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Home Healthcare and Performance: Development and Application of a Typology for Home Health Agencies

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HOME HEALTHCARE AND PERFORMANCE: DEVELOPMENT AND APPLICATION OF A TYPOLOGY FOR HOME HEALTH AGENCIES

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DOCTOR OF SCIENCE IN HEALTH SERVICES ADMINISTRATION

ABSTRACT

This three-paper dissertation sought to examine the existence of strategic groups in the home health industry, the application of Porter's generic strategies (cost leader, differentiator, "stuck-in-the-middle" and both cost leader/differentiator) in identifying these groups, and the association of group membership with agency performance. The findings of this study will provide researchers and managers with a highlight of the current strategic makeup of the home health industry and its relationship with quality and financial performance. The results of this dissertation provide some evidence that strategic groups do exist in the home health industry and can be described along the basis of Porter's generic strategies. Additionally, the results suggest that there is a relationship between group membership and quality and financial performance. Specifically, differentiators had better quality performance and higher operating revenue than cost leaders and stuck-in-the-middle agencies. Cost leaders had lower operating expenses than differentiators. In addition, both cost leader/differentiator agencies appeared to have the best overall performance. These agencies had a higher likelihood of being in the high tier of the quality star rating and were associated with higher percentages of patients who reported the most positive HHCAHPS reviews than all of the other groups. They also had higher operating revenue than the cost leader and lower operating expenses than the

differentiators. The findings of these studies will help home health agency leaders in strategic decision making.

Keywords: home health agency, home health, quality, financial performance, Porter's generic strategy

DEDICATION

This document is dedicated to my family, my mother Connie Evans, my father Roland Evans Jr., and my brother Roland (Trey) Evans III. Without the support of my wonderful family, I would not have made it this far.

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I would like to say thank you to my mother. She has managed to be an amazing mother and my best friend. I would like to thank my father who encouraged me to achieve this goal. I would like to thank my dissertation chair, Dr. Weech-Maldonado, for all of his advice, patience, and guidance. I would also like to thank my committee members, Dr. Burke, Dr. Grammas, Dr. Jablonski, and Dr. Metha, for being a part of this process. I would also like to thank my fellow Ph.D. students, Dr. William Opoku-Agyeman and Gani Davlyatov, for their advice and encouragement during this process. Finally, I would like to thank the Lord. Without Him none of this would be possible!

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INTRODUCTION

Home health agencies originated in the 19th-century under a tradition of religious benevolence provided by a group of women in Charleston, South Carolina. This group of women nurses provided care and household comfort (Buhler-Wilkerson, 2012). Over time, the demand grew. By the 20th-century approximately 600 organizations across the United States were sponsoring visiting nurses as a public health initiative (Murkofsky & Alston, 2009). The number of agencies then grew significantly from 1,100 in 1963 to a current estimation of 12,000 agencies (Centers for Disease Control and Prevention [CDC], 2016).

Although home health care existed long before the 1960s, the enactment of Medicare increased the growth of agencies significantly by making home care affordable to the elderly. These services were extended to people with disabilities in 1973 (Deans, 2004). Home health is a wide range of health care services provided in the home. It is defined as a system of services provided in the patients' home by nurses, speech and language therapists, occupational therapists, social workers, and physical therapists.

Home health is different from other clinical settings in that the work environment for clinicians involves less direct contact between clinicians. Clinicians work in the home of patients with administrative services provided from a central location. Communication between clinicians is usually conducted via telephone, fax, and email (National Association for Home Health Care & Hospice, 2017). These agencies aim to treat an illness or injury while helping the patient to become self-sufficient. Furthermore, home

health care is typically less expensive than, more convenient than, and as effective as hospital and skilled nursing care (Centers for Medicare & Medicaid Services, 2017). Home health agencies are crucial to the American healthcare system in that they provide an essential connection between institutional care and patient self-care (McCall, Korb, Petersons, & Moore, 2003). The goal of home health care is to slow the decline in functional health and increase the independence of home bound patients. Home health care originated as a method to facilitate earlier hospital release by acting as transitional care after hospitalization (Shaughnessy & Kramer, 1990).

Home health is among the fastest growing sectors in health care. Approximately, 12,000 home health agencies (HHAs) serve more than 4 million Medicare and Medicaid beneficiaries per year (Centers for Disease Control and Prevention [CDC], 2016). The potential role for home health care increased significantly in the past decades (Helbing, Sangl, & Silverman, 1992). This increase in use is partly due to the growing number of agencies (Hyatt & Hopkins, 2013). Furthermore, structural changes in health care such as the 1997 Balanced Budget Act that extended per-case payment methodologies to all types of post-acute care and the growth of managed care's incentives to decrease hospital stays have stimulated the demand for post-acute home services (McCall et al., 2003). This helped to bring focus to the role of home health care in care transition. Evidence began to emerge reflecting that home health care was effective in decreasing the length of stay of patients in earlier phases of their illness (Kenny, 1991; Kenney & Dubay, 1992; Shaughnessy & Kramer, 1990).

Furthermore, two critical changes were made in Medicare inducing the rapid growth of HHAs. First, chronic illness could not be the sole reason to deny a patient

coverage. Second, clinical evidence became required in order for a physician's prescription of home health care to be rejected (American Medical Association & American Academy of Home Care Physicians, 2007). Technological advancements have made it possible to provide many of the same care services provided in the hospital, in the home of patients (Murkofsky & Alston, 2009). The care provided in home is usually less costly and more convenient than institutionalized care. Considering these advantages of home care along with the growing preference to remain at home, home care is preferred over hospital or nursing home care (American Medical Association & American Academy of Home Care Physicians, 2007; Ng, Harrington, Musumeci, & Reaves, 2015).

An increasing number of patients require continued care at home. In 2012 alone, Medicare reimbursed 3.46 million beneficiaries in home healthcare. Approximately 65% of the home health care beneficiaries were 65 and older (Centers for Medicare and Medicaid Services [CMS], 2017). The use of home health care and associated expenditures is expected to increase as the elderly population grows (CMS, 2017). Thus, improving quality of care, improving outcomes of patient care, and cost-effectiveness are important areas of consideration in home health care (Berwick, Nolan, & Whittington, 2008).

The Medicare Payment Advisory Commission reports that HHAs are increasing in number and the health care expenditures associated with home health are increasing as well (CMS, 2017). However, HHAs are facing constraints due to Medicare budget reductions. Medicare is the largest payer source in home health care (Murkofsky & Alston, 2009). Home health care is significantly impacted by payer source. These

reductions can impact their ability to provide efficient and effective care by influencing strategic decisions made by the HHA.

In addition, there is an increasing interest in the quality of care provided in health care and in developing methods to continuously improve care (Dalby & Hirdes, 2008). There has been extensive research conducted in the long-term care and acute care sectors examining the relationship between quality and organizational characteristics such as staffing levels, size, ownership status, and accreditation (Aaronson, Zinn, & Rosko, 1994; Needleman, Buerhaus, Mattke, Stewart, & Zelevinsky, 2002). Little research has been conducted exploring the impact of the organizational structure of HHAs on quality. Studies found differences in patient outcomes for rural versus urban and for-profit versus non-profit for HHAs (Sutton, 2007). No literature has explored the influence of agency characteristics on quality and financial performance.

The ability of Home Health Agencies (HHAs) to serve this growing population depends significantly on agency characteristics that serve as valuable resources. Organizational characteristics such as size, ownership, location, and affiliation are associated with organization performance. Organizations vary from one another in these characteristics and in their ability to provide services efficiently and effectively (Ozcan, Luke, & Haksever, 1992). In addition, differences in outcomes exist among home health agencies. Studies report differences in the nature of care provided among rural versus urban HHAs (Sutton, 2007). Specifically, patients of rural agencies were significantly less likely to receive rehabilitative services such as physical, occupational, and speech therapy (Franco, 2004; Sutton, 2005).

However, the relationship between agency outcomes and characteristics other than location were not examined in these studies. In a study examining three different types of HHAs, patients in the for-profit community-based agency and the private hospital- based agency were more likely than patients in the public community-based agency to receive services that maximize agency revenue (Williams, Mackay, & Tomer, 1991). Furthermore, national data on HHAs suggest that the amount of services provided to enrollees is different for different types of HHAs (Sutton, 2007). Identifying the way in which agencies differ and how these differences impact performance can provide benefits to strategic planning within the agency.

Prior studies have not developed or used a typology of HHAs and have only explored individual characteristics of agencies. The concept of strategic groups has been used in the nursing home and hospital industries research to classify these organizations on the basis of specified characteristics. Theory suggests that HHAs may vary significantly on characteristics important to the operations of these organizations. This study aims to examine the variation in HHA strategic characteristics and to identify the existence of strategic groups within the HHA industry. This study proposes to develop and apply a strategic group typology for home health agencies.

Dissertation Contents

This dissertation consists of three distinct but related papers (See Figure 1) exploring the existence and influence of strategic groups in the home health industry. The first paper uses Porter's generic strategies to explore and identify strategic groupings among home health agencies. The second paper examines the relationship between strategic group membership and quality performance using the strategic group concept

and structure-process-outcome (SPO) framework. The third paper focuses on the relationship between strategic group membership and financial performance using the strategic group concept. Each paper is summarized in the following sections.

Paper 1: Developing a strategic group typology for home healthcare agencies

This study seeks to further understand the home health agency industry. Using the strategic group concept, this study explores the existence of strategic groups and the applicability of Porter's generic strategies in the home health industry. Additionally, this study explored the association of market and organizational characteristics with home health agency strategic groups. A cross sectional design using a national sample of Medicare-certified home health agencies for the year of 2015 with 7,715 was used to examine the purposed research questions.

Data were obtained from the Area Health Resource File (AHRF), Medicare Costs Reports, and Provider of Service File (POS). Natural groupings based on specific agency characteristics were examined using a hierarchal cluster analysis. This study provides a contribution to the home healthcare body of literature by assessing the applicability of Porter's generic strategies in developing a typology for home health agencies.

Paper 2: Home Healthcare and Quality: Application of a Typology for Home Healthcare Agencies

The purpose of this study was to examine the relationship between strategic group membership and quality performance. Using the strategic group concept and SPO, this study explores the relationship between quality measures and membership in the strategic groups emerged from the cluster analysis of paper one. A cross sectional design using a national sample of Medicare-certified home health agencies for the year of 2015 with 7,715 was used to examine this relationship. Data were obtained from the Area Health

Resource File (AHRF), Medicare Costs Reports, Home Health Compare, and Provider of Service File (POS). Multivariate relationships between group membership and likelihood of top tier quality star rating were examined using logistic regression analysis. In addition, multivariate relationships between group membership and measures of Home Health Care Consumer Assessment of Healthcare Providers and Systems were examined using multiple regression analysis with state and year fixed effects. This study provides a contribution to the home healthcare body of literature by assessing the influence strategic group membership has on quality performance.

Paper 3: Home Healthcare and Financial Performance: Application of a Typology for Home Healthcare Agencies

The purpose of this study was to examine the relationship between strategic group membership and financial performance. Using the strategic group concept, this study explores the relationship between financial measures and membership in the strategic groups emerged from the cluster analysis of paper one. A cross sectional design using a national sample of Medicare-certified home health agencies for the year of 2015 with 7,715 was used to examine this relationship. Data were obtained from the Area Health Resource File (AHRF), Medicare Costs Reports, and Provider of Service File (POS). Multivariate relationships between group membership and operating expenses per patient and operating revenue per patient were examined using multiple regression analysis. This study provides a contribution to the home healthcare body of literature by assessing the influence strategic group membership has on financial performance.

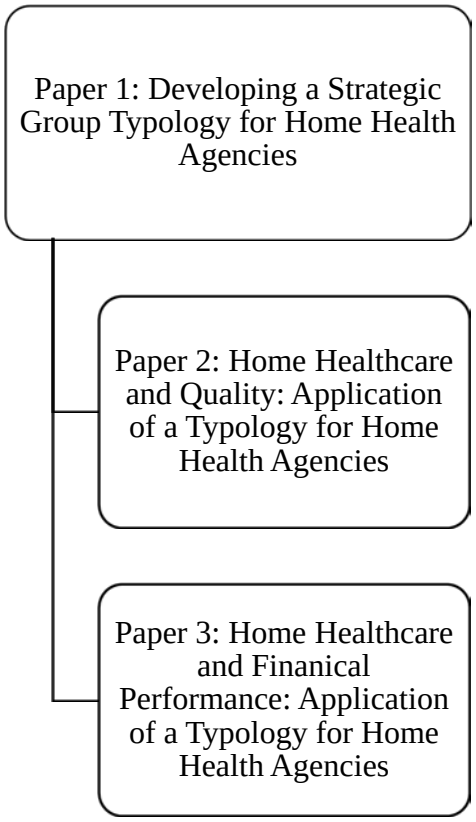

Figure 1. Depiction of three paper dissertation layout.

DEVELOPING A STRATEGIC GROUP TYPOLOGY FOR HOME HEALTHCARE AGENCIES

by

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DEVELOPING A STRATEGIC GROUP TYPOLOGY FOR HOME HEALTHCARE AGENCIES

Abstract

Background: Considering the growing interest in Home Health Agencies, an important area of examination relates to the strategic decisions made by agency leaders.

Purpose: Using Porter's generic strategies to explore the existence of strategic groups in the home health industry.

Methods: A secondary analysis of data on agency resource deployment and scope characteristics were combined with secondary agency market and organizational characteristics. Hierarchical cluster analysis was used to examine the existence of strategic group. The relationship between group membership and organizational and market characteristics were examined using ANOVA.

Results: Data from 7,715 agencies were explored in this analysis. A four cluster solution emerged yielding clusters of sizes: cluster 1=3,763, cluster 2=539, cluster 3=1,731, cluster 4=1,682. Cluster #1 was classified as the both cost leader and differentiator group with the second highest scope and second lowest resource deployment. Cluster #2 was classified the stuck-in-the-middle group with the second lowest scope and highest resource deployment. Cluster #3 was classified as the differentiator group with the highest scope and second highest resource deployment. Cluster #4 was classified as the cost leaders with the lowest resource deployment and lowest scope.

Conclusion: Using Porter's generic strategies, the results showed evidence that strategic groups exist in the home health industry. Furthermore, home health agency strategic group are significantly different based on market characteristics.

Introduction

Strategic groups are groups of organizations within an industry with similar strategies that differ from other groups within the same industry (Cool & Schendel, 1988). The concept of strategic groups was introduced into the industrial organization research stream to explain the performance differences among organizations competing in the same industry (Hunt, 1972; Newman, 1978). Hunt coined the term "strategic group" in an examination of the white goods appliance industry (Reger & Huff, 1993). Hunt found that organizations facing similar market pressures within an industry can be classified according to their strategic responses (Perryman & Rivers, 2011). The theory was expanded by Caves and Porter by introducing the notion that strategic groups are sets of organizations that are different from other sets of organizations in the industry that face the same threats and opportunities (Caves & Porter, 1977).

Furthermore, the theory of strategic groups posits that organizations within the same industry can make different strategic decisions and achieve better performance than those organizations with different strategies (Leask & Parker, 2007). This existence of various organizational strategies within an industry suggests the existence of strategic groups. Thus, the number of strategic groups within an industry reflects the number of distinctive strategies within that industry (Marlin, Sun, & Huonker, 1999). In the home health industry, agencies in a strategic group focusing on lowering costs may be distinct from agencies aiming to distinguish themselves by providing numerous care services (Porter, 1980).

