UCLA FIELDING SCHOOL OF PUBLIC HEALTH

Competencies for Graduate Degree Programs

October 5, 2016

FSPH MPH Competencies

Core MPH Competencies (Apply to All Students in MPH Programs)

Core MPH Competencies in Biostatistics (Domain A)

Code	Competency
A1	Judge, critique and interpret reports of individual epidemiologic studies; evaluate strengths and limitations of epidemiologic reports
A2	Use existing databases to provide background information or data to address research questions and draw appropriate inferences/estimates from epidemiologic data
A3	Describe preferred methodological alternatives to commonly used statistical methods when assumptions are not met.
A4	Distinguish among the different measurement scales and the implications for selection of statistical methods to be used based on these distinctions.
A5	Apply descriptive techniques commonly used to summarize public health data.
A6	Apply common statistical methods for inference.
A7	Apply descriptive and inferential methodologies according to the type of study design for answering a particular research question.
A8	Apply basic informatics techniques with vital statistics and public health records in the description of public health characteristics and in public health research and evaluation.
A9	Interpret results of statistical analyses found in public health studies.
A10	Develop written and oral presentations based on statistical analyses for both public health professionals and educated lay audiences.

Core MPH Competencies in CHS (Domain B)

Code	Competency
B1	Identify basic theories, concepts and models from a range of social and behavioral disciplines that are used in public health research and practice.
B2	Identify the causes of social and behavioral factors that affect health of individuals and populations.
B3	Identify individual, organizational and community concerns, assets, resources and deficits for social and behavioral science interventions.
B4	Identify critical stakeholders for the planning, implementation and evaluation of public health programs, policies and interventions.
B5	Describe steps and procedures for the planning, implementation and evaluation of public health programs, policies and interventions.
B6	Describe the role of social and community factors in both the onset and solution of public health problems.
B7	Describe the merits of social and behavioral science interventions and policies.

Code	Competency
B8	Apply evidence-based approaches in the development and evaluation of social and behavioral science interventions.
B9	Apply ethical principles to public health program planning, implementation and evaluation.
B10	Specify multiple targets and levels of intervention for social and behavioral science programs and/or policies.

Core MPH Competencies in Environmental Health (Domain C)

Code	Competency
C1	Describe the direct and indirect human, ecological and safety effects of major environmental and occupational agents.
C2	Describe physiologic and psychosocial factors that affect susceptibility to adverse health outcomes following exposure to environmental hazards.
C3	Describe federal and state regulatory programs, guidelines, and authorities that control environmental health issues.
C4	Specify current environmental risk assessment methods.
C5	Specify approaches for assessing, preventing and controlling environmental hazards that pose risks to human health and safety.
C6	Identify key sources of data and use existing databases to provide background or supportive data to address environmental health questions
C7	Discuss various risk management and risk communication approaches, including their relation to issues of environmental justice and equality.
C8	Develop a testable model of environmental insult.
C9	Explain the general mechanisms of toxicity in eliciting a toxic response to various environmental exposures.

Core MPH Competencies in Epidemiology (Domain D)

Code	Competency
D1	Identify key sources of data for epidemiologic purposes.
D2	Identify the principles and limitations of public health screening programs.
D3	Describe a public health problem in terms of magnitude, person, time and place.
D4	Explain the importance of epidemiology for informing scientific, ethical, economic and political discussion of health issues.
D5	Comprehend basic ethical and legal principles pertaining to the collection, maintenance, use and dissemination of epidemiologic data.
D6	Apply the basic terminology and definitions of epidemiology.
D7	Calculate basic epidemiology measures.
D8	Communicate epidemiologic information to lay and professional audiences.
D9	Draw appropriate inferences from epidemiologic data.
D10	Evaluate the strengths and limitations of epidemiologic reports.

Core MPH Competencies in HPM (Domain E)

Code	Competency
E1	Apply epidemiologic and statistical reasoning and methods to address, analyze, and solve problems in public health
E2	Describe the legal and ethical bases for public health and health services.
E3	Explain methods of ensuring community health safety and preparedness.
E4	Discuss the policy process for improving the health status of populations.
E5	Apply the principles of program planning, development, budgeting, management and evaluation in organizational and community initiatives.
E6	Apply principles of strategic planning and marketing to public health.
E7	Apply quality and performance improvement concepts to address organizational performance issues.
E8	Apply
E9	Communicate health policy and management issues using appropriate channels and technologies.
E10	Demonstrate leadership skills for building partnerships.

Cross-Cutting Core MPH Competencies (Domain F)

Code	Competency
F1	Understand the concepts of human subject protection and confidentiality
F2	Recognize ethical issues that arise in epidemiological research
F3	Apply legal and ethical principles to the use of information technology and resources in public health settings.
F4	Collaborate with communication and informatics specialists in the process of design, implementation, and evaluation of public health programs.
F5	Demonstrate effective written and oral skills for communicating with different audiences in the context of professional public health activities.
F6	Use information technology to access, evaluate, and interpret public health data.
F7	Identify public health programs and strategies that are responsive to the diverse cultural values and traditions of the communities being served.
F8	Engage in dialogue and learning from others to advance public health goals.
F9	Demonstrate team building, negotiation, and conflict management skills.
F10	Use collaborative methods for achieving organizational and community health goals.
F11	Articulate how biological, chemical and physical agents affect human health.
F12	Discuss sentinel events in the history and development of the public health profession and their relevance for practice in the field.
F13	Describe basic principles of ethical analysis (e.g. the Public Health Code of Ethics, human rights framework, other moral theories) as they relate to issues of public health practice and policy.
F14	Apply evidence-based principles and the scientific knowledge base to critical evaluation and decision-making in public health.

