

Recommendations for Undergraduate Public Health Education

October 2008



Public Health
101



Epidemiology
101



Global Health
101

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Association
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ASSOCIATION FOR PREVENTION TEACHING AND RESEARCH

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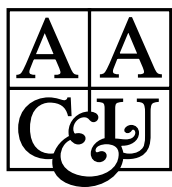
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The recommendations draw heavily on *The Educated Citizen and Public Health: A Consensus Report on Public Health and Undergraduate Education* published by the Council of Colleges of Arts and Sciences through the APTR-CDC Cooperative Agreement (www.ccas.net). Feedback on draft recommendations was sought as part of version 1, 2, and 3 of the Curriculum Guide for Undergraduate Public Health Education. A PDF version of the full Curriculum Guide is available at www.teachpublichealth.org and www.aacu.org.

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1 Review and Recommendations

In 2003, the Institute of Medicine (IOM) of the National Academies concluded that keeping the public healthy required not only a well-educated public health workforce but also an educated citizenry. It therefore recommended that “all undergraduates should have access to education in public health.”¹

In November 2006 a Consensus Conference on Undergraduate Public Health Education developed a set of implementation recommendations. The Consensus Conference was convened by the Association for Prevention Teaching and Research (APTR) Healthy People Curriculum Task Force, which includes representatives of seven health-professions educational associations. The conference was co-sponsored by Council of Colleges of Arts and Sciences (CCAS) and the Association of Schools of Public Health (ASPH). The full report of the Consensus Conference is available at www.ccas.net under publications. Participants in the Consensus Conference, which included the Association of Schools of Public Health and the Council of Colleges of Arts and Sciences, agreed on the following basic principles:

- The aim and rationale for an integrative undergraduate public health program within general and liberal education is to develop an educated citizenry.
- Introductory public health courses should be designed to fulfill the essential learning outcomes of Liberal Education and America’s Promise (LEAP), the signature campaign of AAC&U.
- Introductory public health courses should be designed to fulfill general education requirements. Minors in public health or global health should build intentionally on introductory/core curricula.

Both arts and sciences and public health should share in fostering and developing an educated citizenry. Such citizens should be able to recognize the spectrum of global health challenges and exercise intellectual and practical skills in response. As LEAP recommends, well-educated citizens ought to be prepared to accept personal and social responsibility and demonstrate capacity to synthesize, integrate, and apply their learning. The fields of public health offer intrinsically interesting subjects of study while enabling students to address vital social issues and to do so with an awareness of world context. An integrative, intentionally designed study of public health should thus promote engagement with democracy.

The LEAP essential learning outcomes follow in box 1. Achievement of these learning outcomes can be initiated through the recommended core curriculum outlined in this guide. Experiential learning activities, such as service-learning, are readily integrated into and, ideally, scaffolded through the curriculum in public health.

Public health may be integrated into general and liberal education in a number of ways. These include development of integrative courses focused on a particular issue, such as HIV-AIDS or tobacco control, that draw on multiple disciplines. An integrative multidisciplinary curriculum incorporating elements of the

¹Gebbie K, Rosenstock L, Hernandez LM. Who will keep the public healthy? Educating public health professionals for the 21st century. Washington DC: National Academy Press, 2003: 144.

sciences, social sciences, and humanities may also be effective.

The approach outlined in these recommendations focuses on the development of three core courses, each of which is designed to fulfill general education requirements. All three of the following courses could be taken as part of general education and could form the core curriculum for a minor in public health.

The three courses that are outlined in detail in these recommendations are:

1. **Public Health 101**
An introductory overview course designed to fulfill a social science requirement, perhaps integrated into the humanities, advancing both intellectual and practical skills and embracing civic learning and application.
2. **Epidemiology 101**
An introductory course illustrating the scientific method and designed to fulfill a science requirement, including the option for an “epidemiology laboratory,” integrating such skills as quantitative thinking, inquiry and analysis, and teamwork.
3. **Global Health 101**
An introductory course focused on applying public health principles in developing as well as developed countries, designed to fulfill a global studies integrative requirement, perhaps incorporating service and research.

Public health practitioners as well as faculty from clinical disciplines that apply public health principles, such as nursing, may be eager to collaborate in order to expose students to the world of public health practice.

The Essential Learning Outcomes



★ Knowledge of Human Cultures and the Physical and Natural World

- Through study in the sciences and mathematics, social sciences, humanities, histories, languages, and the arts

Focused by engagement with big questions, both contemporary and enduring

★ Intellectual and Practical Skills, including

- Inquiry and analysis
- Critical and creative thinking
- Written and oral communication
- Quantitative literacy
- Information literacy
- Teamwork and problem solving

Practiced extensively, across the curriculum, in the context of progressively more challenging problems, projects, and standards for performance

★ Personal and Social Responsibility, including

- Civic knowledge and engagement—local and global
- Intercultural knowledge and competence
- Ethical reasoning and action
- Foundations and skills for lifelong learning

Anchored through active involvement with diverse communities and real-world challenges

★ Integrative Learning, including

- Synthesis and advanced accomplishment across general and specialized studies

Demonstrated through the application of knowledge, skills, and responsibilities to new settings and complex problems

LEAP Vision and Activities: The LEAP campaign is organized around a 21st century vision of liberal education—a design for learning that broadens horizons, fosters transferable knowledge and skills, and cultivates a strong sense of ethical and social responsibility. Characterized by challenging encounters with important issues, a liberal education—comprising both general education and one or more major and minor fields, and spanning the undergraduate professional and pre-professional majors as well as the arts and sciences—prepares graduates for both socially valued work and active citizenship in a diverse and globally engaged democracy.