This study explores the strategic group structure of home health agencies. Since Hunt's introduction of strategic group theory, there have been a number of studies

examining the existence of strategic groups, the formation of strategic groups, and strategic group membership's impact on organization performance. Prior studies in health care have explored strategic groups in hospitals, nursing homes, and hospice agencies (Castle, 2003; Ketchen, Combs, Russell, & Shook, 1993; Kirby, 2012; Zinn, Aaronson, & Rosko, 1994). However, to date there have been no studies examining the existence of strategic groups in the home health agency industry.

Home health involves a system of skilled services provided by nurses, occupational therapists, physical therapists, speech and language therapists, and social workers in the home of patients (American Association for Homecare, 2017). Home health is different from other clinical settings in that the work environment for clinicians involves less direct contact. Clinicians work in the home of patients with administrative services provided from a central location (National Association for Home Health Care & Hospice, 2017).

The goal of home health agencies is to support homebound patients in slowing the decline in functional health and encouraging independence (Murkofsky & Alston, 2009). A number of treatments provided in the hospital can also be provided in the home. Care provided in home is usually less costly and more convenient than care provided in an institutional setting such as the nursing home or hospital. Considering the technological advances in healthcare and the preference to remain at home, there is a growing preference among care providers for home care versus emergency room, hospital, or nursing home care (American Medical Association and American Academy of Home Care Physicians, 2007). Although the attention given to home health has and is increasing, these agencies have been facing threats to their ability to provide effective

care. It would be beneficial to agency strategic planning to identify strategies that lead to agency success in the face of constraints.

Purpose

The purpose of this study was to examine the existence of strategic groups among home health agencies (HHAs). This study will also determine if these groups can be classified along the basis of Porter's generic strategies (Cost Leader and Differentiator). The goal of this study is to develop a strategic group typology of home health agencies that can be used in future studies to examine the relationships between HHA strategic group membership and quality and financial performance.

Research questions.

1. Do strategic groups exist in the home health industry?
2. Can these groups be defined using Porter's generic strategies?

Conceptual Framework

Organizational configurations are groups of organizations within an industry that have similar characteristic make ups (Meyer, Tsui, & Hinings, 1993; Miller & Mintzberg, 1984). These configurations are comprised of clusters of organizational strategies, structures, and processes that frequently take place (Miller 1987; Miller & Friesen 1984; Miller & Mintzberg 1983; Ketchen, Thomas, & Snow, 1993). The clusters are complex and exhibit consistent patterns within the clusters that develop because the characteristics forming the clusters are dependent on each other. The factors that make organizations work are not any of its individual characteristics, but how these characteristics fit together and support each other in a systems-like manner (Lee et al., 2005).

Throughout the 1990s, numerous studies were conducted exploring the relationship between organizational configuration and performance in the healthcare industry (Perryman & Rivers, 2011). Some of these studies applied the concept of strategic groups (Marlin et al., 1999; Zinn et al., 1994). This concept proposes that organizations within an industry can be grouped on the basis of their strategic composition. Within an industry, organizations can be group by the strategic decisions the organizations make (Cool & Schendel, 1988).

Mobility barriers make it difficult for outside organizations to freely move into another strategic group. Organizations may face significant costs in attempting to imitate the strategic decisions made by other strategic groups (Caves & Porter, 1977). The existence of this barrier makes the strategic grouping of most industries relatively easy to identify (Zinn et al., 1994).

Strategic group theory posits that strategic group membership can predict performance outcomes (Cool & Schendel, 1988; McGee & Thomas, 1986; Oster, 1982; Thomas & Venkatraman, 1988). The theory also proposes that organizations in an industry face similar market forces and that differences in organizational performances are a consequence of differences in organizational capabilities (Hunt, 1970; Reger & Huff, 1993). Various studies have explored the relationship between strategic group membership and performance (Fiegenbaum & Thomas, 1990; McGee & Thomas, 1986). However, very few studies have been conducted in the health care industry (Zinn et al., 1994). This study aims to identify strategic group structure within the home health industry.

Strategic Factors and Strategic Groups: Scope and Resource Deployment

Strategic groups are formed based on similar combinations of scope and resource deployment (Cool & Schendel, 1988). Scope involves deciding in which market segment to compete and the types of services to offer (Marlin et al., 1999). Given that the market in any industry can be highly complex, dynamic, and turbulent, many organizations have become more innovative and seek to better fit their services with customer's needs (Deshpande, Farley, & Webster, 1993; Johnson & Selnes, 2004; Treacy & Wiersma, 1993; Neu & Brown, 2005).

On the other hand, resource deployment refers to labor, price, and capacity decisions (Zinn et al., 1994). It is the allocation of resources to functional areas that are essential to gaining competitive advantage. Labor costs account for majority of home health agency costs, therefore, the level and composition of staffing are significant indicators of resource deployment (Horen, 1983).

Studies have been conducted in the nursing home industry applying the strategic grouping concept. Like home health agencies, nursing homes face the same reimbursement mix and government imposed resource constraints across the industry, however, they respond to these forces in different ways (Perryman & Rivers, 2011). Strategic grouping studies in nursing homes show that strategic groups are based on scope and resource deployment variables. Two studies have identified seven strategic groups (Marlin et al., 1999; Zinn et al., 1994).

One of these two studies was conducted by Zinn and colleagues (1994) on nursing homes in Pennsylvania. In this study, seven strategic groups were identified using six scope and five resource deployment variables. The results of this study revealed

significant differences in performance among the seven groups. In the second study, Marlin and colleagues (1999) analyzed data on nursing homes in Florida finding significant performance differences between seven strategic groups. The groups were identified using eight scope and seven resource deployment variables. This study proposes that using the strategic group model to explain strategic behavior in the home health industry should be based on scope and resource deployment decisions (Cool & Schendel, 1987).

Organizational Strategy and Strategic Group Membership

An agency's membership in a strategic group is dependent on the strategic decisions made by the organization. There are two generic strategies identified by Porter (1980) by which organizations can achieve competitive advantage: low cost leadership or differentiation. The pursuit of these organizational strategies has implications for scope and resource deployment decisions.

Cost leadership refers to pursuing lower costs for services provided as compared to competitors (Porter, 1980). Organizations allocate or deploy resources to their functional areas in order to identify and exploit the resources of cost advantage. Resource deployment involves gaining and maintaining competitive advantage through the allocation of resources to functional areas (Horen, 1983).

In differentiation, an agency will aim to gain competitive advantage by setting itself apart from other agencies in areas most valued by patients. The agency will identify characteristics that patients perceive as important and position itself to meet patients' needs. Agencies are able to set higher prices for their uniqueness. Literature reflects that organizations may differentiate themselves by way of focusing on scope. Scope refers to

strategic decisions that indicate the organization's position in the market. Scope decisions include choosing the types of services the organization will provide. Zinn and colleagues reported that nursing homes within the same market may compete based on the scope of services provided (Zinn et al., 1994).

The scope measures of interest for this study include the percent of visits by service type. This involved a measure of total visits by service type and total visits overall. Service types of interest include: skilled nursing care, physical therapy, occupational therapy, speech pathology, medical social work, and home health aide. Resource deployment was measured by the number of FTEs by service type per 1,000 visits. The service types of interest include: skilled nursing care, physical therapy, occupational therapy, speech pathology, medical social work, and home health aide. Medicare costs reports provide the number of patient visits per agency. These services are those typically offered in home health agencies. Variation in these scope and resource deployment measures reflects Porter's generic strategies behaviors.

Based on resource deployment and scope decisions, we expect four strategic groups to emerge among HHAs (See Figure 1 & 2):

1. *Cost leaders* – Cost leaders have low scope and low resource deployment. Agencies in this cluster are expected to have lower mean staffing levels and visits by service type. The staff of interest in this study included those associated with home health agency clinical operations: registered nurses, home health aides, occupational therapists, physical therapists, and medical social workers, and speech pathologists. Considering that labor and service provision costs account for a substantial portion of home health agency costs, these scope and resource

deployment measures are key indicators of strategic group membership (Unruh, 2001).

2. *Differentiators* – Differentiators have high scope and high resource deployment. Agencies in this cluster are expected to expend more resources on service provision. These agencies are expected to have a higher mean visit and staffing level by service type. Services of interest include occupational therapy, physical therapy, speech therapy, medical social work, direct nursing, and home health aide. Organizations tend to add more services to their service offerings as part of their differentiation strategy (Gebauer, Edvardsson, Gustafsson, & Witell, 2010; Neu & Brown, 2005; Oliva & Kallenberg, 2003).
3. *Both cost leader and differentiator* – agencies in this cluster are expected to have a lower number of staff members and a higher mean visit by service type. Empirical evidence supports the existence of organizations that score high on both cost leadership and differentiation strategies (Yamin, Gunasekaran, & Mavondo, 1999).
4. *Stuck-in-the-middle* – stuck-in-the-middle agencies have low scope and high resource deployment. Agencies in this cluster are expected to have a lower number of staff members and lower mean visit by service type. Porter (1980) defined stuck-in-the-middle organizations as those with no clear focus on any of the two generic strategies. The author suggested that because of the lack of focus on any of the two generic strategies, stuck-in-the-middle organizations will perform poorer than organizations with one of the two strategic focuses (Porter, 1980). Furthermore, empirical studies reflect the existence of organizations that

score low on both cost leadership and differentiation strategies (Dess & Davis, 1984; Yamin et al., 1999).

Methods

Data Source

The study utilized secondary data from several sources, including the Healthcare Cost Report Information System (HCRIS), Provider of Service File (POS), and Area Health Resource File (AHRF) data. The Healthcare Cost Report Information System from Centers for Medicare and Medicaid Services (CMS) provided information on organization characteristics, utilization, and costs for Medicare-certified providers. The Provider of Service dataset from CMS provided quarterly information regarding characteristics of home health agencies (CMS, 2017). Finally, the Area Health Resource File provided the county level information on health facilities, environmental and socioeconomic characteristics (Agency for Healthcare Research and Quality, 2017). Based on a national sample of Home Health Agencies, our study utilized data from 2015; this was because of data availability. Data from 2015 were the most complete and inclusive of all variables of interest across all datasets.

Sample

The analysis sample included 7,715 agencies. The POS included 24,260 agencies. The sample was limited to only agencies that reported to Medicare Costs Reports. Once merged, the sample included 10,707 agencies. A total of 476 observations in the sample were dropped due to qualifying as a hospice agency. In addition, only agency facility type of official health agency and other were included. Hospital, skilled nursing facility, rehabilitation facility, visiting nurse association, and combination government voluntary

based agencies were not included resulting in a 2,252 reduction. This resulted in the reduction of the number of home health agencies used in the cluster analysis to 7,715 agencies.

Operationalization (Measures)

The variables of interest are described in Table 1 and Table 2. Scope was measured by the percent of visits by service type. Medicare Costs Reports provides a measure of total visits by service type and total visits overall. Service types of interest include: skilled nursing care, physical therapy, occupational therapy, speech pathology, medical social work, and home health aide. These services were used to create the variable indicating percentage of visits by service type.

Resource deployment was measured by the ratio of FTEs by service type per 1,000 visits. The service types of interest included: skilled nursing care, physical therapy, occupational therapy, speech pathology, medical social work, and home health aide. Medicare costs reports provided the number of patient visits per agency. The number of FTE staff for these service types were divided by the total number of visits and multiplied by 1000.

We also examined organizational and market differences across the identified cluster groups. Organizational characteristics of interest included state, location, and ownership. These variables were provided by the POS file. This location variable consists of urban or rural. Urban is defined in POS as populations of more than 2,500. Rural is defined as populations of less than 2,500. Ownership includes: voluntary non-profit – religious affiliation, voluntary non-profit – private, voluntary non-profit – other, proprietary, and government – state/county (CMS, 2017). This variable was collapsed to

include for-profit, non-for-profit, and government. Market characteristics of interest were provided by AHRF and include percent of population 65 years or older, percent of population 65 years or older without insurance, and Medicare managed care penetration.

Analysis

The analysis was conducted at the HHA level utilizing cluster analysis to develop a typology of Home Health Agency strategic groups. The cluster analysis was used to identify homogenous groups of variable cases on the selected characteristics. Cluster analysis allowed for defining groups of Home Health Agencies based on their characteristics. The analysis groups agencies into clusters so that agencies within the same cluster are more similar to one another than they are to agencies in different clusters. It aims to maximize homogeneity within agency clusters while simultaneously maximizing the heterogeneity between agency clusters (Hair, 2006). Thus, when plotted, agencies within clusters are closer together and different clusters are farther apart. The focus of clusters analysis is on comparing agencies based on a group of specified variables. The clusters that emerge reflect the structure of the data and are defined by the specified variables. The selection of clustering variables in this study was based on Porter's generic strategies.

The clustering variables included measures of scope and resource deployment. Cluster analysis has been employed in a variety of disciplines, including biology, marketing, and organizational research, mostly used to identify typology. A typology is a theoretically based classification which is the ultimate goal of this study. The cluster analysis used in this study is to confirm the existence of Porter's generic strategic grouping among home health agencies (Hair, 2006).

A hierarchical cluster analysis method was used in this study. In this method, cluster solutions are formed in a stepwise manner. The Ward's Minimum Variance method was applied in the hierarchical cluster analysis. It is an agglomerative approach where each agency starts as its own cluster and agencies are paired as they move up the hierarchy. Ward's method begins with all agencies as a cluster of size 1 and continues until all observations are included into one cluster. A criterion of the Ward's minimum variance method is to minimize the total within-cluster variance and the similarity between clusters is the sum of the squared differences of each observation from the overall mean within the clusters summed over all variables (Hair, 2006).

K-means cluster analysis was performed to assess cluster validity. This method works as a repetitive process that assigns each observation to one of K groups based on the outlined scope and resource deployment measures. In order to ensure reproducibility of results, we used the option to pick k of the observations at random as the initial group centers. We also supplied a random-number seed for reproducibility and added the keepcenters option so that the means of the four groups were added to the bottom of the dataset (Makles, 2012).

This study used Analysis of Variance (ANOVA) to examine the differences in market factors across the newly identified strategic groups. A chi-square analysis was used to examine the differences in organizational characteristics across the identified strategic groups. All statistical analysis was conducted using STATA 13.1 at the 95% confidence level.

Results

A four-cluster solution was determined. The partitioning resulted in 4 clusters reflecting Porter's Generic strategies. The clusters were then categorized according to Porter's generic strategies. Clusters were identified as differentiator, cost leader, both differentiator and cost leader, and stuck-in-the-middle. The definitions of these identifiers are shown in Figure 2.

The results of the hierarchal cluster analysis are displayed in Table 3. Cluster #1 (N=3,763) was classified as the both cost leader/differentiator group with the second highest scope and second lowest resource deployment. These home health agencies had the highest mean patient visits per service type and the second lowest mean staff FTE per patient visits. Cluster #2 (N=539) was classified as the stuck-in-the-middle group with the second lowest scope and highest resource deployment. These agencies had a higher mean staff FTE per patient visits which disqualifies this group as cost leaders and a lower mean patient visits per service type which disqualifies this group as a differentiator. Cluster #3 (N=1,731) was classified as the differentiator group with the highest scope and second highest resource deployment. This cluster had second highest mean patient visits per service type and the second highest mean staff FTE per patient visits. Cluster #4 (N=1,682) was classified as the cost leaders with the lowest resource deployment and lowest scope. This group had the lowest mean staff FTE per patient visits and lowest mean patient visits per service type.

The K-means cluster analysis results mirrored those of the hierarchal cluster analysis (See Table 4**)**. Cluster #1 (N=2,587) was classified as the differentiator with the second highest scope and highest resource deployment. Cluster #2 (N=772) was

classified as the stuck-in-the-middle group. This cluster had the second lowest scope and second highest resource deployment. Cluster #3 (N=1,770) was classified as the cost leader because it had the lowest resource deployment and lowest scope. Cluster #4 (N=2,586) was classified as the both differentiator and cost leader group with the highest scope and second lowest resource deployment.