Code	Competency
F15	Differentiate between qualitative and quantitative evaluation methods in relation to their strengths, limitations, and appropriate uses, and emphases on reliability and validity.
F16	Explain how the contexts of gender, race, poverty, history, migration, and culture are important in the design of interventions within public health systems.

Discipline-Specific MPH Competencies (Apply Only to MPH Students With a Concentration in Specified Discipline)

Discipline Specific Competencies for MPH in Biostatistics (Domain G - applies only to MPH students in Biostats concentration)

Code	Competency
G1	Explain the fundamental concepts of statistical analysis such as scientific hypothesis testing, estimation and statistical modeling for datasets from health studies.
G2	Develop analytical skills and obtain broad insights involving the design and analysis of experiments to understand and model the dependence between different variables (e.g. regression), handle missing or incomplete data, and carry out rigorous statistical modeling for data obtained from a variety of public health study designs.
G3	Develop analytical and computational skills for the management, modeling and analysis of public health datasets with several variables that may be dependent on one another using statistically rigorous methods and models.
G4	Consult with public health professionals and researchers helping them design research studies (using statistically rigorous methods for sample size determination and power) and analyzing data obtained from such designs.
G5	Complete a statistical consulting project with a health professional, communicate the findings using a written report and with oral presentations.
G6	Learn statistical programming and computational skills for conducting statistical simulation experiments, designing studies and analyzing public health datasets with several variables and potentially complex relationships.
G7	Describe preferred methodological alternatives to commonly used statistical methods when assumptions are not met.
G8	Develop written and oral presentations based on statistical analyses for public health professionals as well as lay audiences.

Discipline Specific Competencies for MPH in CHS (Domain H - applies only to MPH students in CHS concentration)

Code	Competency
H1	Access and understand the public health literature and information and apply it to community health.
H2	Describe theories, concepts, models from the social and behavioral sciences and apply these theories to community health practice.
H3	Identify and explain how social, cultural, and behavioral factors affect the health of individuals, communities and populations.
H4	Describe how health inequities are related to historical and contemporary structural inequities in power and privilege.
H5	Describe, explain and apply procedures for evidence-based planning and implementation of community health programs, policies and interventions.
H6	Recognize when existing approaches may not be culturally appropriate for a particular population and to collaborate with communities and others to design, implement and evaluate more suitable health programs.
H7	Identify, explain and apply steps and procedures based on social science approaches for evidence-based evaluation of community health programs, policies and interventions, including community based participatory research.
H8	Apply basic principles of biostatistics, epidemiology, environmental health sciences, and health policy and management to community health issues.
H9	Effectively communicate orally and in writing with public health professionals, members of the community, and stakeholders about community health issues, interventions, programs, and policies.
H10	Behave in an ethical manner in practice and research and in interactions with others.

Discipline Specific Competencies for MPH in EHS (Domain I - applies only to MPH students in EHS concentration)

Code	Competency
Domain I1: Environment Important to Health	
I1.1	Describe major direct and indirect human health and safety effects of major environmental or occupational agents or conditions.
I1.2	Identify the most important disease burdens with major environmental or occupational risk factors and the environmental or occupational risk factors that produce the most disease burden in either the general population or in heavily affected subgroups.
I1.3	Identify significant gaps in the current knowledge base concerning health effects of environmental or occupational agents.
I1.4	Be able to construct and interpret models of environmental health pathways to develop solutions to environmental health problems and exposures.
Domain I2: Toxicity and Toxicology	
I2.1	Explain the general mechanisms of toxicity in eliciting a toxic response to various environmental or occupational exposures.

Code	Competency
I2.2	Describe how chemical agents are tested for acute, sub-chronic and chronic health effects, including reproductive, developmental and carcinogenic effects, and use of "omics" methods, and interpret toxicological data in terms of relevance to human health.
Domain I3: Exposure and Exposure Assessment	
I3.1	Describe how humans are exposed to chemical, physical, and biological agents in the workplace and environment and how exposures are determined.
I3.2	Describe how exposures can be controlled through administrative procedures, personal protective equipment, various engineering technologies, and social interventions
Domain I4: Patterns of Disease and Epidemiology	
I4.1	Utilize epidemiological data, with due regard to statistical validity and sources bias, in the assessment of impacts of hazardous agents on the health of human populations
I4.2	Describe genetic, biological, psychosocial, and socio-economic factors that may affect susceptibility to adverse health outcomes following exposure to environmental hazards
Domain I5: Methods for Assessment	
I5.1	Use at least three of these assessment methods: quantitative risk assessment; burden of disease using disability-adjusted life years; spatial analysis and geographic information systems; health impact assessment; alternatives assessment.
I5.2	Identify areas of uncertainty in exposure and risk assessment processes
Domain I6: Environmental Health Policy	
I6.1	Describe major types of institutions responsible for occupational or environmental health policy
I6.2	Identify major state, federal, international regulatory programs or authorities for occupational or environmental health.
I6.3	Analyze policy contexts and develop responsive policy proposals reflecting environmental health science
I6.4	Define the important constructs used in policy analysis and development including risk, costs, benefits and the contribution of empirical work to them.
Domain I7: Equity and Justice	
I7.1	Define environmental justice and give examples of environmental exposures that are distributed unequally with regard to race/ethnicity and/or socio economic status.
I7.2	Explain how equity can be considered in environmental health.
Domain I8: Community Environments and Health	
I8.1	Describe importance of community and home environments and what contributes to cumulative impacts.
I8.2	Define the built environment.
Domain I9: Global Environments and Health	

