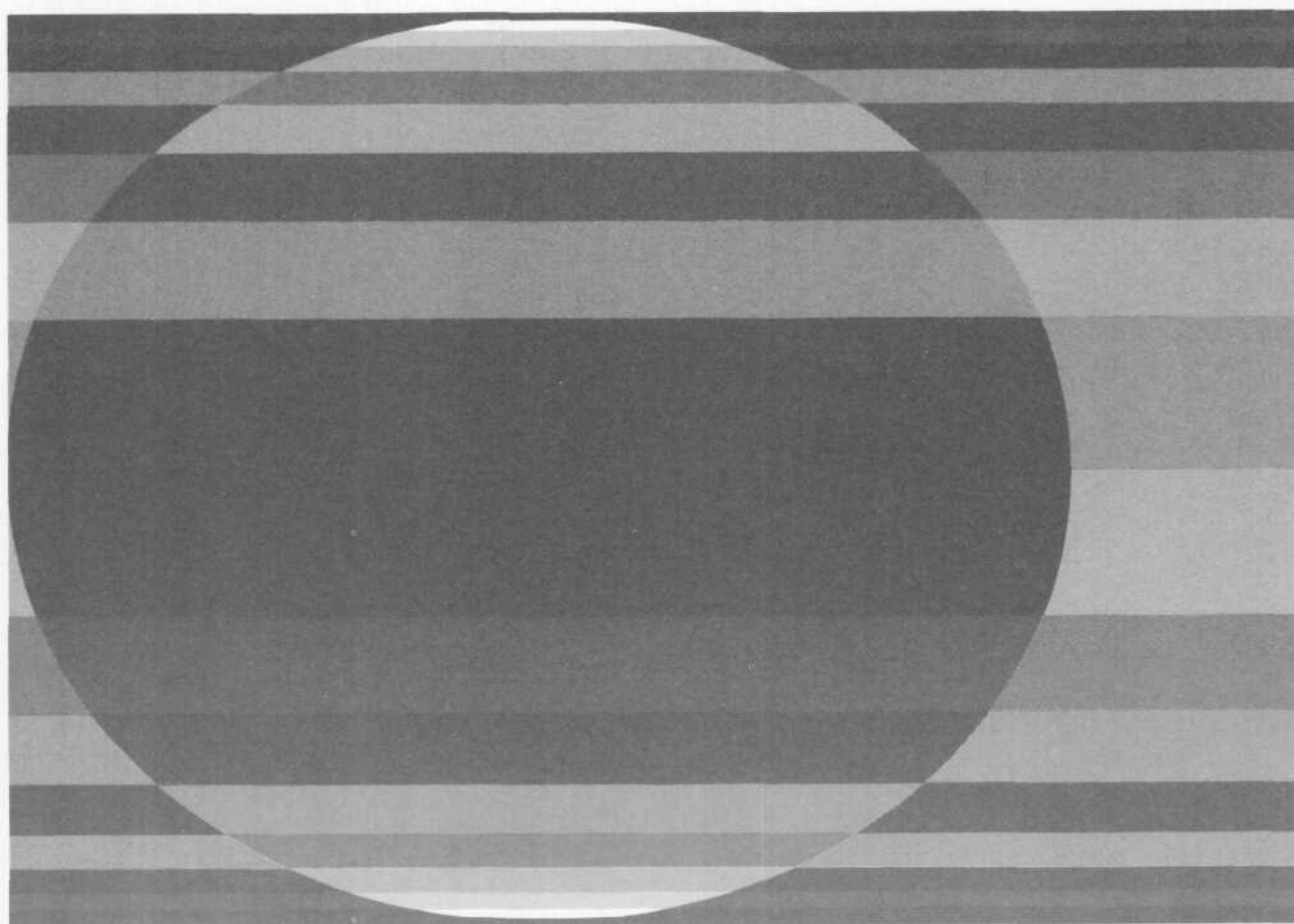


BACKGROUND PAPER

Physician Extenders: Their Current and Future Role in Medical Care Delivery

April 1979



Congress of the United States
Congressional Budget Office

PHYSICIAN EXTENDERS: THEIR CURRENT AND
FUTURE ROLE IN MEDICAL CARE DELIVERY

The Congress of the United States
Congressional Budget Office

PREFACE

The 96th Congress and its successor will review legislation authorizing federal aid to schools that train physician extenders. This paper, requested by the Senate Budget Committee, analyzes the current performance of physician extenders, their economic impact on medical practice, and policy options regarding their future role. In accordance with the Congressional Budget Office's mandate to provide objective and impartial analyses of budget issues, the report contains no recommendations.

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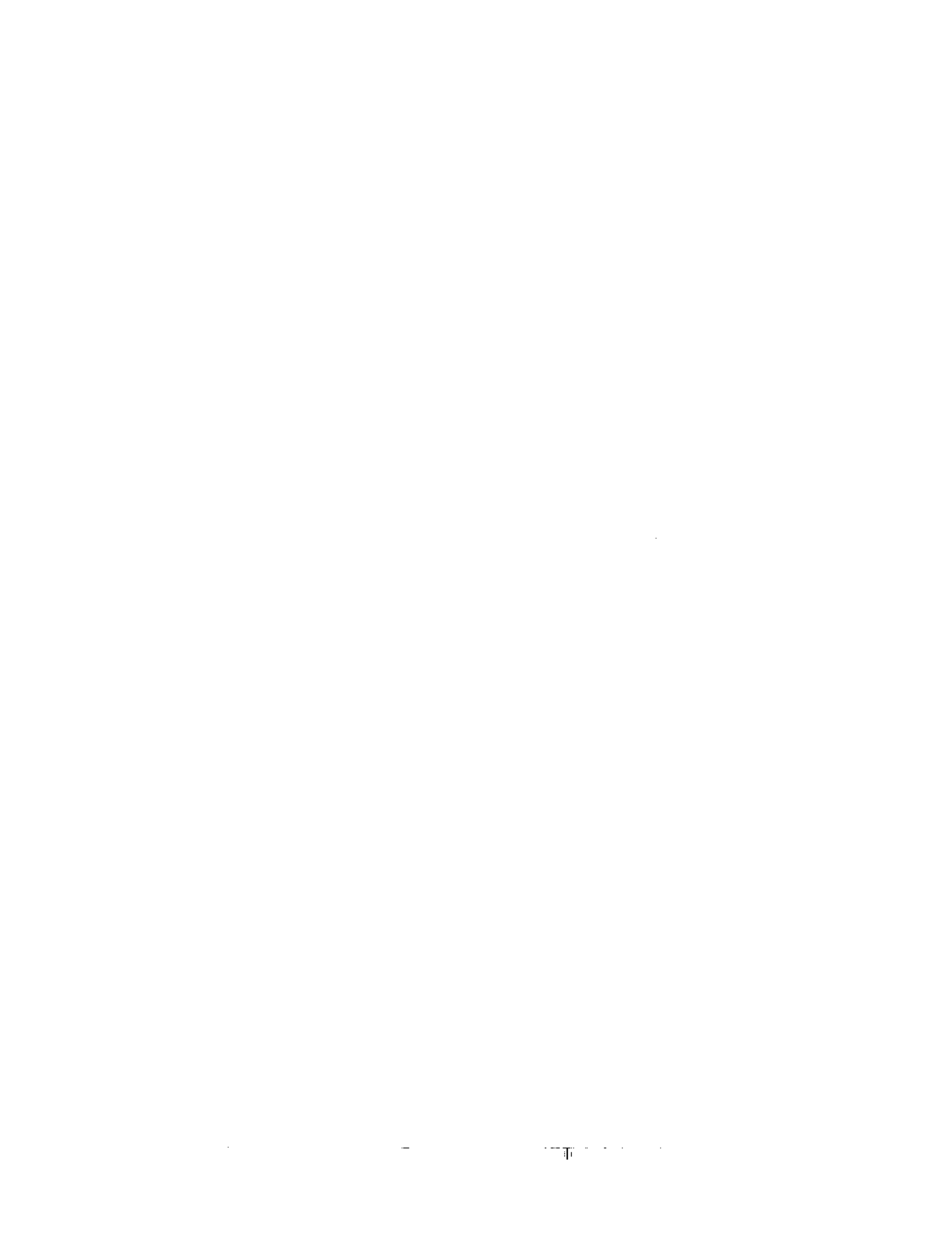
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SUMMARY

The delivery of primary medical care by physician extenders (PEs) is potentially a significant departure from the traditional medical practice in this country, which has been dominated by physicians. Potentially, PEs could improve access to primary medical care of good quality, reduce medical care price increases, and lower total medical care spending. Greatly increased utilization of PEs may not occur, however, unless other major changes in the medical care system take place first.

Three broad types of PEs--physician assistants, Medex, and nurse practitioners--have been trained in the United States in the last decade; they differ by type of training and previous health care experience. All three types of PEs, however, can perform many routine and basic medical care services usually performed by physicians. Nevertheless, PEs are not recognized as independent medical care providers, and they comprise only a small segment of the medical care sector. Physicians engaged in patient care outnumber PEs by 18 to 1. Currently, about 3,500 PEs are trained annually.

Although total federal support for PE training programs is small, it has been growing and it accounts for a large share of the training costs of federally assisted programs. Annual federal expenditures for PE training programs have increased from less than \$1 million in fiscal year 1969 to more than \$21 million in fiscal year 1979. Approximately 50 to 70 percent of the costs of training PEs in those programs that receive federal aid are subsidized by the federal government. In fiscal year 1978, about 40 percent of all nurse practitioner programs and nearly 90 percent of all physician assistant and Medex programs received federal funds.

During the 96th Congress, the Congress will decide how much federal assistance should be provided to PE training programs and whether legislation authorizing federal aid to those programs should be continued. But a decision to expand significantly the supply of PEs and to support their practice depends on broader choices about whether large-scale changes in the medical care

delivery system are desirable and how they should be achieved. Once larger goals are established, a major issue is whether PEs are an effective means of accomplishing those objectives upon which federal support is predicated. A decade of experience with PEs has provided considerable information about their performance, productivity, and acceptance by consumers and other health care providers. Little attention, however, has been paid to the impact of PEs on medical care costs, prices, and expenditures--a major focus of this paper.

THE PERFORMANCE OF PHYSICIAN EXTENDERS

The best information about PEs suggests that they provide primary medical services of high quality and improve access to medical care for residents in communities with relatively few physicians. PEs successfully manage a high proportion of common, uncomplicated illnesses without any specific physician intervention.

Do Physician Extenders Increase the Cost-Effectiveness of Medical Practice?

PEs can do much to improve the cost-effectiveness of medical practice. Considering both the salaries and supervisory costs of PEs, they are about one-third to one-half as costly to employ as physicians per hour of work. PEs, however, spend more time with their patients: nurse practitioners see about 60 percent, and physician assistants and Medex about 90 percent, as many patients per hour as physicians. Hence, a patient visit appropriately managed by a nurse practitioner can be provided at about two-thirds to four-fifths of the expense of a similar visit provided by a physician; a physician assistant or Medex can provide care at about one-third to one-half of the physician expense.

Nevertheless, if a physician's own work effort decreases or if a PE provides services that were not previously available, such as nutrition counseling, the cost of the "average" treatment episode may not decline after a PE is incorporated into a medical practice. In fact, delivery costs per visit may increase.

Do Consumers Benefit from Lower Prices When Medical Care is Delivered by Physician Extenders?

Although PEs may produce medical services at lower cost levels, their presence in the medical sector may not lower medical care prices. Available evidence suggests that charges per patient visit in some practices with PEs average 20 percent less than charges in similar practices without PEs. Some physicians, however, report that they charge the same fee regardless of whether they or a PE provide the service. In addition, if PEs are used to improve quality of care rather than to expand patient volume, medical care fees may increase.

