PUBLIC HEALTH DEGREES—NOT JUST FOR GRADUATE STUDENTS

Richard K. Riegelman, MD, PhD
Joel B. Teitelbaum, JD, LLM
Nancy Alfred Persily, MPH

Schools of public health by history and philosophy have been graduate institutions. This history dates to the origins of schools of public health as institutions parallel with schools of medicine, producing graduate-level health professionals to assume leadership roles in public health departments.[1] The focus on graduate education has been operationalized in the accrediting process of the Council on Education for Public Health (CEPH), which does not set minimum requirements or evaluate performance of undergraduate programs offered by schools of public health.[2]

A number of forces are at work to encourage the growth of undergraduate education in public health. For example, the bioterrorism scare of 2001 resulted in an enormous expansion of interest in and understanding of public health among undergraduate students as well as the general public. However, interest in undergraduate public health programs preceded the events of 2001.

Medical schools have begun to appreciate the need for an educational background that goes beyond the traditional science background expected from premed students, and, indeed, many have expanded the types of baccalaureate degrees they consider appropriate for applicants, no longer severely limiting the choice of majors open to undergraduates interested in admission to medical school.

From the university perspective, public health education is a natural extension of increasingly interdisciplinary undergraduate education. Public health education can be viewed as the study of the factors that affect the health of the public, inherently drawing from a broad range of science, social science, and humanities disciplines. Economics, political science, philosophy, history, mathematics, biology, chemistry, sociobiology, anthropology, and literature are just a sampling of the disciplines that can be applied to understanding public health.

The study of public health is also a logical foundation for postgraduate study in such fields as law, business, human services, and international affairs. Health policy, health law, health administration, social work, and international affairs are emerging as important fields of graduate study that can build upon a foundation of undergraduate study in public health. All of these fields benefit from the "population perspective" that is intrinsic to public health.

In addition, it is increasingly being recognized that the skills taught as part of public health education are generic skills useful in a variety of fields. An understanding of the biological and social bases of health and disease is excellent background for future health professionals. The critical thinking skills of epidemiology can be applied to clinical medicine, administration, human services, marketing, and a variety of research disciplines. The population perspective of public health is useful background for the study of such fields as law, economics, human services, and international affairs. Quantitative and computer skills are useful background for careers in the rapidly expanding application of health information. The skills needed for health promotion are useful skills for a broad range of communications and human services professionals.

Schools of public health have rapidly expanded training at the MPH level over the last decade. This growth has begun to satisfy the demand for the MPH degree. However, there is increasing recognition that a large proportion of the public health work force has little or no formal education in public health.[3] For some, this may be viewed as the primary reason for the development of undergraduate public health education.

EXISTING APPROACHES TO UNDERGRADUATE PUBLIC HEALTH DEGREES

In 1978, Lilienfeld et al. outlined a model for an undergraduate major in public health with an emphasis on epidemiology and quantitative course work.[4] A review of the literature, however, reveals that little else has been written over the last 25 years describing specific undergraduate degrees in public health.

To understand the current spectrum of undergraduate degree offerings associated with accredited schools of public health, we reviewed websites for all CEPH-accredited schools of public health. We are also aware, based on discussions with school of public health administrators, that additional programs are in the planning stages.

Schools of public health are usually part of broader universities that include substantial numbers of un-

dergraduate students, making it relatively easy to recruit undergraduates to a variety of programs. This is reflected in the wide spectrum of programs currently offered by accredited schools of public health, as is illustrated by the examples below. It is important to recognize that in addition to undergraduate offerings from schools of public health, a number of health/community health education programs offer undergraduate curricula.

Exercise Science

Exercise Science programs at the University of South Carolina,[5] the University of Massachusetts,[6] and George Washington University[7] have all incorporated undergraduate programs into their degree offerings. Such programs have their own histories and objectives, having often evolved from physical education programs. They may include accredited athletic training programs and may prepare students for specific postgraduate training in such fields as physical therapy and exercise physiology. Society's increased focus on nutrition and exercise has made it possible to integrate exercise science programs into the mission and structure of schools of public health.