²Association of American Colleges and Universities, College Learning for the New Global Century, Washington D.C. 2007, 3.

2 Undergraduate Public Health Education Core Courses

Principles for Design of Core Courses

Three core public health courses are recommended for all colleges and universities. These courses should be designed in an intentional and integrative way to satisfy each institution's general education program and thus contribute to the overall liberal education experience. The core courses are:

- Public Health 101
- Epidemiology 101
- Global Health 101

These three courses are intended to be organized so that a student can take all three. Each may be designed to be taken without prerequisites. The design assumes a modest degree of overlap, which will require careful coordination. For instance basic principles of epidemiology are included in Public Health 101 and repeated in Epidemiology 101 as well as Global Health 101. This plan is consistent with a need to understand these concepts as central to an evidence-based public health or population health approach, which should underlie all three courses.

This evidence-based approach to public health has four components:

1. Problem—identify the problem
2. Cause—identify risk factors or if possible, contributory causes
3. Recommendations—consider evidence-based recommendations for potential interventions to control or eliminate the problem
4. Implementation—develop a strategy for putting one or more interventions into practice and evaluating the outcomes

All three core courses are designed to prepare students for the LEAP outcome of life-long learning. As such the courses should teach students how to frame questions, analyze underlying causes, brainstorm solutions, and critically analyze the methods for implementation. An evidence-based public health or population health approach can help students to achieve all of these objectives. An extended example of the population health approach, with links to an array of Internet resources, is available at www.teachpublichealth.org under resources.

These three courses should be designed to fulfill general education requirements. For instance, if a college or university requires a social science, science, and/or global course credit or equivalent experience within general education, either the set of courses or individual courses may be applicable.

For institutions with integrative general education programs, these courses may be designed to offer excellent cross-cutting public health examples. For instance HIV-AIDS might be a topic for a cross-cutting, inter- or multi-disciplinary course involving biology, psychology, anthropology, political science, sociology, etc. Tobacco control might engage history, humanities, statistics, and visual arts as well as many of the above disciplines. There are many more examples from Avian flu, to traditional healing, to the impacts of modern technology.

These courses are intended for undergraduates and not as substitutes for graduate courses, although they may enable students to enter more rigorous graduate-level courses. They are designed to be part of general education and to fulfill LEAP learning outcomes.

The Consensus Conference outlined a series of specific recommendations for Epidemiology 101 that highlight the uniquely undergraduate focus that is intended. Epidemiology 101 should be designed to encourage students to see epidemiology as a way of thinking and a way of learning generalizable principles of the scientific method.

To achieve these aims the Consensus Conference recommended the following:

- Epidemiology 101 should be conceptual rather than technical so that the underlying methods are apparent to a broad range of students. For example, the course might employ stratification rather than regression methods to illustrate adjustment for confounding, because the emphasis is on active engagement and ensuring an intuitive and clear understanding of key principles.
- Epidemiology 101 should stress learning outcomes that are part of the broader LEAP aims of general and liberal education, including ethical reasoning—such as the ethical expectations of randomized clinical trials, teamwork for problem solving, integration of learning, and skills for lifelong learning. These goals are compatible with and may be integrated with the LEAP outcomes of understanding scientific methods, critical thinking, and quantitative and information literacy.
- Epidemiology 101 should use examples not limited to traditional health and medicine, again as recommended by LEAP learning outcomes and principles of excellence. Cause and effect might be illustrated by examples from biology or economics. Quantitative decision-making may use examples ranging from forensics to environmental monitoring. The specific examples are less important than the emphasis on illustrations reinforcing the broad applicability of epidemiology from basic science to public policy.

Enduring Understandings, Curriculum Frameworks, Learning Outcomes

The following materials serve as the basis for the Undergraduate Public Health Faculty Development Program sponsored by APTR and AAC&U. The materials on Public Health 101 and Epidemiology 101 presented here originated largely from the Consensus Conference on Undergraduate Public Health Education. The Epidemiology 101 materials draw heavily on the work of the Robert Wood Johnson Young Epidemiology Scholars (YES) program. Global Health 101 has been added, based on the clear interest of colleges and universities that have participated in the faculty development program. Additional modifications are expected based on the continuing feedback received on versions of the curriculum guide.

The following materials are provided to assist faculty in developing each of the core courses.

- Enduring Understandings: These are key principles that should become a part of the long-term understanding of all those who complete the course. Each section contains 10 key principles intended to remain part of the thinking of graduates many years after graduation. Enduring understandings should be the starting point for “backwards design” of curriculum.
- Curriculum Framework with Commentary: Outlines with explanations providing structures for core courses. These may serve as the basis for development of syllabi.
- Learning Outcomes: Outcomes of courses that can serve as the basis for student assessment, coordination of curriculum, and evaluation of courses. Learning outcomes were designed using Bloom’s Taxonomy. Basic and advanced learning outcomes are provided for Public Health 101, Epidemiology 101, and Global Health 101.

