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California's Hospital Safety Net: Participation as Adaptation to Social,
Political and Fiscal Constraint

by

Alicia V. Neumann

DISSERTATION

Submitted in partial satisfaction of the requirements for the degree of

DOCTOR OF PHILOSOPHY

in

Sociology

in the

GRADUATE DIVISION

of the

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by
Alicia V. Neumann

Dedication and Acknowledgements

This project is dedicated to David, Juliana, Brady, and Caroline, who reminded me through all of the challenges and joys that accompanied this research why it mattered to me personally. It is also dedicated to my friend Nietzsche Keene who encouraged me to pursue this degree and passed before I was able to complete it. Additionally, I owe special thanks to my parents, siblings, and friends for the love, support, and understanding that they have shown me, especially during the past few years.

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Others to whom I owe a debt of intellectual gratitude include Brad Gray for his thorough critique of an earlier project on nonprofit hospitals that informed many aspects of this paper, and former colleagues at the San Francisco Department of Public Health, including Tangerine Brigham, Colleen Chawla, and Lindsey Angelats. Susan Moore, Director of Finance at the UCSF Medical Center was also very helpful during formative thinking, and Kenny Kwong at the California Office of Statewide Health Planning provided invaluable assistance navigating the data.

Abstract
California's Hospital Safety Net:
Participation as Adaptation to Social, Political, and Fiscal Constraint

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University of California, San Francisco, 2011

Purpose: This study describes hospital revenue for direct participation in the safety net—treating the poor—from 2006 through 2008 and associations with environmental and organizational factors of theoretical interest.

Background and Significance: During the past 40 years U.S. hospital care has decentralized and grown increasingly competitive. Vague or overly detailed hospital regulations provide no specific goals regarding care for the poor. Studies have documented concentration of hospital safety net care, and a need for new outcome measures. This study uses hospital safety net revenue to measure theoretically *responsive* behavior by hospitals to serve poor populations.

Design and Analysis: This research includes secondary analysis of hospital safety net revenues from OSHPD's Hospital Annual Financial Report Data, 2004 through 2005, and 2006 through 2008. Safety net revenues were compared as organizational and market shares. Hospital isomorphism toward low shares prompted the use of logistic regression to test the effect of factors on the odds of participation above an equal distribution.

Key Findings: The 70 hospitals with high safety-net revenue as both organizational and market shares accounted for \$7.7 billion of \$11.5 billion in total safety net revenue. These hospitals were positively associated with concentrated markets, clinical teaching, larger size, less medically complex patients, and city/county or nonprofit ownership.

Hospitals with high safety net revenue as market share only earned \$1.1 billion of total safety net revenue. These facilities were positively associated with location in a concentrated market, increased size, nonprofit ownership, and system affiliation.

Hospitals with high safety net revenue as organizational share only earned \$1 billion of total safety-net revenue. This group was more likely than the others to be located in a more competitive county, independently operated by investors or a public district, smaller and treating less medically complicated patients.

Implications: Regulators should work to encourage hospital safety net participation and better distribute the burden of low margin hospital care. Additional research is needed on hospital ownership, access, and quality, especially regarding patient acuity.

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California's Hospital Safety Net:

Participation as Adaptation to Social, Political, and Fiscal Constraint

Chapter 1: Problem and Background

Over the past 40 years U.S. hospitals have experienced intense competitive and financial pressure (Lewin & Altman, 2000). These pressures have reduced the participation of many facilities in the *hospital safety net*—provision of hospital care to low-income and indigent patients (Cunningham & Tu, 1997)¹. Hospitals that minimize their hospital safety-net participation may be in financial distress, or they may be seeking a competitive advantage. Either way, their decreased participation places stress on other local hospitals. Ultimately, the issue of participation in the hospital safety net reflects conflicting societal norms and contradictory policies for changing the mission and delivery of health care.

Such contradictory policies include the determination of what should be expected of different hospital ownership models. Nonprofit hospitals represent 60% of the U.S. hospital market (American Hospital Association, 2007), and these facilities receive tax exemptions in exchange for following a largely self-defined charitable mission.²

1. This paper focuses on access to a hospital safety net to distinguish hospital treatment and services from other types of health care services provided by primary care clinics or physicians.

2. These include exemptions from paying federal income and employment taxes, eligibility for postal discounts and tax-exempt revenue bonds, and the ability to receive

Regulations on nonprofit hospitals, however, do not set any broad, definitive standards regarding access to the hospitals' services and treatments. This paper seeks to increase understanding of how hospitals, especially nonprofit facilities, provide hospital safety-net care.

Existing research on hospital ownership and safety-net participation represents a subset of extensive work. A review of this literature determined that challenges have arisen in identifying, quantifying, and isolating meaningful measures of hospital safety-net participation (Schlesinger & Gray, 2006; McHugh, Kang, & Hasnain-Wynia, 2009; Zwanziger & Khan, 2008; Gray & Schlesinger, 2009). For example, hospital safety-net participation has often been operationalized as spending on uncompensated care (Shortell et al., 1986; Zuckerman, Bazzoli, Davidoff, & LoSasso, 2001; Currie & Fahr, 2004; Bazzoli, Lindrooth, Kang, & Hansnain-Wynia, 2006) or as participation in wellness and other community programs (Ginn, Shen, & Mosely, 2009; Olden & Hoffman, 2011).

Both of these measures of hospital safety-net participation pose problems. Uncompensated care is difficult to estimate, and wellness programs may neither represent attention to low-income patient populations nor increase access to care that is only available at hospitals. Although nonprofit hospitals may donate funds to community programs that provide primary care to low-income individuals in an attempt to prevent or forestall these individuals' need for more serious hospital services, such programs do not help those vulnerable patients who require hospital services.

tax-deductible donations (Sanders, 1995, p. 448). Additionally, federal benefits often accompany state and local exemptions from paying sales, income, and property taxes.

Thus, this study contributes to existing research on hospital ownership and safety-net participation primarily by using the revenues associated with safety-net patients to measure hospital safety-net participation. This approach, which eliminates some of the problems associated with the use of data on uncompensated care, has been developed from a framework of resource dependence theory with concepts from sociology and economics. The research also provides a timely update on the influence of ownership and other factors on hospital safety-net participation.

Background on U.S. Health Care and Hospitals

During the past 30 years, changes in health treatments and funding have complicated and fragmented health care delivery structures. As medical costs rose throughout the 1970s and into the 1980s managerial and market pressures gained force. Society adopted the logics of “efficiency” and “consumer choice and responsibility” (Scott, 2003, pp. 37–38; Goodrick, Meindl, & Flood, 1997). A new competitive environment for health care appeared in which “economic discipline presupposes organizational discipline, which in turn demands improved management” (Brown, 1992, p. 10).

These philosophical changes, new managed-care delivery mechanisms, and ongoing developments in technology and pharmaceuticals affected the supply and demand associated with hospital care. Inpatient hospital days in the United States declined 35% between 1980 and 1995 (Cutler, 2000, p. 1). Also, the government, insurers, physicians and consumers began to hold all hospitals to similar standards, especially regarding cost containment, pressuring nonprofit and for-profit hospitals to converge (Schlesinger & Gray, 2006, p. 392).

In the 1990s, investor-owned hospital chains and the hospital industry experienced widespread mergers and changes in ownership (Kutner, 1996). Data from the American Hospital Association show that between 1980 and 1995, 842 acute-care independent hospitals closed, a decrease of 14%, while others merged, reduced their capacity, or converted to for-profit status (Cutler, 2000). Moreover, Williamson Institute statistics indicate that the percentage of acute-care general hospitals affiliated with at least one other hospital more than doubled during the decade (Luke & Walston, 2003). Such network and system affiliation may increase profitability through either higher revenue or lower costs (Bazzoli, Manheim, & Waters, 2003).

Vertical integration also occurred during this era linking hospitals with both provider systems and subsidiary services. Traditional community hospitals have been and continue to be “incorporated within and subordinated to wider, organizational governance systems” (Scott, 2003, p. 38). Hospitals, physicians and clinics developed new relationships among themselves and with other providers such as laundry services, hearing aid manufacturers, pharmacies, and home health care (Weisbrod, 1988, pp. 112–113; Luke & Walston, 2003, p. 290; Shortell et al., 1995; Tuckman & Chang, 2006).

Thus, since the 1980s the role of hospitals within health care has changed. No longer independent facilities at the center of all medical treatments, hospitals have become networked participants, or “servant organizations, giving and receiving empowerment from others” (Shortell, Gillies, & Devers, 1995, p. 137). They operate in medical-management systems (Shortell et al., 1995, pp. 140–143). Additionally, running a hospital requires significant expertise and “formal business training” (Steele, 2005, p. 115). The president of Catholic Healthcare Partners describes the situation as follows:

The emphasis on financial stewardship has become particularly crucial in recent years due to the increased size and complexity of many NP [nonprofit] organizations, many of which could qualify as Fortune 500 organizations based on their revenues, assets, and number of employees. (Connelly, 2004, p. 7)

Moreover, regulation of the hospital industry throughout this period has lacked clear policy direction, reflecting conflicting forces and power shifts. All hospitals experience regulatory pressure from numerous sources, including federal, state, and local governments as well as professional medical associations. Additionally, different payers, such as private insurers or the Centers for Medicare and Medicaid Services, make demands on facilities.

This complicated environment presents a problem for all hospitals with regard to the provision of hospital safety-net care. Since 1987, for-profit hospitals, which are legally obligated by their charters of incorporation to maximize returns for investors, have also been federally required³ to stabilize patients in an emergency regardless of their ability to pay (U.S. Department of Health and Human Services, 2006). Additionally, investor hospitals have often found it necessary to fund community relations with no clear policy direction or tax benefits, especially in markets that also include nonprofit hospitals (Gray, 1986).

Meanwhile, nonprofit hospitals, and even public facilities to some extent, have been expected to maintain a charitable social mission while they compete financially with investor-owned organizations. Seay and Sigmond (1987) have described the conflict for

3. Requirement is established by Medicare provider terms.

nonprofit hospitals as follows: “Public policy toward hospitals implores them to act more and more like for-profit businesses, while chiding them for not acting enough like charitable institutions” (p. 3).

Trend analysis of uncompensated care shows that since the early 1990s hospital participation in uncompensated care has decreased, with fewer facilities providing more of the care. This situation is due primarily to more restrictive managed-care payments that have stopped hospitals from shifting the cost of uncompensated care to private payers and to decreased government subsidies (Cunningham & Tu, 1997; Bazzoli, Lindrooth, Kang, & Hasnain-Wynia, 2006).

Schlesinger and Gray (2006) believe that the changing landscape has increased the need for nonprofit hospitals due to their mandate to provide community benefits such as charity care, treatment of Medicaid patients (despite shortfalls in payments), and other programs and services that promote public health. How these hospitals can fulfill this mandate, however, remains unclear.

Hospital ownership. Among all 4,927 community hospitals⁴ throughout the United States, 60% (2,919) operate under a nonprofit model, 17% (889) represent for-profit interests, and 23% (1,119) either are public or are run by a government entity such as a state, county, or federal agency (American Hospital Association, 2007). In general, nonprofit facilities operate in older areas of the country while for-profit hospitals have been established in the South-Central and Western regions of the United States

4. *Community hospitals* are defined as all nonfederal, short-term, general, and other special hospitals (American Hospital Association, 2007).

(Weisbrod, 1988, pp. 8–84). Nonprofit hospitals do not pay state or federal income taxes or local property taxes in exchange for operating according to various community benefit regulations.

Although hospitals achieve nonprofit recognition from both federal and state governments by maintaining a “charitable” purpose and by following operational constraints, both of these requirements are challenging to implement and enforce. To prove a charitable purpose, nonprofit hospitals provide community benefits, which are only loosely defined at the federal level and may include any amount of uncompensated care.⁵ Some states and localities have promulgated more specific laws governing community benefits, including guidelines for notification of patient assistance as well as public reporting on spending for wellness services and programs. Exact benefits, however, remain largely self-defined and reported.

Additional problems plague the operational requirements for nonprofit status. Nonprofit hospitals must abide by two primary business exclusions. First, although the facility may earn a profit, or revenues in excess of expenses, trustees must reinvest such proceeds into the facility and cannot pay them out as returns on capital investment or as excessive salaries. This spending restriction is commonly referred to as a “nondistribution

5. Throughout the past decade Senator Charles Grassley (R-IA) has actively pursued the issue of *community benefits*, decrying inconsistency in the definitions of this term used by hospitals. See, for example, subscriber news archives from the American Hospital Association at

<http://archives.subscribermail.com/msg/0d7b7aa19ebb46538f0387e96237120b.htm>

constraint” (Hansmann, 1981, p. 56). Second, nonprofit facilities do not have access to private capital from investors but may raise funds—but only from commercial activities, donations, or the issuance of tax-exempt bonds (Hansmann, 1981). Problems arise primarily around the first of these provisions. Who defines *excessive salaries* and *bonuses*? Clearly, there are “entrepreneurs who are willing to take on the coloration of a nonprofit organization” to derive financial gain (Gray, 1993, p. 356). Identifying such practices, however, requires significant effort and exceptional judgment (Tuckman & Chang, 2006, pp. 634–635).

Health and hospital regulations. Hospital regulations lack broad goals or outcomes, and changes in hospital law since the 1980s reflect the increased acceptance of profit taking in the provision of health care. Market reforms of the Reagan era attracted investors to health care and compounded industry changes that were occurring due to the increased funding from Medicare and Medicaid (Schlesinger & Gray, 2006, p. 392). Regulations and enforcement have attended primarily to systemic behavioral details rather than to broad “macro” constraints or individual problematic cases (Brown, 1992, pp. 20–21).

