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A significant amount of research has shown that non-physician health care providers can be cost-effectively employed in a wide variety of settings either to supplement existing physician services or to replace those which may be required by increased demands on health care facilities. However, relatively little progress has been made in terms of absolute numbers employed with respect to identified potential. This paper focuses on the way

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in which previous research has contributed to the problem and points out changes in research methodologies which we believe will correct these past shortcomings.

The Limited Use of Non-Physician Providers: Is More Research the Cure?

Abstract

A significant amount of research has shown that non-physician health care providers can be cost-effectively employed in a wide variety of settings either to supplement existing physician services or to replace those which may be required by increased demands on health care facilities. However, relatively little progress has been made in terms of absolute numbers employed with respect to identified potential. This paper focuses on the way in which previous research has contributed to the problem and points out changes in research methodologies which we believe will correct these past shortcomings.

The discussion of the existence of a necessary trade-off in dealing with the need for elements of equity and efficiency in any proposed restructuring of the health care delivery system in the United States is ubiquitous in the formal literature and popular press [1.]-[7.]. Interest groups, analysts, legislators, and the general populace deal with these perceptions in various ways in arguing the merits of their assertions and agitating for changes which they see as indispensable to an appropriate solution. The major products of such activities are the growing wealth of data and ideas about the nature of the problem and a plethora of proposed "solutions". However, as those of us who have repeatedly spoken and written about the imminence of National Health Insurance (NHI) have discovered, more information does not necessarily guarantee adoption of a solution.

What we have observed is the development of an increasingly specific set of arguments for and against each particular recommended structural change in the delivery system. Much of the literature in such disciplines as sociology, economics, medicine, political science, and decision theory has concerned itself with a diverse range of issues about present and future health care delivery. This wealth of literature with accompanying theories

arose largely as a result of the period of turmoil and change in American society during the 1960's. Activism, the questioning of the distribution of power and resources, and the re-examination of society's responsibilities towards certain racial and economic groups has had implications for many aspects of life. In health care three major areas of debate were raised: 1) access to care and questions of shortage or maldistribution of physicians; 2) quality of care and an emerging gap between expectations and care received; and 3) costs of care; both those of purchasing care and of medical education. These issues remain the subject of considerable debate.

One of the strategies developed to address these issues was the education and use of what we shall term non-physician health care providers (NPP's). The two major categories of NPP addressed in the literature are the nurse practitioner and the physician's assistant. Both roles encompass professionals who are educated to competently perform a portion of those tasks traditionally done by physicians, but whose education (and use) is not as extensive, or as expensive, as the physician's.

However it appears that the failure of research projects to appropriately address the scope of the implementation problem has hindered the rate of integration of this innovation into the health care delivery system. In a recent article in this journal, Stimson and Charles [8.] provide an initial attempt to critically review the limitations of past research. The purpose of the present paper is to extend the bounds of this review by focusing on the potential contribution of NPP's in relation to the equity and efficiency concerns, and to examine the implications of their role as a part of the changing state of health care delivery with specific emphasis on the derived requirements for future research. We provide a more complete perspective for examination of the ideas and solutions proposed rather than new data and attempt to demonstrate that the relatively slow progress toward solution of the target problems

may not be as much a function of lack of information and foundations for adoption of the proposals as it is a lack of integration of the results, and the failure to consider the environment within which changes will have to be made.

While the relative severity of the cost, access, and quality problems may be open to question, the issue has certainly become politicized and the subject of public concern. And once politicized they become the focus of numerous federal, state, and private efforts to alleviate them, many times prematurely. Our sample of the literature highlights the nature of, and attempts to resolve, these problems with specific emphasis on the implications for the role of NPP's.

Genesis of the NPP Concept

Concern over the posited unequal access to the health care delivery system in the United States generated many studies to document the elements and extent of the problem. While the existence of such disparities of access is no longer in question [9.],[10.], the response to their existence remains the major motivation (along with the need for overall cost containment) for NHI adoption. It is safe to say that there is no consensus regarding the most appropriate form of NHI, even where the extent of differential access is known or agreed upon. Rather, the partial efforts to increase consumer access to the system have tended to further complicate the solution process.

Concerns were raised about significant increases in the demand for health care due to demographic changes, the growth in health insurance coverage, and the greater knowledge and expectations of the health care consumer. For example, Fein [11.], analyzed the impact of the socio-economic and demographic changes on demand for care between 1965-1975 and anticipated a 22-26% increase. Of that increase, half would be attributable to rising levels of income and education. In addition the growth of private health insurance coverage and the adoption of Medicare and Medicaid saw the percentage of the population

eligible to receive such financial assistance use from 50 to 80 between 1950 and 1970. Unfortunately costs grew as well as demand [12.]. Since the federal and state governments were responsible for a significant share of these new costs, strong incentives seemed to exist for federal administrators and congress to seek less costly ways of delivery care. Hence, the interest in the role of NPP. The literature is replete with studies indicating that the NPP not only provides greater accessibility to the health care system [13.], but also delivers the care at less cost than the physician [14.], [15.]. This will be addressed further below in the section on costs.

Another major factor exerting pressure on demand was the unquantifiable one of the increasing knowledge of health care, belief in its efficacy, and habit in the use of health services on the part of the consumer. This knowledge was communicated to the public via the media and increased both demand for care and expectations of the care [16.],[17.].

