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AN ANALYSIS OF ENVIRONMENTAL ADAPTATION IN THE NURSING HOME INDUSTRY

by

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A DISSERTATION

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This research attempts to empirically test a model predicated on Pfeffer and Salancik's Resource Dependency Theory. This theory hypothesizes that the organization will adjust its strategy to avoid dependence upon an environment which it believes to be so restrictive as to interfere with its long-term viability. Utilizing the American Nursing Home Industry as a setting, this research theorizes that the strategy of the nursing home operator will be to allocate resources in such sufficient numbers as to attract the more lucrative private-pay patient and, consequently, avoid the hostile environment presented by the Medicaid patient.

Using a national sample of nursing homes, the research found that nursing home staffing resource allocations were significantly affected by an interaction of the percentage of Medicaid patients in the facility and the ownership status or mission of the facility. It appears that although the not-for-profit facility consistently allocated greater resources than did the proprietary nursing home, the patterns of resource allocations varied between the two groups of facilities. The not-for-profit facilities did not appear to employ a resource dependency perspective. There were some indications, however, that the proprietary or for-profit nursing home did allocate greater resources in those

facilities with higher proportions of private-pay patients. Proprietary nursing homes with high percentages of private-pay patients allocated 50 percent more RN services than did proprietary nursing homes with high percentages of Medicaid patients. Nursing homes with high percentages of private-pay patients employed relatively more RNs while nursing homes with high percentages of Medicaid patients employed relatively more LPNs. The dependency level of the patient did not appear to affect the nursing home's strategy.

This research lends empirical support to Resource Dependency Theory. The study suggests that the organization, and in particular, the for-profit organization, did indeed attempt to alter its strategy to avoid the Medicaid patient. The research concludes by recommending that Medicaid reimbursement systems be altered so as to encourage the fair and equitable allocation of resources to Medicaid patients.

Abstract Approved by: Committee Chairman Richard M. Shemchuk

Program Director Lois M. McCoy

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TABLE OF CONTENTS

TABLE OF CONTENTS (Continued)

LIST OF TABLES

LIST OF FIGURES

CHAPTER I

INTRODUCTION TO THE PROBLEM

Do organizations alter their strategies to reduce their dependence upon a hostile environment? This is a fundamental issue around which an ongoing debate in the management literature is focused. The argument questions whether an organization can through its management decisions adjust to changes in its environment and possibly even shape the environment upon which it is dependent. One position of this argument centers around those adaptive theorists who believe that the organization will take steps to acquire the necessary resources in order to assure its survival (Child, 1972; Pfeffer, 1978, 1981; Pfeffer & Salancik, 1978; Thompson, 1967).

Alternatively, the population ecology, natural selection, or deterministic theorists believe that certain organizations are destined to survive or fail because of certain environmental factors (Aldrich, 1979; Hannan & Freeman, 1977; McKelvey & Aldrich, 1983). This viewpoint asks the question: Does organizational inertia and/or poor access to resources result in the survival of only those organizations which are predetermined to have the best environmental fit?

Population ecology theory has its roots in biology (Ulrich & Barney, 1984) and attempts to explain organizational change through a Darwinism approach. Population ecology interprets organizational change through the examination of the type and distribution of resources in an organization's environment. According to this theory,

organizational change comes from new types of organizations entering the marketplace or the modification of old types of organizations (Fahey & Narayanan, 1986). This theory argues that organizations cannot adapt in the long-term, and that changes in the environment, not in the organization, determine organizational survival (Miles, 1982). According to population ecology theory, organizations cannot respond freely to their environments because of the inertia which is the result of an organization's investment in capital and specialized personnel, bounded rationality, internal and political constraints, organizational culture, and barriers to entry and exit from the marketplace (Hannan & Freeman, 1977).

In contrast, the environmental adaptation or strategic-choice theorists assert that not only can the organization alter itself to demands of the environment, but the organization may even play a part in altering its environment. The research in this area has tended to focus on the organization's response to uncertainty or turbulence in the environment (Lawrence & Lorsch, 1967), and an exchange theory (Thompson, 1967) based on the organization securing critical resources from the environment (Pfeffer & Salancik, 1978).

One of the prominent theories which deals with the issue of environmental adaptation is resource dependency theory. According to this theory, the organization will develop strategies designed to free it from dependence upon certain sources of needed elements in the environment (Pfeffer & Salancik, 1978). By freeing themselves from this dependence, the organization will then be able to profit by its ability to retain its autonomy in such areas as the establishment of the prices it wishes to set and the attainment of supplies at reasonable costs.

Purpose of the Study

The purpose of this study was twofold: 1) to contribute to the strategic management literature by empirically testing a model predicated on resource dependency theory, and 2) to contribute to health services research by adding to the stream of literature dealing with the nursing home industry.

The first purpose of this research was to attempt to determine if organizations are able adjust to their environments through altering their strategies. In order to empirically test this idea, a model based on resource dependency theory was developed through the scrutinization of the strategy of various organizations operating in environments which could be segmented between those environments that allowed for high profitability and those environments where profitability was restricted. An assumption of the study was that both environments presented sufficient customers to fully satisfy the production capacity of the organization. If the strategic responses of the organization were significantly different in dealing with the two environments, it could be inferred that the organization took strategic action to attempt to move from one environment to the other.

The second purpose of the research was to contribute to the area of health services research through an examination of the industry chosen as the setting for the study. The nursing home industry was chosen as the setting as it encompasses two clearly defined customer types: the private-pay patient and the Medicaid patient. The private-pay patient clearly represents a more potentially profitable environment than does that of the Medicaid patient as reimbursement for a private-pay patient is higher and as the private-pay patient may be charged more as the dependency level of the

patient changes. The strategic responses of the nursing home in attempting to capture this private-pay market was the area under study.

In addition, this research was an attempt to address the importance of certain contextual variables on the organization's strategy. In particular, the effects of the ownership of the organization was examined in order to determine if this variable affects the organization's attempt to avoid dependence upon an environment with scarce resources. Does the fact that the not-for-profit organization receives more social subsidies than does the for-profit organization affect its strategy? Does the fact that the not-for-profit organization is charged with and subsidized for improving the welfare of the clients it serves affect the resource deployment of the organization? The investigation of the effect of this variable will add to a field of research which questions whether the for-profit or not-for-profit organization best serves the goals of society (Herzlinger & Krasker, 1987).

Statement of the Problem

Do organizations attempt through their strategies to avoid dependence upon an environment with fewer resources? This question was the central focus of this research. This study attempted to add weight to resource dependency theory which posits that organizations do indeed take steps to manage their environments.

It is not clear if organizations take steps to reduce their dependence upon an environment which is less potentially profitable. All organizations have inertia in the form of bureaucratic controls, high costs of entry and exit, and laissez faire management. The question of whether or not these organizational hurdles are so severe as to

restrict the implementation of management's intended strategy has not been fully determined through previous research.

A second question and major theme addressed by this research asks the question: Is the strategy of the nursing home designed to avoid dependence upon the Medicaid patient? Cost containment has been a primary focus of the various state Medicaid reimbursement systems. It is questioned as to whether these reimbursement methodologies have been so stringent so as to create a system of care wherein the private-pay patient receives more services than the Medicaid patient.

The growing number of aged in the United States will place a burden on our limited resources to provide institutional long-term care. The best manner in which to provide this care is a focus of much public policy debate. This paper attempted to show how the strategies of the nursing home function; policy constructed with a knowledge of how these strategies work should help to result in a better long-term care system.

Questions for Research

By testing resource dependency theory utilizing a national sample of nursing homes, the following questions were addressed:

1. Does the organization attempt to reduce dependence upon an environment with fewer resources?
2. Does the mission of the organization and in particular the mission of the nursing home affect its strategy?
3. Does the nursing home differentiate its product so as to attract the private-pay patient, and consequently, reduce its dependence upon the Medicaid patient?

4. Does the nursing home discriminate against the Medicaid patient, and the heavy-care Medicaid patient in particular?

Relevance of Study

The findings of this study, hopefully, add to the stream of research in this area (Hannan & Freeman, 1977; Miles, 1982; Pfeffer, 1982; Thompson, 1967) and assist in the development and support of relevant theories. According to Blau (1965):

> Only systematic comparisons of many organizations can establish relationships between characteristics of organizations and stipulate the conditions under which these relationships hold, thereby providing the material that needs to be explained by theoretical principles and important guides for deriving these principles (p. 325).

Shrivastava (1987) stated that accumulated empirical evidence lends credibility to research findings and provides a basis for the validity of the research.

In addition to addressing issues dealing with environmental adaptation, the study also dealt with issues of concern to policy makers in the nursing home industry. There have been few studies conducted describing how the dependency of the facility on its environment affect the nursing home product (Kane & Kane, 1987). This was somewhat surprising in view of the large amount of public and private monies expended each year on nursing home care. Most studies of the nursing home industry have taken an economic perspective (Nyman, 1985, 1988a, 1988b, 1988c, 1989a, 1989b; Scanlon, 1980), or a cost analysis approach (Brinbaum, Lee, Bishop, & Jensen, 1981; Smith & Fottler, 1981). There have also been numerous studies designed to show which types of Medicaid reimbursement systems best contain costs while encouraging access (Harrington & Swan, 1985; Holahan & Cohen, 1984; Holahan, Cohen, & Scanlon, 1983; Meiners, Thorburn, Roddy, & Jones, 1984;

Weissert, Scanlon, Wan, & Skinner, 1983). Although there are frequent journal articles in the practitioner periodicals which advise the nursing home operator on the proper strategy, no empirical studies of nursing home strategy could be found.

Definitions

This section provides definitions for the terminology used in this research.

Environment is defined as all factors from outside the organization affecting such organization. Generally, the environment is broken into four various sub-environments: the political and legal environments, the social environment, the technological environment, and the economic environment (Fahey & Narayanan, 1986; Wheelen & Hunger, 1987). The environment provides the resources for which the organization must compete including personnel, financial resources, customers, and investors, as well as providing the regulatory agencies which affect the operation of the organization. A hostile environment is one in which needed resources are scarce or unavailable for the organization; conversely, a munificent environment is one in which needed resources are plentiful and easily obtained (Fahey & Narayanan, 1986). Hostile environments are depicted as possessing intense competition and lack of opportunities; munificent or benign environments provide a safe setting for investment by the organization due to the opportunities which they present for high return (Covin & Slevin, 1989; Khandwalla, 1976).

There are many formal definitions of strategy, but most appear to encompass the idea that strategy is a "plan" or "pattern" of actions or a set of decisions (Chandler, 1962; Mintzberg, 1978; Quinn, 1980). Mintzberg and Waters (1985) also distinguish between what was "intended" and what strategy actually "emerged." This recognizes

that strategy involves more than just planning and also involves the recognition that successful strategies can develop from deep within an organization (Hill & Jones, 1989).

According to Hofer and Schendel (1978), "strategy" also incorporates several concepts:

1. Scope or the extent of the organization's interaction with the environment; this is often referred to as the organization's domain;
2. Resource Deployment or the level and patterns of the organization's resource and skill allocations which will allow it to develop distinctive competencies;
3. Competitive Advantage or the unique position that an organization has versus its competitors through its resource deployments; and,
4. Synergy or the joint effects of concepts 1 and 2. It is the resource deployment aspect of strategy which is the focus of this research.

Strategic content refers to those organizational decisions which determine which businesses to pursue and which functional strategies to choose to support these decisions (Shortell, Morrison, & Robbins, 1985). The scope or domain of the organization defines the segment of the environment in which the organization will operate (Bourgeois, 1980). This level of strategy is often referred to as "corporate" or "portfolio" strategy. In contrast, Hofer and Schendel's (1978) second and third concepts relating to strategy deal with the issue of domain navigation or how to compete within the chosen market (Bourgeois, 1980). The focus of this research was on this "domain navigation" and, in particular, how the organization allocates

resources in order to differentiate its product and, consequently, achieve a better alignment with its marketplace.

Nursing homes are defined as facilities offering living accommodations, personal care, and in most instances, health care to the elderly and disabled (Lloyd & Greenspan, 1985). This all-encompassing definition includes skilled and intermediate-care nursing homes, related care homes, domiciliaries, and personal care facilities. The 1985 National Nursing Home Survey reports that there are more than 14,400 nursing homes in the United States which are certified as either a skilled nursing care facility (SNF) by Medicare and Medicaid, certified as a free-standing intermediate care facility (ICF), or certified as both an SNF and an ICF (National Center for Health Statistics [NCHS], 1987).

There are several basic differences between facilities with SNF certification and those with ICF certification. Only SNFs can be Medicare certified. SNFs usually provide a more intensive form of nursing care and generally have a Registered Nurse (RN) on duty each day to supervise patient care. An ICF facility provides care to patients who do not require skilled nursing care but do require care and services above the level of room and board which cannot be made available through the home setting (U.S. Senate: Social Security Act and Related Laws, 1978). Only skilled and combination skilled-ICF facilities were included in this study, recognizing the fundamental differences between these facilities and the free-standing ICF.

It should be pointed out that as of October 1, 1990, the distinction between SNF and ICF facilities for Medicaid classification will be eliminated and the term "nursing facility" will be used. Those facilities which had previously been categorized as ICF

will have to meet the more stringent guidelines of the SNF. The term "skilled nursing facility" will continue to exist to describe those facilities with Medicare certification (Healthcare Financing Administration, 1990). However, as of the time of this study, the designations SNF and ICF were still in use.

Medicaid can be defined as the government program which provides health care coverage for persons eligible for cash assistance payment (Supplemental Security Income) and, at the option of the State, persons above the income standard who are determined to be medically indigent. The Federal government contributes 50 percent to 77 percent of the cost of the various Medicaid program, with the remainder coming from the respective state (Walman, 1987). The program is administrated by the individual states which establish reimbursement policies in accordance with Federal guidelines (Bishop, 1980). Medicaid pays for indefinite stays for eligible recipients in the nursing home. (Appendix A summarizes the various state reimbursement methodologies.)

Assumptions

This research is predicated on three assumptions: that the consumer of nursing home services is rational; that the nursing home provider is rational; and, that there is excess demand present in the industry.

Consumer Rationality. The individual consumer of nursing home services often exhibits either physical or mental frailties, resulting in the choice of nursing homes being made for him or her (Fraundorf, 1977; Grossman, 1972). Usually this decision is made by a family member, a friend, or a social agency. Because the cost of nursing home care can run as high as $30,000 per year, it is difficult to conceive of

the patient's sponsor not checking out the quality of the facility. This is particularly true since there are only a limited number of homes in any area and most referral sources, usually a hospital social worker, have knowledge about the facility.

The cost of nursing home care must be borne by the patient and/or his caregiver or sponsor if there is no insurance. Even when the patient is covered by Medicaid, the patient's resources, usually a Social Security check, must be applied to the charges. Scanlon (1980), in his model of the nursing home industry, theorized that the consumer was both price and quality conscious.

Nyman (1989b), in his work on nursing home consumer rationality, tested the concept of price elasticity on a sample from the Wisconsin Annual Survey of Nursing Homes for 1983. He found that private consumers are very responsive to both price and quality differences among nursing homes. He suggested that his findings imply that private-pay patients may create a significant amount of competition in the market for nursing home care. Chiswick (1976) and Scanlon (1980) both also found that there were significant price elasticities of demand which would be indicative of rational nursing home consumer behavior.

Given this rationality, it can be expected that the nursing home consumer will select the facility which offers the most resources for the patient, all other things being equal. The facility which has best differentiated its product should have first selection from among the available pool of patients.

Provider Rationality. Approximately 73 percent of all nursing homes are proprietary and are assumed to be profit maximizers (Palmer & Vogel, 1985). As such,

these facilities could be expected to give priority in the admission process to those patients that would best allow for this profit maximization.

As will be demonstrated later in this paper, reimbursement for the private-pay patient is higher than that for the Medicaid patient. In addition, there is no additional compensation for a heavy-care Medicaid patient. Therefore, the rational nursing home operator should prefer to admit patients in the following order:

a. Private-pay patient. This patient is the most potentially profitable patient for the nursing home as charges for the nursing home services are greater than that for Medicaid. This class of patient may also be charged extra for additional services and/or supplies. Therefore, the total charges for heavier-care private-pay patients may be greater than that for lighter-care private-pay patients, such as the dependency level of the patient is reflected in the total charges.

b. Light-care Medicaid patient. The light-care Medicaid patient should be the type of patient preferred after all available private-pay patients have been admitted. Since most state reimbursement systems pay one price for a particular category of patient, the profit-maximizing nursing home should give priority to those Medicaid patients who require the least allocation of the nursing home's resources.

c. Heavy-care Medicaid patient. Because the nursing home does not receive additional compensation for a patient requiring a greater number of the facility's resources, the nursing home will probably choose to admit this patient only when there are no other available patients. Indeed, if the nursing home cannot at least recover the variable costs associated with providing services for this patient, access for this patient to skilled nursing home services may not be attainable.

Excess Demand. It has been argued that excess demand is a pervasive feature of the nursing home industry, allowing the facility to select from among the available patients for admission (Scanlon, 1980). Because of the restrictive CON laws and the growing number of elderly, there was a significant decrease in the number of beds per 1,000 population 65 years and over between 1977 and 1985. The number of nursing home beds in the United States fell from 59.7 per 1,000 population 65 years and older in 1977 to 56.7 per population per 1,000 population 65 years and older in 1985. At the same time, the number of persons over 65 rose from 23,494,000 to 28,530,000 (National Center for Health Statistics, 1987).

Limitations

This research attempted to test nursing home's responses to the environment based on a model predicated on resource dependency theory. Although this industry does provide an excellent vehicle in which to test the theory, the industry is highly regulated which would reduce the range of strategic choices which the organization possesses. Economic regulation protects existing competitors within an industry and creates an atmosphere of stability (Marcus, 1985), but regulation also reduces the ability of the organization to adapt to the environment (Murray, 1978). In addition, there are powerful insurers (Medicaid and Medicare) which impose restrictions on the organization. The study should probably be repeated utilizing data from industries which better compete under free-market conditions.

A second limitation of this study was that the only resource allocations it examines are staffing patterns. While these are certainly the most important components of the labor-intensive nursing home's resource allocations, there are others which this study

does not address because of the lack of available data. Examples of resource allocations not addressed by this study would be food costs and expenditures on the physical plant. Higher food costs and a more aesthetically pleasing facility would also be components of a differentiation strategy. While there should be high correlations between food costs and dietary staffing and between the aesthetic value of the facility and housekeeping and maintenance costs, it would have been preferable to have measured these directly.

There were also several limitations in using the data set utilized in this study, the 1985 National Nursing Home Data Set. One limitation was that the data to be used were cross-sectional in nature and allowed only a "snapshot" picture of the facilities at the time of the survey. It would have been preferred that longitudinal data be studied so that the researcher could determine variability over time. It should be also be pointed out that the facilities surveyed in 1985 were not necessarily the same facilities as surveyed in 1973-74 and 1977, and cannot, therefore, be compared across years. However, the large systematic random sample may have helped overcome some of the potential biases.

Another limitation of the data set was that it only included Profit-and-Loss financial data. The Balance Sheet data was not available. The response rate for the financial data was only 68% of the 1,079 facilities surveyed. Because of the problem of missing data and the lack of Balance Sheet items, it was believed that use of the financial data would not be appropriate. This eliminates study of the effects of nursing home strategy on profitability and return to the stockholders.

A final limitation of the data set was that there are no contextual data, such as state identifiers, in this data set. Therefore, there was no way to distinguish the Medicaid reimbursement system used in a particular state and its relevant methodologies. However, this study was designed so as to minimize the effects of this limitation. All Medicaid reimbursement systems have the commonality of built-in restraints to contain costs. They all have various design features which make it difficult to pass all costs along to the patient and/or his or her family. In addition, the policy guidelines mandate that Medicaid reimbursement is always less than private-pay reimbursement. If this proposed study were designed to predict resource allocations or profitability in nursing homes then this limitation would present a serious problem. However, the research proposed here was constructed to examine possible differences among the strategic behavior of nursing homes classified by various payor contingencies.

The state identifiers would also have allowed for control of such items as nursing home beds per population, income levels, and the presence or lack of a CON law. However, it was again assumed that the random nature of the survey and its large size would help to mitigate this limitation.

Rationale for the Selection of the Setting

In order to test whether or not organizations do adapt to their environments, a setting had to be selected for study. An analysis of a particular industry rather than across several industries would enable the researcher to better detect true differences among strategies. According to McKelvey and Aldrich (1983), researchers should focus research and results around homogenous populations which will increase

generalizability and level of explained variance. Snow and Hambrick (1980) stated that moving from one industry to another may cause problems in terms of comparability among measures of strategy and its correlates. Ginsberg and Venktraman (1985) believe that theories of business strategy are best developed through an inductive approach than through the studies of various industries. The use of a single industry would serve to eliminate the problem of variability among the various industry environments.

The industry chosen as the setting for this study was the nursing home industry. There are approximately 1.5 million persons in nursing homes in the United States. Nursing home care is provided by the approximately 14,400 facilities certified by the various regulatory authorities as nursing homes (National Center for Health Statistics, 1987). Nursing home care is the third largest component of the health care industry, following that of the hospital and physician sectors. The demand for institutionalized nursing care is growing due to various demographic factors including the increased longevity of the American people and the lack of available caregivers (Strahan, 1987). The cost of this care is also increasing and is estimated to cost $55 billion annually by 1990 (Arnett, Cowell, Davidoff, & Freeland, 1985). Much of this cost is borne by the government through its Medicare and Medicaid programs. Medicaid, in particular, is responsible for paying almost half the cost of long-term care (Murtaugh, Cooney, DerSimonian, Smits, & Fetter, 1988).

The nursing home industry, which offers a homogeneous organizational structure and product, should provide an excellent vehicle for the study of environmental adaptation for several reasons. Each of the approximately 14,400 certified nursing

homes in the United States operates as its own profit center, or "Strategic Business Unit," providing a useful means of comparison among facilities. In addition, each nursing home encompasses a functional organizational structure by grouping together employees who perform similar tasks (Mintzberg, 1979). Figure 1 illustrates a typical nursing home organizational chart. This uniform organizational structuring is the result of the requirement of the various payor groups that the expenses of the organization be captured in these cost centers. Another reason for selecting the nursing home industry to study the issue of strategy is that the nursing home product is basically undifferentiated among nursing homes except to the degree of services offered.

This industry also offers an opportunity to study how organizations attempt to segment the market in order to reduce dependence upon the less attractive customer. There are basically two types of buyers for nursing home services, one of whom is more profitable than the other. A clear delineation between customer types will allow the researcher to test for the existence of differences in the strategies which the nursing homes utilize in order to achieve market segmentation. A final advantage of studying this industry is that there are both proprietary and not-for-profit nursing homes which will allow for comparisons among facilities with differing missions.