Examples of health care regulation with no broad outcomes or enforcement appear in two federal acts regarding access that passed in 1996. The 1996 Health Insurance Portability and Accessibility Act (HIPAA) created “standards for pre-existing condition exclusions and required guaranteed issue and renewability by all health insurance plans” (Academy for Health Services Research and Health Policy, 2001, p. 8). The act, however, leaves insurers free to price unwanted (sick) customers out of their product. Also, the Emergency Medical Treatment and Active Labor Act (EMTALA),

which applies to all hospitals that accept Medicare patients, mandates stabilization of patients in emergencies and restricts their transfer to other hospitals. The act does not however, prevent any hospitals from delegating control over Emergency Department admissions to contracted physicians.

Such regulation that attempts to control behavior rather than set goals also appears in the tax code applicable to nonprofit charitable institutions, a category that includes hospitals. Congress, with tax-and-spend powers granted by the Constitution, regulates provision of community benefits by nonprofit organizations through its four duties regarding nonprofit tax policy:

- to support the nonprofit sector, an action that occurs through either excluding nonprofit organizations from the tax base or subsidizing specific nonprofit activity;
- to promote equity, an action that raises questions about what should be distributed to whom;
- to regulate management, an action that maximizes the distribution of charitable benefits and prevents private gain; and
- to control competition by preventing an organization's political participation and by constraining its commercial activity (Simon et al., 2002, pp. 267 and 270–292).

The following time line, developed primarily from a report by the Institute of Medicine (2004), shows how either vague or overly detailed regulations have prevailed in U.S. federal regulation of community benefits for nonprofit hospitals since the 1980s.

1. 1983: IRS Revenue Ruling 83-157 specifies that a large percentage of the community must benefit from health promotion activities. Also, hospitals do not have to provide emergency rooms if another nearby facility meets the need.
2. 1991: HR 790 (Roybal, CA) and HR 1372 (Donnelly, MA) fail in committees. Both bills would have defined activities that qualify as community benefits, set a minimum threshold of provision, and set penalties for noncompliance.
3. 1992–2001: IRS audit guidelines recommend increased scrutiny of nonprofit hospitals, including income and incentives for physicians. Also, charity care is recognized as a significant community benefit and requires proof of service to the indigent.
4. 2009: IRS requires hospitals to file revised Form 990, Schedule H, which includes more detailed and standardized reporting of community benefit activities.

Additionally, the IRS does not have the resources for auditors to keep up with all of the nonprofit hospitals in the country (Noble, Hyams, & Kane, 1998). Lack of IRS enforcement has driven some consumer groups to sue organizations in attempts to challenge nonprofit hospitals to justify their profits. Since the establishment of the 1996 Taxpayer Bill of Rights Act, the public has gained increased access to hospitals' annual financial filings, and the IRS has been able to assess specific penalties for excessive payment to individuals instead of simply stripping an organization of its exempt status (Noble, Hyams, & Kane, 1998). All levels of government, however, only either allow or disallow tax benefits. They do not recognize degrees of exemption.

Various state and local jurisdictions have attempted to further regulate provision of nonprofit hospital community benefits by requiring either reporting or quantifiable

standards (Noble et al., 1998, p. 119; Institute of Medicine, 2004). The two approaches and their adherents are summarized as follows.

1. A hospital must meet a specific financial threshold for broadly defined uncompensated care or pay a fine (Texas, 1993; Pennsylvania, 1997; Utah, 1990).
2. A hospital must meet reporting requirements (California, 1994 and 2006; Idaho, 1999; Indiana, 1994; Maryland, 2001; Massachusetts, 2001; New Hampshire, 2000; New York, 1990; West Virginia, 1990; Rhode Island, 2003). Local governments in the City and County of San Francisco, CA, and in Nassau County, NY, have also adopted patient notification and public reporting regulations for planning use (San Francisco, 2001; Nassau County, 2003).

These regulatory approaches with limited enforcement reflect a decentralized approach to encouraging organizational systems and transparency. With the exception of three state-mandated thresholds, no specific outcome requirements or enforcement of hospital requirements by any level of government is assured. Moreover, mandated thresholds for uncompensated care may overly restrict hospitals from maximizing participation in the hospital safety net, and from engaging creatively with their communities to meet broader health needs.

In summary, the role of U.S. hospitals in health care has changed over time, and institutional obligations regarding care for low-income populations remain ambiguous. Conflicting pressures on hospitals to provide or withhold services have been especially problematic for the nonprofit sector of the hospital industry. The nonprofit model enables safety-net participation much better than the for-profit ownership model does because it has no legal mandate to provide a return to investors. Theory and research, however,

explain and indicate that some nonprofit facilities benefit unfairly from their privileged tax status.

Regulation to address this situation and establish broad goals and outcomes for hospital safety-net participation and other community benefits has not occurred. Rather, lawmakers have passed vague behavioral specifications for the hospital industry and have only recently standardized some of the reporting requirements for the nonprofit sector. Meanwhile, emergency rooms at all hospitals, which must stabilize patients regardless of their ability to pay, have been closing during the past 20 years (Hsia, Kellerman, & Shen, 2011). What should the United States expect with regard to community participation from hospitals? How should access to increasingly specialized hospital care be considered in this decision?

Project Aims

This project is needed to explore the use of safety-net revenue as an alternative to using provision of uncompensated care as a fiscal measure of a hospital's safety-net participation. It is also needed to update existing research on access to hospital care for low-income populations in light of the influence from hospital ownership and other factors.

An analysis of published research on hospital safety-net participation and ownership, which appears in Chapter 2, identifies a need for broader definitions of safety-net participation (Zwanziger & Khan, 2008) and new approaches to measure a hospital's charitable work (Gray & Schlesinger, 2009).

This research has attempted to respond to these needs from a theoretical framework based in resource dependence theory with concepts from sociology and

economics. The theoretical foundation is explained in detail in Chapter 3 and generally defines responsive hospital behavior to demand for safety-net services as participation in the revenues associated with low-income and indigent populations over a three-year averaged period from 2006 through 2008. Since individual states define and regulate the majority of funding for their safety nets, the study focuses on acute-care general hospitals in the state of California. This state represents a large and diverse area with more than 300 of these hospitals.

A complete explanation of the research design and methodology for this project appears in Chapter 4. In general, the study is based on two hypotheses about hospital participation in the direct provision of safety-net care.

1. A hospital's safety-net participation is reflected in the amount of the hospital's revenue associated with safety-net patients.
2. Hospital participation in the hospital safety net represents an orientation that is associated with specific environmental and organizational resources such as competition, demand for care, ownership, and health system affiliation, controlling for size and other factors.

The project has tested these ideas through the pursuit of three aims.

Aim 1: Investigate safety-net participation among California study hospitals operating in 2005 and 2007 through a study of hospital revenue. Compare annual revenues associated with safety-net populations averaged over the period from 2006 to 2008 and describe hospitals by different levels and types of participation.

Aim 2: Describe the study hospitals by subgroup of safety-net participation as established through Aim 1. Provide general information on the hospitals' environmental and organizational factors of theoretical interest (e.g., ownership, market competition, demand, profit, culture and power).

Aim 3: Test the influence of specific environmental and organizational factors on high safety-net revenue participation by study hospitals. Establish whether hospital ownership significantly interacts with market competition or cultural measures.

Research findings appear in Chapter 5. Chapter 6 provides a discussion of the meaning and limitations of the analysis as well as directions for future research.

Chapter 2: Literature Review

This research on hospital safety-net revenue in California belongs to a subset of extensive study in two different areas: hospital ownership and access to care for disproportionately needy population groups. From these domains, comparable, empirical, nonepidemiological research on general community hospitals in the United States has been reviewed. The selected articles examine the effect of hospital ownership on direct access to hospital care by disproportionately needy populations. Studies of specialized facilities such as nursing homes and psychiatric hospitals, as well as health management organizations, were excluded from consideration. The research also excluded studies on hospital wellness programs and other general community work by hospitals as well as many studies on the quality of hospital care experienced by safety-net patients.⁶

Methods for Identifying and Reviewing Research

Identification and review of published research occurred through date-unlimited online searches of the Pub Med, AB/Inform, and Lexis/Nexis databases as well as the interlibrary catalog of the University of California (Melvyl). Primary search terms included *safety net*, *access to health care*, *access to hospital care*, *Medicaid payer mix*, *community benefits*, and *hospital ownership*. Additionally, a search of the term *hospital* within the online *Journal of Health Politics, Policy and Law* (since 1995) yielded numerous articles, as did bibliographic reviews of published articles, reviews, and books

6. One comprehensive review of hospital safety-net participation and quality of care was included for its descriptive analysis of hospitals with high participation in the hospital safety net (McHugh, Kang, & Hasnain-Wynia, 2009).

on the nonprofit sector and hospital economics. Articles that studied data prior to approximately 1980 and the widespread implementation of managed care were not included. By this date, however, for-profit hospitals had established a presence in the health care industry throughout the United States.

Especially useful were references from Powell's second edition (2006) of the *Nonprofit Research Handbook*, six reviews of literature on hospital ownership (Clement, White, & Valdmanis, 2002; Needleman, 2001; Rosenau & Linder, 2003; Rosenau, Vaillancourt, & Linder, 2003; Schlesinger & Gray, 2006; Shen, Eggleston, Lau, & Schmid, 2005), and one review of research on safety-net hospitals and quality of care (McHugh, Kang, & Hasnain-Wynia, 2009). Brad Gray was also extremely helpful in recommending specific literature on hospital ownership.

General Findings

More than 400 articles were reviewed, and 150 warranted close examination due to their attention to either ownership or hospital safety-net access. Only 30, however, presented analyses of the relationship between hospital ownership and provision of hospital care to disproportionately needy populations such as indigent or Medicaid patients.⁷ This focus excluded articles about hospital safety-net participation that did not consider ownership and excluded studies of hospital ownership that did not examine access to hospital care by low-income and indigent individuals. Some of these excluded

7. Many articles included analyses of hospital safety-net participation and other behaviors such as system affiliation (Shortell et al., 1986).

articles were nevertheless considered in the summary of meaning for this research that is presented in Chapter 6.

Study period and area. The reviewed articles covered almost 30 years of hospital safety-net participation, with study periods falling from 1979 to 2008. In nine articles, authors presented cross-sectional studies of hospital behavior for one year. Seven of these articles researched the effects of ownership and other specific factors on safety-net participation throughout the United States (Congressional Budget Office, 2006; Fishman, 1997; Gaskin & Hadley, 1999; Gentry & Penrod, 2000; Gray, 1986; Norton & Staiger, 1994; Shortell et al., 1986). Two of the nine focused on the state of California (Clement, White, & Valdmanis, 2002; Kim, McCue, & Thompson, 2009).

The 22 longitudinal studies of hospital safety-net participation ranged in length of observation period from three to 15 years. More than half of the articles (13) researched hospitals throughout the United States (Bazzoli, Manheim, & Waters, 2003; Bazzoli, Kang, Hasnain-Wynia, & Lindrooth, 2005; Bazzoli, Lindrooth, Kang, & Hasnain-Wynia, 2006; Cunningham & Tu, 1997; Frank, Salkever, & Mullan, 1990; Kennedy, McWhorter, Troyer, & Stroup, 2005; Mann, Melnick, Bamezai, & Zwanziger, 1997; McHugh, Kang, & Hasnain-Wynia, 2009; Nicholson, Pauly, Burns, Baumritter, & Asch, 2000; Potter, 2001; Sloan, Valvona, & Mullner, 1986; Thorpe, Seiber, & Florence, 2001; Zuckerman, Bazzoli, Davidoff, & LoSasso, 2001; Zwanziger & Kahn, 2008).

Nine of the longitudinal articles focused on facilities in one state (Banks, Paterson, & Wendel, 1997; Currie & Fahr, 2004; Duggan, 2000; Ferris & Graddy, 1999; Frank & Salkever, 1991; Gruber, 1994; Mann, Melnick, Bamezai, & Zwanziger, 1995; Morrissey, Wedig, & Hassan, 1996; Thorpe & Phelps, 1991).

Data. Most of the hospital data were self-reported or imputed and came from a few secondary sources. Among the 20 national studies, one used primary data collected through a self-administered survey (Shortell et al., 1986), and one analyzed both state and national data (Gray, 1998). The majority of articles (15) analyzed data from the American Hospital Association (AHA) Annual Survey (Bazzoli, Manheim, & Waters, 2003; Bazzoli, Kang, Hasnain-Wynia, & Lindrooth, 2005; Bazzoli, Lindrooth, Kang, & Hasnain-Wynia, 2006; Cunningham & Tu, 1997; Fishman, 1997; Gaskin & Hadley, 1999; Kennedy, McWhorter, Troyer, & Stroup, 2005; Mann, Melnick, Bamezai, & Zwanziger, 1997; McHugh, Kang, & Hasnain-Wynia, 2009; Nicholson, Pauly, Burns, Baumritter, & Asch, 2000; Norton & Staiger, 1994; Potter, 2001; Thorpe, Seiber, & Florence, 2001; Zuckerman, Bazzoli, Davidoff, & LoSasso, 2001; Zwanziger & Kahn, 2008). Three articles used the National Hospital Discharge Survey or Medicare Cost Report (Congressional Budget Office, 2006; Frank, Salkever, & Mullan, 1990; Gentry & Penrod, 2000).

Among the 11 state studies, nine articles used state data from California's Office of Statewide Health Planning and Development Office (OSHPD) (Banks, Paterson, & Wendel, 1997; Clement, White, & Valdmanis, 2002; Currie & Fahr, 2004; Duggan, 2000; Ferris & Graddy, 1999; Gruber, 1994; Kim, McCue, & Thompson, 2009; Mann, Melnick, Bamezai, & Zwanziger, 1995; Morrisey, Wedig, & Hassan, 1996). One used data from the state of New York (Thorpe & Phelps, 1991), and another analyzed data from the state of Maryland (Frank & Salkever, 1991).