3 Public Health 101

Public Health 101: Enduring Understandings

1. The history, philosophy, and literature of public health reflect broader social influences and movements that influence our view of health.
2. Public health represents a population perspective on health as well as evidence-based methods used by health professionals and institutions to define and address our mutual concerns as a society as well as the needs of vulnerable groups within our society.
3. The public health approach includes efforts to define the problem, establish the cause, develop evidence-based recommendations for interventions, and implement and evaluate the impact of strategies for addressing the problem. Epidemiology serves as the basic science of public health by providing evidence for defining the public health problem, assessing causation, and evaluating effectiveness of potential interventions.
4. Options for intervention can be analyzed using a framework including when (primary, secondary, and tertiary), who (individual, at-risk group, general population), and how (education, motivation, obligation, invention) to intervene.
5. Laws and regulations are widely used tools for implementing health policies; they require careful analysis and development to achieve their intended purpose(s).
6. Public health communications and informatics can be effective tools for influencing health behavior, communicating information on risk, and communicating evidence-based public health recommendations.
7. Methods for changing health behavior require the complementary approaches of public health, clinical care, and social interventions including use of health communications methods.
8. Understanding health care and public health systems domestically and globally requires appreciation of the roles of health professionals; the roles and regulation of service delivery institutions; financing mechanisms and incentive systems for the funding of services; and the quality, access to, and costs of health services.
9. Increasingly the predominant impact on mortality and morbidity is from chronic mental and physical conditions reflecting the epidemiological and demographic transitions occurring as countries experience social and economic change. Screening for early detection of disease and social as well as medical management of chronic diseases is needed to respond to changing patterns of morbidity and mortality.
10. Control of communicable diseases, environmental health, and prevention and management of disasters are central to the health of populations; public health methods are key to prevention and control.

Public Health 101: Curriculum Framework

I. Overview and Basic Principles

- a. Context and scope of public health, including history, philosophy, literature, essential services, ethics, and applications to current events—Public health placed in historical and modern perspective.
- b. Public health as cross-cutting and systematic—Interdisciplinary concepts introduced early and integrated throughout the course (e.g., examining the options for interventions to address public health concerns).
- c. Epidemiologic principles and population perspective—Rates, risk factors, and health status indicators of morbidity and mortality; disease determinants, causation, and types of epidemiologic research; plus public health surveillance and vital statistics.

II. Population Health Tools

- a. Health communication and informatics—Assessing and evaluating the quality of health information and data in the mass media, including the Internet.
- b. Health and social and behavioral sciences—Impact on health and methods for altering behaviors at the individual and population levels.
- c. Health policy, law, and ethics—Tools for implementing health decisions including potential tensions between individual rights and social responsibilities.

III. Morbidity and Mortality: Determinants, Burdens, and Interventions

- a. Non-communicable diseases—Effects on longevity and quality of life plus methods to prevent, detect, cure, and minimize impact. Concepts of society's epidemiological and demographic transitions.
- b. Communicable diseases—Prevention, detection, and control from a population perspective.
- c. Environmental health and injury—Current and potential impacts on of health status and strategies for control.

IV. Health-Care and Public Health Systems

- a. Health workforce—Professional roles and career options within the health care and public health workforce.
- b. Organization of health care and public health systems—Institutions and structures of health care and public health systems, both national and international; the distinct roles and complementary responsibilities of health care and public health systems.
- c. Costs, quality, and access to health-care and public health services—Financing of health care and public health services and efforts to control costs; meanings and measurement of quality, and impacts of inadequate access.

V. Special Public Health Education Focus Areas

- a. Health disparities and vulnerable populations—Overview of public health's commitment to vulnerable populations, including maternal and child care, aging, persons with disabilities, and socioeconomically disadvantaged populations.
- b. Public health preparedness and disaster management—Essential roles of public health in preparedness for and response to disasters and to political and civil upheaval.

Public Health 101: Learning Outcomes

Basic Learning Outcomes

1. Identify eras in the historical development of public health and ways that public health emerges in literature and the arts, current events, and everyone's daily life.

2. Illustrate the interdisciplinary, cross-cutting, or ecological character of public health and the contributions of a range of disciplines and professions to improving health.
3. Explain the basic principles of epidemiology, including rates, risk factors, disease determinants, causation, and public health surveillance.
4. Explain how public health assesses the options for intervention to improve the health of a population.
5. Explain how public health can utilize health information and health communications to improve the health of populations.
6. Explain how public health can utilize social and behavioral interventions to improve the health of populations.
7. Explain how public health can utilize health policy and law to improve the health of populations.
8. Explain the impact of the environment and communicable diseases on the health of populations.
9. Explain the burden of chronic diseases on morbidity and mortality and approaches to prevention, early detection, and disease management.
10. Describe the basic organization of health care and public health systems and the contributions of health professionals.
11. Identify the basic payment mechanisms for providing health services and the basic insurance mechanisms for paying for health services.
12. Identify criteria for evaluating health systems including issues of access, quality, and cost.
13. Identify the roles of public health in addressing the needs of vulnerable populations and health disparities.
14. Identify the roles of public health in disaster prevention and management.

