Antagonism and Accommodation: Interpreting the Relationship Between Public Health and Medicine in the United States During the 20th Century

Allan M. Brandt, PhD, and Martha Gardner, MA

A B S T R A C T

Throughout the course of the 20th century, many observers have noted important tensions and antipathies between public health and medicine. At the same time, reformers have often called for better engagement and collaboration between the 2 fields. This article examines the history of the relationship between medicine and public health to examine how they developed as separate and often conflicting professions. The historical character of this relationship can be understood only in the context of institutional developments in professional education, the rise of the biomedical model of disease, and the epidemiologic transition from infectious disease to the predominance of systemic chronic diseases.

Many problems in the contemporary burden of disease pose opportunities for effective collaborations between population-based and clinical interventions. A stronger alliance between public health and medicine through accommodation to a reductionist biomedicine, however, threatens to subvert public health's historical commitment to understanding and addressing the social roots of disease. (*Am J Public Health*. 2000; 90:707–715)

If . . . the medical profession was as much devoted to the practice of the art of preventing as it is in curing disease, there can be no doubt that many diseases which now decimate communities would disappear altogether, and the larger number would have the mortality set opposite them greatly reduced.

Stephen Smith (1873)[1]

Because of the advances of medical knowledge, the medical school curriculum has become so crowded that the social importance of preventive medicine and public health is seldom emphasized. This creates a blind spot which often persists throughout professional life and results at times in misunderstandings between the practicing physicians and the constituted health authorities of the community.

J. A. Miller, George Baehr, and E.H.L. Corwin (1942)[2]

[I]n the future the physician will expend a great deal more effort than heretofore in ascertaining how much of a man's illness is an outgrowth of his interaction with his own personal environment, and what can be done, from a therapeutic point of view, to change this interaction so that the man will be made healthier. I expect that this will be a more difficult challenge than at first it might seem.

Lawrence E. Hinkle, Jr (1966)[3]

The concerns expressed in the quotations above—about integrating knowledge of prevention within medical education—are part of a larger, century-long debate in the United States about the appropriate relationship between medicine and public health, its institutions, and its practitioners. The division of responsibility, authority, and power between public health and medicine has been a continuing source of concern and conflict. Although representatives of both fields have traditionally voiced strong commitments to health and social betterment, the relationship between public health and medicine has been characterized by critical tensions, covert hostilities, and, at times, open warfare. The last century has witnessed a series of attempts to precisely define the professional, institutional, and social boundaries between these inherently interrelated areas of knowledge and practice.[4] As the basic institutions of public health and medicine solidified in the early years of the 20th century, commentators such as those quoted above decried the divisiveness in this complex relationship.

In this article, we briefly narrate the history of this relationship during the course of the century and we evaluate the significant implications of the relationship for the organization of effective interventions at both the clinical and social levels. Recognizing that these are actually dynamic and heterogeneous categories, we use the terms "medicine" and "public health" broadly to convey a prevailing professional ethos. The designations reflect distinct fields that have evolved side by side in their institutional, theoretical, and practical aspects. In the face of shifting patterns of disease, the history of the relationship between medicine and public health draws attention to both the possibilities in and the obstacles to successful collaboration. Therefore, we also examine the ongoing debate about the relative contributions of medicine and public health to changing trends in morbidity and mortality.

Erecting Boundaries

In the historical relationship between public health and medicine, we have a remarkable example of what sociologists would call a boundary issue—an issue involving the division of labor, the differences in theories and skills, and the balance of authority and politics between these 2 fundamentally related fields.[5] Commentators from

Source. Pictures of Health: Center for the Study of the History of Nursing, School of Nursing, University of Pennsylvania Press.

FIGURE 1—The "Baby Saving Station" characterized early 20th-century public health approaches to prevention and education (Philadelphia, ca. 1915).

both fields typically depict public health and medicine as dichotomous. While these depictions do not reflect the full makeup of the disciplines, they do illustrate common perceptions. Although public health has come to be identified with prevention, medicine has historically been committed to cure. Medicine is commonly associated with the care and treatment of the individual, while public health's central focus is on populations. Medicine has come to be associated with an objective and reductionist technocratic science, while public health is identified with interest-oriented policing and politics. While public health claims to "focus upstream"—on ameliorating the social and environmental conditions producing disease—medicine is often assumed to look downstream, late in the process of pathogenesis.

Along with differing outlooks, constituents of each camp have often expressed powerful antipathies. Public health professionals have characterized medicine as a

field dominated by arrogance, self-interest, and economic aggrandizement. Medical professionals have typically viewed public health as a politically corrupted field populated with individuals who are intellectually incapable of medicine and science. These stereotypes reveal deeply held values and beliefs that have endured throughout the century, as well as ongoing disparities in status and authority.

Observers have often highlighted the distinctions between these 2 areas of knowledge and practice precisely because so much is shared between them. Although public health and medicine are usually seen as alternative (and sometimes adversarial) approaches to addressing the problems of disease, in reality they are—and historically have been—mutually dependent and interactive. Assessing the history of this relationship offers opportunities to develop strategies that could more productively address the full range of forces that have limited effective collaboration. There-

fore, we briefly describe and analyze the changing character of the boundary between public health and medicine and trace the history of the social, intellectual, and political processes that have fostered this division through the 20th century.

