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Professional Uncertainty and National Priorities for Use of Resources

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13 DEVELOPMENT AND DEPLOYMENT OF RESOURCES

PROFESSIONAL UNCERTAINTY AND NATIONAL PRIORITIES FOR USE OF RESOURCES

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The Conference Committee has given Sir Philip Rogers and me the global, as well as elusive, task of telling you how public needs and demands might be better matched through development and deployment of health resources. Specifically, we are asked if national priorities for resource planning are needed. And if so, how should they be developed?

It is clearly necessary for me to limit my discussion and therefore I want to apologize at the beginning for my omissions. I agree with Dr. Powles and other members of the Conference who point to the great importance of cultural determinants of illness and am fully supportive of the need for priorities to reduce the abuses to health caused by the environment and lifestyle. In many ways our lack of attention to these areas derives from a misplaced belief in the power of health care to solve the health problems of modern society. But perhaps because my own personal experience deals more directly with the personal health services, I want to restrict my comments to the issues of goals and priorities in that sector of the economy.

In the United States, the question no longer concerns the need for national goals and priorities for resource planning. As a nation, we have recently renovated our commitment to planning through the National Health Planning and Resources Development Act.[1] This planning program, which brings into existence more than 200 regional planning

[1] The National Health Planning and Resources Development Act of 1974 (Public Law 93-641), signed into law on January 4, 1975.

agencies, has been given a goal by the United States Congress: to achieve "equal access to quality health care at reasonable costs." Further, the Congress instructs each planning agency with a second specific objective: to undertake its efforts so as to improve the health status of the population it serves.

The Public Health Service, in its Forward Plan for 1978 through 1982 (DHEW 1976) enunciates the same goals and provides a framework for action as to how the programmatic priorities of the Public Health Service may lead to their realization.

But, while goals and programmatic priorities can be established at the national level, can they, in fact, be implemented? How do they relate to the realities of the market of health care? In the Government's own words, taken from the Forward Plan, are they "doable"?

At least in some regions of the country the prospects for removing income barriers to access to a physician are quite good. In my own State of Vermont, we have sampled households among neighboring hospital service areas. About the same portion of persons contact their physician, regardless of whether they live in areas with higher or lower per capita incomes. Further, as in other parts of the United States, use of health care among the lower income groups has become (by 1973) nearly the same as for higher income groups, at least for episodes of illness. And for hospitalizations, it appears to be higher among some age groups (Wennberg and Fowler).

It is quite reasonable to attribute this to the programmatic priorities of the Medicaid program, indicating that a major objective of public policy—equity of access independent of income—is being implemented. For this reason, I am optimistic that one of the goals—equal access to the system—is realistic and "doable."

But what are the prospects for assuring that, after access, the health care consumed is "quality health care at a reasonable cost"? If, by quality, we mean, among other things, that the service has a reasonable prospect for improving health, I think the prospects are bleak, at least in the short run. And the prospects for providing services at a reasonable cost appear equally dismal, even if we set as a minimum the objective of containing costs incurred for services of uncertain value.

The reason for my pessimism is quite straightforward. Public policy for health in the United States has yet to come to terms with two forces which drive the priorities of American medicine and are responsible for allocating the lion's share of public and private resources.

The first driving force is the accelerating rate of introduction of new technology for the diagnosis and treatment of illness. Characteristically, because we invent and adopt technology in an unscientific way, our

technologies, both the old and the new, are of uncertain value in relation to their expressed objectives: the improvement in health status and well-being of the receiving population.

The second driving force is the accelerating rate of specialization of physician manpower. This trend is producing increasing numbers of physicians who advocate use of greater amounts of technology for treating the common conditions and illnesses.

These two forces combine to increase costs and uncertainty about the value of medical care. They also determine priorities. The immediate determinants of priorities and resource allocation are generated at the clinical encounter, where patient demand is translated by the physician into need for services. But failure to evaluate the end result of technology means there is great uncertainty concerning the costs and benefits of common medical activities. Under circumstances of professional uncertainty, physician decisions are unduly influenced by the traditions and biases of his specialty and other subjective elements that affect clinical decisionmaking.

The market implications are enormous. If the market for health services is not constrained by an underlying professional consensus concerning need, then need and utilization are, phenomenologically, the same. And they are expandable in direct proportion to the supply of physicians.

It is my thesis that the most important factors affecting priorities and resource allocation are technologic expansion and specialty expansion. Technology and health manpower are national issues which must be dealt with at the national level; unless these forces are brought under reasonable public policy, the public sector's efforts to set priorities and allocate resources through decentralized planning of health facilities and programs will prove ineffective, a diversion dealing with side issues, not underlying realities.

