April, 2014
6	One Copy of Bound and Signed Thesis given to Education Office.	Friday, 16 May, 2014

7. Length and Format

The final thesis should not exceed 30 single-sided pages in length, including all diagrams, tables, and references. Appendices may be kept separately and they are not counted within the 30-page limit. All pages must be numbered. The thesis should be typed using single line spacing. All information should be appropriately referenced and references should appear as at the end (no footnotes). Students may use ENDNOTE or variations thereof. With Endnote, the bibliography can either be formatted alphabetically or numerically. The point of the exercise is to learn how to produce a full referenced document with a complete bibliography – to the kind of standard expected of journals and other professional publications. The thesis should be permanently bound with a stiff cover, no staples, clips or ring binders. Samples are in the Education Office, and students are encouraged to look at them. The Thesis should contain the following sections **within the 30-page limit**:

- Title page (see next page for format)
- Signature page (see next page for format)
- Preface
- Table of Contents
- Thesis Abstract
- Thesis text with graphs and tables
- References
- *Appendices (NOT part of the 30-page limit)*

⁵ Signature from Prof. Peter Berman is required to register, signature obtained only after approved and signed statement is submitted to the Education Office.

8. Final submission of the completed thesis

After all the changes have been made and approved by the two readers, the student is responsible for submitting **ONE signed copy** of the thesis in its **final bound form** to Barbara Heil in the Education Office.

**The final bound copy must be received
before grades are submitted to the Registrar's office**

SAMPLE TITLE PAGE

TITLE OF THESIS

NAME OF AUTHOR

A Thesis Submitted to the Faculty of
the Department of Global Health and Population
Harvard School of Public Health
in Partial Fulfillment of the Requirements
for the Degree of Masters of Science
Boston, Massachusetts

Date (month, year)

SAMPLE SIGNATURE PAGE

This Thesis has been read and approved by:

(signature of Thesis Supervisor)

Insert Typed Name of Thesis Supervisor

(signature of Second Reader)

Insert Typed Name of Second Reader

Sample Justification for Orals Committee Members
(the same format should be used for the Research Committee)

**Biomass fuels and air pollution in sub-Saharan Africa:
measurement studies in rural and urban populations**

Major 1: Global Health and Population

Major 2: Environmental Health – Exposure, Epidemiology and Risk

Minor: Biostatistics

Oral Examination Committee Members:

Dr. Majid Ezzati: Global Health and Population

Dr. John Spengler: Environmental Health

Dr. Francesca Dominici: Biostatistics

Dr. Majid Ezzati (overseeing Global Health and Population content):

Dr Ezzati has been conducting research on biomass smoke and exposure to indoor air pollution since he was a PhD student, when he was one of the first to systematically quantify personal exposure to biomass smoke. In particular, his expertise lies in the method of using particulate matter (PM) data from different microenvironments combined with time-location-activity patterns to predict personal exposure to PM. Dr. Ezzati is the lead investigator for both the Ghana and The Gambia air pollution studies which will be the subject of my dissertation research.

Dr. John Spengler (overseeing Environmental Health content):

Dr. Spengler has been a lead investigator in methodological and empirical research on urban exposure to air pollution for over 20 years. He has conducted research in the areas of personal monitoring, air pollution health effects, and indoor air pollution. He is the co-editor of three books on indoor air quality, particles, and their health effects, and is on the editorial board of the journal *Indoor Air*. Dr. Spengler's extensive experience in the fields of air pollution measurement and personal exposure put him in a unique position to evaluate and critique my proposed dissertation research.

Dr. Francesca Dominici (overseeing Biostatistics content):

Dr. Dominici is a leader in developing statistical methods for environmental health research, with an emphasis on analysis of air pollution. Her expertise includes time-series and Bayesian statistics; her experience on the latter will be particularly useful as she advises on my dissertation research related to combining data from multiple measurement locations and collected using different measurement methods.

