Medical Care Research and Review
1–20

DOI: 10.1177/1077558715592295
mcr.sagepub.com
SAGE

Analyzing Determinants of Hospitals' Accountable Care Organizations Participation: A Resource Dependency Theory Perspective

Valerie A. Yeager[1], Yongkang Zhang[1], and Mark L. Diana[1]

Abstract

Accountable care organizations (ACOs) are rapidly being implemented across the United States, but little is known about what environmental and organizational factors are associated with hospital participation in ACOs. Using resource dependency theory, this study examines external environmental characteristics and organizational characteristics that relate to hospital participation in Medicare ACOs. Results indicate hospitals operating in more munificent environments (as measured by *income per capita*: $\beta = 0.00002$, $p < .05$) and more competitive environments (as measured by *Health Maintenance Organization penetration*: $\beta = 1.86$, $p < .01$) are more likely to participate in ACOs. Organizational characteristics including hospital ownership, health care system membership, electronic health records implementation, hospital type, percentage of Medicaid inpatient discharge, and number of nursing home beds per 1,000 population over 65 are also related to ACO participation. Should the anticipated benefits of ACOs be realized, findings from this study can guide strategies to encourage hospitals that have not gotten involved in ACOs.

Keywords

Accountable Care Organization (ACO), health care quality, resource dependency theory, environment

This article, submitted to *Medical Care Research and Review* on October 20, 2014, was revised and accepted for publication on May 28, 2015.

[1]Tulane School of Public Health and Tropical Medicine, New Orleans, LA, USA

Corresponding Author:
Valerie A. Yeager, Department of Global Health Management and Policy, Tulane School of Public Health and Tropical Medicine, 1440 Canal Street, New Orleans, LA 70112, USA.
Email: vayeager@tulane.edu

Introduction

The United States spent $2.8 trillion on health care in 2012—more than any other country in the world (Martin, Hartman, Whittle, & Catlin, 2014). Although the annual growth rate of health care costs has declined slightly over the past few years, the total health care costs still account for 17.2% of the nation's gross domestic product (Fuchs, 2013). Despite these financial investments, Americans have worse health outcomes than individuals in other countries and little guarantee that they will receive high-quality health care. For example, compared with other industrialized countries like Canada and Germany, patients in the United States are more likely to receive the wrong medications, experience medical errors, receive incorrect test results, and experience prolonged emergency department wait times (Davis, Schoen, & Stremikis, 2010; Schoen et al., 2005; Schoen, Osborn, How, Doty, & Peugh, 2009). Furthermore, the prevalence of and mortality due to cardiovascular and respiratory disease in the United States ranks at or near the bottom compared with other high-income countries (Woolf & Aron, 2013).

To address the issues of cost and quality of care within the U.S. health system, accountable care organizations (ACOs) were proposed in the Patient Protection and Affordable Care Act in 2009. This strategy, built on highly coordinated care, is the latest effort to redesign health services delivery and the payment system. An ACO generally is a network of hospitals, individual physicians or physician groups, and other providers such as long-term care organizations. By joining an ACO, providers agree to coordinate care for a defined population of patients, with possible financial rewards if they contain costs while maintaining or improving health services quality (Berwick, 2011b).

ACOs have been rapidly developing across the United States with support from the federal Medicare program, state Medicaid agencies, and organizations in the private sector. Specifically, a total of 366 Medicare ACOs have been established as of January 2014 (Muhlestein, 2014).

Although the ACO program is still in its early development, several studies have examined the determinants of the formation and participation of ACOs (Audet, Kenward, Patel, & Joshi, 2012; Auerbach, Liu, Hussey, Lau, & Mehrotra, 2013; Lewis, Colla, Carluzzo, Kler, & Fisher, 2013). These early studies were limited by the number of ACOs and the number of hospital participants of ACOs; they either focused solely on market-level factors or used a relatively small sample of hospitals; and only one prior study used hospitals as the unit of analysis.

Two of the previous studies identified market-level factors associated with ACO formation. For example, a study conducted by Lewis et al. (2013) found that hospital service areas with higher quality performance, higher Medicare spending per capita, fewer primary care physician groups, greater managed care penetration, and lower poverty rates were more likely to have ACOs. This study focused on 227 Medicare, state Medicaid, and private ACOs identified by the authors as of August 2012. Using hospital referral region data, Auerbach et al. (2013) analyzed the determinants of Medicare ACO formation as of January 2013. They found that regional factors, including a

greater fraction of hospital risk sharing (capitation), larger integrated hospital systems, and primary care physicians practicing in larger groups were associated with ACO formation (2013).

A third study examined hospital-level factors and two environmental factors as they relate to ACO formation using 2011 data (Audet et al., 2012). Audet et al. found that 13% of the 1,672 hospitals in their sample reported participating in an ACO or planning to participate. Their study indicated that hospitals participating or planning to participate in an ACO were more likely to have higher bed numbers, to be members of a multihospital health system, to be located in an urban area, to be teaching hospitals, and to be not-for-profit compared with those not exploring the ACO model (2012).

While these studies provided valuable early insight about ACOs, two of the three studies focused on ACO markets and the one hospital-focused study was limited by a relatively small sample of hospitals that initially participated in ACOs and a narrow range of organizational characteristics. To date, no studies have broadly examined the relationship between the environment where hospitals are situated, hospital organizational characteristics and hospital participation in ACOs based on a nationally representative sample.

Given that hospitals are positioned to play an important role in care coordination, cost control, and infrastructure investment, their participation in ACOs is worth a careful investigation. First, the success of ACOs will require providers' cooperation in clinical practice, administration, and the financial distribution of any cost savings. Compared with physicians, research indicates that hospitals are more effective at organizing providers into groups, achieving agreement on clinical guidelines, and devising ways to equitably distribute money (Kocher & Sahni, 2010). Additionally, involving hospitals in ACOs may lead to further reductions in costs because it may contribute to the prevention of unnecessary hospitalizations, avoidable complications, and redundant tests, which are responsible for a considerable proportion of health expenditures (Bentley, Effros, Palar, & Keeler, 2008; Berwick & Hackbarth, 2012). Last, it is well-recognized that a strong infrastructure, especially a robust health information system, is an essential component of an ACO (McClellan, McKethan, Lewis, Roski, & Fisher, 2010). Since hospitals are more likely to have invested in health information systems such as electronic health records (EHRs; Kocher & Sahni, 2010), hospital participation is integral to ACO formation and may relate to cost reductions and quality improvements as well as the monitoring necessary to measure ACO benefits. For these reasons, this study focuses on factors that relate to hospital participation in ACOs and will contribute additional insight to previous findings about market factors and ACO participation.