How Do Physician Extenders Affect Medical Care Expenditures?

PEs may contribute to an increase in total expenditures for medical care services because they tend to expand the total volume of service proportionately more than they reduce the price of care. This expenditure increase, however, may be desirable if the improved access to care created by PEs prevents more serious and costly problems. Reductions in expenditures to train medical providers may be possible in the future because PEs cost less to train than physicians--on average, about \$10,000-\$12,000, as compared with more than \$60,000 for a physician.

CAN WIDESPREAD EMPLOYMENT OF PHYSICIAN EXTENDERS BE EXPECTED IN THE FUTURE?

Factors affecting future demand for PEs include legal restrictions on their ability to provide and be reimbursed for medical services, perceptions of the advantages and disadvantages of hiring PEs, consumer acceptance of PEs, and PE employment incentives in different types of medical care delivery organizations. State statutes and regulations often specify the degree of physician supervision required for a PE, the number of PEs that can be supervised by a physician, and the conditions under which PEs may prescribe drugs. Virtually no health insurers reimburse PEs directly for their services. Thus, practice opportunities for PEs depend heavily on physician willingness to hire them.

Acceptance of PEs among consumers and physicians is high, but actual demand for PEs among physicians is not as high. Moreover, the rapidly growing supply of physicians may reduce the demand for PEs. Increased physician availability suggests that a major barrier to the hiring of PEs by physicians--insufficient patient volume--could become more widespread. It should be noted, however, that to the extent that other disadvantages associated with PEs--legal and reimbursement ambiguities, lack of acceptance and resistance from other health providers and consumers--are resolved over time, some physicians may become more receptive to hiring PEs. Thus, PE utilization could increase.

Ambulatory care clinics and prepaid group practices have economic incentives to hire PEs; therefore, the level of demand for PEs in these types of medical care delivery organizations is high and is likely to remain so.

Options Under a Continuation of Current Policies

If the medical care delivery system continues essentially unchanged, PEs are likely to have a beneficial but relatively marginal influence on medical care delivery. The principal gains realized from a greater availability of PEs would be improved availability of primary care services in communities with poor access to physicians. Consumers are not likely to benefit systematically from lower prices for PE-delivered care primarily because the price, amount, and type of service provided by PEs are determined by physicians.

Under a continuation of current health care policies and other programs, the Congress might pursue either one of two broad policy options. First, if improved access to primary medical care is not of high priority, federal training support for PEs could be reduced or eliminated. Alternatively, in order to expand the availability of primary care in underserved communities, the Congress might desire to alter existing programs incrementally in order to increase their effectiveness. If this were a desirable goal, several options might be suggested, including: maintaining current levels of support for PE training programs while strengthening the placement of graduates in underserved areas, expanding the number of PEs in the National Health Service Corps, and extending the availability of federal reimbursement for services provided by PEs.

Major Changes in the Medical Care Delivery System
That Would Encourage The Effective Use of PEs

More extensive federal support for PE practice might be desirable if fundamental changes in the financing or delivery of the existing medical care system were sought. These major changes include:

- o Implementation of a comprehensive national health insurance plan that provided more extensive coverage of primary medical care than exists today;
- o Greater development of health maintenance organizations (HMOs) and more independent practice of PEs; and
- o A limitation on the future supply of physicians.

Under each of these major health system changes, PEs would likely play a much greater role in medical care delivery than they do today. Greater federal funding for new PE programs and, in particular, more liberal reimbursement policies for PE services would be key factors in increasing utilization of PEs.

For example, if a comprehensive national health insurance (NHI) plan extending current levels of insurance coverage for primary medical care were to be implemented, consumer demand for those services would greatly increase. As a result, physicians would be more willing to hire PEs and to use them to expand the amount of patient care provided. Further, implementation of a comprehensive NHI plan would provide an opportunity to restructure current physician and PE reimbursement policies in a way that would encourage physicians to delegate routine medical care to PEs.

Similarly, if a policy goal were to make the medical sector more competitive--and thus more cost-conscious--by promoting HMOs and more independent practice of PEs, then the demand for PEs would increase. The federal government has provided support for the establishment of prepaid group systems for several years; it might also take several steps to promote a more independent role for PEs involving adequate access to a physician for consultation and referral. Model statutes governing the nature and scope of independent practice by PEs could be developed as

examples for the necessary state legislation. Demonstration projects in which PEs are reimbursed directly for their services might also be funded.

Finally, policies to constrain future increases in the supply of physicians would increase the need for PEs in order to maintain access to primary care. Major benefits would be lower spending levels for training medical providers, more effective utilization of PEs, and a more efficient medical care delivery system.

Health workers have been used as a substitute for primary care physicians under a variety of circumstances by many countries. ^{1/} In the mid-1960s, this concept of using health care practitioners or "physician extenders" to provide basic medical services traditionally provided by physicians was introduced into the United States as a way to expand the availability of primary medical care.

Physician extenders (PEs) quickly attracted national attention as a promising partial solution to a perceived shortage of physicians (particularly in rural and inner-city communities), a decline in the availability of primary care physicians, and rapidly rising health care costs. In principle, by performing routine and basic medical care, PEs enable physicians to concentrate on more serious and complex tasks. As a result, their lower costs should lead to a reduction in medical care prices. If medical conditions were detected before becoming more serious and costly, the increased availability of medical care resulting from PEs would also lower expenditures for medical services. Training expenditures might also be reduced if PEs cost less to train than physicians. In practice, however, the availability of PEs may or may not achieve any of these results.

The number of PE training programs and their graduates have grown rapidly in the last decade, in part, because of increasing federal assistance, which grew from less than \$1 million in

^{1/} General and family physicians, general internists, and general pediatricians are usually considered to be primary care physicians. Obstetricians/gynecologists are sometimes included in this category as well. Primary medical care focuses on the provision of basic medical services and includes continuing management and coordination of all medical services with appropriate referral for specialized care. Most notable among the substitutes in other countries are the feldsher in the Soviet Union and the "barefoot doctor" in the Peoples Republic of China.

fiscal year 1969 to more than \$21 million in fiscal year 1979. Despite this rapid growth, today there are only about 22,000 active PEs, as compared with about 400,000 practicing physicians and more than 1 million practicing registered nurses. 2/

In 1979, the Congress will decide whether to support an expansion of the supply of PEs. But major decisions concerning the role of PEs in the delivery of medical care depend on the resolution of broader issues and the identification of major health policy goals. For example, if reducing medical care expenditures were a major goal, then training more PEs might be undesirable. Alternatively, if the Congress were to extend insurance coverage for primary care services by enacting a comprehensive national health insurance plan, then increased support for PEs might be warranted.

Once major goals have been established for the medical care system, the effectiveness of using PEs to achieve them can be examined. A decade of experience with PEs has provided considerable information about their performance, productivity, and acceptability to consumers and other health care providers. Little attention, however, has been paid to the impact of PEs on medical care costs, prices, and expenditures. The major questions addressed in this analysis of the role and economic impact of PEs on the medical care delivery system include:

2/ The estimate of the current supply of PEs was derived from data supplied by the Department of Health, Education, and Welfare, Health Resources Administration, Bureau of Health Manpower, Division of Nursing and the American Academy of Physician Assistants. The estimate of practicing physicians (doctors of medicine and osteopathy) was derived from data in HEW, Health Resources Administration, Bureau of Health Manpower, A Report to the President and Congress on the Status of Health Professions Personnel in the United States (August 1978), and Louis Goodman, Physician Distribution and Medical Licensure in the U.S., 1976 (Chicago: American Medical Association, 1978). The nursing supply estimate was derived from data in HEW, Health Resources Administration, Bureau of Health Manpower, Division of Nursing, First Report to Congress (February 1977).

- o What is the current role of PEs--what kind of care do they provide and where? (Chapter II)
- o Do PEs provide cost-effective medical care? (Chapter III)
- o What happens to total medical care prices and expenditures when PEs are introduced into the medical care delivery system? (Chapter IV)
- o Can widespread employment of PEs be expected in the future? (Chapter V)
- o What are the options for future federal support of PEs--assuming either that little change in the existing medical care delivery system takes place or that major structural changes occur? (Chapter VI)

CHAPTER II. THE CURRENT ROLE OF PHYSICIAN EXTENDERS

THE ROLE AND TYPES OF PEs

Although physician extenders are trained to provide much of the basic medical care traditionally provided by physicians, they are not recognized as independent medical care practitioners; hence, they practice under varying degrees of physician supervision or consultation.

There are three types of PEs--physician assistants, Medex, and nurse practitioners--who differ by type of training and previous health care experience. 1/ Physician assistants, some of whom have prior health care experience as military corpsmen, nurses, or allied health workers, receive about two years of classroom and clinical training, and some on-the-job experience. Medex have extensive prior medical experience, usually as military corpsmen, and obtain an additional year of training, generally under the preceptorship of a physician, who often resides in a medically underserved area. 2/ Nurse practitioners are registered nurses who usually receive an additional year of classroom and clinical training relating to primary care.

1/ Nurse practitioners sometimes object to being classified as PEs, which implies being dependent on a physician. They prefer to be recognized as independent professionals who collaborate with physicians. The term physician extender is used here merely because it is a phrase widely used to connote all the various types of nontraditional primary health care practitioners.

2/ In practice, physician assistants and Medex have more common characteristics than distinguishing ones. Both types practice under the same legislative authority, and their training programs operate under the same guidelines for accreditation. Moreover, some Medex programs are converting to physician assistant programs. For the purposes of consistency, however, physician assistants and Medex are referred to separately throughout this paper.

All three types of PEs are trained to provide treatment for most general medical conditions. PE skills include the ability to take health histories, perform physical exams, initiate and utilize simple diagnostic procedures, and carry out basic treatment procedures. PEs commonly manage acute conditions of limited complexity, such as colds and skin infections, and well-child and health maintenance care. They also frequently manage stable chronic conditions, such as hypertension, arthritis, and diabetes. Although estimates vary, at least 60 percent and frequently a much higher proportion of all ambulatory visits can be effectively and safely handled by PEs without physician intervention. 3/

Despite their common role, distinct patterns of practice have emerged among the different types of PEs. Nurse practitioners tend to provide more preventive care, patient education, and counseling, and to function more independently than either Medex or physician assistants. In contrast, physician assistants and Medex tend to provide more acute and emergency care, but with greater physician supervision. 4/ These role distinctions may be a direct result of differences in employment settings, the personal preferences of both PE employers and the PEs themselves, as well as the divergent philosophies of the nursing and medical professions. As former nurses, nurse practitioners have been trained to provide patient education and counseling. Furthermore, nurse practitioner programs place a slightly greater emphasis on those aspects of patient care than do physician assistant and Medex programs. Physician assistant and Medex programs place more emphasis on basic science training, particularly in biology and physiology. 5/ Nurse practitioners have already taken such courses in nursing programs.

3/ See Ouida Upchurch and Jeanne Holzgreffe, National Academy of Sciences, Institute of Medicine, Data on the Roles of the Physician Assistant and Nurse Practitioner, Staff Paper (May 5, 1978).

4/ University of Southern California, Division of Research in Medical Education, Collection and Processing of Baseline Data for the Physician Extender Reimbursement Study, Final Report (August 31, 1978).

5/ System Sciences, Inc., Nurse Practitioner and Physician Assistant Training and Deployment Study, Final Report (Bethesda, Md: SSI, September 1976).

