

The Effects of Health Care Industry Changes on Health Care Workers and Quality of Patient Care

Summary of Literature and Research

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EXECUTIVE SUMMARY

The health care industry has undergone dramatic changes in the past 20 years and these changes affect both workers and patients. The purpose of this paper is to summarize the evidence pertaining to the following questions about the restructuring of the health care industry:

1. Are labor force changes in the health care sector affecting the quality of care?
2. What are the effects on the labor market for health care workers?
3. Are changes in the health care sector affecting worker safety and health?
4. What are the implications for the regulation of health occupations?

The research needed to fully understand the relationships between specific workforce changes and quality of care or, more specifically, patient outcomes is in its early stages. Yet this is critical in an industry where consumers, who lack clinical training, need to make informed choices. While the research to date cannot tie specific restructuring activities or staffing ratios to specific changes in patient outcomes, the evidence does point to a relationship between staffing, skill levels, and quality. Regulation of health occupations and professions is an important component of this relationship, because of the specification of skill levels, the impact on labor supply and costs, and the assumptions regarding protection of the public. As in any industry, there are trade-offs involved in reducing costs. Researchers and policymakers are seeking a better understanding of what constitutes the most cost-effective service delivery, and consumers are seeking assurances that the trade-offs do not result in quality falling

below acceptable thresholds. Key points drawn from a review of the literature are:

- There is evidence in the literature showing that Registered Nurse (RN) staffing characteristics are associated with reduced hospital mortality rates, as well as on other patient outcomes such as length of stay, cost, and morbidity. The literature on other health caregiver occupations is more limited.
- There is much more evidence linking staffing and quality in nursing homes than in hospitals. Studies show a strong positive relationship between both general level of nursing staff and RN staff and resident outcomes.
- Earlier research on the impacts of major health industry changes such as the implementation of the Medicare Prospective Payment System (PPS)¹ indicate that some concerns associated with the impacts of cost containment (such as more patients being released in unstable condition) were in fact borne out, while other dire predictions (such as increased mortality while hospitalized) were, fortunately, not realized.
- The rapid changes in patient mix and technology as well in health care organization and financing, in theory, support work restructuring in health care delivery settings. There is evidence that certain types of work restructuring, implemented carefully and with worker input, are viewed positively by both RNs and other caregivers.
- There has been little research on structural work measures and their relationship to patient outcomes. An understanding of issues such as staffing ratios and staff mix; staff turnover; and relationship of staff needs to particular patient acuity levels is necessary to develop improved staffing and productivity measures.
- Workplace injuries in the health services industry are higher than in private industry as a whole and they are increasing. Research evidence shows an inverse relationship between back injuries and staffing levels. Bureau of Labor Statistics data for 1994 showed health care and social service workers having the highest incidence of assault injuries.
- RNs, Licensed Practical Nurses (LPNs), and nursing aides are among the 30 occupations with the largest growth projected by the Bureau of Labor Statistics based on projections of moderate growth for the period 1992-2005. However, the types of jobs and employment settings are changing. For RNs, more opportunities are projected for those trained in advance practice techniques and procedures. Nursing homes are expected to offer the most new jobs for LPNs and nursing aides.
- The health care industry and health care workers encompass a wide range of labor markets, employment settings, skill levels, and job requirements. Local labor market characteristics, varying work environments, and varying patient needs suggest subgroup analyses would be necessary to fully examine effects of work structure on patient outcomes, since the national picture may obscure important variations.
- Measurement of the quality of care and service is a relatively new science and there are many subtleties involved in measuring how different inputs (e.g., staffing, preventive care) affect the end state, patient outcomes. Additional research is underway on staffing-related issues, including a national nursing research grant program on staffing and quality sponsored by the Agency for Health Care Policy and Research in conjunction with the National Institute for Nursing Research and the Division of Nursing of the Health Resources and Services Administration (HRSA).

With changes in health care organization and delivery come changes in staff roles, responsibilities, and training needs. The existing system of occupational regulation is complex and cumbersome, dominated by professional interests, and slow to adapt to changes in the health care system. Our review of the issues and compilation of information on state-by-state licensing laws and continuing education requirements found that:

- The stated purpose of health occupations regulation is to protect the public's health and safety, but the regulatory system has also had the effect of establishing and maintaining professional identities and enabling different health professions to carve out exclusive domains. These "turf battles" have impeded reform and obscured issues more directly related to protection of the consumer.
- Health care workforce regulation has developed over the last century into fifty separate state systems creating a complex and often irrational organizational patchwork. The lack of uniformity in language, laws, and regulations between the states limits effective practice and mobility, confuses the public, and presents barriers to integrated delivery systems and the use of telemedicine and other emerging technologies (Finocchio et al. 1995).
- In 1995 alone, 850 health professions licensure bills were introduced in state legislatures and more than 300 were enacted into law (Fox-Grange 1995). This activity is concentrated in two areas: expanding the scope of practice and independence of nonphysician providers, and licensing new occupational groups.
- Government and insurance company policies tying reimbursement to particular professional groups are not consistent with the health occupations regulatory system, and pit professions against each other in vying for direct reimbursement by third party payers. Reimbursement issues have the potential to undercut other efforts aimed at reforming and rationalizing the current health occupations regulatory system. Managed care organizations also play a broad role in regulating health occupations/professions through market mechanisms.
- A number of recent studies have called for an overhaul of licensure for health care professionals. Common themes of these studies are increased flexibility in scopes of practice (much of this driven by the desire to cut costs), assuring continued competence of health providers, and assuring patient access to care and to information. As efforts are made to reform the current system of occupational regulation, key issues to consider are supervision, delegation, and accountability. For example, nurses have expressed concerns about liability for the actions of nurse aides or technicians working "under the RN license" when supervised by an RN as part of a patient-focused care team.
- Both the current system and any future reforms entail a significant consumer education effort. Patients need to know who is treating them, if the treatment is appropriate, who is supervising their caregiver, where to learn more, and where to take questions and/or complaints.

1. Introduction

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The paper begins with a discussion of organizational and service delivery changes in the health industry. We consider impacts of these changes on staff roles and work content, productivity, employment and earnings, quality of care, worker satisfaction and safety, and training and credentialing. Examples are included to highlight recent findings and key areas of concern from a workforce perspective. The paper describes key components of the health occupations regulatory system and, using available information, summarizes the current status of credentialing requirements for health

industry workers.

2. Health Industry Changes

The restructuring of the health care industry refers to a sweeping array of changes in the organization, ownership, and regulation of health care providers and in the delivery of services. Cost concerns, increasing competition, influence of investor priorities, technological advances, changing social attitudes, and an aging and increasingly diverse population are factors that will sustain this dynamic situation.

Organizational Changes

Key organizational changes in health care include a move from reliance on hospital-based care to more care being provided on an outpatient basis and in nursing homes; the move to managed care; an increase in for-profit health care providers; and corporate restructuring which includes horizontal (one owner, many hospitals) and vertical (across the care continuum) integration. Admissions to community hospitals declined 7.5 percent from 1985 to 1995, while outpatient visits to community hospitals increased 89.4 percent during this same period (AHA 1996). In addition, a growing amount of care is being provided in nonhospital settings, such as physicians' offices, patients' homes, and freestanding outpatient clinics or surgery centers. Fennel and Alexander (1993) note that this increase in the diversification of organization types and products allows the hospital to reduce its vulnerability to uncertainty within the inpatient acute care sector, by broadening its base of activity.

Changes in ownership and management patterns are reflected in increased concentration of the hospital industry through closure and merger, and an increase in for-profit hospitals. In 1995, 14.5 percent of community hospitals were investor-owned (for-profit), up from 13.8 percent in 1994 (AHA 1996). Of the ten largest hospital systems in the United States in 1993, three were federally owned (Department of Veterans Affairs, Air Force, and Indian Health Service) and the others, including the two largest, were for-profit organizations (Reardon and Reardon 1995).

Increasingly complex interorganizational patterns have evolved, including multi-hospital systems, provider networks, and formal linkages between hospitals, physician groups and insurers. Powerful buyers--big employers, insurance companies, and managed care companies are putting pressure on hospitals demanding contracts with deep discounts in order to cut their insurance bills. Hospitals have adopted strategies such as hospital-to-hospital and hospital-to-physician collaborations in order to offer managed care organizations a continuum of services for their patients, improve efficiency, and lower costs. According to the American Hospital Association's (AHA) Annual Survey of Hospitals, 27.7 percent of community hospitals participated in health networks in 1995, up 6 percent from 1994 (AHA 1996).² In addition, hospitals that are not involved in formal networks are frequently linked up with each other and with other health care organizations through health care systems, joint ventures, or other contractual arrangements. By the end of 1995, 47.8 percent of urban hospitals reporting to AHA had joined health care systems or entered into joint ventures or other contractual arrangements (AHA 1996).³ Hospitals also team up with physicians in various types of integrative arrangements. The physician-hospital organization (PHO), an arrangement that brings hospitals and physicians together into a single organization primarily for the purpose of negotiating contracts with managed care plans or other payers, is the most common form of physician integration (AHA 1996).

Vertical integration refers to the approach wherein one health care organization (such as a hospital or hospital system) provides several levels and intensities of services to its patients. For example, for-profit hospitals are expanding by purchasing outpatient surgery centers and home health networks, enabling them to offer "one stop shopping" or a continuum of care to managed care companies (Pindus and Nightingale 1995).

Organizational changes can be viewed as the first strategy in reducing costs and responding to increased competition. Through managed care and corporate consolidations, excess capacity is squeezed out and cost reductions are achieved. According to the AHA's Annual Survey of Hospitals, declines in the number of hospital beds varied regionally, with the greatest losses occurring in New England (11.6 percent decrease between 1993 and 1995), the East/North Central Region (6.8 percent decrease between 1993 and 1995), and the Mid-Atlantic Region (6.1 percent decrease between 1993 and 1995) (AHA 1996). Once the number of beds have been reduced and hospital length of stay has been shortened, the labor component of the budget will be the next area in which to seek savings. At the aggregate national level, the number of full-time equivalent hospital employees (FTEs) has declined in the last decade, and in 1995, FTEs per adjusted admission reached their lowest point in 15 years (AHA 1996). As in the case of hospital bed reductions, staffing trends vary by region, and in five of the nine AHA regions, FTE levels actually increased in 1995. AHA notes that the overall declines in hospital length of stay, number of hospital beds, and FTEs reflect efficiencies designed to respond to managed care, capitation, and other payment arrangements that provide fixed amounts of reimbursement.

Patient Care and Service Delivery Changes

As is the case in many other industries, health care firms are looking to re-engineer internal organizations to increase efficiency, save money, and improve patient (customer) satisfaction. Changes are being made not only in how work is organized, but also in the workplace culture. In health care, re-engineering seems to involve breaking down departmental barriers and professional alliances; re-examining and reconfiguring job requirements and skills; and bridging the "great divide" of inpatient and outpatient services (Greiner 1995). Traditionally, hospitals have been structured along departmental lines organized by skill area and professional scopes of practice. For example, the respiratory therapy aide and the respiratory therapist can be found in the Pulmonary Medicine Department and report to the Director of Pulmonary Medicine. When a hospital patient requires respiratory therapy or tests of pulmonary function, such services are "ordered" from the Pulmonary Medicine Department. When, with work restructuring, such services are provided by a member of a patient care team on a hospital unit, departmental barriers may be blurred or broken because the respiratory aide on the care team now reports to the nurse who heads the team instead of, or in addition to, the Director of Pulmonary Medicine. If, as a member of the care team, the respiratory therapy aide is now trained to perform other patient care functions as well, or if nurses or nurses aides are also trained to perform some activities previously only performed by respiratory therapy aides, the clear alliance to one profession or discipline is challenged.

Greiner (1995) describes three primary work-restructuring models: patient-centered care (PCC), patient-focused care (PFC), and operations improvement (OI). Under a PCC model (the least prevalent of the three), comprehensive survey data are used to determine what organizational changes will make hospitals more humane. Detailed patient reports are used to execute structural reorganizations, redesign work processes, and provide ongoing information for quality improvement processes. Cost savings have not been a focus of this model. Both patient-focused care and operations improvement, the more prevalent models, involve the restructuring of RN, licensed practical nurse (LPN), and nurses aides jobs. While the two models are often described as interchangeable, the OI model's primary focus is on cost reduction and affects mostly nurses, while PFC emphasizes both cost and quality and affects a broad spectrum of occupations through multi-skilling, redeployment of ancillary services⁴ and teamwork. OI's primary focus is reducing the number of RN FTEs and using more nurses aides, while ancillary services remain mostly centralized. PFC also uses fewer RNs, but delivers services, including ancillary services, through multi-skilled teams of 2 to 4 staff led by an RN. These work restructuring models are in contrast to the primary and modified primary nursing models employed before restructuring. The primary nursing models used a staff of 75-90 percent RNs with most activities performed by RNs except for ancillary services, which are centralized and performed by certified staff. Other aspects of work redesign involve changes in compensation/benefits, employee involvement/empowerment, and training specific to the work restructuring model.