On the supply side questions were raised about the shortage of physicians and nurses. Because of the multiple pronouncements during the 1960's about the gap between existing and anticipated supply of physicians and nurses, and the numbers needed to meet projected health care demands, a series of measures were passed after 1965 to increase the numbers of medical school places and the numbers of nurses and allied health personnel trained [18.]. Among health manpower planners, increasing the numbers of health personnel was not the only proposed solution to the shortage problem. They were also concerned about the lack of rational task distribution among the various types of health professionals. They believed that there were many tasks traditionally handled by physicians that could well be performed by others [19.]. There was ample evidence of the underutilization of nurses, and of the apparent willingness of some physicians to delegate more functions to appropriately trained personnel.

Declines in quality of care were seen as the almost inevitable results

of a situation in which supply was outstripped by demand. Our present physician-centered system allowed little flexibility in relieving this pressure. "Sick people feel betrayed and abondoned by a profession that formerly enjoyed a high position of respect and prestige as being selfless, sympathetic, and available. Indeed today's highly specialized physicians seem to pay more attention to the disease than to the patient as a person." [16, p. 22]. However, any assessment of actual quality decline has been largely inhibited by problems of definition and measurement [20.]. Thus concerns about quality were largely registered in anecdotal form (e.g., about insufficient time per patient because of the pressures of demand for care). Quality of care was therefore also a rationale used for the development of the role of the NPP by stressing the potential for improving quality through the availability of a more appropriate range of services, and by providing more time per patient. Arguments relative to range of services tended to emphasize the NPP's counseling and teaching capabilities: "Clinical studies of general practice indicate that 50-80% of patients come primarily for emtional reasons." [4., p.61]. In technical skills, a number of NPP studies as reviewed by Cohen, et al [13.], have shown the NPP to be delivering quality care comparable to the physician. Arguments relative to time available stressed that with a NPP working collaboratively with the physician, both could spend more time with individual patients.

Fuchs mentions two major concerns about costs of care: the proportion of resources going to health care and the fact that many low income and minority groups found health beyond their purchasing power, and that the cost of educating a physician whose knowledge then is usually not appropriately utilized is inefficient [2.]. As the government became more involved in sharing the cost of health care, they were influenced by the idea of less expensive and quicker alternatives in educating health manpower. Nurses were readily

available and underutilized health professionals and were therefore logical choices to assume more extended duties. Additional non-physician personnel became available when returning Vietnam corpsmen were trained to function in civilian settings in extended roles. Once the more technical feasibility of NPP's functioning in the health care delivery system was demonstrated, the broader question of economic viability was raised. Did the NPP deliver care at less cost than the physician and did this savings offset the cost of NPP employment? Studies indicate that the answer is "Yes" [13.],[21]. Secondly, were these cost savings passed on to the public? As yet this has not been adequately answered since fees charged by physicians and NPP's have tended to be identical. A different, i.e., lower, fee charged by the NPP, although passing savings more directly to the consumer, also tends to connote a lesser quality care. "Even assuming the continuation of a single fee system, however, it seems reasonable that the use of lower cost resources in care delivery would eventually lower, or at least decrease the rate of growth of the cost of care to the public." [22., p.19].

In the following sections we first examine in more depth the topic areas of access, quality, and costs of health care and the implications for a wide variety of systemic changes. We conclude with a set of questions to be answered by future research and a list of policy recommendations which we believe flow from the analysis.

ACCESS TO CARE: WILL NPP's BE USED?

The original approach to mitigating unequal access to health care was to provide specifically designed financial assistance. The evidence is clear that such "demand facilitation" solutions are insufficient where the presently structured system is characterized by an inadequate supply of facilities and personnel. In particular, insurance guarantees only a partner in paying the bill and not services in time of need. Thus we have seen a shift in emphasis to programs to increase the supply of health care as well. Recent congressional initiatives to reimburse under Medicare for the services of "physician extenders" working in clinics which have no physician in rural underserved areas, as well as an HEW/Social Security Administration experimental reimbursement project for the same purpose, are efforts which are aimed at increasing the availability of health care in areas where the mere eligibility for payment assistance is insufficient to generate physician care.

This realization has brought about a renewed emphasis on "primary care". For example, World Health Organizations (WHO) has instituted a major new two-year study to promote primary care in the United States and around the world. The Assistant Director General of WHO, Dr. David Tejado-de-Riviro, has stated that primary health care (PHC) is both the basic entry point for health services and a beginning for integrating health and the community into the development process [23.].

This emphasis on primary care is not a new phenomenon by any means. Previously the euphemism was "Comprehensive Care". Beginning with the Commonwealth Fund Annual Report of 1949, the term "comprehensive care" was first succinctly related to the medical education process. They defined "comprehensive care" as that mode in which doctors deal with people as a whole, instead of in parts. Partially as a result of this report and its recommendations, a number of experimental medical education programs were undertaken. As pointed out

by Reader & Soave (RS), "The aim for students was to reverse their growing absorption with disease at the expense of interest in the patient". [24, p.383]. Unfortunately, until the recent resurgence of interest in "primary care" and "family practice" modes of delivery, these programs suffered an attrition of interest for a variety of reasons. As noted in RS:

> . . . The effect [on physicians in the programs] was short-term: when the students left the program, they tended to revert to a disease rather than a patient orientation.
>
> The setting was recognized as all important in creating the right atmosphere for practicing comprehensive care. Ideally, it appeared to require a place where physicians, appropriate consultants ...., nurses, social workers, aides, and others work together; and, by communicating among themselves, provide a compassionate, friendly, environment.
>
> . . . Well patients and well families do not seem to offer [medical] students the challenge necessary for their professional growth. [24, p.396-397].