CURRENT AND PROJECTED NUMBER OF PEs

Before 1970, there were fewer than 2,000 formally trained PEs. Today, approximately 22,000 formally trained PEs are practicing and their numbers are predicted to increase to more than 56,000 by 1990 (see Table 1). Nurse practitioners account for more than half of all currently active PEs. If current trends continue, they will probably continue to be the dominant PE type in the future.

TABLE 1. CURRENT AND PROJECTED SUPPLY OF ACTIVE PHYSICIAN EXTENDERS (PHYSICIAN ASSISTANTS, MEDEX, AND NURSE PRACTITIONERS), 1979 AND 1990

Type of Physician Extender	1979	1990 <u>a/</u>
Physician Assistants and Medex	9,400	23,900
Nurse Practitioners	<u>12,700</u>	<u>32,300</u>
Total	22,100	56,200

SOURCES: The 1979 estimates were derived from 1978 data supplied by HEW, Health Resources Administration, Bureau of Health Manpower, Division of Nursing and the National Academy of Physician Assistants. Projections to 1990 are CBO estimates.

a/ Both the 1979 estimates and the 1990 projections were adjusted by the number of physician extenders (PEs) expected to be inactive as a PE. Further, CBO projections assume that approximately 1,500 physician assistants and Medex, and about 2,000 nurse practitioners will graduate annually through 1990; that losses due to retirement will be negligible; and that losses due to death are similar to mortality rates for the population as a whole. Current levels of federal assistance to PE programs are also assumed to continue.

Although the number of PEs has grown rapidly and may continue to do so, PEs still constitute one of the smaller groups of health workers. In 1979, practicing physicians outnumbered PEs by about 18 to 1. By 1990, physicians engaged in patient care are projected to outnumber PEs by about 10 to 1 and practicing registered nurses will outnumber them by about 26 to 1.

THE GEOGRAPHIC DISTRIBUTION OF PEs

The most striking feature of the geographic location of PEs is that physician assistants and Medex tend to locate in non-metropolitan areas more than physicians and the population in general, while nurse practitioners work more frequently in inner-city communities. ^{6/} In 1975, 42 percent of the population resided in metropolitan counties with 1 million or more persons. These large metropolitan counties also had 55 percent of all practicing physicians, 51 percent of nurse practitioners, and 32 percent of physician assistants, but only 18 percent of Medex. By comparison, only 17 percent of the total population resided in nonmetropolitan counties with fewer than 50,000 residents and only 8 percent of all physicians practiced there. These counties, however, had 37 percent of Medex, 18 percent of physician assistants, and 15 percent of nurse practitioners (see Figure 1).

As a result of their urban-rural distribution, PEs may be making primary medical care more available to persons with limited access to it. In general, PEs tend to serve more non-metropolitan and poorer clients than do physicians. ^{7/} For example, nurse practitioners reported in 1975 that nearly 53 percent of their patients had incomes below \$4,000. ^{8/} Nevertheless, because PE employment is conditioned upon physician

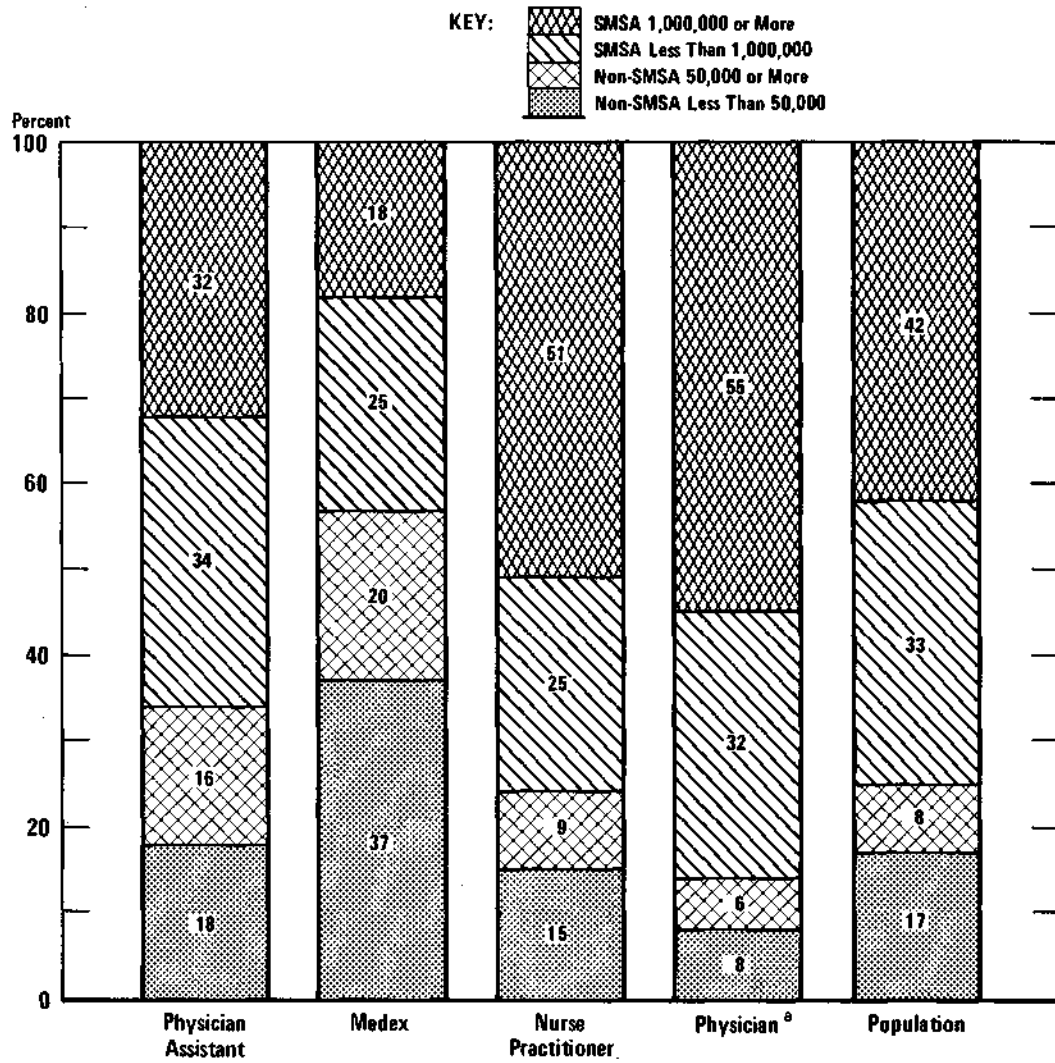
^{6/} Harry A. Sultz, Maria Zielnezny, and Jane Mathews, "Highlights: Phase 2 of a Longitudinal Study of Nurse Practitioners," in Michael Millman, ed., Nursing Personnel and the Changing Health Care System (Cambridge, Mass.: Ballinger, 1978).

^{7/} Stephen B. Morris and David B. Smith, "The Distribution of Physician Extenders," Medical Care (December 1977).

^{8/} Sultz and others, "Highlights: Phase 2."

Figure 1.

Geographic Distribution of Physician Extenders, Physicians, and the Population, by Size of County, 1975



SOURCES: System Sciences, Inc., *Nurse Practitioner and Physician Assistant Training and Deployment Study* (Bethesda, Md: SSI, 1976), and Louis Goodman, *Physician Distribution and Medical Licensure in the U.S., 1976* (Chicago: American Medical Association, 1978).

NOTE: Totals may not add to 100 percent because of rounding.

^a 1976 data.

availability, PEs may not be reaching many of the communities most deficient in health care resources. Only 30 percent of all PEs are practicing in an area designated by the Department of Health, Education, and Welfare (HEW) as a physician-shortage area.

Although the factors influencing the location of physicians are well documented, those influencing the location patterns of PEs are less clear. ^{9/} In addition to the availability of employment opportunities, the urban-rural location pattern of PEs may be influenced by their type of training and by program recruiting and placement mechanisms. For example, the fact that nurse practitioners are more likely to locate in urban areas than other PEs may be because most nurses--the source group for nurse practitioners--are employed in urban localities. Moreover, many nurse practitioner programs have an inner-city clinical training component, which increases the likelihood that their graduates will enter inner-city practice. Medex programs, on the other hand, explicitly try to place graduates in local

^{9/} According to recent studies, the major factors influencing physicians' location patterns appear to be place of rearing, location of education and training, and choice of specialty. Because few physicians come from rural areas and most medical schools and teaching hospitals are in metropolitan areas, few physicians are exposed to rural practice. In addition, most physicians today become specialists rather than generalists. Specialists require the larger population base of urban areas to support referral practice, and they may value more highly than generalists the opportunities for professional contact and the availability of clinical facilities that urban areas offer. As with other professionals, the cultural amenities of urban areas are also important considerations for many physicians. For comprehensive reviews of relevant literature, see General Accounting Office, Progress and Problems in Improving the Availability of Primary Care Providers in Underserved Areas (August 1978); Sinclair Coleman, Physician Distribution and Rural Access to Medical Services (Santa Monica, Ca.: Rand Corporation, April 1978); and National Academy of Sciences, Institute of Medicine, Medicare-Medicaid Reimbursement Policies (March 1, 1976).

rural areas and to recruit applicants from those areas. In addition, Medex graduates, who practice disproportionately in rural settings, are frequently hired by the often rurally-based physicians with whom they receive on-the-job training.

Like physicians, PEs are more heavily represented in states along the Atlantic and Pacific coasts. The distribution of PEs among states, however, may be influenced more strongly than that of physicians by the location of PE training programs, which tend to cluster in those areas. States with training programs are more likely to have addressed the legal ramifications of PE practice; hence, they may offer a more favorable climate for PE practice and greater employment opportunities.

CHAPTER III. THE RELATIVE EFFECTIVENESS AND COST
OF PHYSICIAN EXTENDERS AND PHYSICIANS

The future role of PEs will, in part, be determined by their cost-effectiveness. If PEs can provide high quality medical care and reduce the costs of medical care delivery, the Congress may wish to encourage greater utilization of PEs, especially if these cost savings are passed on to consumers as lower medical care prices. The evidence discussed in this chapter concerning the current economic impact of PEs on medical care practice is limited but suggestive; hence, the conclusions presented are tentative. 1/ The impact of PEs on medical care prices is analyzed in Chapter IV.

THE QUALITY OF MEDICAL CARE PROVIDED BY PEs

The medical care provided by PEs compares favorably with that delivered by physicians for medical conditions for which PE care is thought to be appropriate. Although only a few studies have observed patient outcomes in controlled experiments (one of the better, but more difficult ways to measure quality of care), the conclusions reached in these and virtually all other studies are similar: PEs have performed as well as physicians, with respect to patient outcomes, proper diagnoses, management of "indicator" medical conditions, frequency of patient hospitalization, manner of drug prescription, documentation of medical findings, and patient satisfaction. 2/

1/ The research on these topics is summarized in Appendix A.

2/ An indicator condition is a distinct disease, symptom, state, or injury occurring frequently in primary care with an outcome that can be influenced favorably or negatively by choice of treatment and for which diagnostic and therapeutic procedures are well established.

For studies that analyze the quality of care provided by PEs, see Charles E. Lewis and others, "Nurse Clinics
(continued)

Practices utilizing PEs may even provide better care than those without PEs. For example, in practices with both physicians and PEs, System Sciences, Inc. rated 55 percent of the treatment episodes for three indicator conditions adequate or better, as compared with 46 percent in practices with only physicians. 3/

Quality of care, however, does appear to differ slightly among types of PEs. Practices with nurse practitioners received higher quality of care ratings than all other practices, perhaps because nurse practitioners spent more time with their patients than either Medex or physician assistants. 4/

THE COST-EFFECTIVENESS OF SUBSTITUTING PEs FOR PHYSICIANS

Given that PEs deliver medical services at least equivalent in quality to those provided by physicians, do PEs decrease the costs of providing medical care? In the following sections, the relative cost of PEs and physicians is evaluated in two ways. In the first section, the cost of PEs and physicians is compared with respect to individual patient visits for complaints or symptoms that are appropriate for a physician extender to manage.