It can be argued that the macroenvironment in which the nursing home is situated is restrictive in that it is subject to government regulation and in that one large buyer of nursing home services, the government through its Medicaid program, possesses the power to control the prices for these services. In addition to low Medicaid reimbursement, the cost of nursing home care is often prohibitive to the individual

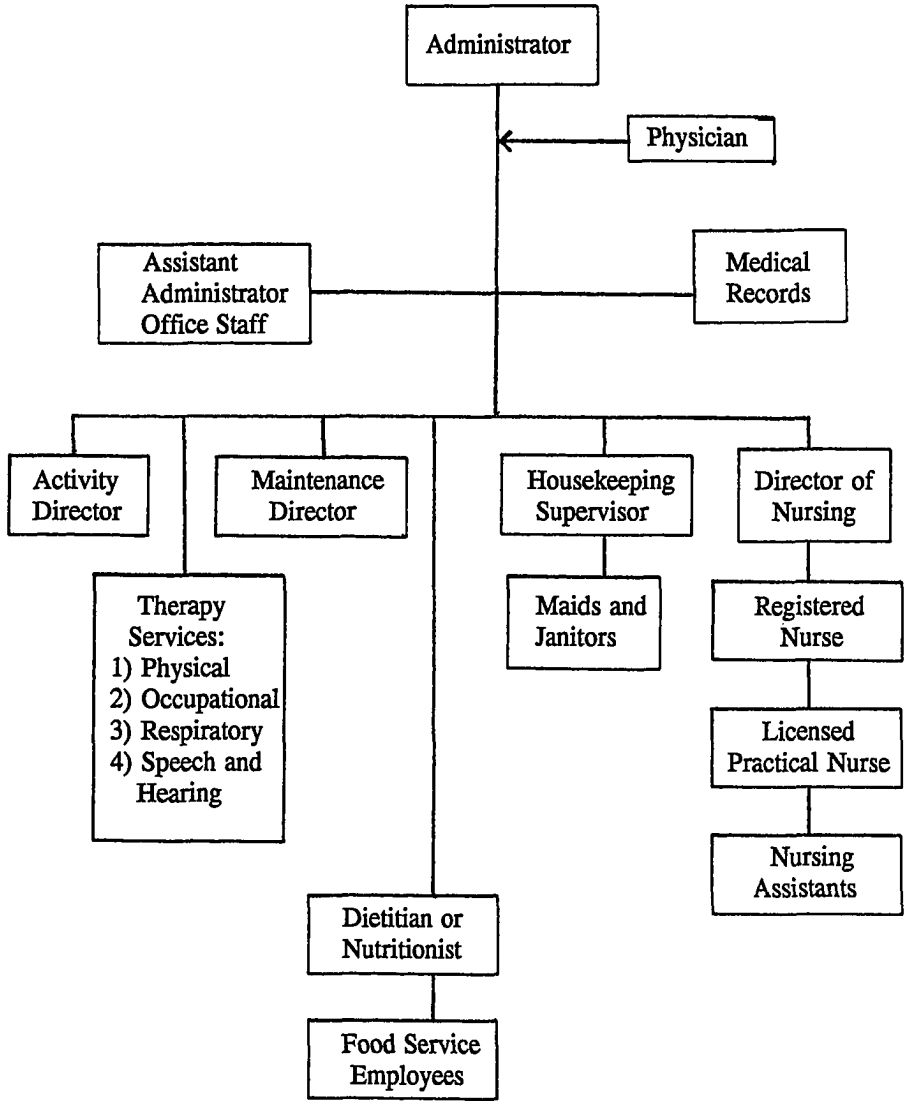


Figure 1. Nursing Home Organizational Chart

consumer. These factors have served to keep profit levels low in recent years despite the growing need for these services. In addition, the industry also suffers from the problem of corporate legitimacy as evidenced by the reoccurring calls for nursing home reform.

However, it is not the intention of this research to study the corporate-level strategy of the nursing home. It will be assumed for the purposes of this study that the organization has chosen to compete in this industry. Instead, this study will examine strategy at the business and functional levels which asks the question "How should we compete in the chosen industry?" and looks at such issues as the development of distinctive competencies (Khandwalla, 1976; Porter, 1985).

This examination of strategy at the business level allowed for the inspection of how the nursing home chooses to differentiate its product in order to segment its market. Market segmentation is important in strategy formulation because buyers within an industry are dissimilar in ways that affect their attractiveness or the way in which a firm gains competitive advantage in supplying them (Porter, 1985).

There are basically two types of buyers of nursing home services: the individual consumer or the private-pay patient, and the government through its Medicaid programs. As will be shown in this paper, the nursing home is reimbursed less for the Medicaid patient than for the private-pay patient. This situation provides an excellent opportunity to study environmental adaptation because, given the phenomenon of excess demand present in the nursing home marketplace, there is no reason for the nursing home to differentiate its services except to escape dependence upon a particular patient class, in this case, the Medicaid patient.

For the purposes of this research, it would have been desirable if there had been an existing body of literature in the health care strategic management arena upon which to build. However, the vast majority of the health care strategy literature deals with the other major institutional health-care provider, the hospital industry (D'Aunno & Zuckerman, 1987; Shortell, Morrisey, & Conrad, 1985; Zajac & Shortell, 1989). While there has been considerable research in the nursing home industry in the area of economics (Nyman, 1988a; Scanlon, 1980), cost analysis (Brinbaum, Lee, Bishop, & Jenson, 1981) and cost containment (Harrington & Swan, 1985; Holahan & Cohen, 1984; Holahan, Cohen, & Scanlon, 1983; Meiners, Thorburn, Roddy, & Jones, 1984; Weissert, Scanlon, Wan, & Skinner, 1983), no studies could be found which attempted to explain the behavior of the nursing home industry through a strategic management perspective. Although both the hospital and nursing home industries are built on a medical model, the hospital studies cannot be generalized to the nursing home sector. The nursing home provides for a different type and level of care than does the hospital, has many consumers who pay for the care directly and are consequently price sensitive, does not grant the physician the same gatekeeper status, and can, to some degree, select from the available pool of patient due to the presence of excess demand.

Format of Research Study

This chapter has presented introductory material including the questions that were addressed, the assumptions upon which the study was built, the definition of terms, the relevance of the study, the study's limitations, and the setting for the study. Chapter 2 focuses on the strategic management literature and provides the theoretical

underpinnings for the study. This chapter also discusses various strategic considerations concerning the nursing home industry and develops the hypotheses to be tested. Chapter 3 explains the methodologies for testing the hypotheses. Chapter 4 provides the results, and the final chapter discusses the implications of the study's findings.

CHAPTER II

REVIEW OF LITERATURE

Strategic Management Literature

The first section of this review concerns the relevant literature in the area of strategic management. This section is followed by a discussion of the literature concerning the nursing home industry. The last section of this review is centered around development of the hypotheses to be tested.

Management theorists have long suggested that organizations are affected by the environment in which they operate. This so-called "general systems theory" (von Bertalanffy, 1972) posits that the organization is a set of interdependent subsystems, which are, in turn, interdependent with their external environment (Krietner, 1986). Today management theorists accept the idea that the organization is part of an open system that depends upon its acquiring sufficient resources from the environment for its survival (Thompson, 1967).

An argument for the strategic-choice or environmental adaptation perspective centers around the idea that decisions made by the manager can serve to align his or her organization with its environment. In particular, resource dependency theory argues that the organization will take steps to reduce its dependence upon critical resources in the environment. By reducing such dependence the organization will increase its autonomy and thereby its ability to control its operations.

The organization will attempt to align itself with its environment through its "strategy." This strategy will enable the organization to develop plans which will include the establishment of goals and objectives to be accomplished, and the determination of which courses of actions and which allocations of resources will best enable it to reach these goals (Chandler, 1962). The establishment of these goals and objectives and the determination of the proper courses of action will be affected by the organization's perception of the availability of resources in the environment and by the distinctive competencies and weaknesses of the organization. The reason that the organization wishes to engage in the strategic management process is because by aligning itself properly with its environment, it may be able to obtain what Porter (1980) terms "sustainable competitive advantage," or a long-term advantage over the organization's competitors.

An issue which is pervasive in the strategy literature is the question of the relationships among the environment, strategy, structure, and performance. One fundamental question under study in this research asks if there is a relationship between the environment and the organization's strategy. This issue is central to this research because if the environment does not affect strategy, then obviously the organization does not engage in the process of environmental adaptation.

Chandler (1962), in his classic case studies of such organizations as DuPont, General Motors, Standard Oil, and Sears Roebuck, believed that "structure follows strategy." Since the strategic management literature theorizes that the strategy of the organization is dependent upon the organization's environment, then the relationship should probably be "strategy follows the dictates of the external environment and then

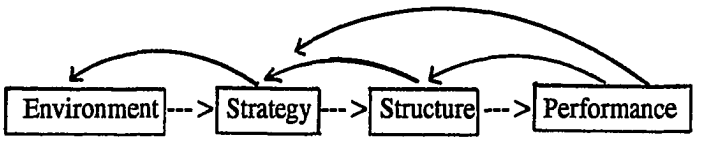
structure follows strategy, at least in organizations that are highly dependent upon their external environments" (Longest, 1981, p. 64), or environment-->strategy--> structure. In addition, the strategy of the organization and its consequent structure are theorized to affect the performance of the organization. For example, those organizations which best pursue their strategies will succeed in maximizing such performance measures as profitability and market share. This leads to the following relationships: environment-->strategy-->structure-->performance.

To further complicate these inter-relationships, Hall and Sais (1980) theorized that the strategy of the organization is dependent upon its structure. In addition, it could also be argued that the past performance of the organization would result in either an abundance or scarcity of resources which would affect the available resources for future strategies. In other words, those organizations which are the most profitable or who can garner the largest market share will have the best resources to sustain their strategies or implement new strategies. Also, if a resource-dependence perspective is valid, then organizations are theorized to affect their environments. Therefore, it follows that the relationships among environment-strategy-structure-performance may not be sequential but reciprocal (Ginsberg, 1988).

Figure 2 illustrates these reciprocal relationships through a nonrecursive perspective (Kaluzny & Veney, 1980). The environment is suggested to affect the strategy which affects the structure which leads to subsequent performance. Performance is believed to affect both the strategy and structure. In addition, the strategy is believed to affect the environment. For example, the nursing home industry, through its extensive lobbying efforts, can affect the regulators and the Medicaid reimbursement

systems. The following section looks at three environmental contextual variables which are suggested to affect the organization's strategy: environmental instability and complexity; environmental change; and organizational mission or ownership status.

Because the environment is theorized to affect the organization, given open-systems theory, environmental context is a factor which has been studied extensively in the strategy literature. Dess and Beard (1984) classified the environment by three factors: munificence, instability, and complexity. Munificence referred to the abundance or scarcity of resources, instability referred to the uncertainty, risk, or volatility present in the environment, and complexity referred to how homogeneous or heterogeneous was the environment. Thompson (1967) stated that when the organization perceives that the environment in which it operates does not have sufficiently abundant resources, it will enter new environments. Instability affects strategy because of the increased risk in the environment, creating the need to reduce or spread the risk by diversifying (Keats & Hitt, 1988). The strategy of the organization is affected by the complexity of the environment because the organization will be required to divisionalize the organizational structure more in order to develop specialized departments which allow the organization to deal with the complexity (Mintzberg, 1979). Thompson (1967) states "organizations facing heterogeneous task environments seek to identify homogeneous segments and establish structural units to deal with each" (p. 70).



Environment: Government as a powerful buyer of nursing home resources has power to contain costs through lower Medicaid rates.

Strategy: Strategy of nursing homes is theorized to be that of attracting the private-pay patient and minimizing dependence on Medicaid patients.

Structure: Structure of the nursing home includes the allocation of resources.

Performance: Profitability of the nursing home.

Figure 2. Nonrecursive Perspective of Environment-Strategy-Structure-Performance Relationships

The literature also suggests that the organization will change its strategy as forces in the environment change. Miles' (1980) study of the tobacco industry showed how the strategies of the industry adjusted as the environment became more hostile. Miles followed the strategies of the "big six" tobacco companies and was able to determine that the companies were able to adjust and maintain their profitability despite an increasingly hostile environment. Zajac and Shortell's (1989) application of the Miles and Snow (1978) Typology to the hospital industry revealed that organizations do not perceive generic strategies to be equally correct at different times. This study

examined data from 570 hospitals and found that the organizations changed their strategies in response to changes in the environment.

Research conducted by Longest (1981) in the hospital industry found that the strategy and design structure of the hospital was strongly affected by changes in the external environment. Specifically, he found the organizational design was affected by the power of the various stakeholders at the hospital.

Alexander and Morrisey (1989) studied the effects of market conditions, regulatory climate, management effectiveness, and certain enabling factors as they affected the decision of the hospital to enter into a management contract. The sample for this study was 321 short-term community hospitals that entered into contract-management arrangements with multi-hospital systems during the period 1980-1983. A group of 963 non-contract-managed hospitals was used for comparison purposes. This study found that after controlling for certain management, regulatory and enabling factors, only a few of the external environment variables affected the hospital's decision to enter into a management contract.

Other studies have found that the degree of hospital regulation has altered hospital output. This has brought about changes in the hospital organizational structure including the entry into multi-hospital contracts (Cook, Shortell, Conrad, & Morrisey, 1983).

It can be inferred that if the organization can indeed change its strategy when the environment changes, then it is attempting to adapt to its environment, an issue which was a focus of this research.

One contextual variable which has been considered in the strategic management literature is the ownership status of the organization and its influence on the organization's strategy. Various government, philanthropic, and religious organizations operate businesses. According to Anthony and Young (1984), in contrast to for-profit organizations where success is measured by the amount of profit earned,

> "in non-profit organizations, decisions made by management are intended to result in providing the best possible services with the available resources; success is measured primarily by how much service the organizations provide and by how well these services are rendered" (p. 38).

Herzlinger and Krasker's (1987) study of the hospital industry, however, showed that the not-for-profit organization acted for the self-interest of the professionals employed by the institution, not just for the welfare of its clientele. Utilizing data from 725 hospitals across the United States, Herzlinger and Krasker found that the non-profit hospital chains earn less than the for-profit, in part because of higher operating costs, but the for-profits do no deny access to care to the poor and uninsured. These results did not confirm the idea that the not-for-profit institution was any more altruistic than the for-profit institution. The results also suggested that the not-for-profit organization may have been more inefficient.

Resource Dependency Theory

Jeffrey Pfeffer and Gerald Salancik (1978) have proposed a theory which explains the behavior of the firm in terms of its strategy in coping with its environment. According to Pfeffer and Salancik (1978), organizations which are dependent upon their environment wish to reduce this dependence in order to maintain autonomy and to accomplish the organization's goals. This dependence is usually based on the external environment's control of some important resource. That different people,

groups, and/or organizations may have different and sometimes incompatible stakes in an organization creates problems for the organization. Faced with these competing demands, the organization must decide which groups of stakeholders are most essential to the organization and must attempt to either coop these groups or reduce the organization's dependence upon these groups (Pfeffer & Salancik, 1978).

Porter's Structural Analysis of Industries

Porter's (1980, 1985) work can be viewed as an extension of the resource dependency theory posited by Pfeffer and Salancik (1978). Porter provides a framework for identifying which stakeholders in the environment are most potentially threatening to the organization.

According to Porter (1980), there are what he terms five "competitive forces" in an organization's environment which, if powerful, can affect the operation of the organization. These forces include: the entry of new competitors, the threat of substitutes, the bargaining power of buyers, the bargaining power of suppliers, and the rivalry among the existing competitors. The ability of the organization to defend against these competitive forces or to influence them in its favor will help determine the ability of the firm to survive (Porter, 1980). These "competitive forces" as outlined by Porter will be explored in some detail as this presents a comprehensive means of surveying the organization's task environment.

The degree of rivalry among existing organizations is often a function of the number of organizations in the marketplace or their relative market share. If the organizations are relatively balanced in terms of size and perceived resources, an instability is created regardless of the number of competitors in the market. Con-

versely, Porter (1980) argues that when there are few organizations, and when these organizations are not balanced in terms of resources, there will be industry leaders. In other words, the rivalry among organizations is dependent on the market share balance in the industry, not on the number or organizations in the market.

The threat of new entries into the marketplace affects the strategy of the industry. If entry costs are high, then the possibility of losing market share to a new competitor is low. Conversely, if entry costs are relatively low, the organization must strive to find some means of attaining a competitive advantage. In some industries, such as the health care and utility industries, entry into the marketplace is carefully regulated.

The threat of substitutes will affect the organization in much the same way as the threat of new entrants into the marketplace. If the organization perceives that the buyers of its services will substitute another product or service, then the organization must find means of strengthening its competitive position. According to Porter (1980), it may choose to do this by undercutting the substitute in price or by differentiating the product so that the buyer believes he or she is getting a premium product for which there is no substitute.

The bargaining power of the suppliers will vary from industry to industry. In labor-intensive industries, suppliers, such as skilled personnel, have strong bargaining power in the marketplace, particularly if there is a shortage of these employees. The bargaining power of the physician in the health care industry is a consequence of the relative scarcity of these highly-skilled workers. This bargaining power enables them to command respect, large salaries and fees, and even to direct much of the operation of the hospital even though they are not hospital employees.

According to Porter (1980), the buyer of an organization's services or products is powerful if the buyer group often purchases large volumes relative to seller sales, the buyer's purchases represent a significant fraction of the buyer's costs or purchases, and if the buyer has full information. In a situation where a buyer of an organization's products or services purchases a large percentage of these products or services, the buyer will be able to bargain with the organization to obtain better prices. Examples of powerful buyers can be found in the health care industry where the bargaining power of the government through the Medicare program and the managed care programs of the health maintenance organizations and professional provider organizations have served to reduce hospital occupancies and revenues (Giardina, Fottler, Shewchuk, & Hill, 1990). Indeed, it has been argued that the buyer of health care services is the most powerful player in the health care industry (Giardina, Fottler, & Shewchuk, 1989).

Means by Which Organizations Manage External Dependence

To avoid having to acquiesce to the dictates of those upon whom they are dependent, the organization will attempt to somehow actively manage this external dependence. There are several ways in which the organization can accomplish this (Pfeffer & Salancik, 1978). These include: 1) The selection of the "domain" or the market niche in which the organization wishes to operate; 2) the establishment of favorable relationships with the external environment through such efforts as the marketing of the organization and the establishment of joint ventures and coalitions with other organizations; 3) the control of who operates in the chosen domain and how they operate through activities such as the formation of trade organizations to influence

legislation; and 4) by achieving distinctive competencies which the consumer values through such strategies as the means and degree by which it allocates resource. It is this number four element of external dependence management, or the achievement of distinctive competencies, which was the focus of this research. Porter's (1985) Generic Strategies of a low-cost provider strategy, a differentiation strategy, and a focus or niche strategy, all provide means for achieving these distinctive competencies.

Generic Strategies

Management theorists have made attempts to identify and group certain types of strategies together. These strategies are based on the premise that commonalities or "gestalts" exist among firms (Hambrick, 1983) which employ different configurations of what are substantially the same strategic variables (Hatten, 1979). The considerable research in this area has tried to develop strategic management typologies, or generic management strategies which are applicable to any type of industrial setting. Hambrick (1984) states that a classification scheme whereby the number of variables inherent in the study of strategy is collapsed into a few parsimonious variables will provide the necessary foundation for research into general strategic trends. Of these the Porter (1980) generic strategies and the Miles and Snow (1978) Typology are probably the best known. It is Porter's strategies which will provide the foundation for the study of the nursing home strategies.

Porter's Generic Strategies

Probably the best known generic business level strategy is Porter's generic strategies of Low-Cost Provider, Differentiation, and Focus (1985). Porter argues

that these strategies can be configured in such a way as to enable the organization to posture itself against the competitive forces in the marketplace which determine the competitive advantage of the organization. These strategies will be discussed in some detail in this section due to their relevance in addressing the research question under study.

The Low-Cost Provider strategy enables the organization to obtain above-average profits through cost reduction. Implementation of this strategy would include the construction of efficient facilities, the minimization of resources allocations, and the joining of a multi-organization coalition in order to achieve economies of scale. Organizations which utilize this strategy would want strict managerial control and would attempt to standardize product lines (Giardina, Fottler, & Shewchuk, 1989). Porter (1985) points out that the Low-Cost strategy does not mean that the firm can ignore quality of the product or service; it simply means that the firm is competing on the basis of cost rather than quality.

It has been questioned whether or not the Low-Cost Provider strategy is sustainable (Peters, 1987). According to research conducted using the PIMS database, a higher market share and greater profitability were obtained by those organizations which stressed quality rather than selling on the basis of price (Peters, 1987).

The second generic strategy discussed by Porter (1985) involves differentiating the services or products produced by the organization from those of the competition. This Differentiation results in the organization developing "distinctive competencies." The Differentiation strategy provides a defense against rival organizations because it can bond the consumer to the organization by offering attributes consumers value,

such as higher technical or service qualities. The unique aspects of these attributes encourage the buyer to be less price sensitive, thereby enabling the organization to charge a premium for its products or services. Buyers may be willing to pay a premium for these services because alternatives do not exist for comparable services. Successful implementation should result in higher profit margins which can be used to satisfy the various stakeholders of the organization.

Techniques to achieve a differentiation strategy include the provision of technical quality, the addition of extra or special services and staff, and vertical integration to allow the consumer access to a continuum of services valued by the consumer. These tactics should be accompanied by an aggressive marketing program to publicize the organization as a marketplace leader in terms of services offered or to differentiate its services within specific market segments.

Similar to the caveat stated in the previous section, the organization choosing to use the Differentiation strategy cannot ignore cost. The organization will not earn profits if the cost of differentiating the product exceeds the premium charged for such differentiation. Indeed, the organization which chooses this strategy should attempt to reduce costs in all area (i.e., support services) which do not affect the differentiation (Giardina, Fottler, & Shewchuk, 1989).

According to research conducted by Peters (1987), the organization which provides a product with features which consumers value will be the most profitable. A 1985 study for the American Society for Quality Control attempted to determine the premium that consumers would be willing to pay for a product which they perceived to possess more desirable attributes than competing products. This study found that

consumers would be willing to pay about a third more for a better car, 50 percent more for a better dishwasher, and twice as much for a pair of shoes which they believed had special qualities. Peters (1987) states: "My unequivocal findings are that customers - individual or industrial, high tech or low, science-trained or untrained - will pay a lot for better and especially best quality" (p.68).

It should be pointed out that "quality" as used here is a factor which is not measured but is instead the consumer's perception of quality. Economists have typically thought of "quality" as a set of product characteristics that consumers find desirable (Lancaster, 1975; Leland, 1977). It is conventionally assumed that organizations are motivated to differentiate their products in order to attract more customers and customers who are less responsive to price changes.

The third of Porter's (1985) generic strategies is the Focus or Niche strategy which involves the organization concentrating in a particular market segment. While the Low-Cost or Differentiation strategies involve the extension of these objectives throughout a market area, the Focus strategy involves achievement of a Low-Cost or Differentiation strategy within a particular market segment. When the organization limits the services or products it provides to a particular product line, then it may be better able to achieve economies of scale (Low-Cost) or to produce a more distinctive or higher quality product or service (Differentiation) within this narrow market (Giardina, Fottler, & Shewchuk, 1989). Peters (1987) states that the Niche strategy is the only strategy which allows the organization to concentrate on market creation rather than market sharing.

Porter's (1985) theories outline the need for an organization to adhere to only one generic strategy. "Stuck-in-the-Middle" is the term given by Porter (1980) to those firms which simultaneously attempt to implement more than one generic strategy. Porter believes that organizations which attempt to pursue more than one generic strategy run the risk of either losing the high-volume customers needed for the Low-Cost Leadership position, or losing the high-margin customers to the Differentiated firms.

Dess and Davis (1984) empirically tested Porter's generic strategies. The researchers conducted a field study to obtain responses from executives concerning the strategies employed at their respective firms. These responses were then referred to a panel of experts in strategy research who developed a survey instrument. This instrument was then completed by 78 executives of various firms. Analyses conducted on the responses indicated that firms which identified with one of Porter's strategies outperformed firms which were "stuck-in-the-middle."