I believe there are some steps which can be taken in the near future which, over the middle- and long-range, will gain for the public sector the capacity to set priorities for the delivery of personal health services. These involve a change in manpower training policy and the development of a program for assessing the value of health-care technology in improving health status. But I want first to review with you some health services research my colleagues and I have undertaken in the Northern New England region of the United States. Our studies illustrate the implications for the health-care economy of unassessed technology, physician uncertainty, and physician influence on utilization.

CLINICAL PRIORITIES AND RESOURCE ALLOCATION IN NORTHERN NEW ENGLAND

In Vermont and Maine, we have applied the classic tools of epidemiology to utilization data to obtain per capita comparisons of health care consumption among neighboring communities. Because the communities are small in population size and, for the most part, use local health care sources, we are able to relate the activities of small cohorts of physicians to the use of health care in the population they serve. We can thus measure and relate to specific physician groups the per capita quantity of dollars spent, the man-years of physician effort invested, and the quantity of different types of services produced (Fig. 1).

Quite in contrast to the equity of access and similarity of personal resources among the areas, there are striking variations in the "post-access" features of the delivered health care.[2] A fundamental observation about the performance of the health-care systems among geographic subdivisions of Vermont and Maine is large variations in per capita use of health care, particularly hospitalized care. In both states, the range of variation among hospital service areas is twofold for per capita expenditures for health care and for age-adjusted surgery rates in hospital. In Vermont, per capita reimbursements under Medicare Part B show a threefold range of variation (Wennberg and Gittelsohn 1973, 1975; Cochrane 1972; Wennberg, Gittelsohn, and Soule 1975; Wennberg, Gittelsohn, and Shapiro 1975).

The impacts on populations of medicine and surgery are strikingly different: For the tonsil, the probability of removal ranges from 8 percent to 62 percent of resident children; the probability of loss of uterus ranges from 24 percent to 52 percent; for the appendix from 7 percent to 17 percent; and for the gallbladder from 11 percent to 31 percent (Gittelsohn 1972) (Fig. 2). Nonsurgical interventions show similarly large differences in population-based impact: The range of variation for hospitalizations for bronchitis and upper respiratory tract infections is sevenfold (Wennberg, Gittelsohn, and Soule 1975); and per capita reimbursements for diagnostic X-rays, electrocardiograms, and laboratory services show similar differences among areas (Wennberg and Gittelsohn 1973). The differences relate to the distribution of provider resources.

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[2] Through household interview survey we have demonstrated that the characteristics of the populations themselves do not appear to account for the differences in utilization. Among hospital service area populations that show up to a twofold difference in per capita expenditures and utilization of hospitals, the distribution of insured persons with health insurance, income below poverty, and other common characteristics related to health care consumption are similar as is the rate of contact with physicians on an annual and on an episode of illness basis (Wennberg and Fowler).