Health Education

The Graduate School of Public Health at San Diego State University offers a BS degree in Community Health Education (through the College of Health and Human Services).[8] Community Health Education programs, often provided through institutions without schools of public health, can allow students to fulfill the requirements for taking the health educator certifying examination. This focused specialization is another model for undergraduate education.

Specialization

The School of Public Health at the University of North Carolina offers highly qualified juniors and seniors an opportunity to complete undergraduate specialization and receive BSPH degrees through the Biostatistics, Environmental Sciences and Engineering, Nutrition, and Health Policy and Administration Departments.[9] This highly selective program appears geared toward students who want to expedite their entry into graduate studies or obtain entry-level positions utilizing specialized knowledge.

BS/MPH degrees

The University of Michigan has a long history of undergraduate public health education and today offers a BS/MPH degree.[10] This degree, like many combined degrees in other fields, is primarily geared toward easing the transition from undergraduate studies to the MPH program and in some cases toward reducing the total time commitment needed to complete both degrees. This model can be seen as facilitating "early decision" by undergraduate students whose focus is on obtaining an MPH degree.

Arts and Sciences degrees with school of public health electives

Johns Hopkins University has developed a popular Public Health Studies major through its Krieger School of Arts and Sciences in cooperation with its Bloomberg School of Public Health.[11] Students take a core set of required public health courses in addition to other undergraduate course work at the Homewood campus. Having completed these requirements, seniors in the Public Health Studies major may take elective courses at the School of Public Health. A BA/MHS is also offered. This approach assumes that the role of the School of Public Health remains largely at the graduate level and allows the Arts and Sciences School to take the lead at the undergraduate level.

A SCHOOL OF PUBLIC HEALTH LIBERAL ARTS MAJOR

Concepts and approaches to undergraduate public health education were outlined in articles by Lilienfeld et al. in the late 1970s.[3,12] In 1987, David Fraser, who at the time had recently left the Centers for Disease Control to become President of Swarthmore College, wrote a landmark article in the *New England Journal of Medicine* titled "Epidemiology as a Liberal Art."[13] This article outlined a broad liberal arts–oriented view of epidemiology based on history, philosophy, the history of science, medicine, and public health as well as solid grounding in quantitative methods and laboratory sciences. These approaches represent the starting point upon which the George Washington University School of Public Health and Health Services (GW-SPHHS) is developing a model for a liberal arts–focused undergraduate major in public health.

GW-SPHHS has offered undergraduate curricula since it was established in 1997, having incorporated the university's longstanding BS degree in Exercise Science. Rapid growth in the number of undergraduate students at GW provided the new School with the opportunity to expand the size and scope of its undergraduate education. In addition to expanding the Exercise Science program to include options in athletic training and health education, the School now offers a 12–18 credit hour secondary field of instruction (essentially a minor) in Public Health and Health Ser-

vices, and a 15 credit hour concentration in Global Health as part of the university's Elliott School of International Affairs undergraduate degree.

Having gained experience and witnessed the interest among students in undergraduate education, GW-SPHHS has systematically examined undergraduate public health education in preparation for designing and implementing a new Public Health major. This process required asking two basic questions: First, what are the goals of an undergraduate major? Second, how should the major be structured to accomplish the goals? In approaching the new undergraduate major, the School determined that undergraduate public health education should not reproduce graduate education at a more introductory level. Rather, undergraduate public health education should have at its foundation its own goals and strategies.

The recently approved undergraduate Public Health major takes a liberal arts approach to critical analysis, information synthesis, and problem solving, with its emphasis on the humanities and social sciences in addition to quantitative and science course work. To accomplish this goal, all students will begin the major with a broad-based introduction to public health and health services. They will also take a course in the history and philosophy of public health, and in their last semester of the major they will enroll in a seminar-style capstone or synthesis course utilizing a case studies method. Courses in the biological basis of public health and preventive medicine will ensure that students understand the sciences upon which public health is built.

