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Back to the Pump Handle

Public Health and the Future

PERSPECTIVES

IN FEBRUARY 2007, CNN viewers watched as thousands of turkeys were herded to slaughter in England. The flocks were destroyed to stop an outbreak of avian flu. The same day brought news of disastrous flooding in Indonesia, where nearly three-quarters of Jakarta was under water. A week or two later, devastating tornados hit Florida and then ripped through the Mississippi Delta. New York City announced plans for a system to detect dirty bombs and bioterror devices. The popular blog *Daily Kos* posted a story on the threat of pandemics to the Internet, a posting

that had nothing to do with software

viruses: if disease closes schools and businesses for extended periods, students will have to learn and employees will have to work at home—and the Internet may collapse. A recent listserv posting to the American Council of Academic Deans asked, in the naturalizing tone of such inquiries, about campus plans for pandemics. This is our new reality. And with each successive report of the United Nations' Intergovernmental Panel on Climate Change (IPCC), terrible prospects loom larger and make stronger claims on our attention.

There is a common feature to these reports: each presents a threat to public health; most present a threat on a global scale. Informed citizens are unlikely to miss the sober news or ignore the need for action. Global Internet

communications enhance the immediacy of crisis by spreading information so quickly that it is difficult to separate imminence from potential and to discriminate between appearance and reality. How to handle the flow of information—let alone the emotional demands—find practical responses, and begin systemic intervention will be the great challenge of our times. In this century, there is no reason to think we will face fewer disasters, dislocations, crises, emergencies, and chronic threats to the environment—to global human health, social well-being, and human sustainability—than we have faced over the past few years. The IPCC tells us we are going to face more.

Toward an educated citizenry

Given the magnitude of the challenges to public health confronting the world in the twenty-first century, many of us are wondering anew how to prepare our students for citizenship. If there is power in learning, it finds expression in practice and enables the practitioner to live well. Confident in the pillars of liberal education, we believe that learning shapes and guides our lives. We stand for the transformative power of education, and we trust that we are producing effects on society through our teaching, no matter how hard it may be to document outcomes or to know how and when our courses have been instrumental. But with such grim facts before us, what, we ask, do we teach? What and how do we teach when the need for an educated citizenry appears never to have been greater? How do we teach sustainably, enabling people to think ethically, systemically, and systematically about the health of humanity? How to think beyond the crises of the moment or the alarmism and panic that prompt short-term and misguided responses?

We believe that colleges and universities ought to heed the National Academy of Sciences' Institute of Medicine's (IOM) call for an

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of Undergraduate Education



The College of
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educated citizenry. In 2003, IOM recommended that all undergraduates be given “access to education in public health” (Gebbie, Rosenstock, and Hernandez 2003, 144). An educated citizenry, they reasoned, is essential to a healthy society. We need citizens who possess an ability to think about the big picture, beyond the individual or constituency. We need citizens who can help as individuals to change social behavior and who are aware of the need for systemic health care, good nutrition, decent housing, and sustainable urban centers. We need to rely on leaders who are able to consider benefits and harms to groups, minority as well as majority, and to engage in systems thinking, understanding how multiple factors interact. These are abilities essential to citizenship for the health of the world.

It is time for higher education to lead in this new integrative field of learning. Academics have an opportunity to identify what is pertinent to our best work amid the chaos of news and information, and return to what we know best—the curriculum. There is a tremendous need to concentrate attention on public health within and through the curriculum, beyond the campus critical incident plan and the development of clean environmental practices and beyond the health professions. The world urges us back to the realm we know best, the arena of our strongest work. Through the curriculum, higher education can advance knowledge, practical skills, and attitudinal

framing that human sustainability and world health now demand.

We argue in favor of teaching and learning about public health—emphasis on lowercase *p* and *h*—holding up the lens of population study, or population science, and taking a look through it at the disciplines of the arts and sciences and then inviting the arts and sciences to take up that lens themselves and see what they discover. We argue in favor of partnership in this work between the arts and sciences and professional schools in the specific field of epidemiology and in public health as an interdisciplinary field. We are not emphasizing preprofessional education, welcome and needed as that education is. In the long run, health professional education will surely benefit from a new emphasis on undergraduate public health education within and across disciplines. We are talking about the education of every undergraduate. Integrative public health programs in the liberal arts and within a liberal education can produce an informed citizenry capable of living—and one hopes *living well*—in the world that is becoming.

The question of utility

In 2005, the Association of American Colleges and Universities (AAC&U) launched its campaign for the new century as a pragmatic call for action on behalf of all students. The Liberal Education and America’s Promise (LEAP) campaign emphasizes application,

direct experience, and civic engagement as ways to achieve “economic creativity and democratic vitality” for the United States.

