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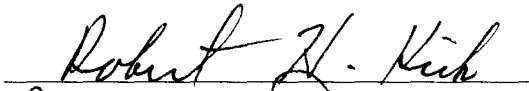
I am submitting herewith a dissertation written by Larry Lee Isley entitled "The Relationship of Market Conditions, Management Practices, and Medical Staff Attributes to Operating Profit of Small Rural Hospitals in the Carolinas." I have examined the final paper copy of this dissertation for form and content and recommend that it be accepted in partial fulfillment of the requirement for the degree of Doctor of Philosophy, with a major in Human Ecology.



Robert J. Pursley, Major Professor

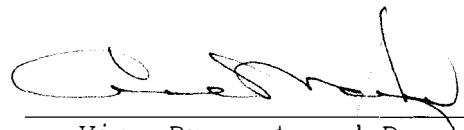
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Accepted for the Council:



Vice Provost and Dean of
Graduate Studies

The Relationship of Market Conditions, Management Practices,
and
Medical Staff Attributes
to
Operating Profit
of
Small Rural Hospitals in the Carolinas

A Dissertation
For the
Doctor of Philosophy
Degree
The University of Tennessee, Knoxville

Larry Lee Isley
May 2002

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DEDICATION

This dissertation is dedicated to my wife
Melissa R. Isley
and our four children
Lacy, Pierceson, Elizabeth, and Jacob Isley
for their loving souls that inspire me everyday
and the sacrifices they made in
supporting me
through my educational endeavors.

To my father,
Larry "Cotton" Isley,
whose gentle spirit is always with me.

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This research was inspired by the daily contact with local, state, and regional healthcare providers and leaders that succeed in providing and insuring quality healthcare for their communities. These individuals, inundated with constant challenges and threats to this pursuit, continue to find creative and innovative means to meet their goal. I am, as their communities, patients, and staff are, indebted to their tireless dedication, spirit, and expertise.

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To WestCare Health System, especially Mark Leonard, for providing me the opportunity to pursue this educational endeavor and providing me an example of healthcare leadership I will aspire to achieve throughout my career.

Finally, to my friends and family who provided me support and encouragement. To my parents, Larry and Sylvia Isley, and my grandparents for instilling in me the invaluable lesson of hard work. Both parents and grandparents made sacrifices so that I might have opportunities coupled with their love and patience. To my in-laws, Larry and Linda Rushing, for always offering their unprejudiced support, love, and interest in all my endeavors.

ABSTRACT

The purpose of the study was to investigate the relationship of the profitability to market conditions, management practices, and medical staff attributes of small, rural hospitals operating in North Carolina and South Carolina. The study included six research questions to measure the three independent variables.

Correlation coefficient using Spearman's Rho and Pearson Correlation were utilized to evaluate the relationship between profit and medical staff attributes and market conditions. A student's t-test evaluated management's decision to merge the rural hospital with a multi-hospital health system.

Results showed a statistically significant correlation ($p < .05$) between small, rural hospitals' profit and market conditions and medical staff attributes. The study concluded that rural hospitals in the Carolinas are in financial trouble, and senior leadership must broaden their understanding and involvement in the infrastructure of their local communities to form partnerships linking the success of each together.

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CHAPTER I

IDENTIFICATION OF THE PROBLEM

Introduction

The status of healthcare has often been the focus of national attention. The development of managed care, the rise and scrutiny of national healthcare chains, the rise of medical costs and the development of local multi-hospital systems have altered the environment in which a community's healthcare is delivered and viewed (Buczko, 2001). These changes and developments have challenged the trust between the local healthcare system and the community it serves.

The dramatic increase in healthcare cost and federal policy related to reimbursement for healthcare over the past two decades have threatened the foundation of the American healthcare delivery system (Saleh, Vaughn, & Rohrer, 2001). The Executive Branch's attempts to control and harness healthcare expenditures have been centered around changing the practice patterns of physicians; however, the greatest burden to facilitate these changes rests on the hospitals (Webb, 2001). Hospitals and employers have been inundated with new payment structures in an attempt to control the rise of healthcare expenditures. Federal payer programs, like Medicare, has structured healthcare

reimbursement to place the burden for cost containment on local hospitals and has shifted greater payment of out-of-pocket expense to Medicare beneficiaries.

The government's attempts to control healthcare costs have resulted in significant changes in the manner professional care decisions have been made over the last 60 years. These changes have shifted decision making from a physician-dominated environment to an administrator dominated environment (Webb, 2001). The result of this shift often places hospital Chief Executive Officers (CEOs) and the Board of Trustees at odds with their medical staff and the community the hospital serves. Analysts have suggested the tightened operating environment is eliminating hospitals that cannot operate efficiently. Is cost efficient operation the true test of a hospital's ability to be successful in the current healthcare market? An answer to satisfy societal needs and to explain the complex reimbursement system has been needed since the passage of Medicare and Medicaid.

Need for the Study

The importance of rural hospitals to the American healthcare delivery system is clear in that rural facilities represent approximately 50 percent of all U.S. hospitals and 25 percent of all inpatient beds (Buczko, 2001; Saleh et al, 2001). A review of literature indicates that in addition to operating efficiencies, changes in the social and economic environment in

which the hospitals operate impact their survivability. Moreover, their organizational characteristics to include bed size (less than 100 beds), small medical staffs, and domination by family practice or general surgeons contribute to their fragility. The limitations allow little margin for administrative decisions (Buczko, 2001). This delicate balance places a heavy responsibility on the Board of Trustees for facilitating a collaborative relationship between the medical staff and hospital administration.

Illustrated as early as the mid-1980's, declining utilization and changes in hospital payment systems placed considerable financial pressure on both urban and rural hospitals (Government Accounting Office [GAO], 1990; Saleh et al, 2001). Many healthcare providers were unable to continue operating under these new regulations. For example, 260 hospitals closed between 1985 and 1988 after the Prospective Payment System (PPS) was implemented (McKay & Coventry, 1994). Closures following PPS were caused by reimbursement rates below the facilities operating cost. Hence, they were not able to exist without any operating margin. Efforts to reduce operating cost and to make large financial turnarounds while trying to meet the community's best interest frequently precipitate complex management situations (Hofmann, 2002).

Dependence on Medicare and low patient volume make rural hospitals financially vulnerable to a greater degree than their

urban counterparts (Buczko, 2001; Bull, Krout, Rathbone -McCuan, & Shreffler, 2001). New cost -containment measures and the intensified competition have required many rural healthcare facilities to reduce services, convert to another type of care, or close.

Rural communities and the shifting demographics have shaped the rural facility and effect their ability to operate in changing markets. For example, a rural community impacts a hospital's ability to recruit and attract staff and physicians. Understanding the impact on rural facilities begins by examining the communities these facilities serve, the facility's dynamics, and the potential impact on communities if a facility closes.

Rural facilities often operate in economically depressed or stagnate areas by the very nature of the community's fragile tax base and minimal corporate or manufacturing structure (Bull et al, 2001). Typically identified as one of the largest employers, rural hospitals have a major influence on the community's local economy (Berry & Seavey, 1994). Local hospitals provide economic advantages over communities without hospitals and may be a deciding factor in recruiting other industries.

Over the past 50 years, attitudes toward healthcare have shifted from viewing healthcare as a right to an open competitive market where "only the fittest" (cost -efficient) survive. This change has placed these characteristics at odds with the current environment where small, rural hospitals operate. Current market

pressures direct decision making into competitive strategy designs. Pressure from large urban -driven providers places rural hospital management in a position to make tough decisions , focusing on current urban healthcare delivery tactics.

The stress of the new operating environment is illustrated in the closing of over 300 rural hospitals during the 1990's, and as reported by the American Hospital Association (AHA), 31 percent of rural hospitals report a negative operating margin (Broyles, Brandt, & Biard-Holmes, 1998). Rural hospitals must manage their competitive markets, financial needs, leadership practices, and medical staff attributes. Hospitals that are not able to balance this "strategic profile" have been trapped in a downward spiral of declining resources, decreased ability to compete, and shrinking markets. If hospital leadership fail to operate within these constraints then market pressures may force reduction in services or ultimately lead to closure. Skillful and timely management of this environment will result in greater community trust, stronger performance, improved staff efficiencies, and collaborative relationships between physicians and administration (Hofmann, 2002). Hence, improved financial performance will follow.

Purpose of the Study

The purpose of the study was to investigate the relationship of the profitability to market conditions, management practices, and medical staff attributes of small, rural hospitals operating in North Carolina and South Carolina.

In order to address the purpose of the study the following research questions were formulated:

1. What impact did the competition, as measured by the Herfindahl-Hirschman Index (HHI), within the county the hospital is located have on the hospital's operating profit?
2. How does the economic health, as measured by the unemployment rate, of the county the hospital is located, impact the facility's operating profit?
3. What impact did the Full Time Equivalent (FTEs) per occupied bed have on a facility's operating profit?
4. What was the relationship between belonging to a multi - hospital system and the hospital's operating profit?
5. How did the size of the medical staff impact the hospital's operating profit?
6. What impact did the specialty mix of the medical staff have on the hospital's operating profit?

Assumptions

The basic assumptions made regarding this study were as follows:

- 1) Information provided to The Duke Endowment was accurate.
- 2) Hospital financial service personnel could provide accurate up-to-date financial elements.
- 3) Duke Endowment's instruments used in the study to collect data were valid and reliable.
- 4) Methods used to calculate market share data by Solucient, Inc. and The South Carolina Budget and Control Board were identical.

(See Chapter III, page 52 for information explaining The Duke Endowment.)

Delimitations

Research should be transferable to the population of rural facilities, but due to resource restrictions, this study evaluated a limited number of facilities. Delimitations were constructed to aid the interpretation of the data. This investigation was delimited to:

- 1) Data obtained from only hospitals in North and South Carolina participating in Duke Endowment's Annual Application for Assistance.

- 2) Small, rural hospitals located in North and South Carolina.
- 3) Community affiliated, acute care hospitals or health systems.
- 4) Hospitals or health systems with calculated adjusted occupied bed range of 1 and 129 during the Fiscal Year (FY) 2000.
- 5) Information excludes Psychiatric, Hospice, and Alcohol and Chemical Dependency facilities.

Limitations

The following limitations applied to this study:

- 1) The hospitals electing to participate in The Duke Endowment Financial Assistance Program were not a random representation of all rural hospitals in the Carolinas.
- 2) Information obtained from hospitals was self-reported.
- 3) Financial information from the Duke Endowment is non-audited financial data.
- 4) Although the HHI was first used by the Department of Justice, its application to this study is based upon similar modifications for healthcare facilities. The index, in context to this study, was used to measure competition and not merger implications.

Definition of Terms

Terms operationally defined for the purpose of this study were:

Board of Directors: Individuals selected to act as trustees for the healthcare delivery system and to provide direction for the facility in meeting the needs of the communities and the medical staff.

Full-Time Equivalency: (FTEs) The number of employees who work for or provide service during a specific period. One person working full time for a full year equals 1.0 FTE; a person working full time for six month period equals .5 FTE, and a person working half time for a full year also equals .5 FTE. (Timmreck, 1997).

Herfindahl-Hirschman Index: The index sums the squares of individual percentage of market share of all hospitals included in the county the hospital being studied is located.

Management Practices: As used in the existing study, the term management practices is constructed to define two selected activities related to decision making for FTEs and whether a rural facility is a member of a multi-hospital system. (See definition of multi-hospital system below.)

Market Condition: The environment in which the hospital operates; for the purpose of this study, market condition was measured as market concentration or level of competition as defined by the Herfindahl-Hirschman Index (HHI) and level of unemployment in the county in which the hospital is located. (See Chapter III, page 56 for example of the HHI calculation.)

Market Share: The percentage of a population, generally separated by counties, receiving medical care provided by the hospital during a specific time period. The amount of business or

services the hospital garners from a particular population. Most often, market share represents the percentage of admissions.

Medical Specialty: The area of medicine in which the physician(s) is/are certified to practice. The area of medicine in which the representative specialty board has certified the physician as a member.

Medical Staff Attributes: Characteristics shared by the medical staff associated with a hospital. For the purpose of this study, the specialty mix of the hospital's medical staff and the number of physicians on the active medical staff measured medical staff attributes. (See Chapter IV, Table 4-2 and 4-4, pages 63 and 68.)

Medical Staff: Physicians granted active, full-time credentials to practice medicine, admit patients, and utilize resources

operated and owned within the hospital facility/system.

Multi-Hospital System: A group of hospitals, minimum of two, which are governed by one Board of Trustees and one common CEO and share financial resources.

Non-Rural: Areas within North Carolina and/or South Carolina that are assigned as a Metropolitan Statistical Area (MSA).

Operating Profit: The difference between a hospital's net revenues as reported on the facility's Medicare Cost Report minus operating expenses during the same fiscal year. Within the context of this study the terms operating profit, operating margin, and profitability were used interchangeable.

Primary Market: The county in which the hospital was located.

Profitability: In healthcare financial management this is the money left over from patient care and operating revenue after all expenses are paid. (Timmreck, 1997). Within the context of this study the terms operating profit, operating margin, and profitability were used interchangeably.

Rural: Areas within North Carolina and/or South Carolina that were not assigned as a Metropolitan Statistical Area (MSA).

Small Hospitals: Community affiliated or community based, acute care, non-federal facilities or systems with less than or equal to 129 adjusted occupied beds.