Chi-square analysis reflected differences across clusters in terms of location and ownership. Cluster #4 (cost leaders) had a higher proportion of urban HHAs, while Cluster #2 (stuck-in-the-middle agencies) had a higher proportion of rural HHAs. Cluster #3 (differentiators) had a higher proportion of for-profit agencies, while Cluster #2 (stuck-in-the-middle agencies) had a higher proportion of governmental and not for-profit agencies. The ANOVA test identified that the clusters were significantly different from each other on percent of population 65 years or older, percent of population 65 years or older without insurance, and Medicare managed care penetration (See Table 5). Cluster #4 (cost leaders) had the highest mean percent of the population enrolled in Medicare Advantage. Cluster #3 (differentiators) had the highest mean percent of the population over 65 without insurance, and Clusters #1 and #2 (both cost leader/differentiators and stuck-in-the-middle agencies) had the highest mean percent of the population over 65.

Discussion

The results of this study supported the existence of strategic groups. Using strategic decisions of resource deployment and scope, this study reflects that home health agencies can be group based on how they provide services and use their resources. The advantage of using visits and staffing by service discipline is the practical applicability. Management can decide resource allocation and what services to provide. Agency

operations are significantly influenced by decisions of how to provide service and use resources. The agency's decisions to balance resource deployment and scope are a significant component of their overall strategy.

Studies have found the existence of Porter's strategies in the nursing home and hospital industry (Marlin et al., 2002; Zinn et al., 1994). However, there are currently no home health agency studies that have attempted to define strategic groups using Porter's generic strategies. The results of this study identified all four of the strategic groups listed in the hypothesis (differentiator, cost leader, both cost leader and differentiator, and stuck-in-the-middle). As expected, the differentiator group had a high proportion of staff per service discipline and visits per service discipline. This group had the second highest proportion of staff per service discipline and visits per service discipline. This reflects that this group seeks revenue generation by providing a higher amount of services. This group also had a higher proportion of for-profit agencies and a higher mean percent of population aged 65 and older without insurance.

The both cost leader and differentiator had a low proportion of staff per service discipline and a high proportion of visits per service discipline. This group had the highest scope and second lowest resource deployment. This demonstrates that this group's strategy was to pursue revenue generation while maintaining cost control. The stuck-in-the-middle group had a high proportion of staff per service discipline and a low proportion of visits per service discipline. This group did not demonstrate a cost leader or differentiator strategy. This group had a higher proportion of rural, not for-profit, and governmental agencies. In addition, this group had a higher mean percent of population aged 65 and older.

The cost leader demonstrated to be the best defined of all the clusters. It had the lowest proportion of staff per service discipline and visits per service discipline. A lower proportion of staff per service discipline indicates a cost leader because it suggests that the agency attempts to control costs by lowering staffing levels. Given that staffing costs makes up a significant portion of agency costs, lowering staffing levels can be an effective means to lowering costs. In addition, a lower proportion of visits per service discipline indicate that this group also controls costs by providing a lower amount of services. In addition, this group had a higher proportion of urban agencies and higher mean percent of Medicare managed care penetration.

Managerial Implications

Management facilitates the application of strategy within their organization. Identifying effective strategies that can improve their performance should be of interest. Strategic group theory posits that organizations face significant barriers when trying to move from one strategic group to another (Porter, 1980). It would require a large investment to increase service provision or hire additional staff. Identifying and acknowledging these barriers when they exist could aide in finding alternative ways to address suboptimal performance that could result from low staffing levels and few revenue generating services.

Policy Implications

Considering the increase in home health agency use and the interest in controlling healthcare costs, state and federal governments are interested in agency funding and the level of care provided. This study demonstrates some evidence of some agencies have strategies directed toward better quality care than others.

Limitations

There were a few limitations that emerged during this study. First, this study only included agencies reported in the Medicare Costs Reports. This limits generalizability. Second, the study only included the parenting location of the agency and not its individual sites. Given that some agencies are located across states these agencies could have separate and distinct strategies to deal with differing external influences. Another limitation was that this study could not identify nursing services that were more intensive or costly than others. It would have been beneficial to identify the concentration of patients with specialty care needs. Agencies providing care to patients with specialty care needs could be implementing strategies not outlined by Porter's generic strategies. In addition, the chi-square analysis results showed that there may be dependency between location and ownership and group membership. This study also used cross-sectional data, thus, the reader should be aware when trying to conclude a causal relationship.

Conclusion

This study demonstrated that strategic groups exist within the home health agency and can be classified on the basis of Porter's generic strategies. The question now is if there is a relationship between strategic group membership and quality and financial performance.

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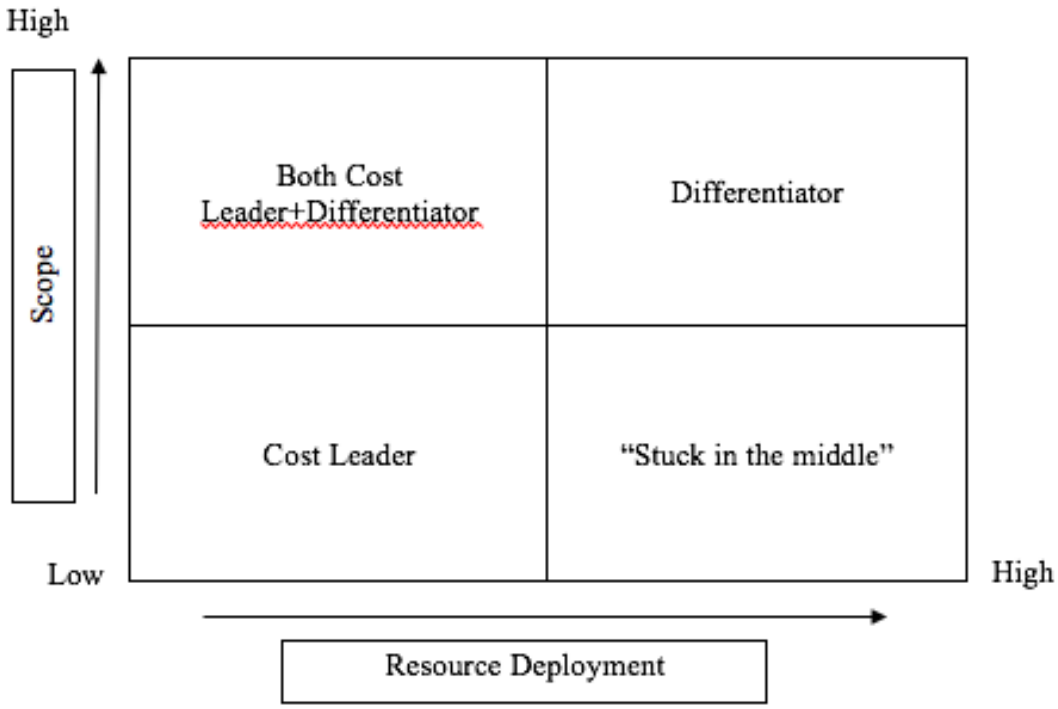


Figure 1. Depiction of Porter's Generic Strategy and Resource Deployment/Scope.

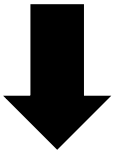
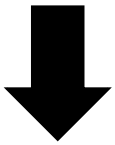
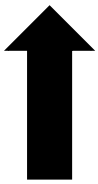
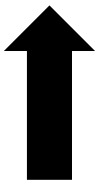
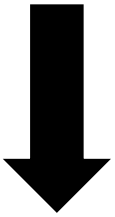
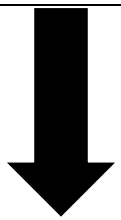
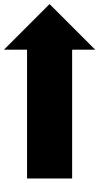
	Scope	Resource Deployment
Cost leader • Agencies in this cluster are expected to have a lower mean staffing levels and visits by service type		
Differentiator • Agencies in this cluster are expected to have a higher mean staffing levels and visits by service type		
Both • Agencies in this cluster are expected to have a lower mean staffing levels and visits by service discipline and higher mean staffing levels and visits by service type		
Stuck-in-the-middle • Agencies in this cluster are expected to have a higher mean staffing levels and lower mean visits by service type		

Figure 2. Depiction of grouping identifiers and definitions.

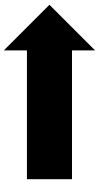
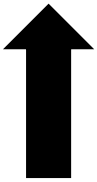
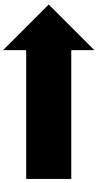
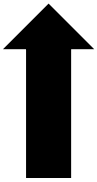
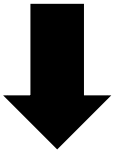
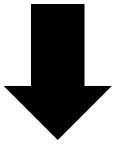
	Scope	Resource Deployment
Cluster 1 Both • Agencies in this cluster are expected to have a lower mean staffing levels by service discipline and higher mean visits by service type		
Cluster 2 Stuck-in-the-middle • Agencies in this cluster are expected to have a higher mean staffing levels and lower mean visits by service type		
Cluster 3 Differentiator • Agencies in this cluster are expected to have a higher mean staffing levels and visits by service type		
Cluster 4 Cost leader • Agencies in this cluster are expected to have a lower mean staffing levels and visits by service type		

Figure 3. Depiction of Hierarchical Cluster Analysis results.

Table 1

List of Clustering, Organizational, and Market Variables and Definitions

Variables	Definition	Data Source
Scope Variables		
Percent of Home Health Aide Visits	The total number of home health aide service visits divided by the total number of visits	Medicare Costs Reports
Percent of Medical Social Work Visits	The total number of medical social work service visits divided by the total number of visits	Medicare Costs Reports
Percent of Occupational Therapy Visits	The total number of occupational therapy service visits divided by the total number of visits	Medicare Costs Reports
Percent of Physical Therapy Visits	The total number of physical therapy service visits divided by the total number of visits	Medicare Costs Reports
Percent of Skilled Nursing Visits	The total number of skilled nursing service visits divided by the total number of visits	Medicare Costs Reports
Percent of Speech Pathology Visits	The total number of home speech pathology service visits divided by the total number of visits	Medicare Costs Reports
Resource Deployment Variables		
Total Home Health Aide FTEs per 1000 visits	The number of full-time equivalent home health aides divided by the total number of visits then multiplied by 1000	Medicare Costs Reports
Total Medical Social Workers FTEs per 1000 visits	The number of full-time equivalent medical social workers divided by the total number of visits then multiplied by 1000	Medicare Costs Reports
Total Occupational Therapists FTEs per 1000 visits	The number of full-time equivalent occupational therapists divided by the total number of visits then multiplied by 1000	Medicare Costs Reports
Total Physical Therapists FTEs per 1000 visits	The number of full-time equivalent physical therapists divided by the total number of visits then multiplied by 1000	Medicare Costs Reports
Total Direct Nurse FTEs per 1000 visits	The number of full-time equivalent direct nurses divided by the total number of visits then multiplied by 1000	Medicare Costs Reports
Total Speech Pathologists FTEs per 1000 visits	The number of full-time equivalent speech pathologists divided by the total number of visits then multiplied by 1000	Medicare Costs Reports

Variables	Definition	Data Source
Organizational Variables		
Location	Indicates whether the agency is in an urban or rural area	Provider of Service File
Ownership	Indicates whether the agency is a for-profit, not-for-profit, or government owned agency	Provider of Service File
State	Indicates the state in which the agency operates	Provider of Service File
Market Variables		
Percent of population 65 years or older	Percentage of total resident population age 65 years or older	Area Health Resource File
Percent of population 65 years or older without insurance	Total percentage of resident population over 65 without health insurance	Area Health Resource File
Medicare managed care penetration	The ratio of Medicare Advantage Plan enrollees over eligible Medicare individuals multiplied by 100	Area Health Resource File

Table 2
Descriptives of Clustering Variables (N=7,715)

Variables	***Mean (SD)***
Clustering Variables	
Scope	
Percent of Home Health Aide Visits	10.14 (15.03)
Percent of Medical Social Work Visits	0.36 (0.77)
Percent of Occupational Therapy Visits	3.75 (5.15)
Percent of Physical Therapy Visits	20.52 (17.39)
Percent of Skilled Nursing Visits	41.55 (27.33)
Percent of Speech Pathology Visits	0.68 (1.66)
Resource Deployment	
Total Home Health Aide FTEs per 1000 visits	0.19 (3.91)
Total Home Medical Social Work FTEs per 1000 visits	0.003 (0.06)
Total Occupational Therapy FTEs per 1000 visits	0.03 (0.03)
Total Physical Therapy FTEs per 1000 visits	0.23 (5.22)
Total Skilled Nursing FTEs per 1000 visits	1.16 (18.74)
Total Speech Pathology FTEs per 1000 visits	0.001 (0.05)

Table 3
Hierarchical Cluster Analysis Results of Scope and Resource Deployment Measures

	Scope						Resource Deployment					
Cluster	**% of Home Health Aide Visits**	**% of Medical Social Work Visits**	**% of Occupational Therapy Visits**	**% of Skilled Nursing Visits**	**% of Physical Therapy Visits**	**% of Speech Pathology Visits**	**Total Home Health Aide FTEs per 1000 visits**	**Total Medical Social Worker FTEs per 1000 visits**	**Total Occupational Therapists FTEs per 1000 visits**	**Total Physical Therapists FTEs per 1000 visits**	**Total Direct Nursing FTEs per 1000 visits**	**Total Speech Pathologists FTEs per 1000 visits**
Both Cost leader+ Differentiator 1 n=3,763	8.763	0.577	6.622	46.117	34.831	1.225	0.016	0.002	0.01	0.041	0.054	0.003
Stuck-in-the-middle 2 n=539	52.863	0.15	1.975	33.34	9.21	0.313	2.114	0.021	0.307	2.35	13.295	0.00009
Differentiator 3 n=1,731	9.588	0.290	1.690	74.190	13.789	0.284	0.171	0.003	0.032	0.197	0.904	0.00005
Cost leader 4 n=1,682	0.111	0.002	0.0336	0.365	0.134	0.006	0.001	0.000003	0.00002	0.00006	0.0006	0.000003

Total n=7,715	10.143	0.357	3.754	41.548	20.512	0.684	0.194	0.003	0.033	0.228	1.158	0.001

Table 4.
K-means Analysis Results of Scope and Resource Deployment Measures

	Scope						Resource Deployment					
Cluster	**% of Home Health Aide Visits**	**% of Medical Social Work Visits**	**% of Occupational Therapy Visits**	**% of Skilled Nursing Visits**	**% of Physical Therapy Visits**	**% of Speech Pathology Visits**	**Total Home Health Aide FTEs per 1000 visits**	**Total Medical Social Worker FTEs per 1000 visits**	**Total Occupational Therapists FTEs per 1000 visits**	**Total Physical Therapists FTEs per 1000 visits**	**Total Direct Nursing FTEs per 1000 visits**	**Total Speech Pathologists FTEs per 1000 visits**
Differentiator 1 n=2,587	8.545	0.397	2.594	69.681	17.997	0.460	0.286	0.004	0.068	0.516	2.843	0.001
Stuck-in-the-middle 2 n=772	46.6	0.192	2.277	36.769	11.125	0.409	0.899	0.007	0.034	0.278	1.738	0.0001
Cost leader 3 n=1,770	0.523	0.012	0.197	1.188	0.64	0.053	0.002	0.001	0.006	0.016	0.024	0.002
Both Cost leader+ Differentiator 4 n=2,586	7.456	0.603	7.79	42.444	39.429	1.422	0.024	0.002	0.017	0.071	0.077	0.001

Total n=7,715	10.143	0.357	3.754	41.548	20.512	0.684	0.194	0.003	0.033	0.228	1.158	0.001

Table 5

Organizational and Market Factors Associated with Home Health Agencies Cluster Groups (Chi-square and ANOVA Results)

Variables	**Clusters**					**p**
	Both cost leader+differentiator	**Stuck-in-the-middle**	**Differentiator**	**Cost leader**	**Chi-square**	
	Frequency (%) or Mean (SD)					
Organizational						
Location					97.09	<0.001
Rural	481 (12.79%)	110 (20.41%)	146 (8.45%)	120 (7.13%)		
Urban	3,281 (87.21%)	429 (79.59%)	1,581 (91.55%)	1,562 (92.87%)		
Ownership					38.45	<0.001
Government	143 (3.8%)	26 (4.82%)	25 (1.44%)	54 (3.21%)		
Not for-profit	108 (2.87%)	21 (3.9%)	28 (1.62%)	48 (2.85%)		
For-profit	3,512 (93.33%)	492 (91.28%)	1,678 (96.94%)	1,580 (93.94%)		
Market					**ANOVA**	
Percent of population 65	13.99[3,4] (4.09)	14.08[3,4] (4.12)	12.25* (3.11)	13.01* (3.72)	F=90.89	<0.001

years or older						
Percent of population 65 years or older without insurance	15.43[3,4] (5.28)	15.36[3] (6.58)	18.99* (6.53)	14.881,[3] (6.68)	F=169.69	<0.001
Percent of Medicare managed care penetration	32.28* (12.49)	30.25* (13.59)	34.9* (12.22)	37.06* (11.88)	F=73.18	<0.001

***Significantly different from all clusters. Superscript is significantly different from identified clusters.**

HOME HEALTHCARE AND QUALITY: APPLICATION OF A TYPOLOGY FOR HOME HEALTHCARE AGENCIES

by

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HOME HEALTHCARE AND QUALITY: APPLICATION OF A TYPOLOGY FOR HOME HEALTHCARE AGENCIES

Abstract

Background: Given the potential benefits for strategic planning, an important area of examination relates to the relationship between strategic group membership and quality performance.