3. Impacts of Health Industry Changes

As policy and decision making moves outside of the individual doctor/patient relationship, and as traditional staffing and service delivery patterns change, attention has focused on the quality of care. Responding to pressures from large public and private employers, consumer groups, unions, and legislators, managed care organizations are collaborating to find objective ways to measure the quality of health care, such as developing formulas for measuring the effectiveness of treatments for specific illnesses (Noble 1995). With respect to how quality may be affected by staffing, the Institute of Medicine recently completed a comprehensive study of the adequacy of nursing staff in hospitals and nursing homes (Wunderlich et al. 1996). The Institute of Medicine appointed an expert committee that reviewed and analyzed available research reports, data, and literature; consulted with experts in the field; held public hearings and obtained written testimony; conducted site visits; and commissioned background papers. These activities took place during 1994-1995. The scope of the committee's study included all nursing personnel (registered nurses, licensed practical nurses, and nurse aides) in hospitals and nursing homes. The IOM committee stated that, "an assessment of the adequacy of nursing staff must be contextual," and that "no single model, in all contexts and all circumstances, leads to an optimal outcome." The consensus of the IOM committee was that, while the aggregate numbers of registered nurses are adequate to meet national needs, at least for the near future,

the education mix may not be adequate to meet either the current or future demands of a rapidly changing health care system. Specifically, concerns were raised about the "paucity of professional nurses employed in nursing homes" and the likelihood that professional nurses in inpatient hospitals "may be called upon increasingly to fill roles that require increased professional judgement, management of complex systems that span the traditional boundaries of service settings, and greater clinical autonomy." (Wunderlich et al. 1996).

Since publication of the IOM report, a survey of nurses sponsored by the American Journal of Nursing (Shindul-Rothschild 1996) has been released and a number of new research efforts to measure and monitor quality have been initiated. Over 7,000 registered nurses responded to the American Journal of Nursing (AJN) Patient Care Survey in 1996. This was a voluntary, self-administered survey, but the distribution of respondents was representative of the U.S. registered nurse population. Seventy-one percent of the respondents were staff nurses and seventy-seven percent were employed in a hospital setting. Results from this survey are described later in this paper. In 1997, the American Nurses Association released, "Implementing Nursing's Report Card," which measured nursing's impact on selected patient outcomes using data from 1992 and 1994 in California, New York and Massachusetts. The study quantified nurse staffing, patient incidents, and length of stay in the sample hospitals. Patient incidents studied were pressure ulcers ("bedsores"), pneumonia (not community acquired), urinary tract infections, and postoperative infections (ANA 1997). Key findings of that study were that increased nurse staffing was associated with decreased lengths of stay and that RN staffing increases were associated with reductions in the patient incidents studied.

The School of Nursing of the University of Pennsylvania has also embarked on a study of hospital restructuring's impact on outcomes. This national prospective three year study, funded by the National Institutes of Health, will analyze data from 30 university teaching hospitals. The study, now in its first year, will describe work restructuring and re-engineering activities; structural variables such as staff mix, worked nursing hours per patient day, and nursing expenses per day; selected process variables such as culture, leadership, and collaboration; and patient outcomes such as pressure ulcers, falls and injury rate from falls, pain management, and patient satisfaction. The aim of the study is to evaluate relationships of skill mix and worked nursing hours per patient day to patient outcomes and determine if the data suggest that there are staffing thresholds linked to quality patient care outcomes (personal communication from Margaret Sovie).

Thus, the ongoing research in this area is consistent with the recommendations of the IOM Committee related to staffing and quality in hospitals and nursing homes. The structural changes in the industry strongly suggest a need for further investigation of improved methods of matching patient needs with the appropriate level and type of staffing.

Staff Roles and Work Content

Hospital work redesign is also resulting in dramatic changes in staff mix (20 to 50 percent reductions in the number of RNs and increases in less-skilled staff) while patient acuity levels (acuity refers to the level and intensity of care required) in hospitals continue to rise. Since cost pressures dictate that patients be cared for in the least resource-intensive setting, hospitals are seeing a higher proportion of seriously ill patients and are caring for patients only during the most acute phase of their illness, after which they are likely to be discharged to nursing homes or home care. Almost half of the nurses responding to the AJN survey reported that part-time or temporary RNs have been substituted for full-time RNs, and two out of five reported the substitution of unlicensed assistive personnel for RNs (Shindul-Rothschild 1996). This latter trend has been referred to as "de-skilling." While part-time and temporary RNs have the same level of training and licensure as permanent nursing staff, they may not do as well in assuring continuity of care and in having familiarity with specific unit or institutional procedures when they are substituted for permanent staff.

Redesigned patient care delivery models such as patient-focused care use multi-skilled teams to perform ancillary tasks. Multi-skilling involves combining skills and tasks previously performed by a number of licensed certified and unlicensed uncertified occupations into a generalist job. For example, clinical generalist positions would replace the phlebotomist, EKG technician, respiratory therapist, IV (intravenous) therapist and others. Composition of care teams varies depending upon the patient population and the patient-focused care design, but they tend to include a core team of direct care providers as well as administrative and service teams. The caregiver team includes at least one RN and one or more of the following: an LPN, a nurses aide, a respiratory therapist, and/or some other type of technician. Service partners, or patient service associates, or unit service associates perform dietary, transportation, housekeeping and materials management tasks. In some cases, they also perform basic patient care, such as baths. This is a radical departure from previous models, in which all patient care is performed by nursing staff.

Greiner (1996) conducted interviews and focus groups with nurses and other care givers (multi-skilled clinicians--nursing assistants, technical partners, clinical partners) in five hospitals that had undergone restructuring designed to have significant impacts on quality of patient care and services, staff satisfaction, work patterns, and cost. Focus group participants were direct caregivers, including registered nurses, licensed practical nurses, and nurse aides. Interviews included staff in these three categories, as well as technicians. Three work restructuring models were examined: patient-focused care, operations improvement, and patient-centered care. In general, restructuring (especially Patient Focused Care) received some positive reviews from nursing personnel, particularly unlicensed caregivers (e.g., they preferred the teamwork model, and learning new skills added to their self-esteem and occupational prestige), although several drawbacks and concerns were also expressed. For example, all staff participating in the focus groups felt that they did not have as much time as they would like to provide education and psychosocial support for patients and families. RNs also felt there was not as much time as they would like to do thorough assessments. In addition, staff did not feel they were adequately compensated for their new responsibilities. The five settings examined by Greiner were unusual in that the employers invested considerable resources in training, physical plant redesign, and information resources; they also piloted their models before redesigning the whole hospital and did not have reducing costs as their primary motivation.

Productivity, Employment, and Earnings

In the AJN survey, 66 percent of nurses reported that they are taking care of more patients and 59 percent reported that they have been cross-trained to take on more responsibilities. Shindul-Rothschild (1996) uses the term "speed-ups" to describe efforts to increase productivity where fewer workers are expected to work harder and do more. She notes, "...at this time the most deleterious labor trend reported by most respondents to the AJN survey is speed-ups." The AJN survey found that this phenomenon affects nurse managers and nurse executives as well as staff nurses. Nurse managers are supervisors of direct caregivers, for example on a hospital nursing unit or floor. Nurse executives have broader managerial responsibility for administrative as well as nursing staff and/or for hospital departments not necessarily limited to nursing.

Greiner (1996) found that the impact of hospital work restructuring on patient loads, as perceived by the caregiver, varied. This finding was consistent with expectations, since the hospitals varied in the timing of implementation, acuity levels of patients, staffing levels, and involvement of staff in planning for changes. Workers at one hospital reported increased patient loads, coupled with higher acuity levels. At another hospital, there was no change in RN workload and a lighter workload for other care givers under patient-focused care, at least initially (interviews were conducted 6 to 9 months after redesign implementation). Focus group respondents also reported that compensation, promotion opportunities, and working conditions are less than optimal. Other (non-RN) care givers feel they are not adequately compensated for new skills and broader responsibilities; and they are concerned about lack of portability of skills and limitations on moving up the career ladder. While RNs reported feeling more stressed due to the enhanced responsibility they assumed for unlicensed staff on their teams, they also felt they had more control over where and when patients received necessary tests or treatments with patient-centered care. Less skilled staff were generally pleased with their new skills and enhanced understanding of the patient care process.

There appears to be conflicting evidence and a difference between perception and national projections with respect to the employment outlook and the demand for nurses. In the AJN survey, significantly more nurses (64 percent) in the Northeast and East/North Central regions reported reductions in the number of RNs than nurses in other regions, but in every region, more than half of nurses responding reported a decline in the number of RNs (Shindul-Rothschild 1996). American Hospital Association survey data (AHA 1994, 1996) also indicates reductions in nurse staffing to be greatest in New England, but only one other region, the mid-Atlantic, reported reductions in the number of RNs. Reductions in LPN staff were reported in six of the nine AHA regions (see Table 1). National data (AHA special tabulations cited in Wunderlich et al.1996) also indicate a continuing increase in the number of RNs employed in hospitals and in the number of RNs as a percentage of the total nursing staff. By 1993, about 874,000 RNs were employed in community hospitals throughout the country and RNs represented 67.5 percent of total nursing staff (Wunderlich et al. 1996).

Concerns about possible declines in nurse staffing have risen despite the continued growth of hours worked by nursing personnel. A study of nursing staff trends in California found that the average number of hours worked by nursing personnel in short-term hospitals rose from 1977 to

1995 despite a recent decrease in the number of hospital discharges (Spetz 1996). Spetz suggests several factors that may explain these concerns. First, nursing personnel employment grew more slowly between 1993 and 1995 than before 1993, and it declined in some care settings. Second, the lower average length of stay during this same period is likely to have increased the intensity of care provided to patients during their hospital stays, creating a perception that employment is dropping. Another explanation may be that, while RNs continue to be employed in short term hospitals, they may increasingly serve in roles other than direct care, such as administration and quality review (conversation with Gooloo Wunderlich, June 1997). Finally, these studies, current as of 1995, may not have captured the full extent of redesign changes enacted over the last few years as well as changes in RN employment patterns.

The overall employment outlook for Registered Nurses, Licensed Practical Nurses and nursing aides is positive. These three occupations are among the 30 occupations with the largest growth projected by the Bureau of Labor Statistics based on projections of moderate growth for the period 1992-2005. Employment was projected to grow 42 percent for RNs, 40 percent for LPNs, and 45 percent for nursing aides over this period (BLS 1994). Although this represents a slower growth in registered nurse employment than in the past, the Bureau of Labor Statistics still projects 469,000 new nursing jobs for Registered Nurses in the next 10 years in the public and private sectors. For registered nurses, more opportunities are projected for those trained in advanced practice techniques and procedures. Nursing homes are expected to offer the most new jobs for licensed practical nurses and nursing assistants as the number of aged and disabled persons in need of rehabilitation and long term care rises rapidly. In both the public and private sectors, nearly 197,000 new jobs are projected to open up for licensed practical nurses over the next decade and nearly 380,000 new jobs are projected for nursing assistants (Miller 1997).

The Institute of Medicine committee studying the adequacy of nurse staffing acknowledged the continued job growth for nurses, but described the changing role of nursing and the potential mismatch between the educational preparation of nurses and their future job demands. For example, the IOM committee noted an increased need for professional nursing in nursing homes due to the growth of rehabilitative services and the increasingly complex case-mix at such facilities. In summary, workforce adequacy needs to be considered not only in terms of numbers, but in terms of appropriate knowledge and skills as well.