Summary

Shifting demographics, a tenuous economy, implementation of PPS, and potential isolation from information and technology has made rural hospitals vulnerable to the changing healthcare

market. This chapter established the foundation for the investigation on how rural hospital leadership manages these unique situations related to a vital rural resource. Definitions, delimitations, assumptions, and limitations established within this chapter guided the development and the scope of this study.

The Chapter II examines a broad range of literature drawn from the healthcare field, addressing issues facing rural healthcare delivery and the healthcare environment. The chapter reviews operating strategies and categories that direct healthcare organizations.

Chapter III addresses the methodology for this research. Also included are descriptions of instruments, methods, and statistics used for analysis.

Chapter IV analyzes the data and reports the findings. The chapter addresses the research questions and the findings based on the data.

Chapter V presents a summary of findings, conclusions, and interpretations of the data, and answers the research questions. Finally, the chapter provides recommendations for future studies.

Chapter VI provides a retrospective review of the research and study. In addition, it provides conclusions and recommendations arrived at extending beyond the basic research questions.

CHAPTER II

LITERATURE REVIEW

Introduction

This chapter will provide an outline and introduction into literature, theory, and research available regarding issues surrounding the changing healthcare environment and how facilities delivering healthcare services are affected. The issues explored will provide a background and template for an investigation into these complex issues and how rural healthcare providers face unique challenges within this market. Through this review, the framework for the theoretical model guiding the research was developed and supported.

Rural Demographics

Rural America infrastructure has undergone many changes over the last two decades. Although rural economies are tenuous, many do not rely solely on agriculture. Increasingly, small communities have replaced farming with industry, manufacturing, and construction. Although diversified, rural economic conditions continue to be very fragile and extremely vulnerable to global changes (Agency for Healthcare Policy and Research [AHCPR], 1991; Berry, 1988; Berry & Seavey, 1994). In the South, the loss of textile and clothing manufacturing jobs have impacted small,

rural communities and defines the loss of community infrastructure in North and South Carolina.

Employment trends have been accompanied by shifting demographics, and rural population growth has fluctuated over the past two decades. Population shifts are often associated with the transient and delicate job market in these isolated areas. Rural communities with a slightly older population than their urban counterparts influence the stability of the local market (16.0 percent over 65) (AHCPR, 1991; Kinsella, 2001).

The economy of the rural community makes the percentage of residents living in poverty surpass that of urban cities (Bull et al, 2001; Weisgram, 1995). The disproportionate number and density of poor people lends itself to other healthcare issues. Major barriers and limited choices exist in accessing healthcare due to the limited economic resources and isolation of the rural population, resulting in poor infrastructures, few healthcare options, and weak social support (Mansfield, Worthington, & Curry, 2001; Bull et al, 2001). Limited access and isolation often result in the type of medical care needed to be more complicated and severe, lending to greater resources and charitable care from the health system serving this population (Weisgram, 1995).

Issues Facing Rural Hospitals

Social and economic trends influence the environment in which rural providers must operate. Changing environments require a

fluid transition to remain successful, and many rural facilities have limited choices to meet these needs. Each system may have unique challenges because of their community environment, but characteristics of important health trends can be identified that are unique to all rural healthcare facilities and impact their operation. These characteristics include the following:

1. Reduced reimbursement or restricted reimbursement by third - party payers (Medicare and Medicaid)
2. Unstable local economy and tedious financial options for expanding or adapting to changes in the industry or environment (Bull et al, 2001)
3. The growth and expansion of globalization within the industries supporting the economic foundation within rural communities (e.g., textile and clothing in North and South Carolina)
4. Continuous changes in the industry, rewarding consolidation and urban strategies
5. Changes in the locus of care from inpatient to outpatient procedures (AHCP, 1991)
6. Continuous need for capital to meet the changes in healthcare delivery
7. Physician recruitment and retention
8. Continuing medical educational needs of rural physicians and allied health professionals to remain up -to-date

9. Technology development and acquisition to remain competitive with larger facilities
10. Fragmentation and lack of resources in transportation services or emergency medical services in many rural locations (AHCPR, 1991; Bull et al, 2001)

Rural Health Environments

The complexity in discussing rural healthcare is evident in attempting to define the term itself. The U.S. Census Bureau's definition of "rural" comprises several environments. Non-metropolitan statistical areas (non-MSA) as defined by the bureau can range from central cities with 50,000 residents and population densities of up to 100 persons per square mile, to densities of less than one person per square mile (Berry, 1988). This difference in defining rural hospitals complicates addressing the needs and issues facing these facilities. A community geographically located next to a large city will face different challenges and cost compared to communities where the next town is located several hours away. The complexity and diversity of rural communities is possibly the most misunderstood fundamental factor that impacts the success of small, rural hospitals (Berry & Seavey, 1994).

Evaluation of all types of healthcare markets is beneficial, and all players in the healthcare market impact each healthcare provider. In the context of this discussion, evaluation will be limited to the small, rural hospitals and

delivery systems. Small hospitals, as defined by the American Hospital Association (AHA), are facilities with less than 100 acute care beds (Manus, 1999). Other definitions include The Duke Endowment's use of hospitals with less than 129 beds. No matter the definition adopted, these hospitals are of specific interest due to their unique characteristics that impact their ability or inability to adapt to changing markets. Characteristics shared by many small, rural hospitals make them unique. They include the following: 1) they are often the first or second largest employer within the community; 2) they are viewed as serving a primary social-medical utility; 3) they often provide their community an economic and marketing advantage over communities without a hospital, and 4) they are more visible and involved in their communities. These unique characteristics often force small community hospitals to be at odds with their social and medical obligations and their economic performance. This delicate balance combined with vulnerability of the demographic characteristics of their communities makes even successful hospitals subject to uncertain futures.

Theoretical Design

The hospital industry has contributed to this financial uncertainty by expecting small, rural hospitals to perform according to the rules of a pro-competitive political economy within the healthcare industry (Berry & Seavey, 1994). This "pro -

competition" focus contributes to the often conflicting environment in which rural facilities operate.

The development and creation of this focus can be traced over the last 60 years. Hospitals and medical care of the early 1900s was custodial, most often owned and operated by physicians to house patients that could not be cared for in the individual's home. Third party reimbursement was non-existent. A growth in access to medical care gave rise during the 1920s to voluntary church sponsored or operated hospitals. Post-World War II era witnessed a proliferation of medical technology, and the sentiment that healthcare was a basic right for all Americans grew (Webb, 2001). Supporting this new view, Congress passed programs that provided low-interest or "free" money for every community to build hospitals. Programs like the Hill-Burton Act placed the emphasis on access to care not profitability or efficiency (Dowell, 1987).

The growth of accessible healthcare was accompanied by the development of private health insurance, significantly changing the landscape of healthcare delivery and the transfer of the expense to third party payers like insurance companies and the federal government (Webb, 2001). The next twenty years, supported by programs like the Hill-Burton Act, the development of Medicare and Medicaid, continued the proliferation of medical services, supporting a rising inflation in providing care.

Throughout this period of healthcare growth, decision making for healthcare was shifting from physician oriented to administrator oriented. This transition was relatively seamless. In an attempt to control the rising healthcare cost, duplication of services, and costly technology, the federal government created local and state health agencies charged with approving major capital expenditures related to demonstrated need and limiting duplication (Webb, 2001). The National Health Planning and Resource Development Act of 1974 (PL 93 -641) changed the relationship between the physician and administration placing administrator and hospital boards in a position to make decisions on allocations of health resources that directly effected a physician's practice. A large component of the 1974 Act was the certificate of need (CON) requiring states to regulate capital and medical equipment purchases in order to receive Medicare and Medicaid funds.

The 1980's witnessed a transfer from a cost -reimbursement system to a prospective payment system (PPS), requiring hospitals to control costs so that in-patient reimbursement kept ahead of expenses. During this same period, North Carolina and South Carolina witnessed improved infrastructures linking small communities together and reducing the time to travel to larger cities. This development in improved infrastructure made small towns less isolated and increased mobility. The 1990's witnessed extreme cutbacks in healthcare payment sources, tightening of

criteria for reimbursement, an increase of managed care, and double-digit inflation of healthcare costs. In reaction to rising cost, Congress enacted the 1997 Balanced Budget Act (BBA). The intent of the act was to reduce Medicare Part A spending by \$115 billion over five years (American Hospital Association (AHA), 1999). After one year, the effects of the 1997 BBA, were devastating to the healthcare industry and threatened service access especially for the community healthcare system (AHA, 1999). Congress responded by enacting the BBA Relief Act to assist the communities and to reduce the impact of the cost reduction measures.

The explicit and implicit advice from the industry to small community hospitals is centered around urban strategies favoring diversification into a array of healthcare related businesses, vertical and horizontal integration, system affiliation, and satellite relationships with urban centers (Berry & Seavey, 1994; Webb, 2001). Revenue strategies often revolve around opportunities that have traditionally been the domain of physicians, placing the hospital in jeopardy of straining often limited physician resources.

Many small hospitals found themselves faced with two strategic options when deciding how to work within the confines of the rural environment. Their options were to establish comprehensive health services to support and capitalize financial incentives, or to work within public utility strategies in which

the hospital operates to provide essential services regardless of the financial burden (Berry & Seavey, 1994). The limited resources and restricted operating environment required many small hospitals to balance operations between these two strategies with limited choices and severe consequences for unwise decisions.

Strategic Theory

The method or means which a hospital chose to manage or account for the unique situations that rural providers faced may have been the very indicator of success or failure. As discussed earlier, one of the challenges in operating in a rural market was the severe consequences of wrong or untimely decisions. Rural facilities were faced with many challenges and had to explore options appropriate to limited resources and alternatives. In addition, these organizations had to balance this competitive style-strategy with the public utility design that kept the community's health interest as their primary concern.

From theorists such as Max Weber, Elton Mayo (Hawthorne experiments), Daniel Katz, and Robert Kahn, rural hospitals adopted the theory of strategic development and planning. These earlier individuals applied the foundation of organizational behavior theory and developed the organization as an entity that was impacted by its operating environment, the workers, and the company's goals or motivations.

This framework allowed the concept and theory of strategic management and strategic planning to develop. Strategy has been defined as follows: "Strategy involves positioning the organization relative to its environment and competitors in order to achieve its goals and assure its survival"(Shortnell and Zajac, 1990). Strategic management as a developing theory seeks to combine the organization's goals, positions within the market, and internal and external operating environments to consolidate the goals of the organization. The processes require a continual effort of the organization's leadership to evaluate and adapt to the changing market place.

Over the development and refinement of strategic theory, researchers have identified three different approaches in the literature: Rationalistic; Incremental; and Interpretive. These three different perspectives provided the framework for discussing strategic planning as it relates to decision making. Rationalistic strategy was the outcome of a planned search for the best solution to a well-defined problem (Sudduth, 1992).

Incremental decision making has also been labeled as an adaptive analysis. In this analysis, decisions were made on the basis of outcomes, comparing possible outcomes, and optimal results. Objectives were not well defined initially but develop as the decision process progresses. L. R. Pondy theorized that strategy was not first determined and then implemented but worked out through being presented with situations as the operation of

an organization occurred (Pondy, 1983). These choices that had to be made were: 1) as operations occurred and strategy developed allow incrementalism to unify rationality; and 2) as intuitive models of strategy formulized and rationalized (Sudduth, 1992).

Interpretive approach to strategy development utilized cognitive and symbolic interpretation of the organization and its operating environment both internally and externally. Johnson drawing from many different works, suggested that strategy development is influenced and shaped by the leaderships' interpretation of the organization, the ideology employed, and the culture of the organization (Johnson, 1987).

Strategic Development in Hospitals

To develop and explore viable options for the rural facility, the CEO, senior management team, The Board of Trustees, and Medical Staff had to develop organizational strategies to provide direction, protect the hospital's long-term interest, secure the community's medical interest, and insure the community's economic success. Numerous studies have examined the effectiveness of strategic development and direction on businesses. But only recently, the studies have provided healthcare managers with guidelines for evaluating the effects of strategic development related to healthcare. Questions have remained about the success or effects this direction has on rural hospitals. Studies demonstrated that successful rural healthcare facilities have attained the goals of cost control, quality care

measures, market share domain, pricing strategies, and diversification (Cleverley & Harvey, 1992; Smith, Piland, & Funk, 1992). What was not clear was the extent that strategic development allowed for healthcare facilities to adapt to a changing environment to ensure organizational survival.

Paul Hofmann (2002) discussed the importance of leaderships' decisions, and the impact mistakes have had on the healthcare system. Successful management strategies must align all business units around a clear and focal mission and vision for building collaborative incentives (Hofmann, 2002). The continuing pressure for hospitals to remain financially solvent, provide state-of-the-art care, and meet the community's needs magnify the result of unwise decisions or the absence of strategic direction.

Research has identified strategies that were common among successful rural providers. The most significant of these strategies has been demonstrated in the business community for decades. But only recently has the healthcare industry become interested in the concept of proactive leadership. Through studies comparing successful rural hospitals, Cleverley and Harvey (1995) demonstrated that four specific strategies were shared among successful providers.

Medical Staff Relationships and Development

The first strategy identified was an organization's decision related to the development and support for expanding and

developing its medical staff. Rural hospitals have had less flexibility for devising adaptive responses for managing physician relationships. An important concern was the need to ensure that physicians understand the facility and their codependent relationship in which both were dependent on leadership decisions of the Board and management team (Smith & Piland, 1991; Buczko, 2001).