Code	Competency
I9.1	Explain climate change and likely direct and indirect impacts on environment and health.
I9.2	Define major approaches for climate change mitigation and adaptation in California and internationally.
Domain I10: Communicating Science and Results	
I10.1	Organize information and data, prepare technical reports and give oral presentations on environmental contaminants and impacts.
I10.2	Communicate effectively with diverse audiences
Domain I11: Working through Cases, Finding Solutions	
I11.1	Draw upon scientific knowledge and assessment methods to develop approaches to assess, prevent and control environmental hazards that pose risks to human health and safety.
Domain I12: Communicating Science and Results	
I12.1	Present cogent and well substantiated arguments for actions to address environmental health concerns
I12.2	Draw upon key information sources and references essential to environmental health practice

Discipline Specific Competencies for MPH in Epi (Domain J - applies only to MPH students in Epi concentration)

Code	Competency
J1	Understand how to access, critique, and interpret epidemiological studies, including their strengths and weaknesses
J2	Describe a public health problem in terms of magnitude, person, time and place.
J3	Identify key sources of data for epidemiologic purposes
J4	Identify the principles and limitations of public health screening programs
J5	Apply the basic terminology and definitions of epidemiology, including definitions of populations, sources of bias, principles of causation for morbidity and mortality (both infectious and chronic), and risk and protective factors.
J6	Calculate basic epidemiology measures
J7	Draw appropriate inferences from epidemiologic data
J8	Effectively communicate orally and in writing epidemiologic information to lay and professional audiences.
J9	Behave in an ethical manner in the collection, maintenance, use and dissemination of epidemiologic data
J10	Identify, explain and apply epidemiologic principles and methods in a research, public health, or community setting.

Discipline Specific Competencies for MPH in HPM-Management (Domain K - applies only to MPH students in HPM-Management concentration)

Code	Competency
Domain K1: Health System Skills	
K1.1	Understands quality of care, patient safety, and other performance indicators in the context of the U.S. and international health systems.
K1.2	Describes and understands the main characteristics, components and issues of the organization, financing, and delivery of health services and public health systems in the U.S.
K1.3	Assesses the impact of determinants on population health and health status.
K1.4	Understands the impact of the heath care system on health disparities.
K1.5	Differentiates and understands private and government roles in health care delivery.
K1.6	Comprehends public and private payment methods used to finance health care.
K1.7	Applies knowledge of current legal concepts, such as statute and regulation, to health care delivery and the health care system.
K1.8	Analyzes economic decisions related to health care organizations and the health care system.
K1.9	Understands workforce issues and policies and their impact on the health system.
K1.10	Analyzes the effects of political, social and economic policies on health systems, community health, and access to care.
K1.11	Advocates for improvements in personal and population health status and a more effective and efficient health system.
K1.12	Understands quality of care, patient safety, and other performance indicators in the context of the U.S. and international health systems.
K1.13	Describes and understands the main characteristics, components and issues of the organization, financing, and delivery of health services and public health systems in the U.S.
Domain K2: Management Skills	
K2.1	Human Resources: Understands basic human resources policies and practices in order to ensure the appropriate mix of employee skills, knowledge and abilities so the organization can achieve its strategic goals.
K2.2	Organization Development and Change: Recognizes the need to change; determines what and how to change; and manages and leads the change process in order to improve organizational effectiveness.
K2.3	Organizational Design, Structural Analysis, and Process Management: Identifies the structure, processes and relationships in an organization and organizes them to achieve the organization's strategic initiatives.
K2.4	Financial Analysis: Understands and explains financial and accounting information.
K2.5	Information Management: Understands the use of electronic clinical and management information systems and decision support tools.

Code	Competency
K2.6	Market Analysis, Research, and Assessment: Analyzes consumer and purchaser behavior through market segmentation, and makes decisions based on tested communication, innovation and usage patterns.
K2.7	Organizational Awareness and Behavior Theory: Ability to understand and use the formal and informal decision-making structure, interpersonal networks, and power relationships in an organization to accomplish personal and organizational goals.
K2.8	Systems Thinking: Recognizes system level properties that result from dynamic interactions among individuals, groups, organizations, communities, and environments.
K2.9	Strategic Orientation: Considers the business, financial, demographic, ethno-cultural, political, and regulatory implications of decisions and develops strategies that ensure the viability and long-term success of the organization.
K2.10	Program and Project Planning, Management, Evaluation, and Implementation: Designs, develops, implements, and evaluates projects and programs to improve individual and community health.
K2.11	Quality and Performance Management: Understands and uses methodologies to assess, improve and monitor organizational quality and performance on diverse indicators; analyzes and designs or improves an organizational process, incorporating principles of quality measurement and customer satisfaction.
K2.12	The Managerial Role: Exemplifies and models healthcare managerial principles in daily managerial work.
Domain K3: Analytical Skills	
K3.1	Comprehends financial and economic analyses and their application.
K3.2	Identifies and analyzes problems, potential solutions and best practices in order to determine appropriate courses of action.
K3.3	Applies appropriate statistical tools, techniques and procedures to health management and policy.
K3.4	Achieves familiarity with use of data to conduct needs analysis, market assessment, outcome and process evaluation, forecasting, and quality improvement activities.
K3.5	Comprehends qualitative and quantitative data collection strategies.
K3.6	Interprets substantive results of statistical analyses in public health, management, and health policy studies.
K3.7	Finds, consults, and evaluates available sources (including research, expert advice, and existing data) to develop evidence-based plans of action.
K3.8	Analyzes interest group and stakeholder concerns.
K3.9	Assesses economic decisions of health care consumers, providers, organizations, and the health care system.
K3.10	Evaluates external environmental factors and their impact on the health system.