Labor costs are a major part of hospital costs. Increasing RN salaries combined with the increasing size of the RN workforce are behind some of the efforts by hospitals to restructure patient services and staff mix (Wunderlich et al.1996). The Occupational Compensation Survey (OCS) conducted by the Bureau of Labor Statistics collected data on pay for registered nurses, licensed practical nurses, and nursing assistants. The most recent data, from 1994, found that weekly pay for registered nurses ranged from \$590 to \$1464, with higher wages going to registered nurses who specialized in a particular medical discipline, and with nurse anesthetists having the highest average wage. Ninety percent of registered nurses worked at level II, where they average \$711 a week nationwide (nurses are classified as level I-IV in the OCS). Over 9 in 10 licensed practical nurses were classified at level II (LPNs are classified as levels I-III in the OCS), and these workers averaged \$453 per week. Most nursing assistants were level II (nursing assistants are classified as level I-IV in the OCS) and their pay averaged \$272 per week. Of the registered nurses in the survey, 85 percent worked in hospitals, including nearly every specialist level II, registered nurse level III, and registered nurse level IV. In contrast, 43 percent of licensed practical nurses and 23 percent of nursing assistants worked in hospitals (Miller 1997).

Quality of Patient Care and Patient Outcomes

The conceptual framework commonly used in the area of quality of care was originally developed by Avedis Donabedian (1966), and involves the measurement of three factors: structure, process of care, and outcomes or end results of care. Among measurement experts, the term outcome refers to the result of an intervention that has an effect on a patient's health status. We are, of course, interested in learning about the end result, but researchers are also interested in knowing the interrelationship between:

- *Structural measures* (e.g., hospital accreditation, staffing ratios, heart surgeon board certification) *and outcomes* (e.g., heart surgery morbidity and mortality).
- *Process measures* (e.g., immunizations and prenatal care) *and outcomes* (e.g., morbidity and mortality from measles, polio, etc., and infant mortality).

The inter-relationships between these types of measures are not always clear, and research continues to pursue a better understanding of these linkages.

The Institute of Medicine Committee on the Adequacy of Nurse Staffing in Hospitals and Nursing Homes concluded:

The Committee found that little empirical evidence is available to support the anecdotal and other informal information that hospital quality of care is being adversely affected by hospital restructuring and changes in the staffing patterns of nursing personnel. At the same time, it noted a lack of systematic and ongoing monitoring and evaluating of the effects of organizational redesign and reconfiguration of staffing on patient outcomes.....This research suggests that there may be problem areas with the quality of hospital care, but that the extent of these problems today is not known because of the lack of objective current data."

While it is true that current research has yet to provide a substantial body of empirical evidence on the impacts of the most recent hospital and health care delivery organizational changes, earlier studies identify factors associated with quality of care that are of relevance to the current dialogue. For example, similar concerns about impacts on quality were expressed at the time that the Medicare Prospective Payment System (PPS) was implemented in the early 1980s. An in-depth before and after evaluation of the effects of Diagnosis Related Group (DRG)-based PPS was conducted by the RAND Corporation. The RAND study concluded that hospital mortality was unaffected by PPS and that improvements in hospital processes of care that began prior to PPS continued after its introduction. However, the study also confirmed the fear that more patients were discharged too soon and in unstable condition. Those who were discharged in unstable conditions had significantly higher mortality rates (Rogers et al 1990, Kahn et al 1990, Kosecoff et al 1990).

A series of studies of *magnet hospitals* provide insight into some of the impacts of the organization of nursing on quality of care and quality of service. In 1982, a study identified hospitals throughout the United States that had a reputation for being good places to work and to practice nursing and which had been particularly successful in attracting and retaining professional nurses at a time of serious nursing shortages. The final sample included 41 magnet hospitals. Infusion of hospital nursing departments with the values of excellent nursing care was found to be the identifying characteristic of magnet hospitals. The study inferred a relationship between retention of a qualified nursing staff and quality patient care (Kramer and Schmalenberg 1988). In a study comparing Medicare mortality data for 39 of these hospitals to control hospitals, Aiken (1994) found that the magnet hospitals have lower mortality than matched hospitals, which are similar along other organizational dimensions, but that are not known as settings that place a high institutional priority on nursing. Mortality rates were lower in magnet hospitals than in matched control hospitals by a factor of approximately 5 per 1,000 Medicare discharges. The magnet hospitals did differ from their matched controls in their nursing skill mix (they had a higher proportion of registered nurses) but, based on other organizational studies of the magnet hospital, Aiken and colleagues concluded that it was the organization of nursing care (e.g., greater status, autonomy, and control afforded nurses in the magnet hospitals) and not the skill mix alone that accounted for the difference in mortality. (Aiken 1994).

The Institute of Medicine report (Wunderlich et al. 1996) concludes that, "Literature on RNs' impact on hospital mortality rates is considerable...While nursing staffing is not the only factor predictive of mortality outcome, it is an important one affecting the quality of hospital care." They cite as examples studies by Prescott (1993), Hartz and colleagues (1989), and a commissioned paper by Verran (1995). Prescott reviewed empirical evidence of the impact of nursing staff levels and mix on quality of patient care in hospitals and found overall, "substantial evidence linking RN staffing levels and mix to important mortality, length of stay, cost and morbidity outcomes." (Prescott 1993, cited in Wunderlich et al. 1996). Hartz and colleagues (1989) analyzed Medicare discharges in 1986 and found that hospitals with a higher percentage of RNs and hospitals with higher staffing levels had lower adjusted mortality rates. Verran reviewed recent research and demonstration projects examining the interrelationship of staff, organizational, and client outcome variables and concluded that both the proportion of RNs on a nursing staff and a professional practice environment ⁵ have a positive influence on severity-adjusted Medicare mortality rates.

There is even more evidence relating quality of care and nurse staffing in nursing homes. A comprehensive review of the literature by the Institute of Medicine (Wunderlich et al. 1996) reported that there is considerable evidence linking quality and nursing staff in long term care settings. Higher nursing staff levels (nursing staff hours per resident day) in nursing facilities have been associated with higher quality of care as measured in terms

of care processes and various outcomes. However, the type of nursing staff may be more important than the availability of hours per se. The Institute of Medicine committee concluded:

The preponderance of evidence from a number of studies using different types of quality measures has shown a positive relationship between nursing staff levels and quality of nursing home care, indicating a strong need to increase the overall level of nursing staff in nursing homes. There is also a strong need to improve the level of nursing staff (RNs, LPNs, and NAs in nursing homes, but prescribing a staffing ratio across all residents and facilities is inadequate....Based on the empirical evidence...., the committee concludes that a relationship between RN-to-resident staffing and quality of care in nursing facilities has been established.

Subacute facilities fall somewhere in between hospitals and nursing homes in terms of the level of care provided and the acuity of patients. Subacute medical and rehabilitation services are a discharge option for patients who are suffering from cardiac conditions and cancer, recovering from surgical procedures and transplants, who require wound management, or who are ventilator dependent. Subacute care includes physician supervision and RN care and physiological monitoring on a continuous basis. A subacute care facility can be free-standing, or a unit of a hospital or of a nursing home.

The subacute care sector is a rapidly expanding area of the health care industry, and the expansion is dominated by for-profit organizations. Many subacute care programs are comparable to medical, surgical, and rehabilitation units of an acute care hospital, yet the cost of care in a subacute care unit is about 40 to 60 percent less than comparable care in an acute care setting. Although hospitals are ahead of nursing facilities in establishing subacute care units, several major nursing home chains are rapidly moving into this area. As of 1995 (Wunderlich et al. 1996) more than 10 percent of nursing facilities offered some type of subacute care and more than 15,000 beds were dedicated for subacute care. Growth in subacute care is projected to increase from \$1 billion today to \$10 billion by the year 2000 (Stahl 1995b, cited in Wunderlich et al. 1996).

Since subacute facilities are relatively new entrants in the hospital market, they have received only limited study to date in terms of staffing or patient outcomes. The Joint Commission on Accreditation of Healthcare Organizations (JCAHO) has recently incorporated subacute care into its survey process. Outcomes, physical plant, and physician credentials are three major areas addressed in JCAHO accreditation standards for subacute units, but RN credentials are not included in the standards. The AJN survey reported the greatest concerns about quality in subacute care settings, which employ the fewest RNs. (Shindul-Rothschild 1996). For example, 47 percent of nurses in subacute care, compared with 37 percent of all nurses, reported increases in medication errors. Overall, only 43 percent of nurses in the AJN Patient Care Survey said the quality of care in their health care organization met their professional standards. But, in subacute care that figure dropped to 35 percent. Close to a quarter of nurses working in subacute care rated the overall quality of care as poor or very poor, a figure much higher than that given by most nurses in all health care facilities (14 percent).

Worker Safety and Health

Health industry restructuring and changes in the delivery of patient services will naturally affect the work environment. Adverse effects on workers may translate into reduced quality of patient care. Work related injuries, violence in the workplace, and stress on the job are interrelated aspects of work conditions that are sensitive to both internal (such as staff cutbacks) and external (increased crime or substance abuse in a community) changes. Worker safety and health have implications for patient care and costs because staff turnover and lost workdays (the median absence from work for a work-related injury is 5 days [BLS 1994]) affect continuity of care and availability of trained staff.

Injuries

Findings from the national survey of work-related injuries in private industry conducted by the Bureau of Labor Statistics indicate that nursing homes led all other industries in overexertion incidents, the most common way in which lost worktime injuries occur. Nursing aides/orderlies was the occupation with the third highest number of injuries and illnesses involving days away from work in 1994. Only truck drivers and nonconstruction laborers reported more injuries. (BLS 1996) Back injuries are a particular concern for the staff of nursing homes. They account for a higher percentage of all injuries in nursing homes than in any other industry. Back injuries are the most common injuries among nurse assistants and their incidence is higher among nurse assistants than among other nursing personnel. The major sources of such injuries are lifting and moving patients and overexertion. Studies have found that recently employed nursing staff are more likely to injure their backs than are more experienced nursing personnel, a fact which is noteworthy in light of the high turnover rates of nurse aides (Wunderlich et al. 1996). Significantly more work-related injuries were reported by the 476 psychiatric/mental health, emergency, operating room, pediatric intensive care units (PACU), orthopedic, primary care, and neurology nurses who participated in the NJN survey than other nurses responding to the survey. The greatest increases in workplace injuries were reported by psychiatric nurses (57 percent), followed by those in orthopedics (55 percent), neurology (55 percent), operating room/PACU (54 percent), primary care (54 percent), and emergency nursing (51 percent) .

Violence

According to the BLS survey of work-related injuries, workers in the health services industry accounted for thirty eight percent of lost workday injuries resulting from assault (BLS 1996). Of these, nursing aides and orderlies accounted for 27 percent of lost workday cases resulting from assaults, the highest of any single occupational group in the BLS survey. Registered nurses accounted for an additional 7 percent of cases due to assault, and health aides (except nursing) accounted for another 3 percent. "They and other workers in health and residential care occupations (nurses and social workers, for example) were assaulted primarily by patients or residents who resisted their help or were prone to violence (BLS 1996). The Occupational Safety and Health Administration notes that there is a likely under reporting of violence and a persistent perception within the health care industry that assaults are part of the job (OSHA 1996). In addition to such factors as the increased prevalence of handguns among patients, families or friends and the availability of drugs or money at hospitals, clinics and pharmacies (making them targets for robberies), OSHA also notes the following as risk factors associated with work-related assaults: long waits in emergency or clinic areas, leading to client frustration; and low staffing levels during times of specific increased activity such as meal times, visiting times, and when staff are transporting patients (OSHA 1996). In the AJN survey, nurses in psychiatry/mental health, emergency, and primary care reported rates of workplace violence twice as great as nurses overall (Shindul-Rothschild et al. 1996).

Stress

Greiner (1996) found that hospital workers reported higher stress levels associated with the complexities of close teamwork, precise coordination, delegation, and effective communication. RNs expressed general satisfaction with quality of care but also mentioned being stressed and working harder. Nurses and other care givers indicate going out of their way to assure quality of care (e.g., skipping lunch, skipping breaks, working late) when other members of their patient care team do not carry their weight. The institutions examined by Greiner had invested significantly in worker training, had piloted units before full implementation, and did not see the primary motivation as saving money. Work restructuring, and related job stress may have implications for worker safety and injury. The Institute of Medicine (1995) noted that visible concern and leadership from high management levels, as well as good training (especially for lesser educated nursing staff) can have a substantial impact on reducing injuries.

4. Occupational Regulation

Occupational regulation has implications for quality of health care, labor supply and mobility, and cost. However, the existing system of occupational regulation is complex and cumbersome, dominated by professional interests, and slow to adapt to changes in the health care system. As managed care expands, increasing competition and cost containment in the health care sector, state regulatory bodies and third-party payers will face the challenge of collaborating to ensure that economic incentives do not undermine the quality of care or access to qualified providers. Our compilation of information on state-by state licensing laws and continuing education requirements excluded physicians and executive administrators. However, it should be noted that the medical profession has shaped much of the current health occupations regulatory system and is the predominant source of examples in the literature.