However, Porter's position in this regard is quite controversial. Some strategic management theorists believe that it is desirable (and even mandatory) for organizations to combine generic strategies in order to respond to the often contradictory environmental pressures (Murray, 1978). The health care industry is a good example of an industry experiencing the contradictory pressures for both quality and cost containment. It should also be pointed out that in the case of highly regulated industries, there will be minimal levels of service and staff required and often ceilings established on prices the organization may charge which will affect the ability of the organization to achieve a true Low-Cost strategy. Murray (1978) found that in

industries which are highly regulated by the government, the "zone of strategic discretion" for top level corporate managers is reduced.

This section of Chapter II has presented relevant theory from the strategic management literature. The next section attempts to apply this theory to the nursing home industry by introducing the pertinent research in this area.

Structural Analysis of the Nursing Home Industry

In order to examine the behavior of the nursing home industry, it is necessary to understand the competitive forces (Porter, 1985) which shape an industry's strategy: the bargaining power of the suppliers, the threat of new entrants into the marketplace, the rivalry among existing competitors, the possibility of substitutes, and the leverage of the buyers of the industry's services or products. Four of these competitive forces are of little consequence to the nursing home industry as will be explained below. The fifth of these competitive forces, the power of the buyer, is of paramount importance in the establishment of nursing home strategy.

The bargaining power of the Supplier is low as there are many suppliers of services and products which the nursing home utilizes. In most markets, there is a readily available supply of the unskilled personnel who staff most nursing homes. It should be pointed out, however, that the low unemployment rates of recent years are having an effect on the nursing home industry which uses large amounts of unskilled labor (Wagner, 1989). If present trends continue and there are not enough workers available to staff the facilities, then these employees may obtain more bargaining power.

The threat of new entrants into the nursing home marketplace is small. Because of the restrictive CON laws, there have been few nursing homes built in recent years relative to the need. It is also expensive to build new nursing home beds (approximately $29,000 per bed) (Finkler, 1987), and profit margins have been thin in recent years (Wagner, 1988, 1989).

Excess demand in the marketplace serves to reduce the competition and rivalry among the nursing homes. Most nursing homes can select patients from among an available pool. However, the premise of this paper is that not all patients are equally desirable. Therefore, although the nursing home will be full, it may not possess the payor mix it desires. Consequently, the rivalry which does exist among the area nursing homes is for the more profitable private-pay patient.

There is also little threat of substitutes for nursing home care as the present reimbursement systems are biased in favor of institutional placement. It is also a myth that community support services such as home health care could empty institutions of large proportions of older people and would also be cheaper than the cost of institutionalization. The fact is that relatively small proportions of the institutionalized aged could be maintained in the community at lower cost and then only if services were available. Studies of specific alternatives such as day care and homemaker services show that they may actually cost more than institutional care (Fox & Clauser, 1980). The National Channeling Project suggested that it is unlikely that community support services such as home health care could empty institutions of large proportions of older people. This project, which studied the efficacy of replacing institutional care with care in the community, also found that no savings

could be realized from home care versus nursing home care (Hamm, Kickham, & Cutler, 1985).

The only substantial competitive factor with which the nursing home has to contend comes from the buyer of the facility's services. The primary buyer of nursing home services is the government through its Medicaid program. Medicare and other payors such as the Veterans Administration, the United Mine Workers, and Champus pay for a small fraction of nursing home services and as such do not significantly affect the strategy of the nursing home.

Medicaid costs are a significant component of the various state budgets. Increasing appropriations for nursing home care have resulted in considerable strains being placed on these state budgets. The states have responded to these strains by instituting various cost-containment mechanisms to control Medicaid expenditures, including the restrictive CON laws. Stringent financial and medical eligibility rules have made it difficult for all but the poorest and sickest patients to qualify for nursing home placement under Medicaid. Some states have imposed ceilings on Medicaid rates and have restricted allowable costs (Harrington, Newcomer, Estes, Lee, Swan, Parringer, & Benjamin, 1984; Holahan & Cohen, 1987) so that in many states Medicaid rates are at such low levels that the facility with high percentages of Medicaid patients may find financial viability to be difficult.

There is one other significant buyer group: the self-pay or private-pay patient. These private-pay patients account for almost half of nursing home placements. However, unlike the Medicaid patient, the private-pay patient and/or his or her family does not have concentrated buying strength. The many buyers of nursing home

services are indeed price sensitive but unlike the government lack full information and do not purchase large volumes so as to enable them to bargain for better rates. The nursing home may charge the private-pay patient 'whatever the market will bear', and may also charge for additional services such as various therapies and ancillary items.

Table 1 illustrates the success of the government in holding down Medicaid rates versus that of the unorganized private-pay patient. Private-pay rates are higher than Medicaid rates in every certification class. Medicare rates tend to be the highest of all but Medicare accounts for less than two percent of nursing home revenue. The distinction between private-pay and Medicaid rates is also extended to the not-for-profit segment of the industry. It can be inferred from this discussion that, given the phenomena of excess demand, the rational nursing home would give preference to the private-pay patient over the Medicaid patient. That the nursing home will seek to first admit private-pay patients and consequently fill any remaining beds with Medicaid patients can be observed through the economic theory developed by Scanlon (1980).

Nursing Home Economic Theory. This economic theory is depicted in Figure 3 (Scanlon, 1980). Private demand is represented by the line D_P and includes those patients paying private-pay rates and those for whom Medicare is paying. As Medicare will reimburse the facility reasonable costs or charges, these patients are viewed as the equivalent of private-pay patients. The reimbursement rate for Medicaid patients in the facility is at P_M. The combination of eligibility policies, and incomes and preferences of the eligible persons results in the number of eligibles

Table 1. Per Diem Rates by Source of Payment, Ownership Type, and Section of the Country

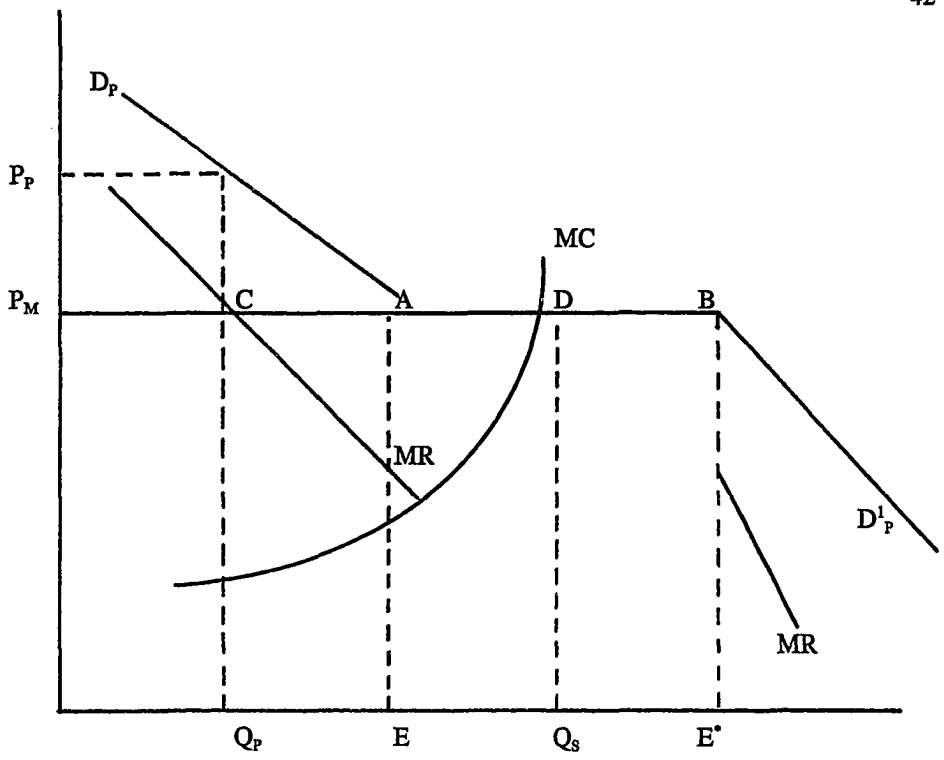
(In Dollars)

	Private SNF	Private ICF	Medicare	Medicaid SNF	Medicaid ICF
Mean	61.01	48.09	62.02	49.93	39.57
Proprietary	58.67	47.28	60.76	47.54	38.58
Not-For-Profit	67.28	49.38	63.97	55.18	41.88
Northeast	79.85	63.33	58.24	63.93	48.87
North Central	57.08	46.01	63.89	47.70	38.33
South	53.19	43.83	58.13	42.95	35.47
West	58.22	47.44	68.41	46.49	43.02

Note. From Nursing home characteristics: Preliminary data from the 1985 National Nursing Home Survey (Report No. 131) by G. Strahan, 1987, Hyattsville, MD: National Center for Health Statistics, Public Health Service. (DHHS Publication No. (PHS) 87-1250).

who want to be in a nursing home of E* - E. The Medicaid program thus produces a kink in the private-pay demand curve at point A, the Medicaid prices, where a horizontal segment equal to Medicaid demand is added. The result is that the total demand schedule faced by nursing homes equals the curve DPABD1P.

Approximately 73 percent of all nursing homes are proprietary and are assumed to be profit maximizers (Palmer & Vogel, 1985). Because profits are maximized when the homes avoid admitting the Medicaid patient in favor of the private-pay patient, the facility will attempt to recruit as many private-pay patients as possible and then fill



Note. From "A Theory of the nursing home market" by W.J. Scanlon, 1980, Inquiry, 17, p. 18.

Figure 3. Model of the Proprietary Nursing Home Market

the remaining beds with Medicaid patients. Profits are maximized when the marginal cost of providing the last unit of total output, MC, equals the marginal revenue from the last unit sold to each type of resident. For the private-pay patients, marginal revenue is the curve, MR, while for Medicaid patients, it is a constant at P_M as long as eligibles seeking care exist. The profit maximization strategy is then to supply Q_P beds to Private-pay patients at price P_P, and to supply the remaining beds, Q_S - Q_P, to Medicaid patients at the state-established price of P_M as long as the cost of caring for the patient covers variable costs and makes a contribution to fixed costs.

Scanlon's (1980) theory of the nursing home market helps to provide the rationale for this study. As Scanlon points out, the nursing home administrator will first choose to admit all private-pay patients and then fill any remaining beds with Medicaid patients. This study is based on the premise that the nursing home provider will prefer to admit the private-pay patient since this patient provides for a higher level of income. This study carries out Scanlon's theory one step further by hypothesizing that the nursing home provider will differentiate his or her product through its strategy of higher resource allocations in order to attract the desirable private-pay patient and, consequently, avoid having to accept the Medicaid patient.

It should be pointed out that the nursing home administrator would prefer to admit a non-Medicaid patient for other reasons than simply the fact that Medicaid rates tend to be lower than non-Medicaid rates. Medicaid reimbursement has been at times uncertain. When the states have had shortages in the monies appropriated for Medicaid, they have occasionally delayed reimbursement or have even reduced the monies owed the nursing homes. In addition, Medicaid requires that considerable paperwork be completed on each Medicaid admission and that periodic inspections be made to assure that appropriate and adequate care is being received.

Finally, Medicaid does not take into consideration the acuity level of the patient; sicker and more dependent patients cannot be charged for additional services and treatments as can private-pay patients. Because the higher costs of caring for these patients will not be reimbursed by the intermediatory, it has been suggested that the heavy-care Medicaid patient may experience difficulty in gaining admission to nursing homes (Gruenberg & Willemain, 1980).

Although there has been considerable discussion of how to compensate the nursing home based on patient acuity levels (Schneider, Fries, Foley, Desmond, & Gromley, 1988), reimbursement systems which are linked to patient acuity levels are not yet in widespread use (Holahan & Cohen, 1987). Currently, only nine states (Illinois, West Virginia, Ohio, California, Connecticut, Maryland, Minnesota, Virginia, and New York) utilize a case-mix approach to reimbursement (Arling, Zimmerman, & Updike, 1989; Butler & Schlenker, 1989; Feder & Scanlon, 1989). Of these, the Resource Utilization Groups (RUGs) utilized in New York state are the best known (Arling et al.).

Nursing Home Strategy

Porter (1985) has made the case for differentiating an organization's product in order to bind the consumer to the organization. It is theorized that the nursing home can successfully do this by offering services which the nursing home consumer values. In the case of the labor intensive nursing home, this could take the form of adding additional staffing. In other words, the nursing home strategy would be to configure its resource allocations in such a way as to achieve a differentiation strategy.

There is considerable precedence for the use of staffing variables to measure the differences among nursing homes. Holmberg and Anderson (1968) used data from Minnesota nursing homes to study the quality of nursing homes. Variables which they studied included the staffing hours per week per patient, the percentage of RN staffing to total nursing staffing, and the number of hours a physician spent each week with the patient. These researchers found that physician time spent with the patient

varied by type of facility ownership. Fottler, Smith, and James (1981) broke staffing levels into nursing hours per patient day, non-nursing hours per patient day, and total hours per patient day. This study found that profitability was negatively affected by staffing ratios. Lee and Birnbaum (1983) utilized staffing variables as measures for quality. These authors found that higher staffing measures resulted in higher costs.

This does not imply that those nursing homes which provide higher staffing levels are, in fact, providing a higher quality of services. However, as quality is so often measured using a structure approach as outlined by Donabedian (1980), much of the research on the nursing home industry concerning various staffing levels intermixes the concepts of quality and product differentiation. Since the nursing home consumer selects the nursing home because of a perception of quality, and since the staffing variables are so often used to measure this quality, staffing variables are probably an appropriate measure of both product differentiation and the consumer's perception of quality. There is considerable precedence for the use of staffing variables to measure differences among nursing homes (Fottler, Smith, & James, 1981; Holmberg & Anderson, 1968; Lee & Birnbaum, 1983).

It should be pointed out that not all nursing homes will be able to attract the private-pay patient. Some communities simply do not have sufficient elderly in the higher socio-economic groups to fill their beds with private-pay patients. Other nursing homes are at relative competitive disadvantage to other nursing homes because of older and less aesthetically appealing physical structures. These facilities may be unable under any circumstances to attract the private-pay patient. In this case, these facilities might find that a low-cost provider strategy is preferable.

Summary of The Development of this Paper

Because the development of the hypotheses to be tested in this study is somewhat complex, it was believed that a presentation of the summary of this development would enhance the understanding for the reader. Consequently, such a summary is presented below.

A. There are certain forces in an organization's environment which control resources vital to the organization. Because the organization is dependent upon these resources for its survival, these forces in the environment are sufficiently powerful to force concessions from the organization.

B. The organization will wish to reduce its dependence upon these forces so that it may assure its autonomy. The organization will choose a strategy designed to assure its independence from the influence of the dominant forces in its environment.

C. Porter's Generic Strategies offer a means to counter the influence of the powerful forces in the environment.

D. The nursing home industry faces two primary types of customers: the private-pay consumer and the Medicaid patient. Because the government pays for a substantial amount of nursing home services, it is able to contain the Medicaid reimbursement it pays for nursing home services. This results in Medicaid reimbursement being less than reimbursement for the private-pay patient, and the lack of any special allowances for the heavy-care Medicaid patient.

E. The nursing home will attempt to reduce its dependence upon the Medicaid environment in order to maximize its income. The presence of excess demand in the industry allows for the selection of patients by the nursing home from among an

available pool of patients. The nursing home will first select the more profitable private-pay patient followed by the low-care Medicaid patient. Conversely, nursing home patients are rational and will select those nursing homes which provide the most comprehensive care and services as they perceive these to provide the highest levels of service.

F. The nursing home is theorized to adopt a differentiation strategy to attract the private-pay patient which will result in a reduction of the facility's dependence on the Medicaid environment. This differentiation strategy is suggested to take the form of additional nursing care, therapy services, and support services.

Statement of the Hypotheses

As has been pointed out, resource allocations are a component of the organization's strategy (Hofer & Schendel, 1978). In order to recruit the more profitable private-pay patient, it is hypothesized that the nursing home will differentiate its product by allocating greater staffing resources. Higher levels of nursing, therapy, and support services could be thought of as differentiating the nursing home product in that the patient would receive more nursing care, more therapy, greater degrees of professional care, and more attention paid to food preparation, cleanliness, and maintenance.

It is important to remember that there is excess demand present in the nursing home industry. Given that the nursing home can select from among an available pool of patients, there is no reason why the facility would allocate greater resources than those mandated by regulation except to escape dependence upon the hostile Medicaid environment.

Given that the consumer is rational (Nyman, 1989b), and given the prevailing excess demand present in the marketplace, nursing homes with higher staffing levels would have first selection from the available patient pool. If those nursing homes which have the greatest resources have first selection, and if the private-pay patient is chosen first, then it could be expected that nursing homes with higher percentages of private-pay patients would have greater staffing levels. Conversely, those facilities with greater percentages of Medicaid patients could be expected to have lower staffing levels. This leads to the following hypothesis:

H_o1: There will be a significant inverse relationship between the staffing levels of a nursing home and the nursing home's percentage of Medicaid patients.

Effect of Mission on Staffing Levels

The strategy literature also suggests that the mission of the organization affects its strategy. There is inconclusive evidence, however, in the nursing home literature (Elwell, 1984; Holmberg & Anderson, 1968; Linn, 1974) concerning whether not-for-profit nursing homes allocate greater resources to patients than do proprietary. This question bears investigation as concern over the best manner in which to provide quality care in an efficient manner is a matter of public policy debate.

It is reasonable to assume that the not-for-profit facility because of its more altruistic goals may provide more services to its patient. Unlike the proprietary nursing home, the not-for-profit facility may provide a greater degree of resources to its patients regardless of payor mix because of its mission, because of greater resources in the form of endowment, philanthropy, and/or tax appropriations, and because there

is no need to utilize any funds towards a return to the stockholders. This suggests the following hypothesis:

H_o2: Those patients in not-for-profit nursing homes will receive significantly more services than will patients in proprietary nursing homes.

Figure 4 illustrates the hypothesized staffing relationships of nursing homes. As can be seen, the staffing levels are theorized to decline due to the increase in the percentage of Medicaid patients. The staffing levels in not-for-profit nursing homes are also suggested to be higher than those in proprietary facilities.

Effect of Patient Dependency Levels on Staffing Allocations

In his studies of the nursing home markets, Scanlon (1980) theorized that the nursing home would give priority in the admission process to the private-pay patient because reimbursement was higher than for the Medicaid patient. The nursing home would admit all private-pay patients and fill any remaining beds with Medicaid patients. It follows that the nursing home would also select from among the available pool of Medicaid patients in order to assure the highest profitability. Since most state reimbursement methodologies make little or no provision for payments to nursing homes based on the patient's needs, it can be assumed that the nursing home would first select those Medicaid patients for whom care is less costly.

Private-pay patients followed by low-care Medicaid patients can be assumed to be the most desirable patients from the nursing home perspective. Conversely, the patient, regardless of payment status, would desire to be admitted into the best possible facility. This suggests that there is a selection process whereby all private-pay patients are first selected, followed by low-care Medicaid patients, and then by

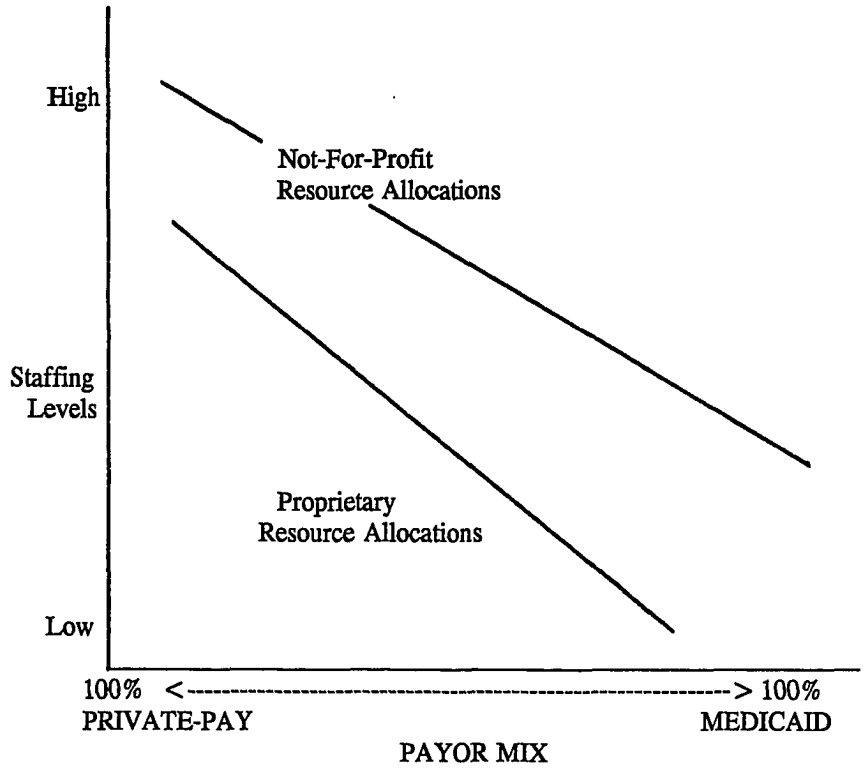


Figure 4. Resource Allocations by Payor Mix - Hypothesized Relationships

heavy-care Medicaid patients. Since nursing homes with the most resources are the most desirable given consumer rationality (Nyman, 1989a), have first choice in the selection process, and presumably would select the Medicaid patient needing the least care, this would suggest that the lighter-care Medicaid patients are in nursing homes with higher levels of services. In other words, the more dependent Medicaid patients will receive fewer services because they are chosen last and would be admitted to those nursing homes with the fewest available resources. This suggests the following:

H_o3: Facilities with high percentages of Medicaid patients who are highly dependent will allocate significantly fewer resources than will nursing homes with high percentages of Medicaid patients with low dependency levels.

Figure 5 illustrates the hypothesized strategy of the nursing home industry. As can be seen from this figure, the strength of the supplier, the fear of substitutes, the potential new entrants into the marketplace, and the competition among existing nursing homes are non-factors in the nursing home's hypothesized strategy. It is the power of the government as a buyer of nursing home services through its Medicaid program which is able to constrain Medicaid reimbursement, resulting in a nursing home strategy which is hypothesized to reduce dependence upon this class of patients.

Summary

This chapter has presented relevant strategic management theory. Resource dependency theory was introduced and elaborated on by the work of Porter (1980). Porter's generic strategies were discussed as a means by which the organization competes. The pertinent literature surrounding the nursing home industry was presented. Hypotheses were then developed which will allow research questions to be tested.

FACTORS INFLUENCING NURSING HOME STRATEGY

I. NON-SIGNIFICANT FACTORS

A. Supplier Strength: No significant supplier although this may be affected as RN's become more scarce and pool of unskilled labor becomes smaller.

B. Fear of Substitutes: Reimbursement is biased in favor of institutionalization.

C. Potential New Entrants: CON laws, Medicaid regulations, and lack of sufficient reimbursement make entry into market-place prohibitive.