Analysis. All but five of the articles measured safety-net participation primarily as uncompensated care; the others analyzed hospital performance as service mix (Gentry

& Penrod, 2000), patient admissions or discharges of low-income patients (Duggan, 2000; Frank, Salkever, & Mullan, 1990; Gaskin & Hadley, 1999), or a combination of these measures (Gray, 1998; McHugh, Kang, & Hasnain-Wynia, 2009; Potter, 2001; Zwanziger & Kahn, 2008).

All of the articles provided descriptive information about safety-net participation and other environmental and organizational characteristics, including ownership. Additionally, 19 articles used statistical regression analysis to draw inferences about relationships between political or economic factors and hospital safety-net participation. To accommodate data that did not meet the assumptions of ordinary least squares regression, 12 of these 19 articles used alternative approaches such as logit, probit, and other robust models (Banks, Paterson, & Wendel, 1997; Bazzoli, Manheim, & Waters, 2003; Bazzoli, Lindrooth, Kang, & Hasnain-Wynia, 2006; Clement, White, & Valdmanis, 2002; Currie & Fahr, 2004; Duggan, 2000; Frank & Salkever, 1991; Gentry & Penrod, 2000; Gruber, 1994; Kim, McCue, & Thompson, 2009; Norton & Staiger, 1994; Thorpe & Phelps, 1991).

Research questions. Research questions tended to address one of three primary issues: 1) how ownership affected hospital safety-net participation, 2) how environmental factors influenced hospital safety-net participation and whether any such influence varied by owner type, and 3) how the value of nonprofit hospitals' safety-net participation compared to the sector's tax exemptions. Over almost 40 years of study, the reviewed research has documented the influence from managed-care practices, the increased presence of for-profit hospitals in the marketplace, and the increased implementation of internal hospital cost and efficiency controls. The findings tell a story of wide variation in

hospital safety-net participation that has in the aggregate diminished over time relative to demand and has been concentrated among fewer facilities. Although nonprofit hospitals have, on average, shown higher hospital safety-net participation than for-profit facilities over time, many individual nonprofit hospitals have shown very low participation. The following sections provide details about all of the articles in three general sections: 1) the period from 1980 through 1997, 2) the period from 1995 through 2003, and 3) a subset of eight articles from 1997 through 2006 that focus on safety-net hospitals (those facilities that provide very high levels of hospital safety-net care).

1980 through 1997. The reviewed research tracked the performance of hospital participation in the safety net during this period by owner and studied the effects of competition from for-profit hospitals, system affiliation, cost constraints, and efficiency measures as well as price and income fluctuations on these hospitals. Three retrospective studies discussed at the end of this section summarized the trends over time.

In the earliest study, Frank, Salkever, and Mullan (1990) analyzed national data on discharges of indigent patients from 1979 to 1984 and found that private, nonprofit hospitals showed higher average participation in the hospital safety net than for-profit hospitals did. Similar results were presented in a study of AHA and state data on hospital admissions and uncompensated care for the 1982–1983 fiscal year. In this work sociologist Brad Gray (1986) examined the effect of for-profit hospitals on services and uncompensated care. He found that nonprofit hospitals generally served more uninsured patients and provided more uncompensated care than investor facilities did. Gray could not determine whether for-profit hospitals were favoring profitable patients and services to the detriment of other local hospitals.

In a study of 1981 American Hospital Association (AHA) data, Norton and Staiger (1994) tested the effect of location on this observed difference in average performance. Using a robust regression, they found no difference in the average provision of uncompensated care between for-profit and nonprofit hospitals competing with each other in the same county market. They did find that for-profit facilities often avoided treating the uninsured by locating in better-insured areas. This research established that location characteristics such as income levels in the surrounding area should be an important factor in subsequent research. Additionally, Norton and Staiger's conclusion that location explained any differences in hospital safety-net participation was challenged by another study in the mid-1990s by Clement, White, and Valdmanis (2002).

With a special interest in multihospital systems, Shortell et al. (1986) administered a national survey in 1984. Their analysis found that investor-operated hospitals provided less charity care than other hospitals in highly competitive markets. System-affiliated and nonprofit hospitals provided more charity care in markets with stronger regulatory rate review. And, although system-affiliated hospitals provided less charity care⁸ in markets with low Medicaid eligibility, there was no difference between investor-owned and nonprofit hospitals with regard to provision of charity care in these markets.

8. *Charity care* is the component of uncompensated care that does not include bad debts, service discounts, and contractual adjustments (Shortell et al., 1986, p. 100). Use of this isolated amount was deemed unreliable for research over time (Bazzoli, Lindrooth, Kang, & Hasnain-Wynia, 2006; Kim, McCue, & Thompson, 2009).

Additional studies on hospital behavior in the early 1980s to mid-1990s focused on the influence of hospital competition, income, and demand for safety-net care. A Maryland study of nonprofit hospitals from 1980 to 1984 found that both greater competition and lower payments for care to hospitals increased provision of charity care, ostensibly because hospitals were committed to supplying services at some level of capacity (Frank & Salkever, 1991).

In a study of New York nonprofit hospitals from 1981 to 1984, researchers Thorpe and Phelps (1991) found a similar increase in participation in the hospital safety net. After funding subsidies for the provision of indigent care were changed in the state, the researchers found that increasing hospital cost reimbursement for hospitals was associated with higher levels of uncompensated care, indicating that there had previously been unmet demand for hospital services. They also found that there was no effect on provision of uncompensated care from increased hospital income.

The effect of decreased funding, however, showed negative effects. In a national study of data from 1991 to 1997, Thorpe, Seiber, and Florence (2001) found a 10% increase in managed care associated with decreased margins of 2% and a 0.6% decrease in the provision of uncompensated care. For-profit hospitals provided 1.3% less uncompensated care relative to expenses than nonprofit facilities did.

Additionally, in five California studies, the demand for safety-net care and the falling prices for hospital services and treatment were tested to determine their effects on hospital safety-net participation. In a study of data from 1981 to 1989, Banks, Paterson, and Wendel (1997) found that high unemployment and a hospital's location in an area with low Medicaid eligibility increased provision of uncompensated care at for-profit

hospitals. Additionally, a hospital's proximity to a public hospital reduced the provision of uncompensated care at both for-profit and nonprofit hospitals, although more so among the for-profit facilities.

In a study of the same time period, Ferris and Graddy (1999) found greater adaptation to cost-control policies in the nonprofit sector with fewer hospital closures and conversions than occurred among the for-profit or public facilities. They also found that the hospitals that remained nonprofit facilities from 1981 to 1989 reported higher average uncompensated care than the others did.

Two other California studies, however, found that provision of uncompensated care was sensitive to falling prices for services and treatment. In a study of OSHPD data from 1980 to 1989, Mann, Melnick, Bamezai, and Zwanziger (1995) found that lower reimbursements from managed care and increased competition from for-profit hospitals had a negative effect on overall provision of uncompensated hospital care statewide. This effect was especially pronounced on the hospitals that had previously showed significant levels of uncompensated care. In another study of OSHPD data from 1982 to 1988, Gruber (1994) calculated that with each decrease of 1.0% in hospital resources, uncompensated care fell from 0.4% to 1.0%. He found that nonprofit facilities showed the greatest reaction to downward pressure on prices with regard to the provision of uncompensated care.

A later study of 1996 OSHPD data, however, found no effect from price competition on provision of charity care among nonprofit and public hospitals. In this analysis of competition between hospital sectors, Clement, White, and Valdmanis (2002) also retested Norton and Staiger's work from 1994 regarding the effect of hospital

location on the provision of uncompensated care. Using probit and multivariate regressions to control for investor hospitals locating in more profitable areas, the Clement group found that in mixed ownership markets, for-profit hospitals provided significantly less charity care than nonprofit facilities did. These results differ from those of Norton and Staiger's earlier study.

Another study on hospitals in the state of Texas explicitly sought to assess hospital response to legislation establishing (and then lowering) a mandated threshold for charity care. In a study of data from 1991 to 1997, Kennedy, McWhorter, Troyer, and Stroup (2005) found that nonprofit hospitals modified their charity care expenditures toward the threshold, although hospitals providing care above the level of the threshold prior to the legislation did not significantly decrease their provision. Additionally, these researchers found that for-profit facilities with more Medicaid-covered patients spent more on charity care than larger hospitals treating more Medicare patients did.

Currie and Fahr (2004) found that over the next eight years, from 1988 to 1996, competition from managed care showed no effect on charity-care discharges at nonprofit hospitals in California. They found increased numbers of charity-care discharges at public hospitals and greater numbers of Medicare patients and Medicaid births among for-profit facilities. Additionally, they saw evidence of patients in need of more complex treatment through increased costs among the nonprofit hospitals and public hospitals. Revenue increased correspondingly only at nonprofit facilities.

Finally, in the wake of federal Disproportionate Share Hospital (DSH) funding to subsidize facilities treating a high percentage of Medicaid patients, Duggan (2000) studied California Medicaid admissions from 1990 to 1995. He found that nonprofit

hospitals in close competition with for-profit facilities showed no difference in behavior and were equally responsive to “financial incentives” (Duggan, 2000, p. 446).

Retrospective studies for 1980 to 1997. Three national studies evaluating the entire period from the early 1980s to the mid-1990s showed that the competitive changes in the U.S. hospital industry had a great effect on the hospital safety net. Fewer hospitals, especially public and teaching facilities, were providing more of the uncompensated care. Nonprofit hospitals showed positive influence as a sector with higher average safety-net participation; individual facilities, however, increasingly reported very low and reduced safety-net participation.

One of the studies tested sociology’s institutional convergence theory for hospital ownership models from 1980 to 1994. Potter (2001) found that behavior between nonprofit and for-profit hospitals was converging only in efficiency, not in safety-net participation. Her efficiency outcome measures—expenses per admission and full-time employees (FTEs) per daily census—showed no significant difference in regression testing between hospital owner types. Nonprofit hospitals, however, were shown to provide more Emergency Department (ED) visits and teaching programs than for-profit facilities did. Additionally, teaching programs were positively associated with a higher proportion of Medicaid patients, and ED utilization increased with the unemployment rate.

In the late 1990s, Mann, Melnick, Bamezai, and Zwanziger (1997) conducted a descriptive study of uncompensated care from 1983 to 1995. They found that the total captured value of uncompensated care increased by \$11.4 billion, an amount that represented a 150% increase in inflation-adjusted dollars. They also found, however, that

this increase was not matching the rising need for care. Total increases in uncompensated care after 1988 were proportionally lower than corresponding increases in the number of uninsured people and in hospital expenses. Also, the amount of uncompensated care provided for every dollar of insured patient revenue dropped from \$0.42 in 1984 to \$0.36 in 1995.

Both demand for care and hospital income were influencing hospital safety-net participation. Increased uncompensated care was associated with a high percentage of Medicaid patients, and reductions in uncompensated care were associated with losses in Medicare profit. Additionally, yearly analysis of fluctuations in spending on uncompensated care showed high spikes in provision from 1983 to 1986 and from 1991 to 1993. The second spike, which was not as high, occurred at the same time that the federal government implemented DSH funding.

Cunningham and Tu (1997) found similar trends in a comprehensive study of the uncompensated care provided by hospitals, physicians, and community clinics. With AHA data that had been collected every five years between 1980 and 1994, they found that the cost of hospital uncompensated care increased through the 1980s and early 1990s and then started falling in the mid-1990s. Their study also showed a nearly doubled increase in patients diagnosed with conditions that might have been better treated in a primary care setting and showed a higher proportion of these patients among the uninsured. They concluded from these findings that better access to primary care might change demand for a hospital safety net.

Cunningham and Tu also concluded that a select group of public, teaching, and nonprofit hospitals had assumed greater participation in the safety net. They found a drop

in the number of hospitals providing uncompensated care valued at 10% or more of total hospital costs. Also, the smaller group of hospitals that maintained high levels of uncompensated care reported increased associated costs.

Participation in the hospital safety net and tax subsidies. Three additional reviewed studies of hospitals in the 1990s sought to research the value of nonprofit tax exemptions. Two studies spanned four years and one study focused on the year 1995. The earliest, by Morrissey, Wedig, and Hassan (1996), compared the estimated tax benefits of California nonprofit hospitals with the value of the uncompensated care that they provided in 1988 and 1991. The researchers found that more than 80% of their study hospitals provided benefits in excess of subsidies.

A few years later, Nicholson, Pauly, Burns, Baumritter, and Asch (2000) studied the period from 1995 through 1998 and directly compared a benchmark value for U.S. for-profit hospitals' taxes and profits with an estimated value of nonprofit hospitals' community contributions. The estimated value of the contributions included uncompensated care, wellness programs, net research and medical education expenses, and patient treatment and service costs in excess of payments received. These researchers estimated that actual benefits fell short of expected benefits by an average of \$5.8 million to \$9.9 million per nonprofit hospital.

Finally, Gentry and Penrod (2000) estimated the tax benefits of nonprofit hospitals for the year 1995 from Medicare cost reports and compared for-profit and nonprofit facilities. They calculated a total capital value of \$6.3 billion in subsidies to nonprofit hospitals from uncharged income and property taxes. They also compared hospital participation in services associated with safety-net patients, such as maternity

and medical education. Findings included the determination that small nonprofit hospitals were more likely to maintain an emergency department (ED) and to provide maternity services. No difference in provision of ED services appeared for hospitals with between 75 and 150 beds or with more than 300 beds. Additionally, larger size and nonprofit ownership were positively associated with clinical teaching programs.

1987 to 2003. Most of the reviewed studies on hospital safety-net participation after the late 1990s focused on the select group of high-performing hospitals mentioned by Cunningham and Tu (1997). Research on these safety-net hospitals is discussed in the section after this one. Two other articles, however, on data from 2003, continued to examine uncompensated care at large.

Studies for the year 2003 were published by the Congressional Budget Office (2006) and by Kim, McCue, and Thompson (2009). The Congressional Budget Office studied ownership and provision of a variety of national hospital characteristics (e.g., case mix, teaching status, and location characteristics), including the provision of uncompensated care. They found that nonprofit hospitals as a group provided more uncompensated care than similar for-profit facilities did. Individual hospitals, however, varied widely in their performance, and the distributions of participation for nonprofit and for-profit hospitals were similar.