The LEAP National Leadership Council recommends, in sum, an education that intentionally fosters, across multiple fields of study, wide-ranging knowledge of science, cultures, and society; high-level intellectual and practical skills; an active commitment to personal and social responsibility; and the demonstrated ability to apply learning to complex problems and challenges.

(AAC&U 2007, 14)

A population that is economically creative and democratic in its participation in the world will be a healthy population and will promote global public health. If we position the greatest threats to human health amid the LEAP goals—amid the best we can imagine, that is, for liberal education—there is no doubt what ought to follow (see sidebar). What better approach to human health and sustainability than through what David W. Fraser, M.D. (1987), former president of Swarthmore College, identified presciently in *The New England Journal of Medicine* as “epidemiology as a liberal art”?

Connecting Undergraduate Public Health Education with the LEAP Essential Learning Outcomes

Knowledge of Human Cultures and the Physical and Natural Worlds

Recognize and integrate the contribution of arts and sciences' disciplines into public health: Public Health 101.

Intellectual and Practical Skills

Teach epidemiology as a way of thinking based on the scientific method and develop critical thinking and quantitative literacy skills: Epidemiology 101.

Personal and Social Responsibility

Incorporate experiential learning, e.g., service-learning, community-based research, capstone projects, or global experiential learning.

Integrative Learning and Complex Problem Solving

Provide global perspective on learning and develop internationalist or world views; understand concept of interdependence; apply learning to global health challenges: Global Health 101.

Also in 2005, the Council of Colleges of Arts and Sciences (CCAS), a national organization for liberal arts deans, joined a project launched by deans and faculty of public health schools and programs and an array of allied health professions. Responding to the IOM call for an educated citizenry and inspired by David Fraser's concept, leaders in the health professions sought to engage the arts and sciences in planning a large-scale campaign. The launch was a historic first, a consensus conference on the future of undergraduate public health education held in November 2006 at the Boston University School of Public Health. Funded by the Josiah Macy Jr. Foundation, the conference brought deans of arts and sciences together with deans of public health, nursing, medicine, dentistry, allied health, and pharmacy. The meeting was cosponsored by the Association of Schools of Public Health and the Association for Prevention Teaching and Research. The conference included participants from the Centers for Disease Control and Prevention (CDC) and AAC&U.

The two-day conference generated extraordinary energy and achieved a high degree of consensus. Many participants in the arts and sciences recognized something of a conversion experience to belief in the power of epidemiology and global public health within the disciplines of the liberal arts. Many in the health professions had a similar conversion to belief in the power of liberal education to address the urgent health needs of our era. We found common ground in agreement that we cannot address the health needs of this country, let alone the interrelated needs of the world, solely through the preparation of health professionals. On a much larger scale, this single-expedient approach would be as effective as trying to stop gridlock by building more highways. We converged on the idea of an educated citizenry and found significant common ground.

We also faced the risks. The arts and sciences cannot enter the realm of public health without making changes within and across disciplines and without embracing applied knowledge. Disciplinary boundaries and enrollments may shift—an often disturbing prospect. Within the health professions, the project entails a move across and beyond the defined professions into the strangely

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unregulated regions of the arts and sciences—turf on which a sociologist without a degree in public health teaches Public Health 101 and a biologist teaches epidemiology. Or a baccalaureate nursing professor teaches general education community health together with a Spanish professor. The interdisciplinary potential is, of course, far easier to imagine than to realize. Yet the urgency of the need and the potential benefit to human health, human rights, and social justice overcame the fear of risk.

An integrative curriculum

Beyond the ferment of the plenary sessions—full of people who rarely attend conferences together, let alone attempt to reach consensus—the conferees revised and endorsed for circulation the reports of three pre-conference working groups.* Honoring a commitment to applied knowledge, the conference produced the core of an integrative curriculum for undergraduates through general or liberal education and then moved the project into the dissemination phase. One working group composed a rationale and framework for a course entitled Public Health 101. This

course provides an overview of public health and epidemiological principles, with learning outcomes that emphasize a population perspective or a “big picture” population health framework and systemic thinking. Public Health 101 may be designed to meet learning goals of general education or liberal learning in the social sciences. It introduces public health as a cross-cutting interdisciplinary field, founded on knowledge of current events, the social sciences, history, philosophy, literature, ethics, public policy, and law.

The second group produced the rationale and framework for Epidemiology 101. This course emphasizes the history, philosophy, and uses of epidemiology and develops understanding of statistics and applied basic and clinical sciences. It teaches descriptive and analytical epidemiology and presents such concepts as association and causation. It introduces evidence-based study and explores applications to policy. It is, in short, an introduction to epidemiology as a way of thinking. An introductory course in epidemiology, Epidemiology 101, may be organized using a curricular framework designed to achieve critical

thinking as part of the goals of general and liberal education. The course is readily structured to fulfill a science general education requirement and may be structured as a laboratory science course.