D. Competition Among Existing Nursing Homes: High occupancy rates result in only competition being for private-patient.

II. SIGNIFICANT FACTORS

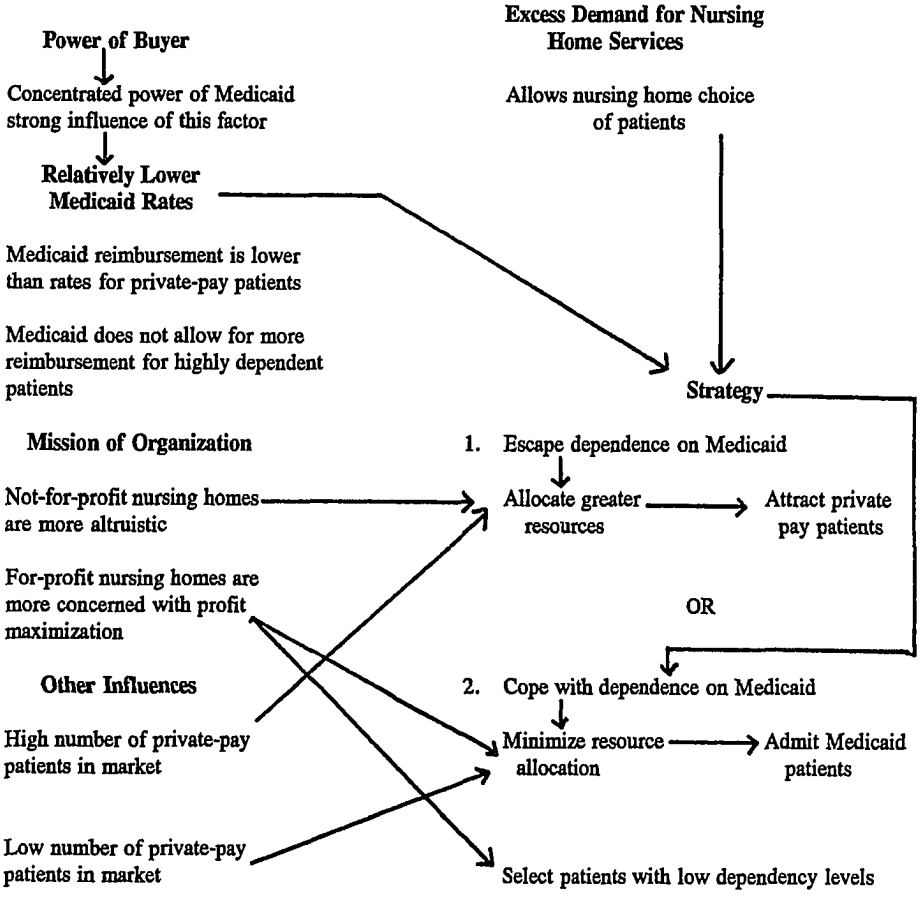


Figure 5. Nursing Home Strategy Development

CHAPTER III

METHODOLOGY

This chapter presents the research methodology and procedures used in the study. A detailed description of the sample and its limitations and the development of the variables used in the research are also provided. This chapter has been divided into three sections: description of the data set used in the study; development of the variables; and, the methods of analyses employed to test the hypotheses.

Sample

The data set used to test the hypotheses was the 1985 National Nursing Home Data Set. This data set was compiled through a sampling of nursing homes selected on a stratified random basis from across the United States. This data set includes information on nursing and related care homes, their registered nurse employees, and their current and discharged residents. This is the third survey in a series of such surveys conducted by the National Center for Health Statistics. The two previous surveys were conducted in 1974-1974 and 1977 (Sekscenski, 1987).

The homes selected for study were obtained from the 1982 National Master Facility Inventory, from the 1982 Complement Survey of the 1982 National Master Facility Inventory, from businesses classified as nursing homes for the period 1982 through June, 1984 by the National Center For Health Statistics Agency Reporting System, and from hospital-based nursing homes as cataloged by the Health Care Financing Administration. From the resulting frame of 20,500 nursing homes and

related care home, a sample of 1,220 homes was selected to be surveyed (Sekscenski, 1987).

This data set contained five files each relating to different areas of interest: demographic, descriptive data about the facility itself; financial data; data concerning the registered nurses employed by the facility; data concerning residents currently residing in the facility; and, data obtained about discharged residents. In this study, only two of the available data files, the facility data file and the current resident data file were utilized.

The survey was conducted through personal interviews with the facility staff and patient families. Data on nursing home operating and utilization characteristics were obtained by personal interviews with the administrator. Data on a random sample of patients currently residing in the facility were obtained by interviewing the staff person most familiar with the medical records of the resident. Additional information about the resident was obtained in a telephone interview with a family member or other caregiver. There were 5,243 current residents residing in 1,079 nursing and related care homes which participated in the survey. One nursing home had to be discarded from the sample leaving a total of 1078 facilities on which data is available.

The facility files and the current resident files had identification numbers which allowed the files to be cross-referenced. This allowed the researcher to be able to match the patient data in the current resident file with the facility in which the resident resided.

An issue of concern to the investigator was the use of all levels of nursing home certification in this research. It was decided that non-certified facilities and

free-standing intermediate-care facilities were intrinsically different from facilities which were certified as either skilled or as skilled-ICF combination facilities (U.S. Senate: Social Security Act and Related Laws, 1978), and were thus eliminated from the data set. This left 204 SNF facilities and 503 SNF-ICF facilities for a total of 707 cases to be studied.

Descriptive statistics were run on the 707 facilities to be studied. Table 2 illustrates that the 707 facilities chosen were dispersed across the country with 185 in the Northeast, 238 in the northcentral states, 159 in the South, and 125 facilities in the West. Most facilities were proprietary with only 31.3 percent owned and/or operated by not-for-profit entities. The average facility bedsize was 154 beds. The nursing home bedsize variable was truncated at 300 beds as facilities greater than 300 beds were considered to be outliers.

The average age of a patient in the data set was 79.28 and the average length of stay was 1,049 days. Twenty-eight point three percent of the patients were male, almost 60 percent were widowed, and 93 percent were white. Approximately 40 percent of all admissions were Medicaid. The data set, unfortunately, did not adjust for patients who may have later become Medicaid-certified after their financial resources were exhausted. The data set did, however, include the actual number of Medicaid days for the prior year which may present a more meaningful statistic to use to account for the percentage of Medicaid patients in the facility.

The data set contained the information for activity of daily living scores (ADLs) and cognitive impairment scores. There was a wide range of these scores with a

Table 2. Descriptive Statistics from the National Nursing Home Data Set.

	Number	Percent	Mean	SD	Range
Certification					
SNF-Only	204	28.9			
SNF-ICF	503	71.1			
Region					
Northeast	185	26.2			
Northcentral	238	33.7			
South	159	22.5			
West	125	17.7			
Bed-Size			154.75	76.5	0 to 300
Ownership					
Proprietary	486	68.7			
Not-For-Profit	221	31.3			
Activity of Daily Living Scores			3.165	1.007	0 to 5
Cognitive Impairment Scores			1.914	.915	0 to 4
Age			79.28	7.83	131.6 to 94.8
Length of Stay (Days)			1049	662.55	53.2 to 4304
Sex					
Male		28.3			
Female		71.7			
Payor Mix (at admission)					
Medicaid		39.2*			
Medicare		4.3			
Private-Pay		43.9			
Other		12.4			
Race					
White		92.8			
Black		6.6			
Other		0.6			
Marital Status					
Married		12.6			
Widowed		59.2			
Divorced		6.8			
Other		21.4			

* Number of Medicaid patients is probably understated as these are the patient's status at time of admission. This number would increase during the nursing home stay as resources are exhausted.

Note. From 1985 National Nursing Home Survey. Hyattsville, MD: National Center for Health Statistics, Public Health Service.

mean ADL score of 3.165 and a standard deviation of 1.847. Cognitive impairment scores with a range of 0 to 4 had a mean of 1.892 and a standard deviation of 1.712.

Resource Allocation Variables

It has been hypothesized that the nursing home will differentiate its product in order to attract the private-pay patient. This will be done through a strategy of allocating greater resources. The main means by which the labor-intensive nursing home can provide a higher level of product services is through providing higher levels of staffing.

The number of full-time equivalent RN, LPN, nursing assistant, physician, dentist, pharmacist, registered occupational therapist, registered physical therapist, speech pathologist/audiologist, activity director, dietician or nutritionist, registered medical record administrator, social worker, radiological service personnel, administrative, food service, housekeeping/maintenance and other personnel were available in the data set. These staffing variables were divided into five groups: registered nurses, licensed practical nurses, nursing assistants, professional staff, and support staff. The RN, LPN, and nursing assistant variables were all given in the data set. The professional staffing variable was a composite of the physician, dentist, pharmacist, registered occupational therapist, registered physical therapist, speech pathologist/audiologist, activity director, dietician or nutritionist, registered medical record administrator, social worker, radiological service personnel variables. The support staffing variable was a composite of the administrative, food service, housekeeping/maintenance, and other non-health personnel given in the data set.

It was believed that since each of these five types of health care personnel play a significant role in the care of the nursing home patient, it was important to describe their respective duties. A brief description follows concerning the duties of each category of nursing home staff.

RNs provide the skilled nursing care at the facility as well as provide leadership and perform many management functions. Higher levels of RN services would be indicative of more skilled and better supervised nursing services at that facility.

LPNs provide many of the treatments and dispense medications in nursing homes. Much of the bedside nursing at the facility is accomplished by the LPN. Higher levels of LPNs would tend to be associated with more personal nursing care.

The nursing assistant provides custodial or maintenance care of the patient including the bathing, feeding, transporting, and dressing of the patient. Higher levels of this type of staffing would imply that the patient was receiving more hands-on care.

Professional staffing at the nursing home includes medical and dental care, physical, speech, and occupational therapies, activity services, social services, and medical records services. These services are usually mandated by regulation in only small amounts. A nursing home that provides higher levels of professional services would be providing more rehabilitative care and more recreational services.

Support services provided at a nursing home include support in the business office, dietary services, housekeeping services, and maintenance services. Higher levels of these would mean a cleaner and better maintained facility, better food, and more personal attention by the administration.

These five variables were all divided by the number of beds in the facility to adjust for bedsize. This produced a variable which represented a full-time equivalent (FTE) staff member per bed. In order to make the unit of comparison more meaningful and easier to understand, these FTEs per bed were then multiplied by 40 (number of hours a FTE works per week) and then by 60 (the number of minutes per hour). The resulting variables now represent the number of minutes each particular staffing type works per bed per week. For example, the variable FTERNX represents the number of RN staffing minutes that a bed in a particular facility commands during a week.

Table 3 provides a detailed description of the development of these variables along with their acronyms.

Covariates

In order to isolate the effects of the payor mix variable on the facility's resource allocations, it was necessary to control for intervening variables. Variables such as facility bedsize, patient age, and length of stay could affect the allocation of resources in the facility. The variables discussed in the section below are typically used as control or predictor variables in empirical studies of the nursing home industry (Arling, Nordquist, & Capitman, 1987; Lee & Birnbaum, 1983; Meiners, 1982; Murtaugh, Cooney, DerSimonian, Smits, & Fetter, 1988; Nyman, 1985, 1988c; Rosko, Broyles, & Aaronson, 1987; Ullmann & Holtmann, 1985). It should be pointed out that previous studies of nursing home resource allocations did not control for patient characteristics such as age and length of stay.

Table 3. Variable Definitions

Variable	Definition
Resource Allocation Variables (Dependent):	
FTERNX	Total Full-Time Equivalent Registered Nurses Adjusted for Facility Bed-Size and converted to minutes of care per week
FTELPNX	Total Full-Time Equivalent Licensed Practical and Vocational Nurses Adjusted for Facility Bed-Size and converted to minutes of care per week
FTENASSX	Total Full-Time Equivalent Nursing Assistants Adjusted for Facility Bed-Size and converted to minutes of care per week
PROFESSX	Total Full-Time Equivalent Professional Staff Adjusted for Facility Bed-Size. This includes physicians, dentists, pharmacists, occupational and physical therapists, speech pathologists and audiologists, activities director, dietitians, medical records administrators, social workers, radiological service personnel, and all other health professional and technical personnel. The unit of measurement for this variable was converted to minutes of care per week.
SUPPRTX	Total Full-Time Equivalent Support Personnel Adjusted for Facility Bed-Size. This includes administrators and business office staff, food service, housekeeping and maintenance personnel, and all other non-health personnel. The unit of measurement for this variable was converted to minutes of care per week.
Grouping Variables:	
NTILTHRE	Percentage of Medicaid Patients divided into three groups: High % Private-Pay, Mixed % Private-Pay Medicaid, and High % Medicaid.
OWNERSHP	Ownership Status of Facility, i.e., Whether facility is proprietary or not-for-profit.

Table 3. (Continued)

Variable	Definition
DEPENDCY	Patient dependency level. This is a composite of both the patient's average Activity of Daily Living (ADL) score and average cognitive impairment score. ADL scores are measured as the number of dependencies each patient has in eating, dressing, bathing, and incontinence. Dependence in each area is assigned a one if the dependence is present and a zero if the dependence is not present. The number of dependencies (ranging from 0 to 5) are then summed to derive the patient's ADL score. An average of the ADL scores for all patients in a particular facility is then obtained. Average cognitive impairment scores are a composite measure of each patient's ability to remember dates or time, identify familiar locations and people, to recall important aspects of recent events, and to make straight-forward judgements. Impairment in any one of these four areas is given a score of one and lack of impairment in any area is given a score of zero. The number of cognitive inabilities are then summed to obtain a score for a patient. An average of cognitive impairment scores for all patients in a particular facility is then obtained. Dependency levels for patients in a facility are obtained by adding together high average ADL scores and high average cognitive impairment scores to form one group and by adding together low ADL scores and low cognitive impairment scores to form a second group. The first group would consist of facilities with patients with high dependencies and the second group would consist of facilities with patients with low dependency levels.
Covariates:	
AVERLOS	Average Length of Stay for Patients in Each Facility.
AVEROLD	Average Patient Age Per Facility.

Covariates used in the study included facility bedsize, patient age and length of stay. Patient age was included as older patients might require greater services. Length of stay was included as patients with shorter lengths of stay tend to be more acutely ill and in nursing homes for more restorative purposes. Patient age and length of stay were given in the Current Resident file and were aggregated to obtain an average for each facility.

It should be pointed out that facility bedsize was built into the dependent variables by computing the staffing ratios on a per bed basis. This variable was controlled for as larger bedsize would naturally be associated with greater staffing levels. Bedsize was given in the data set.

Grouping Variables

There are three grouping variables used in this study: the percentage of Medicaid patients in the facility; the facility ownership status; and, the dependency level of the patient. It is important to remember that these groups were formed after the data was cleaned and inappropriate cases were dropped.

In order to determine the effects of the payor mix on the resource allocations, the percentage of Medicaid patients in the facility was used as the payor mix grouping variable. This variable has been used frequently in the nursing home literature in order to study how resources vary with payor mix. Fottler, Smith and James (1981), Holmberg and Anderson (1968), and Palmer and Vogel (1985) all used the percentage of Medicaid patients to test the effects of payor mix on resource allocations.

The variable NTILTHRE was formed by dividing the nursing homes into three equal groups based on their percentage of Medicaid patients. This percentage was

derived by dividing the total days at a particular facility into the Medicaid days at that facility. Both total and Medicaid days were given in the data set. Level 1 had higher percentages of private-pay patients, level 2 had a mixture of private-pay and Medicaid patients, and level 3 had high percentages of Medicaid patients. It should be pointed out that each of these three groups contained the same number of facilities (168) and were formed after the data set had been cleaned of outliers and missing data.

Facility ownership was the second grouping variable. This variable was obtained from the data set and was coded as a dummy variable. A 0 represented a proprietary facility and 1 represented a not-for-profit nursing home.

The third grouping variable was the Patient Dependency variable. This was used as a grouping variable in order to determine if the dependency level of the patient was related to the allocation of staffing resources. This variable is a composite of two variables: Activity of Daily Living Scores and Cognitive Impairment Scores.

Functional dependence in activities of daily living (ADLs) is considered to be a more relevant measure of the need for nursing home resources than is the patient diagnosis (Arling, Nordquist, Brant, & Capitman, 1987; Kane & Kane, 1980). For this reason, it is typically used to measure the patient's acuity levels. This survey asked for the need by the patient for assistance in the areas of bathing, dressing, eating, transporting, using the toilet, and continence. These measures can be summarized into a single measure of ADL dependency by summing the number of activities in which a resident required assistance (Katz & Akpom, 1976). The patient's ability to use the toilet was dropped from the measure as there was considerable missing data and because it was felt to be highly correlated with the continence measure. This left

the ADL scores with a range of 1 (or no dependencies) to 5 (or dependent in every area).

A prevalent reason for placing someone in a nursing home is deteriorating cognitive functioning (Kane, Matthias, & Sampson, 1983). Disorientation or memory impairment is defined as being unable to remember dates or time, unable to identify familiar locations or people, unable to recall important aspects of recent events, or unable to make straightforward judgments (NCHS, 1987). Major reasons for these memory losses or disorientation are chronic brain syndrome or senile dementia. The presence of one or more of these functions can be summed to provide a scale measuring the degree of cognitive impairment. This scale ranges from 0 (no impairment) to 4 (impairment in all 4 areas).

Both the ADL scores and the cognitive impairment scores were divided into two groups by range of scores. This produced four groups: facilities with high ADL scores; facilities with low ADL scores; facilities with high cognitive impairment scores; and, facilities with low cognitive impairment scores. Those facilities with both high ADL scores and high cognitive impairment scores were added together to form one level of the new variable DEPENDCY. Those facilities with both low ADL scores and low cognitive impairment scores were added together to form a second level of the variable DEPENDCY. Therefore, the first level of the variable DEPENDCY would consist of those facilities with patients with high ADL scores and high cognitive impairment scores and the second level of the grouping variable would consist of those facilities with patients with low ADL scores and low cognitive impairment scores.

Discussion of Variables

As stated in the limitations section, it would have been desirable to have included a variable for the type of reimbursement methodology used by the particular state. Different methodologies provide different incentives for cost control, and consequently, resource allocation. For example, a flat-rate and prospective reimbursement systems provides an incentive for the facility to control expenses as the facility will get the same reimbursement regardless of costs (Holahan, 1985; Levey, Ruchlin, Stotsky, Kihlock, & Oppenheim, 1973; Meiners, 1982). Retrospective reimbursement systems provide little or no incentives to control costs as all relevant expenses will be reimbursed to the provider (Holahan, 1985). However, this information was not available in the data set and may affect the error rate in the study.

Table 4 provides a justification for the inclusion of each of the variables in the study. This table also shows how these variables were used in the research.

As can be seen in the above discussion, some of the variables used in the study were facility variables and some were patient variables. The data set encompassed 5,028 patients in 1,078 facilities. This presented a problem as the facility in this study was the unit of analysis. In order to resolve this problem, new variables were created. In each facility, not more than 5 current residents were surveyed. Because the patients' ages, lengths of stay, ADL levels, and cognitive impairment scores were all continuous data, it was believed that an average aggregate score for each of these variables for the facility could be obtained. For example, if the survey examined the ADL scores of four patients in a particular facility and the four patients had ADL scores of 3, 2, 5, and 1, respectively, the aggregate ADL score for the facility would

Table 4. Justification For Variables

Important nursing home cost determinants	Status in this study	Justification for this variable
Payor mix	Grouping variable	The Medicaid environment has been shown in the literature to be more hostile than the private-pay environment in that reimbursement is less for the Medicaid patient and there are no provisions for higher reimbursement levels for the heavy-care Medicaid patient. The nursing homes in the study were divided into groups based on whether they had low, medium, or high percentages of Medicaid patients. These groupings allowed for the use of analyses such as ANOVAs and MANOVAs to determine differences among the means of the dependent variables based on which group the facility was included.
Ownership	Grouping variable	The literature is inconclusive concerning whether or not staffing is different in proprietary versus not-for-profit nursing homes. Since the mission of the organization may cause the strategy of the nursing home to vary, the ownership status of the facility is included as a grouping variable.
Bedsize	Control variable	It can be assumed that facilities with more beds will have more staff. In order to compare among facilities, it was necessary to control for facility size. This was done by dividing the staffing variables by the number of beds in that facility.

Table 4. (Continued)

Important nursing home cost determinants	Status in this study	Justification for this variable
Staffing	Dependent variables	It was hypothesized that the nursing home product will be differentiated in order to attract the more profitable private-pay patient and/or the lighter-care Medicaid patient. The main way in which the labor-intensive nursing home can vary its product is through its staffing pattern allocations. These staffing patterns were measured through the use of five dependent variables: FTE Rns per bed, FTE LPNs per bed, FTE Nursing Assistants per bed, FTE Professional Staff per bed, and FTE Support Staff per bed.
Facility certification	Control variable	Staffing would tend to vary with the type of facility certification. There were four types of facilities in the study: free-standing skilled facilities, combination skilled-intermediate care facilities, free-standing intermediate-care facilities, and non-certified facilities. Non-certified facilities were dropped from the study as these did not require the presence of professional care. Free-standing intermediate-care facilities were also dropped as they did not provide the same skilled personnel as the free-standing skilled facilities and the combination facilities, and, were, therefore, considered to be intrinsically different.

Table 4. (Continued)

Important nursing home cost determinants	Status in this study	Justification for this variable
Case mix	Grouping variables	Patients who have greater dependency levels would require higher staffing levels. Dependency in nursing homes is usually measured through Activity-of-Daily Living (ADL) scores and cognitive impairment scores. These patient-care measures were aggregated to obtain a single average ADL and cognitive impairment score per facility. The average ADL scores and cognitive impairment scores are then grouped to form two sets of facilities: those with patients who are highly dependent and those with patients who are less dependent.
Patient characteristics	Control variable	Certain patient characteristics were suggested by the literature to vary with staffing levels. In particular, the age of the patient and the length of stay were shown to affect staffing patterns. Older patients require more care because of multiple problems associated with age. Patients with shorter nursing home stays were hypothesized to have received more staff attention since many of the shorter-stay patients were there for restorative purposes rather than maintenance.

Table 4. (Continued)

Important nursing home cost determinants	Status in this study	Justification for this variable
Staffing requirements	Not included	Staffing requirements will vary by state. It would have been desirable to control statistically for the state in which the facility was located. However, this was unavailable in the data set and could serve to increase the variation in staffing patterns not accounted for by the variables of interest in this study.
Reimbursement method	Not included	The reimbursement methodology of the state would affect the staffing patterns at the facility. Those states with flat-reimbursement systems would tend to encourage the use of fewer staffing. States with retrospective reimbursement methodologies would tend to encourage the use of higher staffing patterns. However, state identifiers were not available through the data set.

be 11/4 or 2.75. This allowed for the use of these variables in parametric statistical analyses.

Additional information concerning computation of the variables proposed to be used in this study can be seen in Appendix B. This appendix allows the reader to identify the file from which the variables are taken and to view the various software commands for the development of the variables. The software package for the analyses will be SPSS/PC+, V2.0 (Norusis, 1988).

Choice of Statistical Techniques

An inspection of the correlation matrices of the dependent staffing variables showed that the variables were all significantly correlated ($p < .01$). In consideration of these correlations, it was determined that some form of multivariate technique as opposed to separate univariate ANOVAs would be the method of choice for the statistical analyses. Because there was also reason to believe that there might be intervening variables which would affect the results such as the patient age and the length of stay, a Multivariate Analysis of Covariance (MANCOVA) was believed to be the most appropriate analyses to determine if differences did exist among the staffing variables.

MANCOVA analysis was used instead of a multiple univariate test because: 1) there is an inflated Type I error with the univariate test, 2) the univariate analyses ignore correlation among the dependent variable, and, 3) the researcher may not get statistical significance from the univariate analysis but may from the multivariate, such as the variables as a set contribute to differences but no one variable alone does (Tabachnick & Fidell, 1983).

A 3 X 2 X 2 MANCOVA was performed on the five dependent variables: FTERNX (minutes of RN staffing per week), FTELPNX (minutes of LPN staffing per week), PROFESSX (minutes of professional staffing per week), SUPPRTX (minutes of support staffing per week), and FTENASSX (minutes of nursing assistant staffing per week). The three grouping factors were NTILTHRE (the three levels of the percentage of Medicaid patients), OWNERSHP (the two levels of ownership categories, i.e., proprietary and not-for-profit), and DEPENDCY (the two levels of dependency scores). The average length of stay (AVERLOS) and the average patient age per facility (AVEROLD) served as covariates.