Also, in a shift from earlier findings (Norton & Staiger, 1994), nonprofit hospitals, on average, now operated in locations with higher average incomes, lower poverty rates, and lower percentages of people without health insurance.

The study of 2003 data by Kim, McCue, and Thompson focused on California and found no effect from ownership on provision of uncompensated care when it

controlled for hospital financial condition. Additionally, the study found continuing negative influence from fiscal issues: Among nonprofit hospitals, greater free cash flow (liquidity of assets) was positively associated with higher levels of uncompensated care, and higher debt was negatively associated with provision of uncompensated care.

Safety-net hospitals. Another approach to research on hospital safety-net participation was found in eight articles. These focused on hospitals with disproportionately high hospital safety-net participation. Six sought to examine relationships between fiscal pressure and safety-net hospitals. The two most recent studies evaluated the definitions of the term safety-net hospitals in research.

In 1997, Linda Fishman studied the financial status of U.S. hospitals with high levels of uncompensated care and teaching programs. She defined a *safety-net hospital* as a facility with a ratio of uncompensated care to operating expense in the top 10% (decile) of all hospitals for the year 1994.⁹ Fishman found that these hospitals had lower average profits. They also served a much higher proportion of Medicaid patients and a lower percentage of Medicare patients than the hospitals in the other deciles did. Additionally, she found that safety-net hospitals and facilities with medical education programs were overrepresented by local government ownership. She suggested that policy makers and researchers watch and protect this top tier of hospital safety-net participation.

9. In that same year, 1997, Fishman and Bentley published an article on safety-net hospitals that did not address hospital ownership but was later cited as a reference for the model by which safety-net hospitals were identified.

Another study of 1994 fiscal data from nine states (Gaskin & Hadley, 1999) defined *safety-net hospitals* in one of two ways: 1) as urban facilities with a membership in the National Association of Public Hospitals or 2) as urban facilities with a high proportion of low-income patients (measured by discharges).¹⁰ Findings reiterated Fishman's concern about the survival of these hospitals, noting that they were dependent upon public subsidies. Gaskin and Hadley also found that of the 177 urban safety-net hospitals they had studied, 50% were nonprofit, 31% were public, and 16% were investor owned. Additionally, most of the investor-owned hospitals were located in Los Angeles and operated fewer than 150 beds.

A group of studies published from 2001 through 2006 continued to explore the financial conditions associated with high-performing hospitals and institutionalized a classification system for safety-net hospitals. Based on the work of Fishman and Bentley (1997) and Zuckerman, Bazzoli, Davidoff, and LoSasso (2001), this new work, led by Bazzoli, measured uncompensated care both as a percentage of hospital revenue (*burden*) and as a percentage of the total uncompensated care for the hospital's local *market*. The colleagues studied four groups of hospitals: high burden and high market, high market only, high burden only, and low participation. (The threshold for high was the top decile of the entire distribution.) Among other findings, the group found that investor safety-net hospitals primarily reported only high burden while nonprofit safety-net hospitals

10. A hospital had high discharges of safety-net patients if the value exceeded one standard deviation above the average for the state. Safety-net patients included those covered by Medicaid or charity care and those paying for themselves.

dominated the high market group and that public facilities represented almost 70% of the safety-net hospitals with both high burden and high market shares of uncompensated care.

Three subsequent national studies led by Bazzoli used this same classification system to define safety-net hospitals. First, using AHA data from 1994 to 1998, Bazzoli, Manheim, and Waters (2003) studied relationships between uncompensated care and hospital ownership systems or network affiliations. They studied uncompensated care as continuous and categorized measures. Findings showed that when compared with all other hospitals, nonprofit hospitals that reported high amounts of uncompensated care had an increased likelihood of delayed network affiliation. Affiliation with health systems, however, in which ownership is transferred, was not delayed and was more likely for hospitals with high amounts of uncompensated care. Bazzoli cautioned that this acquisition pattern was likely to have negative consequences for hospital safety-net care.

The other two articles, national and longitudinal studies, examined these same three groups of safety-net hospitals (high burden and market, high burden, high market) from 1996 to 2000 (Bazzoli, Kang, Hasnain-Wynia, & Lindrooth, 2005) and from 1996 to 2002 (Bazzoli, Lindrooth, Kang, & Hasnain-Wynia, 2006). This research found that uncompensated hospital care fell with a reduction in Medicaid payments for the most committed safety-net hospitals. Uncompensated care also fell at nonprofit hospitals that were competing with for-profit facilities.

Recently, two articles studied the definitions of safety-net hospitals. McHugh, Kang, and Hasnain-Wynia (2009) compared quality studies that employed three different definitions of the term *safety-net hospital*: uncompensated care (according to the system

developed by Zuckerman, Bazzoli, and their colleagues), Medicaid and self-pay caseload, and facility characteristics such as teaching status. The researchers found that outcomes varied depending upon the definition of safety-net hospital that was used. Also, descriptive information on ownership showed that for-profit hospitals had the highest representation (21%) among safety-net hospitals that were defined according to their safety-net patient caseload.

Similarly, Zwanziger and Kahn (2008) used cluster analysis to test three different definitions of the term *safety-net hospital*: the socioeconomic status of the hospital's service area, the proportion of Medicaid admissions, and the uncompensated care as both organizational burden and market share. Their findings recommended the use of a continuous measure of participation and/or ad hoc binary categorization rather a standard threshold. They also found a wide range of participation among the different owner types.

Summary and Recommendations from Reviewed Empirical Research

The reviewed research explored how ownership, as a primary or key control variable, was associated with hospital safety-net participation as provision of health services to disproportionately needy populations.

In analyzing uncompensated hospital care, patient admissions and discharges as well as services for vulnerable patients, the research found that hospital safety-net participation has been concentrated among fewer hospitals over the past 40 years and is currently highest among public hospitals and a select group of nonprofit facilities. Moreover, participation was shown to increase with the presence of more regulations, more resources, greater community need, and larger facilities. Conversely, hospital safety-net participation decreased with reduced facility size and resources.

Additionally, numerous other environmental and organizational factors, often interacting, showed highly significant influence on hospital safety-net participation. Increased participation was positively associated with regulation and review of rates, especially among health system hospitals; increased resources; and, for nonprofit hospitals, competition. High Medicaid eligibility and revenues were also associated with higher amounts of uncompensated care.

This review of research shows specific strengths and limitations. In general, the articles show tremendous breadth and scope in the various factors considered for influence on safety-net participation. Limitations to research, however, appear primarily in definitions of safety-net participation. Challenges for research on hospital ownership have arisen from difficulties in identifying, quantifying, and isolating meaningful measures (Schlesinger & Gray, 2006; McHugh, Kang, & Hasnain-Wynia, 2009; Zwanziger & Khan, 2008; Gray & Schlesinger, 2009). More studies that do not rely on uncompensated care and yet still focus on hospital services to low-income and vulnerable patients are needed.

The Institute of Medicine (IOM) has defined *safety-net participation* as providing “a significant level of health care and other related services to the uninsured, Medicaid, and other vulnerable patients” (Institute of Medicine, 2000, pp. 3–4). The IOM definition also says that safety-net providers do not discriminate because of a patient’s ability to pay and that they maintain a “substantial share” of financially vulnerable patients.

As a measure of safety-net participation, however, uncompensated care poses conceptual, measurement, and policy problems. Conceptually, hospitals with high numbers of vulnerable and disproportionately needy patients may not always report high

amounts of uncompensated care. The measure represents a financial loss—or cost in excess of revenue—and hospitals with high safety-net participation may have relatively high amounts of revenue for safety-net patients.

Additional challenges occur in estimating the value of uncompensated care. To date, hospitals have not made publicly available the actual value of uncompensated care from their cost accounting systems. Since at least 1988, they have not even clearly distinguished their charity from their bad debt (Bazzoli, Lindrooth, Kang, & Hasnain-Wynia, 2006; Kim, McHugh, & Thompson, 2009). To estimate uncompensated care, therefore, researchers have discounted net charges (often including bad debt) with a generic cost-to-charge ratio. However, the ratio is based on lump-sum totals rather than on cost or charges weighted by payer according to negotiated rates. Additionally, because the discount is applied to net charges—after payments have been subtracted—the payment is also discounted.

Finally, as a measure of safety-net participation, uncompensated care does not represent good policy. Hospital care is not free, and the value of tax exemptions can only go so far to meet the demand for services and treatments from low-income populations. It seems much more reasonable to ask hospitals, especially nonprofit facilities, to pursue public revenue sources and tax-deductible donations for care to vulnerable patients before or at least in addition to the subsidy value of any tax exemptions.

Additional recommendations for analysis of hospital safety-net participation and ownership include favoring study of more than one year of data from more than one state (Shen, Eggleston, Lau, & Schmid, 2005). The latter suggestion, however, seems controversial. Conditions in states may not be comparable (Gray & Schlesinger, 2009),

and their hospital policy makers may need more individualized analysis. Health care constitutes a locally delivered service subject to various regulations. Studying hospitals throughout the United States may produce overgeneralized results. Given the differences in Medicaid coverage from state to state, studies on hospital safety-net participation within individual states could be very useful.

To address some of these challenges in researching hospital safety-net participation and ownership, this study used theoretical concepts from sociology and economics to frame hospital accessibility for safety-net populations. These disciplines were able to provide a useful framework and conceptual model for the study of hospitals as organizations.

Chapter 3: Theoretical Framework

This study was undertaken to update research on hospital ownership and participation in safety-net care by using an uncommon approach to evaluate hospital access for vulnerable populations. Theories of organizations, economics, and sociology provided the components for this approach. Organizational resource dependence theory presented a framework to assess hospital safety-net participation under the current constraints of managerial and cost controls. Sociology's institutional theory promoted attention to isomorphic behavior among hospitals regarding their safety-net participation as a result of cultural mores. Economics identified specific differences among hospital ownership models that might affect isomorphism regarding the provision of safety-net care. The following sections explain in more detail each of the theories and its contribution to this study's conceptual model, which appears at the end of the chapter.

Organizational Resource Dependence Theory

Organizational theory was developed in the 1950s with the idea that organizations exist as they persevere, and since the 1960s this theory has increasingly perceived organizations as "open system framework[s]" with fluid boundaries and controls (Scott, 2004, p.1).

More specifically, resource dependence theory frames organizations as open systems that persevere through environmental interaction that is intended to exercise control over resources. Specific tenets of this theory posit that the "context in which an organization is embedded" determines its behavior (Pfeffer & Salancik, 1982, p. 39) and that organizations adapt and survive by perceiving and navigating the interdependent material resources around them (Pfeffer & Slancik, 2006, pp. xi–xii). Also, greater

interdependence among organizational agents promotes their stronger environmental influence on one another (Pfeffer & Salancik, 2003, p. 265).

Specific resource dependence models guide the perception and navigation of these interdependent resources. In general, organizations affect behaviors and outcomes by managing “symbiotic” or “competitive” relationships (Pfeffer & Salancik, 1982, p. 41). By strengthening or weakening external relationships, organizations increase control over needed resources and adapt to their environments (Boyd, 1990, p. 420). Also, an organization’s need for a resource is affected by its importance, the organization’s ability to control the resource, and the availability of alternative resources (Boyd, 1990, p. 419; Pfeffer & Salancik, 1982, p. 45).

In its application to the hospital industry, a resource dependence perspective focuses on hospitals’ management of relations with physician organizations, medical supply companies, and governmental regulatory and accreditation bodies. Vertical and horizontal integration become “strategic mechanisms” that promote control over resources and buyers (Luke & Walston, 2003, p. 299). Strategies used by urban hospitals, typically characterized as market oligopolies, would be likely to emphasize horizontal growth, or *niching*, while monopolistic rural markets would look to vertical solutions to control resources (Luke & Walston, 2003, p. 300).

From this perspective, specific hospital behaviors such as provision of hospital safety-net care represent a strategic action to control resources such as physicians, funding, and government licensure or nonprofit status. Moreover, an organization’s leaders influence their dependence on such resources in three ways: through symbolic, responsive, or proactive behavior (Pfeffer & Salancik, 2003, pp. 262–268). Symbolic

behavior allows the organization to cope with “external demands” such as trust (Pfeffer & Salancik, 2003, p. 264; Luke & Walston, 2003, p. 299). For example, hospital board members who remove or replace a figurehead can influence external pressures, perceptions, and feelings about a hospital’s behavior regarding provision of safety-net care (Pfeffer & Salancik, 2003, p. 264).

Alternatively, responsive behavior allows an organization to interpret, strategize, and adapt to a constraint (Pfeffer & Salancik, 2003, p. 265). Success in responsiveness comes largely from a leader’s ability to assimilate and follow environmental agents (Pfeffer & Salancik, 2003, p. 265). For example, hospitals that provide easier access to care for vulnerable populations may specialize in particular services or, in the case of nonprofit facilities, may have established a large base of wealthy donors who want to subsidize indigent care or a base of physicians professionally committed to caring for disadvantaged populations.

Finally, proactive behavior results from the discretionary role of organizational leaders to control and influence the environment itself, changing “systems of constraints and dependencies” (Pfeffer & Salancik, 2003, pp. 265–266). This role assumes that an organization maintains critical resources and power within its environment (Pfeffer & Salancik, 2003, p. 266). An example of such proactive behavior is a hospital’s participation in wellness programs that successfully reduce demand for hospital care, changing the intensity of the safety-net participation constraint.

Additionally, hospital ownership can be seen as a resource that interacts with other factors, providing another dimension to the framework. For example, nonprofit hospitals that are free from the constraint of investor demands for profit may take a

responsive approach to the constraint of community benefit and provide enhanced access to their hospital care. Or they may resist the constraint of the reduced reimbursement from safety-net funding by separating and protecting their technical core and other structural elements through *decoupling* (Meyer & Rowan, 1991, pp. 356–357). In practice, such a strategy might find a hospital emphasizing proactive community benefit work to reduce demand for hospital care while simultaneously restricting access to that care—protecting the hospital from the constraint of low reimbursement. In either case, however, the nonprofit hospital is behaving differently than a for-profit institution would, although ownership would not appear as a key predictor of safety-net participation.

