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The Need for Professional Doctors of Public Health

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Synopsis

Planning, organizing, and operating today's complex health care systems or heading Federal, State, and city public health agencies in the United States and other countries require professionals broadly prepared in the meaning, philosophy, and strategies of public health. It is and has been recognized that the best trained clinical physician could not be expected to know the policies and practices of official public health programs. The chief health official of a State or other jurisdiction, for example, deals with the epidemiology of many diseases; with all aspects of the environment; with hospitals, drugs, health manpower, and nutrition; with issues of health economics, finance, and poli-

tics; and with administration. For these tasks, most of medical education is irrelevant.

To produce the needed specialists, candidates with a BA degree would be educated as doctors of public health. The proposed 5-year postgraduate curriculum is as demanding as the training for the MD degree, but completely different. The 38 subjects or courses in the curriculum are grouped into four categories: basic tools of social analysis, health and disease in populations, protection of health and prevention of disease, and health care systems and management.

At present, MPH degree holders take only a handful of core and elective courses and emerge with little systematic knowledge about the majority of problems they face. The DrPH candidates at schools of public health spend most of their time on research and dissertation writing—adequate preparation for university teachers, but academia is not the goal of most candidates, nor the greatest need of society. Recruits for the proposed new doctorate in public health may be found among the thousands of young people who want to do "community health work" but see no way to play a significant role without getting an MD degree first.

THE EFFECTIVE PERFORMANCE of health care systems in the United States and throughout the world requires the education of thousands of doctors of public health. I do not mean doctors of medicine, with a bit of supplementary training in public health. The need is for specialists in the health of populations, prepared to at least the same level of professional competence as physicians dealing with the sickness of an individual patient.

Public Health's Origins in Medicine

For centuries, the physician has evolved as the socially recognized expert in treating the sick person. The education of physicians has become increasingly complex and, with the growth of specialization, increasingly lengthy. As more scientific knowledge has accumulated, more facts and concepts and skills must be mastered. Only a small part of the physician's instruction—varying in different times and places—has concerned the prevention of disease and maintenance of good health in populations or even in individual persons.

The concern of certain great medical figures with hygiene and health maintenance can be traced to ancient times and to the Middle Ages. Galen in the late Roman Empire produced his six books on hygiene, and 12th century Italy produced the Salernitan Health Code—advising, in poetry, on the habits conducive to health (1). But these classics were addressed to physicians and laymen alike, and there is little indication that they played much part in medical education. Moreover, most of their advice was relevant only for persons of very high social status.

Medical education was steeped in Latin, Greek, philosophy, and physic (principles of medicine) from the heritage of classical Greece until the end of the 18th century. Anatomy acquired its first independent teaching laboratory in Germany in 1814, followed by physiology, chemistry, and pharmacology (2). Pathology was not established as a discrete discipline to be taught to medical students until 1856, when Rudolph Virchow came to Berlin. Not until 1878 was the first laboratory in hygiene established at Munich, and it took some years for other medical schools to recognize hygiene as a formal discipline in the medical curriculum.

Hygiene was concerned with the influence of the physical environment on the health of the individual person, and it matured with the development of bacteriology. In the early 20th century, hygiene was still limited to this scope. At Leipzig, for example,

the 5-year university curriculum in medicine included 71 distinct courses, of which "Hygiene" was one, in the last part of the fifth year; unlike almost all other subjects, this course required no proof of attendance at lectures but only the passage of an examination.

For many years, instruction in hygiene was closely linked to bacteriology. Around 1920 in Germany and Sweden, there were "institutes of hygiene" within the medical faculties, though in France it was regarded simply as part of bacteriology. In the United States after the first World War, hygiene was taught within departments of bacteriology and internal medicine. In 1924, however, Abraham Flexner wrote of "a change of view, gradually perceptible [in the United States] which tends to permeate the entire medical school with the thought of preventive medicine" (3).