Purpose: To explore the relationship between strategic group membership and quality among home health agencies.

Methods: A secondary analysis of data on agency quality measures were combined with secondary agency market and organizational characteristics. Logistic regression and general linear regression was used to examine the relationship between group membership and quality performance.

Results: Data from 7,715 agencies were explored in this analysis. The differentiator group had a higher likelihood of being in the high tier of the quality star rating and was associated with higher percentages of patients who reported the most positive HHCAHPS reviews than cost leaders and stuck-in-the-middle agencies.

Conclusion: This study indicates that there may be a relationship between strategic group membership and care quality. Differentiators showed to perform better on quality than cost leaders and both cost leader/differentiators showed to perform better than all other groups.

Introduction

Home health care involves post-acute care services delivered in the home of patients. These services include skilled nursing care, occupational therapy, speech therapy, medical social services, physical therapy, and home aide assistance (Dey et al., 2011). Home care allows patients to regain strength, power, and independence in their homes (Hughes et al., 1997). Often serving as a replacement for or continuation of long-term care, home healthcare is one of the most rapidly growing sectors of healthcare (Hirdes et al., 2004). This growth is due in part to the changing preferences and growth of the elderly population (Greene, Ondrich, & Laditka, 1998; Hux et al., 1998; Weissert, Lesnick, Musliner, & Foley, 1997). Over the years, an increasing number of people have begun to prefer to remain in their homes rather than be institutionalized as their capabilities diminish (Shaughnessy et al., 2002).

There is an increasing interest in the quality of care provided in health care and in developing methods to continuously improve care (Dalby & Hirdes, 2008). Two ways to assess HHA quality included the use of Home Health Compare quality star ratings and Home Health Care Consumer Assessment of Healthcare Providers and Systems (HHCAHPS) patient experience. However, few research studies exist exploring quality in home healthcare agencies (HHAs). Studies in other sectors of health care examining factors influencing quality have found that ownership, staffing levels, size, and accreditation are associated with measures of quality (Hillmer, Wodchis, Gill, Anderson, & Rochon, 2005; Miller et al., 2005; Porell & Caro, 1998). The influence of organizational characteristics on quality can be explored through the use of the strategic group concept. This concept posits that organizations within an industry can be grouped

on the basis of their strategic structures and these groupings can be used to explain variation within industry performance (Cool & Schendel, 1988).

There is little research examining factors influencing HHAs performance on quality (Dalby & Hirdes, 2008). This paper applied a typology for HHAs. This typology was used to find an association between the performance in quality and different strategic groups of HHAs. The following section explores the literature around quality in home healthcare. A discussion of the conceptual framework supporting the proposed study is then presented and followed by the proposed methods.

Background

Home health is among the fastest growing sectors of health care. With around 12,000 agencies, HHAs serve approximately 4.5 million Medicare and Medicaid patients per year (CDC, 2017; Henderson, 2012; MedPAC, 2013). Home health involves a system of post-acute care services such as skilled nursing, physical therapy, occupational therapy, speech and language therapy, and social work (National Association for Home Care & Hospice, 2010). This sector of care is different from other settings of clinical care in that care is provided in the home of the patient while administrative services are conducted in a central location. Much less direct contact is involved between clinicians in the home care setting (Ellenbecker, Samia, Cushman, & Alster, 2008). The goals of home healthcare are to assist patients in slowing and restoring the decline of functional health and avoiding institutionalized care (National Association for Home Care & Hospice, 2010).

Home health agencies (HHAs) have significant importance in U.S. health care as skilled and post-acute care service providers. The number of HHAs is expected to

continue to increase along with associated expenditures (Centers for Medicare and Medicaid Services [CMS], 2012). From 1990 to 2003, there was an increase from $12.6 billion to $40 billion and an expenditure increase to 88.8 billion in 2015 (CMS, 2004; CMS, 2017). Thus, improving quality of care, improving outcomes of patient care, and cost-effectiveness are important areas of consideration in home healthcare (Berwick, Nolan, & Whittington, 2008).

Home health agencies face difficulties when ensuring quality care due to the variety of services delivered to a broad range of patients (Scharpf et al., 2008). However, many patients along with their families prefer home care when choosing between home care and institutional care. This reason along with the advancement in technology has significantly contributed to the growth in the home care field over the years (Kemper, 1992; McAuley & Blieszner, 1985; Rivlin & Weiner, 1988). The effectiveness of home health agencies and establishing ways by which to assess and improve effectiveness are of interest to policy makers, providers, insurers, and patients. Insures are increasingly seeking to identify whether home care is more cost-effective than other types of healthcare, seeking to identify the circumstances under which home healthcare is most effective, and attempting to distinguish the types of agencies that are most effective (Shaughnessy et al., 1994).

Quality star ratings and patient experience. Home Health Compare is one tool that can be used to assess agency performance on quality. This tool provides information regarding the quality provided by “Medicare-certified” HHAs. The Centers for Medicare and Medicaid Services developed this tool to provided patients and their families with access to information they can use to choose the right home health agency for them. The

information helps the user to identify how well agencies care for their patients, provides them with data on how often each agency uses best practices, and shows them how other patients rated their recent care experience with an agency. Home Health Compare includes an easy to understand quality of patient star rating. This rating provides a summary of selected process and outcomes measures. The ratings are based on nine process and outcome measures that give a general performance overview. A star rating of 3.5 or above indicates that the agency performed above average as compared to other agencies.

Furthermore, patient experience has become a key indicator of health care organization quality performance. It has increasingly been cited an essential measure of how well a health care organization operates. Considering that cure is a fundamental health service expectation, there is a growing body of support of patient experience as a measure of quality. To some, it is considered the most valuable assessment of quality (Turner & Pol, 1995). Hospitals and nursing homes have made improving patient experience a principal priority.

Literature in multiple health care settings reflects that poor patient reported experiences are associated with slower illness recovery and a lower likelihood of prescribed treatment adherence (Beach, Keruly, & Moore, 2006). Improving patient experience is particularly important for home health agencies, in that these organizations usually provide care for older populations with functional impairment or multiple conditions. These patients tend to be sicker and have lower levels of trust in the health care system (Boulware, Cooper, Ratner, LaVeist, & Powe, 2016; Halbert, Armstrong, Gandy, & Shaker, 2006); thus making them more vulnerable to the negative

consequences of poor health care experiences. Hospital Consumer Assessment of Healthcare Providers and Systems has been used in the healthcare literature to assess the relationship between patient experience and organizational characteristics. HHCAHPS can be useful in exploring the relationship between strategic group membership and patient experience.

Conceptual Framework

The phrase "strategic groups" was created by Hunt in 1972. Hunt observed three sources of homogeneity between "white goods" firms. These sources included the extent of vertical integration, degree of service diversification, and differences in service differentiation. Hunt focused on strategic differences among firms and described groups of firms with similar strategies within the industry (McGee & Thomas, 1986).

A strategic group is often defined as a group of firms within the same industry making similar strategic choices in important areas (Porter, 1980). Strategic groups identify clusters of firms in an industry and a firm's membership to a group defines the significant characteristics of the firm's strategy. The concept of strategic groups has traditionally been used to explore differences in profitability among firms (McGee & Thomas, 1986). Strategic groups are also frequently associated with Porter's argument that firms with similar resources seek similar strategies and result in similar performance in ways that cannot be fully explained by structure-conduct-performance theories.

Many studies have been performed based on the strategic group concept in different industries. Most of these studies have been conducted in the pharmaceutical industry; however, few studies have been conducted in hospitals and health care providers (Leask & Parker, 2007; Schreyogg & Von Reitzenstein, 2008). The majority of

these studies found support of the presence of strategic groups and an association between strategic group membership and performance (Ketchen, Thomas, & Snow, 1993; Short, Palmer, & Ketchen, 2002).

Strategic Group Membership and Quality

Strategic group theory posits that organizations within an industry face the same market pressures and that differences in performance are a result of differences in organizational capabilities. The theory also suggests that significant differences exist within industries, similarities exist within identified subgroups, and group membership can be used to predict organization performance (Cool & Schendel, 1988; Hunt, 1972; Newman, 1978; Reger & Huff, 1993; Ulrich, 1982). Given that home health agencies face relatively the same reimbursement mix and governmental constraints, strategic group theory is an appropriate explanation for the difference in their strategic responses (Perryman & Rivers, 2011).

Porter's generic strategies describe two generalizable strategic groups. The first strategic group is the cost leader. Cost leaders seek to gain competitive advantage through resource deployment. These organizations aim to provide services for cost lower than their competitors by allocating resources to functional areas (Zinn, Aaronson, & Rosko, 1994). The second group is the differentiator. This group seeks to gain competitive advantage through scope. These organizations aim to offer unique and numerous services. Given the difference in strategic responses made by these three strategic groups, there will be differences in performance across groups. Porter's theory guiding the concept of strategic groups is that organizations must choose the type and scope of competitive advantage it wishes to achieve (Yamin, Gunasekaran, & Mavondo, 1999). In

addition to the functional areas noted previously, the three generic strategies vary in other areas.

The market in any industry can be highly complex, dynamic, and turbulent (Neu & Brown, 2005). Many organizations become more innovative and seek to better fit their services with customer's needs by adopting a differentiation strategy (Deshpande et al., 1993; Johnson & Selnes, 2004; Treacy & Wiersma, 1993). Organizations tend to add more services to their service offerings as part of their differentiation strategy (Gebauer, Edvardsson, Gustafsson, & Witell, 2010; Neu & Brown, 2005; Oliva & Kallenberg, 2003). Organizations with a strategic focus on service provision are reported to improve their value. Marketing literature reflects that organizations that provide a higher number of services and more service types have better customer satisfaction outcomes (Zeithaml, Berry, & Parasuraman, 1993). Services being less visible and more staff dependent make them a strategic opportunity and a sustainable source of competitive advantage (Heskett et al., 1997).

Furthermore, in health care specifically, staffing has been associated with better quality performance. Studies in the nursing home industry have found a relationship between staffing and various outcomes, such as: lower death rates, higher rates of discharges to home, improved functional outcomes, fewer pressure ulcers, fewer urinary tract infections, lower urinary catheter use, and less antibiotic use (Bliesmer, Smayling, Kane, & Shannon, 1998; Harrington et al., 2000). A small number of studies have specifically analyzed the relationship between staffing and the application of daily care procedures. These studies found that insufficient staffing has been associated with insufficient care processes (Spector and Takada 1991; Kayser-Jones 1996, 1997; Kayser-

Jones & Schell 1997). As a result of these studies, the Institute of Medicine recommended higher nurse staffing in nursing facilities (Davis, Sloan, & Wunderlich, 1996; Kohler & Wunderlich, 2001). The central notion motivating this study is that HHA structure and strategy are different among groups of agencies and these differences jointly and systematically affect the variation in their ability to provide care efficiently and effectively. Successfully implementation of the strategies requires different resources, skills, leadership styles, and organizational cultures. This further suggests differences in performance as a result of strategic group membership (Grant, 1991).

Home Health Agency Strategic Groups

The existence of strategic groups was examined reflecting that HHAs can be classified on the basis of Porter's Generic Strategies using measures of scope and resource deployment. Scope refers to identifying the number and types of services to offer (Marlin, Sun, & Huonker, 1999). Scope was measured using the ratio of patient visits by service type. Resource deployment involves labor, price, and capacity decisions essential to gaining competitive advantages (Zinn et al., 1994). Resource deployment was measured using the ratio of staff FTEs by service type per 1000 visits. Table 1 provides a list of the scope and resource deployment used in the cluster analysis. Four clusters emerged from this examination. Agencies with higher scope means and lower resource deployment means as compared to the other three derived clusters were classified as both differentiators and cost leaders. Those with lower scope means and higher resource deployment means were classified as stuck-in-the-middle agencies. Agencies with higher scope and higher resource deployment means were classified as differentiators. Cost leaders were those agencies with lower scope means and lower resource deployment

means. The classification of these agencies provides a foundation to assess the influence of agency strategic decisions on financial performance.

Structure-Process-Outcome Framework

The Structure, Process, Outcome (SPO) framework is used to identify the relationship between HHA strategic group membership, the process of care delivery, and the outcomes of care (Donabedian, 2005). Structure represents the settings or inputs of care delivery (Donabedian, 2005). These inputs or settings are usually concrete variables such as facilities, equipment, or incentives (Donabedian, 2005). Through this framework, good and supportive structures are easily identified as contributors to quality care (Donabedian, 2005). Process corresponds to how care is delivered in terms of completeness or acceptability (Donabedian, 2005). These variables are typically less identifiable than structure or outcome variables (Donabedian, 2005). However, there are methods to assess process variables such as appraisals or communication (Donabeidan, 2005). Outcome signifies the end points of care delivered in the health setting (Donabedian, 2005). Outcome variables are typically measured at the patient, provider, and organizational levels (Donabedian, 2005). Although some outcome measures are concrete, outcomes such as attitude or satisfaction are less concrete (Donabedian, 2005). The SPO framework provides a mechanism by which the outcomes of care are influenced by other factors within the nursing home.