Definition of Terms

The terms used to describe levels and functions of occupational regulation vary from state to state and from profession to profession. Adding to the confusion and complexity are private credentialing systems, health facilities regulation and accreditation, and accreditation of educational

institutions, in addition to state government regulation of health professions. **Credentialing** is a generic term that is not usually defined in statute, but is widely used by professionals, the public, regulators, and legislators as evidence (public or private) of someone's qualifications. **Regulation** refers to governmental intervention in market transactions to control or alter the behavior of practitioners (Carpenter 1996).

The three terms most commonly used in state regulatory statutes are: **licensure, certification, and registration**. According to the National Clearinghouse on Licensure, Enforcement, and Regulation (CLEAR), "licensure" is the most restrictive form of state regulation. Under licensure laws, it is illegal for a person to practice a profession without first meeting the standards imposed by the state. Under "certification" the state grants title protection to persons meeting predetermined standards. Those without the title may perform the services of the occupation but may not use the title. "Registration" is the least restrictive form of regulation which usually takes the form of requiring individuals to file their name, address and qualifications with a government agency before practicing the occupation (Smith-Peters 1994).

Licensure, the most common form of health professional regulation, confers a state-protected **practice act ("scope of practice")** authorizing a specific occupation or profession to provide specific services. Scopes of practice draw the boundary between the lay person and the professional. Scopes of practice also draw the boundaries among the professionals, creating exclusive domains of control over the delivery of specific services. Practice acts can be exclusive and monopolistic (especially for the early-established professions such as medicine), a carved-out section of another profession's scope of practice, or a combination of various portions of others' scopes of practice (Finocchio et al. 1995).

State certification, as defined by CLEAR, is a public function that protects a profession's title. It is often confused with private certification--usually by private specialty associations or boards, which identifies practitioners who have met the standards of the private organization. The Task Force on Health Workforce Regulation of the PEW Health Professions Commission recommends that: "Because the vast majority of state health professional regulation is in effect, "licensure," (establishing minimum standards, practice acts, and sanctioning mechanisms for violations), state legislators should use the term 'licensure' to refer to any regulation of practice acts and title protection. States should decline to use the term 'certification' leaving it to the exclusive use of private sector credentialing bodies." (Finocchio et al. 1995)

At the institutional level, **accreditation** refers to the process by which an agency or organization evaluates and recognizes an institution or program of study as meeting certain predetermined criteria or standards (Carpenter 1996).

Relationship to Quality

With work restructuring, ancillary personnel are taking on new roles, roles for which they may not have been trained or certified. The argument for occupational regulation is based on protection of consumers by assuring a minimum level of competence. It assumes that consumers lack the information or technical expertise to make informed choices about the quality of health care services without some established standards. So, occupational regulation would seem appropriate in the restructured health care system. However, the Task Force on Health Workforce Regulation of the PEW Health Professions Commission concluded that the regulatory system may not effectively protect the public. Continuing education requirements do not guarantee continuing competence. The complaint process is often difficult for the consumer to initiate, and many complaints go without adequate investigation. Moreover, regulatory systems, in large part, have failed to implement mechanisms to evaluate their effectiveness and correct shortcomings (Finocchio et al. 1995). The IOM Committee on Adequacy of Nurse Staffing (Wunderlich et al. 1996) concluded that, "In the hospital sector, issues of training and competency of non-RN staff remain critical. No national standards exist for minimum training or certification of ancillary nursing personnel employed by hospitals." The IOM Committee found a wide variation in educational attainments and training and no accepted mechanism to measure competency or certify the attainment of a mastery of needed skills.

For most health occupations, states individually define competency and scope of practice, although the relationship between this system and quality assurance is unclear. Safriet (1994) comments, "Since health and illness are for the most part biologically and physically based, with some psychological and emotional components, it is not at all clear why licensure laws--that is, proxies for competency--should vary according to political boundaries rather than competency domains." The Task Force on Health Workforce Regulation of the PEW Health Professions Commission concluded that scope of practice acts "have encouraged a system that treats practice acts as rewards for the professions rather than as rational mechanisms for cost-effective, high quality and accessible service delivery by competent practitioners." (Finocchio et al. 1995). Questions related to quality arise in three areas of occupational regulation: entry to practice; continued competence; and disciplinary actions.

Entry to practice: standard setting and educational and skill competencies

The PEW Foundation's Task Force on Health Workforce Regulation identifies three critical problems with respect to entry to practice requirements: 1) lack of uniformity in entry-to-practice requirements among the states limits effective professional practice and mobility; 2) current entry-to-practice standards are not limited to competence; 3) the processes and systems for entry-to-practice development are not accountable to the public (Finocchio et al. 1995).

In health occupations, minimum level of competence has generally been measured in terms of educational attainment and examination. An almost universal requirement for entry into regulated practice is the successful completion of an examination approved or accepted by the state regulatory board. In the majority of instances, these examinations are developed by private sector vendors for national use (Finocchio et al. 1995). Carpenter (1996) notes that licensing does a reasonable job of gatekeeping by preventing clearly incompetent persons from entering an occupation or profession. Improvements in the field of testing and examination have probably reduced the level of false positives and false negatives in such screening. Unfortunately, for reasons of cost and logistics, didactic knowledge is more easily verified than clinical and applied knowledge (Carpenter 1996).

Minimum education and competency requirements are also a concern in health occupations at the nonprofessional level. In a study of California hospitals cited by the IOM Committee, 99 percent of the hospitals reported less than 120 hours of on the job training for newly hired ancillary personnel. Only 20 percent of the hospitals required a high school diploma and 59 percent of the hospitals provided less than 20 hours of classroom instruction (Barter et al. 1994, cited in Wunderlich et al. 1996).

In contrast to hospital settings, the Omnibus Budget Reconciliation Act (OBRA) of 1987 required certification of nurse aides in Medicaid-approved skilled nursing facilities and instituted competency exams and/or training for home health aides employed by Medicaid-certified home health agencies, beginning in 1990. Requirements include classroom and practical skills training as well as annual in-service continuing education. Quality concerns related to the high turnover and limited training of paraprofessional long term care workers were the primary impetus for these certification requirements, but additional research is needed to determine the impact of these requirements on quality of care. The fact that these requirements exist for long term care workers but not hospital workers is probably related to the more limited nurse supervision of paraprofessionals in long term care settings. Nursing aides make up 85 percent of nursing staff in nursinghomes and provide the majority of direct care to residents (Maraldo 1991, in Wunderlich et al. 1996). Home health workers, in particular, operate with a fair degree of autonomy.

Retesting

Continuing public protection is not assured solely by initial licensure. Practitioners must continue to learn and improve their knowledge, skills, and clinical judgement throughout their professional career. The credential earned at the beginning of a career may have little direct relationship to skills used and required later in practice (Finocchio et al. 1995). Most states and professional associations have addressed this problem by imposing continuing education requirements on licensees. But, there is a distinction to be made between continuing education and continued competency. Some state boards, acknowledging the failure of continuing education to guarantee continuing competence, are dropping continuing education requirements (Colorado Board of Nursing 1994 in Finocchio et al. 1995). However, in most cases they are not taking the next step-- guaranteeing continued competence. Periodic retesting, one way of assessing continued competence, is perceived by professionals as punitive and has been incorporated in requirements for health practitioners in only a limited number of states and occupations.

One example is found in California, where certified emergency medical technicians (EMT-1) are required to demonstrate their continuing competence every four years by passing a competence-based written and skills demonstration exam. Additionally, all EMT-1's must complete required continuing education courses every two years--either an approved 24-hour refresher course or a combination of approved continuing education courses focused on pre-hospital emergency care (Finocchio et al. 1995).

Disciplinary Process and Accountability

The most persistent criticism of licensing made by consumer groups is that the regulatory system fails to identify, weed out and/or rehabilitate incompetent, unethical and impaired practitioners, such as substance abusers and the mentally impaired (Carpenter 1996). A number of professional boards employ mandatory remedial education to address identified deficiencies of practitioners who have come before boards in disciplinary proceedings. In recent years, complaints to state licensing boards have increased. Washington's medical disciplinary board handles nearly twice as many physician complaints as it did in 1989, and in New York complaints have risen over 300 percent from 1989 to 1993 (Cohen and Raines, 1994 in Finocchio et al. 1995). In 1993, it was estimated that California had over 8,000 complaints about physicians alone (Schubert Associates 1994 in Finocchio et al. 1995). It is not known whether the increase in complaints stems from poorer quality care, heightened consumer education and awareness, or simply improved communications and recordkeeping.

Tracking the number of complaints is only the first step. Key issues are the response to complaints and the availability of information to those who license or employ health professionals, including state licensing boards, private credentialing organizations such as medical specialty boards, hospitals, and consumers. In response to public concerns about the diminishing numbers of disciplinary actions, the Massachusetts Board of Registration started issuing physician profiles to the public on all licensees, beginning in the summer of 1996.

At the national level, the National Practitioner Data Bank (NPDB) was created as a central clearinghouse for disciplinary actions taken by various state and federal agencies, such as the Drug Enforcement Administration and HCFA, as well as revocation or limitation of staff privileges taken by hospitals and health care networks. Despite the broad reporting mandates of the NPDB, little information has actually made its way into the system. A 1995 Office of the Inspector General report indicated that only 25 percent of all hospitals in the U.S. reported any incident to the NPDB during a three-year period. Only state licensure boards, provider institutions, individual practitioners, and some researchers are allowed to access the NPDB. There is no public access to the information. Provider institutions are required to query the NPDB every two years as a condition of granting privileges. However, state boards are not required to query it before allowing a practitioner to practice in their state. (Finocchio et al. 1995).

Many states require that malpractice awards and settlements be reported to licensing boards. There is, however, mixed evidence regarding the timeliness, completeness, and usefulness of the information provided about malpractice settlements and awards to boards (Finocchio et al. 1995). Health professions boards have varying policies regarding public access to information on disciplinary actions taken, number of complaints filed, malpractice settlements, and adverse actions taken by hospitals and peer review organizations.

Relationship to Labor Supply

Licensing, by definition, is exclusionary--it aims to exclude from practice those who do not meet a predetermined standard. But, licensing should not be used as a way to regulate the supply of practitioners for the economic benefit of those in a given occupational group (Shimberg 1982). Yet, there is a reverse incentive for licensing boards (composed largely of practitioners) to escalate entry requirements beyond those needed to assure a minimum standard of competency. When boards restrict practitioner supply through restrictive licensing requirements, the cost of services and thus the income of those licensed increases (Morrison and Carter 1996).

Labor supply is a key factor in the recent trends in state licensure laws to break down traditional scope of practice barriers for non-physician providers and give them more authority. The lack of generalist physicians, especially in medically underserved areas, encourages states with many, rural, physician shortage areas to give nonphysician providers more responsibilities (Fox-Grange 1995). For example, the physician assistant (PA) profession developed in the mid-1960s in response to a shortage and uneven distribution of primary care physicians. A physician assistant practices medicine under the supervision of a physician and may be employed in a primary care or hospital setting. Because they are less costly to train and earn about half the annual income of a physician, physician assistants can cost effectively spend more time with the patient and can staff clinics in remote areas (Brown 1997). Today, a third of PAs practice in communities with populations of 50,000 or less, and 18,000 are in rural areas with 10,000 or fewer people.

Nurse practitioners, who perform many of the same duties as physician assistants, are nurses with advanced training (a master's degree) that practice autonomously under their own licenses. Sekscenski et al. (1994) rated state practice environments for nurse practitioners, physician assistants, and nurse-midwives on the basis of legal status, reimbursement for services, and prescription writing authority. Their study found that favorable practice environments are strongly associated with a larger supply of these practitioners. In the case of nurse practitioners and physician assistants, their scopes of practice overlap to a large extent, with employers substituting one for the other depending upon local labor market conditions. This, of course, raises issues about why these two professions would be subject to different scope of practice laws.

Relationship to Cost

The health occupational regulatory system is frequently criticized for being costly because the system itself is so complex and duplicative due to the existence of licensing boards in every state. It is also argued that the system adds to the cost of health care by restricting the supply of licensed professionals and restricting access to less costly providers. Economists view licensure laws as state-enforced service monopolies that decrease competition, increase costs, and decrease access for the consumer, with the most restrictive licensure statutes contributing the most economic harm to the consumer (Hall in Finocchio et al. 1995).