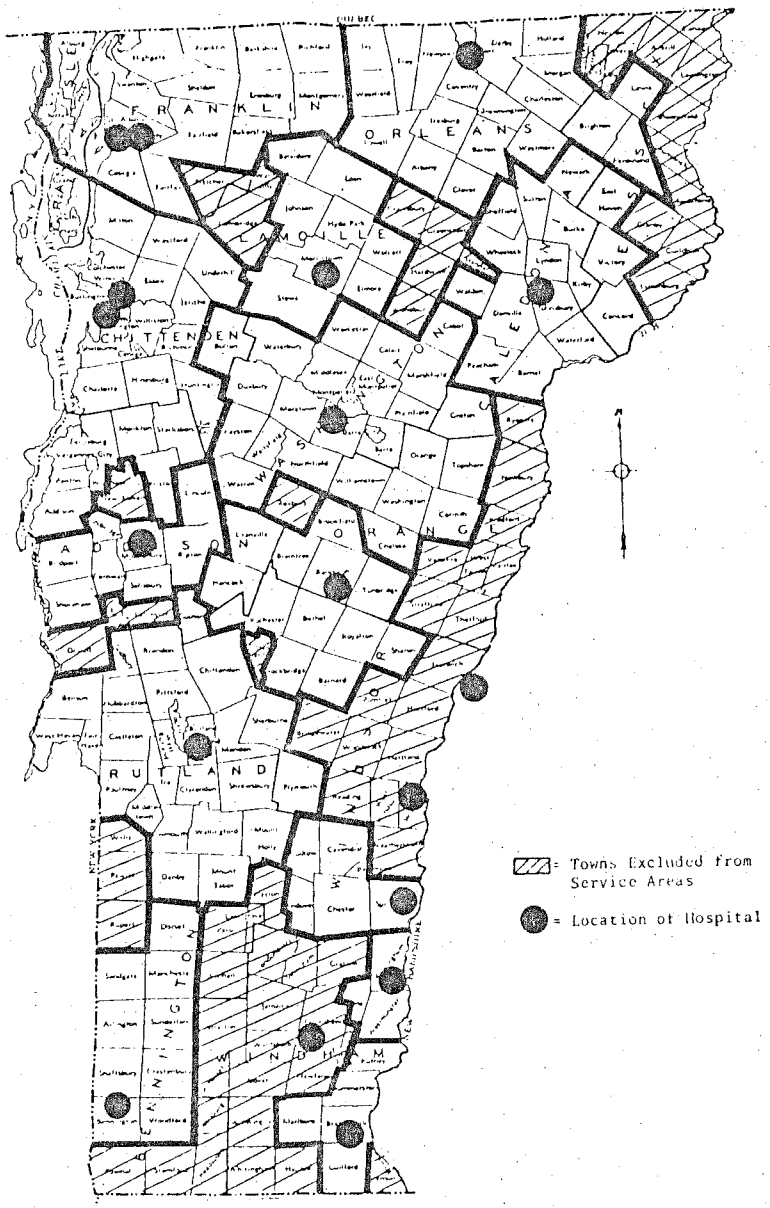

Figure 1. The State of Vermont (population circa 450,000) has been divided into 13 subareas based on residents' use of hospital. In each area, the majority of patients are hospitalized locally. While the per capita rate of hospitalization and surgery varies extensively between these areas, characteristics that predict an individual's use of health care vary little. In contrast, supply factors are correlated with utilization. See text and starred references.

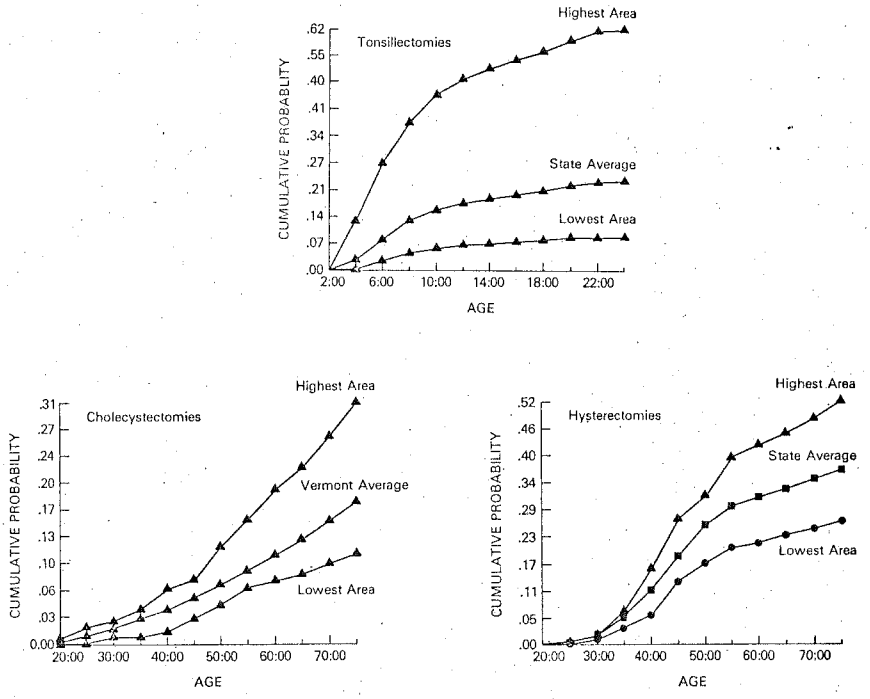

Figure 2. Probabilities of specific surgical procedures by given age, highest and lowest areas, and state average for 13 Vermont hospital service areas, 1969–1971.

The total quantity of institutionalized care and surgery use in an area is highly dependent on beds and the specialty characteristics of physicians with whom the residents of an area come in contact: Areas served by proportionately more surgeons receive more surgery and have higher admission rates to hospitals. Those served by more internists have higher expenditures for hospital and greater reimbursements for lab tests, X-rays, and electrocardiograms. Those served by more general practitioners who do not perform surgery have lower use of hospitals and surgery.

But while overall supply of a particular technology is directly proportionate to the supply of specialists, the allocation of specific procedures shows a curious independence from supply. Take the case of surgery. Although the total surgery rate among neighboring areas may be the same, the technology is allocated differently among the available procedures: In the five largest Maine hospital service areas, patterns of

allocation of common procedures are quite different, even though the overall rate of surgery is similar in three of the areas (Fig. 3). And the area receiving the greatest overall rate of surgery can readily receive more of several common procedures without exceeding examples of rate of use that pertain to its neighbor. Professionally defined "need" for the services of surgeons shows no evidence of "clearing" the area of all potentially treatable problems. More work can be done if supply is further increased.