Thus, although they conclude that such a program, namely the Comprehensive Care and Teaching Program (CC&TP) at Cornell, was successful in demonstrating the <u>feasibility</u> of building an interdisciplinary team to teach and practice the delivery of comprehensive care, in a setting such as described above, their specification of the reasons for the demise of the CC&TP includes a disturbingly familiar element. In particular they note that a Cornell faculty study:

> . . . Identified a considerable number of faculty members with a constellation of attitudes represented by lack of interest in some patients, desire to refer out those patients with social and psychiatric problems, and doubt that students gain anything from working with patients on their own. This point of view is clearly antithetical to teaching the comprehensive care of patients and contributed to its demise. [24, p.398].

Notwithstanding the renewed interest in "primary care" and "family practice" by educators and medical students, it has been estimated (in the position paper on Integrated Health Manpower Policy for Primary Care prepared by the Federated Council for Internal Medicine) that at least 2500 <u>new</u> training slots are needed to prepare the physicians for primary care delivery opportunities. Since this

number of new physicians is not likely to be attained, RS add their voices to the increasing number of calls for NPP development and Team Practice as a viable alternative in meeting the demands for more primary care and hence access to the system [25.]. (It should be noted that as far back as 1932, the National Commission on Costs of Medical Care urged a Team Approach to the provision of health services).

They note approvingly the recent work by Parker, Walsh, and Coon [26.] in which a consensus definition of "primary care" was developed:

> Primary Care provides basic services, including those of an emergency nature, in a holistic fashion. It provides continuing management and coordination of all medical care services with appropriate retention and referral to other levels. It places emphasis, when feasible, on the preventive end of the preventive-curative spectrum of health care. Its services are provided equitably in a dignified, personalized, and caring manner.

Thus it is posited by RS that "Training of [PHC] team members should be rapidly expanded along with graduate training of primary care physicians" especially given that the Parker, et al, definition "....does not refer to an individual physician as a provider. No one, even the most skilled family practitioner, could provide all that the definition requires for patients. Parker, et al, appear to be referring to a <u>system</u> within which the patient will find what he or she needs" [24, p.409]. However,the admonition of Relman [18, p.146] is pertinent here:

> We should remember that the primary care problem is not to be solved simply by giving the appropriate training to the appropriate mix of physicians. The demand for more primary health care being heard on all sides these days is symptomatic of a much broader malaise in our health care system. To deal effectively with the roots of the problem, we will need important changes in the organization and financing of the system as well as reforms in graduate education.

Indeed a major goal of the Parker, et al, study was to identify the organizational structures most effective in delivering the type of care they defined. It is significant that their general findings included: "....increasing the base of participation in primary care planning may bring greater attention to patient

defined needs [but] that broadening of medical care objectives from medical care to a more inclusive health care is not imminent" [24, p.415]. The implication is that narrowly defined micro-sector studies and experiments such as those described in the teaching of comprehensive or primary care will ignore significant system environmental paramenters and thereby discount such studies' value in terms of providing long-term solutions.

As noted earlier, Stimson and Charles [8.] discuss the limitations observed in past research studies dealing with the use of NPP's in the delivery of primary care. They conclude with the specification of five new areas to be explored by researchers so that the NPP may be integrated in the most appropriate way. Two of these recommendations have direct bearing on the present argument:

> 1. There is a need for studies that analyse how physician extenders should function in providing primary care and what the relationship should be between physicians and physician extenders in individual clinic or office settings. Overall, studies conducted in doctors' offices show great variability in how medicine is practical with or without physician extenders. This variability strongly suggests that no single solution exists to the question of how physician extenders should be used in primary care settings. The organization and administration of such settings is still another area in need of study.
>
> 2. There needs to be study of why physician extenders are kept from using their skills in certain settings. Some argue that present medical education, current financial incentives, and traditional patterns of behavior inhibit effective use of physician extenders in providing primary care.... Another argument is that changes in medical education are not enough to change physician attitudes toward physician extenders. Present structure and traditions in medical practice have to change too. The impact of changes in the financing and delivery of medical care need to be considered in studies of the use of physician extenders. [8, p.10].

In commenting on the Stimson and Charles piece, Glenn and Hofmeister [26.] add another dimension: the insufficient motivation of the physician to hire a physician extender. Their position stems from the belief that

> "Physician extender impact on primary care delivery will not hinge on the experimental and academic practice setting or on the HMO-type and large group practices which thus far have been the scene of much of the reported physician extender analysis.

> The real impact will come through the private physician practicing solo or in the smaller fee-for-service groups in small or rural communities or any area where the physician/patient ratio inhibits accessibility of primary care. Surveys of physicians show that support of the physician extender concept is a necessary, but not sufficient condition for physician motivation." [27, p.69-70].