Advanced Learning Outcomes

1. Apply the public health approach—problem, cause, intervention and implementation—to a new public health problem.
2. Apply principles of health communications and informatics to evaluate the quality of health information on the Internet and in the mass media.
3. Analyze the advantages and disadvantages of potential interventions.
4. Apply principles for evaluating the quality of an existing health delivery system to that of a different health delivery system.
5. Analyze the determinants of morbidity and mortality in a new situation.
6. Analyze the degree of success in implementing essential public health services in a new situation.
7. Synthesize the principles and tools of public health as applied to a new public health problem.

4 Epidemiology 101

Epidemiology 101: Enduring Understandings

1. The causes of disease are discoverable by systematically identifying their patterns in populations, formulating hypotheses, and testing those hypotheses using group and individual comparisons. These methods lie at the core of the science of epidemiology, the basic science of public health.
2. Health and disease are not distributed randomly. There are patterns to their occurrence. These patterns can be identified through public health surveillance, looking for patterns based on person, place, and time. Analysis of these patterns can help formulate hypotheses about the possible causes of health and disease.
3. Hypotheses can be tested by comparing the frequency of disease in selected groups of people with and without an exposure to determine if the exposure and the disease are associated.
4. One possible explanation for finding an association is that the exposure causes the outcome. Because studies are complicated by factors not controlled by the observer, other explanations also must be considered, including chance and bias.
5. When an exposure is hypothesized to have a beneficial effect, studies known as randomized clinical trials may at times be designed in which participants are randomly assigned to study and control groups. Those in the study group are then exposed to the hypothesized cause and their outcomes are compared to those in the control group.
6. When an exposure is hypothesized to have a detrimental effect, it is not ethical to intentionally expose a group of people. Randomized clinical trials and community trials may be used to provide evidence for efficacy of potential interventions to reduce the risk.
7. Judgments about whether an exposure causes a disease are developed by examining a body of epidemiologic evidence as well as evidence from other scientific disciplines. While a given exposure may be necessary to cause an outcome, the presence of a single factor is seldom sufficient. Most outcomes are caused by multiple factors including genetic make-up, behaviors, social, economic, and cultural factors, availability of healthcare and the physical environment.
8. Individual and societal health-related decisions about interventions to improve health and prevent disease are based on more than scientific evidence. Social, economic, ethical, environmental, cultural, and political factors may also be considered in implementation decisions. The effectiveness of a health-related strategy can be evaluated by comparing the frequency of the outcome in carefully selected groups of people who were and were not exposed to the strategy. Costs, trade-offs of harms and benefits, and alternative solutions must also be considered in evaluating the strategy.
9. Principles of testing and screening based on Bayes theorem lie at the core of disease diagnosis and screening for disease and have applications to a range of social decision-making in security, forensics, quality control efforts, etc.

10. An understanding of non-health related phenomena can be also be developed through epidemiologic thinking, by identifying their patterns in populations, formulating causal hypotheses, and testing those hypotheses by making group and individual comparisons.

Epidemiology 101: Curriculum Framework

I. History, Philosophy, and Uses of Epidemiology

- a. Historical contributions and modern uses of epidemiology—Development of epidemiologic thinking and placement of epidemiology in historical and modern perspective.
- b. Ethics and philosophy of epidemiology—Appreciation of the links between epidemiology and broader ethical and philosophic traditions and concerns.

II. Descriptive Epidemiology

- a. Condition, frequency, and severity—The basic tools of epidemiologic analysis, including case definitions and populations, incidence, prevalence, and case-fatality rates.
- b. Using data to describe disease and injuries—Vital statistics, public health surveillance, and measures of health status, including methods for describing quantitatively the natural/clinical history, frequency, and changes in communicable diseases, non-communicable disease, and injuries.
- c. Patterns of disease and injuries—Application of the basic tools of epidemiology to generate hypotheses based upon person, place, and time; changes and differences in rates; exposures; incubation periods; and disease spread.

III. Association and Causation

- a. Estimation—Measures of the strength of association, graphical display of data, and measures of risk, relative risk, attributable risk, and population impact.
- b. Inference—Concepts of statistical significance and confidence intervals.
- c. Bias, confounding, and adjustment—Identification of bias, confounding, and effect modification/interaction and methods to prevent and take into account their impact.
- d. Causation—Principles of contributory cause based upon evidence of association, the “cause” precedes the “effect” and “altering the “cause” alters the “effect.”

IV. Analytic Epidemiology

- a. Basic epidemiologic study designs and their applications to population health including: ecologic or population comparison, cross-sectional, case-control, and retrospective and prospective cohort.
- b. Experimental studies—Randomized clinical trials and community trials and their applications to understanding disease or injury etiology and the benefits and harms of intervention.

V. Evidence-Based Public Health

- a. Harm, benefit, and cost analyses—Evidence-based recommendations regarding benefits, harms, and cost-effectiveness of interventions.
- b. Intervention effectiveness—Evidence-based evaluation of degree of success of interventions.