Thus, resource dependence theory models a dynamic, creative flow between an organization and its environment that affects performance (Boyd, 1990, p. 419). It also isolates responsive action as one option for controlling important relationships. From this perspective, executives strive to influence organizational interactions by balancing limitations, operations, and structures, “reducing dependencies and seeking adequate power advantages” (Luke & Walston, 2003, p. 299; Scott, 2004, p. 6). Environmental adaptation to control resources requires strategically working political and economic systems (Scott, 2004, p. 6).

Theorists who criticize resource dependence theory do so by calling for more attention to geography, history, social class, and social status (Pfeffer & Salancik, 2002, pp. xxi–xxii). Sociology’s institutional theory provides useful concepts to assess industry trends in behavior and cultural influences, and economic theory adds important concepts associated with geography and social class: competition and demand for safety-net care.

Institutional Theory

Sociology's institutional theory complements resource dependence theory well, especially by attending to unconscious organizational behavior (Oliver, 1991).

Institutional theory explains that organizations are open social systems that create and establish boundaries for social reality in specific ways (Myer & Rowan, 1991; Scott, 1987, p. 507). Similar to resource dependence theory, institutionalism highlights the organizational environment but emphasizes the culture and rules that “shape” and structure organizations: “Organizational environments are composed of cultural elements, that is, taken for granted beliefs and widely promulgated rules that serve as templates for organizing” (DiMaggio & Powell, 1991, p. 28).

Thus, social and cultural beliefs exist as myths and symbols embedded in organizational structures. For example, from an institutional perspective, hospitals assimilate the mythology of a *free market* by resisting regulation and pursuing profit as medical success. Moreover, such assimilation predicts that organizations in the same field will experience isomorphism, or a tendency to resemble each other. The similarities occur as organizations adapt to the same coercive, mimetic, and normative pressures from society, markets, and regulation (DiMaggio & Powell, 1983). Cultural influences work effectively but informally as structural controls (Scott, 1987, pp. 506–507).

To study the power of environmental forces on organizations, Scott, Ruef, Mendel, and Caronna (2000) have provided three critical constructs as tools for researchers:

- logics, which specify goals and values (e.g., mission, ownership, case mix);

- actors, which embody and enact structures and processes (e.g., regulators, patients, and physicians); and
- governance structures, which arrange power and authority (e.g., system affiliation, size).

Additionally, most institutional theory has recognized two significant actors since the 1950s: government and the professions, also known as “the great rationalizers of the second half of the twentieth century” (DiMaggio & Powell, 1983, p. 147). These actors promote different organizational forms with regard to centralized or decentralized controls (Scott, 1987, p. 508). Also, the methods used by each actor to promote structures vary: The state typically uses coercion, such as the threat of stripping a hospital of its license or nonprofit status while the professions “rely primarily on normative and/or mimetic influences and attempt to create cultural forms consistent with their own aims and beliefs” (Scott, 1987, p. 509). Such normative influence may be seen in the common hospital practice of requiring a physician’s approval to admit patients.

An institutional perspective on safety-net participation suggests that market pressure on all hospitals, regardless of ownership, has resulted in isomorphism toward reduced access for low-income populations since the 1980s. As all hospital administrators confronted shrinking resources due to managed care and other cost constraints, they strove to strategically position their organizations for survival, to increase revenues, and to adopt some of the competitive market and managerial mechanisms that were culturally popular at the time.

A previously important and conflicting mythology in U.S. health care, however, may have complicated the influence of free market approaches to medicine and divided

hospitals into subgroups. Historically, hospitals have assimilated and promulgated the idea that the treatment of disease and illness equals *care*. They have done so through a multitude of adaptive decisions over time, including the use of a nonprofit business model, which is supposed to diminish the influence of market concerns and increase pressure to provide enhanced access, in part by requiring community benefits from hospitals.

Thus, the hospital industry has assimilated two conflicting cultural values: cost control and caring. Given the duration and intensity of market and managerial pressures over the past 40 years as well as the relatively weak actor of government, as explained in Chapter 1, to what extent have other critical constructs in the hospital industry such as the logic of ownership or the governing structure of system affiliation influenced ongoing safety-net hospital care?

Gray and Schlesinger (2002) maintain that within the context of shifting policy and industry practices, ownership influences a hospital's response to its environment. The influence is a result of different environmental pressures on nonprofit facilities. While for-profit hospitals may experience some normative pressure to act in the public interest—to care—due to the life-and-death nature of their services, the pressure on nonprofits is both normative and coercive. Nonprofit hospitals must provide community benefits to maintain the tax exemptions associated with their ownership status, and some states and localities, including California, provide additional regulation of this activity.

Whether nonprofit ownership and other critical constructs predict increased participation in hospital safety-net care as an extension of community benefit, however, is not theoretically clear. Ownership may influence assimilation of market values, and it

may influence control over relationships and resources that depend upon safety-net participation. However, other factors such as system affiliation or demand for services may be more important. Economic theory adds final details to the conceptual model of this research regarding the ways in which some constructs, such as ownership, may influence provision of safety-net hospital care as a responsive way to control political, social, and economic relationships.

Economics

Economic theory contributes to this research by explaining organizational fields in terms of resource distribution through market-based exchanges. The theory provides models for the production, distribution, and consumption of goods and services such as hospital care. Markets and the ways in which they distribute services are expected to mirror the income distribution of the society in which they operate. As Yoder (1986) explains: “According to standard economic theory, the profit-maximizing firm in a competitive economy sells its product at the market price to anyone who wants to buy at that price and who can afford it” (p. 24).

Without regulation, the distribution of services that results from such a standard model tends to conform to a libertarian philosophy, which “elevates individual liberty to the status of the single, overriding social value to which all other values are subordinate, and which can never justly be traded off against any subordinate value” (Reinhardt, 1986, p. 7).

Health care as a product, however, has three unique properties that violate its conformance to the standard economic model and that have historically justified its regulation. First, health care requires medical expertise to determine treatment options.

Patients cannot be adequately educated to demand many health care services on their own, so they work in partnership with physicians. This situation affects demand for services by conflating supplier and purchaser, a phenomenon that justifies licensing and accreditation restraints on providers.

Second, health care as a product can trigger the expression of egalitarian values. As Reinhardt (1986) explains, “Egalitarian philosophers elevate ‘equal respect for all individuals’ or ‘equality of opportunity’ to the overriding value of a just society to which all other values—among them individual liberty—are deemed subordinate” (p. 7). Egalitarians maintain that health care, as a basic good and service, represents an opportunity and measure of respect that should be available to all individuals (Reinhardt, 1986, p. 7). An example of regulation toward egalitarian values is the federal EMTALA law for hospitals. As previously explained in Chapter 1, this law mandates emergency stabilization of patients regardless of their ability to pay.

Finally, health as an outcome provides social benefits at large, such as a strong labor force, that markets cannot identify as inherently valuable without regulation. In the United States services that promote such outcomes also include education and the arts and are typically served by nonprofit organizations. Unlike for-profit firms, nonprofit organizations are expected to pursue a goal other than a positive return on capital investment. Typically, this expectation means that nonprofits seek to provide higher quality or greater access to hospital care than that demanded by free markets.

Together, these three characteristics show that the economic field of health and hospital services does not fit a traditional free market model very well. The competitive

forces at work in the health care market differ from those operating in other markets. These differences may affect hospital safety-net participation.

Competition. Economics perceives competition as a critical and stabilizing force on markets, regulating supply, demand, and efficiency as well as pricing. Feldstein (2005) identifies two factors that affect competition in a local, geographically defined hospital market:

- economies of scale, which measure how an increase in the size of an organization decreases the average cost of production and can be affected by case mix—i.e., the average severity of patient illness treated at a hospital. Economies of scale can lower a hospital's expenditures on marketing and liability insurance while increasing its revenue from health insurance and plans.
- barriers to entry, which may include capital investment, government regulation, community perceptions, and other obstacles to opening or closing a hospital (p. 264).

These factors can give nonprofit hospitals a competitive advantage. In fact, Hansmann (1987) has suggested that the current dominance of nonprofit hospitals in the marketplace is maintained through their competitive advantage derived from tax exemptions and subsidies and that their dominance is also affected by their funding constraints, which restrict quick market entry and exit (pp. 31–38).¹¹

¹¹ Brown and Slivinski (2006) warn that prohibiting for-profit activity in a nonprofit-dominated industry may actually cause supply problems because of nonprofits' inability to respond quickly to shifts in demand for services.

This competitive advantage for nonprofit hospitals, which are expected to pursue enhanced quality and or/access, might encourage the provision of safety-net services throughout the market, depending on local conditions and hospital resources (Gruber, 1994; Mann, Melnick, Bamezai, & Zwanziger, 1995).

Pioneering economic theory about nonprofit firms, however, presents a typology that classifies nonprofit hospitals as most similar to for-profit organizations because of their “commercial” and “entrepreneurial” aspects: 1) They rely on production of goods or services, not donations, for their primary source of revenue, and 2) they are controlled by a board that is self-perpetuating, as opposed to being controlled by a large group of members (Hansmann, 1987, p. 29). Thus, although economic theory can explain why hospital ownership would have a positive influence on the direct provision of safety-net care and would positively influence the market at large, it also provides a caveat about the typology of these facilities. Also, given the market and competitive pressures from for-profit health care over the past 40 years, ownership alone may not be a strong enough factor to predict safety-net participation. Other factors such as a hospital’s mission or case mix may combine with ownership to exert interdependent influence toward responsive behavior from hospitals regarding the provision of safety-net care. Understanding such interactions may help regulators enforce important aspects of the charitable mission requirement for nonprofit hospitals.

Conceptual Model

To address specific recommendations from previous research on hospital ownership and safety-net participation, this research uses a resource dependence model with concepts from sociology and economics. This model, which is illustrated in Figure

1, posits that provision of hospital safety-net care constitutes organizational adaptation to the constraint of low reimbursement services. This adaptation constitutes a strategic action to control key political, economic, and social relationships.

Sociology's institutional theory suggests that organizations will exhibit similar participation in the provision of care due to their unconscious assimilation of social values, or mythologies. The conflicting pressure to conform to values that economists refer to as libertarian or egalitarian, however, may divide hospitals into subgroups according to a dominant alignment with political, professional or patient pressures.

Factors expected to influence this alignment include environmental characteristics associated with economic competition and demand. Additional factors are critical organizational constructs, such as the cultural logics of hospital mission, ownership, and patient acuity; and the governance structures of size and profitability which provide the power to withstand market pressures and to adapt to the financial constraint of providing hospital access at reduced reimbursement rates. Table 1 presents a list of constructs and associated factors; Figure 1 presents an illustration of the permeable environment of resource dependence in which these factors influence responsive hospital safety-net participation as a way for hospitals to control relationships and resources.

Table 1

Institutional and Economic Constructs of Interest to Hospital Safety-Net Revenue

Theoretical Interest	Associated Factors
Institutional Critical Constructs	
Logics	Culture as ownership, system affiliation, mission, and case mix.
Actors	Government and the professions through federal and state regulation as well as professional practices.
Governance Structures	Power as net profit margin and size
Economics	Competition and demand

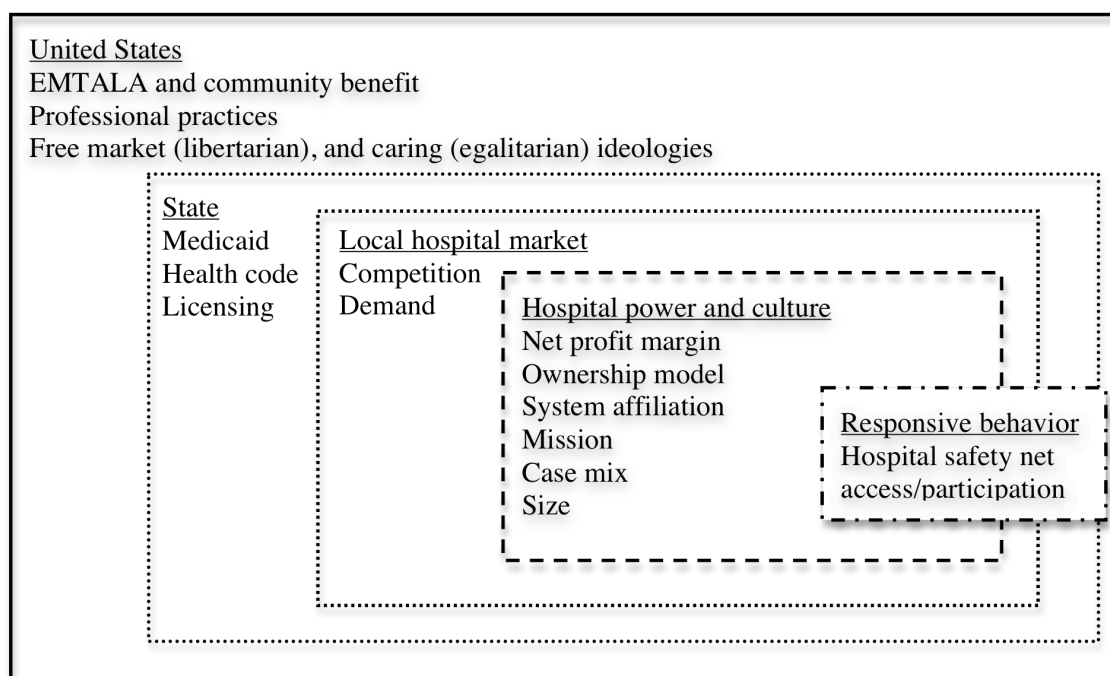


Figure 1. Conceptual Model of Safety-Net Orientation.