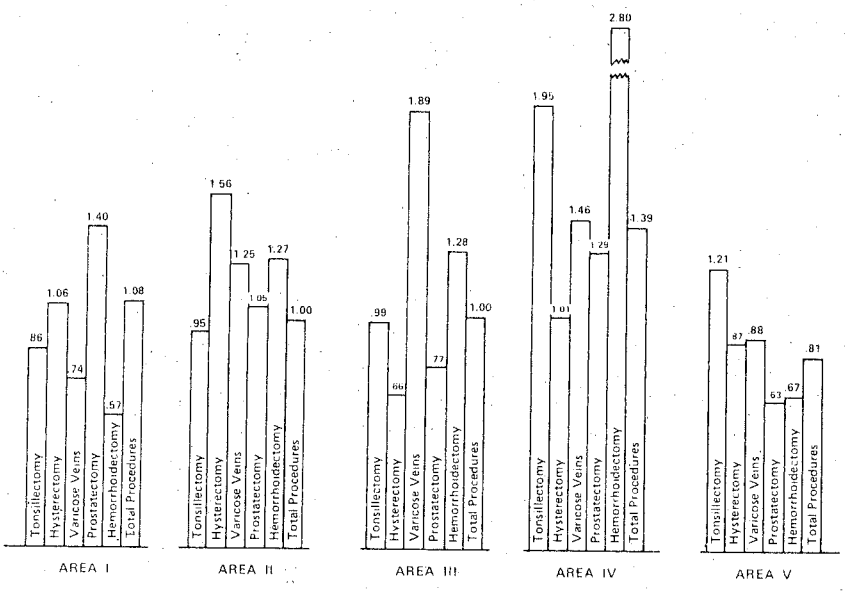

Figure 3. The ratio of the observed to the statistically predicted, "expected" number of selected surgical procedures occurring in the five largest hospital service areas in Maine. The expected number is the age-corrected number of cases that would occur in each area if the state average rate applied. "The figure shows that the rates at which specific procedures are performed within an area vary markedly and to a large degree independently of the total operation rate: For example, while area II and area III have the same total operation rate, area II exceeds in hysterectomies (doing 56 percent more than the state average) and area III exceeds in varicose veins (doing 84 percent more than the state average). In contrast, in area III, the hysterectomy rate is well below the state average and one-third the rate in area II. Of the five procedures, in each of the five areas a different procedure is performed most often; in four of the five areas, the least performed procedure is different." (Reproduced with the permission of the *Journal of the Maine Medical Association.* Further reproduction prohibited without permission of copyright holder.)

What about the cost-benefit implications of the varying strategies for use of institutionalized care and surgery? Given the magnitude of the variations, the possibility of too much medical care and the attendant likelihood of iatrogenic effects would appear as strong as the possibility of not enough care and unattended morbidity and mortality.

The possibility of iatrogenic illness is particularly significant when invasive medical care is undertaken for conditions that pose no intrinsic threat to longevity. While opinions concerning the impact of such treatments on morbidity or patient satisfaction (on quality of life) may be ambiguous and unevaluated, the impact of such care on longevity can be assumed to be negative, since below some small number, risk of death from an untoward event (for example, an anesthetic death) is irreducible. Populations who receive more intervention (of equal technical skill) will have marginally higher rates of death when compared to an otherwise similar population which receives less. Statistical associations between higher age-adjusted rates of use of hospitals and surgery and death rates in Vermont suggest—but do not confirm—that this outcome may be occurring in Vermont.

Those considerations lend particular emphasis to Professor Cochrane's advice that the point of departure in the evaluation of health services should be the null hypothesis: Therapy should be considered ineffective unless there is evidence to the contrary. And under current circumstances, the only certainty is the costs (Cochrane 1972).

The cost implications in dollars of the varying strategies for allocation of the common practices of medicine can be appreciated by comparing the per capita rates of hospitalization expenditures for 9 common surgical procedures among the 13 largest Maine hospital service areas (Table 1). In the areas of highest incidence, total per capita costs of the nine procedures is $29.39; in areas of lowest incidence, total costs of the nine procedures is $11.93. If the high-use strategy were the "medically necessary" level of care (Wennberg, Gittelsohn, and Soule 1975), it would take (at 1973 Maine costs) $6.3 billion to provide these services across the nation. In contrast, if the low-use strategy were generalized, $2.5 billion would be expended. The potential savings for the nation for these nine procedures alone should be adequate reason for determining which level is appropriate. The dollar cost of uncertainty for these nine procedures alone is $3.8 billion or about 10 percent of the 1973 national investment in hospital care. And, as we learned yesterday from Dr. Fredrickson, this amount is greater than the total biomedical research budget of the Federal Government.