2/ (continued)
and Progressive Ambulatory Patient Care," New England Journal of Medicine, vol. 277 (December 7, 1967); Walter O. Spitzer and others, "The Burlington Randomized Trial of the Nurse Practitioner," New England Journal of Medicine, vol. 290 (January 31, 1974); and Eva D. Cohen and others, An Evaluation of Policy Related Research on New and Expanded Roles of Health Workers (Office of Regional Activities and Continuing Education, Yale University School of Medicine, October 1974).

3/ The quality of care provided to patients with one of the indicator conditions was assessed according to nationally approved medical care protocols for each of those diseases. System Sciences, Inc., Survey and Evaluation of the Physician Extender Reimbursement Experiment, Final Report (March 1978).

4/ Ibid.

In the second section, the cost (practice expense) of an "average" patient visit when medical care is provided by a PE-physician team is compared with the cost (practice expense) when medical care is provided solely by a physician. 5/ A physician's office visit fee may be based on this "average" patient visit cost.

The Relative Cost of Individual Patient Visits

Differences in Patient Care Time. The cost-effectiveness of PEs in treating appropriate medical conditions depends, in part, on how PEs compare with physicians with respect to cost per unit of time and amount of time spent with patients. Substitution of a PE for a physician for PE-appropriate medical care will be cost-effective if the cost of the PE's management of a treatment episode (cost per unit of time X units of time required) is less than the cost of the physician's management of a similar patient visit.

Although data based on comparable patient mixes are not widely available, PEs in general--and nurse practitioners in particular--appear to spend more time with their patients than physicians. Recent research suggests that a nurse practitioner spends 65 percent more time per patient visit, while a physician assistant or Medex spends only 13 percent more time than a physician (Table 2). 6/

5/ A physician-PE team is construed loosely here; a physician's only involvement with a PE may be periodic checks, signing patient records and prescription orders, and being available for consultation.

6/ University of Southern California, Collection and Processing of Baseline Data. The extent to which productivity differentials between physician assistants and Medex on the one hand and nurse practitioners on the other are the result of differences in case mix cannot be ascertained with available data. The results of the USC and other studies, however, suggest that differences in case mix may not significantly affect PE and physician patient care time differentials. See also, Sheldon Greenfield and others, "Efficiency and Cost of Primary Care by Nurses and Physician Assistants," New
(continued)

TABLE 2. PATIENT CARE TIME AND COST OF PHYSICIAN EXTENDERS AND PHYSICIANS a/, 1975

	<u>Physician Extender</u>			Nurse Practitioner/ Physician Ratio	Physician Assistant and Medex/ Physician Ratio
	Nurse Practitioner	Physician Assistant and Medex	Physician		
Minutes per Patient Visit	19.4	13.2	11.7	1.65	1.13
Cost per Hour (in dollars)	9.43-12.22	8.36-10.73	23.90	0.39-0.51	0.35-0.45
Direct compensation	6.63 <u>b/</u>	5.98 <u>b/</u>	23.90 <u>c/</u>	0.28	0.25
Supervision	2.80-5.60 <u>d/</u>	2.38-4.75 <u>d/</u>	N.A. <u>e/</u>	N.A. <u>e/</u>	N.A. <u>e/</u>
Cost per Patient Visit (in dollars)	3.04-3.94	1.84-2.36	4.66	0.65-0.85	0.39-0.51

SOURCES: Data for minutes per patient visit are from University of Southern California, The Collection and Processing of Baseline Data for the Physician Extender Reimbursement Study (August 1978). The data are not necessarily representative of all PEs and office-based primary care physicians.

Data for PE compensation and weekly hours of work are from System Sciences, Inc., Nurse Practitioner and Physician Assistant Training and Deployment Study (Bethesda, Md.: SSI, September 1976). Data on physician earnings are from

(c o n t i n u e d)

TABLE 2. (Continued)

SOURCES: (continued)

Zachary Y. Dyckman, A Study of Physicians' Fees, staff report prepared by the Council on Wage and Price Stability (March 1978). Data on physician weekly hours of work and annual weeks of work are from American Medical Association, Profile of Medical Practice, 1977 (Chicago: AMA, 1978). Data on physician supervisory requirements are from Jane Record and Joan O'Bannon, Cost Effectiveness of Physician Assistants, Final Report (1976), and System Sciences, Inc., Survey and Evaluation of the Physician Extender Reimbursement Experiment, Final Report (March 1978).

- a/ Productivity and cost figures refer to each type of provider working alone. Physician data are for office-based, primary care physicians.
- b/ Annual median salary for each PE type was divided by the annual hours of work for each PE type. An average hourly compensation cost for nurse practitioners, and for physician assistants and Medex, was arrived at by weighting the divided hourly salary figures for each specific type of PE by its share of the PE population.
- c/ Median net income. Because this includes profit to the physician, the relative costs of PEs and physicians are understated. Primary care physicians who are salaried, such as those in HMOs, tend to earn less than those in the fee-for-service sector.
- d/ Supervisory costs were calculated by multiplying physician median net income by an estimated proportion of time (10 to 20 percent of annual practice time) spent on PE-related activities. Total supervisory costs were then distributed over the average annual practice hours of each PE type to arrive at a supervisory cost per PE hour. An average hourly supervisory cost for nurse practitioners, and for physician assistants and Medex, was derived by weighting cost figures for each specific type of PE by its share of the PE population.
- e/ Not applicable.

In addition to spending more time with their patients, PEs tend to see fewer patients than physicians because PEs often work fewer hours than physicians, provide indirect patient care by telephone, or perform administrative activities. Nurse practitioners in particular tend to spend proportionately more time than other types of PEs or physicians in administrative activities, staff interaction, and other professional activities. Most nurse practitioners report seeing from 5 to 14 patients daily, as compared with most physician assistants and Medex, who report seeing more than 20 patients a day. 7/

Differences in Employment Costs. A second factor determining the relative cost of PEs is the cost of PE employment in medical practice as compared with that of physicians. This comparison is complicated by the fact that most physicians in the United States are self-employed persons whose compensation is established on a fee-for-service basis. Virtually all PEs, however, are salaried employees. 8/ Moreover, PE-related employment costs include not only PE salaries but also the costs of physician supervision and consultation. In 1975, the median hourly earnings of physician extenders were about one-fourth the net hourly earnings of an office-based physician: about \$6, as compared with \$24. Estimates of physician time devoted to PE activities vary considerably, but a PE appears to require from

6/ (continued)
England Journal of Medicine, vol. 298 (February 9, 1978); and E. Charney and H. Kitzman, "The Child-Health Nurse (Pediatric Nurse Practitioner) in Private Practice," New England Journal of Medicine, vol. 285 (December 9, 1971).

7/ Systems Sciences, Inc., Training and Deployment.

8/ The earnings of salaried physicians, such as in HMOs, would have provided a better comparison with the earnings of salaried PEs. The primary reason is that, if most office-based salaried physicians earn less than their counterparts in the fee-for-service sector, the earnings differential between physicians and PEs is overstated by using physician net income data. National data on the earnings of salaried physicians, however, were unavailable.

10 to 20 percent of a physician's time for supervision and consultation. ^{9/} This adds about \$3 to \$5 to the hourly salary cost of physician extenders. The amount of physician supervision required may, however, depend on the type of PE, the type of practice arrangement, and the manner in which the PE is utilized. In general, however, about 54 to 72 percent of the total cost of a PE is attributable to direct compensation; supervisory costs make up the remainder.

When both salaries and supervisory costs are considered, the hourly costs of PEs appear to be about one-third to one-half those of physicians. In 1975, for example, physician extenders cost \$8 to \$12 per hour, as compared with about \$24 for physicians (see Table 2).

Differences in Use of Support Services and Resources. A third factor that may affect the cost differential between PEs and physicians is their relative use of medical practice support services and resources. If a physician must buy new equipment, add new examining rooms, or hire additional nursing and clerical staff to accommodate a PE, the relative cost of a PE will clearly rise. Similarly, if PEs use diagnostic tests and laboratory equipment more intensively than physicians, PEs may provide care less economically. Evidence on PE use of diagnostic aides is inconclusive. Recent research shows that nurse practitioners performed 53 percent more diagnostic tests per 100 patients than the physicians with whom they worked and 46 percent more than physicians in practices with no PEs. The proportions for physician assistants and Medex were much lower--21 percent and 16 percent, respectively, for physician assistants; 7 percent and 3 percent, respectively, for Medex. ^{10/} Whether these findings are representative of all PEs and differ from the practice of new, inexperienced physicians is unknown. Similarly, it is not known whether PE patterns of practice will change over time.

^{9/} See Jane Record and Joan O'Bannon, Cost Effectiveness of Physician's Assistants, Final Report (1976), and System Sciences, Inc., Survey and Evaluation.

^{10/} Stephen B. Morris and David B. Smith, "An Evaluation of the Potential Impact of Physician Extenders on Primary Care Practices in the United States," unpublished paper presented at the 2nd International Congress of the World Federation of Public Health Associations (May 24, 1978).

11

Other Potential Factors Affecting Relative Costs. The cost differential between PEs and physicians could change in the future. The compensation of PEs and physicians is determined by the supply of health care providers, the demand for their services, and the structure of the medical care market. Changes in these factors may alter the earnings of providers. For instance, if the demand for PEs were to increase more rapidly than the supply of PEs (all other things equal), their salaries would probably shift upward. Such a shift would, in turn, increase the cost of PEs relative to that of physicians. Sizeable increases in the supply of both PEs and physicians by 1990 are projected, but the effects of these changes on the relative level of physician and PE compensation are far from clear. Increases in the demand for medical care--for example, those resulting from implementation of comprehensive national health insurance--might also change the relative level of health provider compensation and thus change demand for both physicians and PEs. Changes in the structure of the medical care market, brought about by regulatory or other actions, could also affect absolute and perhaps relative levels of provider compensation.

Summary. In summary, available evidence suggests that PEs can improve the cost-effectiveness of medical practice. PEs compare favorably with physicians with respect to the quality of PE-appropriate services. At present, nurse practitioners see about 60 percent, and physician assistants and Medex about 90 percent, as many patients per hour as physicians. But PEs cost about one-third to one-half as much as physicians per hour, including supervisory costs. Hence, for PE-appropriate care, medical services can be provided by nurse practitioners at about two-thirds to four-fifths of the cost of medical care delivered by a physician; and by physician assistants and Medex at about one-third to one-half of physician costs. 11/

11/ For reasons mentioned earlier in the text, these rough calculations may make PEs appear somewhat less costly than they actually are.

The Impact of PEs on Average Practice Expenses per Patient Visit

Although a PE may manage treatment episodes less expensively than a physician, the cost of the "average" treatment episode or patient visit may or may not decline after a physician extender is incorporated into a medical practice. Average per visit expenses depend on both total practice expenses and total patient volume. The degree to which these components change with the addition of a PE(s) to a medical practice appears to depend on the way in which physicians utilize PEs when their services become available. 12/

If the number of patients seen alone by physicians remains constant, the addition of a PE in a medical practice may reduce average per visit practice expenses, because the additional patients seen by the PEs would offset the incremental practice expenses related to them. For example, the SSI study showed that practice expenses in solo physician practices that employed PEs were 74 percent higher than those in comparable solo practices without PEs. 13/ Total patient volume, however, was 146 percent higher. Thus, the average per patient visit practice expense of solo practices that employed PEs was 29 percent lower than those that did not employ PEs. 14/ Apparently, then, the solo

12/ For a more detailed discussion of the determinants of physician practice expenses, see Barry S. Eisenberg, "Medical Practice Expenses: Trends, Determinants, and Impact," in National Commission on the Cost of Medical Care, 1976-1977, vol. 2 (Chicago: American Medical Association, October 1978).