This collective assessment of the research areas in urgent need of attention is derived from recognition that in most, if not all, of the research projects and experiments dealing with the cost, quality, acceptance, and productivity of NPP's ... "a crucial assumption is made: that certain technical tasks cannot be performed by certain categories of physician extenders. This assumption is open to serious question because there is evidence that physician extenders are capable of performing all of the technical tasks encountered in giving primary care ..." and indeed that " ... physician extenders do many of these tasks as well as or even better than physicians". [8, p.8]. It is noted that there is usually the additional assumption of an existing unique set of tasks which describe what primary care providers do. This does not allow for the significant variance between practice or for the varying degrees of clinical judgement and counseling performed by these providers. The literature is replete with studies which, although well-done from a technical standpoint, exemplify these failings and thus are less convincing than they might have been [28.],[29.]. A study by Smith, et al [30.], both illustrates the variability in the tasks actually delegated to NPP's and recognizes the need for a wider view in order to provide more appropriate policy guidance. In a recent review of the literature on the substitution of NPP's in the production of health care by Reinhardt and Smith [31.], it is suggested that further interdisciplinary research is necessary into the determinants of task delegation. This is not an easily borne burden for researchers [32.],[33.], but is essential if useful guidelines are to be provided to operational level personnel. For, as noted by Stimson and Charles [8, p.9]:

> . . . The [present] studies are seen as providing a rational framework within which it is easier to deal with the politics of the change process. However, the belief that a rational scientific approach to problem solving will overcome those aspects of resistance to change in individual and organizational behavior that heretofore have not been handled successfully by operations researchers remains to be demonstrated.

The import of this research need was dealt with in a recent article by Fottler and Pinchoff (F&P) concerning the attitudes of health care administrators towards the use of NPP's in their institutions [34, p.262]. Their survey of the research literature indicates that:

> Community acceptance [of nurse practitioners] has been excellent in all of the research studies reported. It does not appear that consumers have an irrational attachment to physicians that would restrict or preclude their acceptance of nurse practitioners.

In explaining why we have not observed a larger number of nurse practitioners' programs and graduates, they point out that non-academic health care institutions in general are less than enthusiastic about the nurse practitioner concept for a variety of reasons. In their research they discovered that, in addition to the legal barriers and uncertainties associated with utilizing nurse practioners in their institutions "....there is a great deal of uncertainty, confusion, and lack of information concerning the concept [i.e., of the nurse practitioner role] at the present time". [34, p.271].

Using a theoretical framework from the discipline of organizational behavior to explain their results and derive policy recommendation, F&P emphasize the "innovation" element in the concept of an expanded role for nurse practitioners. In particular they note that in behavioral theory it is both the characteristics of the innovation itself and those of the potential adopters which affect the rate of adoption. The former category encompasses the innovation's "relative advantage" (profitability potential), "Compatibility" (with the present overall system structure), "complexity" (of understanding and use), "divisibility" (i.e., can it be tried, implemented gradually), and "communicability" (to others of the basic idea). In terms of those potentially adopting

the concept or innovation, they emphasize that "....the perceived cost of innovation in terms of its effect on the administrative function of maintaining a balance between employee inducements and contributions may also be an impediment to adoption". [34, p.264].

A study by Record and Cohen [35.] of the use of midwives in a Kaiser-Permanente plan documents high patient receptivity to this significant innovation while recognizing some of the broader organizational and incentive problems inherent in it. We conjecture that the researchers' perspective was greatly enhanced by the fact that the project was based upon an actual implementation of the innovation and not hypothetical. (This along with the existing physician shortage in the plan involved probably also affected the relatively good physician acceptance noted). However the vast majority of research and experiments about NPP's in general has thus far been concentrated on establishing the "relative advantage" of the concept [36.],[37.]. For example, although about half of the administrators involved in the F&P study had consistently positive views concerning the relative advantage of the nurse practitioner innovation, the majority of the remainder of the sample were uncertain, which naturally led them to be more cautious [34, p.271].

The authors therefore conclude that:

> Reduction of uncertainty may be accomplished through the interaction of innovators in the later stages of the adoption process (trial and adoption) with those in the earlier stages of adoption (awareness, interest, and evaluation).
>
> . . . A strong promotional effort on the part of those concerned with adoption of the nurse practitioner concept to emphasize the relative advantage of the concept should hasten adoption. [34, p.271-2].

The need for a less parochial perspective by researchers who design experiments is exemplified by the HEW/SSA project mentioned above. Its goal is an effective increase in the availability of care to populations living in underserved rural areas. The mechanism proposed to accomplish this end is a

change in the Medicare reimbursement regulations to allow patient services provided by nurse practitioners, physician assistants, and MEDEX's to be reimbursable without the patient being seen by a physician. The experiment would supposedly determine the economic viability and acceptability in terms of quality of care by the substitution of NPP for physician services in these areas where it has been determined that access to physician care is insufficient. However, in our view the lack of adequate consideration of the systemic environment within which the experiment will take place will tend to vitiate the utility of the project in determining the extent to which NPP's services can be substituted for those of physicians. First of all, the project requires that a physician must accept full, legal and ethical responsibility for the services delivered by these types of NPP's. Although the legal status of certain types of NPP's (specifically physician assistants and MEDEX's) is directly tied to the physician-sponsor through legislation, this is not the case for the nurse practitioner who is legally covered under separate legislation. The licensing law of a state does not place nurses under the supervision of any other profession. Furthermore, the Medicare experiment would reinforce counter productive attitudes concerning accountability of professional nurses for their actions and their previously dependent relationship with physicians. Both encourage continuing barriers to valuable innovations in the delivery of health care services. We question as well the ability of any person to assume ethical responsibility for another's actions. This requirement in the reimbursement experiment would not only be difficult to demonstrate, but also indicates a lack of awareness of the code of ethics of other health professionals.