By 1930, medical schools in the United States were establishing "departments of preventive medicine." According to the Commission on Medical Education reporting in 1932, preventive medicine had two distinct features: one was concern with "the protection of the health of the community through organized public health programs and the other with the prevention of disease and disability in the individual" (4). The first aspect was a well-recognized part of the curriculum in practically all U.S. medical schools; it dealt with such matters as "vital statistics, sewage disposal, milk, food, and water supplies, communicable disease, quarantine, industrial hazards, and other features of an environmental character." The second aspect, disease prevention for the individual, was expected to permeate the teaching of all the clinical subjects, although it seldom did.

It is not hard to understand why teaching the organizational principles of public health did not succeed very well in medical school. In comparison with the fascinating advances of biomedical sciences, study of organized public health programs fell flat with most medical students and was barely tolerated by the general faculty. After World War II, there arose in England the concept of "preventive and social medicine," which put new life in the field by building a bridge between clinical and social aspects of medicine (5). In the United States, the change was signaled by renaming the responsible departments "community health" or "community medicine." The approach to community health problems was through the examination of individual cases; demonstration of a patient with syphilis introduced discussion of venereal disease control,

and a malnourished infant was the prelude to discussing maternal and child health programs. Still, the social and preventive aspects of syphilis or malnutrition did not seem very interesting or relevant to students who were struggling to master diagnosis and therapy, and only a handful showed any interest.

Various strategies have been used in the 125 U.S. medical schools and the 1,100 other medical faculties throughout the world to increase the effectiveness of teaching social concepts to medical students. Almost everywhere the effort has been unsuccessful. Departments of social and preventive medicine, community health, family and community medicine, by whatever name, have in general been weakly staffed and poorly regarded. In relation to the "hard" basic sciences and the dramatic clinical fields, these disciplines sit meekly on the sidelines. In the eyes of most medical students and most faculty members they fall at the bottom of the ladder of academic prestige.

The Rise of Schools of Public Health

The need for graduate training in public health was recognized as early as 1912 at the Massachusetts Institute of Technology, through the initiative of William Sedgwick, an environmental engineer. When he joined forces with Milton Rosenau, the professor of preventive medicine at Harvard Medical School, the foundation was laid for a graduate school of public health. In 1916, with Rockefeller Foundation support, the first such institution was established as the Johns Hopkins School of Hygiene and Public Health (6). Isolated courses in public health had been given in European and American medical schools long before this—for example, at the University of Leeds' (England) Department of Preventive Medicine and Public Health in 1884—but independent graduate schooling in public health did not arise before 1916 in Baltimore (7). Relatively early schools of public health, independent of any medical faculty, were launched in London (1924), Madrid (1926), Manila (1927), Mexico City (1922), Calcutta (1921), Toronto (1925), and Sao Paulo (1925).

These early schools at first admitted only physicians for graduate study. After a few years they admitted members of closely allied professions such as dentists and veterinarians. Outside the United States, the great majority of the approximately 80 existing graduate schools of public health in the world that are independent of medical faculties (that is, not simply medical school departments that offer

graduate training) still admit only physicians, dentists, and veterinarians. The approximately 115 medical school departments world-wide that offer graduate training in public health are almost all limited exclusively to physicians.

The striking deviation from this general admission policy is found in the United States where, since World War II, persons with a much wider range of academic and experiential backgrounds have been accepted in the graduate schools of public health. In the highly pluralistic U.S. health care system, the needs for public health personnel, particularly administrators, have been far greater than could be met by physicians (plus dentists and veterinarians) interested in such work. As a result, in all of the 23 U.S. schools of public health a majority of the students are from backgrounds in nonmedical health fields—such as nursing, pharmacy, physiotherapy, nutrition, laboratory technology, optometry, or the like—or from the social sciences (sociology, economics, political science, psychology, history and so forth) or even from the humanities. All these candidates for public health training must have a bachelor's degree, and sometimes they are required to have had a certain amount of experience. The basic concept is that socially useful public health training can be built upon a great variety of academic foundations (8).

The majority of students undertaking graduate public health training are working toward a master's degree or its equivalent. An increasing proportion (25–33 percent) of students in the U.S. schools, however, are working toward a doctoral degree. Many U.S. schools offer the PhD degree, the qualification usually intended to prepare a candidate for teaching and research in a university. In addition, virtually all schools in the United States offer a "doctorate in public health" or a DrPH degree.