13/ Physicians who practice by themselves (solo) or with one other physician are the predominant mode of medical practice today. Physicians in group practices (three or more physicians) constitute only about one-fourth of all practicing physicians.

14/ System Sciences, Inc., Survey and Evaluation. The higher level of practice expense and patient volume in solo practices with PEs may not be attributable solely to the presence of PEs, however, because solo physicians who hired PEs saw more patients by themselves (63 percent more) than the physicians who did not employ PEs.

physicians who hired PEs used them to expand total patient volume rather than to lessen their own patient load.

If the number of patients seen by physicians decreases when PEs are incorporated into their practice, PEs may not lower per visit practice expenses. Significantly lower per patient visit practice expenses did not occur among group practices employing PEs. 15/ Those practices with PEs had an average practice expense per patient visit only 1 percent less than that in traditional group practices. 16/ This result is somewhat surprising because the potential for efficient use of PEs is generally believed to be the greatest in group practices. One source of the lack of a reduction in average practice expenses per visit is that physicians in group practices with PEs saw 27 percent fewer patients per week than physicians in comparable practices without PEs. 17/ There are two possible explanations for this result. Physicians in group practices may spend more time with the patients they do see when a PE is available. Alternatively, physicians may devote the same amount of time per patient seen but reduce the total amount of time spent in office-based patient care. The physician time freed by having a PE may be spent in leisure activities, administrative duties, or with hospitalized patients. 18/

15/ Group practices, as used hereafter, include practices with two or more physicians.

16/ System Sciences, Inc., Survey and Evaluation.

17/ PEs in group practices also saw slightly fewer patients than their counterparts in solo practices.

18/ Disaggregated data that might have distinguished differences between solo- and group-practice physicians with PEs with respect to hours worked or length of patient encounter were not available. In the aggregate, minutes per patient encounter did not differ significantly between physicians with PEs and those without PEs. Total time devoted to direct patient care was 11 percent less for physicians with PEs as compared with those without PEs, but physicians with PEs spent more time in consultation and supervision.

Per visit practice expenses can also increase as a result of PE utilization if PEs serve as complements to rather than as substitutes for physicians. 19/ This occurs because patient volume changes attributable to the addition of a PE would be insignificant. 20/

In summary, although PEs can lower per visit practice expenses, physician behavior and the distribution of patient care among physicians and PEs determine whether those reductions actually occur. The available evidence suggests that the use of PEs in some solo medical practices may have reduced the "average" practice expense of patient care by almost one-third; however, similar cost reductions have generally not occurred in group practices that use PEs. The differential impact of PEs in solo and group practices may be influenced more by the type of physician in the two kinds of practice arrangements than the organizational arrangement itself. If physicians who join group practices value leisure time more highly than do solo practitioners, they may be more likely to use PEs in order to reduce their workloads. Physicians in group practices may also use their freed time to spend with patients in the hospital. Empirical evidence on this point, however, is generally weak.

19/ An example of a PE performing in a complementary role would be in a medical practice in which the PE sees patients only after they are seen by a physician.

20/ See Robert L. Kane, Donna M. Olsen, and C. Hilman Castle, "Effects of Adding a Medex on Practice Costs and Productivity," Journal of Community Health, vol. 3 (Spring 1978).

CHAPTER IV. THE IMPACT OF PHYSICIAN EXTENDERS ON MEDICAL
CARE PRICES AND EXPENDITURES

Although PEs may produce medical services at lower cost levels than physicians, their presence in the medical sector may not lower medical care prices or expenditures. The first part of this chapter examines how PEs affect medical care expenditures by influencing the price and amount of care provided. The second part of this chapter compares the costs of training PEs and physicians. 1/

THE IMPACT OF PEs ON THE PRICE AND AMOUNT OF MEDICAL CARE

PE Impact on Medical Care Prices

If the utilization of PEs in medical care practices reduces per visit medical care expenses, their (widespread) utilization in a competitive market would ultimately reduce medical care prices. In the current less competitive situation, however, these savings may or may not be passed along to consumers in the form of lower medical care prices. If prices remain the same, the extra practice income may be absorbed by physicians in the form of greater financial profits, or physicians may earn the same amount of income working fewer hours.

In fact, the available evidence suggests that modest price reductions do occur in some medical practices that utilize PEs. Thus, patients in practices employing PEs sometimes benefit from lower medical care fees. For example, in 1977, the average charge per patient visit was \$13 in 70 practices with a PE, as compared with \$16.48 in 50 similar practices without PEs (see Table 3).

1/ Medical care expenditures, as used hereafter, refer to total spending rather than simply federal spending for medical care services or for training medical care providers.

TABLE 3. AVERAGE CHARGE PER PATIENT VISIT IN PRACTICES WITH AND WITHOUT PHYSICIAN EXTENDERS, 1977: IN DOLLARS

Type of Practice <u>a/</u> and Provider	Average Charge per Patient Visit <u>b/</u>
Physician with PE	13.00
Nurse practitioner	8.13
Physician assistant or Medex	12.02
Physician	15.06
Physician without PE	16.48

SOURCE: System Sciences, Inc., Survey and Evaluation of the Physician Extender Reimbursement Experiment, Final Report (March 1978).

a/ Includes both solo and group practices.

b/ It should be noted that one source of the lower charges in physician-PE practices could be that these practices were located to a greater extent in lower income areas with fewer health resources than the comparison physician-only practices.

Nevertheless, many physicians report that they do not charge less for services provided by PEs. 2/ This issue has generated considerable controversy. On the one hand, some observers argue that PE-delivered services should not cost less than physician-delivered services because of their comparable quality. Other observers, however, believe that consumers, rather than physicians, should receive the economic benefits (as well as other

2/ See General Accounting Office, Progress and Problems in Training and Use of Assistants to Primary Care Physicians (1975).

benefits such as improved access to quality medical care) from the availability of PEs. 3/

PE Impact on Amount of Medical Care Delivered

The annual number of patient visits in practices employing PEs is on average 50 to 60 percent higher than that in comparable practices without PEs. 4/ Moreover, a significant proportion of these additional visits appear to stem from new patients. 5/ Hence, the major benefit to consumers from the use of PEs appears to be improved access to medical care rather than reduced prices.

PE Impact on Medical Care Expenditures

Although the impact of physician extenders on total medical care expenditures has been negligible because their total number is so small, it is clear that increased utilization of PEs may result in further increases in medical care expenditures.

3/ Several studies have suggested that hiring PEs may be profitable for physicians. See Robert L. Kane and others, "Effects of Adding a Medex on Practice Costs and Productivity." See also Eugene Nelson, Arthur Jacobs, Karyn Cordner, and Kenneth Johnson, "Financial Impact of Physician Assistants on Medical Practice," New England Journal of Medicine, vol. 293 (1975); Mary O'Hara-Devereaux, John Dervin, Len Hughes Andrus, and Leona Judson, "Economic Effectiveness of Family Nurse Practitioner Practice in Primary Care in California," in Ann Bliss and Eva Cohen, eds., The New Health Professionals (Aspen Systems Corp, 1977); Donald Shiff, Charles Fraser, and Heather Walters, "The Pediatric Nurse Practitioner in the Office of Pediatricians in Private Practice," Pediatrics, vol. 44 (July 1969).

4/ University of Southern California, Collection and Processing of Baseline Data.

5/ Ibid. Of the patients seen in practices with PEs, 20 percent were new patients as compared with 11 percent in practices with no PEs.

Estimated roughly, in 1977, medical care expenditures in practices employing PEs were 19 to 24 percent higher than they might have been without PEs. 6/

Increasing total medical care expenditures may or may not be desired. For example, they may be desired if they are the result of medical services provided to persons previously unable to obtain care. Further, the increases in primary medical care expenditures resulting from improved access may be offset by savings gained from the early detection of illness and a possible decrease in the utilization of more expensive specialized providers and hospitals. 7/ On the other hand, if PEs are used to provide more service-intensive medical care rather than to improve access to medical care, expenditures will grow, but improvements in health status may be marginal.

6/ The impact of physician extenders on prices, patient volume, and expenditures in practices where they were employed in 1977 can be summarized as follows:

	<u>Average per Visit Price Index</u>	X	<u>Total Average Annual Patient Volume Index</u>	=	<u>Total Expenditure Index</u>
Before PE	1.00		1.00		1.00
After PE	0.79 <u>a/</u>		1.50-1.57 <u>b/</u>		1.19-1.24

a/ Derived from data in System Sciences, Inc., Survey and Evaluation. See Table 3.

b/ University of Southern California, Collection and Processing of Baseline Data.

7/ Today, many physicians trained in nonprimary care fields provide substantial amounts of primary medical care. This is particularly true for internal medicine subspecialists and general surgeons. For example, about half of all cardiologists spend half of their time providing basic medical care. See Charlotte L. Rosenberg, "How Much General Practice by Specialists?" Medical Economics (September 15, 1975).

ARE PHYSICIAN EXTENDERS LESS EXPENSIVE
TO TRAIN THAN PHYSICIANS?

On average, physicians are at least five to seven times more costly to train than PEs, primarily because of their longer training period. Training expenditures for a medical student are greater than \$60,000, as compared with \$11,900 and \$10,300 for a physician assistant or Medex, and a nurse practitioner, respectively (see Table 4). 8/

The federal government provides a greater share of the total training costs of PEs than it does of physicians, but federal support for training physicians accounts for more dollars. In fiscal year 1978, the federal government provided about \$190 million to medical schools for basic medical education and training. These funds amounted to slightly more than \$3,000 per medical student, or about 20 percent of their average annual training costs. Equivalently, \$4,000 to \$5,000 in federal aid was spent for each student enrolled in a PE program. Total federal payments to PE programs in fiscal year 1978 were about \$22 million, but they accounted for approximately 50 to 70 percent of the average annual PE training costs in federally supported institutions. 9/

8/ Expenditures vary widely among both physician and PE training programs. Annual training costs for some physician extenders are thus sometimes quite similar to or more than those for physicians. Overlapping training costs for the two provider types are probably a consequence of the fact that PE and physician training programs (particularly physician assistant and Medex programs) have similar faculty, equipment, and clinical training needs.

9/ In fiscal year 1978, about 40 percent of all nurse practitioner programs and nearly 90 percent of all physician assistant and Medex programs received federal funds. Nearly all medical schools, however, received federal aid.