A measure utilized to denote a hospital's leadership success with the integration of the medical staff in the organization's mission was through the evaluation of the length of stay (LOS). Regression models in Cleverly and Harvey's studies suggested that for every one day in reduction in Medicare case - adjusted LOS, the return on investment (ROI) was increased by 1.09 percent (Cleverley & Harvey, 1992). These findings were consistent with return on investment results in previous studies examining urban facilities.

The difficulty was not in the understanding or acceptance that these results occur or that increasing the ROI will enhance the stability of a facility, but in how a facility effected the patient's LOS. A major obstacle to establishing a physician - hospital relationship is identified in Ermann's 1990 research study where he suggested that rural hospitals need to control cost, forcing management to encourage physicians to limit the LOS. Moreover, the financial short falls limit programmatic

efforts to support and facilitate medical practice (Ermann, 1990; Smith & Piland, 1991).

The demand for medical staff services, the cost of physician recruitment, and costly specialty equipment combine with perceived small potential for practice growth limits the rural facility's ability to recruit physicians. Limited and valuable assets must be expended on recruiting and retaining the appropriate mix of physician specialties providing the greatest return to the rural hospital and the community it serves (Full, 2001). Linkage between the hospital's utilization, revenue, and potential success and its medical staff is demonstrated in Figure 2-1 (Smith & Piland, 1991).

Outlined in a series of articles by Craig Holm (2000) on creating successful physician-hospital relationship, partnerships must balance the risk and reward for both the physician and hospital. Although difficult to create business relationships between the not-for-profit hospital and the for-profit physician practice, a hospital's ability to gain operating efficiencies and community benefit requires continuing communication, collaboration, and alignment of incentives between the two entities.

Despite the difficulty of forming business relationships between the hospital and physician practice, there are several compelling business reasons for doing so: 1) the skills, characteristics, and needs of the physician and hospital are

complementary; 2) hospitals and physicians are in the same business line and serving the same community; and 3) competition within this limited environment waste valuable community assets (Holm & Brogadir, 2000).

Staff Development

Labor costs comprise a large portion of a hospital's operating budget, and it was not surprising that labor productivity appears to be linked to financial success in small rural facilities. This correlation was linked to the fact that successful hospitals in the Cleverly and Harvey (1992) study were able to influence LOS and shorten the amount of patient days, thus affecting the amount of staff labor per patient required. Other methods that have proven to be successful in rural hospitals are cross training personnel so one individual can meet a greater array of patient and facility needs. Overhead cost control was another strategy shown linked to successful small, rural hospitals. A hospital's attention to indirect patient costs directly affects the cost per discharge and amount of operating margin obtained. Several studies identified capital investment as the last indicator. The link between capital investment and a hospital's success was best illustrated through investing in labor-saving capital equipment.

Administrative expectations and requirements of managerial staff in rural hospital environments were significant, and not

all of a hospital's success was accounted for by a regression model. How do administrators balance the fiscal needs of the organization and the needs and perceptions of the community it serves? Administrators must develop innovative designs that convey the strategic policies of the hospital to the community at a level the community can understand and support. Research conducted by Berry and Seavey (1994) suggested that successful hospitals were able to achieve this type of diffusion, and local citizens not associated with the community hospital were knowledgeable regarding the facility's strategic plan and its contributions to the community.

Multi-Hospital Health Systems / Mergers

Planning strategies and implementation are designed to manage the pressures of a changing and delicate environment. Although studies conducted in the business industry have demonstrated the relationship between success and strategy, it is only recently that researchers have begun to understand the impact on the healthcare industry and how that it applies to rural hospitals. It is arguable that even detailed planning cannot account for all facets and needs of the rural environment. Access to care issues and viability of diversification in the small, rural market may not be a universal opportunity for all healthcare delivery systems. How do rural facilities decide the most appropriate direction for the rural system to pursue? The most viable decision linked to cost-control measures or

management may be the discovery that they are not able to affect change with current resources and must consider other options.

A strategy employed with struggling small, rural hospitals throughout the 1990's were mergers with larger healthcare systems. The premise supporting this action was that small hospitals attempted to improve their profitability potential by increasing market power (Brooks & Jones, 1997). Rural facilities may benefit from the economy of scale not easily achieved in their small, rural market. These economies include access to specialized resources (marketing, quality improvement, risk management, group purchasing) and the alignment with competitive forces.

Impact of Management Strategies

The realization that current strategic plans do not allow for the continued operation of the facility is the most difficult process in the management cycle of a rural hospital. Many external factors and agents may be influencing management to continue current operations unabated.

Once a decision is reached that organizational change is required, the type of change chosen can have long-term implications on the community's health. Possible organizational changes will focus on the hospital's decision to close, to convert to another type of healthcare provider, or to seek some

type of affiliation with another facility, whether formal or informal (Broyles, Brandt, & Biard-Holmes, 1998).

Facility Closure

Closure of a facility refers to a situation in which a rural community hospital ceases to provide hospital services or other forms of healthcare services to the community (Alexander, D'Aunno, & Succi, 1996). The closure of a local hospital can have significant impact on the community's long-lasting medical, economic, and psychological fitness (Muus, Ludtke, & Gibbens, 1995). Studies have attempted to investigate the direct and indirect impact to the community's health when management decides to close a facility. These studies by Weisgram (1995) have provided insight to characteristics common to these facilities, and debate continues over the significance and cost of the impact on the community.

The first issue associated with the findings is identification of common characteristics shared among facilities that elect to close instead of choosing another alternative. Contributing factors that suggest facilities are at a significantly higher risk of closure include poor financial performance, low occupancy, small size (less than 50 beds), weak local economies, for-profit ownership, and competition from other hospitals (Alexander et al, 1996; Berry & Seavey, 1994; GAO, 1990; U.S. Department of Health and Human Services, 1992; Rosenbach & Dayoff, 1995).

Although common characteristics shared among facilities that are subject to close are agreed, the impact of these changes on the healthcare of the community is unclear. Much of the controversy over the impact of rural hospital closures centers on the diverse definition of "rural". Data have revealed little impact from some rural hospital closures. In fact, the findings suggested the implication for the closure was due, in part, to local residents by-passing the local facility for a larger hospital in the next community. It is understandable that the impact to communities located close to urban areas may perceive little consequences from the local community hospitals closure.

What health factors are present in isolated rural communities where the closest hospitals operating is located 50 - 150 miles? Studies conducted by healthcare researchers have suggested that as rural residents encounter an increasing number of obstacles to access healthcare; care-seeking delays become pertinent issues (Berry & Seavey, 1994; Mansfield et al, 2001; Bull et al, 2001; Buczko, 2001). Residents of these small communities are often concerned regarding their access to care. In a 1995 study conducted by Muus et al, the team surveyed residents of Beach, North Dakota where their local facility had recently closed. The researchers wanted to assess how local residents felt the closure would impact them and their family. The results revealed "poor access to emergency care" (47.2 percent) as the primary concern for the study population, and

87.5 percent felt there would be negative medical implications for the population (Berry & Seavey, 1994). These concerns are supported by research, suggesting people facing distance barriers to healthcare resources utilize the services less, and report a poorer health status than do individuals with fewer obstacles (Berry & Seavey, 1994; Rosenbach & Dayoff, 1995; Buczko, 2001).

Converting Services

Closure of a facility is seen as the most drastic type of organizational change. Facilities operating in a single provider market often explore other options instead of electing to close, and the community or another organization often revitalizes facilities that do close. As documented by the number of facilities reopened or converted to another type of provider between 1986 and 1990, of the 345 acute-care hospitals that ceased operations during this span, 111 of these facilities were later converted to another type of provider (Rosenbach & Dayoff, 1995). This option allows many rural facilities to continue to offer some type of emergency access and medical care to the community. However, they need to operate in a market niche to increase the facility's chance of survival.

Although conversion may inherently be the preferred method of organizational change, not all facilities are identified as viable candidates. A broad set of environmental and organizational factors compel rural facilities to consider extreme organizational change. Resources available influence the

type of change to that facility that allows for its emergence into another market domain (Alexander et al, 1996; McKay & Coventry, 1994). From this point, it can be argued that a facility that has access and knowledge to resources favorable for success in the proposed market will result in a hospital choosing conversion instead of closure. Access to resources for success in other market domains is not sufficient to initiate the conversion. A facility must possess or have access to resources that allow for support during the change and helps the facility to build a support base within the new market. Hospitals must examine their current strategic competencies in deciding alternative healthcare delivery mechanisms. The type of alternative healthcare delivery evolution is determined by the environmental pressure for change and the resources available to support that change.

Market analysis conducted by Savage, Blair, Benson, and Hale (1992) identified several factors contributing to a facility's decision to change instead of closing. These include the following: 1) Local resources available to support the change; 2) an opportunity for a market niche to exist; 3) local economic conditions that depend on the facility (per capita income, unemployment); and 4) current operation of non -acute care. Conversion, perhaps unlike closure, is not a point -in-time event, but an incremental process as rural facilities adapt to environmental pressure. It also appears decisions faced by rural

facilities that are evolving into alternative healthcare systems are a multi-process event. First, a rural provider decides how to adapt to its environmental pressures. Then hospital leaders must make decisions on strategies to adopt resources, expertise, and market domain to be successful in a chosen new market. The ability for rural health providers to adopt new delivery measures or markets allows for continued access, although limited to healthcare for the community.

Managing Partnerships

Rural care providers may identify environments that require action, and the option of closure or conversion does not fit the organization's strategic goals. A significant number of rural healthcare providers participate in some form of cooperative efforts with other urban facilities or a network with other rural providers. These affiliations are subject to different structures, from affiliations that allow for joint purchasing to ownership by a multi-hospital system.

Formal structures between a larger urban system or a multi-hospital system and the rural provider usually allow the rural facility to benefit from the injection of capital and resources such as expensive technology, primary care physicians, and specialists. These arrangements can allow the rural provider to remain an acute care provider in a diverse environment and effectively meet changing demands. These partnerships, like the

decision to close or convert, require careful multi-stage data analysis and market strategies.

Traditionally, these arrangements allow rural providers to benefit from the larger facility's resources in return for referral patterns. Facilities considering this type of affiliation must examine the stakeholders interest in this type of change. This decision matrix is often an arduous task with many complex issues influencing a hospitals decision. Stakeholders may not agree on how to best meet the needs of the facility or agree that a formal arrangement meets the strategic needs of the environment. Identification of key stakeholders that rural facilities must address before entering this type of arrangement is useful in first anticipating the interest and needs this type of change will represent. In many rural systems, stakeholders hold many different positions and points of interest. Rural community leaders, local government, physicians, and the urban center are examples of the diverse group with a stake in any decision reached at the local facility level.

Urban-rural hospital affiliations are both the outgrowths of the external pressures experienced by rural providers and the need for urban centers to strengthen their share of tertiary referrals (Rosenbach & Dayhoff, 1995). This strategy may provide the rural facility with additional options in meeting the social and medical needs of the community. However, close evaluation must be undertaken to ensure both facilities can fulfill their

strategic policies. Evaluation of each organizations need for control and fit with stakeholder management concerns may provide the insight for successful adventures.

Literature Content and Methodology

Management Control and Theory

Sudduth (1992) explored strategic management development in rural hospitals and how strategic management theory impacted the hospital's leadership in preparing for change. The model utilized an instrument to evaluate the management level of acceptance and recognition of change. His research focused on the Shortnell and Zajac (1990) model that organizes the strategic adaptation process. This model identified three key principles or stages of change theory. The three processes identified by Shortnell and Zajac and evaluated by Sudduth were demonstrated through the change theory progression which is: 1) recognizing the need for change, 2) identifying the feasibility of change, and 3) managing the change process (Sudduth, 1992).

Directly related to change theory, Miles and Snow (1978) identified four main strategic orientations employed by organizations in adapting to their environment: 1) prospectors, 2) defenders, 3) analyzers, and 4) reactors (Ginn, 1990; Ludke, Westhoff, & Flood, 1992). These orientations address how organizations approach the change process. Sudduth (1990)

attempted to capture and evaluate the strategic adaptation theory utilized by organizations. He also looked at how management identified change management, and what type of role the organization (prospector, defender, analyzer, reactor) assumed in managing the environment. He used an interview and a survey design to capture management development through change management theory.

Other studies attempted to identify and isolate characteristics of successful rural hospitals. Rosenbach and Dayhoff (1995) used data from the American Hospital Association and Medicare reports to examine rural hospitals and the shared characteristics of facilities that eventually closed. Hospitals used in this specific study evaluated Medicare, short-term and general acute-care hospitals, which closed in either 1986 or 1987 (Rosenbach & Dayhoff, 1995).

Studies conducted in 1983 and repeated in 1987 demonstrated the effects of reimbursement reductions on rural hospitals in New Mexico. The instrument used in the comparative study was pertinent in that conditions described by the researchers in 1991 were similar to the changes that have occurred after the BBA of 1997. Further, these study effects continue to impact small, rural hospitals across the country in 2002.

Research conducted by Shukla, Perstain, and Clement (1997), utilized 1993 data from Virginia Health Services Cost Review Council to evaluate and compare variables among hospitals to draw

a general conclusion between for-profit (FP) and not-for-profit (NFP) management strategies. Obtained from two independent, non-correlated sources within Virginia, seventy (70) NFP hospitals and 13 FP hospital were included in the study.