VI. Applications to Policy and Basic and Clinical Sciences

- a. Outbreak investigation, testing, and screening—Application of epidemiologic methods to basic and clinical sciences.
- b. Public health policy—Application of results from investigations and analyses to policymaking.
- c. Special epidemiologic applications—Molecular and genetic epidemiology, environmental health and safety, unintentional injury and violence prevention, and behavioral sciences.

Epidemiology 101: Learning Outcomes

Basic Learning Outcomes

1. Describe the historical roots of epidemiologic thinking and their contribution to the evolution of the scientific method.
2. Explain how ethical principles affect epidemiologic research.
3. Use rates and proportions to express numerically the amount and distribution of health- and non health-related outcomes.
4. Use the distribution of a health-related outcome in groups to generate hypotheses that might provide a causal explanation.
5. Explain basic statistical and epidemiologic concepts of estimation, inference, and adjustment to establish association.
6. Explain how to use evidence of an association to make a judgment about whether an association is causal using the principles of contributory cause.
7. Describe the basic epidemiologic study designs that are used to test hypotheses, identify associations, and establish causation.
8. Describe the concepts of measurement of test performance and be able to apply the concepts of testing and screening in different settings.
9. Apply the concepts of benefits, harms, and cost to a public health decision.
10. Describe the broad applicability of epidemiologic methods to clinical and basic science as well as public policy.

Advanced Learning Outcomes

1. Analyze the evidence for and against a recommendation for intervention.
2. Analyze a public health problem (e.g., investigation of a disease outbreak).
3. Synthesize epidemiological methods to assess the strengths and weaknesses of assertions in the scientific literature and popular press.
4. Evaluate the design of an epidemiologic investigation, demonstrating the ability to reconcile scientific validity and ethical sensitivity.

5 Global Health 101

Global Health 101: Enduring Understandings

1. There are strong links between health and economic and social development. This health and development link is especially important in economically developing societies but also applies to developed countries.
2. Health status is determined by factors including socioeconomic status; practice of healthy behaviors; biology including gender, the physical environment; and access to quality health services. When measuring and comparing health status it is important that morbidity be considered along with mortality.
3. There has been enormous progress in improving health status over the last 50 years in many countries. Progress is reflected in the substantial increases in life-expectancy. Some of this progress has come about as a result of overall economic development and improvements in income. However, much of it is due to improvements in water supply/ sanitation and better education. Increased nutritional status has also had a large impact on improvements in health status. Technical progress such as the development of vaccines against childhood diseases and the development of antibiotics has also improved human health.
4. The progress in health status, however, has been very uneven. Hundreds of millions of people, especially poorer people in low- and middle-income countries, continue to get sick, be disabled by, or die from preventable causes of disease. In many countries, nutritional status and health status of lower-income people have improved only slowly and may decline as illustrated by the HIV/AIDS epidemic.
5. Enormous disparities in health status and access to health services exist both within and across countries. Wealthier people often have better health status and better access to health services than poorer people. In general, urban dwellers and ethnic majorities enjoy better health status than rural people and disadvantaged ethnic minorities. Women face a number of unique challenges to their health.
6. As countries develop economically they go through two important transitions. The first is the demographic transition, a shift from high fertility and high mortality to low fertility and low mortality. The second is a shift from a pattern of disease that is predominantly characterized by communicable diseases to one that is characterized predominantly by non-communicable diseases. It increasingly appears that countries also go through a nutrition transition, from unprocessed and locally prepared foods, relatively low in sugar, salt, and fats to manufactured and processed foods, relatively high in sugar, salt, and fats.
7. Countries do not need to be high-income to enjoy good health status. There are a number of examples that make clear that low-income countries or low-income areas within countries can help their people to achieve good health, even in the absence of extensive financial resources to invest in health. However, this achievement requires strong political will and a focus on sanitation, education, and low-cost but high yielding investments in nutrition and health.
8. Many important contributors to the burden of disease can be addressed through interventions that are cost-effective. Many of these are low cost as well, such as control of TB or prevention, early diagnosis and treatment of malaria.

9. Some global health issues can only be solved through the cooperation of various actors in global health. Current examples include control of pandemic influenza, climate change, and eradication of specific diseases.
10. An important part of health status is determined by individual and family knowledge of prevention, including principles of sanitation, health behavior, and nutrition. Individuals and communities also have tremendous abilities to improve their own health status through community-based efforts.

Global Health 101: Curriculum Framework

I. Basic Principles of Global Health

Basic frameworks for understanding global health issues and the improvement of health at a population level

- a. Measuring Health—Measures of health status such as mortality of children under 5, life-expectancy, and health adjusted life expectancy (HALEs).
- b. Determinants of Health—Demographic and epidemiological transitions as well as the biological, behavioral, environmental, geographical, medical and socio-economic determinants of health.
- c. Health and Socio-Economic Development—The health and development link, equity and social justice, and the principles of cost-effectiveness analysis in health.

