Who Will Keep the Public Healthy? The Case for Undergraduate Public Health Education: A Review of Three Programs

Sarah Bauerle Bass, Sally Guttmacher, and Elahe Nezami

While most universities have focused on graduate education to create public health leaders, undergraduate public health education is another way to ensure a prepared workforce at all levels. This article provides examples of three Council on Education for Public Health accredited graduate programs outside schools of public health (University of Southern California, Temple University, and New York University) that also offer undergraduate public health education, one that is in its first year of offering a public health minor, and the other two offering majors and minors. Although these programs come from different philosophies, all have an underlying mission to influence how public health is understood. Considering the current need for public health workers, we anticipate that most higher education institutions will soon offer undergraduate public health courses. These programs must be mindful, however, of newly emerging accreditation requirements, which might have implications for both established and newly developing undergraduate public health programs, as well as articulation issues between undergraduate- and graduate-level master of public health programs. An examination of existing programs, as well as a discussion of accreditation requirements and articulation issues, will help institutions create curricula that meet their students’ educational needs as well as the need for a strong public health workforce.

KEY WORDS: public health workforce, undergraduate public health education

As threats of infectious disease, bioterrorism, chronic disease, and health disparities loom, there is critical need for leaders who understand the complex relationships of individual behavior, environmental and social conditions, as well as legal, political, and psychological factors that affect health. Public health professionals are expected to work with communities and stakeholders, government agencies, as well as the private sector, trying to keep public health concerns at the forefront of public consciousness. Preventive strategies have also become important across the healthcare spectrum, increasing the need for public health education for future doctors and other clinicians. The Institute of Medicine (IOM)\(^1,2\) has indicated that the development of a prepared public health workforce ready to address emerging problems is essential to maintain the public’s health. Similarly, Turnock,\(^3\) Lichtveld and Cioffi,\(^4\) Baker et al,\(^5\) and Tilson and Gebbie\(^6\) have all indicated the need for a trained, fully competent public health workforce.

It is imperative that public health professionals are trained to provide leadership, with a solid academic foundation in the five public health core areas: biostatistics, epidemiology, healthcare administration, environmental science, and social/behavioral health. Although most academic programs have focused on graduate education, another way to ensure a prepared workforce at all levels is to provide comprehensive public health education at an undergraduate level. Undergraduates with public health training can provide

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a number of functions. They can fill entry-level positions in health departments and community-based organizations; they can also go on to graduate or professional school with a background that ensures a public health perspective in all health fields. Ideally, the goal is to have a cadre of undergraduates who not only supplement the existing public health force but also have basic education in all key areas of public health.

The aim of this article is to provide examples of three Council on Education for Public Health (CEPH) accredited graduate programs outside schools of public health (University of Southern California [USC], Temple University [TU], and New York University [NYU]) that are also offering undergraduate public health education. (The CEPH is the accrediting body for all undergraduate and graduate programs in public health both in and outside schools of public health.) The USC program primarily trains undergraduate public health majors, Temple primarily trains undergraduates for entry-level public health positions, and the NYU is just starting to provide undergraduate public health courses for the general student body along with a minor in public health. Thus, these programs come from different philosophies, each with a different goal. But all have an underlying mission to train undergraduates by providing public health education that will help expand their thinking, influencing how these students see, and understand public health. The following provides a brief background on undergraduate public health education, a synopsis of each of the programs, and a discussion of how current trends in public health, such as accreditation of undergraduate public health programs and articulation between undergraduate- and graduate-level public health programs, might affect how institutions go about establishing undergraduate programs.

○ Background

Why teach public health to undergraduates?