Various studies have used the SPO framework to identify relationships between various factors within the nursing home. In a 2004 study conducted by Weech-Maldonado and colleagues, the SPO framework was used to assess the impact of RN staffing patters on quality of care outcomes (Weech-Maldonado, Meret-Hanke, Neff, &

Mor, 2004). Structure was represented by staffing patterns, process was represented by the methods of delivering care, and outcome was represented by the level of well-being of nursing home patients (Weech-Maldonado et al., 2004). In this proposed study, structure involves agency membership in the strategic groups of interest (Donabedian, 2005). Based on the clusters derived from the typology examination and theory of SPO the following hypotheses will be tested:

A study by Zinn et al. (1994) exploring the effect of strategic group membership on nursing home performance and strategic behavior found that two of the groups with a low cost strategy performed significantly poorer on overall performance than the differentiator and focus groups identified in the study. This study also reports that groups that were low cost focused performed worse on patient outcome measures than groups with well-staffed facility (Zinn et al., 1994). Hospital and nursing home research reflects that higher levels of staffing are associated with better patient outcomes (Konetzka, Stearns, & Park, 2008; McCue, Mark, & Harless, 2003; Weech-Maldoando et al., 2004). Furthermore, marketing literature reflects that organizations with a greater portfolio of services provided receive higher consumer satisfaction rates (Zeithaml et al., 1993). Agencies in the cost leadership group have lower resource deployment and lower scope. These agencies have a lower mean staffing levels and visits by service discipline. Differentiators have a higher resource deployment and higher scope. The differentiator group has a higher mean staffing levels and visits by service discipline. Given the characteristics of these groups, this study proposes:

Hypothesis 1: Agencies with a differentiation focus will have a higher quality performance than agencies with a cost leadership focus.

Porter defines stuck-in-the-middle organizations as those with no clear focus on any of the three generic strategies. He suggests that because of the lack of focus on any of the three generic strategies, stuck-in-the-middle organizations will perform poorer than organizations with one of the three strategic focuses (Porter, 1980). Furthermore, empirical studies reflect the existence of organizations that score low on both cost leadership and differentiation strategies with high resource deployment and low scope (Dess & Davis, 1984; Yamin et al., 1999). Given the lack of orientation towards any of the two generic strategies along with the lower staffing levels and services provided, this study proposes:

Hypothesis 2: Agencies that are stuck-in-the-middle will have a lower quality performance than agencies with a differentiation or both cost leadership and differentiation focus.

Methods

Data Source

This study was a secondary analysis of the Home Health Compare database, Provider of Service File (POS), Medicare Cost Reports, and Area Resource File (ARF). Home Health Compare is a CMS database that houses information about the quality of care provided by "Medicare-certified" home health agencies throughout the United States. The information provided by Home Health Compare includes how well agencies care for their patients, how often each agency used best practice in care provision, and what patients said about their experience with each agency (CMS, 2017). The Healthcare Cost Report Information System from Centers for Medicare and Medicaid Services (CMS) provided information on organization characteristics, utilization, costs and

charges for Medicare-certified providers. The Provider of Service dataset from CMS provided quarterly information regarding characteristics of health care facilities, including home health agencies (CMS, 2017). Finally, the Area Health Resource File provided the county level information on health facilities, environmental and socioeconomic characteristics (Agency for Healthcare Research and Quality, 2017). Based on a national sample of Home Health Agencies, our study utilized data from 2015; this was because of data availability. Data from 2015 were the most complete and inclusive of all variables of interest across all datasets.

Sample

The analysis sample included 7,715 agencies. The POS included 24,260 agencies and the Home Health Compare included 12,361 agencies. The sample was limited to only agencies that reported to Medicare Costs Reports. Once merged, the sample included 10,707 agencies. A total of 476 observations in the sample were dropped due to qualifying as a hospice agency. In addition, only agency facility type of official health agency and other were included. Hospital, skilled nursing facility, rehabilitation facility, visiting nurse association, and combination government voluntary based agencies were not included resulting in a 2,252 reduction. This resulted in the reduction of the number of home health agencies used in the cluster analysis to 7,715 agencies.

Operationalization (Measures)

The independent variables include cluster membership. Four clusters emerged in the typology paper. These clusters were formed on the basis of scope and resource deployment variables and classified using Porter's Generic Strategies as a foundation. The results of the cluster analysis are shown in Table 2 and depicted in Figure 1. The clusters were included in this study as the independent variable.

The dependent variables of interest will capture the quality of service provision of different home health agency types. The star rating for process and outcome quality of patient care was used as one of the study's independent measures. These measures were developed by the CMS to guide consumer choice in identifying quality home health care (CMS, 2017). A binary quality of patient care star rating was created indicating a low rating including star ratings of 1 to 3 and high rating including star ratings of 4 to 5. The quality of patient care star rating is a summary measure of the agency's performance on nine process and outcome quality measures selected to give an overview of performance using measure that apply to most patients. These measures were selected by the CMS as those that give a general overview of an agency's performance and include the following:

- Process of care measures
    - How often the agency initiated patient care in a timely manner
    - How often the agency provided patient/caregiver drug education on all medications
    - How often the agency ensured patients received flu vaccine for the current season
- Outcome of care measures
    - How often the patient got better at walking or moving around
    - How often the patient got better at getting in and out of bed
    - How often the patient got better at bathing themselves
    - How often the patient was able to engage in activity with less pain
    - How often the patient experienced less shortness of breath
    - How often the patient required acute care hospitalization (CMS, 2017).

Home Health Consumer Assessment of Healthcare Providers and Systems (HHCAHPS) measures are reported through Home Health Compare. HHCAHPS contains 34 questionnaire items that are case mix adjusted for patient characteristics: age, education, non-English speaking, use of a proxy, residence status, self-reported health status, mental status, and diagnoses. There are 25 questions specifically related to patient experience. The questions cover topics such as: communication about care, pain, and prescription medication use, the care received from the home health agency, staying informed about scheduling, and global ratings. The measures capture the experience of home health care patients receiving care from Medicare-certified home health agencies. Consumer Assessment of Healthcare Providers and Systems measurement tools have frequently been used to examine patient experience (CMS, 2017). Studies reflect support of this tool as reliable and valid (Dyer, Sorra, Smith, Cleary, & Hays, 2012). The measures included in this study were three composite measures (See Table 3) and two ratings:

- Percent of patients who reported that their home health team ALWAYS gave care in a professional way
    - Questions 9, 16, 19, and 24
- Percent of patients who reported that their home health team ALWAYS communicated well with them
    - Questions 2, 15, 17, 18, 22, 23
- Percent of patients who reported that their home health team ALWAYS discussed medicines
    - Questions 3, 4, 5, 10, 12, 13, 14
- Percent of patients who gave their home health agency a rating of 9 or 10 on a scale from 0 (lowest) to 10 (highest)
- Percent of patients who reported YES, they would definitely recommend the home health agency to friends and family (CMS, 2017).

Control variables included factors likely to influence performance. There is extensive literature examining performance in the hospital and nursing home settings.

Several organizational characteristics have been associated with performance in the healthcare literature. Factors such as ownership and affiliation have been identified in the literature as significant contributors to performance. Studies examining ownership and affiliation consistently find positive relationships with financial performance (Dalton, Daily, Certo, & Roengpitya, 2003; Holt, Clark, DelliFraine, & Brannon, 2011; Weech-Maldonado et al., 2010). Location has also been found to have a positive association with performance as measured by profitability (Langland-Orban, Gapenski, & Vogel, 1996). Studies report a positive relationship between these factors and performance (Capon, Farley, & Hoenig, 1990). Organizational characteristics of interest include state, location, and ownership. These variables are provided by the POS file. The location variable includes urban or rural. Urban is defined in POS as populations of more than 1,500. Rural is defined as populations of less than 1,500. The ownership variable includes: voluntary non-profit – religious affiliation, voluntary non-profit – private, voluntary non-profit – other, proprietary, and government – state/county (CMS, 2017). This variable was collapsed to include for-profit, non-for-profit, and government. Market characteristics of interest were provided by AHRF and include percent of population 65 years or older, percent of population 65 years or older without insurance, and Medicare managed care penetration. Control variables of interest also included the percent of Medicare visits. This variable was controlled for in attempt to control for influence of Medicare versus Medicaid services would have on agencies who disproportionately service Medicaid patients.

Analysis

Bivariate analysis included an ANOVA to identify if there are significant differences among clusters on the basis of their mean values for the performance measures. The clusters found in the typology paper were regressed against the quality indicators of interest from the Home Health Compare dataset. A general linear regression analysis was used to determine the relationship between the cluster membership and the five summary HHCAHPS measures controlling for state, location, ownership, percent of population 65 years or older, percent of population 65 years or older without insurance, and Medicare managed care penetration. A logistic regression analysis was used to determine the relationship between the cluster membership and the binary quality of star rating controlling for state, location, ownership, percent of population 65 years or older, percent of population 65 years or older without insurance, and Medicare managed care penetration. The analysis included a state fixed effect to control for interstate differences in the regulatory environment. The regression equations were as follows:

$$logit(Y_i)=b_0 + b_1X_1 + b_iX$$

Where:

- Y_i= dependent variable: binary quality of star rating
- b_0= intercept
- b_1= coefficient of cluster membership variable
- X_1= cluster membership: both cost leader/differentiator, stuck-in-the-middle, differentiator, and cost leader
- b_i= coefficient of all independent variables

- X_i= control variables: total number of Medicare visits, location, ownership, percent of population 65 years or older, percent of population 65 years or older without insurance, and Medicare managed care penetration

$$Y_i = b_0 + b_1X_1 + b_iX$$

Where:

- Y_i= dependent variable: Percent of patients who reported that their home health team ALWAYS gave care in a professional way; Percent of patients who reported that their home health team ALWAYS communicated well with them; Percent of patients who reported that their home health team ALWAYS discussed medicines; Percent of patients who gave their home health agency a rating of 9 or 10 on a scale from 0 (lowest) to 10 (highest); Percent of patients who reported YES, they would definitely recommend the home health agency to friends and family
- b_0= intercept
- b_1= coefficient of cluster membership variable
- X_1= cluster membership: both cost leader/differentiator, stuck-in-the-middle, differentiator, and cost leader
- b_i= coefficient of all independent variables
- X_i= control variables: total number of Medicare visits, location, ownership, percent of population 65 years or older, percent of population 65 years or older without insurance, and Medicare managed care penetration

All statistical analyses were conducted at 95% confidence interval ($p < 0.05$). The analysis was conducted using STATA Data Analysis and Statistical Software Package 13.1.

Results

A description of the variables of interest is provided in Table 4. The chi-square results reflected that the both cost leader/differentiator group had a higher proportion of agencies with quality star ratings 4 and above (30.24%) and the cost leader group had a higher proportion of agencies with quality star ratings below 4 (84.25%). The ANOVA confirmed that the cluster groups 1 (both cost leader/differentiator) and 4 (cost leader) were significantly different from all of the strategic groups on all of the quality measures ($p<.001$) (See Table 5). The average percent of patients who reported that their home health team always gave care in a professional way (66.06%), communicated well with them (63.65%), and discussed medicines with them (62.15%) were higher for the both cost leader/differentiator group. The average percent of patients who rated the agency a rating of 9 or 10 (62.53%) and reported they would recommend the agency to friends and family were also higher for the both cost leader/differentiator group (58.42%). The average percent of patients who reported that their home health team always gave care in a professional way (17.44%), communicated well with them (16.85%), and discussed medicines with them (16.63%) were lower for the cost leader group. The average percent of patients who rated the agency a rating of 9 or 10 (16.51%) and reported they would recommend the agency to friends and family was also lower for the cost leader group (15.05%). Clusters 2 (stuck-in-the-middle) and 3 (differentiator) were not significantly different from each other with approximate averages of 55% for percent of patients who reported that their home health team always gave care in a professional way, 53% for percent of patients who reported that their home health team always communicated well with them, and 52% for percent of patients who reported that their home health team always discussed medicines with them. The average percent of patients who rated the

agency a rating of 9 or 10 and reported they would recommend the agency to friends and family was approximately 52% and 49% respectively.

Hypothesis #1 was partially supported. The differentiation group performed better than cost leaders on the HHCAHPS quality measures (See Table 6, Model 1). As compared to differentiators, cost leaders had a lower percent of patients who reported that their home health team always gave care in a professional way (-22.19%), communicated well with them (-20.92%), and discussed medicines with them (-20.19%). As compared to differentiators, cost leaders also were associated with a lower percent of patients who gave their home health agency a rating of 9 or 10 (-21.31%) and reported that they would definitely recommend the agency to family and friends (-20.22%). There was no significant difference between differentiators and cost leaders for the likelihood of being in the high quality star rating group.

The second hypothesis was partially supported (See Table 6, Model 2). As compared to the stuck-in-the-middle group, the both cost leader/differentiator group was 2.13 times more like to be in the high quality star rating group. Furthermore, as compared to the stuck-in-the-middle agencies, both cost leader/differentiator agencies were associated with a higher percent of patients who reported that care was always given in a professional way (16.17%), that the agency team communicated well with them (15.94%), that the agency team discussed medicines (14.64%), that gave their agency a high rating (15.92%), and that they would recommend the agency to friends and family (15.32%). As compared to the stuck-in-the-middle group, differentiators were 1.71 times more likely to be in the high quality star rating group. As compared to the “stuck-in-the-middle group”, differentiators were associated with a higher percent of patients who

reported that care was always given in a professional way (9.92%), that the agency team communicated well with them (9.74%), that the agency team discussed medicines (9.47%), that gave their agency a high rating (9.89%), and that they would recommend the agency to family and friends (9.56%).

Discussion

This study partially supported the hypothesis that the differentiator group would have a higher quality performance than the cost leader group. The differentiator group was associated with higher percentages of patients who reported the most positive HHCAHPS reviews than cost leader agencies. This result suggests that focusing on providing more services and having higher staffing levels can lead to better quality outcomes. This result also suggests that controlling costs by lowering staffing levels can have a significant negative impact on the patient's experience.

When compared to the other groups, the stuck-in-the-middle agencies had a lower likelihood of being in the high tier of the quality star rating than the both cost leader/differentiator group and the differentiator group. The stuck-in-the-middle group also was associated with lower percentages of patients who reported the most positive HHCAHPS reviews than the both cost leader/differentiator group and lower on one of the HHCAHPS measures in comparison to the differentiator group.

In addition, a post-hoc analysis was conducted and revealed that the both cost leader/differentiator group had a higher likelihood of being in the high tier of the quality star rating and were associated with higher percentages of patients who reported the most positive HHCAHPS reviews than all of the other groups with the exception of a nonsignificant relationship between cost leaders on the likelihood of being in the high tier

of the quality star rating. This suggests that this group have achieved some optimal balance of service provision and cost control in achieving a higher quality performance.

Managerial Implications

This study revealed that the strategic decisions made have an impact on an agency's quality of care delivery. A primary concern of agency managers is ensuring high quality of care to patients. With differentiators having higher staff FTEs and visits per service discipline, cost leader agencies should consider if they are making a tradeoff between having a strategy of controlling costs versus service provision and providing quality care.

Policy Implications

Given that home health agencies are primarily reimbursed by Medicare, state and federal governments have an interest in the quality of care provided by these agencies. It would be useful to the government to know if some strategies are better than others in ensuring quality of care. This study found evidence that agencies with strategies focused toward providing more services and higher staffing levels have better quality of care than agencies with strategies focused on cost control. Future policies should be directed towards influencing the minimum amount of services and staffing levels to ensure optimal quality of home health care. Considering the costliness of post-acute care, further research should explore the optimal amount of services and staffing levels an agency should provide.

Limitations

There are several limitations to this study. This study used cross-sectional data, thus, the reader should be aware when trying to conclude a causal relationship.

Furthermore, the quality star rating is a summary measure and does not indicate the specific areas of quality. It would be helpful to know the specific quality areas in order to directly address the issues.

Conclusion

This study indicates that there may be a relationship between strategic group membership and care quality. Differentiators showed to perform better on quality than cost leaders and both cost leader/differentiators showed to perform better than all other groups.