New Contributions

Although research on ACOs is increasing, few published studies involve both environmental level and organizational level data. Compared with previous studies conducted at earlier points in time, the current study examines ACO participation 3 years into the ACO program. Early studies were limited by the number of ACOs and the number of

hospital participants of ACOs. Previous studies either focused solely on market-level factors or used a relatively small sample of hospitals, limiting their ability to provide a full picture of hospital participation of ACOs. The current study, using a more recent sample of ACOs and hospital participants, provides new insight into ACO participation and employs a broader range of possible factors in a multivariate model. This is also the first empirical study using a national sample to analyze determinants of hospital ACO participation. From the perspective of resource dependency theory (RDT), this study provides an analysis of the determinants of hospital ACO participation by using a comprehensive set of environmental and organizational characteristics. Findings may provide policy makers new information about factors that may be facilitating or impeding ACO participation. This information can inform policies that strategically work to extend the ACO program to more hospitals and the wider U.S. population, ultimately extending the benefits of the ACO program as well.

Conceptual Framework

Resource Dependency Theory

For this study, RDT was employed to examine the relationship between the external environment and hospital participation in ACOs. RDT highlights the significance of the external environment in understanding an organization's strategy, structure, and performance (Dickson & Weaver, 1997; Duncan, 1972; Miller, 1987; Pfeffer & Salancik, 2003).

Specifically, RDT posits that each organization is an open system and, typically, individual organizations do not control all the necessary resources needed for organizational survival and development. Therefore, every organization depends, to some extent, on the external environment to satisfy their resource needs. According to RDT, when there is instability or uncertainty within the environment, or both, an organization may be exposed to various risks such as problems with resource supply. As a result of this uncertainty or instability, organizational decision makers may employ strategies to reduce the organization's dependence on the environment or to reduce some of the uncertainty (Dickson & Weaver, 1997; Duncan, 1972; Miller, 1987; Pfeffer & Salancik, 2003). In studies that have empirically operationalized RDT to examine the external environment, three constructs are typically considered: munificence (Pfeffer & Salancik, 2003), dynamism, and competition (Dess & Beard, 1984; Kreiser & Marino, 2002; Yeager et al., 2014). The following sections explain each of these constructs in the context of ACOs as well as their hypothesized relationships.

Environmental Characteristics

Munificence. Munificence refers to the availability and accessibility of resources necessary for an organization's survival and development within its external environment (Dess & Beard, 1984; Sharfman & Dean, 1991). A munificent environment is important because it can provide financial, professional, and other resources needed but not

possessed by organizations. Organizations that operate in less munificent environments have to reduce their dependence on certain resources and find alternative resource supplies. Previous research suggests that hospitals operating in less munificent environments were more likely to pursue less expensive and less labor-intensive health information technology strategies than their counterparts that had more financial and human resources (Menachemi, Shin, Ford, & Yu, 2011).

In the context of this study, ACO participation represents a complex, resource-intensive initiative for a hospital. Hospitals will need to invest notable resources in efforts to establish a suitable ACO organizational structure and in coordinating health services among ACO partners (Fisher et al., 2009; Kocher & Sahni, 2010; McClellan et al., 2010). An environment lacking necessary resources will not be able to provide sufficient revenue to the hospital, necessary health and information technology professionals, and other resources needed to invest in an ACO. Therefore, we hypothesize that hospitals operating in more munificent environments will be more likely to participate in ACOs.

Dynamism. Dynamism represents the rate of environmental change or innovation (Dess & Beard, 1984; Miller, 1987). A dynamic environment can introduce uncertainty to an organization and influence its performance, structure, and strategy. According to RDT, a dynamic environment may not be able to ensure the sustainability of resources. In addition, uncertainty due to dynamism can reduce acquisition activity by placing the value of new resource combinations in doubt (Hoskisson & Hitt, 1990). Dynamism can influence decision makers' perception of the environment, compelling them to devise new strategies to adapt to the turbulence in the environment or to create a more stable, predictable existence. Previous research found that physicians practicing in more dynamic environments, characterized by high levels of unemployment rate change and high levels of poverty rate change, were less likely to adopt an EHR system (Menachemi, Mazurenko, Kazley, Diana, & Ford, 2012).

ACO participation represents a complicated strategic change for a hospital. Hospitals participating in an ACO may implement changes in their health services delivery model, organizational or legal structures, and their relationships with other health care providers (Fisher et al., 2009; Kocher & Sahni, 2010; Rittenhouse, Shortell, & Fisher, 2009). A more dynamic environment may make it difficult for hospitals to complete these tasks or to have enough information to reliably decide to engage in such strategies. Thus, we hypothesize that hospitals within a more dynamic environment will face more uncertainty and be less likely to participate in an ACO.

Competition. Competition is reflected in the number and diversity of stakeholders (e.g., competitors, suppliers, and buyers) that decision makers need to consider in formulating strategies (Smart & Vertinsky, 1984). A competitive environment will increase the level of uncertainty perceived by decision makers, expanding the time they need to understand the environment and possibly making them less willing to undertake new strategies. Previous studies found that hospitals in less competitive environments were more likely to be alliance members (Zinn, Proenca, & Rosko,

1997). Another study found that greater managed care penetration could introduce risk in terms of hospital profitability, limiting a hospital's ability to get resources to cross-subsidize costly uncompensated care (Thorpe, Seiber, & Florence, 2001).

As aforementioned, pursing an ACO model will require hospitals to build a cooperative network with other providers and organizations. Highly competitive health care environments may make developing collaborative ACO arrangements challenging; thus, we hypothesize that hospitals in more competitive environments will be less likely to participate in an ACO.

Organizational Characteristics

In addition to environmental characteristics, several hospital characteristics may be associated with hospital access to resources. Hospitals with certain characteristics may have more resources compared with their competitors. Hospital size, for example, is often positively related to necessary human and capital resources. A larger hospital may have more physicians and greater patient flow and more affiliated providers, potentially providing them a higher level of control over the resources they need, compared with smaller hospitals. Ownership may also be related to resource access. Previous studies indicate that not-for-profit hospitals provide more uncompensated care, potentially exposing them to more uncertainty in finances and fewer financial resources (Horwitz, 2005; Hsieh, Clement, & Bazzoli, 2010; Rosko, 2004). Also, hospitals functioning within a health care system may be more secure in terms of necessary resources and may have greater bargaining power with purchasers and health plans (Bazzoli, Chan, Shortell, & D'Aunno, 2000). Another variable potentially related to hospital resources is EHR implementation. A sound EHR system is essential for hospitals to access timely patient information for diagnosis, treatment, and performance measurement, and to coordinate care beyond the geographic boundaries of clinics. Hospitals with EHRs may be more munificent in terms of information needed for clinical practice compared with those without EHRs, especially considering the care coordination requirement of ACO model (Burton, Anderson, & Kues, 2004; Jha, DesRoches, Kralovec, & Joshi, 2010).