Both its intellectual content and social values make public health a more than suitable field for undergraduate education. The 2002 IOM report \(^2\) calls for the teaching of public health at the undergraduate level to all students including those in liberal arts. Part of the IOM’s rationale is that a public health perspective will both encourage students to integrate the contents of a number of academic disciplines and enable students to develop a deeper understanding of current pressing health policy issues. Undergraduate training in public health helps, they argue, to lay the foundation for critical thinking by using an epidemiologic framework to study health and illness from a population rather than an individual perspective. \(^2\) In fact, the skills undergraduates acquire from an introduction to public health are applicable to many fields outside medicine. For example, the critical thinking skills of epidemiology can be applied to a variety of research disciplines and awareness of population-level health provides a unique perspective for students interested in fields focused on globalization issues, such as economics, ethics, or law. The Task Force on Undergraduate Education of the Association of Schools of Public Health \(^7\) now recommends that an introductory course in public health be made available to all undergraduates. The task force reasons that an understanding of the biological and social determinants of health and disease is useful background for all students, including those pursuing health professions.

In addition to increasing the awareness of public health, there are other more practical reasons for teaching public health to undergraduates. There is a need for increasing the public health workforce to address the current and growing shortage. Currently, it is estimated that 20 percent of public health positions remain vacant as workers retire, and workers with formal public health training are not available to fill such positions. \(^5\) Indeed, most people in the public health workforce have no formal public health training. \(^5\) This situation is becoming more critical as our population ages and interventions to prevent chronic disease, or new pressing infectious diseases such as SARS or bird flu, become more important.

The development of public health minors and majors

Many undergraduate institutions have already gone beyond the development of one or two courses in public health and are now offering minors or majors to students interested in public health. \(^8\) The core curricula of these programs are similar, though each institution has its individual stamp. These programs can be offered by institutions already experienced with graduate public health programs, by arts and science faculties in which public health is a new venture, or as collaboration between faculties. In any organizational configuration, these public health offerings are increasingly sought after by undergraduates, as evidenced by all three reviewed programs and recent unpublished surveys of both the Association of Schools of Public Health and the Association of Teachers of Preventive Medicine.

Public health programs based in schools or departments of arts and science may lean heavily upon the social sciences and attempt to incorporate a public health perspective across disciplines. Programs developed from graduate-level public health curricula may have a more applied focus, including classes in public
health core content. Most will also include some sort of internship or capstone experience. Public health minors usually require about half the number of course credits as majors and will require foundation courses such as Epidemiology and Public Health 101, in addition to a number of electives. As evidenced by the following reviews, each college or university has an opportunity to include undergraduate public health education in a way that best suits that location. The underlying philosophy, however, should support the idea that undergraduate public health education can make a substantial contribution to building an educated citizenry, as well as an entry-level workforce that understands the role and worth of public health.

**Program Descriptions**

**University of Southern California’s BS in health promotion and disease prevention studies**

The USC is one of the nation’s top private universities, enrolling 33,000 students. Of these, approximately 32 percent are from American minorities and 17 percent are international students, more than any other university in the United States.9

The bachelor of science (BS) program in health promotion and disease prevention studies is housed within the USC Institute for Health Promotion and Disease Prevention Research (IPR), in the Department of Preventive Medicine at the Keck School of Medicine. In addition to its PhD program in health behavior research, the IPR also offers master of public health (MPH) and joint BS/MPH programs, as well as sponsors joint programs with the USC master’s programs in biostatistics and molecular epidemiology and doctor of medicine (MD), doctor of pharmacy (PharmD), doctor of physical therapy, and clinical psychology PhD programs.

Launched in 1997, the BS program was modeled after the IPR doctoral program, with a strong emphasis on transdisciplinary research. The mission of the program is to inspire future healthcare professionals to serve the whole person and the whole of society by educating them about the sociocultural, behavioral, psychological, and biological factors that contribute to wellness and disease. As shown in Table 1, students are required to complete courses in biology, chemistry, mathematics, psychology, statistics, health policy, and health behavior research methods in addition to a variety of electives in areas such as substance abuse prevention, nutrition, AIDS, and culture and health. The program also requires students to complete an internship or directed research project to apply their classroom knowledge in the field. Students work under the supervision of faculty researchers or community health leaders for a minimum of one semester and earn at least two units of credit for their activities. They may continue their work for up to four semesters and earn up to a total of eight semester units of credit. The degree requires a total of 128 credit hours to complete, 66 of which are determined by the major’s curriculum.10