Perhaps one of the most impressive aspects of the sharp boundary between medicine and public health is just how recently it was erected. In the last years of the 19th century, medicine and public health—both only weakly professionalized—were viewed as overlapping areas of interest and activity; sharp lines between the fields had yet to be drawn. With the profusion of proprietary medical schools, educational standards were minimal. Public health lacked consensus about the particular skills required for practice; no official training or certification took place in the field. Indeed, in a striking irony, participation in public health campaigns and activities was one mechanism by which physicians could achieve status and authority
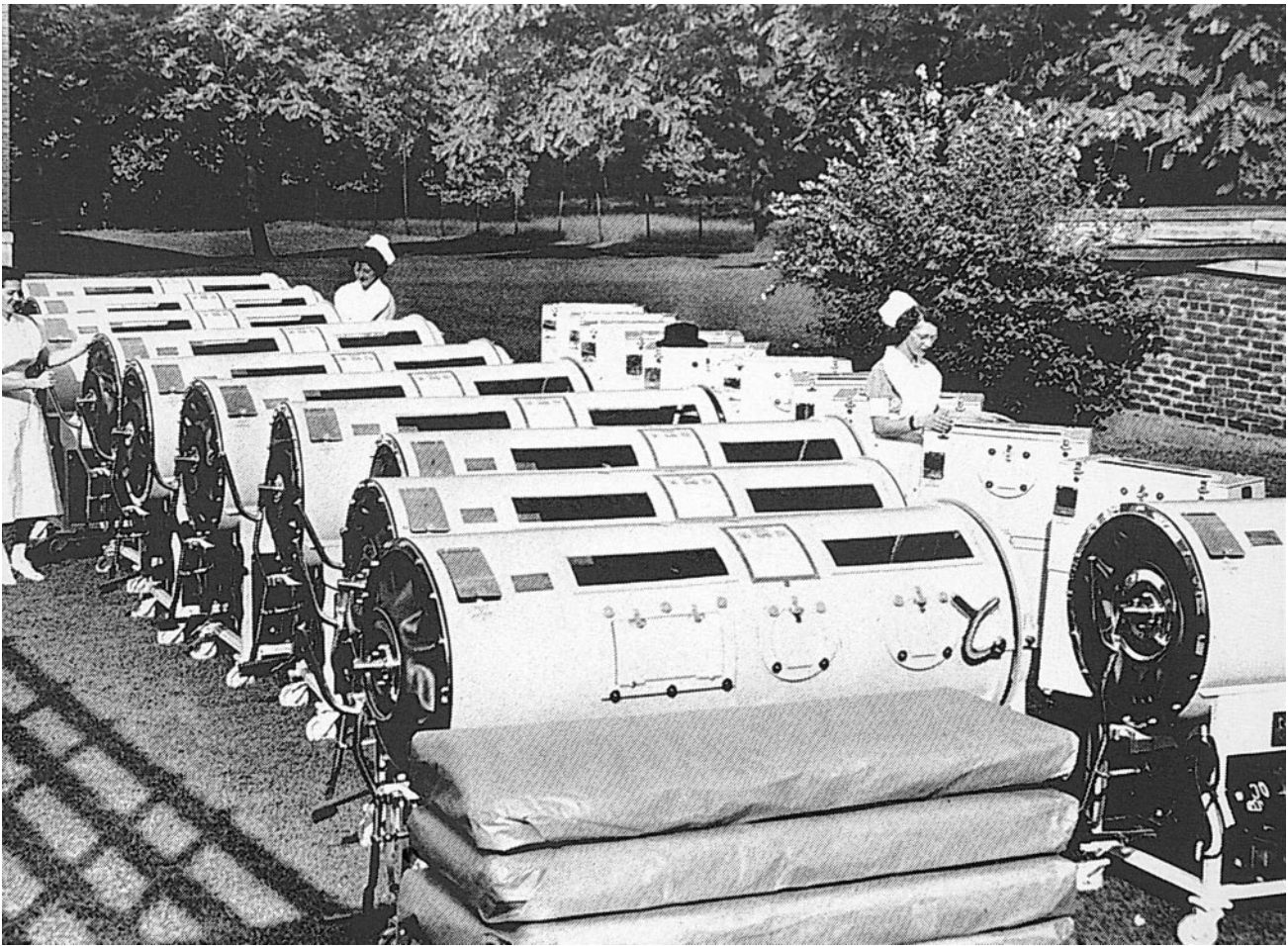
Source. Urban Archives, Temple University, Philadelphia, Pa.

FIGURE 2—The iron lung symbolized the triumph of technological medicine at midcentury (Episcopal Hospital, Philadelphia, 1942).

at a time in which professional distinction in medicine was difficult to attain.[6]

Physicians were a dominant presence, for example, in the early history of the American Public Health Association, founded in 1872. At the turn of the century, physicians constituted up to 80% of the association's membership.[7] Goals and outlooks overlapped as well. During the late 19th century, physicians typically felt that public health offered them important insights into environment, sanitation, and policies to control epidemics. And public health advocates often perceived physicians as providers of new knowledge about disease and its origins from their research, clinical observation, and experience. Medicine and public health were often allies in 19th-century social and moral reform movements.[8] This is not to suggest, of course, that most physicians took a particular interest in public health campaigns and reforms, but rather that such activity was deemed complementary to the work of medicine.

Separate and Unequal

The opportunities for union began to erode precipitously in the early 20th century. Tensions and resentments that would characterize the relationship between medicine and public health by midcentury were quickly becoming evident. The developing fracture has received considerable attention from historians of public health and medicine, and can only be sketched briefly here.[9] It had several critical components, developing from the changing professional and scientific ethos of the turn of the century, and medicine's rising authority was a key factor.