This model is not primarily conceived of as a feeder for public health graduate training, but is instead designed as a pre-professional degree program. The pre-professional degree is designed to be compatible with a wide range of graduate training from medicine to law and business to human services and international affairs. The major requires 36 credit hours, including 30 hours of core courses plus 6 credit hours of electives. Three of the 10 core courses are being developed on a School-wide, interdepartmental basis, while the remainder are department-based. The limited number of required courses will allow students, with the advice of their advisors, to select electives focused on public health issues applicable to their preparation for specific graduate programs. It will also selectively allow students to pursue a secondary field of study (minor) or even a second major elsewhere in the university.

The modest number of credits required for the major is also designed to allow for future expansion of the degree options. For example, the initial degree program does not allow career-oriented credentialing to be incorporated into the bachelor's degree. Health educator, sanitarian, and nursing home administrator are three existing examples of the types of credentials that can be satisfied by undergraduate course work and could be incorporated into an expanded undergraduate degree.

The movement toward credentialing in public health is likely to expand options for undergraduate public health programs with career-specific curricula. This possibility, though not the original focus of the major, may be accommodated in GW's program in a second, quite different stage of curriculum development if there is student and faculty interest. Career specialization could include areas, such as health information and health communications, with substantial career potential even in the absence of specific certification.

ISSUES FACING UNDERGRADUATE PUBLIC HEALTH DEGREE PROGRAMS

Undergraduate degree programs in public health face the issue of articulation of undergraduate and graduate course work. Articulation of undergraduate and graduate education is not a new issue: business, social work, international affairs, nursing, and a wide spectrum of arts and sciences disciplines have already devised methodologies for allowing students to pursue both undergraduate and graduate training without repeating course work. To tackle this issue, GW-SPHHS is considering a variety of options, including cross-crediting of a limited number of graduate-level credit hours to the BS and MPH degrees, a five-year combined BS/MPH degree, and/or waiving required MPH courses and allowing substitution of higher-level graduate course work.

Beyond the issue of articulation, schools have chosen a variety of methods for administering their undergraduate programs, including a departmental focus (e.g., locating the program within a department of Exercise Science); delegation of degree administration to the School of Arts and Sciences; and incorporation of the degree into a discipline-specific structure such as epidemiology or environmental health. GW maintains a School-wide administrative structure for degree approval, curriculum development, advising, and financial management and benefits from particularly strong involvement of its seven departments.

Furthermore, developing strategies for how and when to recruit students is a task faced by all undergraduate public health programs. For example, should recruitment focus on high school seniors, students

entering the university through other schools, or even on pre-health professional students who seek a second major? The rapid growth in undergraduate students at GW makes transfer from other schools of the university a feasible and attractive option, but this may differ across universities. The more generic and national issue arises when one asks whether high school seniors have the requisite information and are prepared to choose to enter an undergraduate degree program in public health.

CONCLUSION

Undergraduate education in public health is now on the agenda for many schools of public health and their universities. The growth in undergraduate public health education has been initiated at the school and institutional level without a national framework or review process. This has resulted in a wide spectrum of degree programs based on local needs, interests, and opportunities. Indeed, our Web-based search identified various existing approaches to undergraduate public health education, and we added to the mix a liberal arts–oriented option designed to prepare students for graduate study not only in medicine and public health but in a wide spectrum of fields that benefit from the skills and population perspective of public health.

This approach to the development of undergraduate public health curricula can be contrasted with the one taken by the Association of University Programs in Health Services Administration (AUPHA), which in the mid-1980s created a Task Force on undergraduate education that reviewed existing programs and published curriculum models.[14] Despite the absence of accreditation for undergraduate health administration programs, AUPHA has created a peer review process leading to certification.[15]

It is clear that public health degrees are not just for graduate students anymore. Our review suggests that undergraduate public health education is already flowering and is about to bear fruit. It will soon be the season for a national discussion of the goals and strategies for undergraduate public health education.

Dr. Riegelman is with the Department of Epidemiology and Biostatistics, George Washington University School of Public Health and Health Services (GW-SPHHS), Washington, DC. Mr. Teitelbaum is with the Department of Health Policy, GW-SPHHS. Ms. Persily is with the Department of Health Policy, Management and Behavior, School of Public Health, University at Albany, SUNY, Rensselaer, NY. Ann Carpenter, a student in the Epidemiology MPH program at GW-SPHHS, compiled information for the website search.

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