Certain organizational variables may also be related to the uncertainty within the environment. Given that the U.S. health system is moving toward more value-based payment schemes, hospitals may be motivated to participate in ACOs as an overall strategy to be aligned with this changing reimbursement environment. Regardless of the type of ACO program (e.g., Medicare or Medicaid), hospitals that focus on better care coordination may benefit as reimbursement changes for both Medicare and Medicaid patients. Hospitals with a higher proportion of Medicare and Medicaid patients may, therefore, face uncertainty (such as financial instability) and may be motivated to explore strategies such as joining an ACO. Essentially, focusing on improving health care quality and reducing costs through ACO participation may eliminate some of the uncertainty associated with future, value-based reimbursement changes. Such a strategy has the potential to control costs and improve health care quality, thereby reducing some of the risks of the quality-focused, changing Medicare and Medicaid reimbursement environment.

Given these considerations, we hypothesize that larger hospitals, for-profit hospitals, hospitals within a system, hospitals with a comprehensive EHR, and hospitals with a higher percentage of Medicare and Medicaid are more likely to participate in ACOs.

Method

Primary Data Collection

To obtain the dependent variable of interest—hospital ACO participation status—we first identified all Medicare ACOs established as of January 2013 using fact sheets that were publically available on the Centers for Medicare and Medicaid Services's website. Second, since the specific hospitals participating in the ACOs were not provided, we examined ACO websites to identify participating hospitals within each ACO. Five ACOs did not have websites and were contacted directly through telephone or e-mail to inquire about their participating hospital(s). Third, to verify the list of ACO hospitals generated in Step 1, we cross-referenced the list with ACO participant taxpayer identification numbers and names available in an additional document released by Centers for Medicare and Medicaid Services.

Secondary Data

Three secondary data sets were matched with the primary data on ACO hospitals. First, data from the 2012 Area Health Resource File (AHRF) were included to examine environmental characteristics of hospitals (U.S. Department of Health and Human Services, 2013). Second, data from the American Hospital Association (AHA) 2012 Annual Survey provided general organizational information about hospitals. A supplement to the AHA survey, the Health Information Technology (HIT) Supplement, which collects information on EHRs and other HIT information, was used to provide additional organizational information on hospital EHR use (AHA, 2012). The AHA data sets were matched with the ACO hospital list using Medicare provider numbers. AHRF data were matched to all hospitals using county identifiers.

Study Population

More than 6,300 hospitals available in the 2012 AHA Annual Survey were considered for inclusion in this study. Hospitals in Guam, Puerto Rico, and the Virgin Islands were excluded because environmental information was not available for these areas. Hospitals owned by the federal government, such as military or veterans hospitals were also excluded from analysis as none of these participated in an ACO. The final data set used for analyses includes 6,030 hospitals, of which 431 were participating in the 252 Medicare ACOs as of January 2013. Although a total of 366 Medicare ACOs existed as of January 2014, we were unable to include ACOs established after January 2013 due to lack of data on these newly developed ACOs.

Several potential options were available for defining a hospital's environment (or market) in this study. The majority of empirical studies using RDT use the county as the market (Yeager et al., 2014). State and metropolitan statistical areas (MSA) are other options and have been used for some variables in several studies conceptualized by RDT (Balotsky, 2005; Zinn et al., 1997). Previous ACO studies have also used hospital service areas and hospital referral regions to define a market (Auerbach et al., 2013; Lewis et al., 2013). In addition, the Department of Justice used the primary service area to set the antitrust policy for Medicare ACO participants (Federal Trade Commission, 2011).

Generally, an ACO can serve patients across counties by involving providers in different counties. Therefore, the county may be too narrow of a definition of an ACO market. Due to the data availability and their specific purpose, hospital referral regions are also not appropriate for the current study as the regions are defined by determining where patients were referred for major cardiovascular surgical procedures and for neurosurgery. The primary service area and hospital service areas are even narrower compared with the county. For example, there are 3,436 hospital service areas in the United States and most of these contained only one hospital (The Dartmouth Atlas of Health Care, 2010). Therefore, we used MSA as the market for hospitals located in urban areas. For rural hospitals, which do not have a designated MSA, we used the county as the definition of the market.

Variables

All variables are presented along with their sources in Table 1. The dependent variable of interest is a binary variable indicating hospital ACO status (*ACO hospital*). Independent variables broadly represented environmental or organizational characteristics that may relate to the decision to join an ACO.

Consistent with RDT, variables were chosen to represent three dimensions of the external environment of hospitals (i.e., munificence, dynamism, and competition). Environmental munificence was operationalized through four environmental variables: physician supply, specialist supply, income level, and the geographic location of hospitals. Specifically, physician supply was measured by *number of physicians per capita*, specialist supply was measured by *number of specialists per capita*, and income level was captured by *income per capita*. All of these variables were measured at the MSA-level for urban hospitals and county-level for rural hospitals. County-level data were extracted from the AHRF file and data were collapsed to create MSA-level variables for urban hospitals. Hospital location was categorized as *rural location* (compared with urban), using the Core Based Statistical Area variable from the AHA Annual Survey (AHA, 2012). All munificence variables are continuous except for *rural location*, which is a binary variable.

In line with previous studies, we used the degree of instability in health services demand to represent dynamism (Hsieh et al., 2010; Menachemi et al., 2011). We measured the instability of health services need by *the change in the number of hospital beds per capita, percentage of poverty change*, and *unemployment rate change*. All

Table 1. Independent Variables Used in Analysis.