First, as the medical profession became more homogenous and powerful, medicine increasingly viewed public health interventions as a potential infringement on the doctor–patient relationship. Early 20th-century calls for the reporting of communicable diseases, such as tuberculosis and syphilis, came under sharp attack from physicians' professional organizations on these grounds. Physicians complained that such reporting requirements would ultimately dissuade patients from seeking care. Public health officials insisted that the public good periodically required the abrogation of individual rights.[10] The interests of the state in policing individuals with communicable diseases now seemed at odds with the sanctity of the doctor–patient relationship.[11]

Second, the delivery of health services by public health agencies appeared to threaten the economic well-being of the rising medical pro-

fession. Institutions and programs from outpatient dispensaries to well-baby care, from diagnostic laboratories to school-based nursing, came under attack as incursions into the medical profession's domain.[12] Public health officials were quick to identify the economic interests behind these protests, labeling such attacks on state authority as mere hypocrisy and medical self-interest. Even so, medicine generally triumphed in direct political conflicts. Innovative programs such as the Sheppard-Towner Act of 1921, which was organized to ensure prenatal and postnatal care for mothers and infants, fell prey to medicine's lobbying in Congress and the state legislatures.[13]

Third, the rise of the hospital, focused on acute tertiary care, as the preeminent institution of modern medicine further separated medicine from public health.[14] Public health officials no doubt chafed at the notion of ending their efforts at the hospital's door. In 1914, H.S. Pritchett, president of the Carnegie Foundation, lamented the isolation of the hospital, noting that "the medical school and the hospital ought to form the very heart of those agencies by which the state undertakes to deal with the public health."[15] Instead, legislative and administrative proposals for neighborhood public health centers that could combine public health interventions with clinical care were derailed by medical interests because of concerns about provision of "free care" to potential paying patients.[16]

Dr Hermann Biggs, head of the New York Department of Health, criticized physicians' organizations after they defeated a bill in the New York legislature in 1920 and 1921 that would have provided state aid to health centers for patient care and research: "Now the general attitude of the medical profession is part of the kind of work that they do; the fact that a physician is generally so absorbed in what he is doing, his own work and the work with his own patients, that he does not look out and get a broad view of the situation as it exists in the state, and his attitude, the natural attitude, is one of obstruction."[17] Supported by the culture of the acute-care hospital, this attitude powerfully influenced the orientation of medical training and practice away from the community and the social forces important in the etiology of disease.[18]

Finally, and perhaps most important, medical and public health education came to be rigidly separated in the early 20th century. The Welch-Rose Report of 1915 is often looked to as the critical moment in the history of the institutional schism.[19] Jointly authored by William Welch, the founding dean of the Johns Hopkins School of Medicine, and Wycliffe Rose of the Rockefeller Foundation, the report guided the Rockefeller Foundation's philanthropic interests in public health and had far-ranging influence. The vision of public health advocated by the report was focused on research rather than practical education.[20] The Johns Hopkins School of Hygiene and Public Health opened its doors in the following year, with Welch at the helm. It was designed to be the preeminent example of institutionalized public health education, and it was supported by the principal medical philanthropy of the time, the Rockefeller Foundation. Following the establishment of the Johns Hopkins school, a range of university-based schools were founded; 10 schools had been established by 1947.[21,22]

The foundation of Johns Hopkins and other schools of public health marked a general shift toward formal organization. In a time marked by professionalization and higher education in all fields, changes in the field of public health underlined the need for a recognized authority.[23] Beginning in the early 20th century, public health was self-consciously transformed from an avocation of individuals with wide-ranging skills, from engineering to medicine, to an independent profession. The need to train officials for positions in local and state public health bureaucracies that would demand a consistent knowledge base and appropriate credentials had gained significance by this time. In 1915, Dr Milton J. Rosenau, professor of preventive medicine and hygiene at Harvard Medical School, explained the need for separate public health schools in the *Journal of the American Medical Association*:

> The teaching of hygiene is becoming increasingly difficult, on account of the widening scope of the subject, including preventive medicine, sanitary engineering, vital statistics, epidemiology, industrial hygiene and public health activities generally. . . . It is slowly being recognized that the training received for an M.D. degree, even in our best medical schools, does not properly fit a man to enter public health work. Sanitation and hygiene has become a separate profession.[24]

Eager to define a distinctive boundary, public health leaders urged the establishment of independent schools and a separate profession.

As these schools gained autonomy and recognition, their curriculum did not become standardized. Unlike medical schools, which became increasingly homogeneous in the years following the establishment of the Johns Hopkins School of Medicine (1889) and issuance of the Flexner Report (1910), founders of these new schools of public health followed a range of models, each with distinct goals and specific needs. As Charles-Edward Winslow, a leader in the movement for public health education and professor at the school of public health at Yale University, explained in his 1953 report on accreditation of public health schools,

> [P]ublic health is not a branch of medicine or of engineering, but a profession dedicated to community service which involves the cooperative effort of a dozen different disciplines. The fact that doctors and dentists and nurses and engineers and health educators and microbiologists and statisticians and nutritionists sit together in our schools is of incalculable importance.[25]

The result was a group of schools heterogeneous in nature and design, serving a myriad of functions. On the one hand they were committed, at least in part, to research into social, environmental, and biological determinants of health and disease in populations; on the other hand, an important part of their mission was to train frontline public health workers to fill the evolving bureaucratic structures of state and federal public health agencies.[26] The breadth of public health as a field created strong tensions at these institutions between practice and research, between the academy and public bureaucracy. The variation in public health training, both within and across schools, was impressively wide.