Students who join the major have a wide variety of interests. Many students plan to pursue professional study in medicine, dentistry, or pharmacy, and seek out the major as a means to gain a broad-based public health education at the undergraduate level. Other students are interested in pursuing careers in nutrition or health education and use health promotion coursework as a part of their required preprofessional training. Increasingly, students are joining the major program with a well-developed interest in public health issues and public health careers. The students in the program are quite diverse; more than 70 percent self-identify as other than White, with 36.8 percent Asian (119 students), 20.7 percent Hispanic (67 students), 8.9 percent African American (29 students), and 5.6 percent some other ethnicity (18 students) (Table 2). In addition, a majority of the students are female (72.4%). Currently, about 325 students are pursuing the major.

Because the USC curriculum is aimed to help those students interested in pursuing graduate health professions gain the science background they need, more than 60 percent (61 total alumni) of the graduates from the classes of 2005 and 2006 have continued their education after completing the bachelor’s program. Twenty-five of these graduates have entered MD, doctor of dentistry, or PharmD programs, and 10 have gone on to pursue an MPH degree. The rest have entered a variety of fields, including law, occupational therapy, nursing, counseling, and education. An additional nine graduates are currently in the process of applying to graduate programs (Table 3).

**Minor programs**

In addition to the BS program, the USC offers minor programs in public health, nutrition and health promotion, substance abuse prevention, health communication, cultural competence in medicine, and cinema-television for the health professions. Fifty-five students are currently enrolled in these six programs. The minor programs are designed to provide exposure to students to the theories and methods of public health and preventive medicine, as well as to a range of salient topics in healthcare. Many students come from related departments and programs, including biology, psychology, and kinesiology, and are often interested in pursuing health-related careers.
Progressive degree programs

Finally, the USC offers three progressive degree programs that allow students to enroll in graduate courses before they complete their bachelor’s degrees, and to finish both a bachelor degree and a master degree in 5 years. The three master’s degree programs open to health promotion undergraduate students are MPH, master of science (MS)-Biostatistics, and MS-Molecular Epidemiology. Students apply during their junior year, and submit a proposal to have up to three courses count toward both their undergraduate and graduate degrees. Applicants do not have to submit GRE scores but are expected to have at least a 3.5 GPA at the time of application. It should be noted that while students are encouraged to pursue the progressive degree, we do not aim to prepare students to enter the public health workforce upon completion of the bachelor’s degree alone.

The progressive degree does not require prior experience in the public health workforce for admission, and is intended to serve as a gateway to practical training for students wishing to thoroughly prepare for careers in public health.

Temple University’s BS in public health

The TU is a comprehensive urban public research university located in Philadelphia that enrolls more than 34,000 students, nearly one third of whom report their ethnicity as other than White. The Department of Public Health is located in the College of Health Professions on Temple’s main campus and offers graduate programs in public health (PhD, MPH, MD-MPH, doctor of osteopathy [DO]-MPH, master of social work [MSW]-MPH, doctor of podiatric medicine [DPM]-MPH,
TABLE 1 • Demographics of public health/health promotion students by gender and ethnicity—Temple University (TU) and University of Southern California (USC)¹

<table>
<thead>
<tr>
<th></th>
<th>TU (N = 197)</th>
<th>USC² (N = 323)</th>
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<tbody>
<tr>
<td>Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>21 (10.7%)</td>
<td>89 (27.6%)</td>
</tr>
<tr>
<td>Female</td>
<td>176 (89.3%)</td>
<td>234 (72.4%)</td>
</tr>
<tr>
<td>Ethnicity</td>
<td></td>
<td></td>
</tr>
<tr>
<td>White</td>
<td>72 (36.6%)</td>
<td>101 (31.3%)</td>
</tr>
<tr>
<td>Black</td>
<td>78 (39.6%)</td>
<td>29 (8.9%)</td>
</tr>
<tr>
<td>Hispanic</td>
<td>7 (3.6%)</td>
<td>67 (20.7%)</td>
</tr>
<tr>
<td>Asian</td>
<td>26 (13.1%)</td>
<td>119 (36.8%)</td>
</tr>
<tr>
<td>Other</td>
<td>14 (7.1%)</td>
<td>18 (5.6%)</td>
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¹Values given are number (percentage).
²Students may select all ethnic groups that apply to them, so the numbers do not sum.