The DrPH degree was originally intended for physicians, dentists, and veterinarians who wished to earn higher public health credentials by conducting some original research and writing a dissertation. In the 1950s, the DrPH was opened to master's degree graduates of other backgrounds; in some schools another doctoral degree, the DSc, had always been considered more appropriate for non-physicians, and later sometimes the PhD. By any of these paths the academic requirements were designed to be very similar to those of the PhD—that is, the conduct of research, preparation of a dissertation, and passage of various examinations. Even though the doctoral graduate—whether PhD, DrPH, DSc, or some other designation—did not finally enter an academic career nor had any inten-

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tion of doing academic work, his or her preparation was very similar (sometimes identical) to that of the PhD model.

Training Needs of Health Care Systems

Meanwhile, throughout the world, the need for personnel to plan, organize, and operate health care systems have become greater and more complex. The initial purpose of the first schools of public health in the early 20th century or, indeed, of the isolated courses in public health that had been offered even in the late 19th century, was to prepare physicians for holding government positions in public health agencies. At Munich, such a course—to prepare public health officials for the State of Bavaria and a few other German States—has been conducted by the government of Bavaria (with teachers entirely from the German public health establishment) ever since 1882. It was and is recognized that the best trained clinical physician could not be expected to know the policies and practices of an official public health program.

In most countries, the preparation of physicians for public health duties in government remains a major, if not the principal, purpose of schools of public health. The usual credentials for a public health official at a policy-making level is a medical degree, supplemented by a 1-year course in public health. The latter training in the United States gives the MPH degree (typically after 9 months of academic study), yielding the familiar “MD, MPH” qualification. Most public health positions of leadership throughout the world, in fact, are held by physicians who are qualified only in medicine and not at all in public health.

By reason of his or her biomedical knowledge about disease in individual persons, the physician everywhere seems to be regarded as generally qualified to understand and take charge of the health of populations. If we consider the directors of public health, for example, in the 50 States of the United States, in 1980 only 10 of them, or 20 percent, had

even a master's degree in public health, although almost all were physicians (9). One need not expect a national minister of health to be a physician, since his position is political rather than technical. The top technical public health official in a nation, however, should have competence in the health of populations and its protection.

Perhaps more important, at the level of Provinces or districts, where public health programs must be carried out, one would think that preparation in the increasingly complex disciplines of public health is essential. A Provincial or State health officer must deal with problems in the epidemiology of every type of disease, with all aspects of the environment, with hospitals, with drugs, with health manpower, with nutrition, with issues in finance and politics, with every aspect of government and society. In one country of North Africa the situation is typical. Some 48 million people live in 24 Provinces, averaging about 2 million each, and these are subdivided into 131 districts, with an average population about 366,000. Directing the official public health programs of these jurisdictions are 24 Provincial Health Officers and 131 District Health Officers. Every one of these officials is a physician, but only a half-dozen have a year's graduate training in public health, according to an unpublished field study that resulted in a U.N. Development Program report. (10).

The results, as reflected in public health performance, should not be surprising. Because they were educated essentially to practice clinical medicine, these public health physicians spend most of their time in Provincial and district hospitals that are, indeed, among their responsibilities. They are comfortable treating sick patients but not in supervising health centers, primary health care, disease control programs, and health education, in planning to meet community needs, regulating the sale of drugs, and so on. After one has seen the failures to provide public health leadership in country after country, Province after Province, one begins to regard training in clinical medicine, training to be a clinical physician, as more of an obstacle than a preparation for the role of public health leader.

The difficulties posed by most impoverished developing countries, in their attempt to implement the WHO strategy of extending primary health care, are especially serious. Scores of these countries have trained “community health workers” for brief periods (usually a few months) and assigned them to provide a wide range of preventive services and limited treatment of common ailments in the vil-

lages. They are expected to immunize, educate, spread family planning, promote sanitation, advance nutrition, and much more. But numerous objective studies have reported discouraging results. The community health workers may do their best, but they lack guidance and supervision from the public health official at the next echelon. As an international expert in auxiliary personnel said (11).