In contrast, by the 1920s—in spite of increasing specialization in medicine—medical education had become largely uniform, consolidated into 2 years of basic science and 2 years of clinical rotation.[27] With schools of public health often in separate buildings and locales from medical schools, medical education became even more isolated from fundamental issues in prevention and social epidemiology. Especially in the 1930s and 1940s, there were attempts to institutionalize preventive medicine at many medical schools, but these attempts failed to alter the dominant medical paradigm of disease-focused reductionism.[28]

In successive evaluations of public health education produced in the course of the 20th century, fundamental questions about the character of public health as a professional field and the nature and background of its practitioners recurred. How much science was a requisite for public health education and practice? Would individuals with medical training be attracted to further education in public health? Should schools train public health officials for administrative positions, or should their focus be on research and original investigation? What would be the evolving relationship between these schools and their powerful sibling institutions? It is important to remember that these innovative institutions had fundamental concerns about their autonomy and authority in relation to the better funded and more powerful medical schools. The rising

cultural authority, prestige, and personal income of members of the medical profession only enhanced such anxieties. These wide differences in power and prestige often justified the need for separation between institutions. Leaders in public health education expressed fears of becoming "appendages" to medical schools.

When former surgeon general Thomas Parran founded the School of Public Health at the University of Pittsburgh in 1949 and 1950, for example, he fought vigilantly to organize a program that would be independent of the medical school. He found that the administration and faculty of the medical school generally opposed his plans, preferring to have the new school of public health be a dependent branch of the medical school. Parran criticized the medical center as "an agglomeration of weak schools and individualistically inclined hospitals, the latter for the most part owing only secondary allegiance to the university and dominated by staffs of part-time appointments in the medical school, but preoccupied primarily with finding beds in the hospital for their private patients."[29] The charges traded between Parran and his critics were characteristic of the ongoing hostilities between public health and medicine. Parran was labeled a communist for his support of compulsory health insurance; conversely, those in the public health camp saw physicians' financial self-interest as overwhelming all sense of the common good.

Impressively, the belief in effective prevention seemed to be uniformly shared by both medicine and public health in the early 20th century; therefore, physicians often viewed public health interventions as a threat to their financial well-being. Today, the notion that public health might eliminate the need for medical care seems strikingly optimistic and naive, but then the ideal of prevention was viewed both with hope and with foreboding. Some suggested that if prevention could eliminate all disease, there would be no need for medicine in the future.[30]

It would be easy to look at medicine's hostility to public health as merely a reflection of self-interest. And there certainly was plenty of self-interest to go around. But it also reflected a fundamental worldview and a deep cultural perspective, a historical commitment to individual care and treatment, and a powerful ideological conviction about the biomedical paradigm. Physicians had come to rely on an understanding of disease and its cure that made public health's broad social and environmental agenda unnecessary. According to this view, the public health was best served by the medical care and treatment offered to individual patients by individual doctors.[31]

The Biomedical Paradigm

The tensions that separated public health and medicine—and the considerable antagonism that evolved between them—can be fully understood only in the context of the emergence of the biomedical model of disease that became dominant in the first half of the 20th century. The rise of modern bacteriology, germ theory, and specificity of disease and treatment transformed research and practice in both medicine and public health.[32] This biomedical paradigm reduced the amount of attention devoted to a wider range of social, behavioral, and environmental forces in the maintenance of health and the production of disease.[33] Issues of socioeconomic status, ethnicity, race and culture, personal psychology, and gender were no longer considered significant factors in disease causation as individuals became patients in an expanding tertiary health care system.

Indeed, the very nature of the biomedical paradigm was to uncouple disease from its social roots. Medicine's tendency to focus on individuals rather than populations was typically criticized by public health advocates even as public health underwent change as well. Beyond the orientation toward individual patients, the biomedical model—even when its practitioners used public health methods—focused research and education on specific diseases.

While public health officials often suggested that medicine's antipathy to prevention was economic in origin, it was also true that a lack of interest in prevention among those in the medical field was generated by public health's commitment to the often complex and cumbersome aspects of social and behavioral change. In contrast, the biomedical paradigm brought to medicine an instrumental elegance focused at the cellular level and based on a sophisticated laboratory science. The timely and effective delivery of new and effective treatments for specific diseases became the new paradigm of clinical medicine. Public health schools often conformed to this model, using specific diseases and isolated research to define their goals. On the ground, public health officials typically continued to institute preventive interventions, but educational priorities were often research based.

Although many physicians recognized the importance of encouraging research and teaching in the area of prevention, such goals were often obscured as medical schools reoriented themselves to more intensive scientific and clinical training. And there was more involved than just priority setting; skepticism about prevention had become entrenched in medicine. The effort to change the social conditions that produce disease was not only difficult, it was seen as tainted by politics, advocacy, individual noncompliance, and social diversity. The appeal of biomedicine was its science-based objectivity and technique, as contrasted with the tumultuous world of public health. Addressing disease at the social level, as public health had often advocated, involved interests, politics, and behaviors that resisted clear, objective solutions. Medicine could not solve the problems of poverty, illiteracy, and inequity—but it could, at least potentially, cure the diseases that these social forces produced. And in many instances, it was argued that the improved health and longevity created by medical intervention and technology would ultimately reduce poverty and other social inequities.

Therefore, medicine's position, in dramatic contrast to bureaucratic public health interventions, was seen as both isolated and insulated from society. Although it served social ends, it was perceived as uncorrupted by social interests, politics, and other subjective forces. The validity of the biomedical paradigm came to be deeply embedded in both professional and popular culture. This reflected a particularly American fascination with scientific and technical remedies for complex social problems as an approach to reform. The reductionism of the medical model, its insistence on mechanism and a universal pathophysiology, directly contradicted long-standing assumptions in public health about the significance of the social environment and behavior in the production of disease.