MS-Epidemiology, MS-Environmental Health, and master of education), as well as a growing undergraduate program. In addition, the program is currently developing a 5-year BS-MPH program for outstanding freshman. The College of Health Professions is currently made up of eight departments, including communication sciences, health information management, kinesiology, nursing, occupational therapy, physical therapy, public health, and therapeutic recreation, and ranks in the top 10 health professions schools in National Institutes of Health funding.

Awarding a BS degree in public health, the Department of Public Health’s mission and undergraduate curriculum are aimed at preparing undergraduate students for diverse entry level public health careers that focus on creating, implementing, and evaluating interventions and programs designed to improve health status and quality of life for individuals. It has recently been one of the first undergraduate programs in the country to be granted CEPH accreditation. Students study the broad range of public health concerns including individual disease prevention and harm reduction behaviors, distribution and development of disease through epidemiological assessment and community program development, implementation, and evaluation. Their experience is rooted in the community, and it is expected that graduates will understand the role public health play in fostering health within communities, especially those that are underserved.

The TU undergraduate major has existed for more than 20 years. Originally a major in community health education, its name and curriculum were changed to public health in 1999, adding courses in epidemiology, introduction to public health, and environmental health. This change has resulted in 150 percent growth in enrollment with just over 200 majors. The public health major requires 124 credit hours to complete, 94 of which are dictated by the major. As shown in Table 1, after all core university classes are taken, a public health major takes courses within core content areas (introduction to public health, health psychology, disease prevention/control, sexuality, substance use, nutrition, epidemiology, environmental health, teaching techniques, research methods, and program planning and evaluation); they are also required to take cognate courses in other university departments including statistics, anatomy and physiology, and healthcare management. Core university classes are required for all TU students and include coursework in writing composition, quantitative reasoning, science and technology, language or international studies, as well as the humanities. These courses are most commonly taken in the freshman and sophomore years, and all undergraduates are advised to take these classes before they begin their major coursework.

In the undergraduate public health program, an emphasis is placed on community-based public health so that majors learn to use educational interventions to provide health information, gain experience in assessing the needs of target populations, clarify program goals and objectives, and develop strategies to motivate their clients in educational interventions. To apply these skills, students are also required to take 14 internship credits (>600 hours of hands-on experience) working in community-based public health agencies. In these settings, students are expected to assume responsibility for tasks in the implementation of the programs of the agency. In addition, as part of their capstone two-semester program planning and evaluation course, students are required to plan, implement, and evaluate their own public health program by writing a grant proposal.¹²

It should be noted that a majority of students come to the public health major as intrauniversity transfers,
meaning they started as one major and transferred to public health most commonly as a sophomore or a junior. While the trend has been for more students to declare public health as a major as freshman, they still constitute less than 10 percent of the total. Students transfer to the major from a variety of programs, most notably biology, chemistry, or prenursing. Others “find” the major when they take content courses such as nutrition, human sexuality, or AIDS and society, which are open for all students. Temple’s public health majors are also quite diverse; more than 60 percent report their ethnicity as other than White, with 39.6 percent African American (78 students), 13.2 percent Asian (26 students), 3.6 percent Hispanic (7 students), and 7.1 percent (14 students) some other ethnicity. Similar to the USC program, most students are female (89.3% or 176 students) (see Table 2).

Because the curriculum uses a community public health model and also emphasizes public health’s role in medicine and healthcare, the result is that undergraduate majors are most often interested in working in community-based public health or look to the major as a stepping stone to graduate programs. As shown in Table 3, the result is a majority of graduates in 2005–2006 work in public health agencies. In general, more than half of Temple’s public health students go on to work for community-based organizations, health departments, hospitals, and other agencies involved in public health. In addition, 7.5 percent are currently in MPH programs, 6 percent are in other professional schools, and 6 percent are currently applying to graduate school. Only 4.5 percent of graduates are not working in public health or furthering their education in a health profession. Although a tracking system has just been put into effect, it is estimated that approximately 30 percent complete graduate or professional school (medicine, nursing, dentistry, MPH, MSW) within 3 years.