Code	Competency
K3.11	Utilizes creative and innovative thinking to arrive at solutions to critical issues, or to adopt previous solutions in new ways.
K3.12	Seeks to understand more deeply by searching for the root of issues, asking penetrating questions, uncovering complexity and going beyond routine questions.
K3.13	Comprehends financial and economic analyses and their application.
K3.14	Identifies and analyzes problems, potential solutions and best practices in order to determine appropriate courses of action.
K3.15	Applies appropriate statistical tools, techniques and procedures to health management and policy.
K3.16	Achieves familiarity with use of data to conduct needs analysis, market assessment, outcome and process evaluation, forecasting, and quality improvement activities.
Domain K4: Communication and Interpersonal Skills	
K4.1	Prepares well-written, effective, convincing managerial reports, including brief and precise executive summaries.
K4.2	Prepares and delivers logical, concise, persuasive oral presentations that can convince, influence or impress others to agree with your preferences.
K4.3	Tailors effective and culturally appropriate written and oral messages.
K4.4	Uses various methods to communicate effectively.
K4.5	Facilitates interactions with individuals and groups.
K4.6	Builds relationships and collaborates with colleagues and constituents.
K4.7	Work effectively in teams.
K4.8	Plans and chairs productive meetings.
K4.9	Demonstrates sensitivity to and awareness of emotional needs of self and others.
K4.10	Represents values of diversity and sensitivity to underrepresented and underserved groups in public health
Domain K5: Leadership Skills	
K5.1	Describes the attributes of leadership.
K5.2	Expresses and applies the organization's mission, set of core values, and vision to work and work group.
K5.3	Engages in dialogue and learning from others to advance the organization and health goals of the community.
K5.4	Contributes to high performance teams using team building, negotiation, and conflict management skills.
K5.5	Conveys transparency, integrity, and honesty in all actions.
K5.6	Embodies individual accountability while using collaborative methods for achieving organizational and community health goals.
K5.7	Applies social justice and human rights principles when addressing organization and community needs.
K5.8	Develops strategies to motivate others for collaborative problem-solving, decision-making, and evaluation.

Code	Competency
K5.9	Articulates the principles of leading organizational change, including assessment and measurement of organizational change efforts.
K5.10	Applies evidence-based principles to strategic and operational decision-making and performance management.
Domain K6: Professionalism Skills	
K6.1	Promotes high standards of personal and organizational integrity, compassion, and respect for all people.
K6.2	Operates in an open and honest manner consistent with professional standards of ethics and practice.
K6.3	Acknowledges and adheres to professional codes of ethics.
K6.4	Participates in the profession including professional organizations.
K6.5	Mentors junior colleagues by sharing expertise and experience.
K6.6	Engages in lifelong learning to assure personal and professional growth.
K6.7	Promotes community stewardship and social accountability.
K6.8	Develops professional identity and values.
K6.9	Establishes, builds and sustains professional network and relationships

Discipline Specific Competencies for MPH in HPM-Policy (Domain L - applies only to MPH students in HPM-Policy concentration)

Code	Competency
Domain L1: Health System Skills	
L1.1	Describe the role of the major US political institutions in health policy and politics.
L1.2	Describe conceptual frameworks for political agenda setting.
L1.3	Describes and understands the main characteristics, components and issues of the organization, financing, and delivery of health services and public health systems in the U.S.
L1.4	Assesses the impact of determinants on population health and health status.
L1.5	Understands the impact of the heath care system on health disparities.
L1.6	Differentiates and understands private and government roles in health care delivery.
L1.7	Comprehends public and private payment methods used to finance health care.
L1.8	Applies knowledge of current legal concepts, such as statute and regulation, to health care delivery and the health care system.
L1.9	Analyzes economic decisions related to health care organizations and the health care system.
L1.10	Understands workforce issues and policies and their impact on the health system.
L1.11	Analyzes the effects of political, social and economic policies on health systems, community health, and access to care.
L1.12	Advocates for improvements in personal and population health status and a more effective and efficient health system.

Code	Competency
L1.13	Describe the role of the major US political institutions in health policy and politics.
Domain L2: Management Skills	
L2.1	Organizational Awareness and Behavior Theory: Ability to understand and use the formal and informal decision-making structure, interpersonal networks, and power relationships in an organization to accomplish personal and organizational goals.
L2.2	Systems Thinking: Recognizes system level properties that result from dynamic interactions among individuals, groups, organizations, communities, and environments.
L2.3	Strategic Orientation: Considers the business, financial, demographic, ethno-cultural, political, and regulatory implications of decisions and develops strategies that ensure the viability and long-term success of the organization.
L2.4	Program and Project Planning, Management, Evaluation, and Implementation: Designs, develops, implements, and evaluates projects and programs to improve individual and community health.
L2.5	Quality and Performance Management: Understands and uses methodologies to assess, improve and monitor organizational quality and performance on diverse indicators; analyzes and designs or improves an organizational process, incorporating principles of quality measurement and customer satisfaction.
L2.6	The Managerial Role: Exemplifies and models healthcare managerial principles in daily managerial work.
Domain L3: Analytical Skills	
L3.1	Evaluate the efficiency of public policies using economic concepts.
L3.2	Critically evaluate both the methods and application of cost-effectiveness analysis to inform public health decision making.
L3.3	Synthesize the research literature, assessing strengths and weaknesses of publishing findings, to guide evidence-informed policymaking.
L3.4	Becomes an educated consumer of more complex analytical methods
L3.5	Identifies and analyzes problems, potential solutions and best practices in order to determine appropriate courses of action.
L3.6	Applies appropriate statistical tools, techniques and procedures to health management and policy.
L3.7	Achieves familiarity with use of data to conduct needs analysis, market assessment, outcome and process evaluation, forecasting, and quality improvement activities.
L3.8	Comprehends qualitative and quantitative data collection strategies.
L3.9	Interprets substantive results of statistical analyses in public health, management, and health policy studies.
L3.10	Finds, consults, and evaluates available sources (including research, expert advice, and existing data) to develop evidence-based plans of action.
L3.11	Analyzes interest group and stakeholder concerns.