Next, the experiment hopes to use a marginal change in the financing mechanism to accomplish (demonstrate) a statistically significant change in the availability (and cost-effectiveness) of health care services. Simultaneously it ignores many of the historical and institutional constraints to the use of

NPP's in the presently structural system. For example, even in states where nurse practitioners are licensed or certified as independent health care professionals (i.e., where they have separate office practices) the experiment would not allow their participation since it is the nurse practitioner's employer who will be reimbursed and not the provider directly. This limits the use of the nurse practitioner as a patient's sole primary health care provider, discouraging establishment of nurse practitioners in underserved areas. It also limits the patient's choice of entry into the health care delivery system and fosters the traditional concept of the physician as the only "real" health care provider.

The results of the Fottler and Pinchoff study reported above that the acceptance of nurse practitioners by administrators in less complex organizations (e.g., PHC clinics) is likely to be much lower than that in the larger multi-service institutions would seem to further lower the probability that many new NPP's would be hired as a result of the experiment. Thus the HEW project may end up only paying presently employed NPP's and thus not significantly affect increases in overall productivity or cost-effectivenss of the system. The recent study of Bentzen et al [38.] documenting the potential economic and technical substitutability of NPP's in Denmark suffers in much the same way by ignoring the traditional and institutionalized power of physicians and administrators to influence the mode of delivery. Their estimates of the possibilities for systemic change in this area are accordingly suspect.

In terms of teaching programs to develop physician members of the health care "teams", both experience with the comprehensive care teaching programs and organizational behavior theory and empirical research seems to clearly indicate that significantly different strategies are required [39.],[40.]. A brief encounter with the PHC team setting within the otherwise normal medical school curriculum will not produce physicians committed to either active or passive

participation on health care teams. First of all, if there are an insignificant absolute number or a relatively few geographic areas in which team practice is prevalent in the non-academic health care sector, the paucity of opportunities will limit the motivation of physicians to "buy into" the team concept. Secondly, the training need for all team members encompasses much more than task delegation and patient flow. The direct confrontation of the historical patterns of intra-provider behavior and resolutions of the conflicts it generates must be an integral part of the program. We would expect apriori that if physicians do not particularly care for "well patient" management or for the increasingly demanded counseling role, the availability of appropriately trained NPP's would be welcomed. However this has not been the usual observation as was discussed above. The uncertainty aspect regarding the non-monetary costs of the adoption and support of the "NPP innovation" must be addressed in the provider education process. Another aspect to be addressed in this process which affects attitudes toward the team concept are the inclusion of courses addressing future and alternative health care systems. These courses should be interdisciplinary in structure and available to students in related health care fields. (Currently at the University of Washington medical and nurse practitioner students attend several courses together which have overlapping content.)

Patient centered versus doctor or disease centered care would directly address the problem of the large percentage of worried-well seen in primary care settings. We need to see an increase in this type of orientation in the education of these who will be delivering primary care. A natural inclusion in their education about the worried-well would be the usefulness of other health team members (i.e., NPP's) in an effective approach centered around the worried-well. As Kane [41.] has put it:

> "What is needed is a clearly articulated definition of the kind of services being sought and particularly a recognition that primary care, perhaps even more than the rest of medical

> care, is more appropriately viewed as a social service than a commodity with direct tangible benefits. In that context, the best provider is the one who most directly meets the consumers' demands at the least cost with the least risk."

In summary, the promise of the development and deployment of significant numbers of NPP's throughout the system in order to augment the supply of health care providers and to provide a more appropriate response to the changing nature of health care demands by the public depends upon the accurate definition of the systemic constraints and the creative use of research experiments to develop appropriate implementation strategies.

QUALITY, EFFICACY AND THE NPP

In this section we investigate the potential of increased NPP utilization for positively affecting the quality and efficacy of the health care delivered. Here the terms quality and efficacy encompass evaluation in terms of being the appropriate technical response to the symptoms and complaints presented as well as the patient's perception of its acceptability. This latter element may be thought of as the patients' satisfaction with the modality and provider behavior when specific health care encounters occur [42.],[43.],[44.].

We note at the outset of this discussion the difficulty in assessing in any meaningful absolute quantitative way the quality of the health care delivered. Although there are many studies extant and in progress which attempt to develop "health status indices" and the like [45.], [46.], [47.], it is safe to say that we as yet have no accurate measures of the "health" of the population. That is we do not have the means to make unambiguous comparisons of the health of populations and individuals. Even if these sorts of measures of the "stock" of health existed, they alone would not necessarily provide the ability to measure the effectiveness of specific health care system encounters in maintaining or restoring health for individuals or population groups. Rather we are forced at present to assess the technical quality of care by examining the process elements associated with specific encounters. This describes the

methodology used by both peer review or medical audit groups within health care facilities and that being developed for implementation by the Professional Standards Review Organizations (PSRO's) under PL-92-641.

The absence of hard measures of quality and efficacy has facilitated increasing criticism of the health care sector by those such as Ivan Illich [3.]. The euphemism associated with this wholesale criticism is "Therapeutic Nihilism"--the disbelief in the effectiveness of medicine [5.]. Illich goes beyond the level of "disbelief" in that he sees much medical care as counterproductive. He assets the medical system causes more illness than it cures. A major basis for the growing body of therapeutic nihilism is characterized by the assertion that:

> The best estimates are that the medical system .... affects about ten percent of the usual indices for measuring health: whether you live at all (infant mortality), how well you live (days lost due to sickness), how long you live (adult mortality). The remaining ninety percent are determined by factors over which doctors have little or no control, from individual life-style (smoking, exercise, worry), to social conditions (income, eating habits, physiological inheritance), to the physical environment (air and water quality). Most of the bad things that happen to people are at present beyond the reach of medicine. [7, p.105].