The following chapter describes the design, measures, and methods for this research.

Chapter 4: Research Design and Methodology

To provide an updated perspective on access to hospital care for vulnerable populations, this research used a framework of resource dependence theory with concepts from sociology and economics to conduct a quantitative analysis. It hypothesized that hospitals' responsive behavior to the need for safety-net hospital care was a) reflected in the amount of hospital revenue associated with safety-net patients and b) associated with specific environmental and organizational factors. These factors included market competition and demand as well as institutional culture and power. Analysis was also based on the assumption that safety-net care from hospitals varied by state according to Medicaid and other regulations associated with indigent health care (described in Chapter 1). Details on the study's design, data, variables, and analysis appear in the following sections.

Research Design and Data

Medicaid eligibility, services, and payments vary widely by state. This situation affects hospital safety-net revenues in national hospital comparisons. Therefore, this study limited its examination to hospitals in one state. With a population of 40 million people and with rural, urban, and suburban markets, California was an attractive choice. Additionally, California's safety-net population included indigent and low-income individuals as well as people who have been disabled from physical injury or serious mental illness.

As summarized in Chapter 1, the research pursued three aims to test its hypothesis.

Aim 1: Investigate safety-net participation among California study hospitals operating in 2005 and 2007 through a study of hospital revenue. Compare annual revenues associated with safety-net populations averaged over the period from 2006 to 2008, and describe hospitals by different levels and types of performance.

Aim 2: Describe the study hospitals by subgroup of safety-net participation, as established through Aim 1. Provide general information on their environmental and organizational factors of theoretical interest (e.g., market competition, demand, culture, and power).

Aim 3: Test the influence of specific environmental and organizational factors on safety-net revenue participation by study hospitals. Establish whether hospital ownership significantly interacts with market competition or cultural measures.

The study used *hospital* as the unit of analysis and included all general acute-care facilities ($n = 331$) that were not operated as part of a health plan such as Kaiser Permanente. Sample hospitals included in the study met two primary criteria: They were licensed in 2005 and 2007 as general acute-care facilities, and they reported net patient revenue. Data for Kaiser Permanente health plan hospitals were unavailable. Four facilities were consolidated between 2005 and 2007, so their earlier data were combined.¹²

12. Not included in the study were three hospitals that opened after 2005 and four hospitals that closed between 2005 and 2007.

The study also used *county* to define a hospital's local market, a practice that has been used in previous research (Currie & Fahr, 2004; Kim, McCue, & Thompson, 2009). Preliminary analysis showed that the 331 study hospitals represented 56 of California's 58 counties and that the number of hospitals in a county ranged from one (13 counties) to 83 (Los Angeles). Additionally, 12 counties featured seven or more hospitals while 43 counties featured six or fewer facilities.

Data came primarily from the California Hospital Annual Financial Disclosure Report (HAFD). Hospitals submit the HAFD annually to the California Office of Statewide Planning and Development (OSHPD) and report by license, which may apply to one or more proximate facilities. Five years of unaudited data from 2004 through 2008 were downloaded from OSHPD's website in 2008 and 2009.

Safety-net participation was calculated as an annual average of revenue data from 2006 to 2008. This average was used to smooth out any irregularities. Similarly, profitability was measured as net profit margin (defined below) and lagged from data averaged from 2004 to 2005. This lag was used to allow hospitals a reasonable amount of time to react strategically to resource advantages or constraints that might affect safety-net care (Thorpe & Phelps, 1991). In five cases data were missing for one of the averaged years, so the study used the adjacent years that were available. For example, if a hospital had closed in 2008, it was not removed from the study; rather, its safety-net revenue was averaged from only the 2006 and 2007 reports. Similarly, when any profitability data from 2004 were missing, 2005 data were used alone.

Variables

As explained in the previous chapter, this study has been framed with a conceptual model from resource dependence theory and required operationalizing sociological and economic concepts likely to influence responsive action from hospitals regarding the direct provision of safety-net care. The following sections explain this process and the measurement of the specific environmental and organizational factors used in the research. Additionally, Table 2 presents a summary definition and data source for all research variables.

Table 2

Measures of Hospital Safety-Net Revenue and Associated Factors

Variable	Description	Data source ^a
Outcome		
Organizational share	Percentage of hospital net patient revenue for Medi-Cal, County Indigent, or Other Indigent patients.	OSHPD (2006–2008)
Market share	Share of county net patient revenue for Medi-Cal, County Indigent, or Other Indigent patients, proportionate to total number of hospitals in county. Calculated as percentage of county safety-net patient revenue x number of hospitals in county.	OSHPD (2006–2008)
Predictor: Environmental factors (competition and demand)		
Competition	Herfindahl-Hirshman Index (HHI) calculated as the sum of the squares of each hospital's organizational share of total staffed beds in the county.	OSHPD
Demand	Percentage of county < 300% federal poverty level.	U.S. Census
Demand	Adjusted gross income for 2007 by ZIP code.	IRS

Variable	Description	Data source ^a
Predictor: Organizational factors (culture and power)		
Profit margin	Profit per dollar of revenue, calculated as revenue – expenses / revenue.	OSHPD (2004–2005)
Ownership	Nonprofit, Investor, or Public (City/County and District).	OHSPD
System	Affiliated with three or more other hospitals: yes or no.	OHSPD
Mission	Teaching, Small/Rural, or N/A.	OHSPD
Size	Number of staffed beds.	OSHPD
Case mix	Factor of adjustment to compare hospitals' average cost per patient. Patients' resource consumption per nationwide average per number of patients. Calculated as sum of DRG weights / # of patients.	OSHPD

^a All data for the year 2007 unless otherwise specified. OSHPD refers to the California Office of Statewide Health Planning and Development; IRS refers to the U.S. Internal Revenue Service.

Outcome variables — Safety-net participation. As discussed at length in Chapter 2, most community benefit and safety-net research has focused on estimating and analyzing the cost of uncompensated care provided by a hospital (Bazzoli, Kang, Hasnain-Wynia, & Lindrooth, 2005, 2006; Schlesinger, & Gray, 2006; McHugh, Kang, & Hasnain-Wynia, 2009). As a measure of safety-net participation, however, uncompensated care poses specific problems, including an overly narrow focus with no consideration of low margin payments for safety-net care. Also, as a matter of policy, it seems much more reasonable to ask hospitals to forego some profit in caring for the needy than to run a deficit. Analyzing the revenue that hospitals receive for treatment and

services provided to vulnerable and low-income patients can present a much broader and yet focused perspective on hospital behavior and ownership.

Safety-net revenue. This research has avoided the problems associated with measuring safety-net participation as uncompensated care costs by measuring safety-net revenues. The study used the percentage of revenue received by a hospital for treating low-income and indigent patients. The approach offers two advantages. First, it measures a hospital's interest in providing care at or below cost to disproportionately needy patients.¹³ For any given service, safety-net revenues have been typically lower than those received for other patients, and high Medicaid revenues have been positively associated with uncompensated care (Morrisey, Wedig, & Hassan, 1996). Second, as a fiscal measure, safety-net revenue combines both inpatient and outpatient activity. It does not distinguish between these areas of care, unlike utilization measures, which consider inpatient activity by days and outpatient care by visits.

The OSHPD HAFD reports that were used for this study include a breakdown of revenues for patients according to the following six payer categories.

1. Third Party is revenue for patients with private insurance.

13. This amount includes the funds that hospitals received from grants or private donors to subsidize indigent care. It does not include \$161.5 million in unrestricted contributions, which may have been needed for capital projects or other health initiatives. Unrestricted contributions, however, were included in the calculation of profits that were tested for influence on safety-net revenue participation.

2. Medicare is revenue for patients covered by federal Medicare insurance who are generally 65 years old or older.
3. Medi-Cal is revenue for patients covered by California's version of federal Medicaid insurance who are poor, blind, or otherwise disabled.
4. County Indigent is revenue for patients who do not qualify for Medi-Cal yet have been identified as indigent by their counties and who are entitled to local coverage per state mandate (California Wellness and Institution Code).
5. Other Indigent is revenue for patients with low income and few assets who do not receive state or local coverage. This category may include restricted donations to subsidize indigent care and Support for Clinical Teaching funds awarded to University of California teaching hospitals.
6. Other is revenue for all other patients, such as those who are self-paying and/or uninsured but not necessarily indigent. This category may include Support for Clinical Teaching funds awarded to University of California teaching hospitals.

Table 3 shows total revenue for study hospitals by payer group. Indigent patients accounted for \$700 million of the \$2.7 billion total for that group. Together, Medi-Cal and indigent patients accounted for \$11.5 billion (21%) of the total.

Table 3

Hospital Revenue and California Population by Payer in 2007

Payer group	Net revenue (millions)	Percentage of net revenue (%)	Percentage of population (%) ^a
Third Party	\$24,314	44.4	59.1
Medicare	16,907	30.9	11.3 ^b
Medi-Cal	10,808	19.7	12.8
Indigent and other	2,737	4.9	16.7
Total	54,766	100.0	100.0

^a Data from the 2007 California Health Interview Survey (CHIS) at www.askchis.org.

^b Most Medicare patients have supplemental coverage, and some have Medi-Cal (for long-term care and other services not covered by Medicare).

Table 4 shows that almost all of the study hospitals received revenue from four categories of payers/patients: Third Party (330/99.6%), Medicare (329/99.3%), Medi-Cal (329/99.3%), and Other (318/96.1%). Approximately 200 hospitals (60%) received revenue for County Indigent patients—subsidies from county general or other funds and any co-pays from patients. Half of the study hospitals (167/50%) reported revenue for Other Indigent patients—donations and other subsidies for indigent care such as Support for Clinical Teaching funds awarded to University of California teaching hospitals. For each hospital, revenue by patient groups varied. In 15 cases negative values appeared despite the fact that revenues were averaged over three years. These results may be due to reporting errors since the data available for this project were unaudited.¹⁴ There are,

¹⁴ Three hospitals reported negative Medi-Cal revenue, three reported negative County Indigent revenue, nine reported negative Other Indigent revenue, and one reported negative Other revenue.

however, legitimate reasons for the occurrence of negative revenue—even when averaged over three years—including paybacks to Medi-Cal, contractual adjustments for capitated services, or other liabilities to a subsidy source. Subsequent calculation of safety-net revenue that combined the Medi-Cal and indigent categories that were likely to overlap resulted in fewer negative values.

Table 4

Hospital Payer Revenue as a Percentage of Total Revenue

Payer group	Measure				
	<u><i>n</i></u>	<u>Range</u>	<u>Mean (%)</u>	<u>Median (%)</u>	<u>SD</u>
Third Party	330	0.0 – 87.2	38.5	41.3	19.0
Medicare	329	0.0 – 96.3	35.0	34.2	16.1
Medi-Cal	329	-4.7 – 97.2	21.3	14.3	20.0
County Indigent	198	-13.6 – 4.6	1.1	0.1	2.6
Other Indigent	167	-3.9 – 6.8	0.2	0.0	1.0
Other	318	-10.8 – 88.4	3.9	2.4	6.6

Note. $n = 331$.

Figure 2 illustrates revenue distributions for each payer group. The histogram for Medi-Cal revenue, which appears first, shows more than 120 hospitals reporting 0 to 10% of total revenue for this payer. Payments for County Indigent and Other Indigent patients are concentrated at or near 0%.

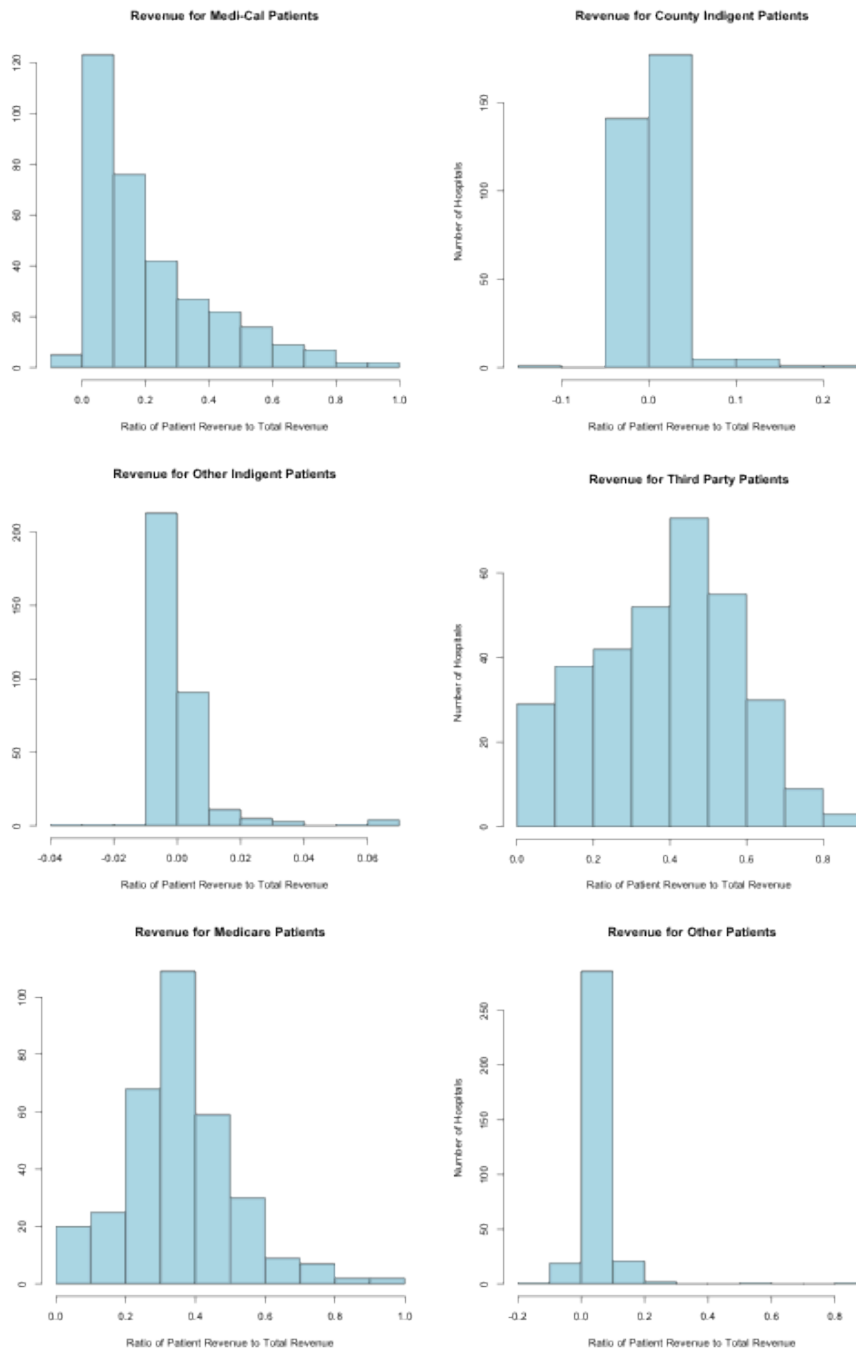


Figure 2. Hospital revenue by payer. Hospitals licensed in 2007 with revenue data averaged from 2006 to 2008; $n = 331$.