Variables	Data source and year	Type
Munificence		
Number of physicians per capita	AHRF, 2011	Continuous
Number of specialists per capita	AHRF, 2011	Continuous
Income per capita	AHRF, 2010	Continuous
Rural location	AHA annual survey, 2012	Binary
Dynamism		
Number of hospital beds per capita change	AHRF, 2011-2007	Continuous
Percentage of poverty change	AHRF, 2011-2007	Continuous
Unemployment rate change	AHRF, 2011-2007	Continuous
Competition		
HHI	AHA annual survey, 2012	Continuous
HMO penetration	InterStudy, 2008	Continuous
Organizational variables		
Number of staffed beds	AHA annual survey, 2012	Continuous
Hospital ownership	AHA annual survey, 2012	Categorical
Health system membership	AHA annual survey, 2012	Categorical
EHR implementation	AHA annual survey, 2012, 2011, and 2010	Categorical
Percentage of Medicare inpatient discharges	AHA annual survey, 2012	Continuous
Percentage of Medicaid inpatient discharges	AHA annual survey, 2012	Continuous
Medical school affiliation	AHA annual survey, 2012	Binary
Member of COTH	AHA annual survey, 2012	Binary
Number of nursing home beds per 1,000 population over 65	AHA annual survey, 2012	Continuous
Hospital type	AHA annual survey, 2012	Categorical

Note. HMO = Health Maintenance Organization; HHI = Herfindahl–Hirschman index; COTH = Council of Teaching Hospitals; EHR = electronic health record; AHRF = area health resource file; AHA = American Hospital Association.

these changes were measured over a 5-year period from 2007 to 2011 and were continuous variables.

Competition was captured through the two variables: the *Herfindahl–Hirschman index (HHI)* and *Health Maintenance Organization (HMO) penetration*. HHI, which ranges from 0 to 1 (lower values indicate greater market competition), is commonly used to measure the level of health care competition in the market. HMO penetration was used to measure competition as previous research indicated that greater HMO penetration was associated with increased competition for resources in the market (Thorpe et al., 2001).

Regarding the organizational variables we identified that may be related to resources, hospital size is measured by *number of hospital staffed beds*; for ownership, since we excluded hospitals owned by the federal government, we categorized *hospi-*

tal ownership as nonfederal government, nongovernment not-for-profit, and investor-owned (for-profit).

The variable of *health care system membership* was based on a study by Bazzoli et al. (Bazzoli, Shortell, Dubbs, Chan, & Kralovec, 1999). Bazzoli's taxonomy includes three categories of centralized health systems, one category of decentralized health systems, and independent hospital systems. Centralization refers to where key decisions are made in an organization (Bazzoli et al., 1999; Menachemi, Yeager, Duncan, Katholi, & Ginter, 2012). Compared with decentralized health systems, centralized health systems have higher levels of control on the decision-making process and services delivery, which may influence the decision to participate in an ACO. Therefore, we created three categories from this taxonomy to indicate *health care system membership*: centralized, decentralized, and no system affiliation. Centralized systems include the three centralized system type categories from the taxonomy, decentralized including the decentralized and independent systems from the taxonomy, and no affiliation included all other hospitals.

For *EHR implementation*, 34% of hospitals in the 2012 AHA data set did not report their EHR status. However, based on the rationale that hospitals that reported having implemented an EHR in a recent survey (2010 or 2011) would likely still have the EHR, hospitals with missing EHR status in 2012 were assigned their prior year's EHR status. In instances where a hospital's EHR status was unavailable or missing across all 3 years, a new EHR category for missing EHR was generated so that these hospitals would not be lost during analyses (Diana, Harle, Huerta, Ford, & Menachemi, 2014). Therefore, there are four categories for *EHR implementation*, full implementation, partial implementation, no implementation, and missing.

We also used the *percentage of Medicare inpatient discharges* and *percentage of Medicaid inpatient discharges* as an indication of possible impact of quality-focused, value-based changing Medicare and Medicaid reimbursements. Again, the assumption is that hospitals with higher proportions of these discharges will strategically join ACOs to be better aligned with this changing environment.

In addition to the aforementioned environmental and organizational variables, several organizational variables have been found to be associated with hospital ACO participation, though they may not be related to resource access. A study by Audet et al. (2012) indicated that hospitals participated or planning to participate in ACOs are more likely to be teaching hospitals. As such, two teaching status variables were included as control variables in our analysis. Teaching status was captured by *medical school affiliation* and *membership of Council of Teaching Hospitals* of the Association of American Medical Colleges. In addition, we also included the *number of nursing home beds per capita* in the multivariate model, as the presence of these facilities provides additional partners for ACOs and may create opportunities to improve cost savings and improved quality (e.g., reduced readmissions) as a result of an improved continuum of care. Last, we included *hospital type* to examine whether hospitals that focus on different types of services vary in their ACO participation. Based on the primary service code provided by the AHA Annual survey, we clustered similar types of hospitals together to create a new variable for *hospital type*. This variable categorizes hospitals as seven types, including general medical and surgical, hospital unit within an institution, specialty

hospital, children's hospital, institution for mental health, acute long-term care hospital, and hospital for alcoholism and other chemical dependencies.

Analyses

Descriptive statistics are presented along with bivariate findings of the relationship between ACO status and independent variables. Multivariate logistic regression is used to examine environmental and organizational characteristics that are associated with hospital ACO participation. To address possible correlation within markets, robust standard errors were used. All analyses were conducted in STATA version 13, and statistical significance was considered at the alpha level of $p < .05$, $p < .01$, and $p < .001$.

Results

Descriptive Statistics

A total of 431 hospitals were identified as participants in the 252 Medicare ACOs established as of January 2013. Specifically, 125 (29.00%) hospitals were involved in the 32 pioneer ACOs, 11 (2.55%) joined in the first wave of Medicare Shared Saving Program (MSSP) ACOs, 154 (35.73%) joined in the second wave of the MSSP, and 137 (31.79%) joined in the third wave of the MSSP. Four (0.93%) of the 431 hospitals are participating in more than one ACO. The geographic distribution of the hospitals participating in ACOs varies. More than 30 ACO-hospitals operate in Illinois and Massachusetts. Five states including California, New York, and Tennessee, each have more than 20 ACO-hospitals. Eleven states such as Iowa and Indiana have more than 10 hospitals, whereas 19 states like Connecticut, Louisiana, and South Carolina have fewer than 10 ACO-affiliated hospitals. Fourteen states including Alabama and Alaska did not have any ACO-affiliated hospitals as of January 2013.

Bivariate Findings

In general, bivariate analyses indicate that ACO hospitals operate in areas with higher levels of munificence, less dynamic environments, and more competition (see Table 2). ACO hospitals' external environments have higher levels of physician supply, specialist supply, and income per capita. In general, fewer ACO hospitals operate in rural areas. In terms of the amount of change in the environment (dynamism), ACO hospitals exist in environments with significantly less change in the unemployment rate. Finally, ACO hospitals generally exist in environments with higher competition as measured by HHI and HMO penetration.

Multivariate Results

Table 3 presents the multivariate relationship between hospital ACO status and the external environment. Of the four variables representing the munificence of the external environment, income per capita was positively associated with ACO participation.

Table 2. Bivariate Relationship Between Hospital ACO Participation and Environmental and Organizational Characteristics.