Thus, goes the argument, the physician, and the health care system in general, by promising too much when they can affect so little of what may ail us, builds dependency and worry: dependency on the system because there will be much which will cause us to genuinely "feel bad" and little that can actually be done; worry because we have been told that medicine can help us whenever we feel bad and thus if things are not quite right and the doctor doesn't find anything "curable", we wonder with what mysterious malady we are afflicted.

However, at a time when there is this increasing disenchantment with the ability of medicine to cure, we observe an unambiguous increase in utilization of health care facilities and providers. The concerns for "equity" and "adequate access" to health care have supported the rising demands placed upon the

system and have led to the many attempts to increase its availability to consumers and the range of services it provides as discussed above. Critics point out the pre-occupation of physicians with specialty practice, and development and implementation of new technologies of dubious (if not negative) value to the average patient. For example, the Computerized Tomography (CT) Scanner is developed and immediately surgeons want one in their hospitals even though the benefits of its use to the patient are not clear. If patients must continue to undergo each of the invasive procedures previously performed in addition to the CT scan, and if the probability of having an operation and a favorable outcome is not altered, then they may in fact be worse off than before even though the physician may be more certain of the diagnosis. Therefore "utilization" increases because physicians, acting as the expert agents for the patient, prescribe these new procedures and third party payers "cover" them.

Another major component of the increased utilization is the visits of the "asymptomatic sick", or "worried-well" as they have come to be known. These Illich would label victims of "social iatrogenesis" which he posits:

> . . . obtains when medical bureaucracy creates ill health by increasing stress, by multiplying disabling dependence, by generating new painful needs, by lowering the levels of tolerance for discomfort of pain, but reducing the leeway that people are wont to concede to an individual when he suffers, and by abolishing even the right to self care [3, p.41].

Within the confines of the debate over the operational meaning of equity in access to care, this utilization, dependent upon the volition of the consumer, has been labeled the demand for "caring" rather than for "curing" [7.]. The root of the question really is whether the consumer's demands or desires for this care should and can be accommodated. This, in turn, hinges upon what we collectively and operationally determine to be the meaning of the individuals "right" to care. Clearly we would like this to mean that each of us has an equal right to "health". However the statistics and causes of ill health cited by the therapeutic nihilist are exactly the reasons that we have had to take a

"second order" approach to such a definition. That is, since the complete historical sequence of job opportunity, wealth positions, discrimination, education, and family health are disparate among the members of the population, we must resort to assessing the controllable portion of the process in defining the right to health. Thus, we argue that the right is actually to adequate access to the health care delivery system. This may directly affect either our health status if our condition or symptoms are "curable" (i.e., broken bones, etc.) or our psychological (and hence potentially physiological) well-being if it is "caring" we seek.

Although this demand for caring in instances where the patients' complaints may be self-treatable and self-limited is generated in part by the "....patients' fears and ignorance of the unknown and to their decreasing autonomy" [17, p.365], one should not visit the burdens of past failures of the health care community solely on those who lack the financial resources to obtain access to such care. Just because the health care community, by promising so much over the years, has generated an almost inherent demand for health care services, even when a properly informed patient might have recognized that self care would have sufficed, or that there was in fact "no-thing" which could be done to their own body to rectify the feelings observed, does not imply that the patient with insufficient income must be forced to abstain from "consuming" those health care services which they perceive as being beneficial. Certainly we must move toward proper patient education and information, but we should not "tax" the poor "worried-well" and allow only those "worried-well" with sufficient income to continue to purchase "caring" and to feel relatively better-off because of it.

Surely, as Wildabsky points out, "Determining how much medical care is sufficient is difficult enough; determining how much 'caring' is, is virtually impossible" [7, p.107]. However, we are not suggesting that everyone's total

demands for caring be fulfilled; rather only that access to caring be equitably rationed. As argued by Whipple [6.], in a system of unequal income and asset positions, this implies only that the rationing mechanism not heavily rely on money prices. Here we extend this argument and posit that a more appropriate response to this demand for caring can be more cost-effective and can diminish the system-induced irrational utilization component.

We believe that the quality and effectiveness of health care in the future will be enhanced by a restructuring of the system so that the patient no longer passively surrenders his health needs to medicine's care, but rather participates so that professional care complements the patients' care for themselves [48.]. However, the notion of patient participation is dependent upon the existence of well-motivated, educated patients who know when and where they can best seek appropriate care. As we have said, at present too many people assume that medicine will take care of their health. Our traditional health care delivery system has fostered this assumption leading to the physician being the "font of knowledge" on all health matters. A national survey conducted in 1968 shows a distressing lack of the most basic health knowledge as well as serious misconceptions about health and health management on the part of a large segment of the population [16, p.177]. The time is long overdue for a major effort on the part of the health professions and societal institutions to inform the public about health, disease, disability and their proper management. However, information alone is not enough to motivate self-care. "We will have to develop self-care with the same energy and money we have given to professional care if we are to make it work. In particular, we will have to develop self-care and preventive health care in the same framework of interpersonal care and in the same expectation of help that has made the placebo effect so powerful in good medical care." [4, p.63].