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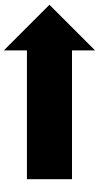
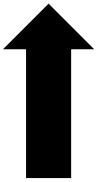
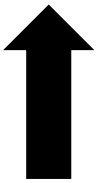
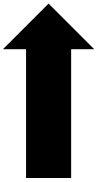
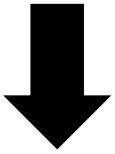
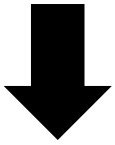
	Scope	Resource Deployment
Cluster 1 Both • Agencies in this cluster are expected to have a lower mean staffing levels by service discipline and higher mean visits by service type		
Cluster 2 Stuck-in-the-middle • Agencies in this cluster are expected to have a higher mean staffing levels and lower mean visits by service type		
Cluster 3 Differentiator • Agencies in this cluster are expected to have a higher mean staffing levels and visits by service type		
Cluster 4 Cost leader • Agencies in this cluster are expected to have a lower mean staffing levels and visits by service type		

Figure 1. Depiction of cluster analysis results.

Table 1
List of Clustering, Organizational, and Market Variables and Definitions

Variables	Definition	Data Source
Scope Variables		
Percent of Home Health Aide Visits	The total number of home health aide service visits divided by the total number of visits	Medicare Costs Reports
Percent of Medical Social Work Visits	The total number of medical social work service visits divided by the total number of visits	Medicare Costs Reports
Percent of Occupational Therapy Visits	The total number of occupational therapy service visits divided by the total number of visits	Medicare Costs Reports
Percent of Physical Therapy Visits	The total number of physical therapy service visits divided by the total number of visits	Medicare Costs Reports
Percent of Skilled Nursing Visits	The total number of skilled nursing service visits divided by the total number of visits	Medicare Costs Reports
Percent of Speech Pathology Visits	The total number of home speech pathology service visits divided by the total number of visits	Medicare Costs Reports
Resource Deployment Variables		
Total Home Health Aide FTEs per 1000 visits	The number of full-time equivalent home health aides divided by the total number of visits then multiplied by 1000	Medicare Costs Reports
Total Medical Social Workers FTEs per 1000 visits	The number of full-time equivalent medical social workers divided by the total number of visits then multiplied by 1000	Medicare Costs Reports
Total Occupational Therapists FTEs per 1000 visits	The number of full-time equivalent occupational therapists divided by the total number of visits then multiplied by 1000	Medicare Costs Reports
Total Physical Therapists FTEs per 1000 visits	The number of full-time equivalent physical therapists divided by the total number of visits then multiplied by 1000	Medicare Costs Reports
Total Direct Nurse FTEs per 1000 visits	The number of full-time equivalent direct nurses divided by the total number of visits then multiplied by 1000	Medicare Costs Reports
Total Speech Pathologists FTEs per 1000 visits	The number of full-time equivalent speech pathologists divided by the total number of visits then multiplied by 1000	Medicare Costs Reports

Organizational Variables		
Location	Indicates whether the agency is in an urban or rural area	Provider of Service File
Ownership	Indicates whether the agency is a for-profit, not-for-profit, or government owned agency	Provider of Service File
State	Indicates the state in which the agency operates	Provider of Service File
Percent Medicare Visits	The ratio of total Medicare service visits over the total number of service visits multiplied by 100	Medicare Costs Reports
Market Variables		
Percent of population 65 years or older	Percentage of total resident population age 65 years or older	Area Health Resource File
Percent of population 65 years or older without insurance	Total percentage of resident population over 65 without health insurance	Area Health Resource File
Medicare managed care penetration	The ratio of Medicare Advantage Plan enrollees over eligible Medicare individuals multiplied by 100	Area Health Resource File

Table 2

Hierarchical Cluster Analysis Results of Scope and Resource Deployment Measures

	Scope						Resource Deployment					
Cluster	**Percent of Home Health Aide Visits**	**Percent of Medical Social Work Visits**	**Percent of Occupational Therapy Visits**	**Percent of Skilled Nursing Visits**	**Percent of Physical Therapy Visits**	**Percent of Speech Pathology Visits**	**Total Home Health Aide FTEs per 1000 visits**	**Total Medical Social Worker FTEs per 1000 visits**	**Total Occupational Therapists FTEs per 1000 visits**	**Total Physical Therapists FTEs per 1000 visits**	**Total Direct Nursing FTEs per 1000 visits**	**Total Speech Pathologists FTEs per 1000 visits**
Both Cost leader+ Differentiator 1 n=3,763	8.763	0.577	6.622	46.117	34.331	1.225	0.016	0.002	0.01	0.041	0.054	0.003
Stuck-in-the-middle 2 n=539	52.863	0.15	1.975	33.34	9.21	0.313	2.114	0.021	0.307	2.35	13.295	0.00009
Differentiator 3 n=1,731	9.588	0.290	1.690	74.190	13.789	0.284	0.171	0.003	0.032	0.197	0.904	0.00005
Cost leader 4 n=1,682	0.111	0.002	0.0336	0.365	0.134	0.006	0.001	0.000003	0.00002	0.00006	0.0006	0.000003
Total n=7,715	10.143	0.357	3.754	41.548	20.512	0.684	0.194	0.003	0.033	0.228	1.158	0.001

Table 3
Questions Used for Quality Star Ratings Composite Measures

Composite Measures
Percent of patients who reported that their home health team ALWAYS gave care in a professional way
Q9. In the last 2 months of care, how often did home health providers from this agency seem informed and up-to-date about all the care or treatment you got at home?
Q16. In the last 2 months of care, how often did home health providers from this agency treat you as gently as possible?
Q19. In the last 2 months of care, how often did home health providers from this agency treat you with courtesy and respect?
Q24. In the last 2 months of care, did you have any problems with the care you got through this agency?
Percent of patients who reported that their home health team ALWAYS communicated well with them
Q2. When you first started getting home health care from this agency, did someone from the agency tell you what care and services you would get?
Q15. In the last 2 months of care, how often did home health providers from this agency keep you informed about when they would arrive at your home?
Q17. In the last 2 months of care, how often did home health providers from this agency explain things in a way that was easy to understand?
Q18. In the last 2 months of care, how often did home health providers from this agency listen carefully to you?
Q22. In the last 2 months of care, when you contacted this agency's office did you get the help or advice you needed?
Q23. When you contacted this agency's office, how long did it take for you to get the help or advice you needed?
Percent of patients who reported that their home health team ALWAYS discussed medicines
Q3. When you first started getting home health care from this agency, did someone from the agency talk with you about how to set up your home so you can move around safely?
Q4. When you started getting home health care from this agency, did someone from the agency talk with you about all the prescription medicines you were taking?
Q5. When you started getting home health care from this agency, did someone from the agency ask to see all the prescription medicines you were taking?
Q10. In the last 2 months of care, did you and a home health provider from this agency talk about pain?
Q12. In the last 2 months of care, did home health providers from this agency talk with you about the **purpose** for taking your new or changed prescription medicines?
Q13. In the last 2 months of care, did home health providers from this agency talk with you about **when** to take these medicines?
Q14. In the last 2 months of care, did home health providers from this agency talk with you about the **important side effects** of these medicines?

Table 4
Descriptives of Quality Indicators and Control Variables

Variables	Frequency (%) or Mean (SD)
Home Health Compare Measures	
Quality Star Rating	
Low	4,133 (73.16%)
High	1,516 (26.84%)
HHCAHPS Measures	
Percent reported care ALWAYS in a professional way	52.37 (43.48)
Percent reported HHA team ALWAYS communicated well with them	50.04 (41.93)
Percent reported HHA team ALWAYS discussed medicines, pain, and home safety with them	49.58 41.32)
Percent of patients who gave their home health agency a rating of 9 or 10	49.53 (41.57)
Percent reported YES, they would recommend agency	46.12 (39.12)
Organizational Variables	
Location	
Rural	857 (11.12%)
Urban	6,853 (88.88%)
Ownership	
Government	248 (3.21%)
Not for-profit	205 (2.66%)
For-profit	7,262 (94.13%)
Percent Medicare Visits	76.77 (28.51)
Market Variables	
Percent of population 65 years or older	13.39 (3.88)
Percent of population 65 years or older without insurance	16.11 (6.19)
Medicare managed care penetration	33.79 (12.56)

Table 5
Quality Indicators Chi-square and ANOVA Results

Variables	Clusters					p
	Both Cost leader+ differentiator Cluster 1	**Stuck-in-the-middle Cluster 2**	**Differentiator Cluster 3**	**Cost leader Cluster 4**	**Chi-square**	
	Frequency (%) or Mean (SD)					
Home Health Compare Measures						
Quality Star Rating					84.13	<0.001
Low	2,390 (69.76%)	340 (86.29%)	1,018 (74.2%)	385 (84.25%)		
High	1,036 (30.24%)	54 (13.71%)	354 (25.8%)	72 (15.75%)		
HHCAHPS Measures						
					ANOVA	
Percent reported care in a professional way	66.06* (38.59)	55.2 [1,4] (43.24)	55.67 [1,4] (42.69)	17.44* (34.81)	F=605.89	<0.001
Percent reported HHA team communicated well with them	63.65* (37.31)	52.97 [1,4] (41.59)	53.39 [1,4] (41.02)	16.85* (33.69)	F=601.88	<0.001
Percent reported HHA team discussed medicines, pain, and home safety with them	62.15* (36.55)	51.94 [1,4] (40.87)	53.52 [1,4] (41.21)	16.63* (33.27)	F=587.21	<0.001
Percent of patients who gave their home health agency a rating of 9 or 10	62.53* (37.03)	52.32 [1,4] (41.43)	52.49 [1,4] (40.89)	16.51* (33.33)	F=590.21	<0.001
Percent reported YES, they would recommend agency	58.42* (35.08)	48.66 [1,4] (39.23)	48.79 [1,4] (38.47)	15.05* (30.63)	F=591.96	<0.001

***Significantly different from all clusters. Superscript is significantly different from identified clusters.**

Table 6
Regression Analysis with the Quality Indicators as Dependent Variable

Cluster	**Quality Measures**					
	Quality Star Rating – High OR (SE)	**Percent reported care ALWAYS in a professional way B (SE)**	**Percent reported HHA team ALWAYS communicated well with them B (SE)**	**Percent reported HHA team ALWAYS discussed medicines, pain, and home safety with them B (SE)**	**Percent of patients who gave their home health agency a rating of 9 or 10 B (SE)**	**Percent reported YES, they would recommend agency B (SE)**
Model 1						
Both	1.24 (0.11)**	6.25 (1.24)**	6.20 (1.19)**	5.17 (1.20)**	6.02 (1.20)**	5.77 (1.12)**
Stuck-in-the-middle	0.59 (0.12)**	-9.92 (2.20)**	-9.74 (2.12)**	-9.47 (2.11)**	-9.89 (2.11)**	-9.56 (1.98)**
Differentiator	*Ref*	*Ref*	*Ref*	*Ref*	*Ref*	*Ref*
Cost leader	1.45 (0.48)	-22.19 (4.19)**	-20.92 (4.03)**	-20.20 (4.01)**	-21.31 (4.00)**	-20.22 (3.77)**
Model 2						
Both	2.13 (0.41)**	16.17 (2.04)**	15.94 (1.97)**	14.64 (1.96)**	15.92 (1.95)**	15.32 (1.84)**
Stuck-in-the-middle	*Ref*	*Ref*	*Ref*	*Ref*	*Ref*	*Ref*
Differentiator	1.71 (0.35)**	9.92 (2.20)**	9.74 (2.12)**	9.47 (2.11)**	9.89 (2.11**	9.56 (1.98)**
Cost leader	2.48 (0.89)*	-12.28 (4.33)**	-11.18 (4.17)**	-10.73 (4.15)**	-11.42 (4.14)**	-10.66 (3.89)**

**p ≤0.05; **p ≤ 0.01*

Control variables: state, location, ownership, percent of population 65 years or older, percent of population 65 years or older without insurance, and Medicare managed care penetration

HOME HEALTHCARE AND FINANCIAL PERFORMANCE: APPLICATION OF A TYPOLOGY FOR HOME HEALTHCARE AGENCIES

by

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HOME HEALTHCARE AND FINANCIAL PERFORMANCE: APPLICATION OF A TYPOLOGY FOR HOME HEALTHCARE AGENCIES

Abstract

Background: Given the potential benefits for strategic planning, an important area of examination relates to the relationship between strategic group membership and financial performance.

Purpose: To explore the relationship between strategic group membership and financial performance among home health agencies.

Methods: A secondary analysis of data on agency quality measures were combined with secondary agency market and organizational characteristics. General linear regression was used to examine the relationship between group membership and financial performance.

Results: Data from 7,715 agencies were explored in this analysis. The cost leader group was associated with lower operating expenses than the differentiator and both cost leader/differentiator group. The differentiator group was associated with higher operating revenues than the cost leader and stuck-in-the-middle group.

Conclusion: This study indicates that there may be a relationship between strategic group membership and financial performance.

Introduction

Considering the growth of the elderly population and the preference for home care versus institutionalized care, the use of home health agencies (HHAs) among patients and providers has been increasing (Greene, Ondrich, & Laditka, 1998; Weissert, Lesnick, Musliner, & Foley, 1997; Shaughnessy et al., 2002). HHAs deliver post-acute care in the home of patients (Dey et al., 2011). Many of the same services provided in the hospital can be provided in the home. Furthermore, home care is usually less expensive and more convenient than institutionalized care (American Medical Association and American Academy of Home Care Physicians, 2007). As a result, the Medicare Payment Advisory Commission reports that HHAs are increasing in number and the health care expenditures associated with home health are increasing as well (CMS, 2017).

Given the increasing HHA expenditures, there have been recent Medicare budget reductions to contain costs (Dickson & Schencker, 2016). The Centers for Medicare and Medicaid Services released a proposed ruling that would cut payments to HHAs by $80 million for the year of 2018. Cuts were made in 2017 to Medicare to regain past overpayments. The cuts involved a $180 million less payment made to home health agencies from Medicare. Furthermore, cuts were made to the CMS's payments to home health by $260 million in 2016, $60 million in 2015, and $200 million in 2014. There is an average of 17.2% difference between providers' costs for providing care and Medicare's reimbursements to providers (CMS, 2017). The cuts to reimbursement place significant constraints on the operations of home health agencies. Agencies have reported having to cut workers' hours and raise fees because of constraining forces (Dickson & Shencker, 2016). These reductions can impact their structure and performance by

influencing strategic decisions. Considering the implications of Medicare and Medicaid costs, recognizing and maximizing the value of home health care is required to meet the challenge of our country's financial health (Landers et al., 2016). To date, no literature has explored the influence of agency characteristics on financial performance. The central notion motivating this study is that structure and characteristics are different among HHAs and these differences systematically affect the ability of HHAs to provide care efficiently and effectively.

Financial performance is an extensively studied body of knowledge in the health care literature. Most of these studies have been conducted in the context of hospitals and nursing homes. Results from these studies indicate a significant relationship between organizational strategy and financial performance (Weech-Maldonado, Neff, & Mor, 2003). Literature exploring the varying strategic structures of organizations within an industry has used the Strategic Group concept. This concept proposes that organizations within an industry can be grouped based on their strategic structure. Specifically, organizations can be grouped based on the strategic decisions that they make and these groups are sustained because of the difficulty associated with changing strategic positions (Cool & Schendel, 1988). Furthermore, strategic group theory posits that membership in a specific strategic group influences the performance of organizations in that group (Cool & Schendel, 1988; Hunt, 1972; Newman, 1978; Short, Ketchen, Palmer, & Hult, 2007). Many studies have been performed based on the strategic group concept in different industries. Most of these studies have been conducted in the pharmaceutical industry; however, a few studies have been conducted in hospitals and nursing homes (Leask & Parker, 2007; Schreyogg & Von Reitzenstein, 2008). The majority of these studies found

support of the presence of strategic groups and an association between strategic group membership and financial performance (Ketchen, Thomas, & Snow, 1993; Short, Palmer, & Ketchen, 2002).