Code	Competency
L3.12	Assesses economic decisions of health care consumers, providers, organizations, and the health care system.
L3.13	Evaluates external environmental factors and their impact on the health system.
L3.14	Utilizes creative and innovative thinking to arrive at solutions to critical issues, or to adopt previous solutions in new ways.
L3.15	Seeks to understand more deeply by searching for the root of issues, asking penetrating questions, uncovering complexity and going beyond routine questions.
Domain L4: Communication and Interpersonal Skills	
L4.1	Prepares well-written, effective, convincing policy reports, including brief and precise executive summaries.
L4.2	Prepares and delivers logical, concise, persuasive oral presentations that can convince, influence or impress others to agree with your preferences.
L4.3	Tailors effective and culturally appropriate written and oral messages.
L4.4	Uses various methods to communicate effectively.
L4.5	Facilitates interactions with individuals and groups.
L4.6	Builds relationships and collaborates with colleagues and constituents.
L4.7	Work effectively in teams.
L4.8	Plans and chairs productive meetings.
L4.9	Demonstrates sensitivity to and awareness of emotional needs of self and others.
L4.10	Represents values of diversity and sensitivity to underrepresented and underserved groups in public health
Domain L5: Leadership Skills	
L5.1	Describes the attributes of leadership.
L5.2	Expresses and applies the organization's mission, set of core values, and vision to work and work group.
L5.3	Engages in dialogue and learning from others to advance the organization and health goals of the community.
L5.4	Contributes to high performance teams using team building, negotiation, and conflict management skills.
L5.5	Conveys transparency, integrity, and honesty in all actions.
L5.6	Embodies individual accountability while using collaborative methods for achieving organizational and community health goals.
L5.7	Applies social justice and human rights principles when addressing organization and community needs.
L5.8	Develops strategies to motivate others for collaborative problem-solving, decision-making, and evaluation.
L5.9	Articulates the principles of leading organizational change, including assessment and measurement of organizational change efforts.
L5.10	Applies evidence-based principles to strategic and operational decision-making and performance management.
Domain L6: Professionalism Skills	

Code	Competency
L6.1	Promotes high standards of personal and organizational integrity, compassion, and respect for all people.
L6.2	Operates in an open and honest manner consistent with professional standards of ethics and practice.
L6.3	Acknowledges and adheres to professional codes of ethics.
L6.4	Participates in the profession including professional organizations.
L6.5	Mentors junior colleagues by sharing expertise and experience.
L6.6	Engages in lifelong learning to assure personal and professional growth.
L6.7	Promotes community stewardship and social accountability.
L6.8	Develops professional identity and values.
L6.9	Establishes, builds and sustains professional network and relationships

DrPH Competencies (Biostatistics Concentration)

Domain A: Develop skills to become an effective leader in the application of biostatistical principles to health-related problems.

Code	Competency
A1	Become an effective leader in the statistical and or public health communities.
A2	Develop skills, knowledge and confidence to enable the creation of public health projects including subject matter relevance, design, and public health significance.
A3	Develop skills necessary to promote collegiality in a collaborative team of scientists.
A4	Develop management and scientific skills to effectively lead a public health project as principal investigator or chief scientist.

Domain B: Develop skills to serve as an effective biostatistician on a collaborative team of scientists working on public health problems.

Code	Competency
B1	Collaborate with researchers to formulate the aims of a public health research project.
B2	Formulate a public health question in statistical terms.
B3	Identify the strengths and weaknesses of different study designs to address public health and scientific questions; communicate these issues to public health researchers.
B4	Assist in the development of data collection tools; evaluate these tools from a statistical vantage point.
B5	Identify and implement steps necessary to insure the quality of data collected in a study.
B6	Conduct appropriate statistical analyses of study data and interpret the results.
B7	Effectively communicate the assumptions and results of analyses through oral and written communications to the collaborative team.
B8	Research biostatistical methods and computational resources for collaborative research.
B9	Adhere to and promote high ethical standards in the conduct of studies, including data collection, statistical analysis, and publication.

Domain C: Effectively communicate biostatical concepts, methods and analyses to scientists, public health professionals, students and other biostatisticians

Code	Competency
C1	Gauge the statistical skill set of an audience to appropriately customize the level of biostatistical presentations.

Code	Competency
C2	Become an effective biostatistics teacher of students who are not biostatistics majors but wish to apply biostatistics to their substantive fields.
C3	Become an effective biostatistics teacher of students whose goals are to become professional biostatisticians.
C4	Effectively communicate statistical concepts and reasoning to public health collaborators.
C5	Learn to write and disseminate substantive field publications and communicate the statistical portion of the methodology to a substantive field audience.
C6	Learn digital tools useful for communication.
C7	Be able to articulate interdisciplinary approaches to solving public health problems.
C8	Become an effective spokesperson for promoting the application of good statistical practice in public health.

Domain D: Perform and disseminate work applying biostatistical principles to address important problems in public health and related fields.