Supervision, if it is to be constructive, must be regular, frequent, informative, supportive, patient, and given willingly. Without careful, appropriate, adequate, and sustained preparation followed by supportive supervision from informed and sympathetic professionals, community health work must inevitably fail.

These "informed and sympathetic" professionals will seldom be found among clinically trained physicians in the district or Provincial office. Such leadership requires thorough sophistication in the meaning, philosophy, and the strategies of public health.

In 1975, the Milbank Commission for the Study of Higher Education for Public Health called on the U.S. schools of public health to reorient their purpose toward training only the "leaders" needed in the field, but it proposed no curriculum or strategy for doing so (12).

The widespread notion that biomedical education is the most appropriate background for public health leadership is understandable. The physician has been recognized as the healer of the sick for centuries. He is generally respected by the people and similarly by political figures. In the 19th century, when the social sciences were scarcely developed, there was no one else at all familiar with the health problems of populations and what to do about them.

In today's world, the requirements for understanding the health problems of populations and the capabilities that exist for coping with those problems are far greater. All countries have developed health care systems which depend on countless economic, political, and social processes. By a very simplified formulation, public health work requires two bodies of knowledge: (a) the causes and attributes of disease in populations and (b) the mobilization of resources to promote health, prevent disease, and treat the sick in populations. Broadly speaking, the first sphere of knowledge is epidemiology and the second is health service administration. There are, of course, many large subdivisions within both these spheres. The education

of physicians, however, includes only trivial exposure to either sphere.

If we set aside the influence of tradition and the threadbare argument that the social respect accorded to physicians makes them the "natural" community health leaders, what would be required for the education of public health specialists? The educational requirements would be extensive but very different from those necessary to attain expertise in diagnosing and treating disease in individual patients. A certain small amount of the education should be biomedical, to clarify the general nature of health and disease, but the main body of learning must be in the social sciences, the sciences of health, and the strategies applicable to the health care of populations.

A curriculum addressed to the capabilities required for public health leadership would be as demanding in time and effort as that for training physicians, but completely different in content. In my opinion, the curriculum may be summarized under four main categories of knowledge:

- basic tools of social analysis
- health and disease in populations
- protection of health and prevention of disease
- health care systems and their management

Curriculum for a Doctor of Public Health

In most of the world, and certainly in the United States, it should be assumed that the doctorate in public health calls for study at the postgraduate level. The potential candidate should have completed a bachelor's degree. The BA major might, for example, be in any of the social sciences, but wide flexibility should be allowed. Experience in a health program dealing with populations should be considered relevant. Insofar as the humanities can contribute to an understanding of culture and the biological sciences can contribute to an understanding of human populations, these disciplines may also be relevant in undergraduate study. Beyond these, the main fields and particular courses of study for the professional doctorate are summarized.

Basic Tools of Social Analysis

1. *Population and Demography.* The composition of different populations, age-sex distribution, socioeconomic and ethnic differentials, trends and their causes, mortality, morbidity, migration, and so forth.

2. *History of Public Health.* General background of mankind's approach to disease over the centuries (not the history of medical science).

3. *Biostatistics*. Methods of analysis of populations, experimental design, sampling, variance, statistical significance, regression, and so forth.

4. *Surveys of Populations*. Methods of study of characteristics in populations, sampling, inferences, and so forth.

5. *Evaluative Methods*. Strategies for judging the effects of health programs according to input of resources, process of activities, and outcome in health status.

6. *Introduction to Medical Sociology*. Application of basic sociological concepts to understanding communities and their relationships to health programs.

7. *Introduction to Health Politics*. Application of basic political science to understanding the role and dynamics of government and political parties or power in the formulation of health policies.

8. *Introduction to Health Economics*. Essentials of conventional economics as well as new concepts and their role in the dynamics of health care systems, involving markets and nonmarket forces that affect the distribution of health resources.