The third group addressed the rationale for and structure of integrative minors in public health and began to identify the administrative challenges to such comprehensive interdisciplinary work. High-quality integrative minors in public health may be designed for institutions with and without schools or programs in public health. Strategies for and design of the minor will differ across institutions, but learning goals will readily converge. The consensus conference report recommends that minor programs in public health require Public Health 101, Epidemiology 101, and Global Public Health 101, together with an experiential learning component and a capstone course. The many possible variations on this plan will address institutional differences (see sidebar).

A closer look at two courses will illustrate what we mean by an integrative approach to public health within the arts and sciences and throughout liberal education. A faculty member in American literature may catch on to the concepts of epidemiology and begin to appreciate and adopt a population perspective. It is analogous to catching on to the power of

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formalism and close reading or historiography—a new conceptual framework and associated method. The literature professor among us taught a course on industrialization and the literary imagination in the United States, beginning with the first uses of steam power for industrial

production and ending with the mass generation and distribution of electricity. The class read fiction, poetry, and nonfiction, looking for evidence of change in felt experience and expression—not just in descriptive language but also in perception. Did railroad time feel different from time before standardization? Did wine taste different when the banquet was illuminated by electric lights? If human experience changed, then surely expression would change. And it did—manifestly and astonishingly. The more one paid attention, the more one saw.

Teaching the seminar while preparing for the consensus conference, the professor began to read public health and epidemiology into her phenomenological narrative of the period. On the most basic level, she traced the appearance of machinery driven first by water, then by steam, and then by electricity, and considered what changed in health by reading human expression. Her attention shifted perceptibly. In Lucy Larcom's *A New England Girlhood*, the change in perception is inescapable as child laborers recall the smell of roses to “make us forget the oily smell of the machinery” (163). Then came the coal smoke. Smoke is everywhere, affecting people and their world. Mark Twain travels down the Mississippi River after the Civil War and cannot believe the aged appearance of buildings in St. Louis—aged prematurely by clouds of smoke. Dining outdoors meant eating soot-specked butter on the bread.

The class discovered industrial melanism in moths—darker moths survive in a polluted environment, and the species evolves from white to black. Moving on to Jane Addams's Chicago, the class discovered the complete lack of municipal sanitation in immigrant neighborhoods and began to pay attention to garbage, sewage, horrific odors, the source of public water, food production and distribution—and illness and life expectancy. When

Potential Structure of a Minor in Public Health

Interdisciplinary Core (Required)

- Public Health 101
- Epidemiology 101
- Global Health 101

Discipline-specific Courses: Selected by the institution and the student.

Departmental public health-related courses based on the interests and strengths of each institution. Some institutions require biostatistics.

Experiential Learning:

- Service learning or internship
 - Capstone or synthesis project
- Structured research, service, or study abroad

the class arrived at *The Jungle*, the book seemed a work of straightforward realism, the resultant Food and Drug Acts clearly related to imperiled national health. The professor had taught these books before, but never pulling into the foreground the evidence of people's health in that unregulated period of industrial development. Realism and naturalism as literary styles or modes of expression took on new meaning.

A public health professor and former dean among us developed an integrative undergraduate course, part of a public health minor. She became acutely aware of the impact that literature and film can have on the study of public health. The course she conceived, From Cholera to Cancer: History, Achievements, and Future Challenges in Public Health, was designed to introduce the student to the history and philosophy of public health. She intended to expose students, through a variety of media, to the impact people and politics can have on health. Readings in public health accompanied plays, novels, and films. For instance, studying environmental health and the case of Love Canal, the students also read a biography of John Snow, the father of public health epidemiology, along with the play *An Enemy of the People* by Henrik Ibsen. Students recognized that the problems confronted by the health director of a small town in Scandinavia in the 1800s differed more in degree than in kind from the pressures of an environmental crisis such as radioactive materials dumped in a community, the levels of polychlorinated biphenyls in the river, or homes built on a dump site.