Code	Competency
D1	Critically review and interpret the biostatistical literature relevant to the application.
D2	Write and present effective and clear reports or publications about the application of statistical methods to health problems.
D3	Develop software and digital tools as necessary to apply statistical methodology.
D4	Develop the skills to become sufficiently knowledgeable about the health related subject-matter to be able to make significant contributions.
D5	Understand and be able to effectively communicate the public health significance of the problems being addressed.

Domain E: Develop skills to enable life-long learning in biostatistics applied to public health

Code	Competency
E1	Develop ability to critically read statistical methodological literature relevant to public health problems.
E2	Develop ability to critically read literature on contemporary public health problems and to identify the salient statistical issues.
E3	Develop ability to comprehend and be engaged in seminars and presentations on biostatistical research.
E4	Develop ability to comprehend seminars and presentations in public health sciences and to distill the critical and salient statistical issues.
E5	Develop ability to evaluate and incorporate new and evolving computational and digital technologies into biostatistical work.

Biostatistics MS Competencies

Domain A: Develop skills to serve as an effective biostatistician on a collaborative team of scientists working on public health problems.

Code	Competency
A1	Collaborate with researchers to formulate the aims of a public health research project.
A2	Formulate a public health question in statistical terms.
A3	Identify the strengths and weaknesses of different study designs to address public health and scientific questions; communicate these issues to public health researchers
A4	Assist in the development of data collection tools; evaluate these tools from a statistical vantage point.
A5	Identify and implement steps necessary to insure the quality of data collected in a study.
A6	Conduct appropriate statistical analyses of study data and interpret the results.
A7	Effectively communicate the assumptions and results of analyses through oral and written communications to the collaborative team.
A8	Use statistical software to answer research questions and communicate the results to other research professionals.

Domain B: Effectively communicate biostatical concepts, methods and analyses to scientists, public health professionals, students and other biostatisticians.

Code	Competency
B1	Gauge the statistical skill set of an audience to appropriately customize the level of biostatistical presentations.
B2	Effectively communicate statistical concepts and reasoning to public health collaborators.
B3	Learn to write and disseminate substantive field publications and communicate the statistical portion of the methodology to a substantive field audience.
B4	Learn digital tools useful for communication.
B5	Be able to articulate interdisciplinary approaches to solving public health problems.

Domain C: Develop skills to enable life-long learning in biostatistics applied to public health.

Code	Competency
C1	Develop ability to critically read literature on contemporary public health problems and to identify the salient statistical issues.
C2	Develop ability to comprehend and be engaged in seminars and presentations on biostatistical research.
C3	Develop ability to comprehend seminars and presentations in public health sciences and to distill the critical and salient statistical issues.
C4	Develop ability to use new and evolving computational and digital technologies into biostatistical work.

Biostatistics PhD Competencies

Domain A: Develop skills to serve as an effective biostatistician on a collaborative team of scientists working on public health problems.

Code	Competency
A1	Collaborate with researchers to formulate the aims of a public health research project.
A2	Formulate a public health or scientific question in statistical terms.
A3	Identify the strengths and weaknesses of different study designs to address public health and scientific questions; communicate these issues to public health researchers.
A4	Identify and implement steps necessary to insure the quality of data collected in a study.
A5	Conduct appropriate statistical analyses of study data and interpret the results.
A6	Effectively communicate the assumptions and results of analyses through oral and written communications to the collaborative team.
A7	Develop skills necessary to promote collegiality in a collaborative team of scientists.
A8	Research biostatistical methods and computational resources for collaborative research.
A9	Adhere to and promote high ethical standards in the conduct of studies, including data collection, statistical analysis, and publication.

Domain B: Develop skills to enable life-long learning in biostatistics.

Code	Competency
B1	Develop ability to critically read statistical methodological literature.
B2	Develop ability to critically read literature on contemporary public health problems and to identify the salient statistical issues.
B3	Develop ability to comprehend and be engaged in seminars and presentations on biostatistical research.
B4	Develop ability to comprehend seminars and presentations in public health sciences and to distill the critical and salient statistical issues
B5	Develop ability to evaluate and incorporate new and evolving computational and digital technologies into biostatistical work.

Domain C: perform and publish original research in the theory and methodology of biostatistics.

Code	Competency
C1	Gauge the statistical skill set of an audience to appropriately customize the level of biostatistical presentations.
C2	Effectively communicate statistical concepts and reasoning to public health collaborators.

Code	Competency
C3	Learn to write and disseminate substantive field publications and communicate the statistical portion of the methodology to a substantive field audience.
C4	Learn digital tools useful for communication.
C5	Be able to articulate interdisciplinary approaches to solving public health problems.
C6	Develop software and digital tools to implement novel biostatistical methodologies.
C7	Organize and present effective seminars on biostatistical research.

Domain D: Effectively communicate biostatistical concepts, methods and analyses to scientists, public health professionals, students and other biostatisticians

Code	Competency
D1	Gauge the statistical skill set of an audience to appropriately customize the level of biostatistical presentations.
D2	Become an effective biostatistics teacher of students who are not biostatistics majors but wish to apply biostatistics to their substantive fields.
D3	Become an effective biostatistics teacher of students whose goals are to become professional biostatisticians.
D4	Effectively communicate statistical concepts and reasoning to public health collaborators.
D5	Learn to write and publish biostatistical methodology in biostatistical journal articles and books.
D6	Learn to write and publish substantive field publications and communicate the statistical portion of the methodology to a substantive field audience.
D7	Learn current and future digital tools useful for communication.
D8	Become an effective leader in the statistical or public health communities.