II. Health and Society

Cross-cutting issues underlying the strategies and organization for delivery of health care and population health services

- a. Human Rights, Ethics, and Global Health—Basic principles of human rights and research ethics; ethical decision making, related to global health.
- b. Healthcare and Public Health Systems—The organization and functions of health systems in developing and developed countries, including connections between healthcare and public health, comparative health care systems, and critical health system challenges.
- c. Culture and Health—Cultural factors influencing the structure and function of healthcare and public health systems as well as individual health behaviors, choices of interventions, and utilization of services.

III. The Burden of Morbidity and Mortality

Approaches to reducing morbidity and mortality including measuring the burden of diseases and other conditions; identification of risk factors; and evidence-based identification of cost-effective interventions to reduce morbidity and mortality. Understanding of the biological principles relevant to key conditions included in each of the areas below is essential.

- a. Environment
- b. Nutrition
- c. Gender and Health
- d. Child Health
- e. Communicable Diseases
- f. Non-Communicable Diseases
- g. Unintentional and Intentional Injuries

IV. Global Cooperation for Health

Approaches to global cooperation to address health issues that cross national borders and/or require consistent multinational approaches for successful intervention

- a. Disasters and Complex Humanitarian Emergencies—Issues of preparedness, emergency response, and post-disaster management.
- b. Science and Technological Innovation for Global Health—Global structures and incentives for encouraging

innovative approaches to health problems and dissemination of innovation.

- c. Global Institutions and Global Cooperation—Collaborations for improving health including multi-national, bilateral and non-governmental organizations (NGOs), foundations, and public-private partnerships.

Global Health 101: Learning Outcomes

Basic Learning Outcomes

1. Describe key public health concepts related to global health, including: demographic and epidemiological transitions, measures of health status, and the burden of disease.
2. Describe how globalization has changed the patterns of the spread of disease and the methods needed to control disease.
3. Discuss the multi-directional links between health and social and economic factors.
4. Discuss how social and cultural factors can affect a society's vulnerability to morbidity and mortality and its approaches to prevention and control.
5. Identify health conditions that have a major impact on morbidity and mortality and key biological concepts needed to understand their public health importance.
6. Identify critical issues in the organization and delivery of public health and health care services and methods to address these issues.
7. Discuss the determinants of health and risk factors for conditions of major importance to global health.
8. Discuss the burden of disease in various regions of the world and the variations in incidence and prevalence both within and across countries.
9. Discuss the potential for science and technology to contribute to improvement in health.
10. Identify key organizations and institutions, their roles in global health, and the manner in which they can cooperate to address key global health issues.
11. Apply principles of cost-effectiveness, benefits and harms, and sustainability of a new intervention designed to improve global health.
12. Apply understandings of the impact of culture on health to address issues of cultural diversity.

Advanced Learning Outcomes

1. Analyze the epidemiological features of a disease that provide opportunities for successful interventions or present barriers to success.
2. Analyze the biological features of a disease that provide opportunities for successful interventions or present barriers to success.

3. Analyze the socioeconomic features of a disease that provide opportunities for successful interventions or present barrier to success.
4. Synthesize the options for intervention for a global health problem and develop a strategy for implementation.

6 Minors and other “Coherent Curricula”

The Consensus Conference on Undergraduate Public Health Education agreed to encourage the development of minors in public health based on the structure outlined in Box 2. This framework aims to build on a coherent interdisciplinary core and provide choices for students based on the strengths of particular institutions. Institutions were encouraged to modify this design to include inter- and multidisciplinary approaches that meet their institutional goals.

Participants at the consensus conference strongly encouraged colleges and universities to integrate service-learning and other types of experiential learning throughout the curriculum. Such vertical integration is a feature of LEAP designs. Just as LEAP recommends that general education be integrated throughout the undergraduate years in an intentional program, the vertical integration of a minor program may likewise work toward general education outcomes as it addresses the essential learning outcomes of a liberal education as a whole.

To strengthen the quality and expertise of experiential learning in public health fields, conferees agreed that institutions should engage community-based public health practitioners in service-learning as well as other activities of undergraduate public health education. Colleges of Nursing, many of which are co-located with arts and sciences institutions, should be sought as partners in developing undergraduate public health education. Collaboration between undergraduate arts and sciences institutions and institutions that include graduate level public health as well as other health sciences also held out promise to conferees.

Institutions may choose to develop undergraduate public health education beyond general education using a variety of structures. In developing these options the Association of Schools of Public Health’s Education Committee has made advisory recommendations as follows:

The Association of Schools of Public Health Education Committee encourages colleges and universities without an accredited School or Program in Public Health to establish introductory undergraduate public health curricula based on the following principles:

1. Develop core courses such as “Public Health 101,” “Epidemiology 101,” and “Global Health 101” based on the ASPH Task Force on Undergraduate Public Health’s Statement on Recommended Content for an Introductory Undergraduate Public Health Course and the recommendations of the Consensus Conference on Undergraduate Public Health Education.
2. Encourage development of well-designed academic minors that build on core curricula, include elective public health courses that take advantage of institutional strengths, and provide options for experiential learning as recommended by the Consensus Conference on Undergraduate Public Health Education.
3. Institutions without accredited Schools or Programs in Public Health should ensure adequate depth and breadth of faculty and financial resources and/or work with an accredited School or Program in Public Health before pursuing an academic major in public health.

