Employment in health services: long-term trends and projections

Demand for health services is expected to grow in response to the increasing number of elderly people; but growth prospects to 1995 for the industry's wage and salary workers are uncertain because of changes in both the financing and delivery of health care

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Health care has aptly been described as a system in flux.[1] Throughout much of the post-World War II period, U.S. health policy encouraged expansion of the delivery system and of patients' access to it. There was a perceived need for more physicians and hospitals, and strategies were developed to increase the supply. The number of beds in hospitals and nursing homes rose, and the supply of physicians, nurses, and allied health professionals grew very rapidly. Now that cost control has emerged as a dominant concern, this has changed: evolving methods of payment for health services are based on incentives intended to discourage use of costly resources and to foster price competition. Greater emphasis on providing care in the most cost-effective setting is one of the principal trends reshaping this large and important industry.[2] This article explores the potential impact on demand for health services workers of the sweeping changes in industry structure currently underway.

Health care is still delivered in doctors' and dentists' offices, hospitals, and nursing homes, for the most part, but the structure of the industry is changing as financial incentives for providing (and using) health services are transformed. Health maintenance organizations (HMO's) are flourishing and new organizational entities such as urgent care centers, birthing centers, and hospices are taking hold.

The boundary between financing and delivery of health care is becoming less distinct, and vertically integrated systems of care are emerging as providers affiliate with one another, or with hospitals, HMO's, and insurance companies. Additional changes in organizational structure lie ahead, inasmuch as financing is in ferment. The prospective payment system launched by medicare in October 1983 may be modified as evidence of its impact accumulates and other payers are experimenting with cost containment programs of their own.

Yet even as the delivery system changes, equally dramatic shifts are occurring in the composition of the U.S. population. Americans are growing older, creating a need for suitable health, housing, and social services. Moreover, the segment age 85 and above is recording much faster growth than any other age group in the population. In the decade ahead, the increasing number of elderly people, especially those of very advanced age, is expected to heighten demand for hospital, medical, and surgical care; for long-term care services; and for new services, including geriatric assessment, case management, adult day care, and respite care. The effort to provide adequate and appropriate health care for an aging population within the constraints imposed by cost containment is stimulating innovative approaches to

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program design, organization, and financing. With both the scope and structure of health care services delivery in flux, however, it is very difficult to anticipate the future pattern of health services.

Given the growth and aging of the population, advances in medical technology, and public support for high-quality care, there is little doubt that the health services industry will continue to grow over the 1984–95 period that is the focus of this article. However, there is considerable uncertainty as to how rapid future growth will be, and what the employment implications are likely to be. This article, undertaken in connection with the Bureau of Labor Statistics' expanding coverage of the service sector, illustrates the wide range of possibilities. It sets up a series of alternative scenarios based on qualitative judgments about the possible course of events affecting the health services industry and provides projections of industry and occupational employment consistent with those assumptions.

The Bureau has for several decades developed medium-term projections of the U.S. economy under alternative sets of assumptions. The latest set of 1995 projections is presented in four articles in the November 1985 issue of the *Review*.[3] The low-growth, moderate-growth, and high-growth alternatives presented there for all industries reflect alternative fiscal and monetary assumptions, rates of growth of productivity, unemployment rates, or what may be thought of as macro alternatives. This article explores the prospects for a single industry sector, the health services industry, under micro alternatives outlined in exhibit 1.

No attempt was made to quantify the effects of specific assumptions in exhibit 1; rather, they portray service delivery patterns and interrelationships that might reasonably be expected to generate varying levels of demand for health services. The base case projections presented here were taken directly from the moderate-growth projections for the health services industry, while the low- and high-scenario projections were derived from analytical judgment. Projections tied to all three alternative scenarios thus represent a qualitative assessment of the likely effect on industry output and employment of alternative courses of events in the health services industry.

This analysis pertains to wage and salary workers in the health services industry only. Excluded are self-employed and unpaid family workers, on the one hand, and workers employed outside the health sector, on the other. Examples of health professionals excluded from the analysis are (1) physicians, dentists, podiatrists, chiropractors, pharmacists, nurses, physical therapists, speech pathologists and audiologists, and other practitioners who are self-employed; and (2) nurses, nursing aides, dietitians, dental hygienists, social workers, psychologists, occupational therapists, physicians, dentists, and others employed in schools, prisons, residential care facilities, temporary help agencies, and other industry sectors outside health. These exclusions have different effects on the validity of the analysis, depending on the occupation or industry of interest. Only about 1 physician in 4 is self-employed and, as such, excluded from the scope of this study. However, most chiropractors, and many dentists, podiatrists, and optometrists are self-employed, which diminishes the relevance of this analysis for those occupations. Note, however, that self-employed practitioners generally work in one or another of the health services industry sectors, and are subject to many of the same trends as wage and salary workers in those sectors. Confining the analysis to the health services industry limits the ability to generalize the findings, too. Because of differences in industry distribution, the projections cover virtually all radiologic technologists, for example; about 4 of 5 registered nurses; 3 of 5 occupational therapists; but only about 1 of 5 speech pathologists and audiologists, social workers, or psychologists.

Projection highlights

The health services industry is defined according to the 1972 Standard Industrial Classification (SIC), and includes the following:

SIC

801 . . . Offices of physicians
802 . . . Offices of dentists
803 . . . Offices of osteopathic physicians
804 . . . Offices of other health practitioners
805 . . . Nursing and personal care facilities
806 . . . Hospitals
807 . . . Medical and dental laboratories
808 . . . Outpatient care facilities
809 . . . Health and allied services, not elsewhere classified

In 1995, the number of wage and salary jobs in the health services industry is projected to vary from 7.3 to 10.5 million, compared with nearly 7.2 million in 1984. (See table 1.) The low scenario shows a barely perceptible 2-percent increase in employment over the 1984–95 period, stagnation that represents a radical departure from past trends. The base case yields a projected employment increase of 26 percent. This is faster than average growth compared with the economy as a whole, but a significant slowdown by health industry standards. Even the high scenario, a 46-percent increase over 11 years, implies a slower rate of job growth than in the past.

The 1995 alternatives have a more pronounced effect on some health industry sectors than on others. At one extreme, hospital employment is projected to decline by 17 percent under the assumptions of the low scenario, from 4.1 million jobs in 1984 to 3.4 million in 1995. Alternatively, under the assumptions of the high scenario, hospital employment would exceed 5 million in 1995, an increase of 24 percent. Underlying the three projection alternatives are significantly different assumptions about hospitals' response to cost pressures and the keenly competitive health care environment. (See exhibit 1.)

Job growth in offices of physicians is projected to outpace the industry as a whole. Nonetheless, under the low sce-

nario, extensive market penetration by health maintenance organizations (HMO's) and imposition of stringent fee restraints are assumed to produce a marked slowdown in growth in this major industry. Wage and salary employment in offices of physicians is projected to vary from 1.2 to nearly 1.5 million jobs in 1995, compared with 908,000 in 1984.

Projected 1995 employment in nursing and personal care facilities varies from 1.3 to nearly 2.1 million wage and salary jobs, up from 1.1 million in 1984. Markedly different assumptions about future directions in long-term care help explain the wide variation in nursing home growth between the low and high scenarios. Strong demand for home health care, a key assumption of all three scenarios, is the principal reason for projected employment growth in health and allied services, not elsewhere classified.

Occupations concentrated in industries that have widely differing growth prospects exhibit the greatest variation under the alternatives. This is particularly true of occupations located for the most part in hospitals and nursing homes. Employment in hospital-based occupations such as respiratory therapist and surgical technician is projected to decline in the low scenario, but grow at a faster than average rate under assumptions of the high scenario. In the case of nursing aides, projected patterns of industry growth are largely responsible for a decline in employment in the low scenario for 1995, compared with much faster than average growth in the high scenario.

Historical trends

Health care has enjoyed a long period of expansion, with continuous growth in funding of services and programs from both the public and private sectors. National health expenditures have grown rapidly, consuming an increasing proportion of the Nation's resources. The growing share of gross national product (GNP) allocated to health, up from 4.4 percent of current dollar GNP in 1950 to 10.6 percent in 1984, is reflected by many indicators of economic activity—personal consumption expenditures on health care, employment, and payroll expenses.

Before turning to an analysis of possible future trends, we should take a careful look at the past. A number of interrelated factors are responsible for the escalation of spending and the expansion of employment in the industry, but incentives built into the health care financing system itself are singularly important. Increases in private health insurance coverage and the introduction of major public programs, including medicare and medicaid, have encouraged greater use of hospital and nursing home care by making such services affordable to segments of the population previously shut out of the health market by price considerations. Methods of financing have shifted as a result of efforts to broaden access to health care. In 1966, the consumer paid directly for half of all personal health care spending, according to estimates by the Health Care Financing Administration. The other half was financed about equally by insurance and public programs. By 1984, public programs accounted for almost 40 percent of all spending; insurance, 31 percent; and the consumer, 28 percent.[4]

The shift of payment responsibility from the consumer to "third parties" such as government and insurance companies is thought to have made patients and providers alike insensitive to the true cost of treatment and care. Both perceive the price of services to be lower than it really is. New programs, new technologies, and new types of personnel have been added because of perceived clinical benefits, with little concern for the cost implications. However, the prevalence of health insurance, as well as the cost of premiums and extent of coverage, differ greatly by sector. Health insurance and public programs currently provide about 90 percent of all spending for hospital care; 72 percent for physicians' services; and 50 percent for nursing home care.

Methods of financing health care have helped shape medical practice patterns and spurred the rapid diffusion of medical technology.[5] For many years, health insurance has given providers an incentive to apply medical technology,

Table 1. Wage and salary employment in the health services industry, 1984 and three projected 1995 alternatives

[Employment in thousands]

Industry	Actual 1984 employment	Projected 1995 employment			Average annual rate of change						
					Historical				Projected 1984–95		
		Low	Base	High	1972–77	1977–84	1982–84	1972–84	Low	Base	High
Total, health services industry	7,188.7	7,325	9,054	10,535	5.3	3.6	1.8	4.3	0.2	2.1	3.5
Offices of physicians	907.5	1,206	1,313	1,450	7.6	5.0	4.9	6.1	2.6	3.4	4.4
Offices of dentists	425.7	533	551	562	8.8	5.8	5.3	7.0	2.1	2.4	2.6
Offices of osteopathic physicians	[1]29.8	39	44	49	8.1	6.0	5.6	6.9	2.5	3.6	4.6
Offices of other health practitioners	[1]148.1	227	290	356	9.7	11.1	10.6	10.5	4.0	6.3	8.3
Nursing and personal care facilities	1,144.6	1,271	1,650	2,057	7.8	4.2	3.6	5.7	1.0	3.4	5.5
Hospitals	4,078.1	3,401	4,366	5,045	3.8	2.2	−0.8	2.9	−1.7	0.6	2.0
Medical and dental laboratories	113.2	126	135	140	6.1	2.8	1.7	4.1	1.0	1.6	1.9
Outpatient care facilities	190.7	284	390	450	12.7	11.5	9.0	12.0	3.7	6.7	8.1
Health and allied services, not elsewhere classified	[1]151.0	238	315	426	13.9	16.0	20.7	15.1	4.3	7.0	9.9

[1] Unpublished BLS data.