Community Health Sciences (CHS) MSPH Competencies

Code	Competency
1	Access and understand relevant sources of information and data about community health.
2	Describe theories, concepts, models from the social and behavioral sciences and apply these theories to community health research.
3	Identify and explain how social, cultural, and behavioral factors affect the health of individuals, communities and populations.
4	Describe how health inequities are related to historical and contemporary structural inequities in power and privilege.
5	Describe, explain, and apply social and behavioral science methods and basic epidemiological principles to community health research.
6	Respect diversity and when existing theories and research methods are not appropriate to a particular population to identify resources and collaborators to select and apply appropriate methods.
7	Identify, explain and apply steps and procedures based on social science approaches for evidence-based evaluation about community health programs, policies and interventions, including community-based participatory research.
8	Conduct analysis of public health data, interpret findings, and draw conclusions about community health.
9	Effectively communicate orally and in writing with public health professionals, researchers, members of the community, and stakeholders about community health research findings.
10	Behave in an ethical manner in practice and research and in interactions with others.
11	Access and understand relevant sources of information and data about community health.

Community Health Sciences (CHS) Ph.D. Competencies

Code	Competency
1	Locate, identify, critically evaluate, and synthesize social, behavioral, and public health research literature.
2	Explain, critique, synthesize, and elaborate major social, behavioral, and public health theories about the social determinants of health and health behavior and apply these theories to an area of research.
3	Review and critique in depth both foundational and cutting-edge work in the student's specific research area, and identify avenues for new research and/or theoretical development.
4	Demonstrate expertise in advanced research methods (including research design and implementation, data analysis, and statistics) in the social and behavioral sciences and apply these methods to conduct hypothesis-testing and/or hypothesis-generating research in the student's own area of research.
5	Formulate a research question on an important public health topic, design a rigorous and original empirical study to answer it, conduct that study, interpret the results, and draw conclusions.
6	Design and implement research that is responsive to potential concerns about research, research methods, and public health issues among diverse social groups, cultural, racial/ethnic, national origin, linguistic, gender, sexual orientation, and community group.
7	Be prepared to teach a course in public health, including developing a teaching philosophy and applying it to the originating a syllabus and course materials, incorporating core competencies, and identifying pedagogical tools for communicating information and ideas to students.
8	Disseminate research findings, including prepare a scientific article suitable for a refereed journal based on an original research project, submit the article for publication, respond to critiques of journal reviewers, and take appropriate action in response to a rejection.
9	Make comprehensible and articulate presentations at national and international professional conferences and to lay audiences.
10	Explain the principles of research ethics and apply these principles to specific research projects, and be able to identify and resolve the specific ethical considerations likely to arise in particular research designs in the student's own area of research.

Environmental Health Science (EHS) MS Competencies

Domain A: Access, critique, and interpret environmental health studies.

Code	Competency
A1	Retrieve and organize literature; synthesize and critically evaluate scientific literature in environmental health, public health and other relevant fields.
A2	Use existing databases to provide background information or data to address research questions and draw appropriate inferences/estimates from environmental health data.
A3	Evaluate seminars and presentations in environmental health and distill the critical and salient issues from them.

Domain B: Design a research study

Code	Competency
B1	Formulate a research question.
B2	Evaluate the scientific merit and feasibility of study designs.
B3	Identify an appropriate target population or organism for investigating the research question.
B4	Identify potential sources of systematic error (bias) as well as random error.
B5	Be able to articulate interdisciplinary approaches to solving public health problems.
B6	Identify potential sources of systematic error (bias) as well as random error.
B7	Implement and use a project monitoring system.

Domain C: Analyze data

Code	Competency
C1	Use computer systems and analytic software packages.
C2	Produce working tables, statistical summaries, and effective figures to summarize data.

Domain D: Interpret data

Code	Competency
D1	Make reasonable inferences from results of analysis of observational and analytic studies

Domain E: **Communicate effectively with wide variety of colleagues and stakeholders**

Code	Competency
E1	Prepare presentation materials including outlines, posters, and Powerpoint presentations.
E2	Deliver effective oral presentations individually and as part of a team.
E3	Explain and interpret research findings for students, professionals, the public, and media.
E4	Work effectively as part of an interdisciplinary team.

Domain F: **Ethics and safety**

Code	Competency
E1	Understand the concepts of human subject protection and confidentiality.
E2	Recognize ethical issues that arise in research.
E3	Identify circumstances when Institutional Review Board, Institutional Biosafety Committee and/or Animal Care and Use Committee review and/or approval is required.
E4	Identify and implement appropriate safety controls and practices.

Environmental Health Science (EHS) PhD Competencies

Domain A: Access, critique, and interpret environmental health studies.

Code	Competency
A1	Judge, critique and interpret reports of individual environmental health studies; evaluate strengths and limitations of environmental health reports

Domain B: Design a research study

Code	Competency
B1	Formulate a research question and determine the appropriate study aims, objectives, study design and hypothesis to address the research question.
B2	Develop and assess appropriate data collection instruments (e.g., questionnaires, physical exam, lab assays, etc.) and evaluate the use of questionnaires and measurement instruments in collection of data to maintain internal validity
B3	Write a scientific proposal including developing specific aims and appropriate background and describing methods in needed detail
B4	Plan and implement quality assurance and quality control procedures for data collection in different study designs

Domain C: Analyze data

Code	Competency
C1	Apply advanced informatics techniques in the description of public health characteristics and in public health research and evaluation
C2	Identify issues needing consultation with a biostatistician

Domain D: Interpret data

Code	Competency
D1	Apply scientific and statistical reasoning and methods to address, analyze, and solve problems in public health
D2	Deduce environmental and public health implications of research results and propose subsequent studies
D3	Make appropriate policy recommendations on the basis of research results and interpretation

***Domain E:* Communicate effectively with wide variety of colleagues and stakeholders**

Code	Competency
E1	Gauge the cultural background, knowledge base and skills of an audience to appropriately customize communications for the target audience.
E2	Organize and make oral presentations to professionals ranging from brief scientific presentations of research findings to longer presentations.
E3	Write a publishable manuscript.
E4	Promote collegiality in interdisciplinary teams.