Minor in public health

The TU also offers a public health minor for students who are interested in supplementing coursework with public health courses. The minor consists of seven, three-credit courses, which are designed to give students a basic background and introduction to content areas in public health. Students are required to take courses in introductory public health, health psychology, epidemiology, and environmental health. They are then allowed the flexibility to tailor their experience by choosing two electives directly related to their areas of interest. Similar to the USC program, students interested in the public health minor come from a variety of disciplines, including nursing, sociology, psychology, geography/urban studies, and anthropology. Currently, more than 50 students are pursing the public health minor course.

New York University undergraduate curriculum in public health

The NYU is the nation’s largest private urban university with 40,000 students. At its inception, the university was established to serve the large and growing population of the greater New York area and to be a center of higher learning open to all, regardless of national origin, religious beliefs, or social background. The Steinhardt School of Culture, Education and Human Development, in which MPH in Community Health and the new undergraduate courses are housed, is 1 of 13 schools at the NYU and is unique in that it incorporates an interdisciplinary approach to education and human development. With support from a curriculum grant offered by the Centers for Disease Control and Prevention through the Association for Prevention Teaching and Research, the NYU offered in the 2006 fall semester two undergraduate public health courses, Health and Society (Public Health 101) and Epidemiology. These courses were developed not only because there was a demand for them but because the experience had been that some undergraduates had a difficult time dealing with the expectations for graduate-level work and these courses provided the content on a developmentally appropriate level. Overall, the goal of both the classes was to teach about the complexity of using demographic characteristics in population-based work, and the limits of our measures of race, gender, social class, and disability on policy. In addition, both courses introduced students to some of the ethical issues involved in epidemiological and public health research.

The goal in developing these two courses was to make evident the interdisciplinary nature of the field by demonstrating how public health draws on the disciplines of demography, biology, the social sciences, history, medicine, and biostatistics. The courses attracted a large, diverse group of juniors and seniors, many more of whom were majoring in the social sciences than anticipated. Demographic characteristics of students were not obtained, but university records indicate that more than 17 different academic departments were represented. The largest groups were from the departments of nursing and psychology, as well as from the social sciences, but students representing the departments of communication, chemistry, fine arts, theater, history, English, religion, philosophy, and political science were also represented. As the NYU intends to offer public health minor, major, and 5-year BS/MPH degrees, it is expected that in the future, departmental representation will be influenced by whether the
student views public health as a terminal degree or as a way to broaden his or her perspective for a career in medicine or nursing. The NYU initial experience confirmed the interest and attractiveness of public health courses at the undergraduate level. In fact, 2 of the 46 students in Health and Society applied and were accepted into the MPH program having decided that they wish to pursue careers in public health rather than clinical medicine.

Health and Society introduced a range of public health topics and approaches to excite undergraduates. Its curriculum included lectures, films, and interactive activities including case-based learning, exposure to public health leaders through guest lectures, visiting local health departments, and student debates on issues such as the advantages and disadvantages of a single-payer system or the health impact of laws enforcing parental consent for minors requesting abortion. The class also made use of the rich diversity of experience within New York City, allowing students to examine health issues as they affected immigrants. Ultimately, it was hoped that students would be stimulated to explore global health issues by taking advantage of the many study-abroad opportunities available at the NYU.

The Epidemiology course stressed the conceptual rather than technical aspects of the field, noting it as the foundation of population-based public health. It used a diverse set of readings and Internet sites such as “The Medical Detectives” by Roueche and the Communicable Disease Web site of the NY State Department of Health. The class was structured around an inquiry into the sources of epidemiological data and their uses, as well as their meaning in public policy and practice.