NOTE: "Unpublished data" do not meet publication standards for accuracy and reliability and therefore are not official Bureau estimates.

Exhibit 1. Assumptions underlying various projection scenarios

Factor	Assumptions		
	Low scenario	**Base case**	**High scenario**
Level and distribution of health sector output in 1995	3.0 percent of total private output: $169 billion in 1977 dollars Distribution by sector Sector 140: 47 percent Sector 141: 32 percent Sector 142: 20 percent	3.5 percent of total private output: $200 billion in 1977 dollars Distribution by sector Sector 140: 42 percent Sector 141: 36 percent Sector 142: 22 percent	4.0 percent of total private output: $226 billion in 1977 dollars Distribution by sector Sector 140: 40 percent Sector 141: 36 percent Sector 142: 24 percent
Technology	Same as base case.	Advances that permit complex procedures to be performed on an outpatient basis continue, facilitating shift in delivery of services to nonhospital settings.	Same as base case.
	Technology applied more selectively than in base case.	Advances in diagnostic and treatment techniques continue, fostering greater service intensity (more tests and procedures per patient).	Service intensity somewhat greater than in base case.
	Diffusion of high-cost technologies constrained by restrictive reimbursement policies and hospitals' difficulty in raising capital. Widespread application of technologies that reduce resource utilization.	Rapid diffusion of high-cost technologies continues. Greater effort to develop technologies that reduce resource utilization.	Diffusion of high-cost technologies more rapid than in base case.
Reimbursement	Stringent reimbursement policies established for physician services.	Some tightening of reimbursement for physician services.	Less tightening of reimbursement for physician services than in the base case.
	Stringent constraints imposed on reimbursement for hospital services. Together with HMO expansion, these contribute to reduced demand for inpatient hospital care.	Continued constraints on reimbursement for hospital services, whether through prospective payment or other methods.	Fewer constraints on reimbursement for hospital services than in the base case.
	Stringent constraints on medicare, medicaid, and other third-party reimbursement for nursing home and home health services.	Some added constraints on medicare, medicaid, and other third-party reimbursement for nursing home and home health services.	Fewer constraints on third-party reimbursement for nursing home and home health services than in the base case.
Delivery system:			
Systemwide	Same as base case.	Shift from inpatient to outpatient care continues.	Same as base case.
	Substantial shift away from fee-for-service medicine. HMO's and nonphysician providers account for larger share of office visits for primary care than in the base case.	Moderate shift from fee-for-service medicine to managed care, chiefly because of HMO growth.	Limited shift from fee-for-service medicine to managed care, reflecting slower HMO growth than in base case.

Exhibit 1. Continued—Assumptions underlying various projection scenarios

Factor	Assumptions		
	Low scenario	Base case	High scenario
Delivery system: —continued			
Systemwide	Same as base case.	Some shift in demand for primary care from physicians to other practitioners because of consumer cost sharing and decision making. Contributing factors include wellness and fitness movement; acceptance of nonphysician providers including nurse practitioners, podiatrists, and chiropractors; greater personal responsibility for health, including treatment options.	Same as base case.
	Less increase in demand for elective or nonemergency health services than in the base case.	Moderate increase in demand for health services of an elective or nonemergency nature, such as dental, vision, mental health, counseling, and nutritional services.	Much greater demand for elective or nonemergency services than in the base case because of consumer preference plus changes in insurance coverage and out-of-pocket spending.
	Same as base case.	Nusing home remains principal site for formal long-term care, despite strong growth of home health and community-based programs.	Same as base case.
Hospitals	Occupancy declines sharply, largely because of widespread HMO enrollments and practice patterns that limit hospitalization of HMO subscribers.	Occupancy continues to trend down moderately, then levels out.	Occupancy rises, reflecting less stringent controls on admissions and lengths of stay by HMO's, insurance plans, employers, and other payers.
	Hospitals emphasize inpatient care. Diversification and expansion into outpatient and community-based services and programs inhibited by severe problems in capital formation. Inability to compensate for reduced demand for inpatient care forces some hospitals to cut back or close altogether.	Hospitals provide mix of inpatient and outpatient care. Diversify and expand into nontraditional areas including home health, hospice, nursing home, rehabilitation, alcohol treatment, occupational health and employee assistance, health promotion and wellness, birthing centers, and outpatient surgery. Addition of new services enables hospitals to compensate in part for reduced demand for inpatient care.	Hospitals provide mix of inpatient and outpatient care, and many offer such amenities as luxury suites and gourmet meals. Diversify and expand into nontraditional areas of patient care. Acceleration of trend toward specialization, joint ventures, multihospital networks. Hospitals compete effectively with other providers for outpatients and new sources of revenue.
	Same as base case.	Techniques for managing patient flow, monitoring physician practice patterns, and achieving staffing efficiences are implemented.	Same as base case.
Nursing homes	Bed supply severely constrained by certificate-of-need regulations and investor uncertainties about the nursing home market.	Bed supply increases as certificate-of-need constraints are lifted and investors take a more favorable view of industry profitability.	Bed supply increases substantially as investors take a favorable view of private pay patients' ability to support such expansion.

Exhibit 1. Continued—Assumptions underlying various projection scenarios

Factor	Assumptions		
	Low scenario	**Base case**	**High scenario**
Delivery system: —continued			
Physicians	Fee-for-service medicine diminishes in importance. Greater standardization of medical practice as physician services predominantly provided through formal organizations or managed care systems such as HMO's, which establish guidelines for ordering of tests, procedures, and hospital stays.	Fee-for-service medicine continues to predominate despite HMO expansion and growth in preferred provider arrangements.	Fee-for-service medicine flourishes. HMO expansion and growth in preferred provider arrangements is less than in the base case.
Staffing:			
Offices of physicians	Same as base case.	Trends toward group practice, advances in technology, and increased case-mix complexity assumed to produce larger and more diverse medical office staffs. As more nurses, clinical laboratory personnel, radiologic technologists, medical assistants, and others hired to assist with tests and procedures, job growth for clinical support staff expected to outpace that for physicians, and for the industry as a whole.	Same as base case.
	Same as base case.	Office automation, plus availability of software tailored for medical office use, assumed to generate productivity gains and somewhat slower job growth for secretaries, typists, and other clerical staff than for the industry as a whole.	Same as base case.
Offices of dentists	Same as base case.	Little change in use of hygienists, assistants, auxiliary personnel. Trend toward group practice and retail dentistry helps sustain widespread utilization of dental auxiliaries.	Same as base case.
Offices of other health practitioners	Same as base case.	Staffing patterns remain relatively stable because establishment size is assumed to stay small. Among practitioners, job growth assumed to be very rapid in fields where public and professional acceptance of private practice, and lifting of legal and reimbursement restrictions, is most recent. More moderate growth among established practitioners including chiropractors, optometrists, and podiatrists.	Same as base case.

Exhibit 1. Continued—Assumptions underlying various projection scenarios

Factor	Assumptions		
	Low scenario	Base case	High scenario
Staffing: —continued			
Nursing homes	Same as base case.	Efforts to streamline operations assumed to result in joint purchasing and other shared services; more use of computers in clinical, financial, and administrative areas; and smaller proportion of staff in clerical, food service, and housekeeping jobs.	Same as base case.
	Same as base case.	Case-mix assumed to include larger proportion of severely impaired patients, notably Alzheimer's and other chronic "heavy-care" patients, necessitating larger nursing staff.	Same as base case.
	Same as base case.	Increased number of posthospital patients requiring nasogastric feeding, ventilator support, and other advanced nursing skills assumed to produce somewhat greater use of licensed nurses.	Same as base case.
			Greater reliance on private pay patients than in the base case assumed to produce staff changes aimed at extending range of services and improving quality of care; more professionals on staff, notably RN's and LPN's, therapists, physicians, pharmacists, social workers, and activity directors.
Hospitals	Same as base case.	Emphasis on management techniques to schedule patients, procedures, and staff; automated systems to handle clinical, financial, and administrative records; contract services in areas including food service, housekeeping, and clinical laboratory; shared service arrangements in purchasing, laundry, materials warehousing, and computer support.	Same as base case.
	Same as base case.	Larger proportion of hospital staff in professional, managerial, and clinical jobs; fewer in clerical, cleaning and housekeeping, protective service, and other support occupations.	Same as base case.

Exhibit 1. Continued—Assumptions underlying various projection scenarios

Factor	Assumptions		
	Low scenario	Base case	High scenario
Hospitals —continued		Emphasis on identifying new markets and adding new programs and services assumed to contribute to larger proportion of social workers, registered nurses, and therapists; more marketing and public relations specialists as well.	Same as base case.
	Same as base case.	Changes in mix of nursing staff: substantially greater use of RN's, less reliance on licensed practical nurses and aides.	Same as base case.

whether in the form of "little ticket items" such as laboratory tests and X-rays, or costly high-tech procedures such as coronary bypass surgery or magnetic resonance scans. Despite recent changes, fee schedules continue to reward physicians more generously for performing tests and procedures than for providing "cognitive services" such as asking questions, listening, and counseling. Extensive ordering of tests and procedures has traditionally been covered by health insurance, contributing to the increasing diffusion of both old and new technologies.[6]

In addition to the role of insurance, other elements have contributed to health sector expansion. Among them are population growth; rising personal and family incomes; public policies designed to support medical research and expand the supply of health care facilities and personnel; advances in scientific knowledge that result in medical intervention for conditions previously undiagnosed or regarded as untreatable; technological developments that foster the use of sophisticated and expensive medical equipment; and practice patterns that encourage referral to medical specialists and extensive use of costly, high-tech procedures.