It is difficult to compare federal subsidies to medical schools and PE programs. Subsidies to nurse practitioner programs include aid for start-up assistance as well as
(continued)

TABLE 4. TRAINING EXPENDITURES a/ FOR PHYSICIANS AND
 PHYSICIAN EXTENDERS, ACADEMIC YEAR 1978-1979:
 IN DOLLARS PER STUDENT

	Annual Cost <u>b/</u>	Total Cost <u>c/</u>
Physician		
Mean	14,200	60,700
Median	N.A. <u>d/</u>	N.A. <u>d/</u>
Range	7,600-20,800	30,200-83,100
Physician Extender <u>e/</u>		
Physician assistant and Medex		
Mean	6,800	11,900
Median	7,400	9,900
Range	4,400-9,900	7,100-17,200
Nurse practitioner		
Mean	12,900	10,300
Median	10,100	8,000
Range	5,300-31,000	3,000-32,000

SOURCES: Physician training expenditure data are from National Academy of Sciences, Institute of Medicine, Costs of Education in the Health Professions, Summary (January 1974). Figures are updated to 1978, assuming an annual 7 percent inflation rate for costs experienced by medical schools. PE expenditure data are from System Sciences, Inc., Nurse Practitioner and Physician Assistant Training and Deployment Study, Final Report (September 1976). Figures are updated to 1978, assuming that PE programs experienced an inflation rate similar to that for medical schools.

a/ Net institutional expenditures--that is, gross expenditures for resources required for educational purposes less income from research and patient care attributable to training activities. Net rather than gross expenditures are compared here because of the lack of gross expenditure data for PE
 (continued)

TABLE 4. (Continued)

- a/ (continued)
programs. Gross expenditures to train a physician are 35 percent higher than net expenditures. If PE programs receive negligible income from patient care or research, the expenditure differentials between physicians and PEs cited in the table are significantly understated.
- b/ For comparative purposes only. Some PE programs are less than one year long.
- c/ Total cost for physicians assume 4 years of basic medical education. Total cost for PE programs are based on programs that vary in length. These cost calculations exclude the cost of education and training required for entry into physician and PE training programs.
- d/ Not available.
- e/ PE data are based on a sample of PE programs that are not necessarily representative of all programs.

In general, federal subsidies providing training support in order to increase the number of physicians and PEs have been successful but expensive ways of producing additional health providers. The public cost of producing new physicians has been particularly high. From 1969 to 1978, roughly \$40,000 to \$60,000 in federal operating subsidies and construction support were required to produce one additional graduate from medical school

- 9/ (continued)
operational support. Since start-up assistance could not be disaggregated for nurse practitioner programs, operational and start-up assistance for medical schools were aggregated for purposes of comparability.

(that is, a graduate who would not have been trained in the absence of federal support). Federal support of PE programs has probably been more cost-effective in producing new PE graduates because much of that support has been used to establish new programs rather than to subsidize the operation of existing programs. The cost to the federal government for each new PE was about \$10,000 to \$20,000. 10/

10/ The public cost of producing new physicians was calculated by a method presented in George E. Wright, The Efficiency of Federal Subsidies to Medical Education, a health manpower policy discussion paper from the School of Public Health, University of Michigan, April 1974. Annual federal operating subsidies and construction support to medical schools from 1969 to 1978 less pre-1969 levels of support were summed and divided by an estimated gain in the number of physicians due to the net increase in support. A similar methodology was followed for PE programs, though increases in PE graduates resulting from federal support had to be somewhat arbitrarily estimated because of a lack of data. It was conservatively estimated that the training of one-fourth to one-half of all PE graduates during this period was the result of federal support.

CHAPTER V. CAN WIDESPREAD EMPLOYMENT OF PHYSICIAN
EXTENDERS BE EXPECTED IN THE FUTURE?

Although PEs can increase access to medical care and decrease medical care prices, if large numbers of consumers are to enjoy either or both of those benefits, physician extenders must be incorporated into the health care delivery system in larger numbers. Assuming that the supply of PEs continues to increase rapidly, one important issue is whether employment of this new type of health provider is likely to be widespread.

There are many interrelated determinants of future demand for PEs; the most important, however, are legal restrictions on PE practice and reimbursement policies, incentives to employ PEs in different medical care delivery organizations, perceptions of the advantages and disadvantages of hiring PEs, and consumer acceptance.

LEGAL RESTRICTIONS AND REIMBURSEMENT POLICIES

State laws and regulations currently link the medical practice of PEs directly to that of physicians. Nearly all states require that medical tasks performed by PEs be delegated by physicians. In particular, direct physician supervision for physician assistants and Medex is explicitly required in 43 states. ^{1/} Further, some states limit the number of physician assistants or Medex that a physician can supervise--usually to one or two. Direct physician supervision is, however, usually not required for nurse practitioners. Only 11 states mention the issue of physician supervision of nurse practitioners in their statutes or regulations. Three states--Alaska, Nevada, and New Hampshire--recognize self-employed nurse practitioners, who work in collaboration with or upon referral from physicians.

^{1/} In some of these states, the physical presence of the physician is not required. Telephone contact may constitute adequate supervision.

The independence of PEs is also limited by state policies on drug prescription. Although many states are now reviewing current prohibitions regarding PE prescription writing, most states that have drug prescription policies specify certain conditions under which various types of PEs may prescribe drugs; for example, if there is a countersignature by a supervising physician. At least eight states, however, prohibit PEs from writing any prescriptions. 2/

Third-party reimbursement policies also closely link PEs to supervising physicians. Few public or private health insurers recognize PEs as bona fide providers of medical care. Third-party payments, when provided for PE services, are almost always provided to employing physicians and institutions rather than directly to PEs.

Federal PE reimbursement policies have recently changed to provide reimbursement for PE services under less restrictive requirements for physician supervision. When a PE is employed in a health care institution, the inclusion of PE compensation as part of an institution's "reasonable cost" basis has always been allowed for reimbursement purposes. Before 1977, however, federal payments for primary medical care services provided by PEs were generally not available. 3/ The Rural Health Clinic Services Act of 1977, authorized federal payment to certified rural health clinics for primary medical care provided by PEs when a physician may only be available for indirect supervision and consultation. 4/

2/ For a more detailed discussion of state statutes and regulations governing physician extender medical practice, see Miller and Byrne, Inc., Review and Analysis of State Legislation and Reimbursement Practices of Physician's Assistants and Nurse Practitioners, Final Report (January 1978).

3/ Medicare payment for services provided by PEs was available if those services were not traditionally provided by physicians and were performed in the presence of a physician. Thus, this condition precluded reimbursement for the very services PEs were trained to provide.

4/ Public Law 95-210.

As a result of these legal and reimbursement restrictions, most PEs in private practice must practice under the general supervision of a physician.

If state policies regarding PE practice became less restrictive and if PEs could be reimbursed directly for their services, the establishment of independent PE practices might expand. A development of this kind would make future demand for PEs directly sensitive to consumer demand for medical care, rather than to physician demand for an extra pair of hands. At present, the American Nurses' Association estimates that only about 300 such practices exist. 5/

Changes in state policies governing the practice of PEs and reimbursement mechanisms are likely to occur slowly. Although there has been a trend toward relaxing the requirements of physician on-site supervision, especially in predominantly rural states, medical practice legislation is generally developed in consultation with the medical profession, which may have a vested interest in restricting the independent practice of physician extenders. In addition, public and private insurers fear the fiscal consequences of funding a new type of health provider, especially when some of the services they provide (such as health education and nutrition counseling) are also provided by other types of health workers, who may also wish to receive third-party payments. The recent change in federal policy concerning the reimbursement of PEs may, however, mean that other insurers may also be willing to relax their reimbursement policies.

INCENTIVES IN DIFFERENT MEDICAL CARE DELIVERY ORGANIZATIONS

Incentives to employ PEs differ among different types of medical care delivery organizations, depending on their budget constraints and physician payment mechanisms.

Health care organizations operating under fixed budgets--for example, nursing homes and neighborhood health clinics as opposed to physician offices, which are usually fee-for-service--

5/ Most of these practices may be providing traditional nursing services rather than primary medical care.

have clear incentives to substitute PEs for physicians wherever possible, if physicians are salaried rather than paid on a fee-for-service basis. About half of all physician assistants and Medex, and about 80 percent of all nurse practitioners, are employed in such organized health care delivery settings. 6/ If a large share of total revenues come from third-party payors on the basis of costs, the incentives are somewhat lessened, because the costs of more expensive physicians may be passed on as easily as the costs of less expensive PEs. Prepaid group practices, in which total revenues equal the product of a fixed payment for each person enrolled and the number of enrollees, are particularly likely to hire physician extenders in order to maximize the difference between total payments and total expenses. For instance, in 1977, one type of prepaid group practice--(federally qualified) health maintenance organizations (HMOs)--provided medical services to their members with a full-time equivalent of 0.44 PEs for each physician, as compared with 0.07 PEs for each office-based physician in the nation. 7/

Although the results of several surveys of physicians suggest that many physicians believe the PE concept to be a good one, a recent survey (1976) found that, of those physicians who did not employ a physician assistant or Medex, only about 15 percent reported that they would be willing to hire one. That survey response translates into a demand for about 20,000 physician assistants or Medex. 8/ Moreover, physicians who practice by themselves--the majority of all physicians--seem less receptive toward hiring a physician assistant or Medex than physicians in group practices.

6/ About half of physician assistants and Medex, and about 20 percent of nurse practitioners work in physicians' offices. See Richard Scheffler, The Supply and Demand for New Health Professionals: Physician's Assistants and Medex, Final Report (November 1977); and Sultz and others, "Highlights: Phase 2."

7/ Unpublished data from the HEW, Office of the Assistant Secretary for Health, Office of Health Maintenance Organizations.

8/ Scheffler, Supply and Demand. No comparable data were available for nurse practitioners.

The overall low level of demand for PEs among physicians in private practice may result in part from the fact that they have few economic incentives to hire PEs. Even though PEs may increase physician earnings, physicians already earn relatively high incomes. Hence, the value solo practitioners place on additional income may not outweigh the perceived disadvantages of having a PE--for example, relinquishing patient care responsibility. Further, the noncompetitive nature of the market for medical care provides physicians with little reason to produce care at a lower cost.

The anticipated growth in the supply of physicians may reduce demand for PEs, particularly for physician assistants and Medex. Many health planners fear that the United States will face an aggregate oversupply of physicians. By 1990, some 594,000 physicians are expected to be active--about 38 percent more than today. Approximately 42,000 new PEs are also expected to become available. The effective supply of physician equivalents will therefore grow from about 200 to approximately 253 per 100,000 persons. At the same time, the demand for physicians' services will range from 221 to 232 physicians per 100,000 persons. 9/ If more physicians become available than are necessary to meet demand, average patient load may decline. 10/ Overall demand for a physician assistant or Medex could then decline since a physician's willingness to hire these types of

9/ U.S. Department of Health, Education, and Welfare, Health Resources Administration, Bureau of Health Manpower, Report to the President and Congress.

10/ Some analysts believe that physicians can control the level of demand for their services by varying the quantity of services provided per patient. If doctors can "induce demand" for their services, the current propensity of physicians to hire PEs would probably be less affected by a growing supply of physicians. It is much more likely that physicians can vary services only within certain limits and that the growth in the physician supply may be large enough to result in a decline in the average patient demand per physician.

PEs appears to be related to the level of demand for the physician's services. 11/ An increase in the supply of physicians might therefore shift the role of PEs from providing medical care to providing support services to physicians. If this occurs, the likelihood of physicians employing PEs (nurse practitioners, in particular, because of the nature of services they provide) may remain the same or increase.

Because ambulatory care clinics and HMOs have economic incentives to hire PEs, recent efforts to encourage the growth of HMOs deserve special mention. As these systems grow, so will the demand for physician extenders. Moreover, if the savings generated by physician extenders take the form of investment in more comprehensive services or reduced payment rates to HMO members, the competitive position of HMOs may be enhanced. This would further stimulate growth and the demand for PEs. The growing popularity of group practice in general may also increase demand for PEs, although, as noted earlier, patient volume may not substantially increase.