This research, by Shukla, Perstain, and Clements (1997) discussed several advantages of using locally submitted data. The advantages were 1) the ability to control for case mix was due to the similarity of the operating environment; and, 2) the region provides very similar characteristics in terms of regulatory environment, size, geographical distribution and percent of Medicare. (Shukla, Perstain, & Clement, 1997). The paper evaluated performance on whether differences existed due to revenue enhancement strategies or cost-management strategies.

Revenue enhancement strategies rely on pricing, utilization of ancillary services, and payer mix. Cost management strategies are comprised of labor, non-labor, and capital. The null hypothesis was that there was no difference between the financial strategies (revenue enhancement or cost management) of FP and NFP hospitals.

Ho: FP = NFP strategies

The significance of the size difference among the samples was tested using a one-way ANOVA. The two samples were found not to be significantly different from one another in terms of size

and other contextual variables. The proportion distribution of hospitals along other contextual variables was tested using a z - test for proportions. There were no significant differences between the two groups on any of the contextual variables at $p < .05$ ($z > 1.69$). To control the effects of the contextual variables, a multivariate regression model was also evaluated for each performance indicator.

The correlation of coefficient analyses confirmed the results of the ANOVA in that the two groups were significantly different from one another on several contextual variables, and more importantly, after controlling for system affiliation, location, bed size, and payer mix, ownership was significantly related to the indicators. Results from the regression analyses FP margins were marginally significant ($p < .10$) related to both profit indicators (Operating margin and Return On Assets). Within "pricing strategies," FP hospitals' pricing was statistically significant from NFP hospitals at the $p < .05$. There was no significant difference in the number of procedures, suggesting FP hospitals used pricing rather than utilization to enhance revenues. For-profit hospitals utilized more registered nurses as a percent of total workforce (26.9 percent vs. 22.7 percent) (significant at $p < .05$). The regression and ANOVA demonstrated significant differences between FP and NFP hospitals among total cost, less total income taxes, non-labor, and capital cost.

For-Profit hospitals used 17 percent fewer FTEs per occupied bed (3.827 vs. 4.624), a statistically significant result ($p < .05$) and used 5 percent fewer paid hours per admission (129.3 vs. 136.4), which was not significant. This resulted in mixed findings in that FP hospitals are more productive; however, due to their 8.4 percent longer ALOS, labor productivity was not significantly different between the two groups.

The final conclusion drawn was that FP hospitals do maintain a margin advantage over NFP because of different strategies, and the prominent strategy employed was revenue enhancement. (Shukla, Perstain, & Clement, 1997). This conclusion agrees with the general belief that FPs tend to use more ancillary patient services.

Community Perceptions

Researchers have evaluated communities' perception following a closure. Research examining this facet was generally focused on the individual's view of how the hospital's closure may affect the individual and the community from a medical perspective. Muus et al (1995) completed a random sample survey of the population residing in Beach, North Dakota, who lost their 27-bed facility while the closest medical facility for 40 miles away. The sample population responded to questions regarding why they thought the facility closed. The respondents also evaluated the impact the closure had on their medical wellness. The unit of analysis in the study was directed at household, and the

researchers did not attempt to over-sample any population represented.

The study found that over 30 percent of the residents identified under-utilization as the major cause of failure. Residents were by-passing the local hospital for services 60 miles away (Muus et al, 1995). While 65 percent of the residents felt the closure would result in poor access to emergency medical care and problems in hospital care, the research did not attempt to examine why the community elected to by-pass their local hospital. These results raised questions as to the amount of community support and the hospital's perception of their community's vision for future growth and development. The survey supported residents' concern for medical care access, but no information was provided as to the individual's value of community support for the success or failure of the facility.

Community and Hospital Relations

Evaluation of industry changes and how those changes are affecting community relations are strong indicators of rural hospital success that can be evaluated through several key individuals within the healthcare network. (Berry, 1988; McKay & Coventry, 1994; O'Shaughnessy et al, 1997). This network can be comprised of community leaders, hospital administration, local physicians, users of services, or major employers in the local area. O'Shaughnessy et al (1997) examined these components by surveying successful rural hospital CEOs.

They utilized a sample of convenience to evaluate CEOs success for formulating a profile. Differentiating it from Rosenbach and Dayhoff's (1995) study, the unique perspective of this study, was that the research examined components of community support and the hospital's community involvement. The profile led to the findings and conclusion supporting the need for future studies to examine successful attributes centered on mutual support between the community and the hospital.

Measuring Market Competition

The premise of an economic market place is based on the Market Based Economic Theory. The premise suggests that providers of healthcare will develop the most economical approach to deliver services (Berstein & Gauthier, 1998). A common method to study the level of competition within a market is through the Herfindahl-Hirschman Index (HHI). This instrument has been used because of the nature of competition existing in the healthcare market. It is also used because the index's ability to control for the effect of competing hospitals when one is studying corporate behavior within geographic boundaries (Phibbs & Robinson, 1993).

In Laine's (1995) research, an argument was developed suggesting the HHI was not merely an arbitrary method to measure market concentration, but rather it measured average market share from the viewpoint of the consumer. Laine's research supported

the notion that the HHI was directly related to the price -cost margin of the measured facility.

Research conducted by Phibbs and Robinson (1993) utilized non-federal, general, short-stay, and acute hospitals in California to evaluate market scope and impact on margin. The research developed several definitions of market radii to include mileage markers, geographic boundaries, and county lines. For each of the dependent variables, the researchers utilized the HHI. The use of the HHI controlled for the competitive nature of the hospitals within the markets and made the data applicable to other markets across the country (Phibbs & Robinson, 1993).

Brooks and Jones (1993) evaluated characteristics of hospitals that merged between 1983 and 1992. The researchers evaluated 17 pairs of merged hospitals with randomly paired hospitals that did not merge during the same period. The research utilized the HHI to measure market competition on the broader context of the "Structure-Conduct-Performance" (SCP) framework of industrial organization economics. The premise (SCP) was based on a firm's performance in the operating environment which related to the structure of the market (Brooks & Jones, 1997).

Researchers excluded the focal hospital in order to measure the competing hospital's impact on the studied facility. The HHI was a tool demonstrating the ability to isolate and control for the degree of competition on the market (Phibbs & Robinson, 1993; Laine, 1995).

Shephard (1972) pointed out that the use of the HHI combines the effects of the operating environment into one statistic. This statistic represents and controls for market share and rivalry into one measurement outcome in the Brooks and Jones' study. The findings associated with the 1997 study found that local market opportunities and market concentration were both factors in leading hospitals to merge.

Summary and Conclusions

Many Americans living in rural communities are finding that healthcare is inaccessible. This may be because of the changing environment in which healthcare is being delivered. Rural providers are shaped and influenced by their local communities and infrastructures. If these structures do not allow for the hospital to adapt to the market, providers and communities must reevaluate the underlying strategic basis (Schmitz, 1992). To remain successful in the healthcare market, providers and communities must provide the needed infrastructure to allow for high quality, efficient exchange of information, patient services, and strategic planning in the rural setting.

The complexity and diversification of rural communities makes the delivery of care to these areas one of the most misunderstood issues in healthcare. The influence of the local community is a controlling factor in determining levels of delivery. The matrix of rural America subjects local providers

(physicians) to a larger percentage of non-reimbursed and under-insured care, greater economic dependency on the hospital, a larger percentage of elderly, and a greater number of high-need, high-risk patients (Bull et al, 2001). Rural communities tend to have less stable economies, and this affects the resources available to the community hospital in meeting the increasing demands of the environment.

The market demands and environment under which rural providers must operate require a cooperative effort from all stakeholders. Rural providers must facilitate stakeholder interaction and understanding of the complex industry environment. Administrative staff must develop innovative approaches to simplify complicated issues to enhance local buy-in. They must also understand current environmental demands and how stakeholders influence the rural provider's abilities to consider alternatives (Berry, 1988; O'Shaughnessy et al, 1997; Webb, 2001).

Difficulty in defining rural healthcare market and identifying subtle differences between rural markets makes the task of developing industry wide standards and policy daunting. The hospital industry must address ways to develop performance expectations that address the unique characteristics of small, rural hospitals. These facilities cannot be held to urban industry's expectations of developing a pro-competitive focus, but rather they must carefully examine local resources and

capabilities to explore viable market strategies that enhance the community's economic and medical well-being. Rural facilities must concentrate their strategies to ensure a community approach combined with establishing a sound financial structure. Conflict between the social-medical and fiscal obligations can be mitigated through proactive open communication and dialogue with local stakeholders.

Rural facilities must develop cost leadership strategies to remain a viable member in their local economy and industry. Attention and balance must be obtained so that rural facilities' resources can adapt to changing markets. The process of developing strategies to manage these changes and identify direction is a multi-stage process and cannot be accomplished through one event. Hospital management must continuously assess and evaluate the direction and resources for the facility.

In order to survive, rural hospitals must shift their strategic policies from a product to market orientation, from a care taking to a risk-taking mentality, and from operational to strategic management (Ludke, Westhoff, & Flood, 1992). The ability to conduct and implement strategic planning is an essential skill and trait needed for rural providers to remain successful in a dynamic market. Facilities must assess opportunities and limitations in their current environment and develop sound decisions based on these findings in order to develop a strategy to ensure healthcare access to rural America.

CHAPTER III

METHODOLOGY

Introduction

This chapter discusses the methodology employed in selecting and evaluating the study population, data collection, and the method for analysis of data. The study examines rural hospitals in North and South Carolina and their changing healthcare environments. Validation and reliability of data collection methods that allowed for the comparative evaluation of the rural hospitals in North and South Carolina are also presented. This chapter also provides the framework for future chapters.

Total Population

This study was a comparative analysis utilizing secondary data available from The Duke Endowment, Solucient, Inc. data sources, The South Carolina Office of Research and Statistics, and US Census Bureau. The study population included selected short-stay, acute-care, non-federal hospitals located in North and South Carolina counties not included in Metropolitan Statistical Areas that participated in Duke Endowment's Annual Application for Assistance program for fiscal year 2000.

Located in North Carolina, 169 hospitals operate serving the medical needs of the citizens. Hospitals participating in the 2000 Duke Endowment's Application for Assistance operate 17,705 in-patient beds. Hospital size ranged from 821 in -patient beds to hospitals with 15 in-patient beds. Within North Carolina, 25 percent of all in-patients are located in small hospitals (less than 129 beds). Of North Carolina's 100 counties, hospitals are located in 65 listed as non-MSA, representing 66 percent of small hospital in-patient beds in the state. Of the 65 counties eligible for inclusion in the study, private, county, city, or governmental entities operate 69 hospitals. After adjusting for the parameters of the study, 43 short -term, acute hospitals operate in non-MSA with fewer than 129 adjusted occupied beds. These 43 hospitals represent 16.4 percent of all the in -patient beds located in the state.

South Carolina has 68 hospitals operating to serve the medical needs of the citizens with 37 listed in non -MSA. The 68 hospitals represent 7287 in-patient beds with rural, small hospitals representing 22 percent of all available beds in the state. Of the hospitals eligible to participate, 15 participate in Duke Endowments Annual Application Process representing 12.6 percent of all available in-patient beds in South Carolina.

Study Population

Because of the relatively limited number of small, rural hospitals operating outside of a MSA, this study included all hospitals meeting the criteria outlined. The availability and access to The Duke Endowment data represented an unexpected and excellent opportunity to study rural hospitals with similar market conditions in two Southern states.

Data Sources

The investigation of the research questions within the context of small, rural hospitals in North and South Carolina utilized established and validated databases and instruments. The databases and instruments included the following: 1) Duke Endowment's Healthcare Division Hospital Data Base; 2) US Census Bureau's 2000 census data for North and South Carolina Counties; 3) Solucient, Inc. data set for fiscal year 2000; 4) The South Carolina Budget and Control Board with the Office of Research and Statistics; and 5) the Herfindahl-Hirschman Index.

The Duke Endowment is a charitable organization established by James Buchanan Duke in 1924 for the sole purpose to financially support four areas through grants and programs. The four following areas are: 1) Faith Based Programs, 2) Healthcare, 3) Children Programs, and 4) Higher Education. Recipients are limited to organizations in North and South Carolina. One of the

services provided by the Duke Endowment is a small reimbursement to each hospital providing charitable care to communities. In order to receive this reimbursement or grant, hospitals must submit a yearly Application for Assistance to the Endowment.

The Database compiled through this application was used as the primary data source to examine strategic development among the study population. This database provides information on virtually every hospital operating in the market and could provide individual data for the entire study population. The data allowed for generalization among all small, rural hospitals. Information obtained through the Duke Endowment included the following:

1. operations (services provided)
2. staffing
3. cost structures
4. revenue structures
5. physician characteristics
6. hospital governance (system design)

Solucient, Inc. contracts with the North Carolina Hospital Association (NCHA). The organization compiles the data for the NCHA, producing available data on each hospital operating in the state to include the following: 1) market share by county, 2) market share by service line, 3) revenue indicators by service line, and 4) market share by payer mix. Although all hospitals must participate by state regulations, the service is free to the

association with each facility able to purchase the data regarding their market. Solucient, Inc. also publishes public access information regarding market share by county for each hospital in North Carolina.

The South Carolina Budget and Control Board with the Office of Research and Statistics compiles data for South Carolina hospitals that mirrors the data collected by Solucient, Inc. South Carolina market share data for 2000 were extracted for hospitals meeting the criteria for this study.