Table 1. Expenditures for Nine Common Procedures in Areas With Highest and Lowest Incidence Rates. Thirteen Largest Maine Hospital Service Areas, 1973 Compared to State Average.

Procedure	High Use Area	Low Use Area	State Average
Hysterectomy	$6.78	$2.88	$4.30
Cholecystectomy	4.98	2.51	3.46
Prostatectomy	3.54	1.47	2.34
Tonsillectomy	4.55	.85	2.33
Hernia	2.51	1.64	1.99
Dilation and curettage	2.68	1.08	1.82
Appendectomy	1.99	.97	1.47
Hemorrhoidectomy	1.43	.23	.54
Varicose veins	.93	.30	.48
All nine procedures	29.39	11.93	18.73

SOURCE: Wennberg and Gittelsohn, 1975. Reproduced with permission of the *Journal of the Maine Medical Association.* Further reproduction prohibited without permission of copyright holder.

A CASE STUDY OF THE IMPACT OF NEW TECHNOLOGY [3]

The incorporation into the common practices of unevaluated technology is not limited to that invented and institutionalized by clinicians of another era. It is a central, very contemporary issue. Let me give you an example of how things change when a new technology becomes available.

Between the years 1969 and 1974, the concept of what is a normal obstetrical delivery underwent a rapid change in certain parts of Vermont. Among mothers living in areas where the majority of deliveries are performed in university hospitals, the percent of deliveries diagnosed as abnormal rose from 23 percent to 44 percent. In contrast, among women living in nonuniversity areas (and using, for the most part, nonuniversity hospitals), deliveries were diagnosed as "abnormal" about 23 percent of the time in each year.

Over a similar period of time, the Cesarean section rate doubled in the university areas: from 5.9 percent in 1969 to 9.6 percent in 1973; in 1974 the rate is estimated at 12 percent. The nonuniversity area changed from 4.3 percent to 5.3 percent from 1969 to 1973 (Table 2).

[3] This section is adapted from Wennberg. J. E.: *Issues and Recommendations of a Seminar of National Health Planning Goals.* Boston, 1976. National Technical Information Service, Springfield, Virginia (in press).

Table 2a. Trends in Diagnosis of Complicated Delivery Among Women Living in Areas Served Principally by University Hospitals and by All Other Vermont Hospitals

Percent of all Deliveries Diagnosed as Abnormal Among Women Living in:	1969	1970	1971	1972	1973	Linear Trend Chi-Square
University hospital service areas..	22.7	33.0	35.2	43.6	41.5	<.001
Non-university hospital service areas	22.7	23.4	23.4	24.3	23.4	.254
Chi-square between areas	.999	<.001	<.001	<.001	<.001	

Table 2b. Trends in Use of Cesarean Sections Among Women Living in Areas Served Principally by University Hospitals and All Other Vermont Hospitals

Percent of All Deliveries by Cesarean Section Among Women Living in:	1969	1970	1971	1972	1973	Linear Trend Chi-Square
University hospital service areas..	5.9	5.8	6.4	7.9	9.6	<.001
Non-university hospital service areas	4.3	4.1	4.8	4.8	5.3	.008
Chi-square between areas	.003	<.001	.004	<.001	<.001	
Number of Deliveries by Year	1969	1970	1971	1972	1973	
University areas	2,578	2,701	2,482	2,105	1,887	
Non-university areas	4,836	5,115	4,918	4,662	4,219	

SOURCE: Wennberg, J. E.: Issues and Recommendations of a Seminar of National Health Planning Goals. Boston, 1976. National Technical Information Service, Springfield, Virginia (In Press).

These changes in diagnostic labeling and in use of Cesarean appear to be largely due to the adoption of electronic techniques for monitoring various physiological parameters of the fetus (so-called "fetal monitoring" techniques). The application of this technology appears to have resulted in a profound intervention into a basic strategy of evolution, natural vaginal birth. A commonly heard estimate is that between 12 percent and 18 percent of births will be Cesarean once the steady state is reached.[4]

The circumstances of this innovation can be simplified without distortion of the policy implications: "Breakthroughs" in the electronics industry have improved techniques for monitoring in "real time" the electrical phenomena of the heart, and various patterns of fetal heart rate now can be observed. Theories and inductions brought to these variations lead to predictions about the natural outcome of the process

[4]The *Washington Post,* January 5, 1976

of birth. This leads some physicians to a strategy of intervention through Cesarean section or other means.

Explicit theorizing and experimental interventions are more common in medical schools. It is not surprising that the rapid changes in standards or measures of normality and use of Cesarean are observed first among mothers who live in areas served by university hospitals.