Accommodation

In the post–World War II era, important innovations in public health knowledge and practice began to fundamentally reorient the field. The rise of modern epidemiology, with its focus on multideterminant analysis and statistical inference, offered new techniques for establishing causality and risk for a wide range of systemic chronic diseases.[34] The biomedical paradigm, so focused on infectious agents, often proved inadequate in assessing the multiple causes of diseases. Modern quantitative epidemiology, biostatistics, and other forms of empirical numeric assessment and evaluation based on population data provided crucial insights into the diseases that were most prevalent following the epidemiologic transition of the 20th century.[35]

Although public health never completely abandoned its commitments to environment, behavior, prevention, and the social determinants of disease, it nonetheless became increasingly accommodationist to the authority of biomedicine. The very method-

ologies and techniques that revolutionized the field of public health proved crucial to the medical enterprise in the postwar years and served to forge new links between medicine and public health after 1960.[36] Answers to the most basic epistemological questions about the evaluation of efficacy and safety rested in the ability to assess quantitatively the impact of new interventions. This required skills that most clinical researchers had not been taught.[37]

Moreover, the assessment of new interventions became increasingly complex—evaluating the efficacy of penicillin or streptomycin was considerably more straightforward than evaluating β-blockers, serotonergic agents, or, for that matter, coronary artery bypass grafts. In this respect, schools of public health moved to train the methodologists who worked to solve the critical questions of efficacy facing medicine. The same statistical techniques used in prospective epidemiologic studies could be translated to randomized clinical studies. Often reflecting the significance of mastering evaluative quantitative skills to serve biomedicine, medical interest in public health training began to rise during the 1970s and 1980s.

As concerns grew about the rising costs of medical care and treatment, public health increasingly offered cost-effectiveness measures as an adjunct analytic technique. While these concerns led to new collaborations between public health and medicine, they also had the effect in some instances of diluting the traditional commitment within public health and public health education to emphasize the social, behavioral, and environmental variables central to the health of populations. In the "new" epidemiology, social and population perspectives were often replaced by a new emphasis on individual risk factors that obscured broader explanations of causality.[38]

The Burden of Disease

Historians have often reviewed the history of the relationship between medicine and public health without assessing its significance for reducing the burden of disease. During the course of the 20th century, as the 2 disciplines developed, patterns of disease, morbidity, and mortality underwent radical change, correspondingly changing the medical and public health needs of the population. In the early 20th century, infectious diseases predominated as the principal causes of death. Chronic infections such as tuberculosis were among the most common ones, and epidemic infections could wreak global havoc. In the Spanish influenza epidemic of 1918 and 1919, as many as 20 million people

died worldwide.[39] However, by midcentury, the relative contribution of infections to the burden of disease in the United States had declined precipitously; infections had been replaced by systemic chronic diseases such as cancer, stroke, and heart disease, which typically have multiple causes.[40]

Historians, epidemiologists, and demographers have debated the causes and implications of this "epidemiologic transition" for a generation. Implicit in the tensions between public health and medicine was the underlying question of which interventions had been most effective in changing patterns of morbidity, mortality, and longevity during the course of the 20th century. Some observers, such as Thomas McKeown and René Dubos, suggested that the perception that biomedical progress could account for these changes was essentially misguided. McKeown used demographic data from England and Wales to show that infections such as tuberculosis were in steep decline long before biomedicine had the capability to modify their incidence as a cause of morbidity and mortality. This finding, McKeown argued, suggested that health resources could be more effectively applied through public health measures—in particular, measures to improve standards of living—rather than the biomedical sciences, which were receiving an increasingly intensive commitment.[41]

Changes in cigarette consumption in the last 25 years offer an opportunity to assess the relationship of public health and medicine as it related to the material incidence of disease. Recognition of the harms of cigarette use resulted from the pathbreaking epidemiologic investigations of midcentury. These studies, conducted in both the United Kingdom and the United States, categorically demonstrated that smoking caused lung cancer, heart disease, and premature mortality. Further, they demonstrated the critical role that epidemiologic technique and statistical inference would play in our understanding of health risks in the second half of the 20th century. Convincing evidence was gathered in population-based studies that had immediate and powerful implications for clinicians and their patients. Despite these findings, however, reducing the use of tobacco proved no easy matter, especially given the tobacco industry's largely effective battle against regulatory measures, its continued aggressive promotion of cigarettes, and the addictiveness of nicotine.[42]

Nonetheless, rates of smoking among adults in the United States declined from approximately 45% in 1962 to 25% in 1992. This decline—a strikingly impressive change in the interest of health—is, however, difficult to attribute. Certainly the institutions of

public health played a critical role, strongly advocating restrictions on tobacco consumption while helping to educate the public about the risks of tobacco use. But so too did physicians, who were increasingly aware that smoking constituted a serious health risk to their patients. The very fact that physicians themselves abandoned smoking in impressive numbers during the 1960s and 1970s offered a powerful message to their patients. The introduction of pharmacotherapies for nicotine addiction augmented physicians' efforts beginning in the 1980s. Finally, changing social mores about cigarettes and risk served to create an environment increasingly hostile to smoking, further encouraging reductions in the use of tobacco.

As this example illustrates, no single approach—be it the interventions of public health or of medicine—adequately accounts for significant changes in many health-related behaviors. Furthermore, the example of cigarette cessation efforts points to important and often overlooked opportunities for more vigorous collaboration between public health programs and related clinical interventions.