Data Collection Procedures

Permission to utilize the secondary data from the Duke Endowment, Solucient, Inc., The South Carolina Office of Research and Statistics, and the U.S. Census Bureau was obtained from the operating officials of each organization.

The Duke Endowment made available the 2000 annual hospital survey through electronic format. The database included data on all hospitals participating in the 2000 survey. In addition, the database included all data elements collected during the annual survey. Hospitals meeting the study criteria were selected and compiled into a separate data file. Pertinent data elements to the study's independent and dependent variables were selected and all data were entered into a data file for statistical analysis using SPSS. Data points for each hospital related to the independent and dependent variables obtained through the Duke

Endowment's data were: 1) operating profit; 2) FTEs per occupied bed; 3) membership in a multi-hospital system; 4) medical staff size; and, 5) specialty mix of medical staff.

Solucient, Inc. made available market share data for all hospitals in North Carolina. Manual selection of each of the study population's home county allowed market share data for all hospitals. Upon entering market share data, a spreadsheet calculation was performed to determine the hospital's HHI. For South Carolina hospitals, the same method was utilized using The South Carolina Office of Research and Statistics as the source for market share data.

Unemployment data for each county was obtained through the U.S. Census Bureau's web-site. Each participating hospital's county was identified and the percentage of unemployment was collected for that county. This information was entered into the SPSS database and linked to the respective hospital for analysis.

Measurement Tool

The Herfindahl-Hirschman Index (HHI) was utilized to measure the intensity of competition in the hospital service area. This index has been consistently used in health service research because of the following reasons: 1) it is sensitive to the number and size of hospital; and 2) it is the measure of market concentration used by the Department of Justice (Brooks & Jones, 1997; Laine, 1995, Phibbs & Robinson, 1993).

$$HHI = \sum_{i=1}^n (MS_i)^2$$

$\sum_{i=1}^n$ = sum of all hospitals with market share in county.

$(MS_i)^2$ = The percentage of Market Share squared (Baker & Blumenthal, 1984)

To illustrate how the HHI is calculated, Alpha County residents receive their healthcare from five (5) different hospitals. Hospital A, located in the county, has 55 percent of the market share. The remaining four hospitals are located outside Alpha County. Hospital B has 20 percent of the market share, Hospital C has 10 percent of the market share, Hospital D has 22 percent of the market share, and Hospital E has 6 percent of the market share. The HHI would be calculated by squaring each hospitals market share and then summing the total of the four hospitals that are located outside Alpha County.

$$HHI = 20^2 + 10^2 + 22^2 + 6^2 = 1020$$

Originally developed for evaluating market share monopoly reaction, in mergers, the index is now used by the Department of Justice in evaluating hospital merger request. The basic design for the Department of Justice has proven to be useful in evaluating healthcare industries. Each hospital's market share was calculated for their primary market. Information regarding market share was determined from Solucient, Inc. and South

Carolina Office of Research and Statistics data set in which all hospitals in North and South Carolina participate. The HHI is calculated by summing the squares of individual market shares (percentages) of all hospitals included in the market. In merger evaluation, a further step recalculates the HHI after taking in account new market share post-merger. For the purpose of this study, two adjustments were made including the following: 1) The market share calculation excluded the hospital under study (Brooks & Jones, 1997), and 2) the final calculation was not completed. The reasons behind these adjustments were because the intent of the HHI in this study was to evaluate market pressure in a hospital's primary county rather than assessing market share subsequent to a merger.

Data Analysis

Comparative analyses of the independent variables were performed on the profitability of small, rural hospitals included in the study (See Figure 3-1). The first step was to evaluate the data separating and identifying hospitals with a positive operating margin in fiscal year 2000, and facilities that end the fiscal year with a negative operating margin. This analysis for each measure was conducted with descriptive statistics using measures of central tendency (Mean & Median) and measures of variability (Standard Deviation).

Independent Variables:

Research Question:

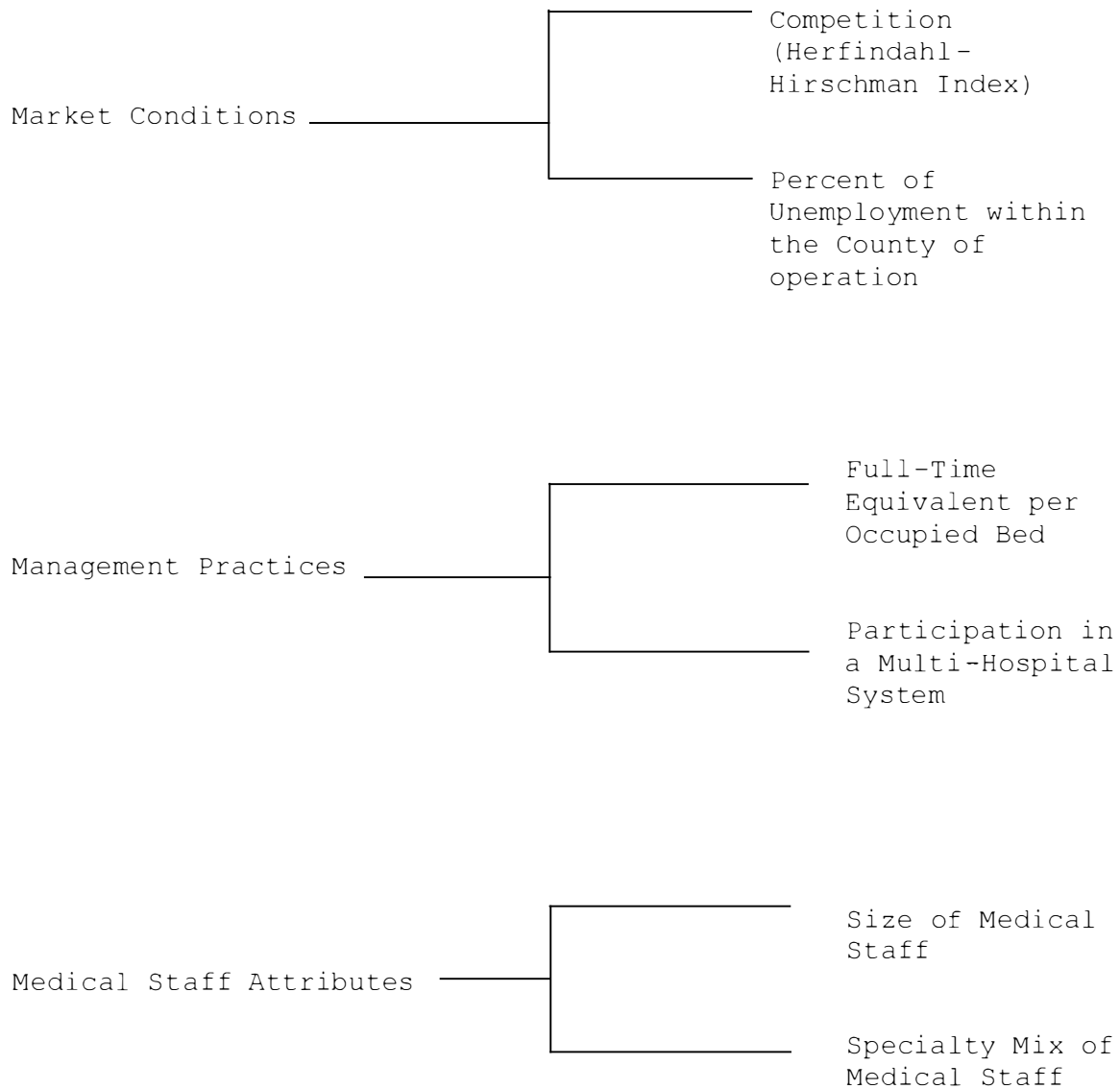


Figure 3-1: Relationship among the Independent Variables And Research Questions

In evaluating the probability of making a Type I error during analysis between the relationship of the independent variables and a hospital's profit, all testing was conducted at the 0.05 level of significance. A Type I error occurs when a null hypothesis is rejected when it is actually true.

Coefficient of Correlation

Analyses of independent variables demonstrating a continuous variable (competition, unemployment, Full Time Equivalents (FTEs) per occupied bed, the total number of physicians on active medical staff, and the number of physicians per specialty) utilized a rank order correlation coefficient. A rank order correlation coefficient test was chosen to evaluate the rank order of a facility's profit to the identified independent variables. By using this correlation methodology, a determination could be made regarding how closely profit margin was explained by the independent variable. Pearson Correlation utilization was selected for variables (percent of unemployment, FTEs per occupied bed, and physician specialty mix) that demonstrated a normal distribution when evaluated using descriptive statistics.

A Spearman's Rho two-tailed correlation examined the relationship of competition and the number of physicians on staff. This nonparametric test was chosen because the sample became a skewed distribution when examined with descriptive statistics.

Student's T-Distribution

A hospital belonging to a multi-hospital system was assigned a numerical code to designate independence of multi-hospital status. A two (2) denoted the facility belonged to a multi-hospital system and a one (1) indicated the hospital was independent. The population's standard deviation was unknown, and the evaluation utilized a two-tailed t-test.

Summary

This chapter outlined the characteristics of the study population, collection of data and the context of data analysis. The understanding of the data elements and data subsets allow the investigation on how small, rural hospitals are impacted by the selected independent variables.

A better understanding of the elements that impact these facilities allows a more thorough evaluation of the strategic development process.

CHAPTER IV

ANALYSIS AND INTERPRETATION OF DATA

Introduction

This chapter presents the analysis and interpretation of data from this study. The purpose of the study was to investigate the relationship of the profitability to market conditions, management practices, and medical staff attributes of small, rural hospitals operating in North Carolina and South Carolina.

To address the purpose of the study the following research questions were formulated:

1. What impact did the competition, as measured by the Herfindahl-Hirschman Index (HHI), within the county the hospital is located have on the hospital's operating profit?
2. How does the economic health, as measured by the unemployment rate of the county the hospital is located, impact the facility's operating profit?
3. What impact did the Full Time Equivalent (FTEs) per occupied bed have on a facility's operating profit?
4. What was the relationship between belonging to a multi-hospital system and the hospital's operating profit?
5. How did the size of the medical staff impact the hospital's operating profit?

6. What impact did the specialty mix of the medical staff have on the hospital's operating profit?

In evaluating the data, descriptive statistics that describe the characteristics of the total study population of hospitals will be discussed. This analysis will be followed by tests of significance contrasting the individual questions on their relationship to hospital profit.

Description of the Hospitals Studied

In total, 58 small, rural hospitals were included in the study. Table 4-1 outlines the characteristics of these facilities. The group consisted of 43 North Carolina hospitals and 15 South Carolina hospitals. Of the study population, licensed beds ranged from 15 - 124 with a mean bedsize of 65.8. Average daily census is the average patients found in the hospital through a given year and is measured in percentage. For this study, hospitals' daily census ranged from 0% - 89.7%, with an average of 32% and a standard deviation of 21.7% throughout the population (See Table 4-2). Table 4-2 outlines the operating margin for all hospitals participating in the study. The mean operating margin for facilities was a negative .009 percent .

The Herfindhal-Hirschman Index (HHI) demonstrated market competition conditions in which the hospital operates as pertained to this study. Hospitals within the study had a mean HHI score of 1478 with a range from 186 to 5396 (See Table 4 -2).

Table 4-1: Hospitals by State

Table 4-1

		Frequency	Percent	Cumulative Percent
Valid	North Carolina	43	74.1	74.1
	South Carolina	15	25.9	100.0
	Total	58	100.0	

Table 4-2: Small, Rural Hospital Characteristics in the Carolinas

Table 4-2

	N	Minimum	Maximum	Mean	Std. Deviation
Operating Margin	58	-.4878	.1000	-.92E-03	8.65715E-02
Licensed bed	58	15	124	65.83	30.14
Daily census	58	1.0	89.7	32.307	21.615
HHI	58	185.920	5396.070	1410.363	1209.91679
Unemployment	58	.015	.154	5.44E-02	2.4767E-02
FTE per Occup Bed	58	.10	8.32	4.3367	1.9331
Total Medical Staff	58	5	122	36.43	24.34
Valid N (listwise)	58				

The HHI works by summing the squares of individual market share percentages of all hospitals included in the market. In merger calculation, the merged facilities' market shares are combined, and the HHI is re-calculated. For the purpose of this study, two adjustments were made: 1) the market share calculation excluded the hospital under study (Brooks & Jones, 1997), and 2) the final calculation for mergers was not completed. The reasons for these adjustments were that the intent of the HHI was to evaluate market pressure in a hospital's primary county.

Unemployment was measured as the percentage of the population meeting the US Census Bureau's definition of unemployment during 2000 in the county in which the hospital was located. The mean percentage of the population unemployed within the study population's county was 5.4% with a range from 1.5 - 15.4 percent (See Table 4-2).

Table 4-2 shows the mean number of employees per the hospital's available beds. For this study population, hospitals employed an average of 4.33 employees for every occupied bed. Among small, rural hospitals included in the study, 45 facilities (77.6%) were operated independently, with a freestanding Board of Trustees and management. Within the study population, 13 facilities, or 22.4%, belonged to multi-system hospital systems consisting of two or more hospitals (See Table 4-3).