As this was the first time that undergraduate public health courses were offered at the NYU, both were offered for only two credits. To evaluate the course content and acceptability of the courses, two focus group meetings (n = 19) were held, one for each course. While a majority of the students participating in the focus groups were premedicine majors (8/12 for Epidemiology and 5/7 for Health and Society), all participants in the focus groups were interested in public health as a career or for future schooling of some kind. The students in the Health and Society course were very enthusiastic about the course but wanted more depth in each of the topics covered and more discussion of relevant current events. They also wanted to hear from more practitioners to enable them to better make the link between their coursework and practice and to see what employment opportunities exist in the field of public health. Although the Epidemiology course was geared at a very basic level, holding a two-credit Epidemiology course presented more of a challenge, especially because some of the students had not taken a statistics course. The students appreciated laboratory-style recitation that accompanied the weekly lectures because it allowed them to go over assignments, although the time required was greater than what was expected in two-credit courses. These two courses convinced NYU faculty and administration of student interest in more exposure to public health topic.

Future directions

The success of these classes led to the development of a public health minor for the fall of 2007. The minor builds on these two courses, which are now offered for four credits each, and includes two new courses, one in public health nutrition and one in global health. Students may also choose a minor with a concentration in public policy, where students will take the original two core courses, a class entitled “Topics in public health policy” and a second class focused on the healthcare system. In addition, plans are being developed for an undergraduate BS in public health, and a 5-year BA/MPH.

Discussion

Given the severe shortage of workers with adequate training in the core competency areas of public health, as well as the growing public interest in public health issues, many institutions of higher education are eager to offer new or expanded programs in public health, especially at the undergraduate level. Student interest in these programs is high both because of the possible job prospects for graduates with public health training and because of high-profile public health issues in the media, such as bird flu, bioterrorism, and food contamination. The discussion about the best ways in which to train and possibly credential public health workers, however, is ongoing, so institutions have chosen to pursue a wide variety of options for structuring their undergraduate public health curricula. Two overarching issues, however, will have profound effects on how existing and newly developing undergraduate programs will be structured: new CEPH accreditation guidelines and articulation issues between undergraduate- and graduate-level programs.

One development in undergraduate public health education is the establishment of accreditation requirements by the CEPH. Universities with programs in public health and schools of public health that have accredited graduate programs and also offer undergraduate programs may now apply for similar accreditation of their undergraduate programs. This development could radically change the scope of undergraduate public health education. Before this, universities developed their curricula with thoughts on only to what they felt...
best served their students, institution, and communities. The result has been a wide berth of programs calling themselves “public health,” with little standardization in curricula. The recent move to accreditation, however, may change this situation. Currently, the CEPH requires that if an accredited program or school offers an undergraduate program and would also like to be accredited, they must apply separately for accreditation or request the undergraduate program be evaluated at the same time as the graduate program. To be evaluated, the CEPH requires that the institution offer a degree in BA or BS in public health or a public health discipline, such as health services administration or health education.18 Regardless of focus, however, the CEPH requires that these programs must achieve basic characteristics. One of these characteristics includes training students for entry-level public health positions by having instruction on addressing the health of populations and communities, emphasizing competency development in health issues that affect society as a whole, especially in vulnerable populations.18 In addition, the CEPH outlines 17 criteria on which they evaluate a program. These criteria include the addition of appropriate practice experiences for undergraduates, such as fieldwork, evidence of coursework in core areas of public health, especially introduction to public health and epidemiology, and a trained faculty in public health dedicated to the undergraduate program.18

These new criteria could have significant implications on the development of undergraduate public health programs. A recent Internet search showed that there were more than 40 undergraduate programs in public health, community health, or health promotion in the United States. Differences in curricula, however, are obvious. The curricula of TU and USC are stark examples of these differences. As shown in Table 1, Temple’s program, which mirrors more an MPH curriculum, including extensive fieldwork experiences, prepares students to work in more traditional public health roles. The USC curriculum, however, is more developed to help students prepare for graduate programs in medicine and other healthcare professions, with required coursework in biology, chemistry, and mathematics. While there is overlap in some coursework, namely, health behavior theory, disease prevention, and an introductory course, the focus of the programs is very different. While Temple’s undergraduate program aims to train entry-level public health workers and has recently been accredited by the CEPH, the USC program requires several changes to its curriculum to achieve accreditation, changes that the institution is currently not willing to make. Instead, the USC program is designed to diverge substantially from programs such as those of Temple’s and sees its mission as familiarizing students with theories and concepts of public health so that they are better equipped to serve populations after continued professional training and study in the allied health field. Students who wish to work in the public health field, then, are expected to receive more in-depth preparation in master’s level programs in public health and/or epidemiology.