Does this change in technology improve health? Like most changes in the technologies of common practices (where properly controlled clinical trials are rarely done), inferences on the relationship between altered practices and outcome are exceedingly difficult to make. The sole reported randomized clinical trial of fetal monitoring (versus nurse auscultation) demonstrates no improvement in fetal outcomes among monitored mothers. Among the auscultated group, the Cesarean rate was 6.8 percent. Maternal complications were higher among the monitored group.

Among Vermont areas served primarily by university hospital obstetric programs, perinatal and neonatal deaths dropped about 30 percent over the 5-year period. A proponent of the technology, observing this trend among his hospitalized population, might well attribute part of the change to fetal monitoring and increased use of Cesarean sections. But the rates also dropped by a similar amount in the nonuniversity areas of the state. Vermont experience thus reflects a worldwide pattern of decline in perinatal and neonatal death rates about which there is no consensus of opinion as to cause. But surely it should not be attributed to fetal monitoring.

The uncertainty about outcome relates to more than the association between the technology and perinatal and neonatal mortality. The more important issue may well be the quality of survival of the infants who do not die. It is plausible that the joint (or separate) efforts of the neonatologists and obstetricians are saving the marginal fetus who, under natural selection or the old set of medical practices, would have died. It is plausible that these infants, once over their pre- and perinatal problems, live normal "productive" lives. It is equally plausible that some members of this cohort of infants, despite the efforts of medicine, have little prospects for a "normal" life. Other specifications of the benefits and costs of the changes are equally plausible.

What does seem clear is that interventions which assuage professional uncertainty at one level—that of interpreting new information about biologic processes—increase uncertainty at a second level, that of the effect of medical interventions on populations.

NATIONAL PRIORITIES AND PROFESSIONAL UNCERTAINTY

The pattern of health care utilization and resource deployment seen across the communities of Northern New England is not a phenomenon

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restricted to a curious part of the United States. Variations in hospitalization rates of a similar dimension have been reported in Canada, the United Kingdom, Sweden, Finland, and Yugoslavia. Documentation of the relationship between physician specialty supply and the nature of the medical workload has been developed in England (Bunker 1970), Canada (Vayda and Anderson 1965), Kansas (Lewis 1969), New York (Lembcke 1959), and Wisconsin (Detmer and Tyson 1976). A recent documentation is from the American College of Surgeons (1975).

What are the implications for the future of the trend toward specialization? Beginning in the last decade, the Federal Government undertook to promote the expansion of medical schools. Recent Government projections of numbers of physicians by specialty indicate that the historic decline in general practitioners and family practitioners will continue (DHEW 1974). By contrast, the trend toward specialization accelerates, so that by 1990 the supply of medical as well as surgical specialists is projected to about double the 1970 figure.

Consider the implications of this trend in regard to surgical workload. On the assumption that the 1970 relationship found by the American College of Surgeons holds, a least square regression line predicts the rates in the high surgery area to go from 91 in 1971 to 167 procedures per 1,000 persons in 1990 (Fig. 4).

I believe the increased use of technology and increased costs predicted by this trend data forbode increased conflict and crisis for American medicine. "Need" expands with supply. The future priorities and resource allocations of American medicine are being set by today's policies concerning physician manpower training. The significance of this trend to the future of American medicine should be widely debated now, while there is time to alter these priorities.

Needed: A National Manpower Policy That Minimizes Certain Risks and Costs

I want to suggest that we need to reverse radically the trends toward specialization because the future costs of the clinical workloads implicit in contemporary trends are greater than identifiable benefits.

In the face of widespread professional uncertainty, it is not possible to plan for health manpower, particularly the numbers of physicians and their distribution among surgical and medical specialities in terms of a rational model based on medical end results. We cannot know the long term implications of one strategy as opposed to a second. There are only two certainties. If we opt for higher technology through the production of greater numbers of specialists, the costs will be greater. And if we employ more invasive technology, the immediate risks of

iatrogenic effects are increased. Under these circumstances, I argue it is better to adopt a manpower strategy that reduces costs and reduces certain risks.