The cost of services is also increased by professional turf battles. The flurry of activity in state legislatures provides evidence that many professionals are investing significant amounts of time and money to garner legislative support for new or broader scopes of practice. The professions with established scopes of practice (such as medicine, dentistry, and pharmacy) are spending comparable, if not more resources, defending their scopes from threats of invasion.

Reimbursement

The reimbursement system encourages professional rivalries and licensing disputes, but the system also has the potential to reduce the ability of restrictive licensing to assure higher incomes. To be reimbursed for services, practitioners usually must be licensed and the services they provide must be included in a regulated scope of practice. The Commission on Licensure, Enforcement and Regulation (CLEAR) views the linkage between reimbursement and licensing as placing a heavy burden on state legislators to enact new licensing statutes for many unlicensed mental health and allied health professionals (Finocchio et al 1995). Examples of linking licensure to reimbursement include federal mandates for states to license nursing home administrators, and later to maintain registries of nurse aides as a condition for Medicare and Medicaid reimbursement (Morrison 1996).

Managed care and capitated payments (payment of a set amount per enrolled person in a managed care plan) will fundamentally alter how services are reimbursed, and consequently, who provides those services. The cost-saving imperatives explicit in capitation could provide an incentive to move service delivery to the least costly practitioners (e.g., from physicians to physician assistants or nurse practitioners). Third-party payers likely will focus more on services than on providers when determining reimbursement.

Mobility, Career Ladders, and Earnings

The lack of standardization among the 50 states' entry to practice requirements restricts interstate mobility for many professionals. Even as nonphysician providers widen their scopes of work, several obstacles limit the nonphysician provider's ability to take his or her authority to a new practice setting or job. For example, prescription writing privileges may require that a state's Board of Medicine--which oversees physicians--rather than its Board of Nursing, authorize NPs and CNMs to write prescriptions. In that situation, the power to write prescriptions becomes a responsibility delegated by a collaborating physician rather than an authority the NP or CNM maintains in his or her own right. In some states, PAs are licensed on their own and they must merely notify the State Board of Registration as to the name and address of their supervising physician. In other states, a PA's license to practice is tied to an individual physician; the PA cannot change employers or practice sites without going through another state approval process. (HHS 1993).

With integrated health care delivery systems and telemedicine (electronic transmission of medical information, permitting diagnosis and consultation across distances) crossing state boundaries, and with the increased mobility of the population, the inflexibility of state licensing seems particularly out-of-step with current realities of the health care marketplace. Internationally, changes are already occurring in the structure and process of professional regulation. Despite profound differences in educational preparation, language, and practice ideologies, in the European Common Market countries, members of more than 150 occupations and professions can now move freely across national boundaries to practice (Orzack 1989

in Morrison and Carter 1994).

Licensure also affects upward mobility and career ladders. Licensure requirements can result in restrictions on mobility for certain population groups, or licensure can serve as a mechanism to professionalize occupations, enhancing credibility and earning capacity. For example, rigid entry to practice requirements that include college, graduate school, and supervised (often unpaid) work experience may result in discrimination against low-income people (Shimberg 1982). Nurse aides are an example of how certification can upgrade an occupation. The Omnibus Budget Reconciliation Act (OBRA) 1987 required certification of nurse aides in Medicaid-approved skilled nursing facilities and instituted competency exams and/or training for home health aides employed by Medicare-certified home health agencies, beginning in 1990. OBRA 1987 established, for the first time, a set of standards for providing hands-on care in a nursing facility, recognized through a certification process. Having a recognized level of expertise changes the status of the nurse's aide in two ways: (1) It weakens their reliance on any one employer, as they now have expertise that is directly transferable to other organizations, and (2) it increases their commitment to the occupation, by virtue of their initial investment of time and effort (Brannon and Smyer 1994). While education and increased training requirements may appear to hinder the ability of some individuals to become home care workers or certified nurse aides (e.g., due to financial barriers), both government and employer-sponsored training initiatives have developed in response to the certification requirement. (Pindus and Nightingale 1995).

Categories of Occupations and Sources of Information

There is no uniform classification of health occupations across all states. The closest to a standard classification is the list of occupations used by the Bureau of Labor Statistics (BLS) to track health services employment. BLS classifies health occupations into four categories: diagnosing occupations, assessment and treating occupations, health technicians and technologists, and health service occupations.

Table 2 summarizes available information on state regulation of health occupations. Several key sources of information were used. The Council of State governments, in its annual *Book of the States*, compiles information provided by state agency staff on state regulation of health occupations and professions. The National Clearinghouse on Licensure, Enforcement and Regulation (CLEAR) produced a comprehensive compilation of occupational and professional regulation in the states in 1994, and the American Academy of Physician Assistants compiled descriptions of state laws for physician assistants in 1997.

Over 100 separate health occupations and professions are regulated in one or more states, and 15 occupations are licensed in all 50 jurisdictions (Carpenter 1996). Table 2 shows only a partial listing. Most notably, it excludes physicians and managers as well as various subcategories of counselor, which are regulated in only a small number of states.

Table 3, taken from Carpenter (1996), shows Bureau of Labor Statistics data on health occupations employment in 1994 and projected employment for 2005. It should be noted that not all of the occupations listed are found in the summaries of state licensure requirements. This is due in part to differences in terminology and, in part to the fact that, for a number of occupations, "certification" refers to a standard or credential awarded by a professional organization rather than by a state licensing board. Considerable growth is projected in almost all of the health occupations listed. In fact, the Bureau of Labor Statistics predicts that the health care industry will continue to be among the fastest growing employment sectors during the next decade. Thus, changes in health occupations regulation will affect a growing segment of the workforce.

Continuing Education Requirements Table 4 summarizes continuing education requirements by state. Key sources of information for this table are the *Book of States* and the Intergovernmental Health Policy Project's review of 1995 legislative activity. Physician assistants and chiropractors are the two health professions with mandatory continuing education requirements in most states. Four state licensure laws specified continuing education requirements for chiropractors in 1995, requiring from 12 to 24 hours of continuing education annually (Fox-Grange 1995). Approximately half of all state boards of dentistry, nursing, optometry, pharmacy, physical therapy, and social work require licensees to take continuing education courses to maintain their licenses. As the table indicates, many fewer health occupations have continuing education requirements mandated by state licensing boards than have entry-to-practice requirements.

Continuing education is more within the purview of professional boards and associations. In a survey of voluntary credentialing organizations conducted by the Citizen Advocacy Center (1997), all respondents either had continuing competence recertification programs in place or were developing such programs for future implementation. Most of these organizations offer or require continuing education as one or the only means of recertification. Reexamination was also a common means for recertification reported by these professional associations. Other, less common recertification activities reported were self-assessment, peer review, and office record review. Most often, voluntary recertification organizations offered the practitioner a choice of methods of recertification. Organizations responding to this survey were medical specialty boards, nursing specialty boards, and other health specialty boards (e.g., American Academy of Physician Assistants, American Medical Technologists, and American Physical Therapy Association). Examples of continuing competency requirements include the following, summarized by the Citizen Advocacy Center (1997):

- **American Academy of Physician Assistants** -- The National Commission on Certification of Physician Assistants requires that physician assistants log 100 hours of continuing medical education every two years and sit for a recertification exam every six years to maintain their national certification.

- **American Medical Technologists** -- The American Medical Technologists, through its Institute for Education, awards credit for continuing education. Acceptable categories include programs related to the registrant's initial certification and job responsibility and programs focused on professional growth. Programs in the first category require objective examination or demonstration of competence. The organization does not require a specific number of hours of continuing education.

- **American Nurses Credentialing Center Board on Gerontological Nursing Practice** -- This organization offers recertification every five years. A candidate has two options for recertification: reexamination or continuing education. The candidate must also fulfill practice requirements which consist of 1,500 hours of gerontological nursing.

Institutional Standards and Accreditation

State licensing boards and professional organizations have traditionally been the key players in health occupations regulation, but they have close ties to the organizations that accredit educational institutions. The most common requirement for entry into regulated health professional practice in any state is graduation from an educational program approved by the state licensing board. In virtually every state and for every profession, approval means that boards defer to private, voluntary organizations that accredit educational institutions or programs (Finocchio 1995).

There are other players as well in the health occupations regulatory process, including the federal government, organizations that accredit health facilities, and managed care organizations. State and federal governments often regulate health care facilities to help them qualify for reimbursements. In addition, a growing number of national organizations attempt to assure health care quality by operating voluntary programs for the accreditation of health care organizations, facilities, and programs. In some cases states and the federal government accept private accreditation as a substitute for their licensure processes (Finocchio et al. 1995). The largest private organization involved in facility regulation is the Joint Commission on the Accreditation of Health Care Organizations (JCAHO). Other organizations are the Commission on Accreditation of Rehabilitation Organizations and the National Committee for Quality Assurance (NCQA). NCQA accredits health plans and produces standardized report cards on the performance of managed care plans.

One of the factors considered in accreditation is the quality and competence of the organization's staff. For example, JCAHO requires current licensure, relevant training and experience, and documentation of current competence of medical staff. In the last 5-7 years, accrediting bodies such as NCQA have been requiring managed care organizations to check the credentials of their providers before including them in their networks, and to use performance information (such as quality measures and patient satisfaction surveys) in the recontracting process. These requirements are an attempt to assure quality and ongoing competency and to broaden decision criteria beyond "economic credentialing," a term which refers to the use of utilization management statistics, referral patterns and cost-based information rather than measures of provider competence, training, or patient outcomes to drive decisions about recontracting. Most economic credentialing has been focused on physicians, psychologists, and psychiatrists. However, it could easily spill over to other practitioners who are recognized as providers in a capitated system. As organizers of care across the country, managed care organizations are positioned to evaluate a range of providers in a variety of settings during the hiring and recontracting

process.

Finally, both state and federal insurance law have jurisdiction over some aspects of health practitioner competence and consumer protection. State insurance codes address reimbursement issues as well as issues related to covered services and access to providers. For example, a number of states have recently enacted "any willing provider" laws, which prohibit insurers from excluding any provider who is qualified and willing to accept the participation terms offered by the plan. These laws are a response to economic credentialing on the part of health plans and are a source of contention between physicians and managed care organizations. The law is presented by physicians as assuring choice to consumers. Managed care organizations view such legislation as physician attempts to regain control of their practices.

A growing number of consumers who are covered by employer-sponsored health plans are not necessarily protected by state regulatory mechanisms if they encounter quality-related problems with their plans or plan practitioners. The Employee Retirement Income Security Act of 1974 (ERISA), which sets federal standards for private-sector employer-provided health plans, preempts, or forbids, the application of state laws that relate to employee benefit plans, but allows states to regulate the insurance policies that some of these plans purchase. The growth of self-insured plans has shielded many health plans from state oversight. Managed care plans have raised a number of complex issues, and Health Maintenance Organizations (HMOs) have attempted to use the ERISA exemption to protect themselves from liability for malpractice by physicians in their employ. This is a very complex issue that is still being tested in the courts.

Legislative Activity, Innovations, and Models

Recent attempts to mold the regulatory system to function more rationally and effectively have included expanded scopes of practice, delegation and supervision stipulations, and practice act waivers. Other initiatives have aimed to clarify terminology, promote uniformity across states, and shift the locus of licensing away from individual professions.

Legislative Activity

In 1995 alone, 850 health professions licensure bills were introduced in state legislatures and more than 300 were enacted into law (Fox-Grange 1995). This legislative activity generally revolves around nonphysician providers proposing to expand or clarify their scopes of practices and define reimbursement of their services. These groups traditionally face strong opposition from the medical community and the insurance industry (because of a reluctance to expand coverage). Some health care services (e.g., prescribing medication and practicing independently) that were long the preserve of doctors, have been opened up to other professionals, including nurse practitioners, physician assistants, optometrists, podiatrists, midwives, and audiologists. (Finocchio et al 1995). Some states and institutions are also revisiting delegation and supervisory rules, for example, and modifying nurse practice acts to limit situations in which RN supervision of nursing assistants is required. For instance, in the late 1980s, Oregon modified its nurse practice act explicitly to permit people who are not nurses to perform nursing functions if they have been taught by a nurse on a patient-specific and procedure-specific basis and have been certified to do the tasks.

The focus of legislative activity in recent years includes: prescriptive privileges, autonomy from physician supervision, and Medicaid and/or third party reimbursement. In addition, some nontraditional providers (e.g., acupuncturists and homeopathic providers) have successfully lobbied for laws that require their licensure, establishing acceptance of their professions. State legislative activity related to nurse aides and other ancillary service providers has been more limited. The Intergovernmental Health Policy Project, which has been tracking annual state legislative activity on this issue for several years, summarized legislative activity for Advanced Practice Registered Nurses, Physician Assistants, Optometrists, Psychologists, Chiropractors, and several alternative health care providers (e.g., acupuncturists, homeopathic practitioners) in 1995 (Fox-Grange 1995). A brief summary of these findings for selected occupations is included here to demonstrate the range of activities and scope of changes being addressed by state legislatures.