Abstract of Research Proposal

Three important themes that characterize the relationship between the environment and population health in the developing world today are water availability and use, biomass fuel use, and urbanization. My dissertation research integrates two of these themes, and focuses on the environmental health effects of biomass fuels in an urbanizing context. Specifically, my work focuses on air pollution using primary field data collected in both rural and urban areas of Sub-Saharan Africa (SSA).

Much of the current literature on biomass air pollution in low-income countries has focused on rural areas, where biomass is nearly universally used as a cooking fuel (Bruce et al. 2004; Ezzati and Kammen 2001; Naeher et al. 2001). These studies have demonstrated high particulate matter (PM) concentrations and exposures, but thus far there is limited quantitative evidence on how fuel and behavioral factors (including cooking and childcare habits) interact to affect personal exposure. Such an understanding is needed to go beyond documenting the problem and begin designing interventions.

A second gap in research related to biomass fuels and air pollution arises from the fact that the growing populations of cities in developing countries also use biomass fuels and traditional stoves, especially in SSA. A consequence of the increasing number of urban biomass users will inevitably be the role of biomass fuels in the rising levels of ambient air pollution in developing country cities. Despite this emerging relevance, the existing research on the role of biomass fuels as a source of urban air pollution is very limited, and virtually absent in SSA (Etyemezian et al. 2005; Jackson 2005; Padhi and Padhy 2008). Specifically, little is known on how air pollution varies between and within neighborhoods in relation to their location, socioeconomic status, and biomass use patterns.

Dissertation Research Questions

My doctoral dissertation aims to address the above knowledge gaps, and focuses on four research questions in SSA:

- Spatial and temporal patterns of PM and carbon monoxide (CO) pollution in multiple urban neighborhoods
- The effects of different combustion and non-combustion sources on local PM pollution
- Exposure to PM and CO in rural populations
- The effects of biomass fuels and specific behaviors on exposure in rural populations

I propose four papers focusing on the analysis of air pollution data I collected over the past three years from Accra, Ghana and The Gambia to answer these four questions and complete my dissertation. The analysis related to the urban component will be the subject of my first paper; the two research questions related to the rural component will be the subject of my second and third papers. A fourth paper, already accepted for publication, deals with the second point.

Paper 1: Urban Pollution from Biomass Fuels

The urban component of my dissertation focuses on neighborhood PM and CO because of the large knowledge gap on the effects of biomass use on local pollution in an urban context. This will be complimentary to existing studies on pollution in rural homes and their cooking and living “microenvironments”. My first paper focused on Accra, Ghana, one of SSA’s larger and more developed capital cities. I designed and conducted a field study in which we measured CO and PM of different size fractions on rooftops and using mobile monitors, in four neighborhoods with a range of socioeconomic and fuel use characteristics. I used these geo-referenced data to investigate the between- and within-neighborhood spatial and temporal patterns of PM variability and their relation to biomass use and other sources; I also conducted basic analysis on CO as a secondary indicator pollutant. The results of the analyses of rooftop data have recently been accepted for publication in the journal *Environmental Science and Technology*; a separate paper on the mobile monitoring data was accepted for publication in *Environmental Health Perspectives*. Results from analysis of these data have helped fill important gaps in the literature on both air pollution levels, and on spatial and socioeconomic patterns of air pollution in the urban developing world setting. The combination of the fixed roof-top and mobile monitoring PM measurements, in conjunction with surveys of biomass use in each neighborhood, allowed for the analysis of within- and between-neighborhood patterns of PM, and the contribution of individual local sources to neighborhood PM pollution.

Papers 2 and 3: Air Pollution Exposure from Biomass Fuels in Rural Households

While the relevance of household air pollution from biomass fuel use as an important global environmental health problem is increasingly recognized, it is also clear that sustainable, affordable and socio-culturally appropriate interventions require a careful understanding of exposure patterns and determinants. I have designed the air pollution exposure component of a study in rural populations in The Gambia, which will provide the data for investigating the two rural research questions above (data collection is on track to be completed in 2010).