Table 4-3: Hospitals by Affiliation

Table 4-3

		Frequency	Percent	Valid Percent	Cumulative Percent
Affiliation	Free-standing	45	77.6	77.6	77.6
	Multi-hospital Member	13	22.4	22.4	100.0
	Total	58	100.0	100.0	

Table 4-2 illustrates the number of total physicians the study hospitals reported as members of their active medical staff. Within the 58 hospitals, the average medical staff consisted of 36.43 physicians, with the largest medical staff consisting of 122 physicians and the smallest having 5 physicians.

The medical staff specialty was divided into nine categories. Definitions for the nine categories consisted of physicians on active medical staff meeting the following criteria: 1) Family Practice: Physicians Board Certified or Board Eligible in Family Practice or Licensed General Practice; 2) Internal Medicine category: Board Certified or Board Eligible Internal Medicine Specialist only; 3) Pediatric Medicine: physicians meeting the qualifications for membership in the American Academy of Pediatrics; 4) Obstetrics and/or Gynecology Medicine: includes physicians Board Certified or Board Eligible in Obstetrics and / or Gynecology; 5) Other Medical Physician: includes Pulmonology, Cardiology, Hematology, Medical Oncology, Radiation Oncology, and other medical sub-specialist; 6) General Surgery: limited to surgeons Board Certified or Eligible by the American Academy of Surgery; 7) Other Surgical Category includes all other surgeons to include Orthopedics, Otolaryngology, Gastroenterology, Ophthalmology, and Oral & Maxillofacial Surgery, and so on; 8) Other Providers: includes other primary providers such as podiatrists, chiropractors; 9) Hospital Based

Physicians: includes only emergency room physicians, radiologist, pathologist, and anesthesiologist (Duke Endowment, 2000).

Physician's Table 4-4 outlines the mean number of physicians per specialty within the study population.

Each question was compared to evaluate the relationship between the independent variables and the operating profit for each hospital. Differences were considered to be statistically significant if the p-value for the test was less than .05. The strength of the relationship was determined by evaluating the correlation coefficient. As the coefficient moves toward positive or negative one (+1 or -1) the greater the ability to explain the dependent variable given the value of the independent variable. Coefficient values are spread into ranges to describe the strength of the relationship (See Figure 4 -1).

Significance Test for Research Questions

Question 1

What impact did the competition, as measured by the Herfindahl-Hirschman Index (HHI), within the county the hospital is located have on the hospital's operating profit?

The analysis for this research question was comprised of a rank-order correlation coefficient utilizing a Spearman's Rho calculation. This rank order allows an evaluation of the extent a hospital's profit can be explained by the amount of

Table 4-4: Medical Staff Specialties for Rural Hospitals in the Carolinas

Table 4-4

	N	Minimum	Maximum	Mean	Std. Deviation
AMSFamilyPracticeT	58	0	18	7.48	3.65
AMSInternalMedicineT	58	0	31	5.97	5.36
AMSPediatricT	58	0	7	2.14	1.96
AMSGynecologyT	58	0	8	2.00	1.89
AMSOtherMedicalT	58	0	28	3.74	5.92
AMSGeneralSurgeryT	58	0	7	2.59	1.45
AMSOtherSurgicalT	58	0	29	4.91	5.68
AMSOtherPhysicianT	58	0	13	.91	2.19
AMSHospitalBasedT	58	0	38	6.28	7.37
Valid N (listwise)	58				

Strength of Relationship:	Value (+ or -) :
Weak	0.00 - .250
Moderate	.251 - .750
Strong	.751 - 1.0

Figure 4-1: Strength of Coefficient Relationship

Source: Levin, R., & Rubin, D. (1983). A Short Course in Business Statistics. Englewood Cliffs, NJ: Prentice-Hall Inc.

competition that exists in the county in which the hospital is located. The study population showed a statistically significant ($p < .05$) negative correlation between the amount of competition and the hospital's profit (see Table 4 -5). This association substantiated a moderate strength relationship ($-.444$).

The correlation coefficient demonstrated a negative correlation of profit and competition, establishing an inverse relationship. This relationship demonstrated that within the hospitals studied as competition increases within its county its operating profit decreases.

A generalized non-statistical statement is as competition increases in the county in which the hospital is located, the hospital's operating margin tends to decrease.

Question 2

How does the economic health, as measured by the unemployment rate, of the county the hospital is located impact the facility's operating profit?

The analysis of this research question utilized a Pearson rank-order correlation to evaluate the relationship between a hospital's profit and percentage of the population unemployed within the county in which the hospital is located. Table 4 -6 shows that the hospitals studied indicates a statistical insignificant negative correlation ($p > .05$) between unemployment and hospital profits. The relationship was a weak association. A non-statistical summary of the analysis is that there was little

Table 4-5: Correlation Between the Level of Competition and the Operating Margin

Table 4-5

			HHI	Operating Margin
Spearman's rho	HHI	Correlation Coefficient	1.000	-.444**
		Sig. (2-tailed)	.	.000
		N	58	58
	Operating Margin	Correlation Coefficient	-.444**	1.000
		Sig. (2-tailed)	.000	.
		N	58	58

** . Correlation is significant at the .01 level (2-tailed).

Table 4-6: Correlation Between Operating Margin and the Percentage of Unemployment Within the County the Hospital is Located

Table 4-6

		Unemployment	Operating Margin
Unemployment	Pearson Correlation	1.000	-.003
	Sig. (2-tailed)	.	.982
	N	58	58
Operating Margin	Pearson Correlation	-.003	1.000
	Sig. (2-tailed)	.982	.
	N	58	58

impact to a hospital's operating margin based on the unemployment rate in the county the hospital was located.

Question 3

What impact did the Full Time Equivalent (FTEs) per occupied bed have on a facility's operating profit?

An analysis of the relationship between the number of FTEs a hospital utilizes to operate the entire facility and the hospital's profit was compared utilizing a rank-order Pearson correlation. Using Table 4-7, the relationship between these variables did not show a statistically significant association ($p > .05$). The coefficient proved to be a weak descriptor (.038) between the FTEs and operating profit. A generalized statement of FTEs per occupied bed as the variable has little impact on the hospital's operating profit. What this most likely means is that the hospitals studied have not allowed overstaffing to occur.

Question 4

What was the relationship between belonging to a multi-hospital system and the hospital's operating profit?

In evaluating management's decision to remain freestanding or join a multi-hospital organization on the hospital's operating profit, a student's t-test was utilized. Research has suggested that one way for small, rural hospitals to remain viable and improve efficiencies is to join a multi-hospital organization

Table 4-7: Correlation Between Operating Margin and FTEs per Occupied Bed Among Rural Hospitals in the Carolinas

Table 4-7

		FTE per Occup Bed	Operating Margin
FTE per Occup Bed	Pearson Correlation	1.000	.038
	Sig. (2-tailed)	.	.780
	N	58	58
Operating Margin	Pearson Correlation	.038	1.000
	Sig. (2-tailed)	.780	.
	N	58	58

(Succi, Alexander, Jelinek, & Lee, 2001). The study population was assigned a numerical code representing whether they were members of a multi-hospital organization (yes = 2) or whether they were freestanding (no = 1). A test to evaluate if the populations demonstrated equal variances was calculated and the two groups were determined to have essentially equal levels of operating profits. A student's t-test was used to analyze the relationship and found a statistical insignificant relationship ($p > .05$) (See Table 4-8).

Hospitals belonging to a multi-hospital system did not demonstrate any higher operating profits than independent hospitals in the study.

Question 5

How did the size of the medical staff impact the hospital's operating profit?

Evaluating the number of physicians a hospital has on its active medical staff utilized a rank-order correlation (Spearman's Rho) to analyze if a relationship existed between a hospital's profit and the aggregate number of physicians on staff. The findings of the study demonstrated a significant positive correlation between the total number of physicians and a hospital's operating profit ($p < .01$). The two variables demonstrated a moderate positive association (.477) (See Table 4-9). Hence, the larger the medical staff the higher profitability.

Table 4-8: Member of Multi-System and Relationship to Hospital Profit

Group Statistics

System Member		N	Mean	Std. Deviation	Std. Error Mean
Operating Margin	Indepedent	45	-2.0E-03	5.74567E-02	8.57E-03
	Multi-System	13	-3.4E-02	.150426	4.17E-02

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Operating Margin	Equal variances assumed	8.191	.006	1.182	56	.242	3.212E-02	2.716E-02	-.22E-02	8.65E-02
	Equal variances not assumed			.754	13.027	.464	3.212E-02	4.259E-02	-.60E-02	1.24108

Table 4-9: Correlation of Medical Staff Attributes and Hospital Profits

Table 4-9

			Operating Margin	AMSTotalT
Spearman's rho	Operating Margin	Correlation Coefficient	1.000	.477**
		Sig. (2-tailed)	.	.000
		N	58	58
	AMSTotalT	Correlation Coefficient	.477**	1.000
		Sig. (2-tailed)	.000	.
		N	58	58

** . Correlation is significant at the .01 level (2-tailed).

Correlations

		Operating Margin	AMSFamily PracticeT	AMSInternal MedicineT	AMSPediatricT	AMSGynecologyT	AMSOther MedicalT	AMSGeneralSurgeryT	AMSOther SurgicalT	AMSOtherPhysicianT	AMSHospitalBasedT
Operating Margin	Pearson Correlation	1.000	.064	.332*	.349**	.394**	.181	.356**	.229	.095	.204
	Sig. (2-tailed)		.631	.011	.007	.002	.174	.006	.084	.477	.125
	N	58	58	58	58	58	58	58	58	58	58
AMSFamilyPracticeT	Pearson Correlation	.064	1.000	.394**	.478**	.470**	.219	.287*	.457**	-.151	.311*
	Sig. (2-tailed)	.631		.002	.000	.000	.099	.029	.000	.259	.018
	N	58	58	58	58	58	58	58	58	58	58
AMSInternalMedicineT	Pearson Correlation	.332*	.394**	1.000	.645**	.635**	.375**	.501**	.452**	-.092	.350**
	Sig. (2-tailed)	.011	.002		.000	.000	.004	.000	.000	.494	.007
	N	58	58	58	58	58	58	58	58	58	58
AMSPediatricT	Pearson Correlation	.349**	.478**	.645**	1.000	.710**	.303*	.520**	.510**	-.071	.608**
	Sig. (2-tailed)	.007	.000	.000		.000	.021	.000	.000	.597	.000
	N	58	58	58	58	58	58	58	58	58	58
AMSGynecologyT	Pearson Correlation	.394**	.470**	.635**	.710**	1.000	.422**	.550**	.612**	.072	.338*
	Sig. (2-tailed)	.002	.000	.000	.000		.001	.000	.000	.591	.009
	N	58	58	58	58	58	58	58	58	58	58
AMSOtherMedicalT	Pearson Correlation	.181	.219	.375**	.303*	.422**	1.000	.410**	.785**	.231	.090
	Sig. (2-tailed)	.174	.099	.004	.021	.001		.001	.000	.080	.501
	N	58	58	58	58	58	58	58	58	58	58
AMSGeneralSurgeryT	Pearson Correlation	.356**	.287*	.501**	.520**	.550**	.410**	1.000	.528**	.188	.303*
	Sig. (2-tailed)	.006	.029	.000	.000	.000	.001		.000	.159	.021
	N	58	58	58	58	58	58	58	58	58	58
AMSOtherSurgicalT	Pearson Correlation	.229	.457**	.452**	.510**	.612**	.785**	.528**	1.000	.217	.334*
	Sig. (2-tailed)	.084	.000	.000	.000	.000	.000	.000		.102	.010
	N	58	58	58	58	58	58	58	58	58	58
AMSOtherPhysicianT	Pearson Correlation	.095	-.151	-.092	-.071	.072	.231	.188	.217	1.000	.049
	Sig. (2-tailed)	.477	.259	.494	.597	.591	.080	.159	.102		.713
	N	58	58	58	58	58	58	58	58	58	58
AMSHospitalBasedT	Pearson Correlation	.204	.311*	.350**	.608**	.338**	.090	.303*	.334*	.049	1.000
	Sig. (2-tailed)	.125	.018	.007	.000	.009	.501	.021	.010	.713	
	N	58	58	58	58	58	58	58	58	58	58

* Correlation is significant at the 0.05 level (2-tailed).

** Correlation is significant at the 0.01 level (2-tailed).

Hospitals with larger medical staff have the potential for a greater number of hospitals admissions and therefore a higher income stream.

Question 6

What impact did the specialty mix of the medical staff have on the hospital's operating profit?

Evaluating the aggregate number of physicians on a hospital's medical staff held all areas of medicine to be equal to a facility's profitability. This research question attempted to determine if the type of specialty or area of medicine the physicians practice were correlated to a hospital's profit. Analysis of this question utilized a rank-order correlation coefficient (Pearson Correlation) to evaluate the existence of a relationship. Table 4-9 illustrates the medical specialty groups and the specific findings for each of the nine medical groupings. The specialties demonstrating a positive correlation ($p < .05$) were Internal Medicine, Pediatric Medicine, Obstetrics and Gynecology, and General Surgery. These independent variables demonstrated, individually, a moderate strength relationship between their specialty and a hospital's operating margin.