Variables	ACO hospitals (n = 431)	Non-ACO hospitals (n = 5,599)	p Value
Munificence			
Number of physicians per capita	0.0030 (0.0016)	0.0023 (0.0016)	.0000
Number of specialists per capita	0.0010 (0.0005)	0.0007 (0.0006)	.0000
Income per capita	41277.76 (8276.18)	37330.65 (7896.175)	.0000
Rural location	46 (10.67%)	1,165 (20.81%)	.0000
Dynamism			
Number of hospital bed per capita change	0.0025 (0.1319)	0.0205 (0.3802)	.3289
Percentage of poverty change	2.63 (1.38)	2.59 (1.96)	.6529
Unemployment rate change	2.06 (1.03)	2.24 (1.29)	.0034
Competition			
HHI	0.33 (0.30)	0.45 (0.34)	.0000
HMO penetration	0.12 (0.09)	0.08 (0.09)	.0000
Organizational variables			
Number of staffed beds	235.47 (233.94)	134.11 (169.36)	.0000
Hospital ownership			
Government, nonfederal	28 (6.50%)	1,283 (22.93%)	.0000
Nongovernment, not-for-profit	359 (83.29%)	2,740 (48.94%)	
Investor-owned (for-profit)	44 (10.21%)	1,574 (28.13%)	
Health care system membership			
No system affiliation	80 (18.56%)	2,399 (42.86%)	.0000
Centralized health system	104 (24.13%)	449 (7.52%)	
Decentralized health system	247 (57.13%)	2,749 (49.03%)	
EHR implementation			
No EHR implementation	9 (2.07%)	725 (12.95%)	.0000
Partial EHR implementation	147 (33.79%)	1,978 (35.34%)	
Full EHR implementation	239 (54.94%)	1,630 (29.12%)	
Missing EHR value	40 (9.20%)	1,264 (22.58%)	
Percentage of Medicare inpatient discharge	46.50 (13.90)	50.09 (44.77)	.0974
Percentage of Medicaid inpatient discharge	18.62 (11.80)	16.07 (21.20)	.0134
Medical school affiliation	178 (41.30%)	1,246 (22.26%)	.0000
Membership of COTH	50 (11.60%)	227 (4.06%)	.0000
Number of nursing home beds per 1,000 population over 65	0.38 (2.10)	1.70 (8.74)	.0018
Hospital type			
General medical and surgical	415 (96.29%)	4,177 (74.63%)	.0000
Hospital unit within an institution	0 (0.00%)	13 (0.23%)	
Specialty hospital	10 (2.32%)	813 (14.53%)	
Children's hospital	3 (0.70%)	138 (2.47%)	
Institution for mental retardation	0 (0.00%)	6 (0.11%)	
Acute long-term care	2 (0.46%)	423 (7.56%)	
Alcoholism and other chemical dependency	1 (0.23%)	27 (0.48%)	

Note. HMO = Health Maintenance Organization; HHI = Herfindahl–Hirschman index; COTH = Council of Teaching Hospitals; EHR = electronic health record. Mean and standard deviation are provided for continuous variables, frequency and percentage are provided for categorical variables.

Table 3. Multivariate Relationship Between Hospital ACO Participation and Environmental and Organizational Variables.

Variables	Predicted relationship to ACO participation	β Coefficients (robust standard error) from logistic regression
Munificence		
Number of physicians per capita	+	150.29 (162.44)
Number of specialists per capita	−	−179.28 (463.48)
Income per capita	+	0.00002* (0.000009)
Rural location (*compared with urban location*)	+	0.38 (0.23)
Dynamism		
Number of hospital bed per capita change	−	−0.23 (0.18)
Percentage of poverty change	−	−0.02 (0.03)
Unemployment rate change	−	−0.07 (0.07)
Competition		
HHI	−	−0.44 (0.25)
HMO penetration change	+	1.86** (0.65)
Organization variables		
Number of staffed beds	+	0.0002 (0.0003)
Hospital ownership (*compared with nongovernment, not-for-profit*)		
Government, nonfederal	−	−1.09*** (0.21)
Investor-owned (for profit)	−	−0.86*** (0.18)
Health care system membership (*compared with no affiliation*)		
Centralized health system	+	1.30*** (0.18)
Decentralized health system	+	0.91*** (0.14)
EHR implementation (*compared with no implementation*)		
Partial EHR implementation	+	1.24** (0.39)
Full implementation	+	1.73*** (0.38)
Missing of EHR	+	0.92*** (0.41)
Percentage of Medicare inpatient discharge	−	−0.005 (0.003)
Percentage of Medicaid inpatient discharge	+	0.09*** (0.002)
Medical school affiliation	−	−0.07 (0.14)
Membership of COTH	+	0.09 (0.23)
Number of nursing home bed per 1,000 population over 65	−	−0.04** (0.01)
Hospital type (*compared with general medical and surgical*)		
Specialty hospital	−	−1.58*** (0.37)
Children's hospital	−	−2.25*** (0.62)
Acute long-term care hospital	−	−2.32*** (0.73)
Alcoholism and other chemical dependency	−	−0.23 (1.10)
Constant		
N		
Pseudo R^2		–4.97*** (0.65)

Note. ACO = accountable care organization; HMO = Health Maintenance Organization; HHI = Herfindahl–Hirschman index; COTH = Council of Teaching Hospitals; EHR = electronic health record.
*$p < .05$. **$p < .01$. ***$p < .001$.

Specifically, hospitals operating in areas with higher level of *income per capita* ($\beta = 0.00002$, $p < .05$) are more likely to participate in ACOs. No environmental variables measuring the dynamism of the environment were significantly related to ACO participation. Finally, in terms of competition, HMO penetration was positively associated with hospital ACO participation ($\beta = 1.86$, $p < .01$), indicating that hospitals existing in more competitive environments were more likely to participate in ACOs.

Four organizational variables were significantly related to hospital ACO participation. In terms of *hospital ownership*, government, nonfederal hospitals ($\beta = -1.09$, $p < .001$), and investor-owned hospitals ($\beta = -0.86$, $p < .001$) were less likely to be ACO participants compared with nongovernment, not-for-profit hospitals. *Health care system membership* was positively associated with ACO participation. Specifically, hospitals that are members of centralized health systems ($\beta = 1.30$, $p < .001$) and members of decentralized health system ($\beta = 0.91$, $p < .001$) are more likely to be ACO participants, as compared with hospitals without any health care system membership. *EHR implementation* was positively associated with hospital ACO participation. Specifically, hospitals with fully implemented ($\beta = 1.73$, $p < .001$) and partially implemented EHR systems ($\beta = 1.24$, $p < .01$) were more likely to participate in ACOs, compared with those without EHRs. The magnitude of association was higher for full implementation than partial implementation. Last, a positive relationship between *percentage of Medicaid discharge* and hospital ACO participation was identified. Hospitals with more Medicaid patients ($\beta = 0.009$, $p < .001$) are more likely to participate in ACOs.