Cleaning of the Data Set

Before proceeding with the analyses, it was important that inappropriate data be dropped from consideration and that the sample meet certain criteria necessary to conduct the MANCOVA. Outliers, truncated cases, and missing data were eliminated from the analyses. This left 504 cases which were appropriate for use in the analyses. Appendix C provides a detailed description of the reasons for dropping certain cases and the results of the various tests for meeting the assumptions necessary for the use of a MANCOVA.

These 504 cases were divided into three equal groups according to the percentage of Medicaid patients. This provided 3 groups of 168 facilities each. Group 1 or the group with facilities with high percentages of private-pay had a mean percentage of Medicaid patients of 33.6 percent. Group 2 had a mean percentage of Medicaid patients of 67.7 percent and Group 3, or the group with the highest percentage of Medicaid patients, had a mean percentage of Medicaid patients of 85.1 percent.

There were 137 not-for-profit facilities in the sample used for the analyses and 372 proprietary facilities. The sample also included 177 facilities with patients who were highly dependent and 332 facilities with patients who were not highly dependent. Cell sizes were not equal but were accounted for through the use of the Option 9 command in the SPSS ANOVA program which allows for the equal weighting of all cells by utilizing a regression approach.

Summary

This chapter discussed the sample used to test the hypotheses and the development of the variables used in the analyses. The MANCOVA was determined to be the best method for conducting the analyses. The following chapter presents the results of the analyses.

CHAPTER IV

RESULTS

This chapter presents the results of the various analyses. The first section provides a description of the sample characteristics or a preliminary data screening. The second section analyzes the manner in which the staffing variables vary with the percentage of Medicaid patients in the facility and the effect of facility mission or ownership status. The final section provides the results of the analyses dealing with discrimination against the heavy-care Medicaid patient.

Preliminary Screening of Data

Tests were run to determine if there were differences in certain demographic variables among the three groups of facilities based on the percentage of Medicaid patients. If differences did exist, then the possibility could arise that certain intervening variables could create problems in the interpretation of the results. A series of ANOVAs and Chi-Squares to test for the differences were run on the variables as can be seen in Table 5.

There were no significant differences among the three groups of facilities as pertained to the patient characteristics of ADL scores, cognitive impairment levels, age, and length of stay. There were also no differences among the patient discharges for the year, the urban/rural status of the facility, the certification status of the facility, or the deaths in the facility by group.

Table 5. Descriptive Statistics of Data to be Used in Analyses by Percentage of Medicaid Patients

	Total n=495	Group 1 (High Private Pay) n=162	Group 2 (Mixed) n=165	Group 3 (High Medicaid) n=168
Sex				
Male	26.3%	26.5%	24.8%	27.4%
Female	73.7%	73.5%	75.2%	72.6%
Race*				
White	93.9%	97.5%	94.5%	89.9%
Black	5.7%	2.5%	5.5%	8.9%
Other	0.4%	.0%	.0%	1.2%
Urban/Rural				
Urban	71.5%	73.9%	69.6%	71.0%
Rural	28.5%	26.1%	30.4%	29.0%
Certification				
SNF-ICF	74.1%	73.7%	73.7%	75.7%
SNF Only	25.9%	27.3%	26.3%	24.3%
Bed Size**	141	128	136	159
Discharges Per Year	121	120	127	117
Deaths	38	40	37	36
Total Days**	48074	44084	46046	54021

* $p < .05$ ** $p < .01$

Table 5. (Continued)

	Total n=495	Group 1 (High Private Pay) n=162	Group 2 (Mixed) n=165	Group 3 (High Medicaid) n=168
AVERADL	3.1560	3.2467	3.0857	3.1353
AVERCOGV	1.9042	1.9861	1.8906	1.8365
AVEROLD	78.98	79.02	78.82	79.11
AVERLOS	1058	1074	1080	1022
% Medicaid	62.13%	33.6%	67.7%	85.11%

* $p < .05$ ** $p < .01$

The facilities with a high percentage of Medicaid patients had significantly more patient days for the year, a larger daily census, and a larger bedsize. However, these differences should not be a problem as the dependent variables are adjusted for the facility bedsize.

It was found that facilities with higher percentages of Medicaid patients had higher percentages of black patients. This is probably a result of the fact that blacks in the United States have lower per capita incomes and, consequently, could not afford private-pay status as often as the white patient. Since the percentage of black patients in nursing homes is so small, it should not affect the distributional characteristics of the sample.

Testing of the Hypothesis

A 3 X 2 X 2 MANCOVA was run to test the three hypotheses. The MANCOVA results were used to determine if there were significant differences among the means

of the set of dependent variables by the main effects of the percentage of Medicaid patients, the facility ownership, and the patient dependency level. The MANCOVA allowed the researcher to determine if there was either significant two-way or three-way interaction among the three grouping factors. The results were further checked to determine that, if there were differences among the means of the set of dependent variable, where among the dependent variables these differences occurred. The amount of variance of the set of dependent variables as well as the individual dependent variables attributed to each of the main effects and the interactions were subsequently evaluated.

The Effect of the Percentage of Medicaid Patients and the Facility Ownership Status on the Set of Staffing Variables

The MANCOVA results indicated that both the main effect of the percentage of Medicaid patients in the facility ($F = 4.89746$, $df = 2, 480$, $p < .0001$) and the main effect of the ownership status of the facility ($F = 25.28251$, $df = 1, 480$, $p < .0001$) were significant. Hypothesis 1 and Hypothesis 2 appear to be supported, such as the staffing levels of the nursing home significantly varied with the percentage of Medicaid patients in the facility and with the ownership status of the facility. The results indicated a high degree of association between the ownership status of the facility (proprietary versus not-for-profit) and the combined set of dependent variables, (Eta-squared = .21) and a smaller degree of association between the percentage of Medicaid patients in the facility (high, medium, and low) and the set of dependent variables (Eta-squared = .10). Eta-squared is the proportion of variance in the combined set of staffing levels which could be attributed to the grouping factor. In other words, 21 percent of the variation in the set of staffing variables could be

attributed to the ownership status of the facility and 10 percent of the variation could be attributed to the payor mix.

A step-down analysis was performed to investigate the effects of the main effect on each of the dependent variables. The analysis was conducted based on an a priori ordering of the importance of the dependent variables. Thus, each dependent variable was analyzed, in turn, with higher priority dependent variables treated as covariates with the dependent variable which was believed to be the most important tested in a univariate ANOVA (Tabachnick & Fidell, 1983). All dependent variables were believed to be reliable enough to justify the stepdown analysis. Results of this analysis are shown in Table 6. In order to apportion the established alpha of .05, the Bonferonni Correction was used (Tabachnick & Fidell, 1983).

Eta-Squared, the measure for the degree of association, is the point bi-serial correlation between the percentage of Medicaid patients and the five staffing variables, and between the ownership status of the facility and the five staffing variables. It is the proportion of variance in the individual staffing scores that could be attributed to the grouping factors after accounting for the effects of the co-variates. The percentage of Medicaid patients in the facility appeared to affect the staffing levels of LPNs, stepdown $F(2, 479) = 13.414$, $p < .01$, Eta-squared = .252, and support services, stepdown $F(2,477) = 7.848$, $p < .01$, Eta-squared = .079. The ownership status of the facility appeared to account for significant variation in the RN staffing levels, stepdown $F(1, 480) = 32.170$, $p < .01$, Eta-squared = .447; in the professional staffing, stepdown $F(1, 478) = 20.224$, $p < .01$, Eta-squared = .663; and,

Table 6. Tests of Percentage of Medicaid Patients, Ownership Status, and Patient Dependency, and Their Interaction.

IV	DV	Univariate F	df	Stepdown F	df	α
Main Effects:						
NTILTHRE	FTERNX	1.234	2/480	1.234	2/480	.01
	FTELPNX	14.378	2/480	13.414**	2/479	.01
	PROFESSX	.660	2/480	1.141	2/478	.01
	SUPPRTX	6.356	2/480	7.848**	2/477	.01
	FTENASSX	2.828	2/480	.849	2/476	.01
OWNERSHP	FTERNX	32.171	1/480	32.170**	1/480	.01
	FTELPNX	2.244	1/480	5.084	1/479	.01
	PROFESSX	36.933	1/480	20.224**	1/478	.01
	SUPPRTX	103.172	1/480	58.105**	1/477	.01
	FTENASSX	14.544	1/480	1.768	1/476	.01
DEPENDCY	FTERNX	1.037	1/480	1.037	1/480	.01
	FTELPNX	2.580	1/480	2.170	1/479	.01
	PROFESSX	.144	1/480	.179	1/478	.01
	SUPPRTX	.264	1/480	.276	1/477	.01
	FTENASSX	.308	1/480	.885	1/476	.01
Two Way Interactions:						
NTILTHRE X	FTERNX	3.984	2/480	3.984**	2/480	.01
OWNERSHP	FTELPNX	4.650	2/480	5.545**	2/479	.01
	PROFESSX	.385	2/480	1.073	2/478	.01
	SUPPRTX	2.587	2/480	4.150**	2/477	.01
	FTENASSX	.577	2/480	.345	2/476	.01
NTHILTHRE X	FTERNX	.478	2/480	.478	2/480	.01
DEPENDCY	FTELPNX	1.959	2/480	2.096	2/479	.01
INTERACTION	PROFESSX	3.880	2/480	3.061	2/478	.01
	SUPPRTX	1.02	2/480	3.078	2/477	.01
	FTENASSX	.298	2/480	.512	2/476	.01
OWNERSHP X	FTERNX	.743	1/480	.743	1/480	.01
DEPENDCY	FTELPNX	1.929	1/480	1.630	1/479	.01
INTERACTION	PROFESSX	1.074	1/480	1.078	1/478	.01
	SUPPRTX	.029	1/480	.153	1/477	.01
	FTENASSX	.066	1/480	.374	1/476	.01

** $p < .01$

Table 6. (Continued)

IV	DV	Univariate F	df	Stepdown F	df	α
Three Way Interaction:						
NTILTHRE X	FTERNX	1.487	2/480	1.487	2/480	.01
OWNERSHP X	FTELPNX	.199	2/480	.376	2/479	.01
DEPENDCY	PROFESSX	.220	2/480	.015	2/478	.01
	SUPPRTX	.924	2/480	2.216	2/477	.01
	FTENASSX	1.052	2/480	1.710	2/476	.01

** $p<.01$

the support services staffing levels, stepdown $F(1, 477) = 58.105$, $p < .01$, Eta-squared = .586.

In order to determine the direction of the differences, a set of means were computed. The cell means for minutes of RN staffing per week can be seen in Table 7, the means for LPN staffing per week in Table 8, the means for professional services staffing per week in Table 9, the means for nursing assistant staffing per week in Table 10, and the means for support services staffing per week in Table 11.

The percentage of Medicaid patients in the facility significantly affected the staffing of LPNs and support services. As can be observed in Table 8, the staffing level of the LPN increased from 176.62 minutes per week per bed for those patients in facilities with high percentages of private-pay patients, to 198.53 minutes per week per bed for those patients in facilities with mixed percentages of private-pay/Medicaid patients, to 213.94 minutes per week per bed for those patients in facilities with high percentages of Medicaid patients. This would indicate that LPN staffing would increase as the percentage of Medicaid patients increased, a finding which was contrary to the direction suggested in Hypothesis 1.

Table 7. Means of Minutes of Registered Nursing Services by Percentage of Medicaid, Ownership Status, Dependency Level, and Their Interactions

Means by percentage of Medicaid	
High % private-pay	162.90
Mixed % private-pay/Medicaid	141.33
High % Medicaid	133.95
Means by ownership	
Not-for-profit	180.81
Proprietary	132.39
Means by dependency level	
High dependency	139.40
Low dependency	149.33

Means by percentage of Medicaid X ownership

	Not-for-profit	Proprietary
High % private-pay	178.79	151.73
Mixed % private-pay/Medicaid	178.04	134.47
High % Medicaid	184.77	114.79

Means by percentage of Medicaid X dependency

	High Dependency	Low Dependency
High % private-pay	163.82	160.08
Mixed % private-pay/Medicaid	143.69	137.41
High % Medicaid	139.35	125.40

Means by ownership X dependency

	High Dependency	Low Dependency
Not-for-profit	187.62	135.07
Proprietary	168.90	127.46

Means by percentage of Medicaid X ownership X dependency

	High % private-pay	Mixed % private-pay/Medicaid	High % Medicaid
Not-for-profit/ high dependency	190.85	193.86	181.63
Not-for-profit/ low dependency	159.49	164.48	193.66
Proprietary/ high dependency	148.59	137.08	118.51
Proprietary/ low dependency	160.66	129.52	109.94

Table 8. Means of Minutes of LPN Services by Percentage of Medicaid, Ownership Status, Dependency Level, and Their Interactions

Means by percentage of Medicaid	
High % private-pay	176.62
Mixed % private-pay/Medicaid	198.53
High % Medicaid	213.94
Means by ownership	
Not-for-profit	200.32
Proprietary	195.15
Means by dependency level	
High dependency	201.12
Low dependency	194.20

Means by percentage of Medicaid X ownership

	Not-for-profit	Proprietary
High % private-pay	175.35	177.73
Mixed % private-pay/Medicaid	188.84	200.34
High % Medicaid	243.12	202.94

Means by percentage of Medicaid X dependency

	High dependency	Low dependency
High % private-pay	179.25	171.27
Mixed % private-pay/Medicaid	195.49	203.57
High % Medicaid	209.02	221.74

Means by ownership X dependency

	High dependency	Low dependency
Not-for-profit	196.67	198.57
Proprietary	193.28	207.40

Means by percentage of Medicaid X ownership X dependency

	High % private-pay	Mixed % private-pay/Medicaid	High % Medicaid
Not-for-profit/ high dependency	175.48	172.40	230.18
Not-for-profit/ low dependency	175.15	202.94	279.81
Proprietary/ high dependency	181.37	198.54	198.59
Proprietary/ low dependency	167.39	203.75	208.60

Table 9. Means of Minutes of Professional Services by Percentage of Medicaid, Ownership Status, Dependency Level, and Their Interactions

Means by percentage of Medicaid	
High % private-pay	135.56
Mixed % private-pay/Medicaid	112.97
High % Medicaid	115.47
Means by ownership	
Not-for-profit	153.38
Proprietary	108.78
Means by dependency level	
High dependency	123.52
Low dependency	117.11

Means by percentage of Medicaid X ownership

	Not-for-profit	Proprietary
High % private-pay	163.96	116.52
Mixed % private-pay/Medicaid	143.10	107.34
High % Medicaid	145.01	104.33

Means by percentage of Medicaid X dependency

	High dependency	Low dependency
High % private-pay	142.76	119.94
Mixed % private-pay/Medicaid	112.23	114.21
High % Medicaid	114.07	117.70

Means by ownership X dependency

	High dependency	Low dependency
Not-for-profit	154.53	152.13
Proprietary	111.97	102.93

Means by percentage of Medicaid X ownership X dependency

	High % private-pay	Mixed % private-pay/Medicaid	High % Medicaid
Not-for-profit/ high dependency	174.54	137.52	137.00
Not-for-profit/ low dependency	147.02	147.89	167.72
Proprietary/ high dependency	124.85	108.89	102.77
Proprietary/ low dependency	92.85	104.39	106.37

Table 10. Means of Minutes of Nursing Assistant Service by Percentage of Medicaid, Ownership Status, Dependency Level, and Their Interactions

Means by percentage of Medicaid	
High % private-pay	810.07
Mixed % private-pay/Medicaid	829.86
High % Medicaid	851.38
Means by ownership	
Not-for-profit	885.56
Proprietary	809.49
Means by dependency level	
High dependency	836.60
Low dependency	821.07

Means by percentage of Medicaid X ownership

	Not-for-profit	Proprietary
High % private-pay	854.78	781.38
Mixed % private-pay/Medicaid	865.75	823.14
High % Medicaid	945.19	816.01

Means by percentage of Medicaid X dependency

	High dependency	Low dependency
High % private-pay	815.11	801.91
Mixed % private-pay/Medicaid	833.98	823.00
High % Medicaid	862.37	833.96

Means by percentage of Medicaid X ownership X dependency

	High % private-pay	Mixed % private-pay/Medicaid	High % Medicaid
Not-for-profit/ high dependency	861.63	847.36	963.84
Not-for-profit/ low dependency	843.81	881.51	892.34
Proprietary/ high dependency	788.90	832.22	812.38
Proprietary/ low dependency	760.01	805.93	820.75

Table 11. Means of Minutes of Support Services by Percentage of Medicaid, Ownership Status, Dependency Level, and Their Interactions

Means by percentage of Medicaid	
High % private-pay	627.04
Mixed % private-pay/Medicaid	520.43
High % Medicaid	543.77
Means by ownership	
Not-for-profit	734.40
Proprietary	497.08
Means by dependency level	
High dependency	566.86
Low dependency	555.37

Means by percentage of Medicaid X ownership

	Not-for-profit	Proprietary
High % private-pay	780.77	521.04
Mixed % private-pay/Medicaid	646.30	496.89
High % Medicaid	717.01	478.45

Means by percentage of Medicaid X dependency

	High dependency	Low dependency
High % private-pay	658.05	611.42
Mixed % private-pay/Medicaid	526.31	516.90
High % Medicaid	504.11	568.80

Means by ownership X dependency

	High dependency	Low dependency
Not-for-profit	739.73	723.91
Proprietary	502.50	487.16

Means by percentage of Medicaid X ownership X dependency

	High % private-pay	Mixed % private-pay/Medicaid	High % Medicaid
Not-for-profit/ high dependency	766.88	644.17	741.52
Not-for-profit/ low dependency	803.00	648.12	647.57
Proprietary/ high dependency	523.83	500.11	483.68
Proprietary/ low dependency	513.10	490.78	471.63

Support services decreased as the percentage of Medicaid patients in the facility increased as was theorized in Hypothesis 1. Those patients in facilities with high percentages of private-pay patients received on average 627.04 minutes of support services per week, those in facilities with mixed percentages of private-pay/Medicaid received 520.43 minutes of support services per week, and those in facilities with high percentages of Medicaid patients received 543.77 minutes of support services per week. In other words, those facilities which had higher percentages of private-pay patients allocated significantly greater amounts of resources in the form of food services, housekeeping, maintenance, and administration to these patients.

The study found that not-for-profit facilities allocated significantly greater amounts of RN staffing than did proprietary facilities. As shown in Table 7, patients in not-for-profit facilities on an average received 180 minutes of RN services per week while those patients in proprietary facilities received 132.39 minutes of care per week. In other words, more skilled nursing care was provided to patients in not-for-profit nursing homes.

The study also found that not-for-profit nursing homes allocated almost 50 percent more in professional services to their patients than did proprietary nursing homes. Not-for-profits provided on average 153.38 minutes of RN care to their patients per week and proprietary nursing homes provide 108.78 minutes of RN coverage per week.

Not-for-profits also provided almost 50 percent more support services to their patients than did proprietary nursing homes. Not-for-profit facilities provided on an average 734.40 minutes of support services per week and proprietary nursing homes

provided 497.08 minutes per week. In other words, the not-for-profit facility provided almost twice as much time in food preparation, housekeeping, maintenance, and administration as did the for-profit facility.

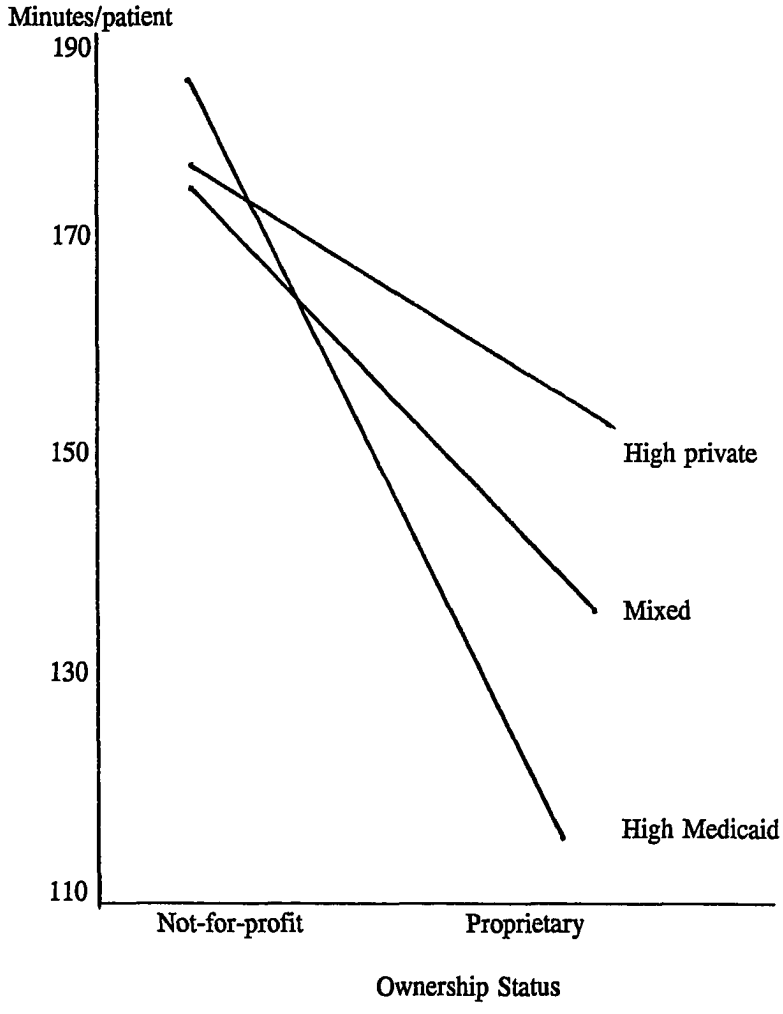
Significant Interaction Between the Percentage of Medicaid Patients and the Ownership Status of the Facility

The results also indicated that the interaction of the percentage of Medicaid patients in the facility and the ownership or mission of the facility affected the set of staffing variables ($F = 2.95981$, $df = 2, 480$, $p < .001$). Eta-squared or the degree of variance in the set of staffing variables which can be explained by the interaction of the percentage of Medicaid patients and the facility ownership is 6 percent. This unique contribution to predicting differences among the staffing variables is made by the combined effect of the percentage of Medicaid patients in the facility and the facility ownership. In other words, there was a singular difference in the allocation of the staffing variables which can be attributed to the joint effect of the two grouping factors. This interaction was observed in three of the individual staffing variables: minutes of RN staffing per week per bed, stepdown $F(2, 480) = 3.984$, $p < .01$, Eta-squared = .052; minutes of LPN staffing per week per bed, stepdown $F(2, 479) = 5.545$, $p < .01$, Eta-squared = .104; and minutes of support services per week, stepdown $F(2, 477) = 4.150$, $p < .01$, Eta-squared = .041. That is, 5.2 percent of the variance in the minutes of RN staffing per week per bed, 10.4 percent of the minutes of LPN staffing per week per bed, and 4.1 percent of the variance in the minutes of support services per week per bed was attributable to the interaction of the percentage of Medicaid patients in the facility and the facility's ownership status.

The results suggest that proprietary facilities may allocate staffing resources significantly different among the three types of facilities as pertains to their percentage of Medicaid patients than may not-for-profit facilities. These behavioral differences make it essential to interpret this interaction in order to capture the true effects of these grouping factors. These differences due to the significant interaction can best be seen through the use of graphs.