To determine safety-net participation, measures were calculated for the revenue groups that consisted entirely of disproportionately needy patients: Medi-Cal, County Indigent, and Other Indigent. Although hospitals may provide financial assistance to patients in other groups when they find the patients' insurance coverage or income inadequate for treatment, safety-net hospitals consistently help disproportionately low-income groups. Thus, measuring hospitals' attention to Medi-Cal and indigent populations provided a way to identify hospitals with the greatest theoretical orientation toward providing hospital-based services to the safety-net population.¹⁵

Two measures were calculated according to a general model established in the 1990s by Zuckerman, Bazzoli, Davidoff, and LoSasso (2001). This model was originally based on Fishman and Bentley (1987) and was most recently adopted by McHugh, Kang, Hasnain-Wynia, and Lindrooth (2009). First the research established total safety-net revenue as the sum of all revenues for Medi-Cal, County Indigent, and Other Indigent

15. Other ways that hospitals may participate suggest a more theoretically proactive or symbolic approach. They may donate funds to community programs such as local primary health clinics or school-based health centers to help people avoid the need for hospital care. Such donations, however, although critical in their ability to potentially lower demand for hospital care, do not help those disproportionately needy individuals who do require hospital care. And there will always be demand for such care (e.g., appendectomies). Thus, this research focused on hospital participation in serving the safety net with hospital-based treatment and services.

patients.^{16, 17} Two comparative values were then calculated from this sum: safety-net payer mix as a measure of organizational share (OS) and market share (MS):

1. *Safety-Net Revenue: Organizational Share (OS)*: The percentage of a hospital's net patient revenue received for Medi-Cal, County Indigent, and Other Indigent populations. A measure of 30% indicates that \$ 0.30 of every dollar that was received came from Medi-Cal payments or funds that could be used for care to indigent populations.
2. *Safety-Net Revenue: Market Share (MS)*: A hospital's proportional share of total county revenue from safety-net populations. Calculated as a hospital's individual percentage of county safety-net revenue multiplied by the number of facilities in the county. A measure of 1.00 indicates that a hospital earned its entire proportional share of county safety-net revenue; a measure of 2.00 indicates that a hospital's revenue from safety-net populations was twice its proportional share of county safety-net revenue.

In brief, this model included establishing both the proportion of a hospital's revenues associated with the safety net and the proportion of local safety-net revenue

16. These groups consist of disproportionately needy—low-income, indigent, and disabled—patients, and although hospitals may have provided financial assistance to other patients, such aid did not constitute a theoretically responsive reaction to public health needs for direct care to large groups of vulnerable patients.

17. This combination is likely to reduce the number of negative values resulting from reporting errors as these are categories of overlap for some patients.

received by a hospital (Zuckerman, Bazzoli, Davidoff, & LoSasso, 2001). Descriptive statistics of both measures of safety-net revenue (see Table 5) show a wide range in participation (100% and 12 times proportional share of county revenue). Two hospitals reported negative values for both of the safety-net revenue participation measures.

Table 5

Hospital Safety-Net Orientation as Revenue: 2007

Outcome	Measure			
	Range	Mean (%)	Median (%)	SD
Organizational share	-4.6% – 97.2	15.40	22.60	21.00
Market share	-0.59 – 12.03	0.59	1.00	1.44

Note. $n = 331$.

Histograms of the revenue measures (see Figure 3) show more variation at the higher ends of the distributions. This finding is especially true for the proportionate share of the market area measure.

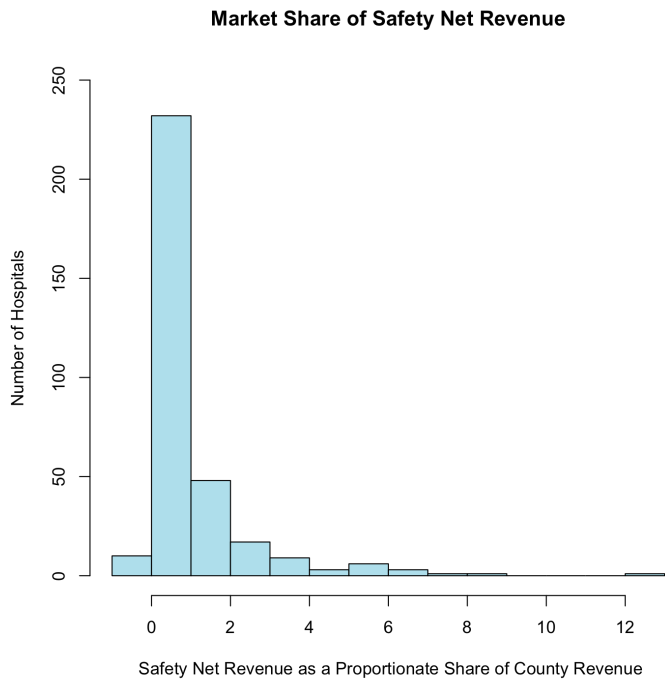
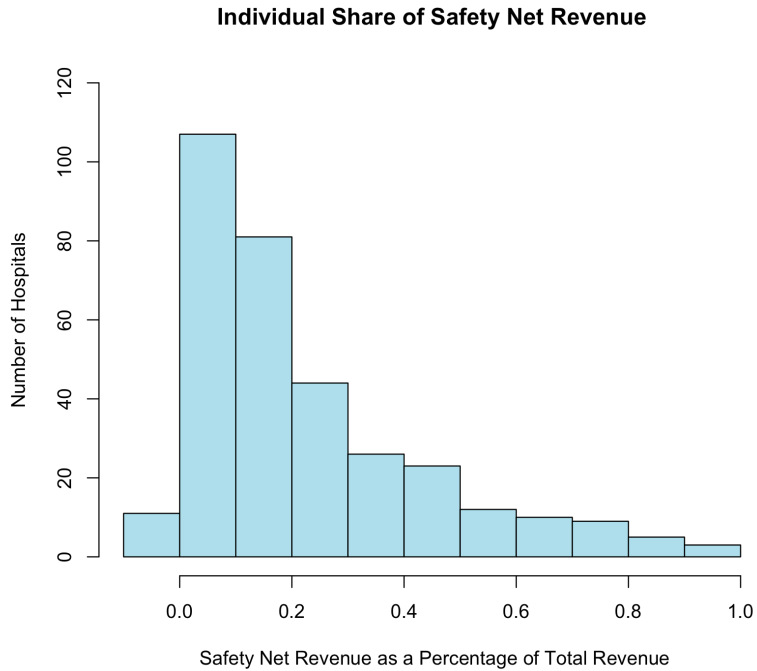


Figure 3. Hospital safety-net revenue participation. Hospitals licensed in 2007 with data averaged from 2006 to 2008; $n = 331$.

Classifying high-performing hospitals. Distributions of the individual and market measures of hospital safety-net revenue were used to identify high-performing subgroups. Revenue measures displayed distributions with much greater variation above the means than below. The lack of variation at the lower end of the distributions suggests some conformity toward a minimum access to hospital care for safety-net patients. No state or industry standards exist for revenues associated with these payers. Equal distribution of statewide safety-net revenue among all study hospitals would result in a standard organizational share of 20% and a proportionate market share of 1.00 for each facility. Statewide safety-net revenue represented 20% of total revenue for the study group, and county revenue distributed equally among all local hospitals resulted in a value of 1.00 for each facility. These values correspond almost exactly with the means of the statewide distributions.

Thus, the means of the distributions provided a meaningful threshold for evaluating variation in participation in hospital safety-net revenue. Descriptive analysis studied this variation in the following two ways.

1. Degree of participation: Descriptive data on the study hospitals' safety-net revenue by subgroups established at the means and quartiles of the distributions. This analysis provided descriptions of different levels of participation in safety-net revenue for the statewide study group. Clear distinctions among the subgroups by level may indicate influence from different factors. For example, top quartile safety-net revenue may be positively associated with a teaching mission while participation between the mean and the top quartile may be associated with

nonprofit ownership. Understanding such a distinction would be useful for policy makers trying to increase safety-net participation.

2. Type of high participation: Descriptive data for hospitals above the means of the statewide study group distributions by measure of organizational or market participation. This analysis identified four subgroups of high-performing hospitals: those with 1) high organizational participation only, 2) high market participation only, 3) high organizational and high market participation, and 4) all high participation (e.g, high organizational share, high market share, and high organizational and high market share). Since it studied safety-net revenue as both organizational and market measures, the research allowed a determination of whether different factors may influence different types of participation. For example, hospitals with only high organizational share may be located in more competitive areas where a higher number of facilities are participating in the local market for safety-net care.

Findings from this descriptive analysis appear in Chapter 5, “Results,” where they are used to identify the subgroups for testing the effects of environmental and organizational resources on performance in the upper end of the distributions.

Independent variables — Environmental resources. Environmental resources of theoretical interest to safety-net revenue were market competition and demand for safety-net services. A hospital in a less competitive market may have lower safety-net revenue relative to its total revenue because its representatives can negotiate higher payments from third-party insurers. Additionally, such hospitals may have a higher market share of safety-net revenue because there are fewer facilities to meet local

demand for care. Additionally, hospitals in markets with lower demand for safety-net services are likely to have lower safety-net revenues. The following sections present descriptive information on each of the specific variables used to measure these environmental factors for the study hospitals.

Competition. This study used the Herfindahl-Hirschman Index (HHI) to measure economic competition. HHI represents the sum of the squares of organizational percentages of market shares. This research used the percentage of a county's staffed beds to define *hospital market share*. The HHI variable was therefore the sum of the squares for each county of each hospital's market share of staffed beds.

To illustrate how declining HHI values reflect increased competition, a county such as Amador, with only one hospital, has an HHI of 1.00; a county with two hospitals, such as Yolo, has an HHI of 0.574; and a county with 14 hospitals, such as Riverside, has an HHI of 0.107. Also, if one hospital in a multihospital market dwarfs the others, the HHI will increase—a reflection of the concentration of power at that large hospital.

In less competitive markets, hospitals, like other organizations, have been able to negotiate for higher reimbursements from private payers, which would reduce a hospital's organizational share of safety-net revenue. HHI was used in nearly all of the reviewed literature on safety-net participation as either an independent variable (e.g., Banks, Paterson, & Wendel, 1997; Clement, White, & Valdmanis, 2002) or a factor of control (e.g., Nicholson, Pauly, Burns, Baumritter, & Ascch, 2000). It has shown a negative association with uncompensated care (Mann, Melnick, Bamezai, & Zwanziger, 1995). Figure 4 presents a histogram of HHI distribution for the study hospitals.

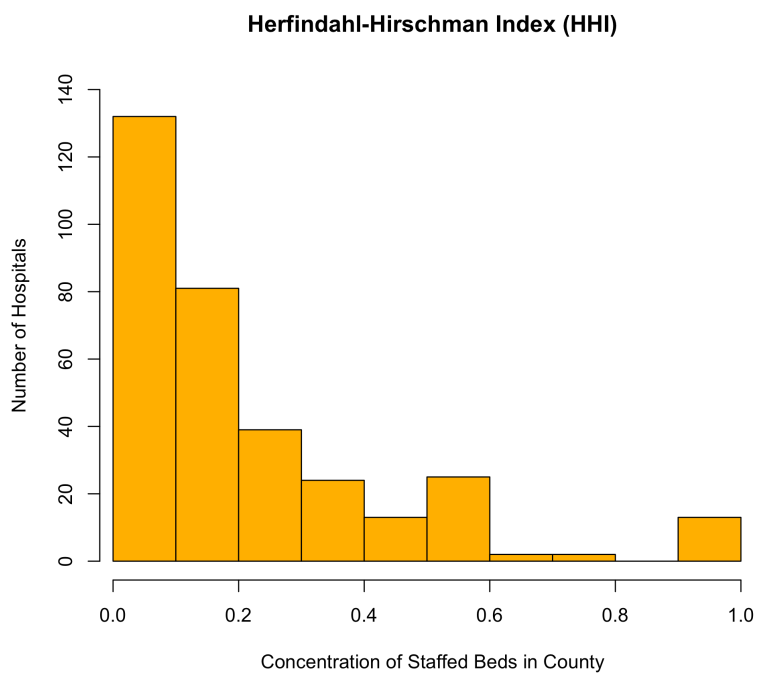


Figure 4. Histogram of study hospitals by Herfindahl Hirschman Index (HHI). Hospitals licensed in 2007 with data averaged from 2006 to 2008; $n = 331$.

Demand. The research used two variables to measure economic demand for safety-net care: a county poverty measure and an income measure by ZIP code. The measures were not expected to compete due to the differences in their geographic areas.