• **Advanced Practice Registered Nurses (APRNs)** -- Nurses in advanced practice include: Nurse Practitioners, Certified Nurse Midwives, Certified Nurse Specialists, and Certified Nurse Anesthetists. There is great inconsistency across states in regulation of these professions. Regulatory names, certification/licensing, prescriptive authority, professional autonomy, and use of terminology can all differ from one state to another. In 1995, legislators in 28 states enacted 50 laws that directly affect the practice of the registered nursing profession. In 44 states and the District of Columbia, APRNs are allowed prescriptive authority, as long as they have some sort of collaborative agreement, protocol, or referral plan with a physician. In 10 of these jurisdictions, APRNs have complete independence in prescribing medications. APRNs in most states can establish independent practices but only under a protocol, collaboration or referral plan with a physician. Nine states waive those limitations. The most significant change in 1995 occurred in Maine, where APRNs are now permitted to establish their own independent practice after two years under the supervision of a physician. Most states do not regulate hospital admitting privileges for APRNs; rather, those privileges are granted at the discretion of the hospital. State Medicaid agencies are required to reimburse for services rendered by registered nurses. Slightly more than half of the states guarantee APRNs third-party payment for services rendered, primarily through provisions in their health insurance codes. A few states have enacted laws that permit APRNs to serve as "gatekeepers" under Medicaid managed care.

Physician Assistants (PAs) -- 40 states plus the District of Columbia allow PAs to prescribe pharmaceuticals. Of those, 30 permit them to prescribe controlled substances, though various restrictions apply. Most states do not require physicians to be physically present at all times when supervising PAs, as long as they are available by some form of telecommunication. Currently 42 state Medicaid programs reimburse PAs at either the same or a lower rate than physicians. According to the American Academy of Physician Assistants, most private health insurance companies cover PA services, though they often differ in how these services are covered. The majority of insurers require the bill for PA services to be filed under the physician's name and provider number.

Optometrists -- The American Optometric Association has been very successful in expanding the scope of practice of optometrists in the past 25 years. Today, optometrists' scope of practice has grown to include diagnostic and therapeutic drug use, as well as treatment of glaucoma. A 1987 change in Medicare allowed direct reimbursement for covered services of an optometrist. In 1995, 26 laws were enacted in 19 states that directly affect optometrists. Optometrists have the authority to treat glaucoma in 33 states, including 6 that acted on this in 1995. States have the option of covering optometric services under their Medicaid programs, and most states covered such services, but with varying restrictions. Two states addressed third party payment for optometry services in their 1995 legislative sessions.

Clinical Psychologists -- Psychologists do not have prescriptive privileges. Those in the employ of the Indian Health Service can prescribe under physician supervision, and more than half of psychologists consult in some manner with physicians on psychotropic prescriptions for their patients. Twelve states and the District of Columbia allow hospitals to grant full staff privileges to psychologists, but only two of these jurisdictions address the issue of hospital admitting privileges; one prohibits psychologists from admitting patients while one permits them to admit patients. States also addressed reimbursement for psychologists through various types of legislation: four states require all health insurers to provide coverage for treatment of mental illness under the same terms and conditions as coverage for other illnesses (known as "mental health parity" laws), three states prohibit insurers from excluding any provider who is qualified and willing to accept the participation terms offered by the plan ("any willing provider" laws), and one state, New Hampshire, requires that HMOs provide access to psychological services.

Initiatives to Review and Recommend Changes in the System

Legislative activity represents an incremental, piecemeal approach to changing regulation of health occupations. A number of task forces, commissions and studies are taking a broader approach, examining and questioning the current licensure system. The Task Force on Health Workforce Regulation of the PEW Health Professions Commission, cited throughout this paper, endorsed the need to reform the regulatory system and issued recommendations for improving the system. The PEW Health Professions Commission is now promoting discussion of action steps related to these recommendations at the national and state level. The Pew Task Force stated that:

United States health consumers need a regulatory system that bases authority to practice on the practitioner's demonstrated initial and continuing competence--acknowledging that differently trained and differently named professions may deliver the same services--so long as they demonstrate competence. Professionals should be allowed and encouraged to provide services to the full extent of their current knowledge, training, experience and skills.

The Maine Health Professions Regulation Project has been underway since 1993 and issued a set of recommendations in June 1995, calling for a new, coordinated health professions regulatory system (Carpenter 1996). The PEW and Maine Health Professions Task Forces both call for increased flexibility and removing barriers to full utilization of competent nonphysician providers. Another state reform effort is the Washington Healthcare Workforce 2000 Project (Carpenter 1996). The AFL-CIO's Department of Professional Employees convened a workshop on licensing and credentialing in the health care industry in February 1996. However, many professional and occupational groups oppose large scale reform out of fear that the gains they have realized in terms of autonomy and economic control would be compromised. The debate over practice acts and alternatives to the current health occupations regulatory system is likely to continue as the restructuring of the health system redefines the roles and relationships of the various health professions.

Examples of Current Innovations

Recent innovations aimed at broader reforms of health occupations regulation include models for uniform terminology, standardizing entry to practice requirements across states, licensing of acts or skills rather than specific occupations, and institutional licensure.

Montana recently adopted a Uniform Licensing Act, which establishes uniform guidelines for the licensing and regulation of professions and occupations under the jurisdiction of professional and occupation licensing boards. The act covers all professional and licensing boards in the state's department of commerce--both health related and technical--and includes provisions for board authority, licensure procedures, complaint investigations, and sanction procedures and policies (Finocchio et al. 1995). Several national associations or professional regulatory boards have also proposed uniform language models, as has the Council on Licensure, Enforcement, and Regulation (CLEAR 1995, cited in Finocchio et al. 1995).

A number of national professional associations, particularly in medicine and nursing, have developed model entry to practice standards and uniform testing instruments which promote standardization across the states. The American Nurses Association uniformly certifies nurse practitioners in all 50 states. There are concerns, however, when state agencies defer to private credentialing organizations in their effort to promote uniformity, because some requirements may stem more from professional interests than protection of the public. Dentistry has explored the concept of national licensure, and some states have adopted "licensure by endorsement" policies that recognize the license of a practitioner from another state (Finocchio et al. 1995).

The Ontario, Canada Health Professions Legislation Review, which began its comprehensive regulatory reform effort in 1982, resulted in a new model of health professions regulation. Responding to the principal that "the sole purpose of professional regulation is to advance and protect the public interest," this model licenses specific acts or functions rather than licensing exclusive scopes of practice of individual health professions (Ontario Health Professions Legislation Review 1989). A law enacted in Ontario in 1993 specifies "controlled acts" that are potentially dangerous to the public. Companion laws that cover the regulated professions each contain 1) individual "scopes of practice" that describe the profession in general terms; and 2) "authorized acts" listing the controlled acts that may be performed by a member of that profession. For example, the Medicine Act grants physicians authority to perform 12 of the 13 controlled acts and the Midwifery Act authorizes midwives to perform seven of the controlled acts (Finocchio et al. 1995).

Another approach to changing health occupations regulation, known as "institutional licensure" has been the subject of much debate since the 1970s. This concept would shift regulatory and public protection responsibilities from state licensure boards to hospitals, HMOs and integrated health delivery systems. Problems inherent in this approach such as conflict of interest, malpractice liability and contractual relationships with practitioners, and limitations on practitioner mobility and wages, have led to the concept being dismissed as a solution to health occupations regulatory reform. However, as noted earlier in this paper, the issues raised have become increasingly important with the growth of a managed care.

5. Interpreting the Evidence: Summary and Conclusions

While the research to date cannot tie specific restructuring activities or staffing ratios to specific changes in patient outcomes, the evidence does point to a relationship between staffing, skill levels, and quality which is likely to hold true in a range of care settings. There is considerable anecdotal evidence of poor patient outcomes and risks to worker safety and health as a result of de-skilling (from the RN perspective) or multiskilling (from the perspective of other caregivers) and speed-ups. Several factors may explain the discrepancy between the presence of anecdotal evidence and the absence of quantitative evidence. One factor may simply be the lack of research. Another may be that negative, more dramatic anecdotes are more likely to be mentioned. A third factor may be the lag time before national trends support what is seen in localized situations. The director of the IOM study, Gooloo Wunderlich notes that "anecdotes should not be ignored, they raise a red flag." (Rich 1996). In their analysis of the AJN survey, Shindul-Rothschild and her colleagues (1996) found variations in nurses' reports of downsizing and service cutbacks or, in some cases, additions to services, by region, setting, and specialty. They suggest that this may explain why it is difficult to reconcile apparent contradictions between anecdotal information from nurses and aggregate national data on manpower trends.

There are many measurement problems and subtleties involved in understanding quality of care. Important measurement problems include:

- linkages between structural and outcome measures are not well understood
- there are varying methods to assess patient acuity, which is linked to needed RN to patient ratios and overall staffing mix
- there is a lack of standardization in hospital quality measurement.

In an effort to improve standardized measurement, the Joint Committee on Accreditation of Health Organizations (JCAHO) has established an approved list of measurement programs and, beginning in January 1998 all accredited facilities are required to participate in at least one of the approved programs. One such approved program is the Maryland Hospital Association's Quality Indicator project. This project is the largest comparative clinical database in the country, with more than 1100 facilities participating. Maryland hospitals began participation in 1985 and national participation began in 1987. Project participants collect and submit quarterly clinical outcomes-based data according to rigorous indicator definitions and receive quarterly annual reports (MHA 1997).

Among the subtleties involved in monitoring quality are the impact of setting, cultural sensitivity, and continuity of care. With patients being moved quickly through the continuum of care to the least restrictive (and least costly) environment, there is a need to look at the entire episode of care. A critically ill patient may go from emergency room to hospital intensive care unit, to acute care bed, to nursing home in the course of one month. In each setting, the patient would be seen by different providers and each setting would have its own set of medical records and quality indicators. Current methods of data collection and analysis are unlikely to associate patient outcomes with care received over the entire treatment episode.

Another variable affecting the impact of work redesign changes is the implementation process. Greiner (1996) reported that implementation of work restructuring on a pilot unit allowed for careful study and revision of the restructuring effort. How innovations are implemented, such as pilot testing of innovations, involvement of workers in the planning process, extent of training provided to staff, and agreements related to employment security will affect the success of the restructuring efforts and its impact on patients.

Calls for reform of the health occupations regulatory system are not new, but changes in service delivery and work redesign have focused attention on this issue. The decentralized nature of the system and intense professional interests have resulted in an almost intractable situation. What is different this time is the nature of the health care marketplace, such as consolidation and nationalization of health care organizations, increased focus on the quality of individual providers, competition for market share, and health care entities aggressively seeking to limit labor costs by substituting less costly staff. This may lead to more comprehensive reform. At the very least, it will bring more attention and discussion to issues that have been "simmering" for a long time.

Recent trends in health occupations regulation, centered at the state level, have opened up some health care services that were previously the exclusive domain of doctors to other professionals. The most notable areas of activity addressed are prescribing medication and practicing independently. Some states and institutions are also revisiting delegation and supervisory rules (Fox-Grange 1995). Under current delegation laws and interpretations, a practitioner may delegate tasks or services within his or her scope of practice to someone who would not otherwise be allowed by law to perform them. Practitioners who currently require delegation or supervision are attempting to gain more independent authority to perform services.

These legislative trends reflect broader changes in health care delivery. Managed care plans are concerned with providing care in the most cost effective manner, so there is an incentive to have the least expensive qualified provider deliver the service. The question is, how do we know who is qualified, and what if the managed care plan makes a mistake? Consumers are faced with more limited choices of employer-sponsored health plans and with more limited choices of providers under managed care. They want to be assured that they will have access to the services they need and that services will be delivered by high quality providers. Authorizing non-physicians to provide some of these services is one way of improving access to care. At the same time, consumers want more information about the providers and services available to them. The myriad of titles, licensing provisions, private occupational oversight bodies, and accreditation agencies makes it difficult for consumers to discern who is accountable for assuring that quality. Finally, the relationship of licensing, scope of practice, or cost to quality of care are not clear. Questions remain as to who is liable if something goes wrong. Consumers have a right to rely on the regulatory system to protect them in this dynamic environment.