PERCEIVED ADVANTAGES AND DISADVANTAGES OF HIRING PHYSICIAN EXTENDERS

Physicians' perceptions of the benefits and disadvantages of hiring a PE provide additional insight into the future employment prospects of PEs. The reasons most frequently cited by physicians for hiring PEs are to improve the quality of care by enabling them to spend more time on complex cases, expand the amount of patient education, and increase the attention given to secondary problems or symptoms. Increasing the number of patients in the practice and providing care for persons previously uncared for have also been cited as reasons for

11/ In addition, there is some evidence that physician demand for physician assistants and Medex may decrease if they become more expensive relative to nurses. Hence, projected large increases in the future availability of nurses may tend to depress nursing salaries and, correspondingly, physician demand for PEs. See Scheffler, Supply and Demand.

using PEs. Few physicians cite a desire to earn more income, though increased income has been a major result. 12/

In two national surveys, physicians and other persons who hire PEs cited a number of barriers to hiring PEs. In order of importance, major obstacles in hiring physician assistants and Medex were a lack of need for any additional personnel and budget constraints, legal restrictions and reimbursement constraints, and a lack of acceptance by patients and physicians themselves (see Table 5). Major perceived barriers to hiring nurse practitioners were legal restrictions, space limitations, and resistance from other health providers. Other perceived obstacles to employing PEs were a diminished physician-patient relationship, low quality of care, and legal and reimbursement ambiguities.

Over time, many of these perceived problems may disappear, as physicians and consumers gain more knowledge about the performance of PEs. If this occurs, demand for PEs might grow.

CONSUMER ACCEPTANCE

Consumer acceptance is another determinant of demand for PEs. Not surprisingly, unfavorable attitudes toward PEs are more prevalent among consumers who have not received care from a PE than among those who have received PE care. Once consumers have received care from a PE, acceptance of and satisfaction with the care is generally high. 13/ For example, patient attitudes were measured in one study of Medex in 10 medical practices. Before the Medex were introduced, only 48 percent

12/ The performance of PEs in various settings has fulfilled one or more of these desired results. See System Sciences, Inc., Survey and Evaluation, and Sultz and others, "Highlights: Phase 2." One exception is that physicians with PEs do not appear to see proportionately more complex cases than those without PEs, nor do they spend more time with their patients. See University of Southern California, Collection and Processing of Baseline Data.

13/ Gloria Ruby, National Academy of Sciences, Institute of Medicine, "Consumer Acceptance of Nurse Practitioners and Physicians Assistants," Staff Paper (January 31, 1977).

TABLE 5. PERCEPTIONS OF MAJOR BARRIERS TO EMPLOYING
PHYSICIAN EXTENDERS

Barriers to Employing Physician Assistants and Medex	Percent of Physicians Citing Barrier <u>a/</u>
Lack of need for any additional personnel, budget constraints	41
Legal constraints, malpractice insurance, and third-party payment problems	24
Lack of acceptance by patients and physicians	18
Barriers to Employing Nurse Practitioners	Percent of Employers Citing Barriers <u>b/</u>
Legal restrictions	31
Space limitations	25
Resistance from other health providers in practice	23
Resistance from other health providers outside the practice	20

SOURCES: Richard Scheffler, The Supply and Demand for New Health Professionals: Physician's Assistants and Medex, Final Report (November 1977); and Harry Sultz, Maria Zielezny, and Jane Mathews, "Highlights: Phase 2 of a Longitudinal Study of Nurse Practitioners," in Michael Millman, ed., Nursing Personnel and the Changing Health Care System (Cambridge, Mass.: Ballinger, 1978).

a/ According to 2,590 physicians who responded that they would not hire a physician assistant or Medex in a 1976 nationally representative survey of 3,076 physicians.

b/ According to a 1976 survey of all employers of nurse practitioners who graduated between May 1974 and June 1975. These employers included physicians as well as persons in hospitals, community health clinics, nursing homes, and other health care delivery settings.

of the patients favored the concept; after the Medex had been practicing for about 10 months, patient acceptance increased to 76 percent. 14/

Actual consumer behavior may provide the best clue to consumer willingness to obtain services from PEs. In most research on patient behavior, consumer acceptance is usually measured by participation in the study, switching from the assigned provider, or missed or broken appointments with the assigned provider. 15/ In one such study, acceptance of nurse practitioners among mothers of infants who received pediatric care from either a pediatrician or pediatric nurse practitioner was high. Mothers were free to change providers at any time. Seventy-five percent of the mothers invited to participate in the study accepted, most of the participants stayed with the assigned provider, and no statistically significant differences between broken or missed appointments were found between patients assigned to the two types of providers. 16/

As the number of PEs increases and information about their performance become more widely available, more consumers may accept and support the medical practice of PEs. Consumer acceptance may, however, be affected by a number of unpredictable

14/ See General Accounting Office, Progress and Problems.

15/ Attitudinal surveys of patient satisfaction with care provided by physician extenders also provide information about patient acceptance. This information, however, is less reliable than behavioral research.

16/ Burnip and others, "Well-Child Care by Pediatric Nurse Practitioners in a Large Group Practice: A Controlled Study of 1,152 Preschool Children," American Journal of Diseases of Children (January 1976). Similar findings for different types of physician extenders were obtained in Spitzer and others, "The Burlington Randomized Trial of the Nurse Practitioner," and Anthony Komaroff, "Protocols for Physician Assistants: Management of Diabetes and Hypertension," New England Journal of Medicine, vol. 290 (February 7, 1974).

factors, such as the personal qualities and characteristics of PEs, and the manner in which their qualifications and abilities are explained to the patient. Physicians' reassurances about the appropriateness of PEs delivering some types of care may also be necessary, which could imply some consumer resistance to PEs practicing more independently of a physician. Finally, the degree to which other factors, such as the availability of physicians' services and changes in fee structures, affect consumer acceptance of PEs is unknown. For example, an expanded National Health Service Corps (NHSC) could substantially increase the supply of physicians in currently underserved areas. ^{17/} Such an expansion could reduce consumer acceptance of PEs, even if they provided care at a lower cost.

CONCLUSIONS

As consumers and physicians gain more information about PEs, they are likely to become recognized as bona fide medical providers. Ambulatory care clinics and prepaid group systems have economic incentives to hire PEs; thus, the demand for PEs will probably grow as these types of delivery systems grow. But future demand for PEs among physicians in private practice--who constitute the bulk of all practicing physicians today--is very uncertain. On the one hand, if legal and reimbursement policies governing PE practice become less restrictive, demand for PEs among physicians might increase. On the other hand, the anticipated increase in the supply of physicians could reduce the demand for PEs. On balance, under current policy, extensive demand for PEs in private medical practices is likely to be limited to those areas where physicians are scarce and patient demand is high.

^{17/} The National Health Service Corps is a major federal program for alleviating shortages of medical providers in underserved communities. In return for scholarships, medical students agree to at least two years of service in a designated community. Practice start-up grants are also available if NHSC physicians decide to practice in their placement area after their service obligation is fulfilled. By 1985, about 3,000 to 4,000 physicians are expected to be placed in shortage areas.

CHAPTER VI. COMMENTS ON THE FUTURE USE OF PEs
AND FEDERAL OPTIONS

During the 96th Congress, the Congress will decide how much federal assistance should be provided to PE training programs and whether legislation authorizing federal aid to some of those programs should be continued. 1/

Decisions about whether the federal government should encourage and support the large-scale use of PEs depend, however, on the resolution of broad policy issues involving large-scale changes in the delivery of health care in the United States. Thus, this chapter assesses the impact of alternative options for federal support of PEs under two scenarios. The first assumes little change in the existing medical care delivery systems--that is, a continuation of current health care policies and other programs. The second assumes that major structural changes in the delivery and financing of health care occur. It is important to remember, however, that assessments of the impact of PEs under these scenarios are constrained by the limited amount of available data. 2/

1/ The Nurse Training Act of 1975, which expired in 1978, authorized federal assistance to nurse practitioner programs. Nurse practitioner programs are now being funded under a continuing resolution. The Health Professions Educational Assistance Act of 1976, which authorizes federal assistance to physician assistant and Medex programs, expires in 1980.

2/ Some questions that are not yet resolved with existing data include:

- o How do different medical care practice arrangements affect the utilization of PEs?
- o How is physician behavior (with respect to hours of work and fee setting) influenced by the presence of PEs?
and

(continued)

OPTIONS UNDER A CONTINUATION OF CURRENT POLICIES

The available information on the impact of PEs suggests that, if the medical care system continues essentially unchanged, the most significant effects on an increased availability of PEs are likely to be improved access to and quality of primary medical care. But lower medical care prices for consumers who receive services from PEs are not likely to be systematically realized for two reasons. First, the price and amount of services provided by PEs are determined by physicians. Second, the supply of physicians is growing and this trend may cause physicians to use PEs to provide support services rather than medical care.

Within this context, the Congress might wish to pursue either one of two broad policy alternatives to current federal programs that support PEs: current federal aid to PE programs could either be eliminated or substantially reduced, or existing programs could be continued or incrementally changed in order to improve their effectiveness.

Reduce or Eliminate PE Training Support

The first option--to reduce or eliminate PE training program support--might be desired if the Congress believes that short-term reductions in total medical care expenditures are of higher priority than improving access to medical care. Medical expenditures might be lowered below otherwise expected levels by the decrease in expenditures to train PEs and by the fact that fewer PEs would be providing medical care. A policy that reduces PE-related expenditures may, however, be short-sighted if PEs prevent greater medical care expenditures in the long run. This option would probably have the greatest impact on physician assistant and Medex programs, which appear less successful in generating private sources of support than nurse practitioner programs. It is likely that many programs that rely heavily on federal support would close.

2/ (continued)

- o How does the availability of third-party payments to physicians for services delivered by PEs affect the price and amount of service delivered by the physicians and PEs?

Incremental Changes to Current Programs

On the other hand, if the Congress is concerned with improved access to medical care, one broad policy alternative that might address this concern within the context of the current medical care delivery system involves incremental changes in existing programs that support PE practice. Options for these incremental changes include strengthening federal grant eligibility requirements for PE training programs, expanding the number of PEs in the NHSC, and modifying federal PE reimbursement policies. (Other options could also improve access to medical care--for example, expanding the number of physicians in the NHSC, but greater use of PEs rather than physicians would be less costly.)

The increasing supply of physicians implies that PEs would be most needed and be most effectively used in rural and inner-city areas that have difficulty attracting physicians. Physicians in these areas are likely to face heavy patient loads and, thus, use PEs to expand the amount of medical care provided. Nonetheless, a continuation of current PE practice restrictions would prevent some communities with no physicians from utilizing PEs. One simple action that might increase the number of practicing PEs in underserved areas would be to require that PE training programs actively develop inner-city or rural training components and mechanisms to place graduates in those areas. Some PE training programs now take this approach, which has been effective. ^{3/} This requirement could, however, increase the costs of some PE programs, resulting in more appeals for federal aid.

A second option would be to provide NHSC scholarships to more students in PE programs than currently receive them. The NHSC has been successful in identifying nurses from underserved areas who are interested in obtaining PE training and providing them with scholarship support. Only a small number of such scholarships can be provided for PE training, however, because 90 percent of all NHSC scholarships, by law, must be provided to medical and dental students. In fiscal year 1979, \$60 million was provided for NHSC scholarships. Nearly 5,000 scholarships

^{3/} See General Accounting Office, Progress and Problems.

were received by medical and dental students, but fewer than 600 were for all other health care students, including PEs. At no additional federal cost, a more flexible policy in which a greater percentage of NHSC scholarships were granted to persons from underserved areas interested in obtaining PE training could help alleviate shortages of medical providers in underserved communities more quickly than providing NHSC scholarships only to medical students. For example, the federal cost of providing a NHSC scholarship annually for four years of training for a student at Georgetown University School of Medicine and two years of practice at a NHSC site could support the training and two years of NHSC practice of approximately three PEs. ^{4/} The NHSC could continue its current practice of placing NHSC teams rather than a sole NHSC worker in designated communities. Instead of placing two physicians, however, a physician and a PE might serve equally as well.