Historically, only a small share of total increases in health care outlays can be attributed directly to population aging. But in the future, upward shifts in the age structure are expected to have an effect on health care outlays, particularly those for inpatient hospital and nursing home care.[7] Potential implications of projected growth in the elderly population for health services demand are discussed later, in the section on alternative scenarios.

Output trends. Historical data on the real value of industry output underscore the dramatic expansion of the health sector over the past 25 years. Table 2 documents year-to-year changes since 1960 in the real value of industry output for the total private economy and for the health sector as defined in the BLS economic growth model.[8] In the economic growth system, output is measured as gross domestic output or duplicated output. Health sector output includes total expenditures for products and services of physicians, dentists, and other practitioners such as chiropractors and podiatrists; expenditures for care in private hospitals and nursing homes; purchases of medical and dental laboratory services; premiums paid to health maintenance organizations; and expenditures for services delivered by home health agencies and outpatient care facilities.[9]

Since 1960, growth in health sector output has been sizable and relatively stable compared with total output growth. Despite price increases that have been much higher than the average for the economy as a whole, the health

Table 2. Output, health sector and total private economy, 1960–84

Year	Output				Health sector output as a percent of total output
	Total private economy		Health sector[1]		
	Millions of 1977 dollars	Annual percent change	Millions of 1977 dollars	Annual percent change	
1960	$1,910,951	–	$ 38,021	–	2.0
1961	1,948,379	1.96	39,365	3.5	2.0
1962	2,051,418	5.29	41,893	6.4	2.0
1963	2,150,199	4.82	44,087	5.2	2.1
1964	2,251,433	4.71	49,083	11.3	2.2
1965	2,238,384	5.91	51,133	4.2	2.1
1966	2,510,818	5.30	53,390	4.4	2.1
1967	2,570,789	2.39	57,528	7.8	2.2
1968	2,693,748	4.74	62,113	8.0	2.3
1969	2,776,735	3.08	66,931	7.8	2.4
1970	2,753,283	−0.84	72,427	8.2	2.6
1971	2,847,304	3.41	77,767	7.4	2.7
1972	3,037,923	6.69	82,794	6.5	2.7
1973	3,204,583	5.49	89,058	7.6	2.8
1974	3,161,930	−1.33	91,542	2.8	2.9
1975	3,051,044	−3.51	98,573	7.7	3.2
1976	3,281,891	7.57	102,839	4.3	3.1
1977	3,455,167	5.31	108,136	5.2	3.1
1978	3,620,496	4.78	112,855	4.4	3.1
1979	3,733,089	3.11	116,925	3.6	3.1
1980	3,640,248	−2.49	121,843	4.2	3.3
1981	3,698,255	1.59	126,304	3.7	3.5
1982	3,574,329	−3.35	130,462	3.3	3.6
1983	3,748,177	4.86	134,826	3.3	3.6
1984	4,085,312	8.99	141,174	4.7	3.5

[1] Economic growth sectors 140 (Doctors' and dentists' offices), 141 (Hospitals), and 142 (Medical services, not elsewhere classified). Data include veterinary services, exclude offices of optometrists.

sector averaged a 5.6-percent annual gain in real output during 1960–84, compared with a 3.3-percent rise in real GNP. Increases in health sector output were greatest in the decade following the 1965 enactment of medicare and medicaid, averaging 7.2 percent a year from 1965 to 1973.

Faster growth in health output than in total private output is responsible for the increasing ratio depicted in chart 1. From 2.0 percent in 1960, the health sector's share of total real output climbed to 3.6 percent in 1982. The drop to 3.5 percent in 1984 shows the effect on this statistic of a vigorously rebounding economy.

Employment trends. Along with a rise in demand for the output of the health sector, employment has grown at a very rapid pace. Health sector employment averaged 5.9-percent annual growth during 1960–84—nearly three times the rate of job growth for the private economy as a whole. Almost 32 million new wage and salary jobs were created in the private economy and of these, nearly 4.6 million or 14 percent, were health sector jobs. Health sector employment has exhibited a remarkably stable pattern of growth for more than two decades, as table 3 shows, and annual gains have consistently outstripped those posted for the total economy. Only twice in the 25 years has job growth in health failed to outpace economywide growth—in 1978 and again in 1984. The health sector's share of wage and salary employment in the private economy has more than doubled as a result, rising from 3.1 to 7.4 percent between 1960 and 1984.

Hospitals have dominated the health care system for decades. From a technological perspective, inpatient hospital care is the cornerstone of our system for delivering complex, acute care services. The hospital is the "workshop" for most physicians and the place where most health professionals receive their clinical training. From an employment perspective, hospitals hire the majority of health industry workers (4.1 of 7.2 million in 1984) and provided more than 40 percent of the 2.8 million new jobs created in the industry between 1972 and 1984. (See table 4.)[10]

From 1972–1982, hospitals posted an average annual job gain of 3.6 percent. During this period, outpatient and clinic care grew—restraining demand for inpatient services—and "service intensity" replaced bed capacity as the driving force behind industry expansion. Service intensity refers to the quantity and complexity of services provided per admission. For example, a cancer patient may require 19 lab tests, 18 pharmacy prescriptions, 3 radiology procedures, and 1 surgical procedure per admission. Contributing to the growth in hospital service intensity throughout the 1970's were the quickening pace of technological advance, changes in treatment approach, and comprehensive insurance coverage coupled with widespread use of cost-based reimbursement.

Gains in the number of tests and procedures per admission more than offset the slowdown in inpatient days during the 1970's, a slowdown caused by shorter hospital stays and growing substitution of outpatient for inpatient services. Outpatient visits to community hospitals rose by 21 percent between 1973 and 1983, compared with a 14-percent increase in inpatient admissions.[11] Hospital employment grew 38 percent over the same period, largely because of significant growth in laboratory, diagnostic, surgical, and other services rendered per patient day.

Employment in offices of physicians and osteopathic physicians rose more than twice as fast as hospital employment during 1972–84. Among the factors contributing to rapid growth over the entire period were substantial increases in the supply of practitioners, widespread insurance coverage for medical and surgical care, greater service intensity, technological developments that permitted substitution of ambulatory services for inpatient hospital care, and emphasis on the use of nurses, medical assistants, and other support staff to extend the physician's productivity. The aging of the population also contributed to job growth inasmuch as both the number of physician visits per capita and intensity of services per visit are relatively higher for the elderly. Some of the growth registered in offices of physicians and osteopathic physicians is a statistical artifact, a consequence of practitioners' increasing propensity to incorporate for tax and other business reasons. The resultant shift in class-of-worker status (from self-employed practitioners, who are not included in these employment estimates, to wage and salary workers, who are) affects the trend data displayed in table 4. However, it is impossible to quantify

Table 3. Employment, health sector and total private economy, 1960–84

Year	Wage and salary employment				Health sector employment as a percent of total private employment
	Total private economy		Health sectors[1]		
	Employment in thousands	Annual percent change	Employment in thousands	Annual percent change	
1960	50,785	–	1,568	–	3.1
1961	50,410	−0.74	1,660	5.9	3.3
1962	51,410	2.19	1,760	6.0	3.4
1963	52,318	1.56	1,857	5.5	3.5
1964	53,534	2.32	1,983	6.8	3.7
1965	55,390	3.47	2,100	5.9	3.8
1966	57,677	4.13	2,225	6.0	3.9
1967	58,939	2.19	2,454	10.3	4.2
1968	60,550	2.73	2,659	8.4	4.4
1969	62,513	3.24	2,883	8.4	4.6
1970	62,583	0.11	3,071	6.6	4.9
1971	62,539	−0.07	3,254	6.0	5.2
1972	64,507	3.15	3,417	5.0	5.3
1973	67,180	4.14	3,648	6.8	5.4
1974	68,235	1.57	3,896	6.8	5.7
1975	66,317	−2.81	4,144	6.4	6.2
1976	68,587	3.42	4,364	5.3	6.4
1977	71,438	4.16	4,599	5.4	6.4
1978	75,207	5.28	4,808	4.5	6.4
1979	77,971	3.68	5,013	4.3	6.4
1980	78,176	0.26	5,302	5.8	6.8
1981	79,173	1.28	5,596	5.5	7.1
1982	77,849	−1.67	5,846	4.5	7.5
1983	78,500	0.84	6,025	3.1	7.7
1984	82,593	5.21	6,141	1.9	7.4

[1] Economic growth sectors 140 (Doctors' and dentists' offices), 141 (Hospitals), and 142 (Medical services, not elsewhere classified). Data include veterinary services, exclude offices of optometrists.

the impact of this factor on industry growth. Physicians currently account for approximately 19 percent of wage and salary employment in offices of physicians and a somewhat smaller percentage of employment in offices of osteopathic physicians.

Historically, employment has risen much faster in nursing and personal care homes than in hospitals. Increased medicaid coverage for nursing home care, State policies of transferring patients from mental hospitals to nursing homes, growth in real incomes, and an aging population help explain the very rapid rise in the industry's employment during the early 1970's.[12] Nursing home employment increased at an average annual rate of 7.8 percent from 1972 to 1977, then slowed as numerous States imposed controls on nursing home construction and otherwise sought to limit medicaid outlays. Additions to nursing home capacity have not kept up with population growth in recent years, and the disparity may grow, according to industry observers. Together with low medicaid reimbursement rates in many States, changes in tax laws have made nursing home construction less attractive to investors.