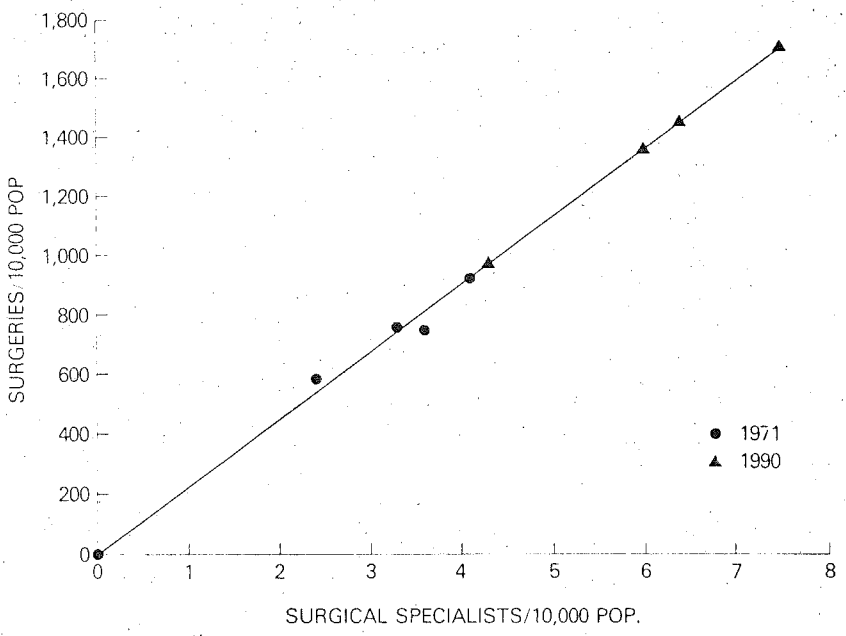

Figure 4. Current and projected relationship between supply of surgical specialists and surgery rate. The circles demonstrate association between surgeons and surgery in four study areas (1971) (American College of Surgeons 1975). The triangles are based on 1990 projected supply of surgical specialists, assuming relative distribution among areas (1971) holds in 1990. A least square linear regression model is used to predict 1990 surgical procedure rates in the four areas.

A risk- and cost-minimizing strategy based on family practice mode of primary care may also more effectively satisfy consumers and lead to stabilization of consumer demand. The evidence indicates that most consumer complaints about the health-care system—and the consumer's subsequent willingness to support industry expansion—derive from his or her difficulty in gaining access to a physician at the moment of perceived need. If there is "excess demand" for health care, the important component of this demand is for contact with physicians and not for a specific technology such as a hospitalization or a surgery. In Vermont, residents of areas served by a greater per capita number of general practitioners had significantly fewer complaints of inability to contact a physician when "needed." The explanation appears to lie in the relative

availability on short notice of the general practitioner who, when compared to other physicians, sees more patients and, on the average, spends less time per patient. Internists behave in the reverse fashion.

The potential benefits of the family practice model of the primary physician for minimization of cost, risk, and excess demand should be urgently considered. Public priorities are needed. National health manpower policy has resulted in the greatly increased numbers of physicians but left to chance the important question of what the new physicians will do. What they do depends in part on their specialty training. However elusive the subject of "Need" and "Demand" may be, we can be reasonably certain that the mechanisms that drive the market for physician specialization have little to do with markets based on consumer satisfaction and demand.

Needed: A National Program for Technology Assessment

I also want to suggest the need for a national program for assessment of the common practices of medicine and for new treatment priorities. Clinical decisionmaking is, by its nature, a complex, particularistic process and will always involve uncertainty. But while uncertainty and ambiguity cannot be removed, they can be greatly reduced. Particularly in the case of invasive technology, I believe we should undertake the necessary steps.

Some may find it ironic that at a time when the profession prides itself in the improved scientific basis of medicine, the extent and quality of the scientific evidence concerning the relationship between medical care and end results should be inadequate. But, while possibly ironic, the situation is understandable and not paradoxical: The emphasis on the biological model as the rational basis for clinical practice, introduced by academic medicine to replace the discredited, undisciplined empiricism of 19th century medicine, has its own methodologic limits. The thrust of any model is to simplify; but in fact, the conditions of human disease and the treatment of diseases are often fundamentally complex, not easily generalized. Models of disease control need to be verified in terms of outcome and under circumstances where opposing practice patterns are tested in a disciplined, rigorous, empirical fashion.

An elegant illustration of the problem of contemporary methodology of technology assessment and also of the importance of specialty ideology in setting clinical priorities—is provided by Mather's study of myocardial infarction patients (Mather et al. 1971). The use of aerospace microtelemetric techniques in treatment of myocardial infarction was rapidly accepted as the rational basis of clinical practice in the United States. But in England, similar attempts by hospital-based (and

often academically affiliated) specialists to declare the coronary care unit a necessary treatment met the opposing experiences of the British general practitioner. The latter maintained that his experience showed that some patients with myocardial infarctions were better treated in the home environment. The innovative aspect of the Mather study is, of course, that the opposing points of view received a test. And incidentally, the test resolved the issue in favor of the general practitioner: His judgment that some myocardial infarction patients do better at home was vindicated by a randomized trial.