This expectation to receive graduate-level public health training creates another challenge to undergraduate program, namely, the articulation between the two levels of education and how curricula must be the same or different. It is hoped that if MPH programs recruit students from the ranks of undergraduate public health programs, there must be a big enough difference in what is being taught at the two levels and enough specialized courses offered at the graduate level to make the MPH degree a worthwhile investment for public health undergraduate minors and majors. On the other hand, if the undergraduate programs are intended to broaden the view of students headed for careers in nursing or medicine rather than public health, duplication of material need not be a big concern.

Employers must also be able to see the difference in skill level if they are going to pay higher salaries to applicants with a master’s degree. If the undergraduate programs are designed to prepare individuals to fill entry positions in the public health workforce, then their academic training must be at a level that is non-competitive in terms of employment with students who graduate with an MPH degree. Therefore, in terms of recruitment for specific workforce positions, the difference in training and competency between an undergraduate major in public health and someone who has been trained at the master’s level must be clear.

Currently, the considerable variation in the skill level of students who graduate with an MPH degree from schools and programs is the primary rationale for the new credentialing examination being developed by the National Board of Public Health Examiners. The explicit goal of setting such an examination is to ensure that all persons who have been awarded an MPH degree will share a similar set of basic public health–related skills. It is not expected that such skills would be acquired at an undergraduate level, but it may be that some undergraduate programs that achieve CEPH accreditation could argue that their students could and should be allowed to be credentialed if they can pass the examination.

Finally, evaluating the knowledge and skill level of an applicant from an undergraduate program to a master’s program is difficult. At the current time, there is no way short of an assessment examination that the faculty of a graduate program can determine the skill level of an applicant who has taken a public health course at an undergraduate level, especially if the applicant is from another university. It may be that once the CEPH
undergraduate public health competencies are established and more programs standardize their curricula to achieve accreditation, a floor will be established for undergraduate education in public health so that there will be greater clarity of the differences in the expected knowledge and skills between an undergraduate and an MPH student.

**Conclusions**

It is safe to assume that many existing undergraduate programs may feel the changes needed to achieve CEPH accreditation too challenging or poorly fitted to their vision and mission, or that the articulation problems between their graduate and undergraduate levels are too problematic to address. The CEPH hopes, guided by leadership of the Association of Schools of Public Health, the Association for Prevention, Teaching and Research, and the National Transition Task Force on Accreditation in Health Education, to help standardize public health curricula to ensure a qualified, entry-level public health workforce. While current programs may not all subscribe to these changes, newly developing programs may use the CEPH requirements, as well as a review of currently accredited programs, as benchmarks for developing curricula that will offer students a wide range of public health experiences under a standard rubric. This is the case with the NYU, which, based on the success and popularity of its first undergraduate public health course offerings, is now offering a minor and developing a major in public health with the aim of gaining CEPH accreditation. Thus, this article describes three differing approaches to offering undergraduate public health education with the hope that other institutions can decide how they might best offer coursework to increase awareness of public health in undergraduates. Whether these offerings are aimed to achieve accreditation, the trend for accreditation is a real challenge both to existing and to newly developing programs.

Considering the current strong need for public health workers, the increasing necessity for clinical healthcare professionals to have a foundational education in public health issues, and strong public and student interest in public health, we anticipate that most institutions of higher education will offer undergraduate courses in public health in the near future. These courses will inevitably be followed by minor and major programs of study in public health. A close examination of existing undergraduate public health programs will help colleges and universities create new programs that meet the educational needs of their students as well as the national and international needs for a strong public health workforce.

**REFERENCES**