There has been little change in recent years in the way nursing home care is financed: about half of the money comes from patients and their families, and the rest comes from public programs, of which medicaid is by far the most important. Because additional nursing home beds may generate higher levels of medicaid spending, States have an interest in curtailing growth. Some have done so by cutting reimbursement, implementing stringent certificate-of-need policies, and instituting moratoria on new nursing home construction.[13]

Changes in the industry's structure have occurred since Federal subsidies for nursing home care began in 1956, under the Old Age Assistance program. Changes include an increasingly sophisticated medical orientation in nursing home care, a shift from government-owned to proprietary homes, and, more recently, a growing concentration of ownership in multifacility chains. The more sophisticated medical orientation reflects medicaid requirements for covered care, and State as well as Federal efforts to improve quality by enforcing staffing standards. Both skilled and intermediate levels of medicaid-covered care require more nursing involvement than the small old-age homes from which the industry evolved.[14]

The increasing professionalism of nursing home care, over the decade of the 1970's, produced an increase in staff-patient ratios. These ratios interact with the bed supply (that is, number of residents) to determine the rate of employment growth. According to the National Center for Health Statistics, the number of full-time equivalent employees in facilities with 25 beds or more increased 98 percent from 1969 to 1980, while the number of nursing

Chart 1. Health sector output as a percentage of total private output, 1960-1984, and projected 1985

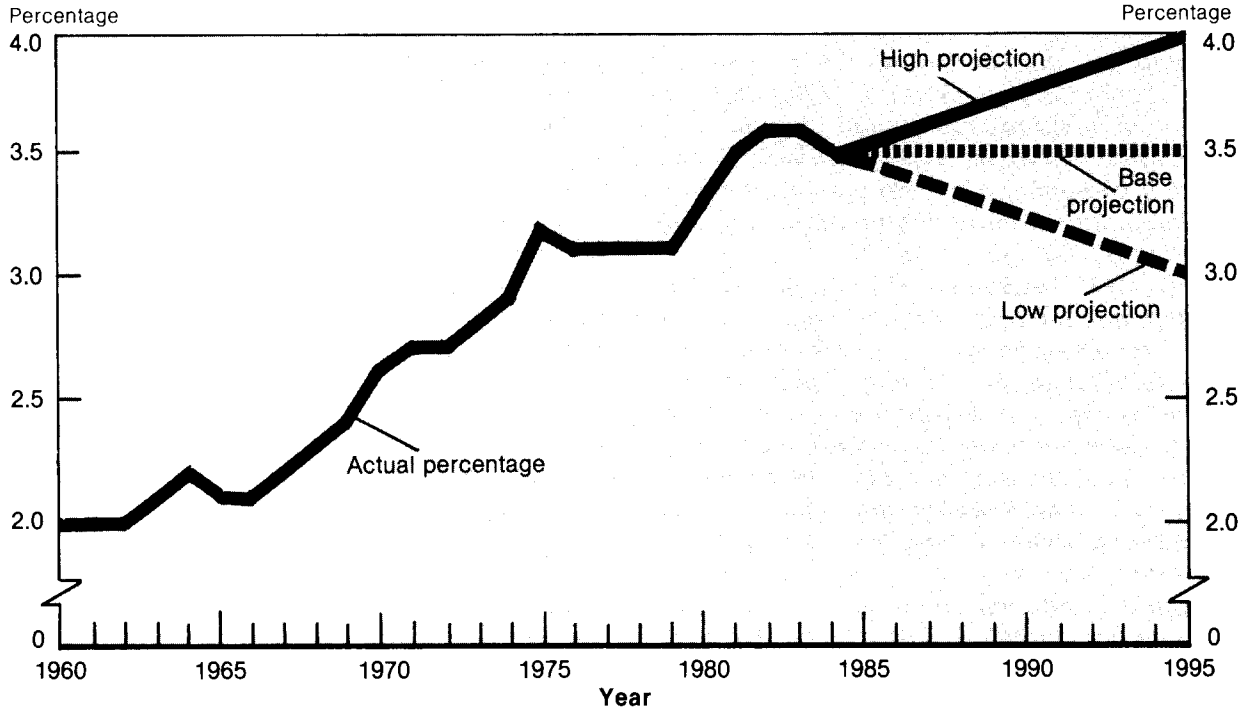

Table 4. Wage and salary employment in the health services industry, 1972–84

[Employment in thousands]

Year	Total, all health industries	Offices of physicians	Offices of dentists	Offices of osteopaths[2]	Offices of other practitioners[2]	Nursing and personal care facilities	Hospitals[1]	Medical and dental laboratories	Outpatient care facilities	Health and allied services, not elsewhere classified[2]
1972	4,338.1	448.1	188.3	13.4	44.6	591.2	2,906.4	69.6	48.8	27.8
1973	4,590.3	497.5	206.3	14.9	50.5	659.0	3,000.8	75.4	54.6	31.4
1974	4,853.0	543.3	227.4	15.9	56.0	708.1	3,126.4	79.5	61.0	35.4
1975	5,125.5	580.5	247.4	16.7	60.2	759.3	3,265.4	84.2	70.4	41.3
1976	5,360.5	613.7	266.2	18.1	64.6	809.1	3,373.3	89.9	78.9	46.7
1977	5,615.7	645.9	286.6	19.8	70.9	860.0	3,497.0	93.5	88.9	53.2
1978	5,867.1	680.6	302.3	21.2	78.5	910.6	3,613.7	99.1	100.4	60.8
1979	6,101.1	716.8	322.0	22.6	88.0	950.8	3,716.7	102.2	113.0	69.0
1980	6,411.5	750.0	341.3	24.1	96.4	996.6	3,883.7	104.7	132.7	81.8
1981	6,699.2	786.8	359.9	25.1	108.9	1,028.9	4,041.2	107.5	149.2	91.7
1982	6,941.1	825.0	383.9	26.7	121.0	1,067.1	4,143.8	109.5	160.4	103.7
1983	7,103.0	867.2	406.7	28.0	134.6	1,106.6	4,151.5	111.6	171.9	125.1
1984	7,188.7	907.5	425.7	29.8	148.1	1,144.6	4,078.1	113.2	190.7	151.0
	Average annual rate of change (in percent)									
1972–77	6.7	7.6	8.8	8.1	9.7	7.8	3.8	6.1	12.7	13.9
1977–82	4.3	5.0	8.2	6.2	11.3	4.4	3.5	3.2	12.5	14.3
1982–84	1.8	4.9	5.3	5.6	10.6	3.6	−0.1	1.7	9.0	20.7
1972–84	4.3	6.1	7.0	6.9	10.5	5.7	2.9	4.1	12.0	15.1

[1] SIC 806 plus State and local government hospitals. Data exclude Federal Government hospitals.

[2] Unpublished BLS data.

NOTE: "Unpublished data" do not meet publication standards for accuracy and reliability and therefore are not official BLS estimates.

home residents rose by 75 percent. The number of full-time equivalent employees per 100 beds rose from 55.0 in 1969 to 62.9 in 1980.[15] However, the overall increase in the staff-to-bed ratio masks significant variation among facilities. Staffing ratios vary according to such factors as degree of illness, payment source, facility size, certification, ownership, and commitment to quality care.

Three industries experienced exceptionally rapid job growth over the 1972–84 period. The industries and their average annual employment gains are as follows: offices of other health practitioners (10 percent), outpatient care facilities (12 percent), and health and allied services, not elsewhere classified (15 percent).

Offices of other health practitioners is a diverse industry that includes a wide variety of health professionals in solo or group practice: chiropractors, optometrists, podiatrists, nurse practitioners, midwives, physical therapists, occupational therapists, speech pathologists and audiologists, dietitians and nutritionists, social workers, and psychologists. No less diverse is the outpatient care facilities industry, which includes HMO's, community mental health centers, family planning clinics, urgent care centers, outpatient surgical centers, birthing centers, and freestanding hospices. Health and allied services, not elsewhere classified, is a relatively homogeneous industry, comprising home health agencies and blood banks.

Job growth in these settings is consistent with steadily increasing acceptance of nonphysician providers, together with the gradual shift away from the hospital as the exclusive site of complex health care. Throughout the decade of the 1970's, ambulatory care alternatives became more important. Technological developments made it possible to provide increasingly sophisticated care on an outpatient basis, while changes in insurance coverage and benefits made such care financially attractive to health care consumers. The pace of the shift from inpatient to outpatient care has accelerated dramatically in recent years because of the emphasis on providing cost-effective health services.

Recent developments

Increased public and private sector emphasis on health care cost containment is the most important development in recent years. Health economists and policymakers had long been concerned about rapidly rising health care expenditures, but it was not until the early 1980's that the combined impact of inflation, recession, soaring outlays for employee health benefits, threatened medicare insolvency, and State fiscal crises produced significant action by business, labor, and government. The hospital payment system mandated by the Social Security Amendments of 1983, medicare's prospective payment legislation, is the leading example of such action.

Medicare's system links payment for hospital inpatient services to rates for each of 467 diagnosis-related groups (DRG's). Hospitals know in advance how much medicare will pay for the treatment of a patient with a particular diagnosis. Under the previous cost-based retrospective system, hospitals were reimbursed for whatever they spent. Because hospitals now bear the loss if the cost of treatment exceeds the fixed medicare payment, it is in their interest to be selective about the patients they admit, scrutinize tests and procedures, discharge patients as soon as possible, and encourage greater use of outpatient services. Not surprisingly, hospitals have responded to the new system with

programs for managing admissions and patient flow, monitoring physician practice patterns, and controlling operating costs.

Cost containment initiatives figure prominently among the reasons for a recent decline in hospital employment. Average annual employment in private, State, and local government hospitals stood at 4,040,900 in 1985, 110,600 fewer jobs than in the peak year of 1983. More than 73,000 hospital jobs disappeared in 1984, and 37,000 more in 1985. While no single factor can fully explain the loss of hospital jobs, management initiatives to reduce labor costs (about 50 percent of community hospitals' operating budgets) through such belt-tightening measures as staff cuts, hiring freezes, greater use of part-time and on-call staff, and a shift to contract services are partly responsible. However, a drop in hospital utilization—notably inpatient admissions, staffed beds, and length of stay—is the underlying factor.

Data from the American Hospital Association indicate a shift in utilization since the beginning of 1983: shorter hospital stays by elderly patients and a sharp decline in admissions of patients under age 65.[16] The average length-of-stay of patients age 65 and above fell from 11.1 to 10.1 days between 1977 and 1982, then dropped to 8.8 days at the end of 1984. Shorter hospital stays for elderly patients appear to be the direct result of incentives to hospitals in the DRG system, although technology and changing medical practices may be responsible as well. The use of lasers, for example, has reduced recovery periods and lengths-of-stay for certain types of eye surgery. The availability of advanced techniques for delivering antibiotic and nutrition therapy at home may also speed discharge.

The reasons for falling admissions of patients under age 65 are not well understood.[17] The most likely causes are utilization review and the expanded use of consumer cost-sharing features built into employee benefit plans, improved health insurance coverage for ambulatory care and the growth of alternative care settings, increased public awareness of the importance of avoiding hospitalization when possible, plus reduced access to care for the poor. Limitations on medicaid program eligibility and increased financial barriers to serving the uninsured may be holding down hospital use by these groups.[18] In addition, economic weakness in regions with heavy concentrations of industries experiencing poor recovery may be an element.[19]

Hospitals confronted with reduced demand for inpatient services have begun to develop a business strategy[20] that emphasizes joint ventures, mergers, specialization, and introduction of new programs and services. Home health care is the alternative service offered by more hospitals than any other, according to several recent surveys.[21] Other services being implemented by hospital administrators include hospice care, nursing home units, rehabilitation, alcohol treatment, occupational health and employee assistance, birthing centers, outpatient surgery, cancer screening, and geriatric assessment. A number of hospitals have set up wellness and fitness centers that offer medical and physiological testing, assessment of lifestyle-related health risks, health education, and sports medicine.