9. *Introduction to Medical Anthropology*. Concepts of culture and their influence on policies of prevention and treatment among diverse ethnic, religious, and national groups.

Health and Disease in Populations

1. *Major Diseases of Man*. Elementary biomedical explanation of the major disorders: infections, tumors, metabolic disorders, psychological disorders, diseases of body systems, trauma, and so forth.

2. *Major Forms of Diagnosis and Therapy*. History and physical examinations, laboratory and X-ray procedures, diagnostic inference. Therapies by medication, surgery, physical modalities, psychotherapy, combinations, and so forth.

3. *Descriptive Epidemiology*. Major causes of mortality in populations, according to age, sex, social class, and other characteristics. Major causes of disability and defects by age, sex, and social variables. Trends.

4. *Introduction to Epidemiologic Methods*. Concept of agent, host, and environment. Concept of risk and probabilities. Methods of investigation, epidemiologic research design, and so forth.

5. *Epidemiology of Infectious Disease*. Acute infections (bacterial, viral, and parasitic). Tuberculosis. Sexually transmitted diseases. Malaria and other vector-borne diseases. Poliomyelitis and other infectious diseases.

6. *Epidemiology of Chronic Disorders*. Cancer and environmental factors. Cardiovascular disease and risk factors. Neurological disorders, diabetes, arthritis, and other chronic disorders.

7. *Nutrition and Malnutrition*. Role in health and disease. Nutritional surveys. Relation to agriculture, economics, and culture. Main nutritional disorders in developed and developing countries.

8. *Environmental Hazards*. Contaminated water and food. Excreta disposal. Air pollution. Accident hazards in homes, transport, and public places. Radiation.

9. *Mental Health*. Main problems. Psychoses and psychoneuroses. Alcoholism. Drug abuse and addictions. Cigarettes. Sexuality problems. Epidemiology of mental disorders.

10. *Global Ecology of Disease*. Distribution of diseases on earth among developed and developing countries. Tropical diseases. Diseases of "civilization." Long-term trends.

Protection of Health, Prevention of Disease

1. *Environmental Sanitation*. Principles of safe water and sewage disposal. Control of atmospheric pollution. Prevention of accidents on roads and public places. Vector control. Food and milk control. Special strategies in rural areas.

2. *Occupational Health Programs*. Prevention of industrial accidents. Control of occupational diseases. In-plant health services. Mandatory standards of safety and health. Responsibilities of management and workers. Agricultural programs.

3. *Maternal and Child Health*. Prenatal and maternity care. Infant and child health promotion. School health services. Crippled children's programs. Health protection of adolescents. Family planning and related issues.

4. *Mental Health Services*. Mental hospitals. Mental health clinics and crisis programs. Child mental services. Substance abuse control programs.

5. *Health Education*. Fundamentals of human behavior. Strategies in diverse problems: personal hygiene, behavior regarding smoking and substance abuse, coping with stress, community organization, media strategies, and others.

6. *Nutritional Programs*. Nutritional policy. Adult and school health education on diet. School lunch programs. Industrial feeding. Problems of the elderly. Institutional dietetics.

7. *Dental Health Programs.* Fluoridation and related programs. School dental service. Dental hygiene. Relation to diet. Dental manpower training.

8. *Chronic Disease Control.* Smoking cessation programs. Obesity and dietary controls. Hypertension control. Exercise programs. Early case-detection. Screening by Papanicolaou smears, X-rays, stool examinations, and other measures.

9. *Geriatrics and Rehabilitation.* Special needs of the elderly. Activity programs, senior citizen centers. Social security and pensions. Meals on wheels. Home care programs. Institutionalization in custodial, board and care, and skilled nursing homes. Rehabilitation, sheltered workshops. Exercise programs.

10. *Communicable Disease Control.* Reporting, isolation, and quarantine. Tuberculosis control. Sexually transmitted disease control. Prostitution. Sex education. The AIDS problem. Case detection and contact tracing. Control of major tropical parasitic diseases such as malaria, schistosomiasis, and filariasis.

Health Care Systems and Their Management

This field cuts across much of the previous material.