The sample learning outcomes/competencies are designed to be achieved as part of a comprehensive

Box 2: Generic Structure for a Minor in Public Health

Required Interdisciplinary Core

- Public Health 101
- Epidemiology 101
- Global Health 101

Selectives or Electives *

- Discipline-specific or interdisciplinary courses determined by the institution and the student
- Departmental or inter-departmental public health related courses based on the interests and strengths of each institution

Experiential Learning- Health Related Activities

- Service-learning
- Capstone or synthesis project
- Structured research and/or study abroad

* Examples of selective courses include: Health Behavior (Psychology); Biostatistics (Mathematics or Statistics); Health Policy & Law (Political Science, Sociology); Environmental Health (Environmental Sciences, Biology); Biology for Public Health/ Infectious Disease (Biology, Biochemistry, Microbiology, or other biological sciences); Health Economics (Economics). Examples of interdisciplinary courses: Organizational Theory and Public Health Practice (Sociology, Psychology, Management); Women's Health (Women's and Gender Studies, Ethnic and Cultural Studies, English, Sociology); Addiction Studies (Biopsychology, Neuroscience); Environmental Policy and Justice (Political Science and other social sciences); Health Communication (Communication Studies, Journalism); Health and Development (Economics, Geography, Anthropology); Health and International Human Rights (Philosophy, History, Sociology, Political Science); Sexuality Studies (Psychology, Anthropology, Woman's Studies, the Humanities).

undergraduate generalist degree program.* Minor or certificate programs may wish to select from these competencies/learning outcomes based on the curricula included in their minor or certificate program.

1. Explain the population health perspective and the methods used by public health to define and address population-wide/social concerns and the needs of vulnerable populations through the provision of essential services.
2. Apply options for intervention frameworks including when (primary, secondary, and tertiary), who (individual, at-risk group, general population), and how (education, motivation, obligation, invention) to intervene.
3. Explain principles of epidemiology necessary to understand health and impairments of health including the uses of rates, the meaning of causation, and the evaluation of the effectiveness of interventions. Apply principles of epidemiology to assigned reading of research articles, including case-control, cohort studies, and randomized clinical trials.
4. Explain from a global perspective the burden of disease, social-economic determinants of health, the links between health and development, and approaches to global cooperation to monitor, promote, and protect health.
5. Describe biological principles needed to understand public health issues across the life span and apply these principles to public health interventions to eliminate, prevent, and control disease and to minimize their impact on health.
6. Explain the use of clinical interventions for assessing, protecting, and improving health and preventing, detecting, curing, and minimizing the impact of disease.
7. Explain the way biological, environmental, and social/cultural factors interact in disease production and understand how these influences can impact prevention strategies. Describe historical examples of the changing definitions of public health in a variety of cultures and times, including major scientific advancements and achievements that have had a significant impact on the advancement of public health. Compare and contrast response to public health issues in different times and cultures.
8. Describe the current U.S. public health and health care delivery systems; explain structures for and approaches to development of health policies; apply knowledge of the U.S. public health and health care delivery systems to current policy debates; and apply principles for conducting a health policy analysis.
9. Explain the range of social and behavioral theories applicable to health behavior and apply these theories to interventions addressing a variety of health impairing conditions, populations, and intervention contexts.
10. Explain the impacts of the physical environment on health and use these explanations to understand human actions that alter, detect, and/or minimize these impacts.
11. Describe and explain the impact of management theory, finance, and economics as applied to managing in the health services and public health field.
12. Synthesize interdisciplinary approaches to the analysis of the determinants of health and disease as well as interventions to eliminate or control diseases and other health impairing conditions.

*Adopted from competencies for the Public Health Major at George Washington School of Public Health and Health Services

The recommendations included here are intended to guide institutions and individual faculty who are designing and implementing courses and/or coherent, programmatic curricula in undergraduate public health. Modifications and additional recommendations will be needed in the future as undergraduate public health education continues to evolve. Issues that will need to be addressed in the future include:

- Articulation of undergraduate and graduate public health education.
- The role of undergraduate public health education as preparation for medical and other health professions education.
- The role of community based service-learning locally and globally in the development of undergraduate public health education.

7 Undergraduate Public Health Resources

Consensus Conference on Undergraduate Public Health Education Report

The “essential findings” of the Consensus Conference on Undergraduate Public Health Education were published in the CDC’s Morbidity and Mortality Weekly Report on October 19, 2007. They are available at www.cdc.gov/mmwr. The full report of the Consensus Conference is available through the Council of Colleges of Arts and Sciences at www.ccas.net under publications.

Association for Prevention Teaching and Research

The Association for Prevention Teaching and Research (APTR) has developed the web site www.teachpublichealth.org as a resource for all those interested in undergraduate public health. The site includes the full curriculum guide, resource materials, information on meetings, and an electronic mailing list.