Other changes, too, are occurring in the health care environment. One of the most striking is the rise in HMO enrollments, up from 10 to 21 million subscribers between 1981 and 1985.[22] Industry observers expect continued rapid growth. There is a wide range of opinion on the extent to which HMO's will penetrate traditional health-care markets (many analysts expect HMO enrollment to peak at 30 to 35 million by 1995, but some estimates are considerably higher).

HMO's are prepaid health insurance plans designed to deliver affordable and comprehensive medical services to enrolled members. Starting from the premise that physicians govern a substantial portion of total health spending by virtue of their authority to hospitalize, order batteries of tests, and so forth, HMO's and other systems of "managed care" seek to control utilization by influencing physicians' ordering behavior. Comparative studies have found that HMO enrollees pay 10 to 40 percent less than those enrolled in fee-for-service health insurance plans. In addition, the hospitalization rate for people enrolled in HMO's is considerably below the rate for those enrolled in traditional fee-for-service plans. This is attributed to HMO emphasis on preventive health care, broad ambulatory coverage, multispecialty staff, and risk-sharing by HMO physicians, who are offered incentives to reduce unnecessary hospitalization.

There are three types of HMO's. The first, called a "staff model" HMO, delivers medical services at one location or more, using physicians directly employed by the organization. The second kind, known as an "individual practice association" (IPA), makes contractual arrangements with doctors in private practice who treat HMO members in their own offices. The third, the "group" or "network" HMO, involves contractual arrangements between the HMO and two group medical practices or more.

Long-term care constitutes the third major area of change in recent years. Heightened awareness of the "greying" of America has focused attention on the distinctive needs of individuals who are disabled, chronically ill, or functionally impaired. By no means are all of these people elderly. Nonetheless, the need for long-term care services is strongly associated with age. Elderly persons, by virtue of their high risk of disabling conditions, are the primary recipients of long-term care services, whether formal or informal. In recent years, both the number and proportion of the population 65 and older have increased significantly (table 5), a demographic trend of major proportions that will continue well into the next century. Within the 1984–95 timeframe that is the focus of this article, projected growth in the number of persons 85 and above merits special attention because of the implications for long-term care, in general, and for the nursing home sector in particular.

At advanced ages, there is a high risk of chronic disease, limitations in mobility and ability to perform everyday activities, and the loss of spouse or other family helpers. The following tabulation, based on 1977 data,[23] reveals the sharp increase in nursing home use after age 85:

	Percent of age group residing in nursing homes	
	Men	*Women*
All age groups	0.4	0.8
Under 65 years	0.1	0.1
65 years and over	3.0	5.9
65 to 74 years	1.3	1.6
75 to 84 years	4.0	7.6
85 and over	17.8	26.2

Utilization rates that take marital status into account underscore the role of informal social supports in precipitating institutionalization, on the one hand, or delaying it, on the other. Elderly people with serious health problems are more likely to enter a nursing home if they are widowed or single than if they are married. Further, it appears that substantially greater use of nursing homes by women than by men is not simply because of women's greater longevity, but also reflects their greater likelihood of becoming widowed.

Traditional health and social service providers have begun to modify their programs to respond more effectively to the service needs of the elderly. Many hospitals, for example, regard the elderly as a market opportunity and are expanding their home health and community outreach programs accordingly.[24] Family service agencies, too, are revamping their offerings as clients' needs change. A broad range of long-term care initiatives has been launched in recent years, many with foundation support or on a demonstration basis. Most of these seek to improve community-based services, strengthening the network of formal and informal care givers whose services permit people with disabilities to remain at home. Community-based long-term care is likely to play a more prominent role in 1995 than it does today, because of consumer preference and provider flexibility. However, the potential impact on the nursing home industry is difficult to assess, for it is unclear to what extent community-based care complements, rather than substitutes for, institutional care.

Table 5. Growth of the older population, actual and projected, 1950–95

[In thousands]

Age group	1950	1960	1970	1980	1984	1990	1995
All ages	150,697	179,323	203,302	226,505	236,416	249,657	259,559
Under 65	138,427	162,763	183,322	200,960	208,431	217,960	225,672
65 years and over	12,270	16,560	19,980	25,545	27,985	31,697	33,887
65–74 years	8,415	10,997	12,447	15,578	16,596	18,035	18,503
75–84 years	3,278	4,633	6,124	7,727	8,793	10,349	11,311
85 years and over	577	929	1,409	2,240	2,596	3,313	4,073
	Percent distribution						
All ages	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Under 65	91.9	90.8	90.2	88.7	88.2	87.3	86.9
65 years and over	8.1	9.2	9.8	11.3	11.3	12.7	13.1
65–74 years	5.6	6.1	6.1	6.9	7.0	7.2	7.1
75–84 years	2.2	2.6	3.0	3.4	3.7	4.1	4.4
85 years and over	.4	.5	.7	1.0	1.1	1.3	1.6

NOTE: 1950–80 are decennial census data; 1984–95 are middle-series estimates and projections as of July 1.

SOURCE: U.S. Bureau of the Census.

Alternative scenarios

The size and structure of the health industry in 1995 will be shaped by events that are still unfolding. Despite considerable uncertainty about the future, a number of relevant factors can be identified and assessed. This section begins with a discussion of three such factors: the impact on overall demand for health services of HMO expansion and changes in physician reimbursement; prospects for hospital utilization; and directions in long-term care financing. Qualitative assumptions consistent with each of three growth scenarios (low, base, and high) are presented in exhibit 1. The section then explains how the growth scenarios were translated into alternative projections of health industry employment in 1995.

A shift from traditional, fee-for-service medicine to systems of managed care is underway. Indicative of this trend are the emergence and very rapid growth of such organizations as HMO's, IPA's, preferred provider arrangements, and medicaid "gatekeeping" schemes in which primary-care physicians control referral to specialists. Systems such as these limit consumer choice and set guidelines for physicians and other practitioners in order to gain greater control over service utilization—for example, lab tests, X-rays, and hospital admissions. According to one estimate, patient use of traditional fee-for-service medicine, an estimated 94 percent in 1982, could drop to 70 percent by 1987.[25] Depending on the extent to which managed care systems replace fee-for-service medicine by 1995, practice patterns, establishment size, and staffing in offices of physicians could change. Furthermore, the shift to managed care may reduce future demand for hospital care. It is generally agreed that the fee-for-service method of paying physicians encourages more hospitalization and greater use of tests and procedures.

Much will depend on future developments in health care financing, including changes in reimbursement patterns and regulation of physicians' fees. Reform of the medicare payment system for physician services lies ahead, with extension of prospective payment to physicians being one of a number of options under consideration. Each of the three growth scenarios embodies a different set of assumptions about the future role of fee-for-service medicine, on the one hand, and constraints on physician reimbursement, on the other. (See exhibit 1.)

As noted, hospital utilization is down sharply, according to such standard measures as admissions, inpatient days, and average length of stay. Recent reductions in hospital use

are attributed to rising HMO enrollments, greater consumer cost sharing, and stricter utilization review procedures, as well as to medicare's prospective payment system. However, whether the decline will continue over the long run is questionable.[26] For one thing, technological progress could lead to greater—rather than less—hospitalization as medical possibilities are enhanced.

The aging of the population will put pressure on demand for hospital care during the next 10 years unless health status, practice patterns, or both, change a great deal. Hospital use is significantly greater for the elderly than for persons under 65; elderly people are hospitalized more frequently and stay there longer. In addition, the rapidly growing population 85 years and above uses twice as many hospital days per capita as persons aged 65 to 74 years. One reason for this is the presence of multiple health problems in the very old, which produce much longer hospital stays. Another is a dramatic increase in the number of surgical procedures performed on elderly patients, as technological advances continue to make surgery less risky. The growing importance of outpatient surgery could have a dampening effect on demand for inpatient hospital care, depending on future patterns in outpatient surgery on the elderly.

Also contributing to uncertainty about future trends in hospital use is the issue of length of stay. Recent decreases have been dramatic, but will they continue? We may be approaching the limit for shortening the hospital stays of elderly patients, who account for approximately 40 percent of all hospital days of care. Among patients under 65, the proportion in HMO's—together with hospitalization guidelines adopted by HMO's—will play a significant role in future length-of-stay trends. Because so many factors are at work, the three growth scenarios reflect widely varying assumptions about the level and nature of future demand for hospital care. (See exhibit 1.)

What has been termed the "nursing home dilemma" centers on the conflict between the demographics of population aging, on the one hand, and the economics of the nursing home industry, on the other.[27] The number of people seeking admission to nursing homes can be expected to continue to rise for a number of reasons, but very rapid growth in the population over the age of 85 is the key factor. Americans age 85 or above are projected to number 4.1 million in 1995, up from 2.6 million in 1984, as table 5 shows. This represents a 57-percent gain, markedly faster growth than that projected for any other age group.

The prospect of explosive growth in the population needing long-term care is widely acknowledged, but future directions in financing and service delivery are cloudy. All payers—Federal, State, and private—are reluctant to expand benefits or push for significant improvements in long-term care financing because of concern about "uncontrollable" costs. Uncertainty about the potential costs of community-based long-term care programs, together with concern about increasing expenditures under medicaid and other public programs that currently finance much institutional long-term care, have shifted attention to private sector initiatives that might relieve fiscal pressures on public programs and, at the same time, improve the elderly's ability to finance long-term care. Some of the options that have emerged in recent years as feasible alternatives for financing long-term care include private health insurance, health care Individual Retirement Accounts, life care communities, and home equity conversion.[28]

Interest in private long-term care insurance appears to be mounting.[29] This method of financing long-term care is backed by the American Health Care Association and the American Association of Retired Persons, among others, and many States—faced with mounting medicaid expenditures for nursing home care—are expressing interest in it. Private insurance for long-term care has been suggested not only because of growing fiscal constraints on public program expenditures, but more basically because private insurance coverage is currently available for a wide variety of health care services, but it is generally not available for long-term care services or for the costs associated with chronic illnesses such as Alzheimer's disease. Tremendous growth would be necessary before private long-term care insurance covered a substantial portion of nursing home costs; currently, such insurance pays about 1 percent. However, if significant developments occur in this area it could dramatically alter the long-term care picture in the future.