The need for improved exposure assessment

Investigating the role of specific exposure determinants requires reliable data on personal exposure, coupled with data on its fuel, housing and behavioral determinants. Measuring children’s personal PM exposure is particularly difficult because current PM monitors are bulky and heavy, making it difficult for a small child to carry a monitor for many hours. Previous research on household air pollution has been primarily conducted and applied in epidemiological studies, with less focus on exposure determinants (Ezzati and Kammen 2001; McCracken et al. 2009). While we collaborate with epidemiologists who will use my exposure estimates, the innovation and strength of my research lies in the ability to compare exposure estimated using two indirect methods, and compare those estimated exposure measurements to a smaller sub-set of directly-measured PM exposures.

Study design and methods

An epidemiological study conducted by the Medical Research Council (UK) Laboratories in The Gambia (“the MRC Laboratories”) is examining risk factors for pneumonia incidence and severity in young children. The ongoing study includes 1,200 children younger than 5 years of age. My epidemiologist collaborators and I are using this study as a platform to investigate indoor air pollution (IAP) as a risk factor for pneumonia.

The three exposure measurement methods in my dissertation data are:

- Indirect method 1: We will estimate children's PM exposure by combining data on PM levels inside the cookhouse (the main location of exposure) with information on time-location-activity budgets collected from household surveys described above. This method of estimating exposure using separate microenvironment pollution levels and time-location-activity budgets has been used previously in developing country settings (Ezzati et al. 2000).
- Indirect method 2: PM exposure will also be estimated by measuring personal CO as a proxy indicator pollutant (CO monitors are much smaller than PM monitors and can be worn by children over many days). We characterize the CO-PM relationship using measurements from co-located stationary monitors. A study in Guatemala has found that CO from biomass cooking fires is correlated with PM (Naeher et al. 2001), thus the personal CO measurements can be used to predict personal PM exposure.
- Direct method: A small sub-set of children will have the more difficult personal PM measurements, providing the "gold standard" direct PM exposure to evaluate the validity of both of the above methods and to calibrate their estimates accordingly.

Surveys have also been conducted, in which participants' mothers or other primary caretakers provide information on exposure determinants, including type and quantity of fuel used, housing and kitchen characteristics, and cooking and child-care habits (e.g. frequency and duration of cooking and how often a child is carried on a mother's back while cooking).

For the second paper in my dissertation, I propose to predict children's personal exposure to CO by combining the data from indirect method 2 with information from the surveys using a random effects model. A model is being used because combining multiple CO measurements with child and household level covariates will provide a better estimate of usual exposure to CO than the actual personal CO measurement, since each individual measurement includes measurement error due to variability.

The third paper will utilize these estimates of personal exposure to CO to estimate personal exposure to PM using the CO-PM relationship determined from measurements done in the cookhouses. Within the third paper, I will also compare the estimates of personal exposure to PM from the CO-PM relationship with the estimates obtained from indirect method 1, and from the direct method of PM measurement, both described above. To do so I will use statistical methods such as structural models to pool data collected using different measurement methods.

The richness of these data will allow us to examine the association of these factors with personal exposure using a large sample size. Beyond contributions to my own dissertation, comparing the indirect methods of PM estimation with the set of direct measurements will allow us to determine the best methods to use for estimating exposure in future studies.

Outside Reader Procedures

1. The student and their Research Committee should meet as soon as the first complete draft of the thesis is in view to discuss possible nominees for the outside reader. All members of the Research Committee must agree that the thesis is ready for the Outside Reader review before the process may begin. When considering these individuals, please refer to the following criteria:

The Outside Reader should:

- (a) Be a full professor in a major academic institution with years of experience with the direction and assessment of doctoral dissertations. In general, based on this criterion, those in firms and development agencies are unacceptable.
 - (b) Be a leading figure with professional standing in the field. This is important since we often find our Outside Readers are very valuable as referees for jobs and promotion after graduation.
 - (c) Have worked in the student's area of research (usually evidenced by appearing in the student's bibliography).
 - (d) Should be individuals NOT previously involved directly with the research or the production of the thesis since we are seeking an assessment independent of the work of the student and the previous guidance provided by the Research Committee.
2. With the Research Committee's approval, the student's departmental faculty advisor submits the following materials to Barbara Heil or Anjanee Jaimungal in the Education Office for distribution to the doctoral committee for review:
 - (a) an abstract of the thesis;
 - (b) a copy of the bibliography, even if incomplete;
 - (c) 2-3 names of possible Outside Readers meeting the criteria above with a short note from the advisor indicating how the work of each is tied to the student's thesis work and the suitability of the person to serve as an Outside Reviewer.
 3. The Doctoral Committee will review the materials and inform the Advisor of their preferred nominee with a reserve in case of refusal. The Chair of the Doctoral Committee then contacts the nominated individual and invites the person to serve as an Outside Reader. At this time, the role of the reader is explained with the attached instruction sheet and details of responsibilities, the time frame and remuneration.
 4. Once the nominee has agreed to serve as the Outside Reader, the faculty advisor will meet with the student, inform them of the decision and agree on the final timetable up to and including the thesis defense.
 5. The student will then be responsible for giving their thesis to the Education Office **six to eight weeks** prior to the defense date. The Education Office will then send the thesis directly to the reader for review. Note that the thesis must be complete (all sections written, tables, graphs and references included) even though the Reader and the Committee recognize this as the penultimate version of the thesis prior to the defense.

6. During this review process, the only communication with the Outside Reader will be through the Doctoral Committee Chair and/or the Education Office. The student may not contact the outside reader directly at any time during this process.
7. The Outside Reader's report is sent to Barbara Heil in the Education Office and is circulated immediately without commentary to all members of the Doctoral Committee, to the student's Research Committee and to the student before the public defense of the thesis.
8. If the Outside Reader fails to provide a report within the agreed timetable, the Doctoral Committee will take action to ensure that the defense is not unduly delayed.

Recommendations from the Outside Reader

Once the report has been received from the Outside Reader, the student meets with the Research Committee to review the commentary and to agree on a strategy for responding to any criticisms before the thesis defense and the production of the final version of the thesis. In the past, these comments have included a mix of general commentary, strategic and theoretical and some more detailed points, both statistical and grammatical.

In the event that the Outside Reader indicates that the student's thesis is not ready to be defended, the Department Chair will make a determination on the scheduling of the defense after consultation with both the Research and Doctoral Committees.

Departmental Committees 2013/14

Doctoral Committee

Joshua Salomon, (Chair and Joint Head Population and Reproductive Health Major) –

jsalomon@hsph.harvard.edu

Till Bärnighausen, (Joint Head of Population and Reproductive Health Major)

tbaernig@hsph.harvard.edu

David Canning, (Head of Economics Major) – dcanning@hsph.harvard.edu

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Wafaie Fawzi – (Department Chair) mina@hsph.harvard.edu

Master of Science Committee

Peter Berman, (Chair) – pberman@hsph.harvard.edu

Goodarz Danaei – gdanaei@hsph.harvard.edu

Margaret McConnell – mmcconne@hsph.harvard.edu

Daniel Wikler – wikler@hsph.harvard.edu

Wafaie Fawzi – (Department Chair) mina@hsph.harvard.edu

HSPH Master of Public Health Committee

Global Health Concentration Leader:

Peter Berman – pberman@hsph.harvard.edu

**Department of Global Health and Population
Course Offerings 2013/14**

Fall

GHP 210 Fall	Concepts and Methods of Global Health and Population Studies; Bärnighausen, B. Bloom, Vollmer; (5.0)
GHP 225 Fall	Population, Health and Development; Canning; (5.0)
GHP 229 Fall	Theories and Methods of Health Politics; Reich; (5.0)
GHP 272 Fall	Foundations of Global Health and Population; D. Bloom, Lamstein; (5.0)
GHP 525 Fall	Econometrics for Health Policy; Fink; (5.0)
GHP 530 Fall/Spring	Global Health and Practice; Berman; (1.25)
GHP 568 Fall	Contemporary South Asia: Entrepreneurial Solutions to Intractable Social & Economic Problems; Khanna; (5.0) Cross-listed and taught at HBS as 1266
GHP 215 Fall	Foundations in Humanitarian Studies and Human Rights; VanRooyen; (2.5)
ID 250 Fall 1	Ethical Basis of the Practice of Public Health; Eyal/Norheim; (2.5)
ID 262 Fall 1	Introduction to the Practice of Global Health; Cash; (2.5)
GHP 539 Fall 1	The Social, Economic, and Political Dimensions of Infectious Disease in Low and Middle-Income Countries; Cash, Weisfeld; (2.5)
GHP 552 Fall 1	Section 1. Leadership Development in Global Health/Health Policy: Making the Case for Universal Health Coverage in Turkey; Akdag/Fawzi; (1.25)
GHP552 Fall 1	Section 2. Leadership Development in Global Health – Healthcare Delivery: Are We Moving in the Same Direction Globally?; Bengoa/Fawzi; (1.25)
GHP 211 Fall 2	Management Control in Health Organizations; Mitchell; (2.5)
GHP 230 Fall 2	Introduction to Economics with Applications to Health and Development; McConnell; (2.5)
GHP 244 Fall 2	Health Sector Reform: A Worldwide Perspective; Bossert; (2.5)
GHP 253 Fall 2	Human Ecology; Levins; (2.5)
GHP 255 Fall 2	HIV Interventions: Rationale, Design, and Evaluation; Bärnighausen, Mayer; (2.5)
GHP 288 Fall 2	Issues in Health and Human Rights; Marks; (2.5)
GHP 293 Fall 2	Individual and Social Responsibility for Health; Wikler; (2.5)
GHP552 Fall 2	Section 3. Leadership Development in Global Health: Policy Making for Better Healthcare Delivery in Kenya: Case of Four Parastatals; Nyongo/Fawzi; (1.25)

WinterSession

ID 535	Managing Community Health Centers; Campbell; (1.25)
GHP 550	mHealth: How Will It Change Health Care? Mitchell; (2.5)
GHP 263	Grant Writing for Funding of Research and Health Care Projects; Dumbaugh, Fawzi; (2.5)
GHP 532	Introduction to Global Health Delivery; Rhatigan, Mukherjee; (2.5)
GHP 268	Field Experience in Health and Human Rights; Marks; (1.25)
GHP 297	Field Trip: Health Reform and Community Medicine In Chile; Bossert; (1.25)
GHP 298	Field Trip to India; Cash; (1.25)
GHP 540	Field Trip to Urban and Rural Bangladesh; Rahman, Cash; (1.25)
GHP 541	Health System Reforms in China: Seminar and Field Study; Liu; (2.5)
GHP 542	Field Trip to Brazil; Castro; (1.25)
GHP 543	Field Study in the Middle East: Assessing the Syrian Refugee Crisis in Lebanon; Bröderlein; (2.5)
GHP 544	Field Trip to Mexico; Reich; (1.25)
GHP 546	Field Research Methods in Humanitarian Crisis: Refugee Health at the Thai-Burma Border I; Parmar, Greenough; (1.25)
GHP 547	Field Experience in Maternal Health; Langer (1.25)