Analysis of a particular health risk, such as tobacco use, forces us to investigate more closely how medicine and public health contribute to better health and how interactions between them may foster this goal. In the last 2 decades, the assessment of health outcomes has become a critical marker in evaluating both medical and public health effectiveness.[43] These assessments relate to the problem of technological "fit." In other words, how effectively do the knowledge, skills, and resources of medicine and public health (together and independently) address historically specific patterns of disease?[44] The history of the epidemiologic transition of the 20th century suggests—in an industrialized, developed nation such as the United States—that significant modifications in priorities and approaches have been required as the burden of disease has changed. For example, as the bulk of the burden of disease shifted from infectious to chronic diseases, medical knowledge, training, and institutions had to respond in order to be effective.

If a crucial goal of medicine and public health is to reduce the burden of disease, then better mechanisms for assessing the character of the burden of disease and interventions for its reduction are necessary. Central to this approach is the notion that public health and medicine are not dichotomous forces in addressing issues of health and disease, even as they maintain distinctive methods, values, and approaches. Historians and health policy analysts need to avoid counterposing these activities, and instead evaluate

the evolution of these interactions in a more sophisticated way. This approach could move medicine and public health to more fully eclipse the persistent burden of disease. We need to explore much more systematically the relationship of the health care delivery system to community-based social interventions. If we conclude that medical education has historically often failed to adequately situate the individual patient in a cultural, community, or population context, so too public health has often neglected the opportunities inherent in clinical care for social and behavioral intervention.

Conclusion

Is there any reason to believe that this moment offers particular possibilities for new approaches to collaboration between public health and medicine?

The resurgence of infectious diseases that were assumed to be under control has called new attention to the fissure between public health and medicine, especially as it relates to questions of compulsory measures, prevention, and behavior modification.[45] AIDS in particular has been a tragic reminder of the power of social determinants of disease and how fundamental social inequities create particular vulnerabilities to biological agents. AIDS has also revealed inadequacies in our public health system.[46] Further, public funding for HIV/AIDS research has often focused on biomedical research on vaccines and treatments, while social and behavioral approaches to risk and risk reduction—especially concerning sexuality and drug use—continue to be underexplored.[47]

Even before AIDS highlighted medicine's limitations, the cost of medical care had been rising precipitously, with little evidence that this intensive investment necessarily led to better health. The social, political, and economic responses to this health care crisis—the problems associated with the expense of tertiary care, the resurgence of primary care medicine, and the rise of the managed care industry—have served to generate renewed attention to prevention and population-based care. These concerns have created new collaborative interests among those in public health and in the medical profession. The growing interest in evidence-based medicine, cost-effectiveness, outcomes assessment, and quality of care has created demand for the population-based skills of epidemiology, statistics, and health services research that formed the core of postwar public health training.

In 1994, Samuel Thier, former president of the Institute of Medicine, stressed that academic medicine "must be willing to ask whether the entire paradigm of the educational model—the acute care, biologically-based medical approach—is in need of a philosophical modification and broadening."[48] Even with such recent calls for change, the obstacles to serious reform of the biomedical paradigm, which is entrenched in American medical education, remain impressive. And the contemporary exigencies of the economic transformation of the American health care system may only make such changes more difficult.

As we have already seen, interest in collaboration has not managed to bridge the gulf between medicine and public health effectively in the past. Observers and activists on both sides of the divide have urged greater cooperation throughout the 20th century. In spite of their efforts to encourage collegiality, public health and medicine have all too often continued to be viewed as dichotomous—either-or variables in a zero-sum game, alternative and incompatible approaches to the same problems, competing for the same limited resources. In addition, the rise of federal funding for medical research in the second half of the 20th century increasingly directed both medicine and public health research into a narrow biomedical paradigm.

The obstacles to integration have typically been institutional, theoretical, and sociocultural. The separation of schools, the tensions between the social and reductionist concepts of disease, and the vast differences in power, resources, and prestige have all served at an ingrained level to prevent medicine and public health from pursuing opportunities to achieve common goals. All this has occurred—in the United States, at least—within a culture that prizes individualism, technology, and magic-bullet medicine and has an inherent skepticism about social reform and regulation. For these reasons, considerable obstacles to more constructive relations between public health and medicine persist.[49]

Tension, competition, and even hostility are not always bad. As destructive as some tensions may be, others, at times, stimulate productivity and creativity and may result in innovation and constructive change. Therefore, attempts at cooperation should recognize the distinctive characters of medicine and public health. Co-optation of public health by medicine could result in the development of a single vision of health that obscures the important and essential differences between medicine and public health. Moreover, if collegiality is accomplished by capitulation to a reductionist biomedical paradigm in which public health primarily comes to help evaluate the safety, efficacy, quality, and costs of biomedical interventions, something

central will be lost: a powerful research and practical agenda concerning the social, cultural, and economic determinants of disease and suffering.

As population-based thinking is integrated into medical care and clinical thinking into public health, it is important to be clear about the definition of "population." What are the particular characteristics of a community, and for what purposes is it defined? Today, populations are constructed by economic incentives, insurance plans, and carve-outs—this is not what public health experts have historically meant by "population" in population-based analyses and in programs devised to address the burden of disease.[50]

In this respect, it is critical to be clear about congruence and opportunities for cooperation as well as separate and independent interests and approaches. It is important to continue to honor the individual doctor's obligation to be his or her patient's advocate, even in instances that might contradict the social good, as well as to articulate such conflicts clearly. The relationship between medicine and public health over the last century demonstrates the importance of examining the specific character of the battles that have occurred between them. No doubt, these tensions often reflected important differences in power, prestige, and the relative availability of resources, but they also revealed critical differences in ideology, world view, politics, methods, and technologies—underlying questions about *where* and *how* to address problems associated with disease and its biological and social ramifications.