Underlying the base case, as exhibit 1 shows, is the assumption that demographic pressures will force some resolution of the financing, reimbursement, and certificate-of-need issues that have slowed nursing home growth in recent years. The low scenario assumes that uncertainty will continue to prevail, discouraging investment and putting a brake on industry expansion despite very rapid growth in the elderly population. The high scenario makes relatively optimistic assumptions about public and private spending for institutional long-term care.

Moving from the qualitative assumptions summarized in exhibit 1 to alternative projections of industry and occupational employment was a procedure that encompassed several steps. As the first step, data points above and below the base case level were selected to represent projected output under high and low scenario conditions. The output projections were then used, first in conjunction with the Bureau's input-output model and then with its industry-occupational matrix, to generate alternative projections of wage and salary employment by detailed health industry and occupation. The five steps that make up the projections process are summarized below.

1. Set alternative levels of projected output for the private health sector by projecting the ratio of health sector to total private sector output. The moderate-growth projection (3.5 percent in 1995) was chosen for the base case; data points above (4.0 percent) and below (3.0 percent) the base case were selected to represent the high and low scenarios. This determined the total dollar value

of goods and services that would be produced by practitioners and establishments in the economic growth sectors (doctors' and dentists' offices, hospitals, and medical services, not elsewhere classified) under varying assumptions about health system performance in 1995.

2. Set alternative levels of projected output for each of the three economic growth health sectors by varying the distribution of total health sector output.

3. Derive estimates of projected employment for each of the detailed economic growth sectors. That is, estimate the number of wage and salary workers required to produce the projected level of output established in step 2.

4. Translate projected employment in the economic growth sectors into industries categorized by Standard Industrial Classification and adjust these data to include State and local hospitals and offices of optometrists and exclude veterinary services, so these data conform to the configuration of the National Industry-Occupational Matrix.[30]

5. Convert the industry employment data developed in step 4 into projections of occupational employment by applying staffing patterns consistent with each of the alternative scenarios.

Output and employment

In 1984, services produced by the private health sector were valued at more than $141 billion in constant dollars, or 3.5 percent of the Nation's total private sector output that year. By 1995, under the moderate-growth projections discussed in the November 1985 issue of the *Review*, output for the private economy as a whole is expected to reach $5.6 trillion. The health sector's share is projected to range from $169 billion to $226 billion.

Table 6. Health sector output and employment under alternative projection scenarios, 1984 and projected 1995

Year	Sectors 140–142	Sector 140	Sector 141	Sector 142
	Output (in millions of 1977 dollars)			
1984	$141,174	$58,882	$54,927	$27,365
Projected:				
1995 Low	169,311	79,782	54,927	34,602
1995 Base	199,705	84,591	70,826	44,288
1995 High	225,748	90,299	81,269	54,180
	Average annual rate of change (in percent)			
1984–95 Low	1.7	2.8	0.0	2.2
1984–95 Base	3.2	3.3	2.3	4.5
1984–95 High	4.4	4.0	3.6	6.4
	Employment (in thousands of wage and salary jobs)			
1984	6,141	1,396	2,994	1,751
Projected:				
1995 Low	6,473	1,842	2,441	2,190
1995 Base	8,049	1,972	3,253	2,824
1995 High	9,468	2,125	3,870	3,473
	Average annual rate of change (in percent)			
1984–95 Low	0.5	2.5	−1.9	2.1
1984–95 Base	2.5	3.2	0.8	4.4
1984–95 High	4.0	3.9	2.4	6.4

NOTE: Sector 140 — Doctors' and dentists' offices (SIC 801, 802, 803, 8041)
Sector 141 — Hospitals (SIC 806)
Sector 142 — Medical services, not elsewhere classified (SIC 8049, 805, 807, 808, 809, 074)

Base case. Efforts to constrain spending are expected to dampen rising demand for health services under the assumptions of the base case. As table 6 shows, health sector output is projected to increase at an annual rate of 3.2 percent over 1984–95. This is markedly slower growth than in the past (compound growth rates): 5.6 percent during 1960–80, 4.9 percent over 1970–84, and 3.9 percent, 1977–84. The base case assumes no change between 1984 and 1995 in the share of private sector output generated by the health sector. (See chart 1.) A departure from historical trends, this assumption seems plausible in light of intense cost containment pressures and excess hospital capacity. Wage and salary employment is projected to grow at an annual rate of 2.5 percent under the assumptions of the base case, less than half the rate attained during 1970–84. With labor costs constituting providers' largest single outlay, efforts to achieve efficiencies in a cost-conscious climate are bound to target staff.

Low scenario. The low scenario assumes cost containment measures that alter medical practice patterns; restrictive reimbursement policies, declining admissions, and problems in capital formation for hospitals; and deceleration in the rate of spending for institutional long-term care. Private health sector output is projected to grow at an annual rate of 1.7 percent, roughly one-third the rate posted during 1970–84. The output of the health sector is assumed to decline as a percentage of total private sector output. A decline in this statistic is unprecedented. Wage and salary employment in the health sector is projected to grow at an annual rate of only 0.5 percent over the 1984–95 period under the low scenario.

High scenario. Output of the private health sector is projected to grow at an annual rate of 4.4 percent under the high-scenario assumptions, about the rate attained during the latter half of the 1970's. From a 1984 level of 3.5 percent of private sector output, health sector output is projected to reach 4.0 percent by 1995, continuing the long-term upward trend, but at a slower rate than in the past.

Compared with the base and low scenarios, the high scenario offers a more optimistic picture of prospects for hospital sector expansion. In addition, it assumes exceptionally rapid growth of the nursing home and home health industries because of significantly increased spending for long-term care. (See exhibit 1.) Wage and salary employment is projected to grow at an annual rate of 4.0 percent, slightly less than the 4.2-percent rate posted during 1977–84.

Projected 1995 employment in the health industry, under the alternative sets of assumptions summarized in exhibit 1, varies from 7.3 to 10.5 million wage and salary jobs. In each alternative, projected growth is slow by historical standards, as table 1 shows. The projected increase of nearly 1.9 million health industry jobs under the assumptions of the base case represents an annual growth rate of 2.1 percent

during 1984–95, less than half the rate posted for 1972–84. The high scenario, which generates approximately 3.3 million new health industry jobs, assumes a rate of growth roughly equivalent to that attained over the 1977–84 period.

Historical patterns of job growth vary greatly across the nine health industries, and this variation carries forward in the projections to 1995. Detailed industry discussions follow.

Offices of physicians (SIC 801). The annual rate of job growth in offices of physicians is projected to outpace the health industry as a whole under all three scenarios, although several other sectors are projected to experience much faster growth. In 1995, wage and salary employment in this industry is projected to range from 1.2 to nearly 1.5 million jobs, a difference of 20 percent between the low and high scenarios. Helping to explain the variation is the low scenario assumption of market penetration by HMO's and the shift to managed care, trends which are expected to dampen demand for medical services. At least partially offsetting the dampening, however, is rapid expansion of IPA and network-type HMO's, which contract with physicians in private practice to provide medical care to their members. Essentially unchanged policies regarding reimbursement for physicians' services is a key assumption of the high scenario.

Offices of dentists (SIC 802). Wage and salary employment in offices of dentists is projected to be roughly the same under all three 1995 scenarios.

Offices of osteopaths (SIC 803). Osteopathic physicians are likely to be affected similarly to other physicians by the assumptions that underlie the alternative scenarios. Employment in this small industry is projected to vary by approximately 26 percent between the low and the high scenarios. Under the base case, 1995 wage and salary employment is projected to reach 44,000, rising from a 1984 level of 30,000.

Offices of other health practitioners (SIC 804). Consumer acceptance of nonphysician providers is so well-established, and the trend toward alternative delivery systems is so strong, that continued rapid expansion is assumed under each scenario, placing offices of other health practitioners in the ranks of the fastest-growing health industries. Wage and salary employment is projected to increase at a rate nearly double that for offices of physicians and osteopaths.

The wide range in projected 1995 employment—a difference of nearly 57 percent between the low and high scenarios—is largely explained by different assumptions about third-party reimbursement. The high scenario assumes more favorable coverage for the services of nonphysician providers than is the case today, for example, more liberal mental health benefits.

Nursing and personal care facilities (SIC 805). Second only to hospitals in employment size, the nursing and personal care sector provided more than 1.1 million wage and salary jobs in 1984. Projected employment in 1995 ranges widely from 1.3 to nearly 2.1 million jobs.

Hospitals (SIC 806 plus State and local government hospitals). From a level of 4.1 million wage and salary jobs in 1984, hospital employment is projected to increase more slowly than average under the base case. Employment is projected to decline sharply in the low scenario, dropping to 3.4 million jobs in 1995. The high scenario paints an entirely different picture: faster than average growth is projected to create 1 million additional hospital jobs over the 1984–95 period.

The base case assumes a downturn in use of inpatient services as occupancy rates slide. Offsetting this is an expansion of outpatient services and diversification into nontraditional areas such as home health. The base case also assumes that hospitals' ability to restructure to take advantage of emerging market opportunities is constrained by problems in raising capital. Limited access to needed capital is an even greater constraint in the low scenario. However, the key assumption of the low scenario is the shift to managed care, which produces stringent controls on hospital utilization by HMO subscribers and others in managed care systems. These assumptions are outlined in exhibit 1.

Medical and dental laboratories (SIC 807). The alternative scenarios sketched here have a limited effect on projected employment in this small industry. The volume of laboratory work ordered by physicians may be affected by changes in reimbursement levels and guidelines, to the extent that testing has been implicated as a source of rising health care costs. However, other factors besides physicians' ordering practices determine how much laboratory work is sent to commercial laboratories for analysis.

Among these are the economics of in-house versus contracted clinical laboratory services for hospitals; advances in medical diagnostics that increase the amount of testing as new tests are developed; changes in case mix—an increase in the number of patients with illnesses that require extensive laboratory workups, for example; and the availability of portable analyzers that can be installed in the physician's office or clinic. The potential impact of further developments in laboratory automation must also be kept in mind. Automation of chemistry and hematology, two of the most labor-intensive functions in the clinical laboratory, is already well-established.[31] Microbiology, immunology, and serology are candidates for widespread automation in the coming decade. Prospects for even greater diffusion of automated systems help explain the very modest growth projected for this industry under all scenarios.