Other organizational variables also indicated relationships with ACO participation. Specifically, hospitals in environments with higher numbers of nursing home beds are less likely to participate in ACOs ($\beta = -0.04$, $p < .01$). In terms of *hospital type*, specialty hospitals ($\beta = -1.58$, $p < .001$), children's hospitals ($\beta = -2.25$, $p < .001$), and acute long-term care hospitals ($\beta = -2.32$, $p < .01$), were less likely to participate in ACOs, relative to general medical and surgical hospitals.

Discussion

New ACOs are quickly forming across the United States. Hospitals may play an important role in the operation and, perhaps, the ultimate success of the ACO model. Thus, it is important to understand what factors are associated with hospital participation in ACOs, especially since hospitals are currently involved in approximately half of the Medicare ACOs. To date, few studies have examined the external environmental and organizational characteristics related to hospital ACO participation. Thus, this study provides a new contribution to the health care literature by examining both the external and organizational determinants of hospital participation in the Medicare ACO program.

Key findings indicate that in general, there is a relationship between the external environment in which a hospital is situated and the decision to participate in an ACO. This relationship appears to be consistent across more munificent and more competitive environments. Environmental dynamism does not appear to influence the decision by hospital management to participate in an ACO.

Our first hypothesis—predicting a positive relationship between munificence and hospital ACO participation—is partially supported. Although there is no significant association between physician supply, specialist supply, and location with hospital ACO participation, income per capita is positively associated with hospital ACO participation, suggesting that hospitals operating in more munificent environments may be more likely to participate in ACOs. Our results are consistent with one previous study indicating that ACOs are more likely to be established in areas with lower poverty rates (Lewis et al., 2013). This finding also aligns with previous studies suggesting that hospitals located in more munificent areas may have greater financial flexibility to pursue resource intensive strategies (Menachemi et al., 2011). Last, findings from one prior study (Audet et al., 2012), indicating an increased likelihood of ACO participation in urban areas, were inconsistent with the current study's findings.

The positive relationship with HMO penetration indicates that hospitals operating in more competitive environments will be more likely to participate in ACOs, which is inconsistent with our third hypothesis. Typically, decision makers will not pursue daunting strategic change when facing high levels of competition as they will perceive higher levels of uncertainty in that market. One possible reason for our finding is that hospitals operating in competitive markets may be seeking to increase market share or achieve market power through ACO participation. Providing some support for this theory, a survey conducted by Porter Research (2012) indicated that seeking opportunities to increase market share is one of the top reasons for hospital ACO participation. Another potential explanation for this finding may be concerns about monopolization. The Federal Trade Commission and Department of Justice provide guidelines to address potential antitrust problems regarding ACO formation. These guidelines indicate that holding more than 30% market share is viewed as a monopoly; however, ACOs in markets with high levels of competition are able to exist without being too constrained by these guidelines (Scheffler, Shortell, & Wilensky, 2012). On the other hand, hospitals already holding sizable market shares in less competitive markets may be less likely to pursue ACO participation under the supervision of these laws.

We also found that several organizational characteristics related to munificence or uncertainty are significantly associated with ACO participation. In terms of hospital ownership, we found that, compared with not-for-profit hospitals, nonfederal government and for-profit hospitals are less likely to participate in ACOs, which was inconsistent with our hypothesis. Audet et al. (2012) research is consistent with this finding. Previous research suggests that hospitals with different ownership may experience environments differently and also may have disadvantages in financial performance (Anderson, 2012; Ramamonjiarivelo et al., 2014; Shen, Eggleston, Lau, & Schmid, 2007). Thus, there is a possibility that not-for-profit hospitals are participating in ACOs as a strategy of sharing financial risk with other providers.

Health care system membership was found to be positively associated with ACO participation, which was consistent with our hypothesis and several previous studies indicating that ACO participation and formation is associated with multihospital system affiliation (Audet et al., 2012; Auerbach et al., 2013) or system or network membership (Lewis et al., 2013). Integrated health systems and multihospital systems may

already possess some of the required infrastructure, governance structure and coordination experience, making the transition to an ACO smoother than hospitals that are not already a part of an integrated system (Chukmaitov, Harless, Bazzoli, Carretta, & Siangphoe, 2014).

With regard to EHR implementation, findings from this study indicate that the presence of an EHR is significantly related to ACO participation. These findings align with previous studies suggesting that HIT is essential for the operation of an ACO (Berwick, 2011a; Bitton, Flier, & Jha, 2012; Richman & Schulman, 2011). In theory, a robust information system can facilitate communication and coordination among providers, thus ACOs that include hospitals with EHR systems should be able to accomplish strong communication and coordination across the ACO. The current study's finding that there is a positive relationship between EHR implementation and ACO participation suggests that not only are ACOs positioned for reliable communication and coordination, those ACOs that have EHRs will also be able to monitor and examine benefits over time.

Findings also indicate that the percentage of Medicaid discharges is positively associated with ACO participation. This finding supports the hypothesis that decision makers may perceive the changing reimbursement system as uncertainty, especially having a higher percentage of Medicaid discharges, and may strategically align with ACOs to prepare for the changing reimbursement environment. Essentially, focusing on improving health care quality and reducing costs through ACO participation may eliminate some of the uncertainty associated with future, value-based reimbursement changes.

Secondary findings also indicate that hospital type is associated with ACO participation. General medical and surgical hospitals are more likely to participate in ACOs compared with specialty, children's and acute long-term care hospitals. This is likely because general medical and surgical hospitals typically provide a more complete array of health services, which allows them to better provide the health services required of a defined population. Another possible reason is that general hospitals are seeking more market power through ACO participation to compete with specialty hospitals, especially physician-owned specialty hospitals that have advantages in patient referral, profitability, and quality (Greenwald et al., 2006; Schneider et al., 2008). Findings also suggest that hospitals in environments with higher numbers of nursing home beds per 1,000 people over 65 are less likely participated in ACOs. This is counter to the hypothesized relationship that having a higher number of nursing home beds per 1,000 people over 65 would be an environment where there could be substantial gains for hospitals given the likelihood of improved coordination, cost savings, and ultimately reduced readmissions for this population. Additional research in this area may provide more insight into this relationship.

Last, contrary to findings by Audet et al. (2012) that indicated a positive relationship between being a teaching hospital and ACO participation, the current study did find a similar significant relationship when considering medical school affiliation or membership in the Council of Teaching Hospitals.