If population-based medicine simply becomes a rationale for for-profit managed care, and if the new scientific public health simply becomes a reductionist molecular epidemiology eager to avoid confronting the social determinants of the burden of disease, then collaboration will be achieved at a considerable cost.[51] Health disparities have grown even as medical capabilities have become more sophisticated, and failure to ensure access to care has implications for both medicine and public health. If we are sophisticated in our historical understanding of the obstacles to collaboration, we may discover new and creative solutions to both old and new problems. □

Endnotes

1. Stephen Smith, president, at the First Annual Meeting of the American Public Health Association, 1873, as quoted by Milton Terris in "Evolution of Public Health and Preventive Medicine in the United States," in Duncan W. Clark et al., *Academic Relationships and Teaching Resources: A Report of Conferences* (Bethesda, Md: US Dept of Health and Welfare, 1976), 2.

2. J. A. Miller, George Baehr, and E. H. L. Corwin, *Preventive Medicine in Modern Practice* (New York, NY: P. B. Hoeber Inc, 1942), quoted in George Rosen, *Preventive Medicine in the United States, 1900–1975: Trends and Interpretations* (New York, NY: Science History Publications, 1975), 52.

3. Lawrence E. Hinkle, Jr, "The Doctor, His Patient, and the Environment," in *Chronic Diseases and Public Health*, ed. Abraham M. Lilienfeld and Alice Gifford (Baltimore, Md: Johns Hopkins University Press, 1966), 143.

4. See Paul Starr, *The Social Transformation of American Medicine* (New York, NY: Basic Books, 1982).

5. See Harvey Fineberg, "Distinctions Between Public Health and Medicine" (1990), available at http://www.asph.org/phvsmed.htm.

6. See Barbara Gutmann Rosenkrantz, *Public Health and the State: Changing Views in Massachusetts, 1842–1936* (Cambridge, Mass: Harvard University Press, 1972).

7. Cecil G. Sheps, *Higher Education for Public Health: A Report of the Milbank Memorial Fund Commission* (New York, NY: Prodist, 1976), 35.

8. See Charles E. Rosenberg and Carroll Smith-Rosenberg, "Pietism and the Origins of the American Public Health Movement: A Note on John H. Griscom and Robert M. Hartley," *Journal of the History of Medicine and Allied Sciences* 23 (1968): 16–35.

9. See John Duffy, "The American Medical Profession and Public Health: From Support to Ambivalence," *Bulletin of the History of Medicine* 53 (1979): 1–22; John Duffy, *The Sanitarians: A History of American Public Health* (Urbana: University of Illinois Press, 1990); Elizabeth Fee, *Disease and Discovery: A History of the Johns Hopkins School of Hygiene and Public Health, 1916–1939* (Baltimore, Md: Johns Hopkins University Press, 1987); Elizabeth Fee and Roy M. Acheson, eds., *A History of Education in Public Health: Health That Mocks the Doctors' Rules* (New York, NY: Oxford University Press, 1991); George Rosen, *A History of Public Health,* expanded ed. (Baltimore, Md: Johns Hopkins University Press, 1993); and Rosen, *Preventive Medicine in the United States.*

10. See Joyce Antler and Daniel M. Fox, "The Movement Toward a Safe Maternity: Physician Accountability in New York City, 1915–1940," *Bulletin of the History of Medicine* 50 (1976): 569–595; and Allan M. Brandt, *No Magic Bullet: A Social History of Venereal Disease in the United States Since 1880* (New York, NY: Oxford University Press, 1987).

11. See Judith Walzer Leavitt, *Typhoid Mary: Captive to the Public's Health* (Boston, Mass: Beacon Press, 1998); and Elizabeth Fee, "Designing Schools of Public Health for the United States," in Fee and Acheson, especially 189–194.

12. Charles E. Rosenberg, "Social Class and Medical Care in Nineteenth-Century America: The Rise and Fall of the Dispensary," *Journal of the History of Medicine and Allied Sciences* 29 (1974): 32–54.

13. See Rosemary Stevens, *In Sickness and in Wealth: American Hospitals in the Twentieth Century* (New York, NY: Basic Books, 1989), 143–144.

14. Charles E. Rosenberg, *The Care of Strangers: The Rise of America's Hospital System* (New York, NY: Basic Books, 1987); David Rosner, *Once a Charitable Enterprise: Hospitals and Health Care in Brooklyn and New York, 1885–1915* (Princeton, NJ: Princeton University Press, 1987); and Stevens.

15. H. S. Pritchett, "The Medical School and the State," *Journal of the American Medical Association* LXIII (August 22, 1914): 648.

16. See Rosen, *History of Public Health.*

17. Quoted in Terris, 6.

18. See J. G. Freymann, "The Origins of Disease Orientation in American Medical Education," *Preventive Medicine* 10 (1981): 663–673.

19. See Fee and Acheson, 162–176, for a thorough description of the writing of this report and the surrounding discussion.

20. See Fee, *Disease and Discovery*, 40–44.

21. See Fee, "Designing Schools of Public Health," 183–184.

22. *World Directory of Schools of Public Health,* 3rd ed. (Geneva, Switzerland: World Health Organization, 1985), and Charles-Edward Winslow, *The Accreditation of North American Schools of Public Health* (New York, NY: American Public Health Association, 1953).

23. See Burton J. Bledstein, *The Culture of Professionalism: The Middle Class and the Development of Higher Education in America* (New York, NY: Norton, 1976), and Thomas L. Haskell, ed., *The Authority of Experts: Studies in History and Theory* (Bloomington: Indiana University Press, 1984).

24. Milton J. Rosenau, "The Value of a Sanitary Survey in the Teaching of Hygiene," *Journal of the American Medical Association* LXV (July 24, 1915): 321.