The following section will explore the literature around home health agencies and financial performance. The conceptual framework supporting the proposed hypotheses will be presented followed by the proposed methods.

Conceptual Framework

The phrase “strategic groups” was created by Michael S. Hunt in 1972. A strategic group is often defined as a group of firms within the same industry making similar strategic choices in important areas (Porter, 1980). Strategic groups identify clusters of firms in an industry and a firm’s membership to a group defines the significant characteristics of the firm’s strategy. The concept of strategic groups has traditionally been used to explore differences in profitability among firms (McGee & Thomas, 1986). The strategic groups concept is frequently associated with Porter’s argument that firms with similar resources seek similar strategies and result in similar performance in ways that cannot be fully explained by structure-conduct-performance theories.

Strategic group theory posits that organizations within an industry face the same market pressures and that differences in performance are a result of differences in organizational capabilities. The theory also suggests that significant differences exist within industries, similarities exist within identified subgroups, and group membership can be used to predict organization performance (Cool & Schendel, 1988; Hunt, 1972; Newman, 1978; Reger & Huff, 1993; Ulrich, 1982). Given that home health agencies face relatively the same reimbursement mix and governmental constraints, strategic

group theory is an appropriate explanation for the difference in their strategic responses (Perryman & Rivers, 2011).

Porter's generic strategies describe two generalizable strategic groups. The first strategic group is the cost leaders. Cost leaders seek to gain competitive advantage through resource deployment. These organizations aim to provide services for cost lower than their competitors by allocating resources to functional areas (Zinn, Aaronson, & Rosko, 1994). The second group is the differentiators. This group seeks to gain competitive advantage through scope. These organizations aim to offer unique and numerous services. Given the difference in strategic responses made by these strategic groups, there will be differences in performance across groups. Porter's theory guiding the concept of strategic groups is that organizations must choose the type and scope of competitive advantage it wishes to achieve (Yamin, Gunasekaran, & Mavondo, 1999). Successful implementation of the strategies requires different resources, skills, leadership styles, and organizational cultures. This further suggests differences in performance as a result of strategic group membership.

Organization Strategy, Services, and Staffing

The market in any industry can be highly complex, dynamic, and turbulent (Neu & Brown, 2005). Many organizations become more innovative and seek to better fit their services with customer's needs by adopting a differentiation strategy (Deshpande et al., 1993; Johnson & Selnes, 2004; Treacy & Wiersma, 1993). Organizations tend to add more services to their service offerings as part of their differentiation strategy (Neu & Brown, 2005; Oliva & Kallenberg, 2003). Organizations with a strategic focus on service provision are reported to have better return on sales and improve their value. A common

explanation for this reported better return on sales and improvement in value involves using service differentiation to benefit from strategic, financial, and marketing opportunities (Gebauer, Gustafsson, & Witell, 2011). Services being less visible and more staff dependent make them a strategic opportunity and a sustainable source of competitive advantage (Heskett, Sasser, & Schlesinger, 1997).

This brings to attention the importance of staffing in an organization. In health care specifically, staffing has been associated with performance. Controlling staffing levels has been a commonly used strategy to control costs and improve financial status (Unruh, 2001). Numerous studies have examined the impact of nurse staffing on financial outcomes. These studies have examined RN-patient staffing ratios impact on costs, lengths of hospital stay, and cost savings (Brown, Sturman, & Simmering, 2002; Dimick, Swoboda, Pronovost, & Lipsett, 2001; Shamian, Hagen, Hu, & Fogarty, 1994; Titler, Dochterman, Picone, & Everett, 2005). Literature reflects that hospitals may reduce the size of their caregiver staff to reduce costs (Zhao, 2008). Studies reflecting evidence of staff reduction in effort to control costs report reductions in the number of registered nurses (RN) and the RN share of total nurses (Unruh, 2001). Glandon et al., found that nursing units with higher levels of RN staff also experienced higher nursing costs (Glandon, Colbert, & Thomasma, 1989). The strategic decisions made in an organization have significant implications for the performance of that organization.

Home Health Agency Strategic Groups

The existence of strategic groups was examined reflecting that HHAs can be classified on the basis of Porter's Generic Strategies using measures of scope and resource deployment. Scope refers to identifying the number and types of services to

offer (Marlin, Sun, & Huonker, 1999). Scope was measured using the ratio of visits by service type to total visits. Resource deployment involves labor, price, and capacity decisions essential to gaining competitive advantages (Zinn et al., 1994). Resource deployment was measured using the ratio of staff FTEs by service type per 1,000 visits. Table 1 provides a list of the scope and resource deployment measures used in the cluster analysis. Four clusters emerged from this examination. Agencies with higher scope means and lower resource deployment means as compared to the other three derived clusters were classified as both differentiators and cost leaders. Those with lower scope means and higher resource deployment means were classified as stuck-in-the-middle agencies. Agencies with higher scope and higher resource deployment means were classified as differentiators. Cost leaders were those agencies with lower scope means and lower resource deployment means. The classification of these agencies provides a foundation to assess the influence of agency strategic decisions on financial performance.

Based on the clusters derived from the typology examination and the Strategic Group theory the following hypotheses will be tested:

Studies exploring the influence of cost leadership on performance report that high and medium cost leaders perform significantly better on financial measures than low cost leaders. Furthermore, high and medium cost leaders were reported to place more emphasis on financial performance (Yamin et al., 1999). Cost leader agencies have lower resource deployment and lower scope. These agencies have a lower mean staffing levels and visits by service discipline. Staffing is cited as a significant contributor to costs. Lowering staffing levels is a commonly used method to control cost (Unruh, 2001). These agencies are likely to have lower operating expenses (Zinn et al., 1994).

Hypothesis 1: Agencies with a cost leadership focus will have lower operating expenses per patient visits than agencies in the other strategic groups.

Differentiator agencies aim to distinguish themselves from other agencies by identifying services that patients perceive as important and providing these services (Zinn et al., 1994). This reflects a strategic focus in seeking revenue generating services. Differentiators have a higher resource deployment and higher scope. The differentiator group has a higher mean staffing levels and visits by service discipline.

Hypothesis 2: Agencies with a differentiation focus will have higher operating revenues per patient visits than agencies in the other strategic groups.

Porter defines stuck-in-the-middle organizations as those with no clear focus on any of the three generic strategies. The author suggests that because of the lack of focus on any of the three generic strategies, stuck-in-the-middle organizations will perform poorer than organizations with one of the three strategic focuses (Porter, 1980). Furthermore, empirical studies reflect the existence of organizations that score low on both cost leadership and differentiation strategies (Dess & Davis, 1984; Yamin et al., 1999). Stuck-in-the-middle agencies are those with high resource deployment and low scope. This group reflects a lack of focus and strategic direction (Porter, 1980).

Hypothesis 3: Agencies that are stuck-in-the-middle will have higher operating expenses per patient visit than agencies with cost leadership, or both cost leadership and differentiation focus.

Hypothesis 4: Agencies that are stuck-in-the-middle will have lower operating revenue per patient visit than agencies with a differentiation, or both cost leadership and differentiation focus.

Methods

Data Source

This study was a secondary analysis of the Provider of Service File (POS), Medicare Cost Reports, and Area Resource File (ARF). The Healthcare Cost Report Information System from Centers for Medicare and Medicaid Services (CMS) provided information on organization characteristics, utilization, costs and charges for Medicare-certified providers. The Provider of Service dataset from CMS provided quarterly information regarding characteristics of health care facilities, including home health agencies (CMS, 2017). Finally, the Area Health Resource File provided the county level information on health facilities, environmental and socioeconomic characteristics (Agency for Healthcare Research and Quality, 2017). Based on a national sample of Home Health Agencies, our study utilized data from 2015; this was because of data availability. Data from 2015 were the most complete and inclusive of all variables of interest across all datasets.

Sample

The analysis sample included 7,715 agencies. The POS included 24,260 agencies. The sample was limited to only agencies that reported to Medicare Costs Reports. Once merged, the sample included 10,707 agencies. A total of 476 observations in the sample were dropped due to qualifying as a hospice agency. In addition, only agency facility type of official health agency and other were included. Hospital, skilled nursing facility, rehabilitation facility, visiting nurse association, and combination government voluntary based agencies were not included resulting in a 2,252 reduction. This resulted in the

reduction of the number of home health agencies used in the cluster analysis to 7,715 agencies.

Operationalization (Measures)

The dependent variables of interest include ratio of operating expense per patient visit and ratio of operating revenue per patient visit. Operating expenses involves expenses directly accounted for by patient care. Operating revenue is the revenue generated from the agency's day-to-day activities. It is a function of net income minus operating expenses. Net income is defined as total earnings after subtracting all costs including taxes (Bernstein & Wild, 1998; Weech-Maldonado et al., 2010). Operating expenses and operating revenue were divided by total patient visits to create the ratio of operating expense per patient visit and ratio of operating revenue per patient visit variables.

The independent variables include cluster membership. Four clusters emerged in the typology paper. These clusters were formed on the basis of scope and resource deployment variables and classified using Porter's Generic Strategies as a foundation. The results of the cluster analysis are shown in Table 2 and depicted in Figure 1. The strategic group membership is included in this study as the independent variable.

Control variables included factors likely to influence performance. There is extensive literature examining performance in the hospital and nursing home settings. Several organizational characteristics have been associated with performance in the healthcare literature. Factors such as ownership and affiliation have been identified in the literature as significant contributors to performance. Studies examining ownership and affiliation consistently find positive relationships with performance (Dalton, Daily, Certo,

& Roengpitya, 2003; Holt, Clark, DelliFraine, & Brannon, 2011; Weech-Maldonado et al., 2010). Location has also been found to have a positive association with performance as measured by profitability (Langland-Orban, Gapenski, & Vogel, 1996). Studies report a positive relationship between these factors and financial performance (Capon, Farley, & Hoenig, 1990). Organizational characteristics of interest include state, location, and ownership. These variables are provided by the POS file. The possible outcomes for this variable include urban or rural. Urban is defined in POS as populations of more than 1,500. Rural is defined as populations of less than 1,500. Possible outcomes of ownership include: voluntary non-profit – religious affiliation, voluntary non-profit – private, voluntary non-profit – other, proprietary, and government – state/county (CMS, 2017). This variable was collapsed to include for-profit, non-for-profit, and government. Market characteristics of interest were provided by AHRF and include percent of population 65 years or older, percent of population 65 years or older without insurance, and Medicare managed care penetration. The notion is that the mean of each variables of interest are not the same for each strategic group (Zinn et al., 1994).

Analysis

Dependent variable outliers of five standard deviations and above were coded as missing in the dataset. This analysis included an ANOVA to identify if there are significant differences among clusters on the basis of their mean values for the performance measures. The analysis included an examination of normality. Both the ratio of operating expense per patient visit and ratio of operating revenue per patient visit passed the Shapiro-Wilk, Shapiro-Francia, and Skewness and kurtosis test for normality. A general linear regression analysis was used to determine the relationship between the

clusters identified in the typology development paper were in the ratio of operating expense per patient visit and ratio of operating revenue per patient visit. The regression equation was as follows:

$$Y_i = b_0 + b_1 X_1 + b_i X$$

Where:

- Y_i= dependent variable: operating expense per patient visit, operating revenue per patient visit
- b_0= intercept
- b_1= coefficient of cluster membership variable
- X_1= cluster membership: both cost leader/differentiator, stuck-in-the-middle, differentiator, and cost leader
- b_i= coefficient of all independent variables
- X_i= control variables: state, location, ownership, percent of population 65 years or older, percent of population 65 years or older without insurance, and Medicare managed care penetration

All statistical analyses were conducted at 95% confidence intervals ($p < 0.05$). This analysis was conducted using STATA Data Analysis and Statistical Software Package 13.1.

Results

Variables of interest are described in Table 3. The ANOVA confirmed that the cluster groups were significantly different from each other on operating expense per patient visit (F=4.46, p-value=0.0039) and operating revenue per patient visit (F=6.06, p-value=0.0004) (See Table 4**).** The average operating expense per patient visit for the

stuck-in-the-middle and differentiator group were significantly different from each other with means of $175.86 and $316.60, respectively. The average operating revenue per patient visit for the both cost leader/differentiator and cost leader group were significantly different from each other with means of $221.36 and $48.24, respectively. The average operating revenue per patient visit for the stuck-in-the-middle and differentiator group were significantly different from each other with means of $140.82 and $226.17, respectively. In addition, the cost leader and differentiator group were significantly different from each other. The both cost leader/differentiator group and stuck-in-the-middle were significantly different from each other.

The regression results are depicted in table 5. The first hypothesis was partially supported (See Table 5, Model 1). The differentiator was associated with a higher operating expense per visit than the cost leader group. Compared to the cost leader, the differentiator group was associated with an approximately $297 higher operating expenses per visit. There was no significant difference between cost leader agencies and both cost leader/differentiator agencies or stuck-in-the-middle agencies.

Hypotheses 2 was also partially supported (See Table 5, Model 2). Differentiators were associated with higher operating revenue per patient visit than the stuck-in-the-middle and cost leader groups. As compared to the differentiator group versus the stuck-in-the-middle group was associated with an approximately $111 lower operating revenue per patient visit. Compared the differentiator group, the cost leader group was associated with an approximately $206 lower operating revenue per patient visit. There was no significant difference between the differentiator group and the both cost leader/differentiator group for operating revenue per patient visit.

Hypothesis 3 was not supported (See Table 5, Model 3). Contrary to the hypothesized relationship, as compared to the stuck-in-the-middle group differentiators were associated with $181 higher operating expense per patient visit. There was no significant association between stuck-in-the-middle agencies and the both cost leader/differentiator or cost leader groups for operating expense per patient visit. In addition, there was no significant association between the stuck-in-the-middle group the cost leader for operating revenue per patient visit. Hypothesis 4 was partially supported (See Table 5, Model 3). As compared to stuck-in-the-middle agencies, differentiators were associated with $111 higher operating revenue per patient visit and both cost leader/differentiators were associated with a $77 higher operating revenue. There was no significant association between stuck-in-the-middle agencies and cost leader agencies for operating revenue per patient visit.

Discussion

The results found some evidence of the hypothesized relationships. This study found that cost leaders were associated with a lower operating expense per patient visit than the differentiator and stuck-in-the-middle groups. The differentiator group was associated with higher operating revenue per patient visit than stuck-in-the-middle and cost leader agencies. Stuck-in-the-middle agencies were associated with a lower operating revenue than differentiators and both cost leader/differentiators. In addition, the results reflected that differentiators were associated with higher operating expenses than all of the other strategic groups. Cost leaders were associated with lower operating revenue per patient visit than differentiators and both cost leader/differentiators.

Given that the strategic focus of cost leaders is to control costs, it is expected for these agencies to have lower operating expenses. However, these agencies should explore balancing cost control with revenue generation. These agencies also had lower operating revenues. Furthermore, the strategic focus of service provision among differentiators reflects revenue seeking activities. This was supported by the results of this study. These agencies had both higher operating expenses and operating revenue. The higher operating expenses is likely a reflection of the higher costs associated with providing more services and having higher staffing levels. A study by Laberge found that in nursing homes differentiators were able to provide many services while having similar costs as cost leaders (Laberge, 2009). The results of this study suggest that among home health agencies differentiators are experiencing higher expenses than cost leaders. Future research should explore the costs associated with strategic group membership. Lastly, stuck-in-the-middle agencies were associated with lower operating expenses and operating revenue. The operating expenses were lower for these agencies versus differentiators. This further suggests that there are significantly higher costs associated with the differentiator strategic focus. As expected, these agencies were associated with lower operating revenue than differentiators and both cost leader/differentiator agencies.