Outpatient care facilities (SIC 808). This small industry

includes HMO's, outpatient surgical centers, diagnostic imaging centers, urgent care centers, alcoholism treatment centers, community mental health centers, family planning clinics, and other outpatient facilities. Employment is projected to rise much faster than average under all three scenarios. Under the base scenario, for example, employment is projected to increase at an annual rate of 6.7 percent, more than triple that projected for the health industry as a whole. Exceptionally rapid growth in the base case reflects not only the shift to outpatient care, but the success of providers in this industry sector in capturing much of the market.

Turning to the high scenario, favorable reimbursement policies (expanded coverage for mental health and alcoholism treatment, for example) and higher overall levels of health care spending are expected to contribute to very rapid projected growth. Employment in this industry might be higher still under the high scenario, were it not for the assumption that hospitals will set up a broad range of outpatient services—competing effectively in the outpatient market with freestanding outpatient facilities, on the one hand, and large group medical practices, on the other.

Health and allied services (SIC 809). This rapidly growing industry includes home health agencies and blood banks. It seems reasonable to assume that home health care—not blood banking—is responsible for recent recordbreaking growth in this industry. This assumption is carried forward in each projection scenario. On the one hand, intense pressure on the demand for services provided by home health agencies is expected to persist because of the aging of the population, consumer preference, incentives to discharge hospital patients as soon as possible, and changes in private insurance and medicare coverage that make home health more affordable for patients recovering from acute illnesses. Second, blood banking is ripe for automation. Industry observers anticipate that automated laboratory systems will be used by the early 1990's, with likely displacement of blood bank employees.

The annual rate of employment growth in this industry is projected to outstrip the rest of the health services industry under all three scenarios. According to the base case, employment is projected to double during 1984–95, rising from 151,000 to 315,000 jobs. Increased public and private spending for home health care is a key assumption of the base case. The high scenario assumes an increase in out-of-pocket spending for home health services for patients not eligible for insurance benefits, those with chronic conditions and long-term care needs, for the most part.

Occupational projections

In the National Industry-Occupational Matrix, occupational employment in the target year is determined by projected industry employment, on the one hand, and projected staffing patterns, on the other. To project staffing ratios, first, 1984 staffing patterns ("industry-occupational ratios") for each of the nine matrix health industries were analyzed. This step included comparing the 1984 data with patterns from earlier years and other sources, including the Current Population Survey and the annual American Hospital Association survey. Next, projected 1995 ratios were developed, consistent with the assumptions of the base case about future trends in health care financing and service delivery. For example, this involved judgments about the impact of technology, use of contract services and temporary employees, and trends in professional practice, case mix, and length of stay.

The procedure was repeated under staffing assumptions consistent with both the low and high scenarios. For example, staffing patterns for nursing and personal care facilities were adjusted to reflect the impact of more private-pay patients in the high scenario. Facilities serving these patients would presumably offer more amenities, as well as more intense therapy, nursing, recreational, and social services. Some of these assumptions are presented in exhibit 1.

Next, occupational staffing patterns were applied to the industry totals shown in table 1. This generated three sets of industry-occupational matrices for each of the nine health industries, plus industrywide estimates of 1984 and projected 1995 employment for 200 detailed occupations. Industrywide estimates for selected health occupations are shown in table 7.

A wide range of growth prospects appears when projected growth under each of three alternatives is compared with the average rate of job growth for the economy as a whole, 1.3 percent a year over the 1984–95 period. For example, employment of health services managers, physicians, physician assistants, and medical assistants is projected to grow faster than average even in the low alternative. Except for health services managers, who are dispersed across all nine health industries, these occupations are concentrated largely in offices of physicians and osteopathic physicians, industries that are projected to grow considerably faster than the health services industry as a whole under the low scenario assumptions. In addition, most of these occupations are projected to increase as a proportion of industry employment as HMO's, group medical practices, and other large establishments increasingly dominate medical practice.

Considerable attention has been paid to new job opportunities in ambulatory and outpatient settings including home health programs, health maintenance organizations, urgent care centers, wellness and fitness programs, and life care communities. The alternatives presented here show that in the case of registered nurses, the hospital will remain the major source of employment in 1995, despite the emergence of alternative delivery systems and the expansion of long-term care.

Because recent nursing school graduates are a major source of supply for the profession,[32] nursing education will confront vastly different challenges depending on the rate of

industry growth in the decade ahead. The number of new jobs for registered nurses varies widely according to the projection scenario, as table 7 shows. As few as 72,000 additional registered nurse jobs—or as many as 650,000—might be created in the health services industry between 1984 and 1995, depending on the alternative selected. Because supply and demand are roughly in balance in the base case, realization of the high scenario could entail such measures as stepped-up recruiting of inactive nurses, wage incentives, and expansion of training opportunities for nurses. Nursing homes would face a formidable recruiting challenge. Conversely, the sluggish job growth depicted by the low scenario would mean less favorable job prospects in nursing overall, depending on replacement needs and on how rapidly nursing school enrollments responded to an oversupply.

For a number of occupations, the "shrinkage" of the hospital industry under the assumptions of the low scenario would mean an employment decline between 1984 and 1995. Such occupations include licensed practical nurses, nursing aides, psychiatric aides, clinical laboratory technologists and technicians, EKG technicians, respiratory therapists, surgical technicians, social workers, dietitians, dietetic technicians, pharmacists, and recreational therapists. Careful tracking of hospital industry trends is advisable for policy makers and planners concerned with occupations in this group.[33] For if instead of the low scenario, the high-scenario assumptions are realized, prospects are for faster-than-average job growth in many of these occupations. This would require a totally different response from vocational and higher education planners, as well as from industry officials responsible for recruitment and in-service training.

Table 8 depicts projected change in employment for health workers by broad occupational group. Employment in most groups at the lower end of the skill ladder is projected to grow more slowly than the industry average under each of the three alternatives. This continuation of a long-term trend reflects changes in case mix and patterns of patient care, use of contract and shared service arrangements, and widespread application of computers for clinical, financial, and administrative purposes.

Conclusions

Although one can imagine other ways that the next decade may unfold, the three scenarios presented here are representative possibilities. The base scenario assumes that output and employment growth will be somewhat below historical levels, in general because of increased emphasis on cost

Table 7. Wage and salary employment in the health services industry, selected occupations, 1984 and three projected 1995 alternatives

Occupation	Actual 1984 employment	Projected 1995 employment			Average annual rate of change, 1984–95 (in percent)		
		Low	Base	High	Low	Base	High
All occupations	7,188,700	7,325,000	9,054,000	10,535,000	0.2	2.1	3.5
Health services managers	336,204	396,151	482,779	559,382	1.4	3.3	4.7
Psychologists	18,022	19,447	25,060	29,764	0.7	3.0	4.7
Recreation workers	14,431	15,614	20,302	25,618	0.7	3.1	5.4
Social workers	67,187	61,006	82,726	100,819	−0.9	1.9	3.8
Chiropractors	9,371	10,398	12,433	13,989	0.9	2.6	3.7
Dentists	69,513	86,114	90,230	92,956	2.0	2.4	2.7
Dietitians and nutritionists	24,458	23,056	30,875	38,306	−0.6	2.1	4.2
Opticians, dispensing and measuring	16,192	21,364	24,984	28,148	2.6	4.0	5.2
Pharmacists	35,161	32,741	42,025	48,859	−0.7	1.6	3.0
Podiatrists	5,741	6,695	8,020	9,200	1.4	3.1	4.4
Physician assistants	22,077	27,408	31,852	35,961	2.0	3.4	4.5
Physicians	293,407	342,746	394,556	443,843	1.4	2.7	3.8
Registered nurses	1,130,997	1,201,175	1,517,820	1,782,421	0.5	2.7	4.2
Therapists	142,645	144,077	214,798	240,772	0.1	3.8	4.9
Occupational therapists	14,911	15,698	21,326	26,680	0.5	3.3	5.4
Physical therapists	40,648	45,973	61,206	77,233	1.1	3.8	6.0
Recreational therapists	11,665	10,828	14,598	18,365	−0.7	2.1	4.2
Respiratory therapists	54,892	48,639	66,311	82,224	−1.0	1.7	3.7
Speech pathologists and audiologists	11,103	12,214	15,947	19,501	0.9	3.3	5.3
All other therapists	9,426	10,725	14,084	16,769	1.2	3.7	5.4
Dental hygenists	74,037	92,265	95,843	98,088	2.0	2.4	2.6
EKG technicians	17,437	16,319	20,613	23,701	−0.6	1.5	2.8
EEG technicians	5,878	5,632	7,027	8,046	−0.4	1.6	2.9
Licensed practical nurses	485,835	441,787	557,143	673,138	−0.9	1.3	3.0
Clinical laboratory technicians and technologists	210,746	188,746	226,377	257,153	−1.0	0.7	1.8
Dietetic technicians	15,819	14,747	19,057	23,112	−0.6	1.7	3.5
Emergency medical technicians	14,564	12,582	16,122	18,582	−1.2	0.9	2.2
Medical record technicians	29,700	31,128	39,591	46,051	0.4	2.6	4.1
Radiologic technologists	111,026	116,379	138,018	156,873	0.4	2.0	3.2
Surgical technicians	36,284	35,127	41,474	47,753	−0.3	1.2	2.5
Dental assistants	164,241	204,896	213,100	218,368	2.0	2.4	2.6
Medical assistants	121,846	176,456	200,345	226,027	3.4	4.6	5.8
Nursing aides and orderlies	930,366	927,744	1,202,144	1,434,762	−0.1	2.4	4.0
Psychiatric aides	61,882	51,480	66,122	76,499	−1.4	0.6	1.9
Dental laboratory technicians	38,055	44,048	46,892	48,525	1.3	1.9	2.2
Physical, corrective therapy assistants	32,766	32,196	41,923	51,486	−0.2	2.3	4.2

Table 8. Wage and salary employment in the health services industry, by major occupational group, 1984 and three projected 1995 alternatives

Occupational group	Actual 1984 employment	Projected 1995 employment			Average annual rate of change, 1984–95 (in percent)		
		Low	Base	High	Low	Base	High
Total, all occupations	7,188,700	7,325,000	9,054,000	10,535,000	0.2	2.1	3.5
Managerial and management related occupations	397,843	462,883	565,228	654,282	1.4	3.2	4.6
Professional and technical occupations	3,032,158	3,130,002	3,867,484	4,511,088	0.3	2.2	3.7
Administrative support occupations, including clerical	1,227,084	1,189,649	1,442,470	1,642,754	−0.3	1.5	2.7
Service occupations	2,242,698	2,257,703	2,827,438	3,319,710	0.1	2.1	3.6
Cleaning and building services	318,959	287,210	358,765	421,984	−0.9	1.1	2.6
Food and beverage preparers and services	373,628	351,685	453,453	547,289	−0.5	1.8	3.5
Health services and related	1,349,213	1,426,970	1,767,566	2,058,225	0.5	2.5	3.9
Personal services	32,012	34,619	45,554	54,107	0.7	3.3	4.9
Protective services	35,680	26,388	33,849	39,344	−2.1	−0.5	0.9
All other services	133,206	130,831	168,251	198,761	−0.2	2.1	3.7
All other occupations	288,917	284,763	351,380	407,166	−0.1	1.8	3.2

containment. More explicit assumptions involve some growth and rapid diffusion of technology, but an emphasis on that which saves resources, as opposed to resource-intensive high-cost technology. Some tightening of physician reimbursement is assumed, as well as a moderate continuation of the shift from fee-for-service physician care to HMO care. Hospital occupancy is assumed to continue its recent downward trend but then to level, with a shift towards heavier employment of skilled workers relative to clerical, janitorial, and other workers. The bed supply in nursing homes is assumed to increase as regulation of that industry eases. Other assumptions generally involve a moderate continuation of present trends.