Dr. Mather's study is instructive along several lines. First, for those like myself who have worked in the coronary care unit and seen patients apparently doomed by their arrhythmias respond to our therapies, we must deal with a haunting implication of Mather's result: Some of our cures and some of our failures must have been on patients for whom the hospital environment contributes to their arrhythmia. Like Heisenberg's dilemma in measurement of the electron, the act of obtaining evidence through technology appears to alter the circumstance of the experiment.

Second, the study demonstrates the value of a disciplined empiricism for settling conflicts based on arguments from theory as well as arguments from experience. A clinical trial, where the disputing parties agree in advance on the quality of acceptable evidence, can resolve conflicting opinions held by physicians of different backgrounds.

Third, the study indicates the vulnerability to empirical investigation of modes of therapy developed under current academic standards for proof of value. A sobering feature of both the coronary care unit and the fetal monitoring-Cesarean section models is that they are the products of current academic state-of-the-art methodologies for development of medical treatments. These products are susceptible to testing through properly designed empirical studies.

Let me emphasize that we must deal with the existing as well as the new technologies. While the focus of technologic assessment is often on the new technology and its attendant costs, I hope I have convinced you of the great economic consequences of variations in strategies for allocation of existing alternative treatments for common medical conditions. We need to learn the value of the technology we are currently using. Reduction of this uncertainty will not come through a narrowly focused program of technologic assessment. What is needed is to take advantage of differences in points of view and put together the best available tools for undertaking a particular clinical investigation as the settings materialize. This means that not all knowledge will be generated by random trials. Identification of natural populations which exhibit

puzzling variations in use of health care and careful observational studies on these populations concerning evidence of the consequences of their different rates of consumption of health care are epidemiologically sound fields of investigation into the current differences in opinion on the value of common treatment. And I am confident that such studies can be undertaken at a fraction of costs the system must face from the uncertainty itself.

What would be the response of the profession to increased opportunities to evaluate the end results of its activities? Unfortunately, since the opportunities have been few, it is not clear. However, no issue may be of greater importance to the status of the profession than its response to the growing skepticism about the scientific basis of medical practice. I think we can anticipate a positive, constructive response.

I have some reasons for this optimism. I have seen positive steps toward the resolution of the professional differences revealed by our statistics in Vermont. After learning of the variations in tonsillectomy rates, physicians living in the Vermont area with the highest rates for tonsillectomy initiated a second opinion procedure involving a pediatrician and a surgeon. Over a 3-year period, the rate fell to about 11 percent of the baseline year (Wennberg et al. in press). The physicians in this area are currently seeking to undertake matched control studies of school age populations exposed to different levels of tonsillectomy in different Vermont communities. Unfortunately, technical and financial resources necessary to undertake this study are not readily available. I believe such resources should be made available as a national priority.

These considerations bear on my suggestions of priorities for constructing a national program for health care assessment.

1. The program should take advantage of existing differences of opinion within the profession to organize clinical trials directed at resolving differences. This means that if existing differences are to be adequately tested, they must be exposed, talked about, and ultimately resolved by studies undertaken in the practice environment, which clearly includes the nonacademic setting.

2. The organization and administration of the program should be set apart from domination by any one of the constituencies of the several points of view on technology. Its sole priority should be to promote the assessment of the value of health care—both the new and the established practices. It thus needs enabling legislation.

3. The program should have as one of its objectives the strengthening of the tradition of skepticism and disciplined empiricism in American medicine. We need a countervailing national force to the current unchecked enthusiasms for technical innovation and expansion. In the

usual relations between government and the private sector, the means for implementing this objective is to reward those who wish to undertake evaluation studies with the resources to do so.

4. The program must promote a broad methodology. In addition to random trials, it must promote the development of new methods for population monitoring and assessing outcomes in natural populations through improved use of case control techniques.

5. The program must be adequately financed and make longer term commitments to its investigations. The relevance of outcome data to the identification of "unnecessary care" and control of health care expenditures should be directly understood. A 1 percent investment of the annual rate of expenditures for personal health services in the assessment of the value of health care may do wonders for a chronic international disease of health-care systems: inflation.

Let me summarize my overall argument. Our national goal of equal access to quality health care at reasonable cost cannot be realized through existing programmatic priorities of the National Government. While equal access is possible through improving the financial circumstances of lower income groups, it is not possible to assure that the health care consumed by any socioeconomic segment of the population improves health status or is at a reasonable cost. The problem is with our priorities concerning physician manpower training and assessment of the value of the common practices of medicine. Current trends are for more specialists and more unassessed technology which will increase costs and increase immediate risk of untoward events. To minimize inflationary pressures and future conflicts and to gain ground for implementing national goals for personal health services, programmatic priorities are needed at the national level with regard to specialization and the assessment of the outcome value of health care.

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*See Figure 1.