Code	Competency
E5	Demonstrate leadership in interdisciplinary teams, including project management, negotiation and conflict resolution

Domain F: **Ethics and safety**

Code	Competency
E1	Understand the norms and principles of research ethics and demonstrate an ability to incorporate those principles into study designs, programs of data management and quality assurance.
E2	Prepare an application to an Institutional Review Board, Institutional Biosafety Committee and/or Animal Care and Use Committee.
E3	Be able to resolve ethical dilemmas in designing and conducting research.
E4	Develop procedures to assure confidentiality if working with human subjects
E5	Develop appropriate SOPs for safe laboratory and research practices as part of an integrated approach to safety
E6	Train undergraduate and master's students in safe laboratory practices

Domain G: **Relevance and applications of Environmental Research to Public Health**

Code	Competency
G1	Identify environmental health problems requiring additional investigation and research.
G2	Identify existing knowledge gaps amenable to clarification through environmental health research.

Epidemiology MS Competencies

Code	Competency
1	Understand how to access, critique, and interpret epidemiological studies, including their strengths and weaknesses
2	Describe a public health problem in terms of magnitude, person, time and place.
3	Identify key sources of data for epidemiologic purposes
4	Identify the principles and limitations of public health screening programs
5	Apply the basic terminology and definitions of epidemiology, including definitions of populations, sources of bias, principles of causation for morbidity and mortality (both infectious and chronic), and risk and protective factors.
6	Calculate basic epidemiology measures
7	Draw appropriate inferences from epidemiologic data
8	Effectively communicate orally and in writing epidemiologic information to lay and professional audiences.
9	Behave in an ethical manner in the collection, maintenance, use and dissemination of epidemiologic data
10	Identify, explain and apply epidemiologic principles and methods in a research, public health, or community setting.
11	Comprehensively design and implement an epidemiologic research study of publishable quality

Epidemiology PhD Competencies

Code	Competency
1	Locate, identify, critically evaluate, and synthesize current epidemiologic literature and identify avenues for new research and/or theoretical development
2	Describe a public health problem in terms of magnitude, person, time and place.
3	Identify key sources of data for epidemiologic purposes
4	Identify the principles and limitations of public health screening programs
5	Explain the principles of pathological processes that underlie human morbidity and mortality
6	Demonstrate expertise in applying terminology and definitions used in epidemiology, including definitions of populations, bias, principles of causation for morbidity and mortality (both infectious and chronic), and risk and protective factors.
7	Demonstrate expertise in advanced epidemiologic research methods (including research design and implementation, data analysis and statistics) and apply these methods to conduct hypothesis-testing research in the student's own area of research

Code	Competency
8	Formulate a research question on an important epidemiologic topic, design a rigorous and original empirical study to answer it, conduct that study, interpret the results, and draw conclusions
9	Make comprehensible and articulate presentations at national and international professional conferences and effectively communicate, both orally and in writing, epidemiologic information to lay and professional audiences.
10	Explain the principles of research ethics and apply these principles to specific research projects, and be able to identify and resolve the specific ethical considerations likely to arise in the student's own area of research

Health Policy & Management (HPM) MS & PhD Competencies

The Department of Health Policy and Management adopted as its competency model for its PhD program the Agency for Healthcare Research and Quality-sponsored AcademyHealth-developed list of Health Services Research Core Competencies which were designed to specify competencies common to all doctoral trained health services research professionals. The Department also adopted this list of competencies for its MS program. This decision was made because the MS and PhD students take the same core coursework in research design (HPM 225A, HPM225B), statistical analysis of data (BIOSTATS 201A, BIOSTATS 201B), and introduction to the health and health care services (HPM200A, HPM200B). These courses, taught at a high level, provide a solid grounding in the competencies at the depth reflected in the competency description below for all the competencies except (9) professional development. The MS and PhD students in these courses meet the same requirements and are held to the same standards. It would be a misrepresentation of the expectations for level of expertise or competency of the MS and PhD students in this core coursework to suggest that the standards are different for the two programs or to adopt different language to describe the expected competency. Where the programs differ is not in the depth of expertise or competency expected of the students but of the breadth of training and the range of competencies.

Code	Competency
1	Acquire knowledge of the context of health and health care systems, institutions, actors, and environment.
2	Apply or develop theoretical and conceptual models relevant to health services research.
3	Pose relevant and important research questions, evaluate them, and formulate solutions to health problems, practice and policy.
4	Use or develop a conceptual model to specify study constructs for a health services research question and develop variables that reliably and validly measure these constructs.
5	Describe the strengths and weaknesses of study designs to appropriately address specific health services research questions.
6	Sample and collect primary health and health care data and/or assemble and manage existing data from public and private sources.
7	Execute and document procedures that ensure the reproducibility of the science, the responsible use of resources, the ethical treatment of research subjects.
8	Demonstrate proficiency in the appropriate application of analytical techniques to evaluate HSR questions.
9	Work collaboratively in teams within disciplines, across disciplines, and/or with stakeholders.

Code	Competency
10	Effectively communicate the process, findings, and implications of health services research through multiple modalities with stakeholders.
11	Knowledge translation to policy and practice.