Although this study provides valuable new insight about the external environmental factors that relate to hospital ACO participation, there are several limitations to note. Information was not available about certain hospital characteristics that likely relate to the decision to participate in an ACO. For example, data providing information about hospital leadership and internal organizational structure were not available, although it is plausible that they may be related to ACO formation (Fisher, Shortell, Kreindler, Van Citters, & Larson, 2012). Although this study uses primary data collected for this research, it is possible that some hospital ACO participants could have been missed if the information available on ACO websites was not up to date at the time of the study. Last, assumptions made to address missing EHR data would not have accounted for changes from partial implementation to full implementation. In this case, the beta coefficient and significance presented for ACO participation and full EHR implementation may be underestimated.

Understanding characteristics that relate to ACO participation will be particularly important as new research examines and begins to report on the benefits of ACO participation. Since the largest avoidable Medicare costs are hospital-related (Goldsmith, 2011), if ACO participation is related to higher quality and lower costs of care, it may be beneficial for more hospitals to participate in ACOs to achieve further progress in cost control and quality improvement. Should the anticipated benefits be realized, findings from this study can guide strategies to encourage those hospitals that have not gotten involved in ACOs. Policy makers will be interested in the barriers to hospital participation in ACOs and may find ways to support these types of hospitals. For example, since EHRs and HIT are expected to facilitate ACO success, additional HIT-related incentives may encourage more hospitals to participate in ACOs. Additionally, findings suggest that hospitals affiliated with health care systems, which typically have more managed care and care coordination experience, are more likely to be ACO partners. Researchers and policy makers should examine ways to encourage hospitals without strong managed care and care coordination experience to participate in ACOs.

Declaration of Conflicting Interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding

The author(s) received no financial support for the research, authorship, and/or publication of this article.

References

American Hospital Association. (2012). *AHA Annual Survey*. Chicago, IL: Author.

Anderson, S. (2012). Public, private, neither, both? Publicness theory and the analysis of healthcare organisations. *Social Science & Medicine*, *74*, 313-322.

Audet, A., Kenward, K., Patel, S., & Joshi, M. S. (2012). Hospitals on the path to accountable care: Highlights from a 2011 national survey of hospital readiness to participate in an accountable care organization. *Issue Brief (Common Fund)*, *22*, 1-12.

Auerbach, D. I., Liu, H., Hussey, P. S., Lau, C., & Mehrotra, A. (2013). Accountable care organization formation is associated with integrated systems but not high medical spending. *Health Affairs*, *32*, 1781-1788.

Balotsky, E. R. (2005). Is it resources, habit or both: Interpreting twenty years of hospital strategic response to prospective payment. *Health Care Management Review*, *30*, 337-346.

Bazzoli, G. J., Chan, B., Shortell, S. M., & D'Aunno, T. (2000). The financial performance of hospitals belonging to health networks and systems. *Inquiry*, *37*, 234-252.

Bazzoli, G. J., Shortell, S. M., Dubbs, N., Chan, C., & Kralovec, P. (1999). A taxonomy of health networks and systems: Bringing order out of chaos. *Health Services Research*, *33*, 1683-1717.

Bentley, T. G., Effros, R. M., Palar, K., & Keeler, E. B. (2008). Waste in the U.S. Health care system: A conceptual framework. *Milbank Quarterly*, *86*, 629-659.

Berwick, D. M. (2011a). Launching accountable care organizations—The proposed rule for the Medicare Shared Savings Program. *New England Journal of Medicine*, *364*(16), e32.

Berwick, D. M. (2011b). Making good on ACOs' promise—The final rule for the Medicare shared savings program. *New England Journal of Medicine*, *365*, 1753-1756.

Berwick, D. M., & Hackbarth, A. D. (2012). Eliminating waste in US health care. *Journal of the American Medical Association*, *307*, 1513-1516.

Bitton, A., Flier, L. A., & Jha, A. K. (2012). Health information technology in the era of care delivery reform: To what end? *Journal of the American Medical Association*, *307*, 2593-2594.

Burton, L. C., Anderson, G. F., & Kues, I. W. (2004). Using electronic health records to help coordinate care. *Milbank Quarterly*, *82*, 457-481.

Chukmaitov, A., Harless, D. W., Bazzoli, G. J., Carretta, H. J., & Siangphoe, U. (2014). Delivery system characteristics and their association with quality and costs of care: Implications for accountable care organizations. *Health Care Management Review*, *40*, 92-103.

The Dartmouth Atlas of Health Care. (2010). *Hospital service areas*. Retrieved from http://www.dartmouthatlas.org/

Davis, K., Schoen, C., & Stremikis, K. (2010). *Mirror, mirror on the wall: How the performance of the U.S. health care system compares internationally, 2010 update*. Retrieved from http://www.commonwealthfund.org/publications/fund-reports/2010/jun/mirror-mirror-update

Dess, G. G., & Beard, D. W. (1984). Dimensions of organizational task environments. *Administrative Science Quarterly*, *29*, 52-73.

Diana, M. L., Harle, C. A., Huerta, T. R., Ford, E. W., & Menachemi, N. (2014). Hospital characteristics associated with achievement of meaningful use. *Journal of Healthcare Management/American College of Healthcare Executives*, *59*, 272-284.

Dickson, P. H., & Weaver, K. M. (1997). Environmental determinants and individual-level moderators of alliance use. *Academy of Management Journal*, *40*, 404-425.

Duncan, R. B. (1972). Characteristics of organizational environments and perceived environmental uncertainty. *Administrative Science Quarterly*, *17*, 313-327.

Federal Trade Commission. (2011). Statement of antitrust enforcement policy regarding accountable care organizations participating in the Medicare shared savings program. *Federal Register*, *76*(209), 67026-67032.

Fisher, E. S., McClellan, M. B., Bertko, J., Lieberman, S. M., Lee, J. J., Lewis, J. L., & Skinner, J. S. (2009). Fostering accountable health care: Moving forward in medicare. *Health Affairs*, *28*, 219-231.

Fisher, E. S., Shortell, S. M., Kreindler, S. A., Van Citters, A. D., & Larson, B. K. (2012). A framework for evaluating the formation, implementation, and performance of accountable care organizations. *Health Affairs*, *31*, 2368-2378.

Fuchs, V. R. (2013). How and why US health care differs from that in other OECD countries. *Journal of the American Medical Association*, *309*, 33-34.

Goldsmith, J. (2011). Accountable care organizations: The case for flexible partnerships between health plans and providers. *Health Affairs*, *30*, 32-40.