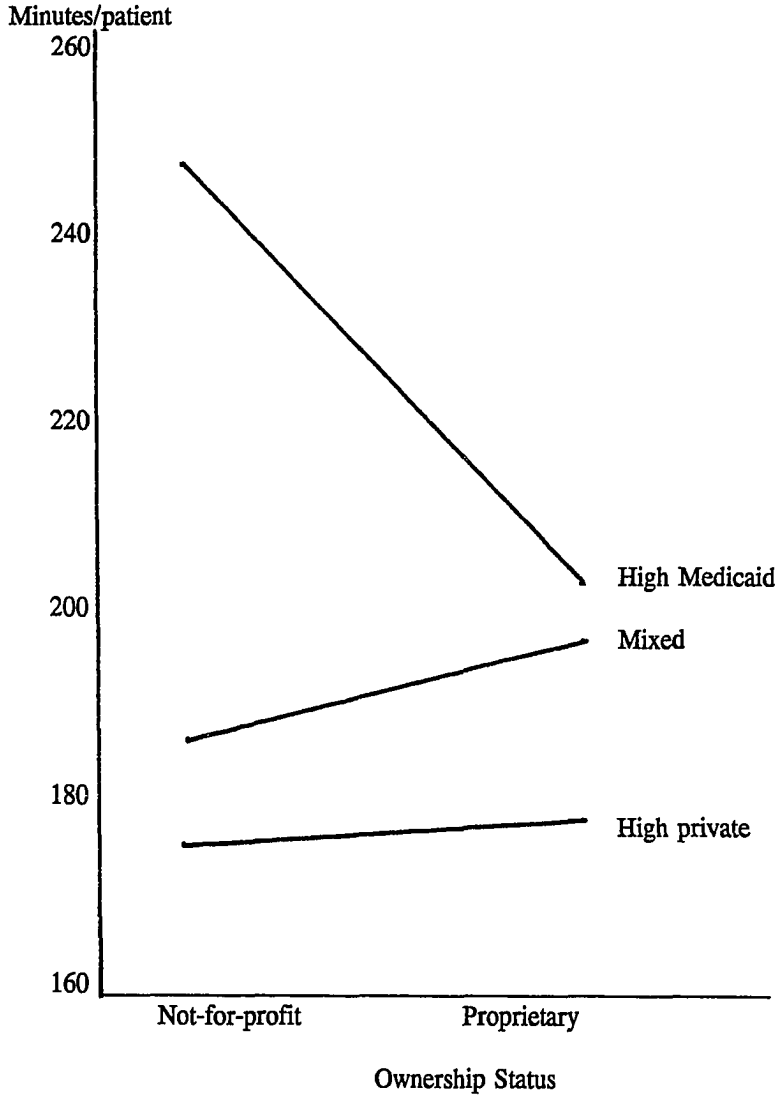
Figure 6 illustrates the interaction between the percentage of Medicaid patients in the facility and the facility ownership status on the allocation of RN staffing. In not-for-profit facilities, there were no significant differences among staffing for RN services. However, in proprietary nursing homes, an ANOVA with a post-hoc Scheffe test showed that nursing homes with high percentages of private-pay patients, nursing homes with mixed percentages of private-pay/Medicaid, and nursing homes with high percentages of Medicaid patients allocated RN services significantly different ($F = 8.6193$, df 2, 362, $p < .01$). The proprietary facility with a high percentage of private-pay patients allocates over 30 percent more minutes of RN coverage per week to its patients on average. Those patients in proprietary facilities with high percentages of private-pay patients receive 151.73 minutes of RN services per week; in mixed private-pay/Medicaid facilities patients receive 134.47 minutes of RN services per week; and in facilities with high percentages of Medicaid, patients receive 114.79 minutes of RN services per week.

As can be observed in Figure 7, the manner in which not-for-profit nursing homes and proprietary nursing homes allocated LPN services varied among the different levels of percentages of Medicaid patients. There was a great deal of variation among



Adjusted for the linear effects of age and length of stay.

Figure 6. Minutes of RN Staffing Per Week by Percentage of Medicaid and Ownership



Adjusted for the linear effects of age and length of stay.

Figure 7. Minutes of LPN Staffing Per Week by Percentage of Medicaid and Ownership

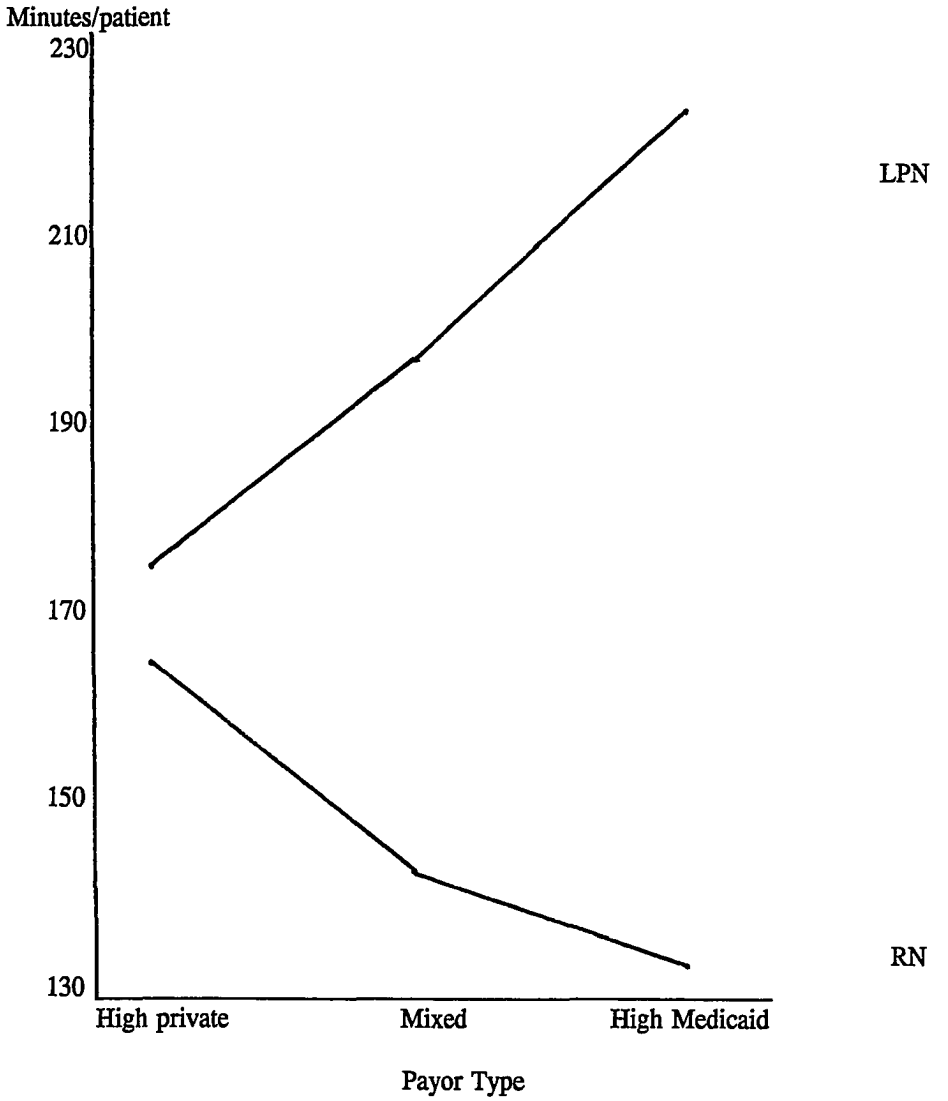
the LPN staffing allocations by percentage of Medicaid patients for the not-for-profit facilities but much less variation among the proprietary facilities although the differences were significant in both types of nursing homes. Proprietary nursing homes allocated significantly more LPN services in those facilities where there are high percentages of Medicaid patients ($F = 4.2101$, $df = 2, 362$, $p < .05$). Not-for-profit nursing homes also allocated significantly more LPN services in nursing homes with high percentages of Medicaid patients ($F = 6.9747$, $df = 2, 137$, $p < .01$). Not-for-profit facilities provided patients in nursing homes with high percentages of Medicaid patients 37 percent more LPN minutes of staffing per week (243.12 minutes per week per bed) than they provided patients in facilities with high percentages of private-pay patients (175.35 minutes per week per bed). Conversely, proprietary facilities which have high percentages of Medicaid patients provided 14 percent more LPN staffing (202.94 minutes of LPN staffing per bed per week) than do proprietary nursing homes with high percentages of private-pay patients (177.73 minutes per bed per week).

It is interesting to note that among those facilities with higher percentages of Medicaid patients, there appeared to be greater levels of LPN staffing and among those facilities with higher percentages of private-pay patients, there appeared to be higher levels of RN staffing. This can be observed in Figure 8. It would appear that the RN staffing decreases as the percentage of Medicaid patients increases and the LPN staffing increases as the percentage of Medicaid patients increases.

It could be argued that RN and LPN services are to some extent substitutes for one another. In any facility with skilled patients (and all of the facilities in this

sample contained skilled patients) there must be by law some RN staffing (Social Security Act and Related Laws, 1978). There is also a requirement that the facility staff for so many additional nurses, of which the facility may choose to hire either Rns or LPNs, providing the home has met the mandated RN coverage. Many nursing homes would choose to provide RN coverage at the minimal level as these nurses cost the facility approximately 40 percent more than do LPNs (M. Gonder, personal communication, January 14, 1991; A. Robertson, personal communication, February 2, 1991). As can be seen on the graph, when there were high percentages of private-pay patients, there were proportionately more Rns and when there were high percentages of Medicaid patients, there were proportionately more LPNs. This finding would be consistent with the product differentiation hypothesis as the facility with high RN staffing levels has no incentive to provide this more expensive and more valued care except to attract the private-pay patient.

These differences in variation between the staffing patterns of not-for-profit facilities and proprietary facilities as pertains to their percentage of Medicaid patients can also be seen in the allocation of support services. There was much more variation among the allocations to the three levels of percentages of Medicaid patients in the not-for-profit facilities than in the proprietary nursing homes. In addition, the not-for-profit facilities allocated greater levels of support services to those patients in facilities with high percentages of Medicaid patients than in not-for-profit facilities with mixed percentages of private-pay/Medicaid. Conversely, proprietary nursing homes allocated the fewest support services to those patients in facilities with high percentages of Medicaid patients. In every instance, the facilities with high percent



Adjusted for the linear effects of age and length of stay.

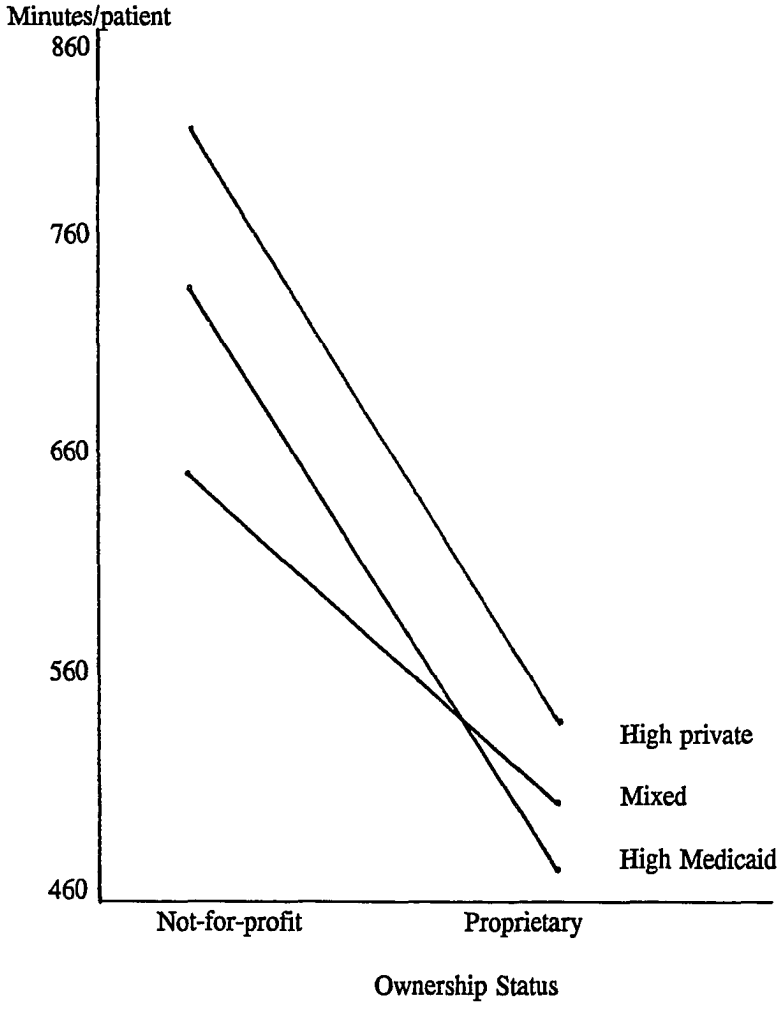
Figure 8. Minutes of Nursing Services Per Week by Percentage of Medicaid

ages of private-pay patients provided more support services. It should be pointed out, however, that there was not statistically significant variation among any of the three payor groups in support services allocations in either proprietary or not-for-profit nursing homes. These relationships can be observed in Figure 9.

The Effect of the Dependency Levels on the Allocation of Staffing Resources

The main effect for the dependency grouping factor was nonsignificant ($F = .90789$, $df = 1, 480$, $p = .476$). Nursing homes which had high percentages of Medicaid patients who were significantly more dependent did not allocate fewer services to these patients than did those nursing homes with high percentages of Medicaid patients who were less dependent. It would appear that the nursing homes did not increase staffing as patient dependency levels changed. It would also appear that the nursing home did not attempt to alter its strategy to attract the lighter-care Medicaid patient by offering more services.

There was also little variation among patient dependency levels among nursing homes which had high percentages of private-pay patients, mixed percentages of private-pay/Medicaid, and high percentages of Medicaid patients as can be seen in the ADL scores and cognitive impairment scores in Table 5. These relationships were summed to form the dependency grouping factor and are graphed in Figure 10 along with the staffing levels for the skilled nursing services and professional services. It could be inferred that if there is no variation among dependency levels, but if there is indeed variation among staffing patterns by percentage of Medicaid patients, then those patients who are no more or less dependent in facilities with high percentages of Medicaid patients would still receive less care than their counterparts in facilities with



Adjusted for the linear effects of age and length of stay.

Figure 9. Minutes of Support Services Per Week by Percentage of Medicaid and Ownership

high percentages of private-pay patients. Although those patients who are in facilities with high percentages of Medicaid patients would be receiving fewer units of services given similar dependency levels to those patients in facilities with high percentages of private-pay patients, it cannot be concluded that the strategy of the nursing home was to consciously discriminate against the heavy-care Medicaid patient.

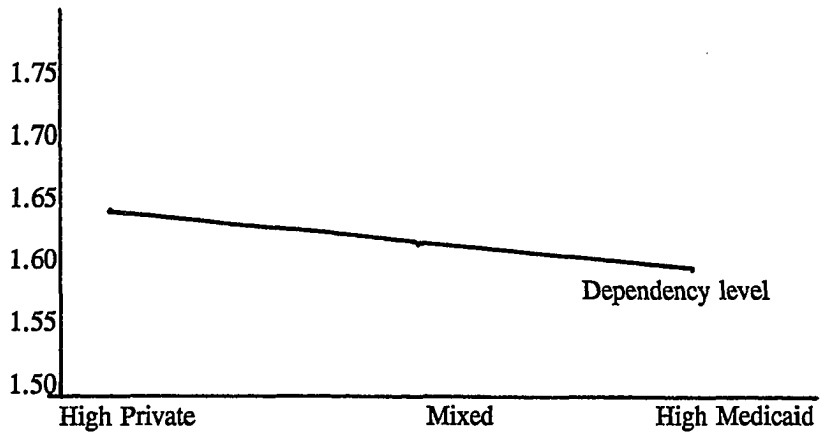
The Effect of the Covariates

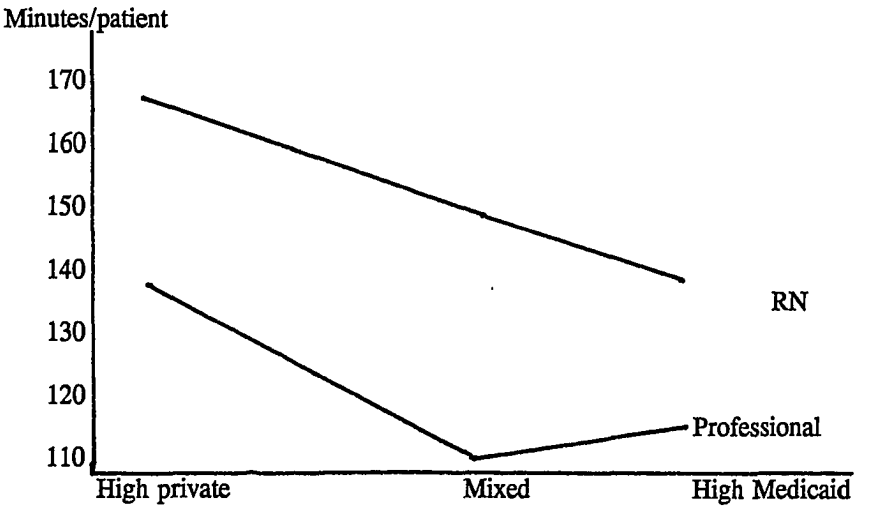
The combined dependent variables were found to be significantly related to the combined covariates, approximate $F(2, 480) = 1.85809$, $p < .05$. The Eta-squared is small, however, at less than 4 percent. Individually, the covariates had relatively little predictive power. Only the dependent variable support services was affected by the average length of stay of the patient, Beta = -.13475, $t(477) = -2.978$, $p < .01$. This implies that shorter patient stays were associated with higher allocations of support services. The only dependent variable affected by the average patient age was the allocation of nursing assistant services, Beta = .11616, $t(476) = 2.566$, $p < .05$. In other words, the older patient ages were associated with higher levels of nursing assistant staffing.

Summary

Research findings from this study revealed that the percentage of Medicaid patients in the facility significantly affects the staffing levels in that facility. In particular, the percentage of Medicaid patients in the facility was significantly related to the LPN and RN staffing levels and the allocation of support services.

The analyses also revealed that the ownership status of the facility significantly affected the facility's staffing levels. Higher staffing levels are associated with the





Adjusted for the linear effects of age and length of stay.

Figure 10. Dependency Levels of Patients by Percentage of Medicaid AND Minutes of RN & Professional Services Per Week by Percentage of Medicaid

not-for-profit facility. This would tend to indicate that the mission of the organization affects its resource allocations.

However, the major finding of the research reveals that the situation is not as simple as the main effects of the grouping factors of the percentage of Medicaid patients and the facility ownership status affecting staffing levels. Instead, there is a significant interaction between the two grouping variables which must be appropriately interpreted. Although staffing levels were almost always lower in proprietary facilities than in not-for-profit facilities, these differences were not uniform among the different payor mixes. It appears that there were wide differences among the staffing allocations of the different payor mixes in the not-for-profit nursing homes and in the proprietary nursing homes. In the proprietary nursing homes there was a great deal of variation among RN staffing levels and among support services staffing levels but little variation among not-for-profit nursing homes. In not-for-profit nursing homes, there was much variation among staffing allocations for LPN services by percentage of Medicaid patients but much less in proprietary nursing homes.

Staffing levels did not appear to vary with the dependency levels of the Medicaid patient. There was no indication that the facility attempted to avoid the heavy-care Medicaid patient by attempting to attract the lighter-care Medicaid patient with more services. However, regardless of their dependency levels, patients in facilities with higher percentages of Medicaid patients received lower levels of services than did patients in facilities with high percentages of private-pay patients.

CHAPTER V

CONCLUSIONS AND IMPLICATIONS

This chapter provides a short summary of the main ideas which motivated this study, a review of the design and analyses, and the findings of the study. The conclusions and implications of the study are provided as well as a discussion of its importance to the strategic management literature and to the stream of health services research dealing with the nursing home industry. Future directions for research are provided.

Overview of the Theoretical Foundations of the Research

The main premise of this dissertation has its roots in Resource Dependency Theory. It states that organizations faced with an environment which provides few resources will take steps to reduce dependence upon this environment.

This dissertation attempted to empirically test a model which was predicated on a resource dependency perspective through a setting of the American nursing home industry. This industry was posited to provide an excellent vehicle for the study of this issue as the nursing home consumer can be divided into two customer types, one of whom is more profitable for the nursing home than the other. Because the private-pay patient presents a more potentially profitable environment than does the Medicaid patient, it was theorized that the nursing home strategy will be one of product

differentiation designed to attract the private-pay patient and, consequently, reduce the facility's dependence upon the Medicaid environment.

In addition, this study examined the effect of the facility ownership or mission on the organization's strategy. Because not-for-profit organizations are suggested to provide higher levels of services due to their more altruistic nature, it was hypothesized that the not-for-profit nursing home would allocate higher levels of resources than would the proprietary nursing home.

It was also be suggested that, if a resource dependency perspective is to be accepted, nursing home strategy would be designed to minimize dependence upon the heavy-care Medicaid patient for whom there is no additional reimbursement. Higher levels of staffing would be associated with less dependent Medicaid patients as the nursing home attempts to attract the more profitable lighter-care patient through a product differentiation strategy.

Discussion of Findings

It was somewhat surprising in many ways that any significant variation was found among staffing patterns. Nursing profits have plummeted in recent years, and many nursing home chains have been forced to spin off some of their facilities because of cash-flow problems (Wagner, 1988, 1989). These financial problems are largely a result of costly acquisitions in the early 1980s and the fact that state Medicaid agencies have constrained Medicaid reimbursement. Many nursing homes have found it difficult to provide more than mandated levels of services due to poor profitability.

Variation among nursing home staffing patterns is also difficult to detect because of staffing floors and economies of scale which exist. Nursing homes are required to have certain personnel regardless of size. For example, a 100 bed facility would have one administrator, one dietitian, and one activity director; the 300 bed facility would also have one administrator, one dietitian, and one activity director. Other staffing such as nursing assistants, dietary, and housekeeping staffing are variable and would increase with an increase in the number of patients.

There were no studies in the literature which could be found which showed that a significant interaction between the percentage of Medicaid patients in the facility and the ownership status of the facility affected the allocation of staffing resources. However, there was evidence in the literature that both the percentage of Medicaid patients in the facility and the ownership status of the facility separately affect the staffing levels.

The Florida Department of Health and Rehabilitative Services (1981) collected data on 268 nursing homes which were certified for Medicaid. This department asked the state surveying agencies to rate the nursing homes in areas perceived to be measurements of quality, such as the provision of rehabilitative and social services. It found that nursing homes which had higher ratings also tended to have a smaller proportion of Medicaid patients.

Fottler, Smith, and James (1981) collected data on 43 nursing homes located in the same geographical area. Using a regression analysis, these researchers found that the nursing hours per day and total hours per day were significantly related to the percentage of Medicaid patients in the facility. They found that as the percentage of

Medicaid patients increased, the staffing tended to decrease, a finding which is consistent with this study.

However, a study of New York nursing homes (Elwell, 1984) found that there were no negative correlations between the percentage of Medicaid patients in the facility and the nursing, administrative, rehabilitative, social services, nutrition, and housekeeping staffing levels of the facility. This study of 493 nursing homes used an analysis of covariance to study the effects of the ownership status of the facility with the proportion of Medicaid patients utilized as a control variable.