Managerial Implications

Controlling costs is a significant area of interest for management. The results reflect some evidence that differentiators are achieving higher operating revenues but also experience higher operating expenses. Although the results for the relationship between cost leaders and both cost leader/differentiators and stuck-in-the-middle agencies were not statistically significant, cost leaders were associated with lower

operating expenses. Since it appears that cost leaders are effectively controlling costs, managers should explore finding methods to control costs while increasing revenue. This could be achieved by focusing on providing limited but specific high revenue generating services. Differentiators should examine the costs associated with the services they provide and their staffing levels. These agencies should explore methods to sustain higher operating revenues while lowering operating expenses.

Limitations

This study used cross-sectional data, thus, the reader should be aware when trying to conclude a causal relationship.

Conclusion

This study found evidence of an association between strategic group membership and financial performance. The results indicated that cost leaders are associated with lower operating expenses than differentiators. Differentiators were found to be associated with higher operating expenses and operating revenue. In addition, stuck-in-the-middle agencies were found to be associated with lower operating revenue.

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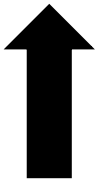
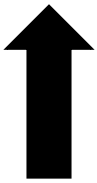
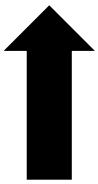
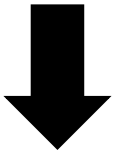
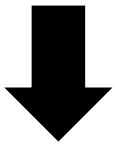
	Scope	Resource Deployment
Cluster 1 Both • Agencies in this cluster are expected to have a lower mean staffing levels by service discipline and higher mean visits by service type		
Cluster 2 Stuck-in-the-middle • Agencies in this cluster are expected to have a higher mean staffing levels and lower mean visits by service type		
Cluster 3 Differentiator • Agencies in this cluster are expected to have a higher mean staffing levels and visits by service type		
Cluster 4 Cost leader • Agencies in this cluster are expected to have a lower mean staffing levels and visits by service type		

Figure 1. Depiction of cluster analysis results.

Table 1

List of Clustering, Organizational, and Market Variables and Definitions

Variables	Definition	Data Source
Scope Variables		
Percent of Home Health Aide Visits	The total number of home health aide service visits divided by the total number of visits	Medicare Costs Reports
Percent of Medical Social Work Visits	The total number of medical social work service visits divided by the total number of visits	Medicare Costs Reports
Percent of Occupational Therapy Visits	The total number of occupational therapy service visits divided by the total number of visits	Medicare Costs Reports
Percent of Physical Therapy Visits	The total number of physical therapy service visits divided by the total number of visits	Medicare Costs Reports
Percent of Skilled Nursing Visits	The total number of skilled nursing service visits divided by the total number of visits	Medicare Costs Reports
Percent of Speech Pathology Visits	The total number of home speech pathology service visits divided by the total number of visits	Medicare Costs Reports
Resource Deployment Variables		
Total Home Health Aide FTEs per 1000 visits	The number of full-time equivalent home health aides divided by the total number of visits then multiplied by 1000	Medicare Costs Reports
Total Medical Social Workers FTEs per 1000 visits	The number of full-time equivalent medical social workers divided by the total number of visits then multiplied by 1000	Medicare Costs Reports
Total Occupational Therapists FTEs per 1000 visits	The number of full-time equivalent occupational therapists divided by the total number of visits then multiplied by 1000	Medicare Costs Reports
Total Physical Therapists FTEs per 1000 visits	The number of full-time equivalent physical therapists divided by the total number of visits then multiplied by 1000	Medicare Costs Reports
Total Direct Nurse FTEs per 1000 visits	The number of full-time equivalent direct nurses divided by the total number of visits then multiplied by 1000	Medicare Costs Reports
Total Speech Pathologists FTEs per 1000 visits	The number of full-time equivalent speech pathologists divided by the total number of visits then multiplied by 1000	Medicare Costs Reports

Organizational Variables		
Location	Indicates whether the agency is in an urban or rural area	Provider of Service File
Ownership	Indicates whether the agency is a for-profit, not-for-profit, or government owned agency	Provider of Service File
State	Indicates the state in which the agency operates	Provider of Service File
Market Variables		
Percent of population 65 years or older	Percentage of total resident population age 65 years or older	Area Health Resource File
Percent of population 65 years or older without insurance	Total percentage of resident population over 65 without health insurance	Area Health Resource File
Medicare managed care penetration	The ratio of Medicare Advantage Plan enrollees over eligible Medicare individuals multiplied by 100	Area Health Resource File

Table 2

Hierarchal Cluster Analysis Results of Scope and Resource Deployment Measures

	Scope						Resource Deployment					
Cluster	**Percent of Home Health Aide Visits**	**Percent of Medical Social Work Visits**	**Percent of Occupational Therapy Visits**	**Percent of Skilled Nursing Visits**	**Percent of Physical Therapy Visits**	**Percent of Speech Pathology Visits**	**Total Home Health Aide FTEs per 1000 visits**	**Total Medical Social Worker FTEs per 1000 visits**	**Total Occupational Therapists FTEs per 1000 visits**	**Total Physical Therapists FTEs per 1000 visits**	**Total Direct Nursing FTEs per 1000 visits**	**Total Speech Pathologists FTEs per 1000 visits**
Both Cost leader+ Differentiator 1 n=3,763	8.763	0.577	6.622	46.117	34.331	1.225	0.016	0.002	0.01	0.041	0.054	0.003
Stuck-in-the-middle 2 n=539	52.863	0.15	1.975	33.34	9.21	0.313	2.114	0.021	0.307	2.35	13.295	0.00009
Differentiator 3 n=1,731	9.588	0.290	1.690	74.190	13.789	0.284	0.171	0.003	0.032	0.197	0.904	0.00005
Cost leader 4 n=1,682	0.111	0.002	0.0336	0.365	0.134	0.006	0.001	0.000003	0.00002	0.00006	0.0006	0.000003
Total n=7,715	10.143	0.357	3.754	41.548	20.512	0.684	0.194	0.003	0.033	0.228	1.158	0.001

Table 3
Descriptives of Financial Indicators and Control Variables

Variables	Frequency (%) or Mean (SD)
Financial Measures	
Operating expense per patient visit	254.81 (1039.17)
Operating revenue per patient visit	212.54 (591.86)
Organizational Variables	
Location	
Rural	857 (11.12%)
Urban	6,853 (88.88%)
Ownership	
Government	248 (3.21%)
Not for-profit	205 (2.66%)
For-profit	7,262 (94.13%)
Market Variables	
Percent of population 65 years or older	13.39 (3.88)
Percent of population 65 years or older without insurance	16.11 (6.19)
Medicare managed care penetration	33.79 (12.56)

Table 4
Financial Indicators ANOVA Results

Variables	Both Cost leader+ differentiator	Stuck-in-the-middle	Differentiator	Cost leader	F	p
			Mean (SD)			
Operating expense per patient visit	243.26 (812.93)	175.86 [3] (724.87)	316.60 [2] (1491.46)	65.18 (168.96)	4.46	<0.01
Operating Revenue per patient visit	221.36 [2,4] (570.73)	140.82 [1,3] (464.13)	226.17 [2,4] (681.63)	48.24 [1,3] (71.42)	6.06	<0.001

***Significantly different from all clusters. Superscript is significantly different than identified groups**

Table 5

Regression Analysis with the Financial Indicators as Dependent Variable

Cluster	**Financial Measures**					
	Operating expense per patient visit B (SE)	**Operating revenue per patient visit B (SE)**	**Operating expense per patient visit B (SE)**	**Operating revenue per patient visit B (SE)**	**Operating expense per patient visit B (SE)**	**Operating revenue per patient visit B (SE)**
	Model 1		**Model 2**		**Model 3**	
Both	167.94 (100.83)	171.77 (59.27)**	-128.58 (33.11)**	-34.39 (19.48)	53.38 (53.88)	76.87 (31.68)*
Stuck-in-the-middle	114.57 (110.40)	94.89 (64.89)	-181.95 (57.98)**	-111.26 (34.09)**	*Ref*	*Ref*
Differentiator	296.52 (102.59)**	206.16 (60.31)**	*Ref*	*Ref*	181.95 (57.98)**	111.26 (34.09)**
Cost leader	*Ref*	*Ref*	-296.52 (102.59)**	-206.16 (60.31)**	-114.57 (110.40)	-94.89 (64.89)

**p ≤0.05; **p ≤ 0.01*

Control variables: state, location, ownership, percent of population 65 years or older, percent of population 65 years or older without insurance, and Medicare managed care penetration

CONCLUSION

The study found evidence of the existence of strategic groups in the home health industry. These agencies can be described using Porter's generic strategies. Porter has three generic strategies: cost leader, differentiator, and focuser. Porter also posits that stuck-in-the-middle agencies that do not demonstrate any clear orientation to one of the three strategies exist. This study examined the application of Porter's generic strategies focusing on the cost leader, differentiator, and stuck-in-the-middle groups. Using visits by service discipline and FTEs by service discipline, a cluster analysis resulted in four clusters define as: cluster 1=both cost leader/differentiator, cluster 2=stuck-in-the-middle", cluster 3=differentiator, and cluster 4=cost leader. The both cost leader/differentiator group had lower mean FTEs by service discipline and higher mean visits by service discipline. The stuck-in-the-middle agencies had higher mean FTEs by service discipline and lower mean visits by service discipline. The differentiator group had higher mean FTEs by service discipline and higher mean visits by service discipline. Lastly, the cost leader group had lower mean FTEs by service discipline and lower mean visits by service discipline.

In addition, this study examined the relationship between strategic group membership and quality and financial performance. The both cost leader/differentiator group showed to have better quality performance than the other three strategic groups. Differentiators had better quality performance than the cost leader and stuck-in-the-middle agencies. Contrary to the expected relationship, the stuck-in-the-middle group

was associated with higher percentages of patients who reported the most positive HHCAHPS reviews than the cost leader group. These results suggest that it is beneficial for agencies to balance service provision with cost control. It is important that agencies examine the tradeoff between cost control and quality. Suboptimal staffing levels and offering too few services can have negative impact on an agency's ability to meet the needs of their patients. Agencies should explore optimal levels of services and staffing while ensuring quality.

This study also found evidence of an association between group membership and financial performance. The results indicated that cost leaders are associated with lower operating expenses than differentiators. Differentiators were found to be associated with higher operating expenses and operating revenue than all other groups. In addition, stuck-in-the-middle agencies were found to be associated with lower operating revenue than differentiators and both cost leader/differentiator groups. Lastly, both cost leader/differentiators were associated with lower operating expenses than differentiators and higher operating revenue than cost leaders and stuck-in-the-middle agencies.

Cost leaders had lower quality performance and lower operating revenue. Although these agencies had lower operating expenses appearing to effectively control costs, they may be some trade-off between cost control and performance. Differentiators showed to have better quality performance and higher operating revenues than cost leaders. However, these agencies had higher operating expenses. The both cost leader/differentiator group appeared to have the best overall performance. These agencies had a higher likelihood of being in the high tier of the quality star rating and were associated with higher percentages of patients who reported the most positive HHCAHPS

reviews than all of the other groups. They also had higher operating revenue than the cost leader and lower operating expenses than the differentiators.

Furthermore, the ANOVA analyses conducted throughout this dissertation provided some interesting implications for HHA strategic group membership. The cost leader agencies appeared to be located in areas with a higher average percent of Medicare eligible enrollees in a managed care plan. This could be a reflection of the influence managed care has on the agencies. Cost leaders may be cost leaders because of the pressure to control costs placed on them by managed care plans. In addition, differentiators appeared to be located in areas with a higher average percent of the 65 and older population without insurance. Agencies in this market could be facing a higher level competition due to the number of consumers with forms of pay other than Medicare. A competitive market could be stimulating their orientation towards service differentiation.

Future Research

The higher operating expenses associated with the differentiator group is likely a reflection of the higher costs associated with providing many services and having higher staffing levels. A study by Laberge found that in nursing homes differentiators were able to provide many services while having similar costs as cost leaders (Laberge, 2009). The results of this study suggest that among home health agencies differentiators are experiencing higher expenses than cost leaders. Future research should explore whether different groups provide more costly services within the service disciplines. The results suggest that agencies with lower mean staffing levels and visits per service discipline had lower quality performance. In addition, there is a point at which providing additional

services and higher staffing levels will not provide substantial improvement in quality. Considering the costliness of post-acute care, further research should explore the optimal amount of services and staffing levels an agency should provide.

Conclusion

This study demonstrated that strategic groups exist within the home health agency and can be classified on the basis of Porter's generic strategies. There appears to be a relationship between strategic group membership and care quality. Both cost leader/differentiators showed to perform better than all other groups.

APPENDIX A

IRB APPROVAL

THE UNIVERSITY OF ALABAMA AT BIRMINGHAM

Institutional Review Board for Human Use

Exemption Designation
Identification and Certification of Research
Projects Involving Human Subjects

UAB's Institutional Review Boards for Human Use (IRBs) have an approved Federalwide Assurance with the Office for Human Research Protections (OHRP). The Assurance number is FWA00005960 and it expires on November 8, 2021. The UAB IRBs are also in compliance with 21 CFR Parts 50 and 56.

Principal Investigator:	Evans, Ronique
Co-Investigator(s):	
Protocol Number:	**E170425001**
Protocol Title:	*Home Health Agency Taxonomy and its Association with Quality and Financial Performace*

The above project was reviewed on 5/4/17. The review was conducted in accordance with UAB's Assurance of Compliance approved by the Department of Health and Human Services. This project qualifies as an exemption as defined in 45CFR46.101(b), paragraph 4.

This project received EXEMPT review.

Date IRB Designation Issued: 5/4/17

Cari Oliver, CIP
Assistant Director, Office of the
Institutional Review Board for Human
Use (IRB)

Investigators please note:

Any modifications in the study methodology, protocol and/or consent form/information sheet must be submitted for review to the IRB prior to implementation.

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APPENDIX B

POST HOC ANALYSIS OF BOTH COST LEADER/DIFFERENTIATOR GROUP

Cluster	Financial Measures		Quality Measures					
	Operating expense per patient visit B (SE)	**Operating revenue per patient visit B (SE)**	**Quality Star Rating – High OR (SE)**	**Percent reported care ALWAYS in a professional way B(SE)**	**Percent reported HHA team ALWAYS communicated well with them B (SE)**	**Percent reported HHA team ALWAYS discussed medicines, pain, and home safety with them B (SE)**	**Percent of patients who gave their home health agency a rating of 9 or 10 B(SE)**	**Percent reported YES, they would recommend agency B(SE)**
Both	*Ref*	*Ref*	*Ref*	*Ref*	*Ref*	*Ref*	*Ref*	*Ref*
Stuck-in-the-middle	-53.38 (53.88)	-76.87 (31.68)*	0.47 (0.09)**	-16.17 (2.04)**	-15.94 (1.97)**	-14.64 (1.96)**	-15.92 (1.95)**	-15.32 (1.84)**
Differentiator	128.58 (33.11)**	34.39 (19.48)	0.80 (0.07)**	-6.25 (1.24)**	-6.19 (1.19)**	-5.17 (1.19)**	-6.02 (1.19)**	-5.77 (1.11)**
Cost leader	-167.94 (100.83)	-171.77 (59.27)**	1.16 (0.38)	-28.44 (4.10)**	-27.12 (3.95)**	-25.37 (3.93)**	-27.34 (3.92)**	-25.98 (3.69)**

**p ≤0.05; **p ≤ 0.01*

Control variables: state, location, ownership, percent of population 65 years or older, percent of population 65 years or older without insurance, and Medicare managed care penetration