Spring

GHP 228 Spring	Quantitative Methods in Impact Evaluation; Cohen; (5.0)
GHP 261 Spring	Models of Complex Systems in Biology and Public Health; Awerbuch, Levins; (2.5)
GHP 299 Spring	Masters Thesis; Berman; (5.0)
GHP 515 Spring	Essentials of Humanitarian Action in the Field I; VanRooyen, Kayden, Walker; (2.5) Cross-listed at Tufts as DHP 213 and NUTR 324
GHP 527 Spring	Political Economy and Ethics of Health Sector Reform; Bossert, Hsiao; (5.0)
ID 217 Spring	Nutrition and Global Health; Fawzi; (2.5)
GHP 231 Spring 1	Sexual and Reproductive Health: A Global Perspective; Langer; (2.5)
GHP 506 Spring 1	Measuring Population Health; Salomon; (2.5)
GHP 507 Spring 1	Population Health Risk Factors; Danaei; (2.5)
GHP 514 Spring 1	Field Research Methods in Humanitarian Crisis: Refugee Health at the Thai-Burma Border II; Parmar, Greenough; (1.25)
GHP 537 Spring 1	Field Methods in Humanitarian Crises I; Greenough; (1.25)
GHP 548 Spring 1	The Global Health System: Governance Challenges and Institutional Innovations: Frenk, Moon; (2.5)
GHP 553 Spring 1	Human Rights Dilemmas in Child Protection; Bhabha; (2.5)
GHP 554 Spring 1	Innovation, Access to Medicines and Global Governance; Røttingen, Hoffman; (2.5)
ID 205 Spring 1	Societal Response to Disaster; Leaning, Cranmer; (2.5)
ID 250 Spring 1	Ethical Basis of the Practice of Public Health; Wikler; (2.5)
ID 513 Spring 1	Ethics and Health Disparities; Daniels; (2.5)
ID 292 Spring 2	Justice and Resource Allocation; Daniels; (2.5)
GHP 214 Spring 2	Health, Human Rights and the International System; Marks; (2.5)
GHP 269 Spring 2	Applied Politics and Economics I: Political Economy of International Health; Reich (2.5)
GHP xxx Spring 2	Behavioral Economics and Global Health; McConnell (2.5)
GHP 509 Spring 2	Advanced Seminar on Population Health Risk Factors; Danaei; (2.5)
GHP 518 Spring 2	Essentials of Humanitarian Action in the Field II; Kayden, VanRooyen; (1.25)
GHP 520 Spring 2	The Ecology of Health in Development; Levins; (2.5)
GHP 534 Spring 2	Introduction to Spatial Methods for Public Health; Castro; (2.5)
GHP 538 Spring 2	Filed Methods in Humanitarian Crises II: Pham, Leaning; (1.25)
GHP 532 Summer 1	Introduction to Global Health Delivery; Rhatigan, Farmer, Mukherjee; (2.5)
GHP 555 Summer 1	Value-Based Management in Global Health Delivery; Weintraub; (1.25)

Others

GHP 300	Independent Study
GHP 301	Tutorial

Research (for Doctoral Students only)

GHP 350	Research
GHP 356	Research Methods in Population; Wyshak
GHP 400	Non-resident Research

----- **Not Offered 2013-14** -----

GHP 220 Fall 2	Introduction to Demographic Methods; Castro; (2.5)
GHP 235 Spring 1	Global Health and Global Justice; Daniels; (2.5)
GHP 265 Fall 1	Ethics of Global Health Research; Cash, Wikler (2.5)
GHP 504 Spring 1	Applied Qualitative Methods in International Health; Betancourt; (2.5)
ID 272 Spring 1	Financing Health Care in Developing Countries; Liu, Hsiao; (2.5)

Other HSPH Resources

In addition to the information in this Guide students at HSPH are expected to review and become familiar with the following resources:

HSPH Academic Calendar

<http://www.hsph.harvard.edu/administrative-offices/registrar/academic-calendar/>

The HSPH Student Handbook

<http://www.hsph.harvard.edu/academics/student-handbook/>

Harvard University Course Catalog

<http://coursecatalog.harvard.edu/icb/icb.do>

Procedure for Cross-registration at other Schools

<http://www.hsph.harvard.edu/administrative-offices/registrar/cross-registration/>

Office of Human Research Administration (OHRA)

<http://www.hsph.harvard.edu/ohra/>

The Career Services Office

<http://www.hsph.harvard.edu/administrative-offices/career-services/>

Other important HSPH resources are:

Student Services

Stanley Hudson, Associate Dean for Student Services

Joann Wilson-Singleton, Registrar

Kathryn Austin, Director, Student Financial Services

Andy Eisenmann, Director for Student Affairs

Vincent W. James, Director of Admissions

Career Services Office

Peter Crudele, Director of Career Services

Office of Alumni Programs

Jim Smith, Assistant Dean for Alumni Affairs