Groups or specialties with $p > .05$ were Family Practice, Other Surgical Physicians, Other Medical Physicians, and Hospital Based Physicians. Although outside the criteria of this study for a statistically significant correlation, other Surgical Physicians demonstrated a correlation coefficient with a p -value

less than .1 (.084). The major implications related to this research question is that certain physician specialties impact a hospital's operating margin more than other. The four specialties of Internal Medicine, Pediatric Medicine, Obstetrics and Gynecology, and General Surgery demonstrate the most favorably increase of operating margin. A question not addressed was what ratio of primary care physicians and combinations of medical specialist would most favorably increase operating margin.

Findings

Overall descriptive findings of the study are discussed first, followed by specific findings of each research question.

The study population consisted of more North Carolina hospitals than South Carolina hospitals, with the average operating margin of North Carolina hospitals at $-.011$ and South Carolina hospitals at $-.0052$. The overall operating margin for the study population was a slightly less than a breakeven ($-.0092$).

The rural hospital's bed size count averaged 65.8 beds compared to the average of all hospitals in the state at 177.25 beds. Beds of the study hospitals account for 21% of all beds available in the Carolinas.

The majority of the hospitals were freestanding and did not operate as part of a multi-hospital system. This finding was the same for all hospitals operating in the two states.

Medical staff members within the hospitals ranged from five physicians to 122 on active medical staffs. The average of 36 physicians on medical staff per hospital was lower than the average for all hospitals in the Carolinas, which showed an average of 170 physicians per medical staff. Hospitals participating in the study reported the most frequent specialties or group of physicians, in order, as Family Practice, Hospital Based, Internal Medicine, other Surgical, other Medical, General Surgery, Pediatric Medicine, and Obstetrics.

Market Conditions

Question 1

What impact did the competition, as measured by the Herfindahl-Hirschman Index (HHI), within the county the hospital is located have on the hospital's operating profit?

When market competition, as defined by the HHI, ranked the hospital's operating profit, the comparison demonstrated a statistical significant negative correlation. The correlation among the study hospital's operating profit and the corresponding HHI demonstrated an inverse relationship. This inverse relationship was shown to hold a moderate strength relationship when evaluated using a Spearman's Rho Correlation Coefficient.

During the evaluation, a trend was noted relating to the type of market share competition hospitals experienced. Within

the study, hospitals with similar market share demonstrated a difference within the HHI score. Hospitals demonstrated a higher HHI index with fewer competitors if those competitors held greater market share individually. This differed from facilities with a greater number of competitors within the county, but one no competitor held concentrated market share. This observation leads to the suggestion that not only the amount of market competition, but also the nature of the competition impacts a hospital's profitability. In general, as the competition within a hospital's home county increases, the hospital's operating margin decreases, but hospitals with larger concentrations of market share (greater than 50 percentage) tend to retain their profitability.

Question 2

How does the economic health, as measured by the unemployment rate, of the county the hospital is located impact the facility's operating profit?

Evaluation of unemployment and a hospital's operating profit attempted to analyze the effect of a community's economic climate on hospital operations. Does the economic climate, as measured by unemployment, impact a hospital's ability to make an operating profit? Identified in the industry research, small, rural hospitals are closely linked with the communities in which they operate, and the economic health of the hospital and community is closely aligned (Berry & Seavey, 1994, Manos, 1999).

In this study, the relationship between a hospital's profit and the percentage of the population unemployed within the county the hospital is located demonstrated an insignificant and weak negative correlation. Although not statistically significant, the negative correlation does suggest a weak relationship. As unemployment increases within the county, the facility's operating profit decreases.

Management Decisions

Question 3

What impact did the Full Time Equivalent (FTEs) per occupied bed have on a facility's operating profit?

The research question attempted to evaluate and study the total amount of human resources that management decided was needed to meet business objectives and its impact on operating profit. This analysis was evaluated using a Pearson correlation. Staffing decisions are reflected within the industry as the number of FTEs per occupied bed. This ratio includes clinical and non-clinical or support personnel and is based on the average beds occupied.

Within this study, during 2000, no statistical significant relationship was observed between FTEs and a hospital's operating profit. Although the variable did not meet the probability criteria for the study, a small association was found, suggesting

that as FTEs increased the operating margin of a hospital decreased.

Question 4

What was the relationship between belonging to a multi-hospital system and the hospital's operating profit?

Many reasons may lead a small, rural hospital to consider joining a multi-hospital organization. Reasons may include capitalizing on the economy of scale and cost -savings achieved from this economy, management and clinical expertise and specialization, and potential protection from competition for primary, core services (Succi et al, 2001). Often a trade -off for these perceived benefits is some loss of autonomy at the local, community level. This research question evaluated a cross - sectional view of this relationship for operating profit for one year. Generalization from these findings must be made within this limitation.

The study found the majority of the hospitals in the study were freestanding facilities and did not participate in a multi - hospital system. The results of the analysis revealed no difference in the operating profit between hospitals operating as a member of a multi-hospital system and the hospitals remaining freestanding. It is reasonable to assume that this outcome might be different in a time -frame when market conditions were more favorable to reimbursement for medical services.

Physician Attributes

Question 5

How did the size of the medical staff impact the hospital's operating profit?

The analysis of the medical staff's impact on hospitals profit is stemmed by the hospital's primary role to provide resources for the physicians to deliver services for patients needing higher level of care than their office allows. This relationship gives rise to the question if simply the number of physicians a hospital has on its active medical staff impacts the facility's operating profit. Although a physician may be a member of more than one medical staff, this question evaluated the impact the total number of physicians a specific hospital had on staff without knowing if a particular physician actually admitted patients to its hospital. Hence, this finding is limited in scope and usefulness.

In this study, the number of medical staff were ranked ordered against operating profit of participating hospitals and were found to have a significant positive correlation. Analysis showed that during the study period, the greater the number of physicians on a hospital's medical staff, the higher the facility's operating margin. The analysis demonstrated a moderately high relationship between the variables. The results of the research suggests that the number of physicians has a

positive impact on a hospital's operating profit and is a moderate indicator of predicting a hospital's operating profit.

Question 6

What impact did the specialty mix of the medical staff have on the hospital's operating profit?

Question 5 evaluated the aggregate number of physicians on a hospital's medical staff. Question 6 expands the analysis and asks if the type of physician specialty impacts the operating profit compared to other physician specialties.

In this study, physicians' groups as reported by The Duke Endowment were ranked ordered and compared to the hospitals' operating profits. The analysis compared each group independently to the operating profit but no analysis was conducted grouping different specialties together. The correlation analysis demonstrated that within the study's population a positive relationship between a hospital's operating profit and Internal Medicine, Pediatric Medicine, Obstetrics, and General Surgery. This finding revealed that as the number of physicians within these specialties increased so did the operating profit. This relationship demonstrated a moderate strength association between operating profit given the number of physicians in any one of these specialties.

Although other specialties were not shown to be statistically significant to operating profit, a significant correlation was discovered between hospital based physicians and

operating profits. During this analysis, each physician specialty was correlated with every other specialty. This correlation produced a significant positive relationship between hospital - based physicians and a hospital having the staff specialties of Internal Medicine, Pediatrics, Obstetrics & Gynecology, and General Surgery. There appears to be a codependence of hospital - based physicians and the same physicians that had a positive relationship with profitability.

This relationship suggests that hospital -based physicians may support or provide the needed medical resources for physicians to build successful practices or provide care within the local hospital. The finding from this analysis suggests that hospital-based physicians are important in attracting the physicians that are shown to positively impact a hospital's operating profit.

CHAPTER V

SUMMARY OF FINDINGS, CONCLUSIONS, AND RECOMMENDATIONS

General

This chapter presents the study's summary of findings, conclusions, and recommendations. The purpose of the study was to investigate the relationship of the profitability to market conditions, management practices, and medical staff attributes of small, rural hospitals operating in North Carolina and South Carolina. The study utilized two questions for each of the three independent variables to measure the effect on a hospital's profit (See Figure 3-1, page 58).

To conduct this study, small, rural hospitals in the Carolinas that completed the 2000 Duke Endowment Annual Application for Assistance were selected. The study captured the year 2000 operating reports for 68% of all small, rural hospitals in the Carolinas. Hospitals were selected based on The Duke Endowment's definition of small hospitals consisting of facilities with less than 129 adjusted acute beds. Rural was determined utilizing the U.S. Census Bureau's criteria of hospitals located outside a Metropolitan Statistical Area (MSA) (US Census Bureau, 2002).

Data were collected from The Duke Endowment, US Census Bureau, Solicient, Inc., and the South Carolina Office of Research and Statistics. Cross-sectional data for 2000 were collected for the hospitals studied and reflected the operating environment, operations, medical staff, and hospital profit. Test statistics utilized in the analysis included Pearson Correlation, Spearman's Rho Correlation, and Student's T-test.

Summary of Findings

The previous chapter presented the results of the analysis of data available for 58 small, rural hospitals in the Carolinas for the year 2000. This population represented 68% of all small hospitals operating in the Carolinas. The hospital's margins averaged a negative .001 percent. How long can rural hospitals continue to operate when they are failing to break even?

An analysis was conducted to evaluate the correlation between a hospital's operating margin and the market conditions, management's decisions, and medical staff attributes (See Figure 3-1, page 58). In total, six questions were evaluated to describe and represent the three independent variables. In evaluating the first independent variable (market conditions), the dependent variable was independently examined with competition and the percent of the population unemployed. A statistically significant negative correlation between a hospital's operating profit and its competition within its county was demonstrated. In the

analysis of unemployment on a hospital's operating profit, the finding did not demonstrate a statistically significant correlation.

The next independent variable evaluated FTEs the hospital used and the decision to remain freestanding or to join a multi-hospital organization. For this analysis the number of individuals employed in the total operation of the hospital did not demonstrate a statistically significant correlation. The same finding was demonstrated by the decision to belong to a multi-hospital system using a student's t-test.

The last independent variable sought to evaluate medical staff attributes. This evaluation demonstrated several statistically significant correlations. First, a positive correlation was observed between the aggregate number of physicians on a hospital's medical staff and hospital profits. Larger medical staffs generated larger hospital profits. This analysis grouped all physicians and did not look at specialties or areas of practice. The second analysis divided physicians into nine groups or specialties to evaluate the correlation between each group and the hospital's profit. Physician specialties or groups that included Internal Medicine, Pediatricians, Obstetrics and Gynecology, and General Surgery all demonstrated positive correlation at $p < .05$. Specialties or groups that did not demonstrate significant correlation include Family Practice,

other Medical Physicians, other Surgeons, other Physicians, and Hospital Based Physicians.

Conclusions

The study evaluated three independent variables, in which two were statistically significant, market conditions and physician attributes. The third variable, management decisions, was not statistically significant using two questions consisting of FTEs per occupied bed and membership in multi-hospital system.

Based upon the analysis of data, six conclusions corresponding to the six research questions are:

1. As competition increases in the hospitals home county, profit decreases. However, hospitals having greater than 50 percent of market share hold steady their level of profit irrespective of small gains by their competitors.
2. As unemployment increases in the hospital's home county, profit tends to decrease. Although an indicator of the market in which a hospital is located, unemployment should not be used as a sole variable in evaluating market conditions or the economic health of the market place.
3. Larger medical staffs increase the likelihood of a hospital's profit and is a general indicator of good financial health.
4. Further, Internal Medicine, Pediatric Medicine, Obstetrics and Gynecology, and General Surgery are specialties which are associated with favorable operating margins. These four

specialties, when supported by hospital -based physicians, represent the most favorable combination of medical staff for increasing hospital profitability.

5. Management decisions regarding joining a multi -hospital system did not provide evidence of financial protection for the small, rural hospitals in this study for the year 2000.
6. The number of employees, as measured by FTEs per occupied beds did not show a significant change in the hospital's profitability.

Additional Observations / Conclusions

At a macro level the following observations / conclusions were extrapolated from the study:

1. Rural hospitals in the Carolinas are in financial trouble, with operating margins slightly below breakeven. This is in accordance with other studies looking at small, rural hospitals across the country (Broyles, Brandt, & Biard -Holmes, 1998; Chan, Feldman, & Manning, 1999; Saleh, Vaughn, & Rohrer, 2001; Buczeko, 2001).
2. Without the financial support of foundations like The Duke Endowment, hospitals in the Carolinas would be in greater financial trouble. Hence, the quality of rural healthcare has been insured and possibly improved for the citizens located in the supported regions.

3. Without continued and perhaps other outside assistance, there is no foreseeable reversal of this trend.
4. Movement to economic globalization, regional development, and relocation of manufacturing and textile industries negatively impact the financial ability of small, rural hospitals (Bull et al, 2001; Kinsella, 2001).
5. The success of small, rural hospitals are closely linked to the economic development of the community. The Board of Trustees and Chief Executive Officer must provide dynamic, active community leadership concentrating on economic development and revitalization processes. Special consideration needs to emphasize partnering of public health and private medicine to conserve resources and eliminate duplication of services (Baker, 2002; Schulte, 2002).
6. Hospitals with similar market share are affected differently given the degree of market concentration surrendered within the county. Hospitals experiencing a greater share (greater than 50 percent) of the market are less effected than hospitals which fail to capture a concentrated market share.
7. Hospital Based Physicians, usually did not have a direct significant impact on a hospital's operating margin. However, these physicians did have a positive impact on a hospital's profitability when combined with the four specialties reported by conclusion 4 on page 89.