The increased utilization of health care facilities at a time of disenchantment with medical care has been largely attributable to the "asymptomatic sick" or "worried-well" population who are often victims of misinformation or a lack of information. Unless their needs for reassurance, sympathy, relief of anxiety, and information about their health status are accurately assessed and alleviated, the cost to the system and to the individual in time (repeat visits), resources (medicines, personnel), and complications (real or "imagined") is phenomenal. To perform these caring functions, in addition to the technical functions of the primary health care provider, requires considerable time spent with these types of patients. Economically physician time is too costly for them to spend much direct effort on education and counseling. Also most past and present medical education has not instilled an ability or willingness by most physicians to supply caring as we have argued above. With NPP's as primary care team members the worried-well have access to someone whose role is more largely defined around this type of therapeutic intervention. Although this quality of care aspect may seem to be quantifiably intangible, the benefits are recognizable to the patient, and patient acceptance of NPP use in such situations has been high [35.],[38.], [49.],[50].

The educational and counseling functions of the NPP are, of course, also applicable to the well and the symptomatic sick. As long as major media, school, and other institutional measures to educate the public about their health are not widespread, a large portion of this task belongs to the NPP. Without a better informed population, patient participatory care will not become a reality.

In addition, we agree with the assessment of Steven Jencks who is:

> disconcerted .... that the unavailability of family practitioners is officially more lamented because patients have trouble getting treatment--a technical problem of access--than because the human experience of being a patient has become less human. The writings

> that are likely to influence planning of national health insurance scarcely mentioned anything that might be called patient satisfaction.... [4, p.62].

It appears logical that once the need for, and right to, "caring" is accepted more concern for the patients' own evaluation of the behavioral environment in which such care is delivered takes on added significance. It is certainly no overstatement to say that relatively little time and resources have been devoted to this element of the health care delivery process in the past. Although some work on measurement and specification of patient satisfaction and its elements has been done [43],[44], it has been confined largely to academic studies. The major exception has been in large prepaid group practice health plans which have an economic incentive to minimize the turnover in their enrolled populations. It is also interesting to note that such plans are the largest employers of NPP's. We believe that patient satisfaction assessment is an extremely tractable problem and that the results of its implementation should be an integral part of "feedback" to the providers and managers of the health care delivery system. As we will discuss in the next section, this appears not only to be a contribution to the goal of utilization and cost control, but also an appropriate response to the need for more humanistic and patient centered health care delivery.

COSTS AND COST CONTAINMENT

Medical Care Costs rose at an annual rate of more than 10 percent during 1976 and it is estimated that we now yearly spend over $140 billion on Health Care in the United States. During the first four months of 1977 these composite prices rose at more than 14 percent on an annual basis [51]. This fact,along with the desire to prepare for the adoption of NHI,motivated the Carter administration to propose the controversial 9 percent lid on hospital cost increases contained in the Hospital Cost Containment Act of 1977. As noted earlier, a major motivation in the development of the NPP concept was the desire to use less costly, but effective and appropriate, health care providers to deliver patient care, especially PHC. Since many studies indicate that the use of NPP's is cost-effective [15], [21], [52], [53], the question is "why aren't there more NPP's used?"

Specifically, Dreye and Stetson [14] determined that over a 10 and 1/2 month period the family nurse practitioner who cost $10,085 in salary generated $31,000 in billed patient charges. Nelson, et al [54], derived profitability estimates of $8,100 - $14,310 for MEDEX's in 12 rural practices. Holmes, et al, note that "There have been several studies to determine the profit to physicians who employ pediatric nurse practitioners.... . The profit to employers in these studies ranged from $2,500 to $39,210 per year [55, p.22]. In the Kaiser prepaid system, Record's recent study concluded that".... the average cost savings from PA employment are at least in the middle of the range between $15,263 and $34,017 .... assuming that PA productivity is equal to that of MD's for noncomplex services." [53, p.53]. Even considering the potential deductions from these figures associated with the payment of fringe benefits, collection rates vs. billings, the cost of supplies, and the marginal tax rates of the physicians employing such NPP's,

the general conclusion remains that there exist significant positive expected net profits.

A reasonable subsidiary question raised regarding these figures is the differential productivity of NPP's and physicians and the impact on the physicians' productivity associated with whatever degree of "supervision" is required. However Record again concludes "It does not seem unreasonable to conjecture that, even taking into account generously all of the apparent productivity differences between MD's and PA's, the PA's presently employed save the system in the neighborhood of $20,000 per PA per year"[53, P.55]. Holmes, et al, [55] demonstrate a significant increase in office productivity between practices with similar patients due to the use of a nurse clinician. Specifically, the physician was 12 percent more productive and the "office" managed 31 percent more visits. And Golladay, et al, conclude "Our research and that of others strongly supports the view that the [NPP] is capable of reducing the cost of quality health care and of expanding the supply of services" [52, p.89].

If we add the legal barriers to any, or efficient, use of NPP's, the fact that the studies which generate the cost savings figures tend to suffer from the rigid task definition research methodology discussed above, the uncertainty and lack of information about the NPP innovation concept also previously discussed, and the fact that studies have not thus far dealt with what we shall term the "encounter avoidance" aspect of the NPP's productivity, the probability of significant cost savings from the use of NPP's is further enhanced.

The impact of the legal barriers to the appropriate and effective use of NPP's in portions of the delivery system extends beyond the strict prohibition of these providers from performing specified tasks. We have noted the results of the Fottler and Pinchoff study [34] above in which the existence

of doubt about the exact nature of tasks allowed to NPP's caused sufficient uncertainty in the minds of administrators and led some of them to determine that no NPP's would be employed. As Giauque, et al, found in their study of the use of NPP's in the military health care delivery system: "In at least one state (California) enabling legislation is so restrictive as to effectively preclude economic PA usage. In the armed forces similar restrictions have been placed on [Nurse Practitioners and Physician Assistants] usage, again with no justifying data" [22, p.127]. The effect of rigid task definition in studies which generate cost saving figures such as those quoted and "optimal" staffing patterns for practices [28.] is questionable on the grounds cited by Stimson and Charles [8.],[56], as well as insofar as they portray a firm concensus about the scope and content of what NPP's can and should do when this has not as yet been determined. For example, Giaugue, et al, [22, p.128] addressed four major questions:

1. What tasks do NPP's do?
2. What are they capable of doing?
3. What people and organizational interfaces affect NPP utilization and how?
4. What differences among NPP and medical roles exist, both as measured by current utilization and potential?