There is mixed evidence in the literature concerning whether or not the ownership status, a surrogate for the mission of the facility, affects the allocation of staffing resources. Elwell's (1984) study cited above also found that nursing, physician, and other staff hours per patient day were higher among not-for-profit nursing homes. However, Holmberg and Anderson (1968) in their study of 118 nursing homes found that the ownership status of the facility was not a significant predictor of RN, LPN, and nursing assistant staffing levels but that administrative hours were higher in proprietary nursing homes and physician hours were higher in not-for-profit nursing homes. Linn (1974) studied a small sample of 24 nursing homes and found that the ownership status of the facility was not significantly related to the allocation of RN, LPN, and nursing assistant hours but that total staff hours were higher in not-for-profit nursing homes.

Although the literature may provide equivocal results in regards to the relationship between facility ownership and staffing levels, the findings of this study strongly

suggest that the not-for-profit nursing homes provide a higher level of staffing services than do the proprietary nursing homes.

It could be argued that the not-for-profit nursing homes are simply not as efficient as the proprietary nursing homes and that because of the profit motive of the proprietary nursing homes, it is imperative that they control costs. However, this argument still does not negate the reasoning that the mission of the nursing home affects its strategy.

A lack of profit motive and a probable altruistic mission can probably be determined as the cause for the not-for-profit nursing home to both allocate greater resources in some cases to the non-private-pay patient and to allocate greater overall resources than the proprietary nursing home. This study solidly suggests that the mission of the not-for-profit nursing home strongly influences the strategy of the organization.

Some persons might choose to argue that the not-for-profit nursing homes had higher staffing patterns because many of these facilities were attached to hospitals. Hospital-based nursing homes would have greater access to skilled personnel and might have sicker patients as the hospital might be using the nursing home for earlier hospital discharge. However, a check of the data set revealed only 14 hospital-based nursing homes in the sample used for the analyses. Since the data was cleaned for outliers, it is believed that variation in the data could not be attributed to the presence of hospital-based nursing homes.

This study found that the nursing home did not appear to take the dependency level of the patient into account when allocating resources thereby lending no support

to Hypothesis No. 3. There did not appear to be an attempt to reduce dependence upon the more dependent Medicaid patient by providing more staffing services in order to attract the less dependent Medicaid patient. In other words, while there was evidence to suggest that the nursing home did attempt to reduce dependence upon the Medicaid patient, there was no proof that the nursing home attempted to reduce dependence upon the heavy-care Medicaid patient.

There is little research which has been conducted which examines the discrimination against the heavy-care Medicaid patient. Feder and Scanlon (1989) found that nursing home care might not be available to heavy care Medicaid patients. They state: "When nursing home beds are insufficient to satisfy demand, the people most in need of the service have the greatest difficulty in finding it" (p.532). These authors found that nursing home operators would prefer patients who pay more (private-pay patients) and patients who require little care to those who need more costly attention. Gruenberg and Willemain (1980) found evidence that nursing home placement took longer for Medicaid patients than for other patients, and particularly longer for Medicaid patients with special care needs.

Most studies of the relationships between patient acuity and resource allocations deal with the best configuration for tying patient care needs to the allocation of resources (Arling, Zimmermann, & Updike, 1989; Butler & Schlenker, 1989; Feder & Scanlon, 1989; Holahan & Cohen, 1987; Schneider, Fries, Foley, Desmond, & Gromley, 1988). These studies examine a case-mix approach to reimbursement and make the assumption that because the proprietary nursing home operator is rational

and because the operator is a profit-maximizer, he or she will not allocate resources for which there is no additional reimbursement.

Conclusions

The first research question relates to strategic management theory and asks if organizations through their strategies attempt to avoid dependence upon what they perceive as a hostile environment or an environment in which resources needed by the organization are scarce. It would appear that the strategy of the organization did indeed have elements of attempting to free itself from reliance on the less profitable Medicaid patients. The fact that there was an association between the private-pay patients and the greater allocation of staffing resources would indicate that the nursing home did try to recruit these patients through a product differentiation strategy. Since the nursing home operator had no reason to allocate any resources greater than those mandated by regulations, and since there did exist excess demand which allowed the nursing home operator to fill all beds under any circumstances, the only reason the nursing home operator would have to allocate greater resources would be to avoid the Medicaid patient and to attempt to attract the private-pay patient.

This was supported by the higher level of support services in the nursing homes with higher percentages of private-pay patients, an indication of better food preparation, more housekeeping services, more attention to maintenance, and more administrative support. This finding is also supported by the apparent substitution effect of the nursing homes with higher levels of private-pay patients utilizing the more expensive RN care and the nursing homes with higher percentages of Medicaid patients using more of the less skilled and expensive LPN services.

It could be argued that the staffing patterns simply increased with the percentage of private-pay patients because the facility was reimbursed more for the private-pay patients' care. Although the facility could certainly afford to provide more and better care if it was receiving higher reimbursement, this still does not negate that fact that the facility could have filled its beds with Medicaid patients but chose instead to try to attract a different clientele.

It is not sufficient to simply state that this effect was felt across all nursing homes. It would appear that the proprietary nursing homes acted more as predicted than did the not-for-profit facilities. The proprietary nursing homes with their profit motivation apparently took greater steps to avoid the Medicaid patient than did the not-for-profit nursing homes. For example, the proprietary nursing homes allocated greater RN services and greater support services to private-pay patients as hypothesized, but the not-for-profit facilities did not follow this pattern. It would appear that although the not-for-profit facilities in all cases allocated greater resources than did the proprietary nursing homes, they did not appear to attempt to employ a strategy designed to avoid the Medicaid patient.

It would appear from this research that the mission of the organization does indeed affect the organization's strategy. The fact that in all cases the not-for-profit facility allocated greater resources and the fact that the not-for-profit nursing home allocated a different pattern of resources would lend evidence to the theory that organizational mission does affect strategy.

Implications

This study adds to the stream of research which centers around the argument concerning whether or not organizations can reduce their dependence upon what they perceive to be a inhospitable environment with few of the resources necessary to their survival.

The organizations, especially the for-profit organizations, did appear to employ a strategy designed to attract a customer type which would better enable the organizations to maintain their autonomy and more control over their fate. This was supported by the evidence that some organizations did employ different levels of a product mix which enabled them to attract a more attractive clientele. The evidence also strongly suggests that this strategy is affected by the organization's mission and will differ according to this mission.

There was also evidence produced to support Porter's (1980, 1985) Generic Strategies of Differentiation, Low-Cost Provider, and, Niche or Focus Strategies. The proprietary nursing homes allocated greater resources in those facilities with higher levels of private-pay patients. This was in keeping with a product differentiation strategy whereby the organization attempts to employ different product qualities for which the consumer is willing to pay extra. Those proprietary nursing homes which could not attract the private-pay patient, either because there were not sufficient private-pay patients in the community or because of their competitive disadvantage, had no choice but to minimize resources and employ a low-cost provider strategy. The fact that nursing homes with high percentages of Medicaid patients were signifi-

cantly larger in bedsize as can be observed in Table 5 is another indication of a low-cost provider strategy which requires economies of scale to be efficient.

This study should be of concern to policy makers. If the goal of policy is to encourage fair and equitable treatment for all nursing home patients, then policy should be developed with an understanding of an organization's behavior. That the proprietary nursing home designed its strategy in order to avoid the Medicaid patient resulting in the Medicaid patient receiving fewer services, should be considered in constructing policy and reimbursement methodologies.

There are several areas of concern to public policy makers which often conflict with each other. These include equitable access to long-term care, quality of the care, and cost containment (Schlenker, 1991). These goals are often competing as both equitable access and quality of care often require greater financial allocations to nursing homes.

Nursing home care expenditures rose from $1.7 billion in 1965 to $47.9 billion in 1989 with Medicaid paying for 43 percent of this total (Schlenker, 1991). In 1990, it was estimated that $54.5 billion, or 8.4 percent to all American health care expenditures was spent on nursing home care (Buchanan, Madel, & Persons, 1991). Because of the stress placed on state budgets to pay for these Medicaid programs, a central focus of policy has become cost containment. The success that states have obtained in containing Medicaid reimbursement relative to that paid by the private-pay patients is demonstrated in Table 1 found in earlier chapters.

If access to equitable care and the assurance of proper care is indeed a priority of state Medicaid systems, then the literature suggests ways in which this might be

achieved. The primary means by which it is believed that equity can be obtained is through what is called a "case-mix" approach.

The various states use different reimbursement methodologies to pay nursing homes for care of the Medicaid patient. The primary requirement established by the Federal government is that the reimbursement methodologies assure that payment be "reasonable and adequate" (Buchanan, Madel, & Persons, 1991). Appendix A provides a detailed description of the different mechanisms the states use to establish rates including a prospective rate-setting procedure, a retrospective, cost-based system, and a flat-rate system. The newest trend in establishing Medicaid reimbursement rates is to employ the case-mix approach which ties reimbursement to the acuity level of the patient. Early studies indicate that the case-mix approach encourages a greater responsiveness of nursing homes to patients' needs (Schlenker, 1991).

With growing Medicaid costs, as well as concern over access for the heavy-care Medicaid patient, there appears to be growing efforts to tie the reimbursement to nursing home resource allocations (Arling, Zimmermann, & Updike, 1989; Butler & Schlenker, 1989; Schneider, Fries, Foley, Desmond, & Gromley, 1988). A minority of states still do not utilize such an approach but the number which do utilize this methodology or which are currently examining such systems is growing (Schlenker, 1991). The increased use of a case-mix approach has probably also been affected by various national legislation which encourages the use of such reimbursement methodologies. The Omnibus Budget Reconciliation Act of 1987 (OBRA) provides impetus for the states to develop reimbursement systems utilizing a case-mix approach (Schlenker, 1991).

Case-mix approaches to Medicaid reimbursement can primarily be broken into two categories: those that tie payment to the need for various services or "service-specific" approaches, and those that group patients into several categories based on their need for resources or "resource utilization groups" (RUGS). Under the service-specific approach, a unique cost is established for each patient depending on his or her needs. In developing these systems, the various states utilized studies of the time required by both the nursing staff and the professional at the facility to estimate the costs of caring for patients with varying diagnoses and conditions. The second type of case-mix approach is less cumbersome because of its ability to place a patient into a group for which needed resources are predetermined rather than having to tailor resources specifically for each patient. Most RUGS approaches are linked to resource use based on the patient's ADLs (Schlenker, 1991).

The service-specific systems appear to have the disadvantage of possibly encouraging the overuse of certain services to obtain higher reimbursement. In West Virginia, for example, the higher payments for catherization resulted in higher levels of catherization (Butler & Schlenker, 1989). (It could be questioned, however, as to whether or not the patients who needed catherization prior to the facility being reimbursed on a case-mix approach were being denied this care.) Although the service-specific reimbursement systems do generate a unique reimbursement amount for each patient, these systems do have the disadvantage of providing incentives that allow patients to decline (and, consequently, utilize more services for which the facility will be reimbursed) and/or providing incentives for the over-utilization of resources (Schlenker, 1991). The RUGS approach appears to provide fewer incen-

tives for over-utilization because of reducing the extent to which various services are used to categorize patients (Schlenker, 1991).

The best known Medicaid reimbursement system which utilizes the RUGS approach is that employed by the state of New York (Schneider, Fries, Foley, Desmond, & Gromley, 1988). This system was put into effect to enhance access to nursing home care for heavy-care Medicaid patients, to keep those Medicaid patients requiring less care out of the institution, and to contain costs. New York spent $2.6 billion in 1988 for 650 Medicaid nursing homes with almost 100,000 Medicaid patients (Butler & Schlenker, 1989). New York designated RUG categories composed of patients with similar care needs. The nursing home is paid according to the patient classification and regular monitoring is in place to assure proper adherence to the system. New York groups patients into 16 categories for Medicaid reimbursement (Schlenker, 1991).

Minnesota also uses a RUGS approach but this model is prospective and is based on the previous year's allowable Medicaid expenditures. In place since 1985, this system ties reimbursement to a patient classification which is composed on ADL scores, behavior maladjustments, and special needs such as skin care, IV's, and dressings (Butler & Schlenker, 1989). Minnesota groups patients into 11 groups (Schlenker, 1991).

Other case-mix reimbursement methodologies are utilized by the states of Ohio, Maryland, Illinois, West Virginia (Butler & Schlenker, 1989). These systems all tie reimbursement to the patient dependency levels but employ different methodologies

including a prospective reimbursement system, a facility-specific system, and the use of ceilings.

There is a wide divergence of opinions as to how to implement these systems. Part of the problem lies in that of definition and interpretation in such areas as cognitive impairment and activities of daily living. In addition, there are wide discrepancies among interpretation of the case-mix approaches among the various states. For example, the ADLs of bathing and dressing are separate services in Maryland but are part of the personal hygiene in Ohio and West Virginia. Mobility has two levels in Maryland (independent and dependent) but has four levels in Ohio (No service, limited assistance, partial assistance, and total dependence) (Schlenker, 1991).

It should be pointed out that quality assurance is vital to the proper establishment of any case-mix approach. Proper accountability and control of either type of case-mix approach is necessary to assure that the patient receives the proper level of care. Most states provide for some type of oversight program for quality assurance.

There is a growing body of literature which deals with the issue of how well case-mix systems achieve the goal of tying the amount of care received by the patients to their needs, although there is no consensus in the research findings. Arling, Zimmermann, and Updike (1989) studied 410 Medicaid patients in 56 nursing homes in Wisconsin. They found that by utilizing a case-mix model they could explain 48 percent of the variation in resource allocations versus the 22 percent explained by utilizing the SNF-ICF classification system favored by the state of Wisconsin. By

tying reimbursement to a case-mix approach, the patient was more closely given the care justified by his or her dependencies or impairments.

Schlenker (1991) studied seven states, three of which (Maryland, Ohio, and West Virginia) utilized a case-mix approach. The results suggest costs in those states which utilized a case-mix approach are more closely associated with the actual patient care received. In other words, in those states that employed a case-mix approach, the patients tended to more often receive the care that was associated with their needs and dependencies. However, the case-mix states incurred higher administrative costs than did the non-case-mix states. Therefore, the states should probably attempt to weigh the advantages achieved by the case-mix approach versus the higher costs of administering such systems.

Murtaugh, Cooney, DerSimonian, Smits, and Fetter, (1988) studied over 8,500 patients in 65 nursing homes. This research was based on data obtained from National Health Corporation (NHC). This nursing home chain owns and/or operates nursing homes primarily located in the American southeast and utilizes a computerized patient assessment system which has been in operation since 1976. This study was an attempt to link various patient conditions and diagnoses with the need for various rehabilitation services. The study found that certain diagnoses, partial dependence in ADLs, clear mental status, and improving medical status were associated with the provision of various therapy services in the nursing home. Of particular interest was the fact that the patient's primary source of payment (Medicare, Medicaid, private-pay, etc.) was a strong indicator of the use of rehabilitation services; Medicare patients received more services and Medicaid patients received fewer

services than the patient's conditions and diagnosis would indicate appropriate. The authors suggest that the nursing home provider may be responding to incentives in the current reimbursement systems. If so, then this is further evidence to support the need for the development of case-mix systems.

Incentives such as the case-mix approach need to be built into the Medicaid reimbursement systems to make certain that the long-term care industry in the United States does not evolve into a system with Medicaid patients receiving one level of care and those patients better able to pay their own way receiving a higher level of care. Inducements must be built into the reimbursement methodologies whereby reimbursement is tied to the patient's acuity or dependency levels will help to assure the Medicaid patient receives the proper level of care.

Directions for Future Research

Further study is needed in two areas: strategic management and health services research.

This study has looked at organizational survival strategies utilizing data from one industry. While this industry provides an excellent vehicle for the study of a product differentiation strategy as its market is segmented, it has drawbacks as a study setting as it is a highly regulated service industry. Other studies need to be conducted in other types of organizations. A compilation of findings over many industries would either confirm or disallow the theory that organizations can and do indeed adapt to their environments. A stream of both empirical and case study research needs to be developed in this area.

Various industries need to be studied to confirm the idea that the power of particular stakeholders results in the organization allowing certain concessions to such powerful stakeholders. The best strategies to utilize for managing these stakeholders and for defeating their leverage on the organization is of importance to both the academician and the practitioner (Blair & Fottler, 1990).

Porter (1980) has established a set of generic strategies which allow the organization to cope with these powerful forces in the environment. Porter's strategies are based on the premise that commonalities or "gestalts" exist among firms (Hambrick, 1983), and organizations employ different mixes of what are substantially the same strategic variables (Hatten, 1979). The study of additional organizations will either lend support or refute Porter's theories of commonalities among organizations. Other characteristics may also be identified which can be determined to better enable the organization to obtain competitive advantage.

In the area of health services research, this study has shown that nursing homes do compete for patients and that this competition is among the proprietary nursing homes for the private-pay patient. The nursing home will differentiate its product in order to attract the more profitable private-pay patient, and, thus, reduce dependence upon the Medicaid patient. This contradicts much of the nursing home literature which states that the nursing home does not compete for patients because of the presence of excess demand (Nyman, 1989). This issue needs to be further studied because of the potential problem of Medicaid patients receiving inappropriate levels of long-term institutional care.

The increasing number of elderly in our country makes it imperative that means be developed to provide the best care to those patients. Incentive programs including the case-study approach need to be developed to assure equitable treatment and access to care. Further examination of the nursing home industry leading to a better understanding of the behavior of the provider can lead to better policy development.

The differences between the strategies of not-for-profit nursing homes and proprietary nursing homes need to be further scrutinized. If profit-motive makes a difference, does this mean that the proprietary nursing homes are providing less care, or does it mean that they are more efficient? This has to be weighed with the goals of public policy: Do we want patient care which is cheap? Do we want patient care which is comprehensive? Do we want to assure access or do we simply wish to provide the care at the least possible cost, even if quality is compromised? The values of society must be examined in setting policy for the care of our elderly.

The data used in this study were five to six years old at the time the research was completed. This study should be replicated and other studies conducted with more recent data. In addition, it would be advantageous to follow nursing homes over time and to be able to identify the state in which the nursing home resides. Knowledge of the reimbursement methodology utilized in that state would provide additional information to properly understand the nursing home strategy.

Summary

This study found some degree of evidence that organizations do attempt to adapt to their environments by tailoring their strategies in order to reduce dependence upon a hostile environment. It was demonstrated that when an organization was faced with

two market segments, one of which was more munificent than the other, the for-profit organization differentiated its product so as to attract consumers from the more friendly environment.

Evidence from this study showed that for-profit nursing homes differentiate their products by providing additional levels of staffing. This product differentiation allowed the nursing home to attract the more profitable private-pay patient. The mission of the nursing home affected the nursing home strategy in that not-for-profit nursing homes were found to offer considerably more staffing than proprietary nursing homes. Although the nursing home took steps to avoid the Medicaid patient, there is no evidence, however, that the nursing home discriminated against the heavy-care Medicaid patient.

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APPENDIX A

Methodologies of State Reimbursement Systems

Medicaid can be defined as the government program which provides health care coverage for persons eligible for cash assistance payments (Supplemental Security Income) and, at the option of the State, persons above the income standard who are determined to be medically indigent. The Federal government contributes 50 percent to 77 percent of the cost of the Medicaid program, with the remainder coming from the respective state (Walman, 1987). The program is administered by individual states which establish the reimbursement policies in accordance with Federal guidelines (Bishop, 1980). Medicaid pays for indefinite stays for eligible recipients in the nursing home.

Because Medicaid benefits for nursing home care are computed by the various states, and because there are differences in the methodologies of these computations (Harrington & Swan, 1984), a brief discussion of Medicaid reimbursement policies appears to be warranted at this point. Medicaid rates across the states differ basically by whether they are based on a facility's own cost or on a set of flat rates. The costs may be determined either retro-spectively or prospectively. Under facility-specific retrospective systems, nursing homes are reimbursed a interim rate computed on their costs for some base year, adjusted for expected inflation. If actual costs exceed the interim rate, homes will be reimbursed the difference, usually up to some ceiling; if costs are less than the interim rate, homes must refund this difference to the state. This system was the original model for Medicaid reimbursement, but concern over its ability to contain costs has prompted many states to experiment with alternative reimbursement systems (Harrington, Newcomer, Estes, Lee, Swan, Parringer, & Benjamin, 1984; Holahan & Cohen, 1987).

Probably the most common alternative has been some form of prospective payment system. Under this type of system, rates are set in advance, regardless of actual costs incurred by the home. Typically, states base these rates on the previous year's costs, inflated forward up to some ceiling. Under this system, there are incentives for all facilities to control costs. Homes above the target rate (or ceiling) face losses of up to 100 percent of the difference, depending on the reimbursement methodology of the state. Homes that keep costs below prospective rates may earn substantial profits, again up to 100 percent of the difference.

The flat-rate reimbursement system is potentially the most cost constraining of all reimbursement methods (Holahan, 1985). Under this system, facilities are paid a set rate regardless of their own cost experience. The state may negotiate flat rates individually, base them on the cost experience of all homes, or set different rates for various classes of homes. Homes which can contain costs below the established rate may keep the difference, and, conversely, those facilities which incur costs above the ceiling will have to suffer the loss (Holahan & Cohen, 1987).

Within these three types of reimbursement systems are many variations. Some states take into consideration such factors as bed-size, ownership, and /or location. Other states set limits on allowable costs in certain cost centers such as administrative expenses (Grimaldi, 1982). There is wide variation as to how inflation is computed in states. Some states provide incentives for efficiencies. A great deal of controversy surrounds the reimbursement procedures for property costs, primarily to prevent the selling of facilities in order to obtain higher rates (Cohen & Holahan, 1986).

Probably the most discussed and debated change in the reimbursement system is how to tie Medicaid rates to the acuity or dependency levels of the patient. If access to nursing home care is to be available to heavy care patients, reimbursement systems must be designed so as to encourage the admission of such patients (Bishop, 1980; Rosko, Broyles, & Aaronson, 1987). This can be done basically in four ways: identify facilities with heavier-care patient mixes and provide increased reimbursement, adjust the reimbursements for all facilities based on the deviations of their patient mixes from the industry average, recognize patient needs in establishing facility-specific cost ceilings, and/or establish a per diem for each patient need category (Deane, 1985). The Resource Utilization Group (RUGS) method of classifying patients for reimbursement purposes is used in New York State and is one of the better known ways of tying payment to patient dependency levels (Schneider, Fries, Foley, Desmond, & Gromley, 1988). However, it should be recognized that reimbursement systems which are linked to patient acuity levels are not yet in widespread use and no clearly defined system predominates among the seven states which do utilize such systems (Holahan & Cohen, 1987).

The prospective method of establishing rates is the most common but the means of controlling costs varies greatly by state (Buchanan, 1987). The most common method of constraining costs appears to be one of the establishment of ceilings on rates. This can be done in one of two ways. One use of ceiling is to tie the ceiling to a percentage of the mean or median of costs incurred by the nursing homes. For example, if the median cost were $50 per day and the ceiling is 125 percent of the mean, then the maximum reimbursable rate would be $62.50 per day. Another use of

the ceiling is to cap the rates. For example, if the ceiling is set at the 75th percentile, those homes having costs in excess of this ceiling would receive the ceiling rate. Other states cap certain cost centers such as Administrative expenses. (Administrative expenses are capped in order to avoid having the facility pay high salaries to the administrators and/or take excessive management fees.) Increases which are computed for states using prospective payment and flat-rate methodologies are calculated based on increases in the Consumer Price Index or the Market Basket Index.

In addition to reimbursement policies, states can contain Medicaid expenditures by establishing stringent eligibility requirements for recipients. These eligibility standards may require the recipient to meet certain financial criteria and/or medical acuity levels. These criteria are often so limiting that only the poorest and/or sickest patients will be eligible for nursing home care under Medicaid.