The Prevention Education Resource Center (PERC) www.teachprevention.org is developed by APTR and is a repository of educational materials related to prevention and population health. PERC is a searchable web site that also posts undergraduate public health education materials and links to organizations supporting integrative study and practice, such as Community-Campus Partnerships for Health, <http://depts.washington.edu/ccph>. Materials posted will be quality-reviewed as well as reviewed by users. Educators are encouraged to submit a wide range of materials including sample syllabi, reading lists, and student assessment materials. All those who teach public health are encouraged to submit their materials and allow them to be shared by others.

Association of American Colleges and Universities

The Association of American Colleges and Universities’ (AAC&U) web site at www.aacu.org presents information on the Educated Citizen and Public Health. The project is linked to AAC&U’s Liberal Education and America’s Promise (LEAP) campaign. The AAC&U website provides links to the full curriculum guide as well as relevant AAC&U publications.

Association of Schools of Public Health

The Association of Schools of Public Health (ASPH) has developed the web site: This is Public Health, www.thisispublichealth.org. This web site includes recommended readings and films and provides links to additional information.

ASPH has also developed the Pathways to Public Health web site, www.pathwaystopublichealth.org, listing curricular descriptions of undergraduate programs at institutions with schools of public health and programs in public health as well as at institutions without graduate public health education.

Centers for Disease Control and Prevention

The web site of the Centers for Disease Control and Prevention (CDC) www.cdc.gov publishes a large number of materials that are useful in teaching.

Specific educational materials include the Excite materials, www.cdc.gov/excite, developed for K-12 but useful as

an introduction to epidemiology at the undergraduate level.

A CDC-sponsored project on the eradication of small pox, <http://gde.emory.edu/smallpox>, contains a wide range of case materials.

The case studies of CDC's Epidemiology Intelligence Service (EIS), www.cdc.gov/eis/casestudies/casestudies.htm, have been used by generations of graduate students and practitioners to provide training using realistic examples of the work of epidemiologists. The case studies continue to be updated and new cases produced. Many of the cases can be used at the undergraduate level or modified to meet the needs of undergraduates.

American Association of Colleges of Nursing

Colleges of Nursing are located on campuses of over 500 colleges and universities without graduate public health education. Bachelors of Nursing degree programs as well as Masters of Nursing degree programs require a community health/public health curriculum. Colleges of Nursing often have expertise and community networks in community health/public health that may contribute to the development of undergraduate public health education. At the national level the American Association of Colleges of Nursing (AACN), www.aacn.nche.edu, has encouraged undergraduate public health by featuring panel discussions and distribution of materials updating their members on national efforts in undergraduate public health.

American Public Health Association

The American Public Health Association (APHA) is a national organization representing over 50,000 public health professionals. In addition to its long standing national efforts in public health, APHA has State Affiliates who are active at the state and local levels. The Committee of Affiliates (CoA) is the APHA component that represents the State Affiliates, visit www.apha.org/membergroups/states/StateRegPHA to link with your local Affiliate. The CoA has encouraged the Affiliates and their members to work with local colleges and universities to support undergraduate public education. Visit www.apha.org/membergroups/states to obtain information on APHA's efforts to support their Affiliates.

About the Association for Prevention Teaching and Research

**1001 Connecticut Avenue, NW
Suite 208
Washington, DC 20036
202.463.0550
www.aptrweb.org**

The Association for Prevention Teaching and Research (APTR) is the professional organization for the academic medical and public health community dedicated to prevention research and interprofessional education. APTR members include health professionals, faculty and students from academic departments within medical and health professions schools, public health graduate programs, health agencies, and schools of public health.

APTR advances population-based and public health education, research and service by linking and supporting members from across the academic prevention community. By advancing interprofessional education and prevention research we aim to redefine how we educate the health professions workforce. APTR develops curriculum, professional development programs, and tools for its membership of educators, researchers, residents and students.

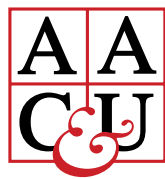
By connecting public, private and government funding opportunities with the academic prevention community we bring together individuals and institutions devoted to health promotion and disease prevention education and research. We also represent the accredited and emerging graduate programs across the U.S. that grant public health degrees and therefore prepare students for professional careers in public health.

About the Association of American Colleges and Universities

**1818 R Street, NW
Washington, DC 20009
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www.aacu.org**

AAC&U is the leading national association concerned with the quality, vitality, and public standing of undergraduate liberal education. Its members are committed to extending the advantage of a liberal education to all students, regardless of their academic specialization or intended career. Founded in 1915 by college presidents, AAC&U now represents the entire spectrum of American colleges and universities—large and small, public and private, two-year and four-year. AAC&U comprises more than 1,150 accredited colleges and universities that collectively educate more than five million students every year. The mission of the Association of American Colleges and Universities is to make the aims of liberal learning a vigorous and constant influence on institutional purpose and educational practice in higher education.

Through its publications, meetings, public advocacy, and programs, AAC&U provides a powerful voice for liberal education. AAC&U works to reinforce the commitment to liberal education at both the national and the local level and to help individual colleges and universities keep the quality of student learning at the core of their work as they evolve to meet new economic and social challenges. With a ninety-year history and national stature, AAC&U is an influential catalyst for educational improvement and reform.



*Association
of American
Colleges and
Universities*



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www.TeachPublicHealth.org