APPENDIX: Concentration Specific Competencies

Your practicum should allow you to apply at least 5 of these concentration-specific competencies learned in the academic program to a public health setting.

Biostatistics

- Describe the roles biostatistics serves in the discipline of public health.
- Distinguish among the different measurement scales and the implications for selection of statistical methods to be used based on these distinctions.
- Apply descriptive techniques commonly used to summarize public health data.
- Describe basic concepts of probability, random variation and commonly used statistical probability distributions.
- Apply common statistical methods for inference.
- Describe preferred methodological alternatives to commonly used statistical methods when assumptions are violated.
- Apply descriptive and inferential methodologies according to the type of study design for answering a particular research question.
- Interpret results of statistical analyses found in public health studies.
- Develop written and oral presentations based on statistical analyses for both public health professionals and educated lay audiences.
- 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.
- Apply biostatistical methods to the design of studies in public health.
- Use computers to appropriately store, manage, manipulate and process data for a research study using modern software.
- Select and conduct appropriate statistical analysis.
- Integrate analysis strategies in biostatistics with principles and issues in epidemiology.
- Describe conceptual frameworks in biostatistics.
- Critically evaluate basic statistical aspects of public health research reported in the literature.

Epidemiology

- Explain the importance of epidemiology for informing scientific, ethical, economic and political discussion on health issues.
- Describe a public health problem in terms of magnitude, person, time and place.
- Apply the basic terminology and definitions of epidemiology.
- Identify key sources of data for epidemiologic purposes.
- Calculate basic measures.
- Evaluate the strengths and limitations of epidemiologic reports.
- Draw appropriate inferences from epidemiologic data.
- Communicate epidemiologic information to lay and professional audiences.
- Comprehend basic ethical and legal principles pertaining to the collection, maintenance, use and dissemination of epidemiologic data.
- Identify the principles and limitations of public health screening programs.
- Articulate the role of epidemiology in preserving and improving public health. Contrast the epidemiologic population-based approach with the clinical perspective. Pose the appropriate...
research question when given a public health or medical problem requiring a epidemiologic investigation.

- Identify sources of health-related data in order to describe the distribution of disease in populations. Generate hypotheses from descriptive data on disease frequency in relation to person, place and time. Interpret health status indices based on these data, such as mortality and morbidity rates.
- Explain the critical differences between epidemiologic descriptive and analytic study designs, the measures that can be estimated from each, and their strengths and limitations. Describe how to select an appropriate study design for a specific research question or health problem.
- Develop field epidemiological procedures consistent with recognized standards of good epidemiological practice. Identify practical issues in conducting epidemiologic studies.
- Identify primary and secondary sources of health data and methods for accessing these sources. Identify the key theoretical and practical issues in selecting study subjects. Identify demographic, social/behavioral and environmental factors which have an impact on the problem under investigation.
- Analyze data using appropriate epidemiologic and biostatistical techniques under the guidance of someone with more advanced training. Define, compute, and interpret epidemiologic measures of prevalence, incidence, relative risk, attributable risk, mortality ratios and estimates of their variance. Use computer software for data processing and statistical analyses.
- Recognize the various forms of potential bias in epidemiological data and their potential for occurrence in specific study situations. Propose methods to measure them and (adjust for them) reduce their influence on the measures of major interest. Explain and apply methods of standardization or adjustment for factors such as age and gender in a study population. Discuss the implications of study findings.
- Evaluate the evidence in favor of and against the likelihood that an observed association in epidemiologic studies is causal using a set of criteria. Define the concept of the multifactorial nature of disease.
- Conduct a systematic critical assessment of published epidemiological and clinical studies and present these findings to a variety of audiences.
- Evaluate the extent to which existing epidemiological findings can be translated into practical public health interventions.
- Articulate the role of epidemiology in public health surveillance. Present the purpose and problems of interpretation in surveillance for acute and chronic diseases and other factors important for public health.

Health Policy and Management

- Identify the main components of the organization, financing and delivery of health services and public health system in the U.S.
- Describe the policy process for improving the health status of populations.
- Describe the legal and ethical bases of public health and health services.
- Apply quality and performance improvement concepts to address organizational performance issues.
- Demonstrate leadership skills for building partnerships.
- Apply principles of strategic planning and marketing to public health.
- Communicate health policy and management issues using appropriate channels and technologies.
- Apply the principles of program planning, development, budgeting, management and
evaluation in organizational and community initiatives.

- Explain methods of ensuring community health and safety preparedness.
- Apply “systems thinking” for resolving organizational problems.
- Identify and analyze the social, economic, legal, ethical and political issues germane to national and local health policies.
- Demonstrate knowledge of the history, dynamics, structure, financing and function of the health care delivery system.
- Apply theoretical concepts and practical techniques of administration to the management of health programs.
- Design and implement effective health services.
- Prepare budgets for and control the financial performance of health organizations.
- Plan and implement research, quality improvement and/or evaluation projects within agencies, institutions and organizations.
- Identify, analyze and solve strategic and operational leadership and managerial problems.
- Demonstrate a mastery of oral and written communication skills.