Recommendations

The following recommendations were formulated:

1. Hospitals must evaluate and monitor the amount of competition within their county and identify facilities holding concentrated market share. When identifying marketing efforts, first priority should be given to addressing out-migration (drive-by) of patients from the county in which the hospital is located to facilities holding concentrated market share.
2. Analyses of multiple economic indicators are needed to evaluate the relationship between the economic success of the community and the hospital. Senior leadership of rural hospitals should become heavily invested in infrastructure revitalization within their local communities. Hospital leadership must avoid parochial views in considering a community's medical care needs and the method in which those needs are best met.
3. The Office of Inspector General (CMS-OIG) needs to allow exceptions for small, rural hospitals facilitating development of collaborative partnerships with their medical staff. Partnerships need to identify incentives that benefit the hospital, physician, and the community. Financial assistance and regulatory programs developed in the future should provide incentives to meet unmet critical services in rural communities. For example, funding for cardiovascular testing such as stress-testing, echo-cardiograms, and halter

monitoring. Current programs to assist hospitals identified as critical to the rural community need to be expanded to allow more options and flexibility than presently exist (e.g., merge, reduce services, or close) to maximize services and profitability.

4. Physician recruitment should be a priority for small, rural hospitals. Management and the Board of Trustees should invest resources for the recruitment of physicians. Attention should be given to developing a balanced, diverse medical staff instead of focusing only on the number of physicians on a hospital's medical staff. A proper mix of primary and hospital based physicians is essential for quality care and profitability.
5. Initiate studies that evaluate a broader aspect on each of the independent variables examined in the present study. Future studies that evaluate small, rural hospitals and their relationship with larger, non-rural, tertiary care hospitals should be conducted.

Summary

This chapter discussed the general overview, conclusions and recommendations generated by this study. The next chapter, Chapter VI, will include a review of the study in retrospect.

CHAPTER VI

STUDY IN RETROSPECT

Introduction

The importance of rural hospitals to the American healthcare delivery system is illustrated by the fact that rural facilities represent approximately 50 percent of all hospitals and 25 percent of all in-patient beds in the United States (Buczko, 2001; Saleh et al, 2001). A review of literature suggests, that in addition to operating efficiencies, changes in the social and economic environment in which the hospital operates impact a hospital's survivability. The organizational structure of small facilities, (less than 100 beds) with small medical staffs dominated by family practice and general surgeons contribute to the fragile nature of the systems, allowing little margin for poor administrative decisions (Buczko, 2001). This delicate balance places greater emphasis on the Board of Trustees facilitating a process that develops a collaborative relationship between the medical staff and administration.

Illustrated as early as the mid-1980's, declining utilization and changes in hospital payment systems placed considerable financial pressure on both urban and rural hospitals (Government Accounting Office [GAO], 1990; Saleh et al, 2001). Many healthcare providers were unable to adapt to these new

operating environments. For example, 260 hospitals closed between 1985 and 1988 after the new prospective payment system (PPS) was implemented by Congress (McKay & Coventry, 1994). The closures following this new policy suggest the new payment rates were below the facilities operating cost. Hence, the facility had no ability to generate operating profits. Efforts to reduce operating cost and make substantial financial turnarounds while continually trying to serve the community's best interest has created complex management situations (Hofmann, 2002).

High dependence on Medicare and the relatively low patient census make rural hospitals more financially vulnerable than their urban counterparts (Buczko, 2001; Bull, Krout, Rathbone - McCuan, & Shreffler, 2001). New cost -containment measures and the new "competitive healthcare market place" have required many rural healthcare facilities to reduce services, convert to another type of care, or close.

Rural facilities in the South most often operate in economically depressed or stagnate areas by the very nature of the community's fragile tax base and minimal corporate or manufacturing structure (Bull et al, 2001). Typically identified as one of the largest employers, rural hospitals have a major influence on the community's local economy (Berry & Seavey, 1994). Local hospitals provide economic advantages over communities without hospitals and may be a deciding factor in recruiting new industry.

Philosophical changes over the past 50 years, which shifted from viewing healthcare as a right to viewing it as an open competitive market where "the fittest" (cost-efficient) survive, often place these characteristics at odds with the current operating environment in which small, rural hospitals are located. Current market pressures direct decision making into competitive strategy designs. Pressure from the larger, urban-driven industry economies places rural hospital managers in a position requiring hard and focused decisions that must mesh with larger facilities.

The stress of the new operating environment is illustrated in the closing of over 300 rural hospitals during the 1990's. As reported by the American Hospital Association, 31 percent of rural hospitals report a negative operating margin (Broyles, Brandt, & Biard-Holmes, 1998). Rural hospitals must aggressively manage their competitive markets, financial needs, and delicately balance medical staff allocation to support the proper mix of primary care and medical specialization. Hospitals that are not able to balance this "strategic profile" are frequently trapped in a downward spiral of declining resources, competitive posturing, and tightening market forces. If hospital management fails to operate within the constraints of industry and financial resources then, market pressures may force reduction of services or closure. Good decisions and aggressive management of this complex environment is imperative in obtaining community trust,

stronger performance, improved staff efficiencies, and collaborative relationships between physicians and administration (Hofmann, 2002). Research needs have been identified in examining how rural facilities balance these opposing strategies, and they examine the relationship between the market conditions and the rural hospitals' response to allow for better decision -making and collaborative management.

Utility of the Study

In discussing the utility of the study to all rural hospitals consideration must be given to the complexity of the problem and the limited scope, resources, and time the study had in evaluating the issues. In the course of preparing, reviewing and conducting research for the study, a pattern emerged linking several characteristics of rural hospitals. This pattern, supported by the findings of the research, provided an initial framework in which broader generalizations were made. In reviewing the findings, conclusions, and recommendations of the study, rural hospitals are closely linked and affected by their community, medical staff, and the market in which the facility operates.

Supported by the findings, market competition does impact a rural hospital profitability. In evaluating the market competition, a general conclusion was drawn that in response to continued decreases in reimbursement and rising cost of services

urban hospitals in the Carolinas have spread their market strategies out to surrounding rural areas to compensate. This encroachment on the rural market mimics the "urban sprawl" and general economy's globalization. This places rural hospitals and their communities in a "catch 22" scenario of shrinking resources, fragile industrial base, and the loss of important human capital.

The importance of a rural hospital's medical staff is also supported by the research findings. The importance of recruiting physicians to rural communities is imperative for the profitability of the hospital and the health status of the community. Moreover, the loss of human capital and non-replaceable economic resources to globalization and urban markets make recruitment and retention of physicians more complex.

A review of the research findings begin to draw several common themes from the independent variables studied. These common elements begin to develop an interdependent rural health paradigm associating the profitability or success of rural hospitals with the local city and/or county infrastructure, the leadership of the local community, the local industries or economic development, and the healthcare provider (See Figure 6 - 1).

Rural Health Paradigm

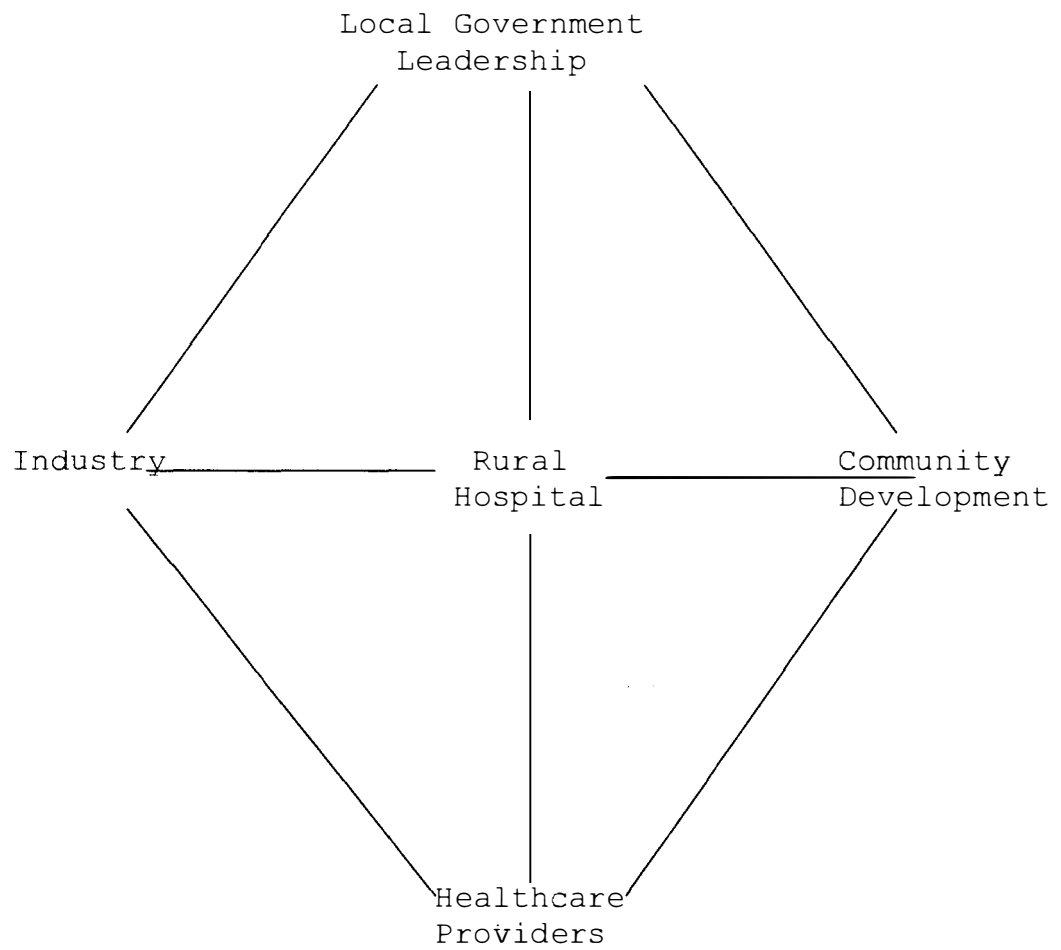


Figure 6-1: Rural Health Paradigm

In North Carolina, the most prominent example of this paradigm is illustrated in Bladen County Hospital's turnaround and success. The hospital won its fourth national award in 1999 being named as the National Rural Health Association Outstanding Rural Health Program. The hospital operates in a rural community of 28,000 in eastern North Carolina. Thirteen years ago, the hospital was in financial straits, vendors had the hospital listed on a "collect on delivery" status, the hospital had not been accredited in 20 years, its medical staff was down to four doctors, and it was 90 days from closing (Egger, 1999).

A new CEO, Leo Petit, implemented a series of strategies to regain financial viability to include physician recruitment, capital projects, collaborating with local government, industry, and other health care agencies in the county to create a rural health network (Lumsdon, 1995; Egger, 1999). The health network continues to collaborate projects within the county to develop a community education outreach program, "Healthwatch", and working on a fitness center combining the recreational and medical model.

Future Studies

Future research is needed to evaluate broader aspects of each independent variable. Evaluation of the three variables suggested a complex set of issues affecting the profitability of

small, rural hospitals. The breadth of the study limited the depth in which each variable was explored.

It is thought that all hospitals must share some common characteristics. Evaluation of the characteristics of small, rural hospitals to that of non-rural hospitals would provide insight to these shared elements. In addition, a study evaluating these two populations of hospitals may begin to identify the unique characteristics of each sub-set.

Elements within the community or environment the hospital operates have been identified through this study's conclusions suggesting they were linked in a paradigm with small, rural hospitals. This paradigm needs scientific evaluation to test its assumptions.

Final Thought

Through the financial assistance and leadership from foundations like The Duke Endowment and individuals like Jim Bernstein with the Office of Research, Demonstrations, and Rural Health Development, NC Foundation for Advanced Health Programs, Inc. hospitals in North Carolina and South Carolina have unique resources to find innovative approaches to the delivery of healthcare.

One of the most recent demonstrations of the capabilities of hospitals to develop community health models is with Swain County Hospital in Bryson City, North Carolina. Through

assistance from Jim Bernstein and The Duke Endowment, the leadership of this small critical access hospital (CAH) re-established a relationship with the county's infrastructure, the public health department, the medical staff, and the community.

Swain County Hospital is located in a small, mountainous community of 14,000 in Western North Carolina. The county's resources are limited due to a fragile economic base and high unemployment. In cooperation with Jim Bernstein and the North Carolina Hospital Association's Rural Health Center, leadership of the hospital brought community stakeholders together to discuss, design, and begin the implementation of collaborative programs that eliminate duplication. Also, the collaborative programs save the community and the hospital dollars while increasing services not available to the county in over ten years.

Other examples exist illustrating this rural health paradigm throughout the Carolinas. It is this type of leadership and vision that is demonstrated across the two states that maintain rural health services. Through these examples and study, senior leadership must broaden their understanding and knowledge of rural community dynamics and invest heavily in the infrastructure of their local communities to form partnerships linking the success of each together.

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VITA

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He started his professional career as a paramedic with Guilford County Emergency Medical Services (EMS) in January 1988. During his tenure with Guilford County he held several field and administrative positions to include Assistant EMS Director. In 1991, Mr. Isley received his Master of Business Administration from Elon University.

In 1995, he went to work with WestCare Health System in Sylva, NC as a Department Director where he initiated the only accredited hospital based EMS in North Carolina. In 1998 he was assigned to an Assistant Vice-President position and currently holds the position Vice-President of Strategic Services with WestCare. In his current position, Mr. Isley is a member of senior management with WestCare and has direct responsibilities for several clinical and support departments within the system. His position also has direct accountability for business planning, service line development, and strategic planning for the system. He is a member of the American College of Healthcare Executives.

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