A third alternative would be to extend medicare and medicaid reimbursement to physicians in rural and inner-city areas for services provided by PEs with only limited physician supervision. This option would increase the availability of primary medical care services or, at least, would reduce financial disincentives for physicians in these areas to hire PEs. Migration of PEs into these areas would thus be facilitated.

A more liberal reimbursement policy would slightly increase federal medicare and medicaid expenditures, but these increases might be offset by reductions in medical care spending in the long run. If such reimbursement had been provided in fiscal year 1979 and if PEs had been reimbursed at the same rate as physicians, federal medicaid and medicare expenditures would have increased by roughly \$40 million or less than 0.1 percent. These expenditures would continue to increase as more PEs located in reimbursable areas. Spending increases would be lower, however, if PE services were reimbursed at lower rates than physician services.

^{4/} Currently, Georgetown University Medical School has the highest tuition charges of all U.S. medical schools and a disproportionate number of NHSC scholarship recipients.

physicians could accommodate. 6/ A cost-effective way to satisfy the increase in patient demand would be to train more PEs rather than physicians because of lower PE training costs. Physicians --facing heavier workloads--would probably be more receptive to hiring PEs than they are today and more willing to use them to expand the amount of patient care provided.

Providing reimbursement to physicians for services delivered by PEs would further encourage them to hire PEs. Implementation of a comprehensive national health insurance scheme would provide an opportunity to restructure current physician and PE reimbursement policies in order to provide incentives for physicians to utilize PEs more effectively. Medical care prices that more closely reflected the cost of providing medical care services might result. Reimbursement for medical services might be based on the type of service and the most efficient and appropriate provider of the service. 7/ Hence, reimbursement for medical tasks appropriately performed by physician extenders would reflect their lower costs. For example, reimbursement for a physical exam might be \$10 regardless of whether a physician or a PE provided it. More complex services would be reimbursed at higher levels. As a result, physicians would be encouraged to delegate low-cost services appropriately performed by PEs in order to concentrate on more complex and higher priced services. 8/

6/ According to the Institute of Medicine of the National Academy of Sciences, the current and projected supply of primary care physicians is and will be inadequate to meet the primary care needs of the nation, even if no NHI plan is enacted. See A Manpower Policy for Primary Health Care (May 1978).

7/ Stuart Schweitzer and others, "Third-Party Payments for New Health Professionals: An Alternative to Fractional Reimbursement in Outpatient Care," Public Health Reports (December 1977).

8/ This system could apply to types of physicians as well. A specialist and a general practitioner would be reimbursed at the same rate for a service appropriate for a general practitioner to provide. In fact, the Institute of Medicine of the National Academy of Sciences has proposed such a

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HMO Development and Independent PE Practice

Greater federal support for PEs would also be consistent with a policy goal of making the medical sector more competitive--and thus, more cost-conscious--by promoting nontraditional medical care delivery organizations, such as HMOs and the independent practice of PEs.

As discussed earlier, because HMOs tend to make more intensive use of PEs than other types of medical care delivery organizations, the need for more PEs would grow if more HMOs develop. Fewer PEs would be needed if a comprehensive national health insurance plan were enacted since HMOs are not likely to become a predominant form of medical care delivery even with rapid growth--a ten-fold increase in HMO enrollment by 1990 would involve only about one-fourth of the total population. But more rapid growth of prepaid group practices could create pressure for

8/ (continued)

service-based reimbursement policy regardless of physician specialty in A Manpower Policy for Primary Health Care. One problem--a tendency for physicians to perform more complex procedures--might be minimized by strengthened peer review and second opinion programs.

An analogue to this reimbursement scheme exists in maximum allowable cost programs for prescribed drugs. Reimbursement rates are set below the usually higher priced brand-name drugs to encourage substitution of equivalent, lower priced generic drugs.

This method of reimbursing physicians and PEs may be one alternative to a more general problem of how to provide incentives through reimbursement mechanisms for physicians to provide care efficiently in the absence of competitive forces. If reimbursement schedules can be aligned with the lowest cost levels of providing a service, desirable effects on medical care prices may result. More research is needed, however, on how reimbursement policies affect physicians' fees.

the fee-for-service sector to produce care at a lower cost. ^{9/} Thus, the demand for PEs in other settings--in particular, in physicians' offices--might also increase, as physicians sought to be more economical providers of medical care. An indirect result, then, of more widespread HMO growth would be a need to train fewer physicians because their capacity to treat patients would be expanded by using PEs.

Similarly, an alternative delivery mode in which PEs might play a greater role would be independent practice of PEs. One form of independent practice by physician extenders would involve self-employment but adequate access to a physician for consultation and referral. This implies that a physician's physical proximity is not required for a PE to deliver adequate care. Mechanisms that ensure that PEs obtain necessary physician consultation and limit PE practice to appropriate medical tasks would, however, be essential.

Independent practice by PEs might also reduce medical care prices by fostering competition in the medical care sector. ^{10/} Physicians would be motivated to use resources--including their own time--more efficiently, and the benefits of the resulting lower cost methods of delivering care with physician extenders would be passed along to consumers. Although there has been little experience with independent PE practices, in areas where independent nurse practitioner practices have been established, fees are set well below prevailing fees in physicians' practices. More independent PEs may be a weak mechanism for establishing competitive practices, however, if their numbers remain small.

^{9/} The ability of HMOs to create competitive forces in some areas where they have developed has been documented. See Federal Trade Commission, Staff Report on the Health Maintenance Organization and Its Effects on Competition (1977).

^{10/} B. C. Agree, "Beginning an Independent Nursing Practice," American Journal of Nursing (April 1974), and H. C. Lave, "Promoting an Independent Nursing Practice," American Journal of Nursing (August 1975).

Physician Supply Limitation

If the Congress wished to constrain future increases in the supply of physicians in order to reduce expenditures for medical care or for training providers, current levels of demand and need for PEs would be considerably increased. If federal subsidies to train physicians were reduced, savings might occur because physicians are much more costly to train than PEs. Moreover, federal spending on medical services might decline if routine ailments once cared for by physicians were treated by PEs. The magnitude of any such reductions would, however, depend on how PE and physician reimbursement policies are structured.

Under this option, substantial increases in federal operating and start-up support for PE training programs as well as more liberal reimbursement policies for services provided by PEs would be desirable. Since many of the medical problems experienced by the population are basic and uncomplicated, expansion of the PE supply in concert with constraining the physician supply might not reduce access to medical care. In fact, geographic disparities in the availability of primary care services might improve, because PEs are less likely than physicians to locate in doctor-rich areas. The efficiency of the current system, however, would greatly improve as more medical service of a less complex nature would be provided by more providers with less specialized training.

APPENDIX

APPENDIX A. RESEARCH ON THE FINANCIAL IMPACT OF
PHYSICIAN EXTENDERS ON MEDICAL PRACTICE

The focus, methodology, and quality of research on physician extenders (from which the findings in Chapter III are derived) vary widely. Because few studies are controlled experiments or evaluations of the performance of PEs in all kinds of medical practices, their results can be generalized to only a limited degree. Furthermore, research has concentrated on medical care practices already employing PEs rather than on the impact of adding PEs to those practices. Most evaluative research has focused on the issues of quality of care or productivity. Since there is more consensus on these issues, germane and reliable studies are simply footnoted throughout the paper, rather than described here. The research on the impact of PEs on medical practice expenses, fees, and revenues is less conclusive and hence is summarized below.

Two studies on the financial impact of PEs have been undertaken as part of the physician extender reimbursement experiment funded by the Health Care Financing Administration of HEW. The first study was conducted by the Division of Research in Medical Education of the University of Southern California. The results of this study are reported in Collection and Processing of Baseline Data for the Physician Extender Reimbursement Study, Final Report (August 31, 1978). This study is a national cross-sectional survey of primary care physician practices that employ nurse practitioners, physician assistants, or Medex and a comparison group of similar physicians that do not employ physician extenders. Data concerning the productivity and utilization of physician extenders were obtained during 1974-1977 from a survey of 1,023 physician extender practices and 975 physician control practices. The USC study has several assets. It includes a geographically representative sample of PE practices, is the largest controlled study of physician extender practices to date, and is also the most recent. Consequently, the USC findings may be best generalized to the total PE population of all the available physician extender studies. Unfortunately, a major flaw is that it studies a self-selected, rather than a

statistically valid, sample of PE and physician practices. Self-selected physicians may possess characteristics that distinguish them from physicians who declined to participate in the survey.

The second study is System Sciences, Inc., Survey and Evaluation of the Physician Extender Reimbursement Experiment, Final Report (March 1978), which validated the data collected in the USC study and collected additional data for analysis. Of the practices included in the USC study, 70 physician extender practices and 50 control practices were selected for on-site visits and collection of data pertaining to practice characteristics and costs. In addition, System Sciences evaluated the quality of medical care provided by physicians and physician extenders. The System Sciences study provides detailed information on practice costs and physician extender performance for a much larger group of practices than nearly all other physician extender research. Its internal validity suffers from the fact that the PE practices studied tended to be located in health resource-poor areas to a greater extent than control practices without PEs. Also, group practices with PEs differed from matched control practices in that they tended to have a larger number of physicians. These differences in practice characteristics slightly bias the study's findings. The study also suffers from the same flaw as the USC study--it lacks a random sample.

In "Effects of Adding a Medex on Practice Costs and Productivity," Journal of Community Health, vol. 3 (Spring 1978), Robert L. Kane, Donna M. Olsen, and C. Hilman Castle take a more reliable methodological approach than the first two studies. Their study utilizes both cross-sectional and time series data. Changes in total revenue, practice expenses, and patient volume were examined in a group of 12 practices both before and after the hiring of a Medex and were compared with similar data for a set of matched control practices that did not hire a Medex. Data for each practice were collected at several intervals over a four- to five-year time period. The generalizability of this study, however, is limited by the small number of practices studied and because only one type of physician extender in only one geographic location was studied. Furthermore, the differences between the Medex and comparison practices along the several dimensions studied were found not to be statistically significant for most of the practices studied.

The efficiency and costs of care delivered to patients by physician extenders and physicians in a single health maintenance organization (HMO) were compared in Sheldon Greenfield, Anthony Kamaroff, Theodore Pass, Hjalmar Anderson, and Sharon Nessim, "Efficiency and Cost of Primary Care by Nurses and Physician Assistants," New England Journal of Medicine, vol. 29 (February 9, 1978). Two hundred patients with any of four common acute complaints were randomly assigned to either a physician or a physician extender. An additional group of patients (not randomly assigned) received care from either type of provider. No significant variation in efficiency or cost of care was found between the two patient groups. This study involved a nearly ideal methodological approach and complete data collection. The data included provider time spent with patients, provider time spent in consultation, provider salary rates, cost of laboratory tests, and medications ordered, as well as frequency of patient return visits and hospitalizations. The generalizability of the findings is limited, however, because only one prepaid primary care practice was studied.

An empirical and theoretical assessment of the financial impact of physician assistants on a prepaid group practice was undertaken by Jane C. Record and Joan E. O'Bannon, Cost Effectiveness of Physician's Assistants, Final Report (1976). This study included a detailed analysis of the costs and performance of physician assistants employed by the Kaiser-Permanente prepaid group practice in Portland, Oregon. Data were collected by observation and examination of Kaiser patient records. Although few faults can be found with the methodological approach undertaken, the results pertain to only one type of physician extender practicing in one setting. Thus, the authors' findings may not necessarily characterize PEs in other settings.