Although it lies between the low and high scenarios, the base case does not represent a midpoint. With respect to prospects for job growth, the low scenario may be more extreme on the unfavorable side than the high scenario is on the favorable side. In any event, the sharply contrasting futures depicted by the low and high scenarios make it clear that the outlook is uncertain. The health services industry is in transition, and it remains to be seen whether organizational forms and approaches that take hold over the coming decade will entail gradual and moderate changes in employment levels, staffing patterns, and educational requirements—or abrupt, even disruptive, change. For employers, educators, and policy makers who seek to plan effectively for the future, staying abreast of industry developments has never been more necessary. □

FOOTNOTES

[1] Warren Greenberg and Richard Mck. Southby, eds., *Health Care Institutions in Flux: Changing Reimbursement Patterns in the 1980's* (Arlington, VA., Information Resources Press, 1984).

[2] Ross H. Arnett, III, Carol S. Cowell, Lawrence M. Davidoff, and Mark S. Freeland, "Health spending trends in the 1980's: Adjusting to financial incentives," *Health Care Financing Review,* Spring 1985; Mark S. Freeland and Carol S. Schendler, "Health spending in the 1980's: Integration of clinical practice patterns with management," *Health Care Financing Review,* Spring 1984.

[3] Those articles, with supplementary tables and a description of the projection methodology, are reprinted in *Employment Projections for 1995: Data and Methods,* Bulletin 2253 (Bureau of Labor Statistics, 1986).

[4] Katharine R. Levit, "Personal health care expenditures, by State: 1966–82," *Health Care Financing Review,* Summer 1985; Katharine R. Levit, Helen Lazenby, Daniel R. Waldo, and Lawrence M. Davidoff, "National health expenditures, 1984," *Health Care Financing Review,* Fall 1985.

[5] Louise B. Russell, *Technology in Hospitals: Medical Advances and their Diffusion* (Washington, DC, The Brookings Institution, 1979).

[6] Marcia Angell, "Cost containment and the physician," *Journal of the American Medical Association,* Sept. 6, 1985.

[7] Louise B. Russell, "An aging population and the use of medical care," *Medical Care,* June 1981; Dorothy P. Rice and Jacob J. Feldman, "Living longer in the United States: Demographic changes and health needs of the elderly," *Milbank Memorial Fund Quarterly/Health and Society,* Summer 1983; Beth J. Soldo and Kenneth G. Manton, "Changes in the health status and service needs of the oldest old: Current patterns and future trends," *Milbank Memorial Fund Quarterly/Health and Society,* Spring 1985.

[8] Economic growth sectors 140, 141, and 142 make up the health sector. Coverage is as follows: sector 140, Doctors' and dentists' offices; sector 141, Hospitals; sector 142, Medical services, not elsewhere classified.

The industry composition of each sector, as defined by the 1972 Standard Industrial Classification (SIC) is:

Sector 140-Doctors' and dentists' offices	SIC 801-Offices of physicians SIC 802-Offices of dentists SIC 803-Offices of osteopathic physicians SIC 8041-Offices of chiropractors
Sector 141-Hospitals	SIC 806-Hospitals (excludes Federal, State, and local government hospitals)
Sector 142-Medical services, not elsewhere classified	SIC 8049-Offices of health practitioners, not elsewhere classified SIC 805-Nursing and personal care facilities SIC 807-Medical and dental laboratories SIC 808-Outpatient care facilities SIC 809-Health and allied services, not elsewhere classified SIC 074-Veterinary services

SIC 8042, Offices of optometrists, is not included in the economic growth health sectors.

[9] Output includes primary (health care) and some secondary products and services such as nonmedical testing performed in medical laboratories. This measure of industry output differs from a measure of commodity output because of these secondary products.

This measure is gross or somewhat duplicated in that some intermediate products or services may be counted more that once in the estimate. Orthodontal appliances sold first by a dental laboratory to a dentist, and subsequently sold again to the patient, illustrate duplication in the measure of output.

Historical estimates of output are converted from current year or nominal dollars to constant dollars and projections of 1995 output are based on constant 1977 prices.

[10] Data on employment by SIC category, shown in table 4, differ from those by economic growth sector shown in table 3 as follows:

Table 3:	Excludes State and local government hospitals Excludes 8042, Offices of optometrists Includes 074, Veterinary services
Table 4:	Includes State and local government hospitals Includes 8042, Offices of optometrists Excludes 074, Veterinary services

Excluded from the data shown in both tables are Federal hospital employees, as well as employees of publicly operated nursing homes, clinics, and other governmental health care facilities. These data also exclude self-employed workers.

[11] American Hospital Association, *Hospital Statistics, 1984 ed.* (Chicago, 1984).

[12] The number of nursing home users rose from about 300,000 in 1950 to 470,000 by 1960 and over 1,400,000 in 1980. A portion of this increase represented a substitution among different kinds of health care institutions. Beginning in the late 1950's after the introduction of psychotropic drugs, but predominantly in the late 1960's and early 1970's, many mental patients were transferred to nursing homes or board and care homes. The deinstitutionalization movement reflected prevailing views about the desirability of providing care in less restrictive settings, court orders, and cost savings to the States from placing patients in facilities where the Federal Government—via medicaid and Supplemental Security Income—would pay some or all of the cost. Burton David Dunlop, *The Growth of Nursing Home Care* (Lexington Books, Lexington, MA, 1979).

[13] William J. Scanlon and Judith Feder, "The long-term care marketplace: An overview," *Healthcare Financial Management,* January 1984.

[14] Ibid.

[15] National Center for Health Statistics, *Trends in Nursing and Related Care Homes and Hospitals, United States, Selected Years 1969–80* (Washington, U.S. Government Printing Office, 1984).

[16] See *Economic Trends* (Chicago, IL, Hospital Research and Educational Trust, 1985).

[17] Karen Davis, Gerard F. Anderson, Steven C. Renn, Diane Rowland, Carl J. Schramm, and Earl Steinberg, "Is Cost Containment Working?" *Health Affairs,* Fall 1985.

[18] Davis, "Is Cost Containment Working?"

[19] Hospital Research and Educational Trust, *Economic Trends.*

[20] Dean C. Coddington, Lowell E. Palmquist, and William V. Trollinger, "Strategies for survival in the hospital industry," *Harvard Business Review,* May-June 1985; Robert A. Vraciu, "Hospital strategies for the eighties: a mid-decade look," *Health Care Management Review,* Fall 1985.

[21] Bill Jackson and Joyce Jensen, "Home care leads rising trend of new services," *Modern Healthcare,* December 1984; W. Barry Moore, "CEO's plan to expand home health, outpatient services," *Hospitals*, Jan. 1, 1985.

[22] *National HMO Census, June 1985* (Excelsior, MN, InterStudy, 1986).

[23] Based on the 1977 National Nursing Home Survey conducted by the National Center for Health Statistics. See *Demographic and Socioeconomic Aspects of Aging in the United States,* Current Population Reports, Series P-23, No. 138 (U.S. Bureau of the Census, 1984), p. 83. Until results of the 1985 National Nursing Home Survey are released, the 1977 utilization data are the most recent available.

[24] Stanley J. Brody and Nancy A. Persily, eds., *Hospitals and the Aged: The New Old Market* (Rockville, MD, Aspen Systems Corporation, 1984).

[25] *Environmental Assessment Overview 1984* (Chicago, IL, Hospital Research and Educational Trust, 1984).

[26] Davis, "Is Cost Containment Working?"

[27] Martha Farnsworth Riche, "The nursing home dilemma," *American Demographics,* October 1985; U.S. General Accounting Office, *Medicaid and Nursing Home Care: Cost Increases and the Need for Services are Creating Problems for the States and the Elderly* (Washington, 1983).

[28] Carol O'Shaughnessy, Richard Price, and Jeanne Griffith, *Financing and Delivery of Long-Term Care Services for the Elderly* (Washington, The Library of Congress, Congressional Research Service, 1985).

[29] Mark Meiners, "The case for long-term care insurance," *Health Affairs*, Summer 1983.

[30] Employment projections for the nine health industry categories of the National Industry-Occupational Matrix were derived from economic growth sectors 140–142 in a two-part procedure.

First, projected employment in SIC 074, veterinary services, was removed from projected private wage and salary employment in the economic growth sectors. Next, disaggregation to the nine matrix industries was accomplished using a time series regression analysis. The results were reviewed and adjusted according to analytical judgment.

Second, projections of State and local government hospital employment were added to the estimate of private hospital employment in SIC 806. No explicit adjustment was made for SIC 8042, Offices of optometrists.

[31] "Automated microbiology systems," *Journal of Health Care Technology,* Winter 1985.

[32] U.S. Department of Health and Human Services, *Report to the President and Congress on the Status of Health Personnel in the United States* (Washington, DC, U.S. Government Printing Office, 1986).

[33] See, for example, annual payroll data on hospital personnel by detailed occupation provided to the Bureau of Health Professions by the American Hospital Association. Survey data for *1981–83,* are summarized in *Trends in Hospital Personnel, 1981–83,* ODAM Report No. 5–85 (Rockville, MD, U.S. Department of Health and Human Services, 1985).