1. *U.S. or Other National Health Care Systems.* Historic background. Health services in government—Federal, State, and local. Voluntary health agencies. Principal patterns of health care delivery. Health expenditures and public and private sources of funds. Problems and trends.

2. *Health Care Resources.* Health manpower: physicians, nurses, pharmacists, and others. Educational schedules. Licensure. Health facilities: hospitals, health centers, pharmacies. Diverse types and sponsorships. Drugs and their distribution. Research. Science and technology.

3. *Health Insurance and Social Security.* Background of the health insurance movement. Various types—statutory, nonprofit, and commercial. Health maintenance organizations. Problems and controls. Coverage, benefits, issues.

4. *Health Planning.* History of concept. Organized framework. Methods of area-wide planning. Planning of resources and services. Institutional planning. Voluntary and governmental planning experience. Issues and trends.

5. *Management of Health Organizations.* Organization theory and practice. Supervision and decision-making. Authority and delegation of responsibilities. Personnel management. Communication and coordination.

6. *Financial Administration.* Capital and recurrent costs. Fundraising. Basic principles of accounting. Cash flow. Depreciation. Schemes of remuneration. Budgeting. Cost controls.

7. *Information and Records.* Purposes of information. Types of record systems. Value of unitary identification. Classification codes. Computers, programming, and communications.

8. *Health Legislation and Ethics.* Foundations of law. Police power of the state. Legal aspects of selected problems of health promotion, prevention, and medical care. Conflict of social versus individual rights. Issues in the ethics of health care.

9. *Comparative International Health Systems.* Overall concept of health systems. Types of systems in industrialized and developing countries. Entrepreneurial, welfare-oriented, and socialist policies. World trends.

An Integrated Education

The 38 courses are intended to show the scope of the field of public health and how very different it is from clinical medicine. The sequence of subjects listed is not meant to indicate the exact curriculum, but rather its range and general content. Coverage of many subjects would require more than one course. Effective teaching would doubtless require a great deal of intermingling of courses from the four main categories.

Methods of teaching should naturally vary with the subject. Biostatistics would require laboratory exercises. Major Diseases of Man would demand observations in a clinical setting. Occupational Health Programs would require factory visits. Management of Health Organizations might entail visits to numerous active health agencies. Problem-solving, self-instruction, and seminars should complement didactic lectures as much as possible.

The scope of knowledge suggested, however, is reasonable to expect for a valid *doctor of public health*. One would not accept a doctor of medicine, for example, who knew nothing about the cardiovascular system or about the diseases of childhood or about the use of the microscope. Yet schools of public health are now turning out scores of doctoral graduates who have never taken a single course in nutrition or mental health or chronic disease control or health planning or medical sociology or management or occupational health or, indeed, the majority of the 38 distinct and essential subjects in the list.

The reason is simple enough. The current DrPH candidate, being modeled essentially on the aca-

demical schedule for the PhD degree, spends the greater part of his or her time doing the research for and writing a dissertation. This endeavor may be reasonable for someone aiming to teach in a university, but the majority of DrPH graduates do not seem to have this aim and do not end up in academia. Their proper role, and the role for which they should be prepared, is to serve the community as public health leaders and policymakers. (Moreover, many schools of public health offer the PhD degree for those with clear academic objectives.)

The customary MPH degree holder, with or without an MD, is even more superficially prepared in the substance of public health, simply for lack of time. He or she takes a handful of core courses in epidemiology, biostatistics, health administration, and so forth, and then a small cluster of courses in one chosen field. The physician with such an MPH then steps into a post in the United States or elsewhere as a city or county health officer or a Provincial or State health director or a national health official, with little if any systematic knowledge about the great majority of the health problems with which he must deal. A clinical physician with equivalent blind spots in his knowledge would not be tolerated for a moment. He would probably not even pass the medical licensure examination (but then there are no such tests for public health responsibility).