Community Health Education

- Describe the role of social and community factors in both the onset and solution of public health problems.
- Identify the causes of social and behavioral factors that affect health of individuals and populations.
- Identify basic theories, concepts and models from a range of social and behavioral disciplines that are used in public health research and practice.
- Apply ethical principles to public health program planning, implementation and evaluation.
- Specify multiple targets and levels of intervention for social and behavioral science programs and/or policies.
- Identify individual, organizational and community concerns, assets, resources and deficits for social and behavioral science interventions.
- Apply evidence-based approaches in the development and evaluation of social and behavioral science interventions.
- Describe the merits of social and behavioral science interventions and policies.
- Describe steps and procedures for the planning, implementation and evaluation of public health programs, policies and interventions.
- Identify critical stakeholders for the planning, implementation and evaluation of public health programs, policies and interventions.
- Conduct health needs assessments at both the individual and community level, including analysis of social, political and bureaucratic barriers that impede health promotion efforts.
- Identify, analyze and interpret factors influencing people's health status through a strong foundation in epidemiology and social and behavioral theory.
- Demonstrate sensitivity to diversity in communities.
- Plan, develop, and implement community health education programs using a variety of strategies to improve a community's health.
- Develop, analyze and evaluate public policies that have an impact on people's health.
- Manage and administer fiscal and organizational resources to insure optimal program and service delivery.
- Evaluate the process and outcome of community-based health education programs.
- Identify and articulate the ethical dilemmas inherent in planned, intentional social and
behavioral change strategies.
- Communicate the mission of public health effectively.

**Environmental Health Sciences**
- Specify approaches for assessing, preventing and controlling environmental hazards that pose risk to human health and safety.
- Describe the direct and indirect human, ecological and safety effects of major environmental and occupational agents.
- Specify current environmental risk assessment methods.
- Describe genetic, physiologic and psychosocial factors that affect susceptibility to adverse health outcomes following exposure to environmental hazards.
- Discuss various risk management and risk communication approaches in relation to issues of environmental justice and equity.
- Explain the general mechanisms toxicity in eliciting a toxic response to various environmental exposures.
- Develop a testable model of environmental insult.
- Describe federal and state regulatory programs, guidelines and authorities that control environmental health issues.
- Recognize the major sources of environmental insults and the physical, chemical, radiological, and biological characteristics involved in establishing materials as potentially deleterious.
- Assess the potential impact of these insults on human health.
- Explain the factors and principles basic to determining the pathways by which humans are exposed to environmental insults.
- Evaluate the environmental fate and transport of materials and biological uptake by humans.
- Apply models for estimating human exposure from the dispersion of contaminants into air, surface and ground water.
- Determine the biological basis of injury for a given exposure to toxic materials through environmental pathways and the resulting human health effects produced from such exposure.
- Interpret models used to perform risk assessments for exposure to such materials.
- Critique the basic methods for measuring environmental media, requirements for sampling, the sensitivity and reliability of analytical methods.
- Identify mandates from regulatory agencies, advisory bodies and professional organizations for the development and dissemination of technical information which control policies for environmental health problems.
- Demonstrate skills in technology transfer acquired during academic training.

**Worcester MPH**
- Be competent in the identification and interpretation of health-related data in order to describe the distribution of disease in populations.
- Identify and analyze the social, economic, legal, ethical and political issues germane to national and local health policies.
- Explain the factors and principles basic to determining the pathways by which humans are exposed to environmental insults.
- Demonstrate knowledge of the history, dynamics, structure, financing and function of the health care delivery system.
- Conduct health needs assessments at both the individual and community level, including analysis of social, political and bureaucratic barriers that impede health promotion efforts.
Apply theoretical concepts and practical techniques of administration to the development and management of health programs.

Demonstrate knowledge of terms, concepts and methods in biostatistics and data management.

Manage and analyze data using appropriate epidemiologic and biostatistical techniques under the guidance of someone with more advanced training.

Critically evaluate statistical aspects of public health practice and research.

Demonstrate a mastery of oral and written communication skills, especially vis a vis the missions of public health and community based health education. Interpret and communicate results of studies to public health practitioners and the public.

Demonstrate sensitivity to diversity in communities.

**Nutrition**

- Critique the terms, concepts and methods in nutritional sciences and in public health.
- Select and use appropriate anthropometric, biochemical, clinical, dietary, functional and socioeconomic assessment techniques to identify and prioritize nutritional problems and needs of populations and communities.
- Develop intervention strategies to correct nutritional problems in target populations.
- Demonstrate critical thinking skills in evaluation of the literature.
- Design and conduct applied nutrition research.
- Describe the role of agencies, advisory bodies, and professional organizations responsible for development and dissemination of technical information and for formulation of nutritional policies.
- Identify the relationships between local, national, and global nutritional and public health problems.
- Translate results of nutritional research to different target populations (public, peers, parents, etc.).
- Integrate knowledge in nutrition, public health, and other disciplines for the identification and evaluation of nutritional problems and in development and implementation of guidelines and policies.