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Notes

1. In 1984, the Health Care Financing Administration changed its system of paying for hospital care for Medicare patients from a cost basis to a fixed-fee prospective payment system based on Diagnosis Related Groups (DRGs). This system contains incentives to reduce length of stay and substitute lower cost services for more expensive ones.
2. AHA defines a network as a group of hospitals, physicians, or other providers, insurers, and/or community agencies that work together to deliver a broad spectrum of services to their community.
3. AHA defines a system as a corporate body that may own and/or manage health provider facilities or health-related subsidiaries.
4. Ancillary services are defined as supplemental health services that traditionally are performed by technicians and other non-registered nurse staff in a central location, such as x-ray, respiratory therapy, and laboratory testing.
5. A professional practice environment is defined as a unit-level self-management model including participant decision making, use of primary nursing, peer review, and a salaried status for RN staff.

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TABLES

Table 1: CHANGES IN NURSE STAFFING BY REGION

	Region								
	1: New England	2: Mid Atlantic	3: S. Atlantic	4: East North Central	5: East South Central	6: West North Central	7: West South Central	8: Mountain	9: Pacific
# RNs									
1993	52,372	172,416	171,377	166,445	63,224	72,602	96,131	47,502	117,355
1995	50,599	168,189	181,185	167,018	67,947	77,648	101,886	49,613	118,645
change	-1,773	-4,227	9,808	573	4,723	5,046	5,755	2,111	1,290
% change	-3.39%	-2.45%	5.72%	0.34%	7.47%	6.95%	5.99%	4.44%	1.10%
# LPNs									
1993	6,834	26,017	33,043	22,663	18,501	12,795	30,995	6,754	17,554
1995	6,139	25,734	31,191	22,029	17,414	13,749	28,851	7,040	17,983
change	-695	-283	-1,852	-634	-1,087	954	-2,144	286	429
% change	-10.17%	-1.09%	-5.60%	-2.80%	-5.88%	7.46%	-6.92%	4.23%	2.44%

Source: American Hospital Association Annual Surveys for 1993 and 1995

TABLE 2: HEALTH OCCUPATIONS REGULATION BY STATE

Health Services Occupations	S T A T E												
	AK	AL	AR	AZ	CA	CO	CT	DC	DE	FL	GA	HI	
Diagnosing Occupations													
Dentist	L	L	L	L	L	L	L	L	L	L	L	L	L
Nurse Practitioners	L	L	L	C	L	---	L	---	---	L	L	---	---
Optometrists	L	L	L	L	L	L	L	L	L	L	L	L	L
Podiatrists	L	L	L	L	L	L	L	L	L	L	L	L	L
Assessment and Treatment Occupations													
Dietitians	---	L	L	---	C	---	---	L	---	L	C	---	---
Nurse Midwife	L	L	L	---	L	L	L	L	L	---	---	L	---
Nutritionists	---	---	---	---	---	---	---	L	---	---	---	---	---
Occupational Therapists	L	L	L	L	---	---	L	L	L	L	L	---	---
Pharmacists	L	L	L	L	L	L	L	L	L	L	L	L	L
Physical Therapist	L	L	L	L	L	L	L	L	L	L	L	L	L
Physician Assistants	R	L	C	C	L	C	L	L	L	L	L	C	---
Professional Counselors	---	L	L	C	---	L	---	L	L	---	L	---	---
Psychologists	L	L	L	L	L	L	L	L	L	L	L	L	L
Recreational Therapists	---	---	---	---	---	---	---	R	---	---	L	---	---
Registered Nurses	L	L	L	L	L	L	L	L	L	L	L	L	L
Respiratory Therapists	---	---	L	---	L	---	---	---	---	L	L	---	---
Speech-language Pathologists & Audiologists	---	L	L	---	L	---	L	---	L	L	L	L	L
Health Technicians & Technologists													
Clinical Laboratory Technologists & Technicians	---	---	---	---	L	---	---	---	---	L	---	L	---
Dental Hygienists	L	L	L	L	L	L	L	L	L	L	L	L	L
Emergency Medical Technicians	L	L	L	L	L	L	L	L	L	L	L	L	L
Home Health Aide/Homemaker	---	---	---	---	C	---	---	---	---	---	---	---	---
Licensed Practical Nurses (LPN)	L	L	L	L	L*	L	L	L	L	L	L	L	L
Nuclear Medicine Technologists/Technicians	---	---	---	---	---	---	---	---	L	L	---	---	---
Nurses' Aide/Nursing Assistant/Anc. Nursing Personnel	C	---	L	C	L	L	---	---	---	C	---	C	---
Opticians	L	---	L	L	C	---	L	---	---	L	L	L	L
Pharmacy technicians	R	---	---	L	R	---	---	R	---	---	---	---	L
Psychiatric technicians/aides													
Radiologic technologists & technicians	---	---	L	C	L	---	---	---	L	C	L	L	L
Other Health Occupations													
Hearing Aid Dealer & Fitter	L	L	L	L	L	L	L	---	L	L	L	L	L
Denturist	---	---	---	L	---	---	---	---	---	---	---	---	---
Dental Assistant	---	---	R	C	L	---	---	---	---	---	---	---	---
Chiropractor	L	L	L	L	L	L	L	L	L	L	L	L	L
Acupuncturist	L	---	---	---	L	R	---	L	---	L	L	L	L
Occupational Therapy Assistant	L	L	L	L	---	---	L	L	L	L	L	L	---
Homeopath	---	---	---	L	---	---	L	---	---	---	---	---	---
*California uses the term Licensed Vocational Nurse (LVN)													
** State does not regulate "professional counselors" but does license alcoholism and drug counselors													
See accompanying paper for definitions													
C = Certification													
L = Licensure													
R = Regulation													
E = Enabling Legislation													
— Not regulated													
Shaded area signifies no information was found													

Source: The Book of the States 1996-97, the Council of State Governments; Occupational and Professional Regulation in States, CLEAR 1994; and AAPA - State Laws for Physician Assistants, 1997.

TABLE 2: HEALTH OCCUPATIONS REGULATION BY STATE

Health Services Occupations	S T A T E											
	IA	ID	IL	IN	KS	KY	LA	MA	MD	ME	MI	MN
Diagnosing Occupations												
Dentist	L	L	L	L	L	L	L	L	L	L	L	L
Nurse Practitioners	L	L	---	---	L	L	---	---	L	---	C	L
Optometrists	L	L	L	L	L	L	L	L	L	L	L	L
Podiatrists	L	L	L	L	L	L	L	L	L	L	L	L
Assessment and Treatment Occupations												
Dietitians	L	---	L	---	L	C	L	---	L	L	---	---
Nurse Midwife	---	---	---	C	L	L	---	L	L	---	C	---
Nutritionists	---	---	---	---	---	C	L	---	L	---	---	---
Occupational Therapists	L	L	L	C	C	L	L	L	L	L	---	---
Pharmacists	L	L	L	L	L	L	L	L	L	L	L	L
Physical Therapist	L	L	L	L	C	L	L	L	L	L	L	C
Physician Assistants	R	C	L	C	C	C	L	R	C	L	L	R
Professional Counselors	---	L	L	C	C	---	L	---	C	L	L	---
Psychologists	L	L	L	C	R	L	L	L	L	L	L	L
Recreational Therapists	---	---	---	---	---	---	---	---	---	---	---	---
Registered Nurses	L	L	L	L	L	L	L	L	L	L	L	L
Respiratory Therapists	L	R	---	C	C	L	L	L	L	L	---	C
Speech-language Pathologists & Audiologists	L	---	L	L	L	L	L	L	L	L	---	C
Health Technicians & Technologists												
Clinical Laboratory Technologists & Technicians	---	---	---	---	---	---	---	---	---	---	---	---
Dental Hygienists	L	L	L	L	L	L	L	L	L	L	L	L
Emergency Medical Technicians	L	L	L	L	L	L	L	L	L	L	L	L
Home Health Aide/Homemaker	---	L	R	---	R	---	---	---	---	---	---	L
Licensed Practical Nurses (LPN)	L	L	L	L	L	L	L	L	L	L	L	L
Nuclear Medicine Technologists/Technicians	L	---	L	---	---	---	L	---	---	L	---	---
Nurses' Aide/Nursing Assistant/Anc. Nursing Personnel	L	L	R	---	R	---	---	R	---	---	---	L
Opticians	---	L	---	---	---	L	---	L	---	---	---	---
Pharmacy technicians	---	---	L	L	---	---	R	L	---	L	---	---
Psychiatric technicians/aides		L					L					
Radiologic technologists & technicians	L	---	L	L	---	L	L	L	L	L	E	---
Other Health Occupations												
Hearing Aid Dealer & Fitter	L	L	L	L	L	L	L	---	L	L	L	L
Denturist	---	L	---	---	---	---	---	---	---	---	---	---
Dental Assistant	---	---	---	---	---	---	---	---	R	---	L	C
Chiropractor	L	L	L	L	L	L	L	L	L	L	L	L
Acupuncturist	---	---	---	---	---	---	L	L	L	L	---	---
Occupational Therapy Assistant	L	---	L	C	C	L	L	L	---	L	---	---
Homeopath	---	---	---	---	---	---	---	---	---	---	---	---
<p>*California uses the term Licensed Vocational Nurse (LVN)</p> <p>** State does not regulate "professional counselors" but does license alcoholism and drug counselors</p> <p>See accompanying paper for definitions</p> <p>C = Certification</p> <p>L = Licensure</p> <p>R = Regulation</p> <p>E = Enabling Legislation</p> <p>— Not regulated</p> <p>Shaded area signifies no information was found</p>												

Source: The Book of the States 1996-97, the Council of State Governments; Occupational and Professional Regulation in States, CLEAR 1994; and AAPA - State Laws for Physician Assistants, 1997.

TABLE 2: HEALTH OCCUPATIONS REGULATION BY STATE

Health Services Occupations	S T A T E											
	MO	MS	MT	NC	ND	NE	NH	NJ	NM	NV	NY	
Diagnosing Occupations												
Dentist	L	L	L	L	L	L	L	L	L	L	L	L
Nurse Practitioners	---	---	L	---	---	L	L	---	---	L	L	
Optometrists	L	L	L	L	L	L	L	L	L	L	L	L
Podiatrists	L	L	L	L	L	L	L	L	L	L	L	L
Assessment and Treatment Occupations												
Dietitians	---	L	L	---	L	R	---	---	L	---	---	
Nurse Midwife	---	L	L	C	---	L	---	L	---	---	L	
Nutritionists	---	---	L	---	---	---	---	---	L	---	---	
Occupational Therapists	C	L	L	L	---	L	L	---	L	---	L	
Pharmacists	L	L	L	L	L	L	L	L	L	L	L	L
Physical Therapist	L	L	L	L	L	L	L	L	L	L	L	L
Physician Assistants	R	N/A	L	L	C	L	L	L	L	L	R	
Professional Counselors	L	L	L	C	---	**C	---	---	L	---	---	*
Psychologists	L	L	L	L	L	L	C	L	L	L	L	L
Recreational Therapists	---	---	---	C	---	---	---	---	---	---	---	
Registered Nurses	L	L	L	L	L	L	L	L	L	L	L	L
Respiratory Therapists	C	L	L	---	L	L	L	L	L	---	---	
Speech-language Pathologists & Audiologists	L	L	L	L	L	L	---	L	L	L	L	L
Health Technicians & Technologists												
Clinical Laboratory Technologists & Technicians	---	---	L	---	---	---	---	---	---	L	---	
Dental Hygienists	L	L	L	L	L	L	L	L	L	L	L	L
Emergency Medical Technicians	L	L	L	L	L	L	L	L	L	L	L	L
Home Health Aide/Homemaker	---	---	---	---	---	---	---	L	---	---	---	
Licensed Practical Nurses (LPN)	L	L	L	L	L	L	L	L	L	L	L	L
Nuclear Medicine Technologists/Technicians	---	---	---	---	---	---	---	L	---	---	---	
Nurses' Aide/Nursing Assistant/Anc. Nursing Personnel	---	L	---	R	L	---	C	---	---	L	---	
Opticians	---	---	---	L	---	---	R	L	---	---	L	
Pharmacy technicians	---	L	---	---	---	---	---	---	---	---	---	
Psychiatric technicians/aides												
Radiologic technologists & technicians	---	---	L	---	---	---	---	L	C	---	L	
Other Health Occupations												
Hearing Aid Dealer & Fitter	L	L	L	L	L	L	L	L	L	L	L	L
Denturist	---	---	L	---	---	---	---	---	---	---	---	
Dental Assistant	---	---	---	---	---	---	---	R	---	---	---	
Chiropractor	L	L	L	L	L	L	L	L	L	L	L	L
Acupuncturist	---	---	L	---	---	---	---	L	L	L	L	L
Occupational Therapy Assistant	---	L	L	L	---	L	L	---	L	---	L	
Homeopath	---	---	---	---	---	---	---	---	---	---	L	---
<p>*California uses the term <i>Licensed Vocational Nurse (LVN)</i></p> <p>** State does not regulate "professional counselors" but does license alcoholism and drug counselors</p> <p>See accompanying paper for definitions</p> <p>C = Certification</p> <p>L = Licensure</p> <p>R = Regulation</p> <p>E = Enabling Legislation</p> <p>— Not regulated</p> <p>Shaded area signifies no information was found</p>												

Source: The Book of the States 1996-97, the Council of State Governments; Occupational and Professional Regulation in States, CLEAR 1994; and AAPA - State Laws for Physician Assistants, 1997.