If the DrPH program were modeled essentially along the lines of the MD or JD or other professional degrees, that is, preparing graduates for a role in society, education in the range of subjects listed in this paper would be entirely feasible in 3 to 4 academic years. Assuming that each of the 38 subjects absorbed an average of 40 classroom hours with more time for laboratory or field studies, this would mean 1,520 school hours. If this work were taken in 3 years, it would mean 507 school hours per year—a reasonable level. Allowing 4 or 5 hours for laboratory or field work per week, and assuming 10 weeks per academic quarter (extra for examinations and holidays), would mean about 23 hours of school work per week—a reasonable level.

Following 3 years of required courses, one full fourth year of about 500 school hours should be allowed for elective subjects, in which the student has special interest. These studies might be interspersed among the required subjects, or concentrated in the fourth year, or distributed partly both ways.

To link theory with practice, an additional fifth year must be provided for supervised field experience. At least 6 months of additional time should be

devoted to placements in two or three types of field setting, working under the direction of a seasoned and competent public health specialist. On the basis of this experience, the candidate should prepare a thorough essay on some problem of special interest, along with his recommendations for its solution. Allowing time for the field placements, the preparation of the essay, and reviewing for final examinations, the entire program would require 5 years. As in medicine, higher level specialization should be possible with further training.

In summary, the 5-year doctoral program would involve

Years I, II, and III	38 required subjects
Year IV	Electives
Year V	Field placement, essay, review, and examinations

The precise arrangements of the 38 required subjects and the electives should be flexible.

Conclusion

Doctors of public health, prepared along these lines, would be far better equipped for the sorely needed public health leadership in America and elsewhere in the world than the customary MD, MPH graduate. The notable performance of certain men and women with these qualifications today cannot be attributed to their formal education. A large share of the MD training has been essentially irrelevant. Competence and creativity, where they have been demonstrated, are due largely to the self-education, the experience, and the inspiration of the exceptional person concerned about the health needs of society.

But public health needs are too great to leave to the exceptional performer. It is high time that society provided the education that the task of public health leadership demands. We have only to break loose from the shackles of tradition and design a course of professional public health study appropriate to the objective requirements.

Some might doubt whether the whole idea outlined in this paper would attract applicants. But witness the thousands now applying for the MPH and the current, inappropriate DrPH. Consider the extravagance now tolerated in preparing those who want to do "community health work" but see no way to play a significant role without getting an MD first. (The generations of the 1930s, the 1960s and,

now again, the 1980s have been full of such young people.) Yet, their motivation is not to study molecular biology but medical economics; it is not to master orthopedic surgery but health planning.

Such a new program of professional training will not, of course, be accepted at once. Every newly defined occupation has a struggle. But the services provided by properly educated doctors of public health would prove their value in a few years. The science and art of public health would not remain a weak sister in the family of medicine. It would become a leader in the family of mankind and help nations to achieve the World Health Organization goal of "health for all."

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Massachusetts' Approach to the Prevention of Heart Disease, Cancer, and Stroke

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Synopsis

Heart disease, cancer, and cerebrovascular disease together cause more than two out of three

deaths in the United States annually. These three diseases are largely a result of widespread risk factors such as smoking, unhealthy diet, high blood pressure, physical inactivity, and environmental toxic exposure. The prevalence of these risk factors can be significantly lowered, resulting in major reductions in mortality rates for these diseases.

Thus far, there have been no statewide disease prevention efforts to reduce deaths from all three diseases simultaneously. The Massachusetts Department of Public Health recently began an aggressive statewide program to prevent deaths from these three causes through a reduction in their underlying risk factors. Within 5 years, this program will save at least 2,000 lives annually. Similar efforts by public health agencies and health care practitioners in the rest of the United States could save many thousands of lives.

HEART DISEASE, CANCER, AND CEREBROVASCULAR disease currently cause almost 70 percent of the deaths in the United States. Approximately one-half of these deaths occur before the age of 75, the average life expectancy in the United States, and are therefore considered to be premature. The price to society of these three diseases is enormous. For

example, the total economic costs from heart disease and cerebrovascular disease in the United States have been estimated to be \$80 billion, including health care costs of \$26 billion (1). For Massachusetts, this translates into total economic costs of \$1.5 billion, including health care costs of \$500 million.