A CDC article, "Plagues, Public Health, and Politics," supplemented biography, fiction, and drama. Studying infectious diseases, students viewed *A Paralyzing Fear: The Story of Polio in America*, a film produced by a historian, not a public health professional. The students attended lectures on infectious diseases and discussed the strides the world has taken to eradicate certain diseases even as we witness an increase in the number of new and emerging infectious diseases. A unit on sexually transmitted diseases followed, in which the students read Tracy Kidder's *Mountains beyond Mountains*. Kidder follows Paul Farmer's remarkable life from his days in a trailer with his family to his arrival at Harvard Medical School. Kidder narrates Farmer's commitment

to fighting HIV/AIDS, beginning as a medical student in Haiti. Through his doctoral study of anthropology and medicine, Farmer addressed the AIDS epidemic first by understanding the culture of the country. Kidder's book allowed the instructor to discuss how economics, environment, politics, and culture all affect global health. Students learned to see public health problems in a global context and to work from a population perspective. They could understand Farmer's achievements as the work of an educated citizen who made an impact on the world. Students then viewed *And the Band Played On*, the story of the discovery of HIV/AIDS in the United States and the personal and political struggles of both the scientists and the gay community affected by this epidemic. A lecture by an international AIDS expert prompted active discussion of the disease.

Also integrated into the course were self-teaching activities in public health and "grand rounds" broadcasts students can download from the Internet, along with lectures by public health school faculty and state Department of Health staff. The course presented sessions on cancer and chronic illness, mental health and addiction, automobile safety, guns and firearms, and access to health care. A wealth of readings and films are applicable to an integrated course in the liberal arts and public health: articles from the *New Yorker* magazine; films such as *Outbreak*, *Civil Action*, and *Erin Brockovich*; and an array of biographies, novels, and plays. By the time they completed the course, students began to read and see things differently. They recognized how public health shapes our experience and how they as educated citizens can make a difference.

Back to the pump handle

In 1855, pioneering epidemiologist John Snow traced the emergence of cholera in London to the public water supply. He persuaded authorities to remove the pump handle on the Broad Street well and thereby slowed and then stopped an outbreak of cholera. It was a revolutionary advance in knowledge of disease emergence, and it became a story—perhaps the ur-narrative of epidemiology—that every public health professional can tell. For faculty in the arts and sciences who have never heard of Snow or only vaguely remember, the narrative has an arresting explanatory power.

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In view of threats to worldwide human health and the critical need for applied knowledge, academic leaders might return again to the venerable and often vexing question of utility—and consider what it means to go back to that pump handle. An enduring value of liberal education arises from its impracticality, its freedom from the demands of usefulness. As anyone who has wrestled with John Henry Newman's *The Idea of a University* knows, knowledge is its own end. Academics stand passionately for Newman's claim. But to hold such a belief is not to express the absolute truth or contrive a moral imperative for inaction.

Frank H. T. Rhodes, former president of Cornell University, approaches the question of utility from another angle, with a different sense of urgency. Rhodes observes that the ancient Greeks revered grammar and logic for their practicality, and that we ought to do the same. He does not ask what a university should be—Newman's nineteenth-century question about the education of gentlemen in the context of industrial modernity—but instead poses a twenty-first-century question: how can humanity endure? He contends that human sustainability may depend on the practicality of the liberal arts and sciences: "the development of freethinking men and women for the current age . . . the effort to frame social and economic policy so as to preserve with minimum disturbance earth's bounty" (Rhodes 2006, B24). Earth's bounty surely should concern us.

There is something in this work for every discipline of the arts and sciences, and indeed for all professional schools. Population science or population study shapes disciplinary activity across many disciplines and fields, including the humanities, social sciences, and sciences. It works as well in engineering and the fine arts. Applied research in sociology and anthropology can address public health in an array of subfields and support global learning in all undergraduate majors. Psychologists know what it means to practice within a given population. Political science can direct attention to health policy. A philosopher can address bioethics and questions of human rights and social justice. Statistics faculty can ask their students to solve biostatistical problems.

The challenge of pandemics such as AIDS and avian flu, environmental and climate change, dangers to the global food supply, disasters of the magnitude of Hurricane Katrina, (bio)terrorism preparedness, threats of widespread

state and civil warfare, and needs of aging populations demand far more than humanity can handle through the education of health professionals alone. Responsible education for citizenship and the well-being of the world will depend on population-based understandings of human sustainability and convergent thinking drawn from the best achievements of the arts and sciences. Through our work, we hope to prompt new thinking about program development for an educated citizenry and to encourage networking for this new national initiative. □

To respond to this article, e-mail liberaled@aacu.org, with the authors' names on the subject line.

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NOTE:

Conference drafts of the reports are available online at www.aacu.org/public_health. The revised reports are published at www.ccas.net, under "Publications." A summary of findings appears in the CDC's *Morbidity and Mortality Weekly Reports*, October 19, 2007, at www.cdc.gov/mmwr. The reports are designed for use at all institutions—two-year, four-year, public, private, small, large—whether or not the campus has a program or school in public health or allied health, whether or not the faculty employs anyone with a public health degree.