In general, the Medicaid policies of the various states have been very successful in curtailing escalating Medicaid costs. By 1981, most states had adopted policies aimed at constraining rising Medicaid costs (Holahan & Cohen, 1987). From 1981 to 1985, Medicaid nursing home spending increased by just 7.7 percent, much less than by historical standards. It should be pointed out, however, that Medicaid patients do not appear to compete well for scarce nursing home beds with private-pay patients. The percentage of Medicaid patients in nursing homes has declined slightly since 1981, and Medicaid spending has declined from 46 percent of all nursing home expenditures to 44 percent in 1984. During this time, private expenditures increased from 46 percent to 49 percent of the total (Holahan & Cohen, 1987). Since Medicaid

expenditures have decreased as a total of all nursing home expenditures, it is possible that given a choice, the nursing home may be choosing to exclude from admission Medicaid patients in preference to private-pay patients.

As can be inferred from the above discussion, the goal of public policy in most states has been the containment of Medicaid costs. Regardless of the methodology used, the objective of state reimbursement policies has been to constrain Medicaid appropriations. These policies have resulted in Medicaid rates tending to be lower than non-Medicaid rates. This is true for both proprietary and not-for-profit facilities and is true in all regions of the United States.

APPENDIX B

Construction of Variables Used in the Study

ADMISONS = "admissions during past year"
fql3: facility file (How many admissions to the facility during year 1984)

AGE = "current age"
0871: current resident file "recode: current age"

The following four variables are, respectively, average adl scores, average cognitive impairment scores, average length of stay, and average ages for all the patients in a particular facility. The following commands were used to aggregate these variables:

```
Get file = '      '.
Aggregate outfile = '   '
/presorted
/break=facid
/averadl = mean(useadl)
/avercogv = mean(cognitive)
/averold = mean(age)
/averlos = mean(currlos).
Join match file =*/table='      '/by facid.
Save outfile = '      '.
```

AVERADL = "average adl scores for facility"

AVERCOGV = "average cognitive impairment scores for facility"

AVERLOS = "average length of stay for facility"

AVEROLD = "average patient age for facility"

BEDSUSED = "beds available for use"
fq4: facility file "how many beds are currently available for residents? All cases with 300 beds or more are coded '300'".
(missing values = -9)

BEDWEGHT = "bed weight"
fqbedwt: facility file. "facility bed weight - first stage facility inflation factor (includes a bed ratio adjustment) used to produce national estimates of characteristics related to bedside such as beds, inpatient days, admissions, discharges and staff (4 decimal places implied)".

CENSUS = "average daily census for the year"
(compute totalday/365).

CERT = "certification status of the facility"
(use this variable - do not use recertcn)
1=both icf-snf beds (combination status)
2=skilled beds
3=intermediate care beds
4=non-certified beds
fqr02001: facility file and current resident file "certification recode"

This variable originally had 9 categories. These were collasped into the current four.

```
recode CERT (1 thru 3 = 1) (4 thru 6 = 2)
(7 = 3) (9 = -9).
missing values CERT (-9).
If (CERT = 1) COMBINED = 1.
If (CERT = 2) COMBINED = 0.
If (CERT = 3) COMBINED = 0.
If (CERT = 4) COMBINED = -1.
If (CERT = 1) SKILLED = 0.
If (CERT = 2) SKILLED = 1.
If (CERT = 3) SKILLED = 0.
If (CERT = 4) SKILLED = -1.
If (CERT = 1) ICF = 0.
If (CERT = 2) ICF = 0.
If (CERT = 3) ICF = 1.
If (CERT = 4) ICF = -1.
```

COGNITIV = "cognitive impairment score"

This variable is composite variable of four variables:

1. DATETIME
   cr341: current resident file "Basic activities: Unable to remember dates/time"
   recode DATETIME (1=1) (Else = 0).
2. LOCATION
   cr342: current resident file "Basic activities: Unable to remember locations"
   recode LOCATION (1=1) (Else = 0).
3. IMPTEVEN
   cr343: current resident file "Basic activities: Unable to recall important events"
   recode IMPTEVEN (1=1) (Else=0).
4. JUDGMENT
   cr344: current resident file "Basic activities: Unable to make judgments"
   recode JUDGMENT (1=1) (Else = 0).

```
Compute COGNITIV =
DATETIME+ LOCATION+IMPTEVEN+JUDGMENT.
```

COMBINED = "facilities which are certified as combination SNF-ICF" This variable generated during effect dummy coding. See CERT.

CURRLOS = "recode current length of stay"
crr00901: current resident file "recode: current length of stay.

DEATHS = "inhouse deaths during 1984"
fq14a: facility file "How many resident/patients died during 1984?"

DISCHRGS = "discharges during previous yeaS'
fq14a: facility file "How many discharges were there from the facility during 1984?"

DOCID = "program generated document id number"
fqdoc: facility file "document id (ckdig10)"

EMPLPPD = "all employees per patient day"
(compute emploppd = hoursemd/census)

EMPLOYEE = "total fte all employees"
(compute fteadm+fter+ftepln+fteasst+ftemd +ftedenst+ftepharm-+fteot+fterpt+ftespher+fteactiv+ ftedietn+ftemedrc+ftesocwk+f-teradio+fteother+fteoffst+ ftefoods+ftehkpg+fteothno)

FACID = "facility id number"
(compute facid = trunc(docid/1000))
This variable is used to join facility and current resident files.

FACLWGNT = "facility weight"
fqwt: facility file "facility weight - first stage facility inflation factor used to produce national estimates of homes (4 decimal places implied)

FORMNO = "program generated form no"
fq-form: facility file "form number (01)"

FTEACTIV = "full time equivalent activity director"
fqr10711: facility file "recode fq21b111 full-time equivalent staff"

FTEADM = "full time equivalent administrator"
fqr10701: facility file "recode fq21b1-1 full time equivalent staff"

FTEDENST = "full time equivalent dentist"
fqr10706: facility file "recode fq21b6-1 full time equivalent staff"

FTEDIETN = "full time equivalent dietitian/nutritionist"
fqr10711: facility file "recode fq21b111 full time equivalent staff"

FTEFOODS = "full time equivalent food service personnel"
fqr10718: facility file "recode fq21b181 full time equivalent staff"

FTEHKPG = "full time equivalent housekeeping/maintenance"
fqr10719: facility file "recode fq21b191 full time equivalent staff"

FTELPN = "full time equivalent lpn"
fqr10703: facility file equivalent staff "recode fq2lb3-1 full time equivalent staff"

FTEMD = "full time physician"
fqr10705: facility file "recode fq2lb5-1 full time equivalent staff"

FTEMEDRC = "full time equivalent medical records"
fqr10713: facility file "recode fq21b131 full time equivalent staff"

FTENASST = "full time nursing assistant"
fqr10704: facility file "recode fq21b4-1 full time equivalent staff"

FTEOFFST = "full time equivalent office staff"
fqr10717: facility file "recode fq21b171 full time equivalent staff"

FTEOT = "full time equivalent occupational therapist"
fqr10708: facility file "recode fq21b8-1 full time equivalent staff"

FTEOTHER = "full time equivalent other health professionals"
fqr10716: facility file "recode fq21b161 full time equivalent staff"

FTEOTHNO = "full time equivalent other non-health personnel"
fqr10720: facility file "recode fq21b201 full time equivalent staff"

FTEPHARM = "full time equivalent pharmacist"
fqr10707: facility file "recode fq21b7-1 full time equivalent staff"

FTEPT = "full time equivalent registered physical therapist"
fqr10709: facility file "recode fq21b9-1 full time equivalent staff"

FTERADIO = "full time equivalent radiologist"
fqr10715: facility file "recode fq21b151 full time equivalent staff"

FTERN = "full-time equivalent RN's"
fqr10702: facility file "recode fq21b21 full time equivalent staff"

FTESOCWK = "full time equivalent social workers"
fqr10714: facility file "recode fq21b141 full time equivalent staff"

FTESPHER = "full time equivalent speech and hearing"
fqr10710: facility file "recode fq21b101 full time equivalent staff"

GROUP = "member of chain"
fqlc: facility file "Is facility member of a group of facilities?"
This variable originally had 5 categories. These were condensed into two (yes and no or unknown) and effect dummy coded as follows:

if (group = 1) yes = 1.
if (group = 2) yes = -1.

HOURLPND = "hours of LPN's per day"
(compute hourlpnw/7)

HOURLPNW ="hours of LPN's per week"
(compute ftelpn*40)

HOURNUD = "nursing hours per day"
(compute hournud=hournuw/7)

HOURNUW = "nursing hours per week"
(compute hournuw = nursing*40)

HOURSEMD = "all employee hours per day"
(compute hoursemd=hoursemw/7)

HOURSEMW ="all employee hours per week"
(compute employees*40)

HOURSNAD = "hours of nuring assistants per day"
(compute noursnad = hoursnaw/7)

HOURSNAW ="hours of nursing assistants per week"
(compute fteasst*40)

HOURSPRW = "professional hours per week"
(compute professl*40)

HOURSRND = "RN hours per day"
(compute hoursrnd=hoursrnd/7)

HOURSRNW = "RN hours per week"
(compute hoursrnw = ftern*40).

HOURSPRD = "professional hours per day"
(compute hoursprw/7)

HOURSSPD = "support hours per day"
(compute hoursprw/7)

HOURSSPW = "support hours per week"
(compute hoursspw=hoursprd*4O)

HSPOWNER = "ownership of nursing home by a hospital"
fqlb: facility file"Is facility owned/operated by a hospital"

ICF = "ICF certification"
This variable was generated during effect dummy coding.
See CERT.

ICFBEDS = "icf Medicaid beds"
fqlla: facility file "how many beds are certified under Medicaid as icf, all cases with 300 beds or more are coded '300'"
(missing values = -9)
(recode renobeds (301 thru highest =-9).

ICFCERT = "is facility certified for icf care?"
fq10: facility file "Is facility certified ICF by the Medicaid program?

ICFPDIEM = (recode 9 thru 99 = -9)
(missing values = -9)

ID = program generated id number

LICBEDS = "number of licensed beds"
fq3: facility file "how many beds are licensed by the health department, all cases with 300 beds or more are coded "300"")
(missing values = -9)
(recode licbeds 301 thru highest =-9)

LPNPPD = "LPN hours per patient day"
(compute lpnppd = hourslpnd/census)

MCBEDS = "beds certified for Medicare"
fq7a: facility file "How many beds are certified under Medicare All cases with 300 beds or ore are coded '300'"
(missing values = -9)

MCDDAYS = "total Medicaid days"
(compute snfdays+useicfd)

MCMCDCER = "Medicare/Medicaid certification"
fq6: facility file
"Is facility certified by Medicare &/or Medicaid"

MCPRDIEM = "Medicare per diem"
This variable is incorrect and should not be used.

MENHLTTH = This variable is a composite variable of the five types of health care personnel who can provide mental health therapy: MD, Psychiatrist, psychologist, clinical social worker, and psychiatric nurse.

"patient received mental health therapy last month"

```
recode mhthersw (1=1) (Else = 0) .crl6b8
recode mhtherrn (1=1) (Else = 0) .crl6b9
recode mhthermd (1=1) (Else = 0) .crl6b5
recode mhtherpy (1=1) (Else = 0) .crl6b6
recode mhtherph (1=1) (Else = 0) .crl6b7

compute menhltth = mhthermd + mhtherpy + mhtherph + mhthersw + mhtherrn.
```

METRO = "urban/rural status"
1. urban
2. rural
0862: current resident file "metropolitan status"

NAPPD = "nursing assistant hours per patient day"
(compute hoursnad/census)

NOFACILS = "number of facilities in cnafq2d: facility file.
"How many facilities belong to this organization?"

NOMCDCD = "existence of non-certified beds"
fq12a: facility file "are any beds not certified by either Medicaid or Medicare?"

NONCBEDS = "skilled Medicaid beds"
fql2b: facility file "how many beds are non-certified beds does facility have, all cases with 300 beds or more are coded '300'"
(missing values = -9)
(recode renobeds (301 thru highest =-9).

NORTHCEN = "northcentral quadrant of country"
variable generated when REGEOGPH dummy effect coded.

NORTHEST = "northeast quadrant of country"
variable generated when REGEOGPH dummy effect coded.

NUPPD = "nursing hours per patient day"
(compute hourud/census)

NURSING = "all fte nursing per day"
(compute ftern+ftelpn+ftenasst)

OCCP = "average daily occupancy rate"
(compute occp = (totalday/renobeds*365)

OTHERDAY = "non-Medicare, non-Medicaid days"
(recode 0 = -9)
(missing values = -9)

OWNERSHP = "entity which owns facility" (FQ2A) (facility file)
if (ownershp=1) proprty = 1.
if (ownershp=2) proprty = -1.
1 = proprietary
2 = not-for-profit

PERCENT = "Medicaid days to total days" (do not use this variable, instead use USEPRCT.

POSBDAYS = "possible patient days per year"
(compute POSBDAYS = RENOBEDS*365)

PRCURDGI = "first current primary diagnosis"
The original variable was classified into 61 disease groups. The Department of Medical Records at SHRP assisted with reclassification of the 61 groups into 17 groups. This was done in accordance with the International Code of Disease Index classifications.

1. infections
2. neoplasms
3. metabolic
4. blood
5. mental
6. nervous system
7. circulatory system
8. respiratory system
9. digestive system
10. gentourinary system
11. skin
12. musculoskeletal
13. congenital
14. originating perinatal
15. ill-defined
16. injury and poisoning
17. supplementary

PRCURDG2 = "second primary current diagnosis"
The original variable was classified into 61 disease groups. The Department of Medical Records at SHRP assisted with reclassification of the 61 groups into 17 groups. This was done in accordance with the International Code of Disease Index classifications.

1. infections
2. neoplasms
3. metabolic
4. blood
5. mental
6. nervous system
7. circulatory system
8. respiratory system
9. digestive system
10. gentourinary system
11. skin
12. musculoskeletal
13. congenital
14. originating perinatal
15. ill-defined
16. injury and poisoning
17. supplementary

PRIMYPAY = "primary source of payment"
cr37: current resident file

1. private-pay
2. Medicare
3. intermediate-care Medicaid
4. skilled-care Medicaid
5. other

(These five categories were collasped from 19 categories).

PROFESSL = "fte professional employees"
(compute professl=fteadm+ftemd+ftedenst+ ftepharm+fteot+-
fterpt+ftespher+fteactiv+ftedietn+ftemedrc+ftesocwk+fteradio+-
fteother)

PROFPPD = "professional hours per patient day"
(compute hoursprd/census)

PROPRTY = "proprietary ownership of facility"
generated during effect dummy coding see OWNERSHP

RACE = "race of patient"
cr2a: current resident file "Racial background that best describes resident"
1. white
2. black
3. other

RECERTCN = "recoded certification status"
(do not use this variable - use CERT instead)

1. combination snf-icf
2. skilled
3. icf only
4. other

REPRDIAG = "first primary admission diagnosis"
The original variable was classified into 61 disease groups. The Department of Medical Records at SHRP assisted with reclassification of the 61 groups into 17 groups. This was done in accordance with the International Code of Disease Index classifications.

1. infections
2. neoplasms
3. metabolic
4. blood
5. mental
6. nervous system
7. circulatory system
8. respiratory system
9. digestive system
10. gentourinary system
11. skin
12. musculoskeletal
13. congenital
14. originating perinatal
15. ill-defined
16. injury and poisoning
17. supplementary

RE2ADMDG= "second primary admission diagnosis"
The original variable was classified into 61 disease groups. The Department of Medical Records at SHRP assisted with reclassification of the 61 groups into 17 groups. This was done in accordance with the International Code of Disease Index classifications.

1. infections
2. neoplasms
3. metabolic
4. blood
5. mental
6. nervous system
7. circulatory system
8. respiratory system
9. digestive system
10. gentourinary system
11. skin
12. musculoskeletal
13. congenital
14. originating perinatal
15. ill-defined
16. injury and poisoning
17. supplementary

REGEOGPH = "geographic quadrant of country"

1. northeast
2. northcentral
3. south
4. west

fqr10801: current resident file "recode: geographic region (from NMFI data)"

if (regeogph = 1) northest = 1.
if (regeogph = 2) northest = 0.
if (regeogph = 3) northest = 0.
if (regeogph = 4) northest = -1.
if (regeogph = 1) northcen = 0.
if (regeogph = 2) northcen = 1.
if (regeogph = 3) northcen = 0.
if (regeogph = 4) northcen = -1.
if (regeogph = 1) south = 0.
if (regeogph = 2) south = 0.
if (regeogph = 3) south = 1.
if (regeogph = 4) south = -1.

RENOBEDS = "number of beds"
fqr02001 from facility file: "recode:fqr00901=fq4 1984 beds recode
(all cases with 300 beds or more are coded "300"))
(recode renobeds 301 thru highest = -9).
(missing values = -9)

RNPPDD = "RN hours per patient day" (compute hoursrnd/census)

SEX = "male/female"
crl: current resident file "What is the sex of this resident?"

1. male
2. female
3. nonresponse

SKILLED = "Skilled certification"
This variable was generated during effect dummy coding. See CERT.

SNFBEDS = "skilled Medicaid beds"
fq9a: facility file "how many beds are certified under Medicaid as SNF, all cases with 300 beds or more are coded '300'"
(missing values = -9)
(recode renobeds (301 thru highest =-9).

SNFCERT = "existence of snf certification"
fq8: facility file "is facility certified as SNF by Medicaid program"

SNFDAYS = "total skilled inpatient days"
(compute snfdays = snfmdday)
(snfmdday = £q152 total inpatient days snf - Medicaid for 1984 from facility file)

SNFPDIEM = (recode 13 thru 99 = -9)
(missing values = -9)

SOUTH = "Southern quadrant of country"
variable generated when GEOGRAPH dummy coded.

SUPPORT = "fte support hours"
(compute support+fteoffst+ftefoods+ftehkpg+fteothno)

SUPPPPD = "support hours per patient day"
(compute suppppd = hoursspd/census)

THERAPY = "Did patient receive therapy last month?"
CRl6A: current resident file

1. yes
2. no
3. nonresponse

TOTALDAY = "total inpatient days for the year"
fql6a from facility file = "total days"
(recode 0 = -9)
(missing values = -9)

URBAN = "Is facility in urban area?"
variable generated when METRO dummy coded.

USEADL = "adl score for patient"
This variable is a composite score of five variables:

1. "EATING"
   cr2la: current resident file "Does resident require any assistance in eating"
   Recode EATING (1=1) (2=0) (ELSE = -9).
2. "BATHING"
   crl9a: current resident file "Does resident require any assistance in bathing"
   Recode BATHING (1=1) (2=0) (ELSE = -9).
3. "DRESSING"
   Cr2Oa: current resident file "Does resident require any assistance in dressing"
   Recode DRESSING (1=1) (2=0) (ELSE = -9).
4. "NEEBTRSN"
   cr23a: curren't resident file "Does resident require assistance transporting out of bed"
   Recode NEEDTRSN (1=1) (2=0) (ELSE = -9).
5. "INCONTIN"
   "Is patient incontinent?"
   recode INCONBLD (1=1) (2=0) (Else = -9).
   recode INCONBOW (1=1) (2=0) (Else = -9).
   missing values INCONBOW INCONBLD (-9).
   If (INCONBOW = 1 or INCONBLD = 1) INCONTIN = 1.
   If (INCONBOW = 0 and INCONBLD = 0) INCONTIN = 0.
   INCONBLD = cr28a: current resident file "Does resident have trouble controlling bladder"
   INCONBOW = cr27a: current resident file "Does resident have difficulty controlling bowels"

   missing values INCONTIN BATHING DRESSING EATING
   (NEEDTRSN (-9).
   compute USEADL =
   INCONTIN+BATHING+DRESSING+NEEDTRSN+EATING.

USEICFD = "inpatient days for ICF Medicaid"
(compute use icfd=daysicf).
(daysicf = £q153 "total inpatient days ICF for 1984", facility file)

USEPRCT = "percent medicaid days to total days"

WEIGHT = "current resident weight"
0863: current resident file "current resident weight - second stage inflatin factor used to produce national estimates of current residents (4 decimal places implied)"

YES = "Facility is a member of a group"
variable created when GROUP dummy coded.

APPENDIX C

Cleaning of Data Used in Analyses

There were several issues concerning the data set which had to be addressed prior to proceeding with the analyses. One issue was missing data. An examination of the data set indicated that this problem does not appear to be prevalent in the data set.

Another issue which had to be addressed was that the bedsize of the facility had been truncated at 300 beds. This posed a problem as the staffing variables had not been truncated. Since the staffing variables were divided by the facility bedsize, this would tend to overstate staffing levels at those facilities with greater than 300 beds. All facilities with 300 beds were dropped from the analyses. This reduced the number of cases for study to 635.

An examination of the data set revealed that there were a number of missing data in the variable 'OTHERDAY'. OTHERDAY was the variable for the private-pay days for the year in the facility. Since this variable was a factor in determining the payor mix at the facility, it was believed that it could affect the percentage of Medicaid patients variable. These 65 cases were therefore eliminated. This reduced those cases for consideration to 570 cases.

Further examination of the data revealed that there were several facilities which did not have either RNs or LPNs. As it was believed that these facilities could not in fact be true nursing homes, 14 facilities were eliminated reducing those facilities under consideration to 556 homes.

Using the Regression procedure which lists outliers, it was discovered that there were 7 cases where univariate outliers existed in the dependent variables. Outliers were defined as those cases which appear as plus or minus three standard deviations from the mean. These were eliminated leaving a data set of 549 cases for analyses.

Evaluation of Assumptions

In order to utilize the MANOVA technique, a set of assumptions must be met. The first of these is the question of normality. This was checked by examining the data for skewness and outliers. Each cell was checked for outliers. Basically, the MANCOVA is robust to violations of normality unless the violations are due to outliers (Tabachnick and Fidell, 1983). The Mahalanobis' Distance gave the top outliers for each cell. Comparing these to appropriate critical value, it was found that there were 44 outliers. These were eliminated leaving 504 cases for analysis in the MANCOVA.

Since equalizing cell sizes was not possible, this problem was solved by the use of the Option 9 command in the SPSS ANOVA program which allows for the equal weighting of all cells by utilizing a regression approach.

The next assumption which must be met is that of homogeneity of variance-covariance matrices. If the n's in each cell are equal, the statistics are robust to violations of this assumption. As this research involved unequal cell sizes, the homogeneity of variance-covariance was checked by the use of Box's M. As this was found to be significant ($F = 1,56059$, $df = 275, 65307$, $p < .001$) indicating lack of homogeneity, and since cell sizes cannot be equalized, this assumption is probably violated. The test was not overly affected, however, since it is already a conservative test, although there will be a larger Type I error problem (Tabachnick & Fidell, 1983).

The next assumption which must be checked is that of Linearity. It is assumed in MANCOVA that there is a linear relationship among all dependent variables in each

cell. This was checked by examining the plots of residuals and the scatterplots. Upon examining the plots, it was found that found of the variables, FTERNX, FTELPNX, PROFESSX, and SUPPRTX, were all slightly deviant. However, since none of the scatterplots showed gross deviation from linearity, and since minor violations of this assumption should do nothing except reduce the power of the MANCOVA (Tabachnick & Fidell, 1983), it was decided to utilize the variables in their computed form.

Reliability should be high as the variables should be accurately measured. Multi-colinearity was checked by examining the determinant (.72317). As the determinant was well above zero, there was no problem with multi-colinearity among the dependent variables.

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