TABLE 2: HEALTH OCCUPATIONS REGULATION BY STATE

Health Services Occupations	S T A T E											
	OH	OK	OR	PA	RI	SC	SD	TN	TX	UT	VA	VT
Diagnosing Occupations												
Dentist	L	L	L	L	L	L	L	L	L	L	L	L
Nurse Practitioners	L	C	---	L	L	L	L	---	L	L	L	---
Optometrists	L	L	L	L	L	L	L	L	L	L	L	L
Podiatrists	L	L	L	L	L	L	L	L	L	L	L	L
Assessment and Treatment Occupations												
Dietitians	L	L	L	---	L	---	---	L	C	L	---	---
Nurse Midwife	L	C	C	L	L	L	L	---	---	L	L	---
Nutritionists	---	---	---	---	---	---	---	---	---	---	---	---
Occupational Therapists	L	L	L	L	L	L	L	L	L	L	C	---
Pharmacists	L	L	L	L	L	L	L	L	L	L	L	L
Physical Therapist	L	L	L	L	L	L	L	L	L	L	L	L
Physician Assistants	R	L	L	C	L	L	C	L	L	L	C	C
Professional Counselors	L	L	L	---	---	L	---	L	L	---	L	---
Psychologists	L	L	L	L	L	L	L	L	L	L	L	L
Recreational Therapists	---	---	---	---	---	---	---	---	---	---	---	---
Registered Nurses	L	L	L	L	L	L	L	L	L	L	L	L
Respiratory Therapists	---	---	L	---	L	L	---	L	L	---	---	---
Speech-language Pathologists & Audiologists	L	L	L	L	L	L	---	L	L	L	L	---
Health Technicians & Technologists												
Clinical Laboratory Technologists & Technicians	---	---	---	---	---	---	---	L	---	---	---	---
Dental Hygienists	L	L	L	L	L	L	L	L	L	L	L	L
Emergency Medical Technicians	L	L	L	L	L	L	L	L	L	L	L	L
Home Health Aide/Homemaker	---	---	---	---	---	---	---	---	---	---	---	---
Licensed Practical Nurses (LPN)	L	L	L	L	L	L	L	L	L	L	L	L
Nuclear Medicine Technologists/Technicians	---	---	---	---	---	---	---	---	---	---	---	---
Nurses' Aide/Nursing Assistant/Anc. Nursing Personnel	---	---	---	---	R	---	R	---	---	---	C	---
Opticians	L	---	---	---	L	L	---	L	L	---	L	L
Pharmacy technicians	---	---	---	---	---	---	---	---	---	---	---	---
Psychiatric technicians/aides												
Radiologic technologists & technicians	---	---	L	---	---	---	---	---	L	L	C	L
Other Health Occupations												
Hearing Aid Dealer & Fitter	L	L	L	L	L	L	L	L	L	L	L	---
Denturist	---	---	L	---	---	---	---	---	---	---	---	---
Dental Assistant	---	C	---	---	---	---	R	L	---	---	---	L
Chiropractor	L	L	L	L	L	L	L	L	L	L	L	L
Acupuncturist	---	---	L	R	L	---	---	---	L	L	L	L
Occupational Therapy Assistant	L	L	L	L	L	L	L	L	L	L	L	---
Homeopath	---	---	---	---	---	---	---	---	---	---	---	---
<p>*California uses the term Licensed Vocational Nurse (LVN)</p> <p>** State does not regulate "professional counselors" but does license alcoholism and drug counselors</p> <p>See accompanying paper for definitions</p> <p>C = Certification</p> <p>L = Licensure</p> <p>R = Regulation</p> <p>E = Enabling Legislation</p> <p>— Not regulated</p> <p>Shaded area signifies no information was found</p>												

Source: The Book of the States 1996-97, the Council of State Governments; Occupational and Professional Regulation in States, CLEAR 1994; and AAPA - State Laws for Physician Assistants, 1997.

TABLE 2: HEALTH OCCUPATIONS REGULATION BY STATE

Health Services Occupations	STATE				
	WA	WI	WV	WY	Puerto Rico
Diagnosing Occupations					
Dentist	L	L	L	L	---
Nurse Practitioners	---	---	---	L	L
Optometrists	L	L	L	L	L
Podiatrists	L	L	L	L	L
Assessment and Treatment Occupations					
Dietitians	L	---	---	---	L
Nurse Midwife	L	L	L	---	L
Nutritionists	L	---	---	---	---
Occupational Therapists	L	C	---	L	L
Pharmacists	L	L	L	L	L
Physical Therapist	L	L	L	L	L
Physician Assistants	L	C	L	L	---
Professional Counselors	---	C	L	L	---
Psychologists	L	L	L	L	L
Recreational Therapists	---	---	---	---	---
Registered Nurses	L	L	L	L	L
Respiratory Therapists	L	L	---	---	---
Speech-language Pathologists & Audiologists	---	L	L	L	L
Health Technicians & Technologists					
Clinical Laboratory Technologists & Technicians	---	---	---	---	L
Dental Hygienists	L	L	L	L	---
Emergency Medical Technicians	L	L	L	L	L
Home Health Aide/Homemaker	---	---	---	---	---
Licensed Practical Nurses (LPN)	L	L	L	L	---
Nuclear Medicine Technologists/Technicians	---	---	---	L	---
Nurses' Aide/Nursing Assistant/Anc. Nursing Personnel	L	---	---	---	---
Opticians	L	---	---	---	L
Pharmacy technicians	---	---	---	---	---
Psychiatric technicians/aides					
Radiologic technologists & technicians	C	---	L	L	L
Other Health Occupations					
Hearing Aid Dealer & Fitter	L	L	L	L	---
Denturist	---	---	---	---	---
Dental Assistant	---	---	---	---	L
Chiropractor	L	L	L	L	L
Acupuncturist	L	L	---	---	---
Occupational Therapy Assistant	L	L	---	L	L
Homeopath	---	---	---	---	---
<p>*California uses the term Licensed Vocational Nurse (LVN)</p> <p>** State does not regulate "professional counselors" but does license alcoholism and drug counselors</p> <p>See accompanying paper for definitions</p> <p>C = Certification</p> <p>L = Licensure</p> <p>R = Regulation</p> <p>E = Enabling Legislation</p> <p>— Not regulated</p>					

Source: The Book of the States 1996-1997, the council of State Governments; Occupational and Professional Regulation in the States, CLEAR 1994; and AAPA - State Laws for Physician Assistants, 1997

Table 3: Health Services Employment in Patient Care by Occupation, 1994 and Projected 2005 (in thousands)

Occupation	1994	Projected 2005	Net Change	
	employment	employment	Number	Percent
Diagnosing Occupations - Subtotal	850	1,003	153	18
Dentists	164	173	9	5
Optometrists	37	42	4	12
Physicians	539	659	120	22
Podiatrists	13	15	2	15
Veterinarians	56	62	6	11
Assessment and treating occupations - Subtotal	2,563	3,294	731	29
Dietitians & Nutritionists	53	63	10	19
Pharmacists	168	196	28	17
Physician assistants	56	69	13	23
Registered nurses (RN)	1,906	2,379	473	25
Occupational therapists	54	91	39	72
Physical therapists	102	183	81	80
Recreational therapists	31	37	7	22
Respiratory therapists	73	99	26	36
Speech-language pathologists & Audiologists	85	125	39	46
All other therapists	36	50	14	39
Health technicians & technologists - Subtotal	2,197	2,815	618	28
Cardiology technologists	14	17	3	22
Clinical laboratory technologists & technicians	274	307	33	12
Dental hygienists	127	180	53	42
Electroencephalographic technologists	6	8	2	28
EKG technicians	16	11	-5	-30
Emergency medical technicians	138	187	49	36
Licensed practical nurses (LPN)	702	899	197	28
Medical records technicians	81	126	45	56
Nuclear medicine technologists	13	16	3	26
Opticians	63	76	13	21
Pharmacy technicians	81	101	20	24
Psychiatric technicians	72	80	8	11
Radiologic technologists & technicians	167	226	59	35
Surgical technologists	46	65	19	43
Veterinary technicians	22	26	4	18
All other professionals and paraprofessionals	374	488	114	30

Occupation	1994	Projected 2005	Net Change	
	employment	employment	Number	Percent
Health service occupations - Subtotal	2,086	2,845	759	36
Ambulance drivers/attendants	18	21	3	15
Dental Assistants	190	269	79	42
Medical Assistants	206	327	121	59
Nursing aides, orderlies & attendants	1,265	1,652	387	31
Psychiatric aides	105	118	13	12
Occupational therapy	16	29	13	82
Pharmacy assistants	52	64	12	23
Physical and corrective aides/assistants	78	142	64	83
All other health service workers	157	224	67	43
Home health aides*	420	848	428	102
TOTALS	8,116	10,806	2,690	33

Source: George Silvestri. "Occupational Employment to 2005." U.S. Department of Labor, Bureau of Labor Statistics. Monthly Labor Review. November 1995. Table 2. p. 70.

* Note: BLS counts this as a personal service rather than a health service occupation.

Table 4: Health Occupations: Continuing Education Requirements by State

Health Services
Occupations

STATES

	# States that Requires C.E.																		
		AK	AL	AR	AZ	CA	CO	CT	DC	DE	FL	GA	HI	IA	ID	IL	IN	KS	KY
Chiropractors	43			R	R			R											
Dentists	25																		
Nurses	25	R	R	---	---	R	---	---	R	R	R	---	---	R	---	---	---	R	R
Optometrists	25	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
Pharmacists	25	R	R	R	R	R	---	R	R	R	R	R	---	R	R	R	R	R	R
Physical Therapist	25	R	R	R	---	---	---	---	R	R	R	R	---	R	---	---	---	R	R
Social Workers	25	R	R	R	R	---	---	---	R	R	R	R	---	R	E	R	E	R	---
Physician Assistants	49	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R

Health Services
Occupations

STATES

	LA	MA	MD	ME	MI	MN	MO	MS	MT	NC	ND	NE	NH	NJ	NM	NV	NY	OH	OK	OR
Chiropractors																	R			
Dentists																				
Nurses	R	R	---	---	E	R	---	R	R	---	---	R	R	---	R	R	---	R	---	R
Optometrists	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
Pharmacists	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	---	R	R	R
Physical Therapist	R	---	R	---	E	R	---	R	E	---	R	---	E	---	R	R	---	R	R	R
Social Workers	R	R	---	R	---	R	E	R	R	R	R	---	E	R	R	---	R	S	R	R
Physician Assistants	R	R	R	R	R	R	R	n/a	R	R	R	R	R	R	R	R	R	R	R	n/a

Health Services
Occupations

STATES

	PA	RI	SC	SD	TN	TX	UT	VA	VT	WA	WI	WV	WY
Chiropractors													
Dentists													
Nurses	---	---	---	---	---	R	---	---	---	---	---	---	R
Optometrists	R	R	R	R	R	R	R	R	R	R	S	R	R
Pharmacists	R	R	R	R	R	R	R	R	R	R	---	R	R
Physical Therapist	R	---	---	---	---	R	---	S	---	R	---	---	---
Social Workers	E	---	R	R	---	R	---	---	---	E	E	R	R
Physician Assistants	R	R	R	R	R	R	R	R	R	R	R	R	R

R = Required
 E = Enabling legislation
 S = Under certain circumstances
 --- No requirement
 Shaded area signifies no information was found

Source: The Book of States 1996-1997, the Council of State Governments; Scope of Practice: An Overview of 1995 Legislative Activity.

Other Publications by the Authors

- Nancy M. Pindus
- Ann Greiner

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