Greenwald, L., Cromwell, J., Adamache, W., Bernard, S., Drozd, E., Root, E., & Devers, K. (2006). Specialty versus community hospitals: Referrals, quality, and community benefits. *Health Affairs*, *25*, 106-118.

Horwitz, J. R. (2005). Making profits and providing care: Comparing nonprofit, for-profit, and government hospitals. *Health Affairs*, *24*, 790-801.

Hoskisson, R. E., & Hitt, M. A. (1990). Antecedents and performance outcomes of diversification: A review and critique of theoretical perspectives. *Journal of Management*, *16*, 461-509.

Hsieh, H. M., Clement, D. G., & Bazzoli, G. J. (2010). Impacts of market and organizational characteristics on hospital efficiency and uncompensated care. *Health Care Management Review*, *35*, 77-87.

Jha, A. K., DesRoches, C. M., Kralovec, P. D., & Joshi, M. S. (2010). A progress report on electronic health records in U.S. hospitals. *Health Affairs*, *29*, 1951-1957.

Kocher, R., & Sahni, N. R. (2010). Physicians versus hospitals as leaders of accountable care organizations. *New England Journal of Medicine*, *363*, 2579-2582.

Kreiser, P., & Marino, L. (2002). Analyzing the historical development of the environmental uncertainty construct. *Management Decision*, *40*, 895-905.

Lewis, V. A., Colla, C. H., Carluzzo, K. L., Kler, S. E., & Fisher, E. S. (2013). Accountable care organizations in the United States: Market and demographic factors associated with formation. *Health Services Research*, *48*, 1840-1858.

Martin, A. B., Hartman, M., Whittle, L., & Catlin, A. (2014). National health spending in 2012: Rate of health spending growth remained low for the fourth consecutive year. *Health Affairs*, *33*, 67-77.

McClellan, M., McKethan, A. N., Lewis, J. L., Roski, J., & Fisher, E. S. (2010). A national strategy to put accountable care into practice. *Health Affairs*, *29*, 982-990.

Menachemi, N., Mazurenko, O., Kazley, A. S., Diana, M. L., & Ford, E. W. (2012). Market factors and electronic medical record adoption in medical practices. *Health Care Management Review*, *37*, 14-22.

Menachemi, N., Shin, D. Y., Ford, E. W., & Yu, F. (2011). Environmental factors and health information technology management strategy. *Health Care Management Review*, *36*, 275-285.

Menachemi, N., Yeager, V. A., Duncan, W. J., Katholi, C. R., & Ginter, P. M. (2012). A taxonomy of state public health preparedness units: An empirical examination of organizational structure. *Journal of Public Health Management and Practice*, *18*, 250-258.

Miller, D. (1987). The structural and environmental correlates of business strategy. *Strategic Management Journal*, *8*, 55-76.

Muhlestein, D. (2014). *Accountable care growth in 2014: A look ahead*. Retrieved from http://healthaffairs.org/blog/2014/01/29/accountable-care-growth-in-2014-a-look-ahead/

Pfeffer, J., & Salancik, G. R. (2003). *The external control of organizations: A resource dependence perspective*. Stanford, CA: Stanford University Press.

Porter Research. (2012). *Providers' perceptions: Accountable care organizations*. Retrieved from http://www.porterresearch.com/Resource_Center/Porter_White_Papers/Files/White_Papers/PR-ACO_White_Paper-3rd_Draft.pdf

Ramamonjiarivelo, Z., Weech-Maldonado, R., Hearld, L., Menachemi, N., Epané, J. P., & O'Connor, S. (2014). Public hospitals in financial distress: Is privatization a strategic choice? *Health Care Management Review*. Advance online publication. doi:10.1097/HMR.0000000000000032

Richman, B. D., & Schulman, K. A. (2011). A cautious path forward on accountable care organizations. *Journal of the American Medical Association*, *305*, 602-603.

Rittenhouse, D. R., Shortell, S. M., & Fisher, E. S. (2009). Primary care and accountable care—Two essential elements of delivery-system reform. *New England Journal of Medicine*, *361*, 2301-2303.

Rosko, M. D. (2004). Performance of US teaching hospitals: A panel analysis of cost inefficiency. *Health Care Management Science*, *7*, 7-16.

Scheffler, R. M., Shortell, S. M., & Wilensky, G. R. (2012). Accountable care organizations and antitrust: Restructuring the health care market. *Journal of the American Medical Association*, *307*, 1493-1494.

Schneider, J. E., Miller, T. R., Ohsfeldt, R. L., Morrisey, M. A., Zelner, B. A., & Li, P. (2008). The economics of specialty hospitals. *Medical Care Research and Review*, *65*, 531-553.

Schoen, C., Osborn, R., How, S. K., Doty, M. M., & Peugh, J. (2009). In chronic condition: Experiences of patients with complex health care needs, in eight countries, 2008. *Health Affairs*, *28*, w1-w16.

Schoen, C., Osborn, R., Huynh, P. T., Doty, M., Zapert, K., Peugh, J., & Davis, K. (2005). Taking the pulse of health care systems: Experiences of patients with health problems in six countries. *Health Affairs*, Suppl. Web Exclusives, 509-525.

Sharfman, M. P., & Dean, J. W. (1991). Conceptualizing and measuring the organizational environment: A multidimensional approach. *Journal of Management*, *17*, 681-700.

Shen, Y.-C., Eggleston, K., Lau, J., & Schmid, C. H. (2007). Hospital ownership and financial performance: What explains the different findings in the empirical literature? *Inquiry*, *44*, 41-68.

Smart, C., & Vertinsky, I. (1984). Strategy and the environment: A study of corporate responses to crises. *Strategic Management Journal*, *5*, 199-213.

Thorpe, K. E., Seiber, E. E., & Florence, C. S. (2001). The impact of HMOs on hospital-based uncompensated care. *Journal Health Politics, Policy and Law*, *26*, 543-555.

U.S. Department of Health and Human Services. (2013). *Area Health Resource File*. Retrieved from http://ahrf.hrsa.gov/

Woolf, S. H., & Aron, L. (2013). *U.S. health in international perspective: Shorter lives, poorer health*. Washington, DC: National Academies Press.

Yeager, V. A., Menachemi, N., Savage, G. T., Ginter, P. M., Sen, B. P., & Beitsch, L. M. (2014). Using resource dependency theory to measure the environment in health care organizational studies: A systematic review of the literature. *Health Care Management Review*, *39*, 50-65.

Zinn, J. S., Proenca, J., & Rosko, M. D. (1997). Organizational and environmental factors in hospital alliance membership and contract management: A resource-dependence perspective. *Hospital & Health Services Administration*, *42*(1), 67-86.