25. Winslow, 44.

26. For a description of US public health schools and their heterogeneous nature, see Charles-Edward A. Winslow, "The Place of Public Health in a University," *Science* LXII (October 16, 1925): 335–338.

27. Kenneth M. Ludmerer, *Learning to Heal: the Development of American Medical Education* (Baltimore, Md: Johns Hopkins University Press, 1996).

28. See Theodore M. Brown, "George Canby Robinson and 'The Patient as a Person,'" in *Greater Than The Parts: Holism in Biomedicine, 1920–1950,* ed. Christopher Lawrence and George Weisz (New York, NY: Oxford University Press, 1998), 135–160.

29. Zaga M. Blockstein, *Graduate School of Public Health, University of Pittsburgh, 1948–1974* (Pittsburgh: Zaga Blockstein, 1977), 61.

30. See René J. Dubos, *Mirage of Health: Utopias, Progress and Biological Chance* (New York, NY: Harper & Brothers, 1959), and Rick J. Carlson, *The End of Medicine* (New York, NY: John Wiley & Sons Inc, 1975).

31. See Rosenkrantz, 128–176.

32. See E. Richard Brown, *Rockefeller Medicine Men: Medicine and Capitalism in America* (Berkeley: University of California Press, 1979).

33. See Elliot George Mishler, *Social Contexts of Health, Illness, and Patient Care* (New York, NY: Cambridge University Press, 1981).

34. See Mervyn Susser, "Epidemiology in the United States After World War II: The Evolution of Technique," *Epidemiologic Reviews* 7 (1985): 147–177.

35. Concerning the epidemiologic transition, see Jean-Claude Chesnais, *The Demographic Transition: Stages, Patterns, and Economic Implications,* trans. Elizabeth and Philip Kreager (Oxford, England: Clarendon Press, 1992); Thomas McKeown, *The Role of Medicine: Dream, Mirage, or Nemesis?* (Princeton, NJ: Princeton University Press, 1979); and Abdel R. Omran, "The Epidemiologic Transition: A Theory of the Epidemiology of Population Change," *Milbank Memorial Fund Quarterly*, 49 (October 1971): 509–538.

36. See Susser.

37. See Starr, 180–197, and Harry M. Marks, *The Progress of Experiment: Science and Therapeutic Reform in the United States, 1900–1990* (New York, NY: Cambridge University Press, 1997).

38. See Neil Pearce, "Traditional Epidemiology, Modern Epidemiology, and Public Health," *American Journal of Public Health* 86 (1996): 678–683, and Nancy Krieger, "Epidemiology and the Web of Causation: Has Anyone Seen the Spider?" *Social Science and Medicine* 39 (1994): 887–903.

39. See Alfred W. Crosby, *The Columbian Exchange: Biological and Cultural Consequences of 1492*, Contributions in American Studies, no. 2 (Westport, Conn: Greenwood Publishing Co, 1972).

40. For a recent, very in-depth consideration of the current and future international burden of disease, see Christopher J.L. Murray and Alan D. Lopez, eds., *The Global Burden of Disease* (Cambridge, Mass: Harvard School of Public Health, 1996).

41. For more a recent assessment, see John B. McKinlay, Sonja M. McKinlay, and Robert Beaglehole, "A Review of the Evidence Concerning the Impact of Medical Measures on Recent Mortality and Morbidity in the United States," *International Journal of Health Services* 19 (1989): 181–208.

42. See Allan M. Brandt, "The Cigarette, Risk, and American Culture," *Daedelus* 119 (fall 1990): 155–176.

43. See Arnold Epstein, "Performance Reports on Quality—Prototypes, Problems, and Prospects," *New England Journal of Medicine* 333 (1995): 57–61.

44. See Walsh McDermott, Kurt W. Deuschle, and Clifford R. Barnett, "Health Care Experiment at Many Farms," *Science* 175 (January 1974): 23–31.

45. Allan M. Brandt, "AIDS in Historical Perspective: Four Lessons From the History of Sexually

Transmitted Disease," *American Journal of Public Health* 78 (1988): 367–371.

46. See Ronald Bayer, "Public Health Policy and The AIDS Epidemic—An End to HIV Exceptionalism?" *New England Journal of Medicine*, 324 (1991): 1500; and Institute of Medicine, Committee for the Study of the Future of Public Health, *The Future of Public Health* (Washington, DC: National Academy Press, 1988).

47. See Elizabeth Fee and Nancy Krieger, "Understanding AIDS: Historical Interpretations and the Limits of Biomedical Individualism," *American Journal of Public Health* 83 (1993): 1477–1486.

48. Samuel O. Thier, "Academic Medicine's Choices in an Era of Reform," *Academic Medicine* 69 (1994): 185–189.

49. See Roz Diane Lasker and the Committee on Medicine and Public Health, *Medicine and Public Health: The Power of Collaboration* (Chicago, Ill: Health Administration Press, 1998).

50. See Walsh McDermott, "Medicine: The Public Good and One's Own," *Perspectives in Biology and Medicine* 21 (1978): 167–87; Geoffrey Rose, "High-Risk and Population Strategies of Prevention: Ethical Considerations," *Annals of Medicine* 21 (1989): 409–413; Steven A. Schroeder, J.S. Jones, and J.A. Showstack, "Academic Medicine as a Public Trust," *Journal of the American Medical Association* 262 (1989): 803–812; and Steven A. Schroeder, "Health of the Public: An Academic Challenge," *Journal of General Internal Medicine* 5, supplement (1990): S3–S10.

51. See Dana Loomis and Steve Wing, "Is Molecular Epidemiology a Germ Theory for the End of the Twentieth Century?" *International Journal of Epidemiology* 19 (1990): 1–3.