It appears to us that the results of private sector studies structured in this way, combined with succeeding efforts to estimate the actual and potential cost savings associated with present and probably future patterns of utilization, would go far in answering the basic research structure objections raised by Stimson and Charles as well as those characterized by the observation of Smith, et al that:

> Although doctors and other practice managers are motivated to reduce costs and possibly relieve some of the workload on the practice by hiring a PE, they find the choice of which type of PE to hire a very difficult one. [28, p.816].

The objective must be to provide information and reduce uncertainty about the NPP innovation process [57.].

Further, research must address the difficult question of the extent of "encounter avoidance" associated with the optimal use of NPP's. Based on limited previous research we hypothesize that there exist significant resource savings associated with providing appropriate and acceptable care to those "worried-well" who continually contact the health care delivery system by reducing future utilization [58.]. Although this type of question seems to have partially motiviated the Kaiser Study [15.], its major focus was on physicians' time saved and not on reductions in future visits by those seen by the NPP's. We conjecture that the provision of information and counseling by NPP's to those seeking "caring" can mitigate continued future use by these individuals and thus reduce costs per eligible significantly even if cost per patient seen does not fall. This position is supported by the results of a recent study by Jameson, et al [59.] which are consistent with those of two previous studies in prepaid settings. They show significant reductions in demands for health care on the insured fee-for-service sector by members whose coverage included outpatient prychiatric services. The plan realized net cost savings as a result, savings which wouldn't have been visible without this subsequent longitudinal monitoring of the demand for care.

Clearly the remaining problem area in need of attention is the incentive structure inherent in the health care delivery system relative to the use of NPP's in place of physicians where appropriate. As Whipple points out in his study of the military health care delivery system [60.], the problem is complex and not susceptible to simple solutions. That is, it is not at all sufficient to assert that prepaid group practices with capitated physician groups are properly motivated to affect even clearly demonstrated beneficial NPP innovations. Consider the example of HIP in New York with an enrolled catchment population over 700,000. Until the advent of the exogeneous (to the medical

groups) incentive reimbursement experiment a few years ago, they employed no nurse practitioners or physician assistants. Because of the direct subsidy given them under the experimental project they now employ six but it is not clear they will hire anymore without further stimulous. The form of the change in endogeneous incentives necessary to accomplish beneficial NPP innovation must be determined [61.]. Another example is provided in the recent research by Reinhardt [62.] which indicates that physician inefficiency does not necessarily lead to innovative behavior on the part of physicians. Though his results support the position that the major way to increase physician productivity is the expanded use of NPP's, the vested decision making power of doctors and the institutions and orgnizational inertia extant inhibits such an occurrence. We will not derive policy decisions which counteract these important obstacles by narrowly focusing on net profitability calculations.

SUMMARY AND CONCLUSIONS

In the context of the continuing concern over the relationship between the social objectives of providing equitable and efficient health care to the nation's population through large scale enfranchisement schemes such as national health insurance, and the implied changes in the structure of the present health care delivery system, we have provided a taxonomy of the major deficiences in research projects dealing with the specific role that non-physician providers might play in such a system. Our assessment has been from the perspective of identifying the necessary components of operationally useful research, that is for policy planners and decision makers on both the macro (system-wide) and micro (facility level) scales. Our conclusions, which are based on an assessment of the utility of previous research and critical evaluations of it, can be summarized in the following way.

First, the appropriate use of NPP's in the health care delivery system appears to answer many of the quality and efficacy of care concerns increasingly expressed by social scientists and consumers. Such use will tend to more accurately match the skills of the providers used to the needs of the majority of patients who demand primary care and increase effective access to that portion of the health care delivery system, thus facilitating the achievement of operational equity among health care consumers. Research studies which attempt to provide quantitative guidelines on the normative magnitude of this "NPP innovation" in the health care delivery system must include specific consideration of the patients' evaluation of the mode of delivery, and the effect of historical constraints such as legal barriers and attitudinal resistance, in an integrated framework. This requirement strongly supports the continued development of interdisciplinary research teams.

Secondly, cost related studies of the use of NPP's must be cognizant both of the needs of the potential users of such study results, and thus be much broader in scope, as well as of the constraints imposed systemically by the existing incentive systems and task delegation patterns which tend to distort the true cost saving potential of the "NPP innovation". Thus reimbursement studies and like experiments must specifically consider and respond to the definition of micro-organizational incentives necessary to foster goal congruence between the macro objectives of sponsors of such studies, and the inherent individual objectives of the providers and managers who will actually "run" the experiment (system). The search for efficient answers to the health care delivery delemma must be appropriately structured and consider a broader range of alternatives than in the past.

In sum we believe that it is possible through the expanded use of NPP's to build a health care delivery system which is both more efficient and more equitable than the present one using the same number of dollars. The research necessary to support these contentions is partially available but significant new projects must be undertaken soon and must build upon the lessons we have learned from identification of past projects' inadequacies.

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