- Percentage of county population below 300% of the federal poverty level. The source for this data was the U.S. Census Bureau, 2005–2007 American Community Survey, and all figures were reported according to 2007 adjusted dollars and in units of 1% (0.01).

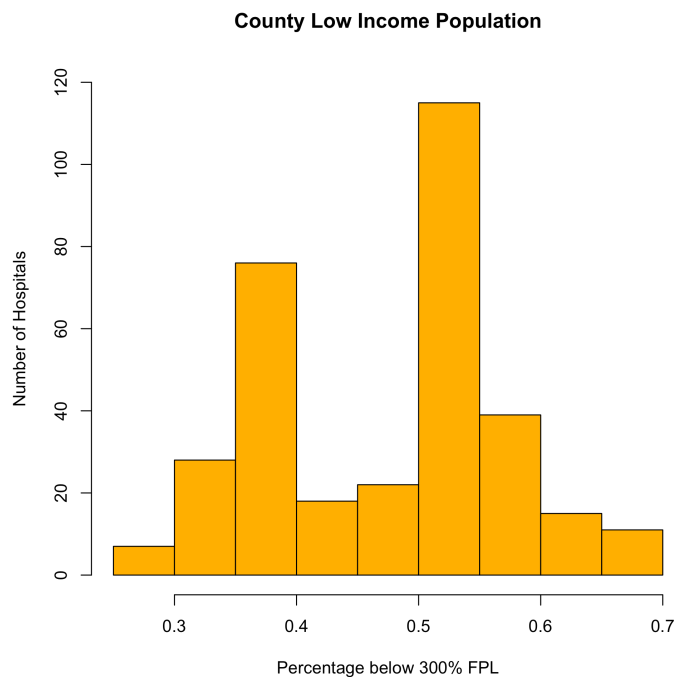


Figure 5. Histogram of study hospitals by percentage of county population below 300% of the federal poverty level. Hospitals licensed in 2007 with data averaged from 2006 to 2008; $n = 331$.

- 2007 adjusted gross income (AGI) by ZIP code. These data were provided in single dollars by the Internal Revenue Service, Statistics of Income Division, Individual Master File (IMF), May 2010. The IRS used individual tax returns to compile these data, so it did not include those people who did not file returns. For use in the analysis, AGI was divided by \$100,000.

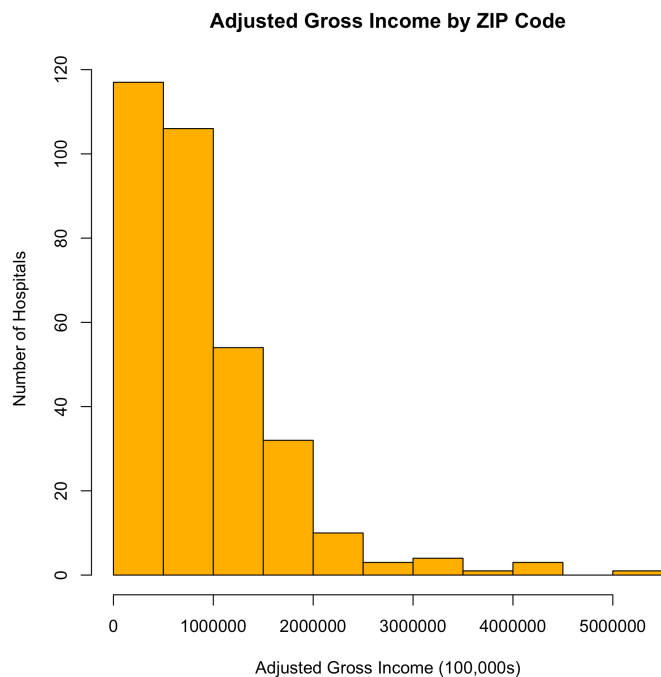


Figure 6. Histogram of study hospitals by ZIP code adjusted gross income (AGI). Hospitals licensed in 2007 with data averaged from 2006 to 2008; $n = 331$.

Table 6 lists the three hospitals located in ZIP codes for which the IRS did not report adjusted gross income; an adjacent ZIP code's AGI was used for these hospitals.

Table 6

ZIP Code AGI Substitutions

OSHPD ID	Name	County	ZIP code	ZIP AGI
106304045	Irvine Medical Center	Orange	92718	92620
106331194	Hemet Valley Medical Center	Riverside	92343	92344
106334068	Southwest Healthcare System– Murrieta	Riverside	92362	92372

One or both of these demand measures are common in the reviewed literature. Among those who used population at or below a level of poverty were Kim, McCue, and Thompson (2009) and the Congressional Budget Office (2006). Also, Clement, White, and Valdmanis (2002) used both a county poverty measure and income by ZIP code.

Independent variables — Organizational resources. Organizational resources of theoretical interest to hospital participation from 2006 to 2008 in California's safety-net revenue were hospital profitability, culture, size, and patient acuity. The following sections present descriptive information on each of the specific variables used to measure these environmental concepts for the study hospitals.

Profitability (2004–2005). For comparative purposes, hospital profitability, which is a measure of organizational power, was calculated as a margin of revenues and expenses. This research used *net profit margin*, also called *total margin*, to measure annual hospital profitability for the period 2004 to 2005. *Operating margin* was not used because it did not include any unrestricted donations received by a hospital that may have influenced subsequent safety-net participation.

Net profit margin represents the proportion of profit to revenues from all activities, calculated as $(\text{Total Revenue} - \text{Total Expenses}) / \text{Total Revenue}$.

In this equation the following were the values.

1. Total Expenses were all costs associated with hospital operations and real estate and other business. Using the OSHPD data set, they equaled the sum of *Total Operating Expenses* and *Non-Operating Expenses*.

2. Total Revenue equaled all funds received from hospital operations and other sources such as donations, investments, and other appropriations. In OSHPD, it is the sum of *Total Operating Revenue* and *Non-Operating Revenue*.¹⁸

The metric for net profit margin is 0.01, so as a hospital's measure rises from 0.03 to 0.04, the company earns an extra \$.01 for every dollar of revenue.

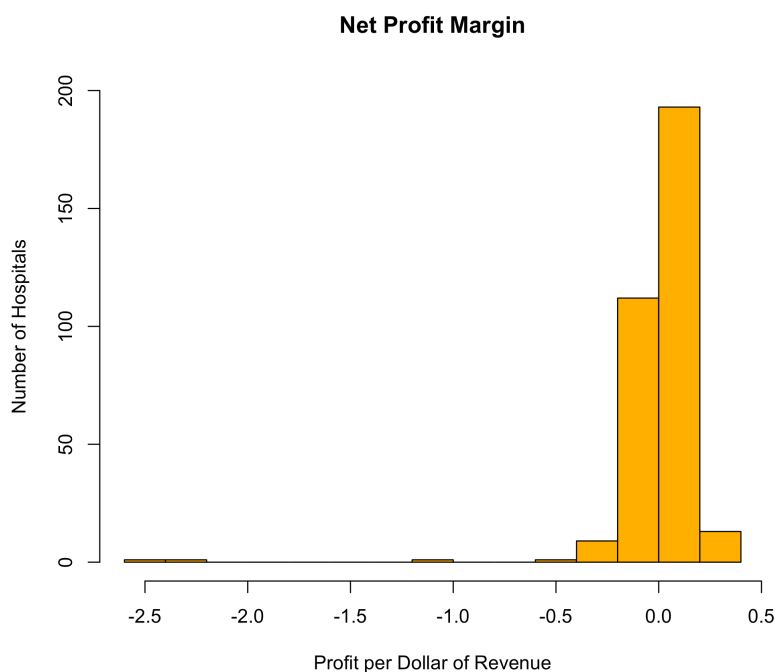


Figure 7. Histogram of study hospitals by net profit margin. Hospitals licensed in 2007 with data averaged from 2006 to 2008; $n = 331$.

The period between profitability and safety-net participation was lagged from 2007 to 2005 to eliminate the possibility of endogeneity, or confounded results due to the

18. Nonprofit hospitals are not expected to show high amounts of other operating revenue. Revenue from other business endeavors may invite scrutiny from the IRS.

safety-net revenue causing low profits. A period of two years was chosen to allow hospitals time to adjust participation, a time frame recommended by Thorpe and Phelps (1991) in the reviewed literature on hospital strategic practices regarding uncompensated care. One other study in the reviewed literature used total margin as an independent variable (Sloan, Valvona, & Mullner, 1986). One used this variable as a control (Congressional Budget Office, 2006), and two used total margin as a dependent variable (Bazzoli, Kang, Hasnain-Wynia, & Lindrooth, 2005; Thorpe, Seiber, & Florence, 2001).

Ownership. *Ownership* as a measure of organizational culture, or institutional logic, was also a key variable of policy interest regarding community benefits and nonprofit hospitals' tax exemptions. It was used throughout the reviewed literature as an independent measure (e.g., Ferris & Graddy, 1999) or a control variable (e.g., Fishman, 1997). This research used these four owner types reported in OHSPD:

1. City/County—operated by a local governmental entity;
2. District—operated by an independent local tax-collecting entity;
3. Investor—operated by an investor as an individual, a partnership, or a corporation; and
4. Nonprofit—operated by a church, nonprofit corporation, or other nonprofit organization.

Table 7

Cross-tabulation of Study Hospitals by Type of Owner

Ownership	<i>n</i>	Percentage (%)
City/County	20	6
District	45	14
Investor	93	28
Nonprofit	173	52
Total	331	100

Due to the small number of City/County facilities, all of the District and City/County facilities were combined into one *Public* category for logistic regression testing.

System affiliation. OSHPD defines *health care systems* as public, for-profit, or nonprofit organizations that own and operate three or more hospitals. These systems may provide hospitals with additional resources and strategic options for the provision of safety-net care. They may also restrict a hospital's orientation toward the safety net and increase a hospital's leverage in price negotiations. System affiliation is a measure of both organizational culture and power.

Table 8

Cross-tabulation of Study Hospitals by System Affiliation

System affiliation	<i>n</i>	Percentage (%)
No	188	57
Yes	143	43
Total	331	100

Findings on system affiliation and safety-net revenue have produced mixed results, with regulatory rate review showing a positive interaction effect and with low Medicaid eligibility showing a negative interaction effect (Shortell et al., 1986).

Mission. The categorical variable of *mission* identifies whether a hospital has one of two unique cultural characteristics that commonly affect delivery of care.

- **Teaching mission:** This is a hospital in which clinical medical personnel receive training for their licensure as physicians, nurses, practitioners, and other health-care providers. This category is identified by OSHPD according to the American Medical Association's Graduate Medical Education Directory (Office of Statewide Health Planning and Development, 2007).
- **Small/Rural:** This is a hospital that serves as a critical source of access to health care for isolated populations. It is defined in Section 124840 of the California Health and Safety Code according to peer group consideration of unspecified characteristics associated with location and patient mix.

Table 9

Cross-tabulation of Study Hospitals by Mission

Mission	<i>n</i>	Percentage (%)
N/A	245	74
Small/Rural	63	19
Teaching	23	7
Total	331	100

Reviewed research has made extensive use of this variable, and findings have often shown that teaching status is positively associated with safety-net participation

(Sloan, Valvona, & Mullner, 1986; Thorpe & Phelps, 1991; McHugh, Kang, & Hasnain-Wynia, 2009).

Size. The size of a hospital can affect patient population and negotiating power with suppliers and payers, increasing the resources available to provide uncompensated care. To best represent the size of actual operations, staffed beds (rounded to the nearest 10) were used as the measure. These are the number of beds available for use according to staffing regulations. Figure 8 shows the distribution of study hospitals by their staffed beds. For use in the analysis, the number of staffed beds was divided by 100.

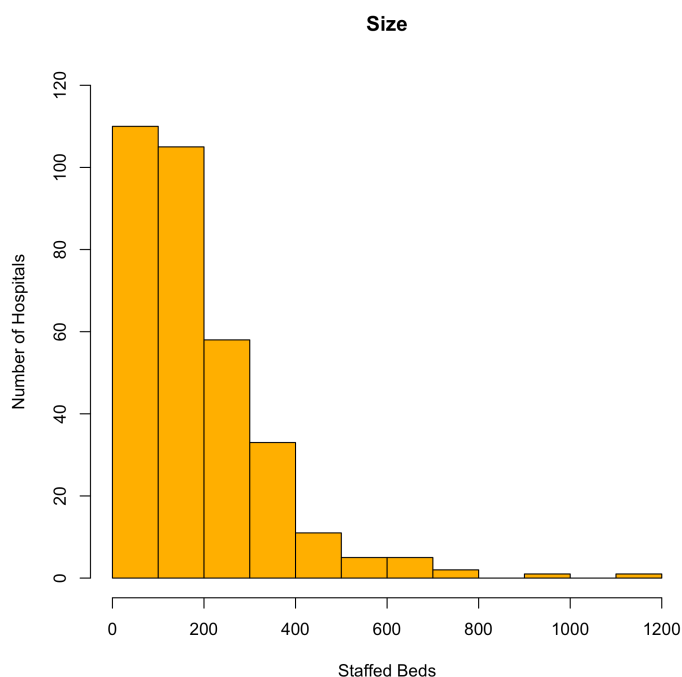


Figure 8. Histogram of study hospitals by size as staffed beds. Hospitals licensed in 2007 with data averaged from 2006 to 2008; $n = 331$.

This measure was used throughout the reviewed literature, primarily as a control (Gentry & Penrod, 2000; Congressional Budget Office, 2006).

Case mix index. The variable of *case mix index* measures a hospital's patient acuity, i.e., its average complexity of cases. This measure primarily represents a hospital's clinical culture, although adjustments may also influence efficiency and hence power (Feldstein, 2005). The OSHPD Hospital Utilization Report provides a case mix index based on resource consumption. In an index centered around 1.00, higher values indicate a more complex and ill patient mix while lower values represent patients who require less complicated care. One unit equals one-tenth of a weight to average patient cost. As case mix increases from 1.10 to 1.11, a hospital's average patient cost increases by a factor of 1.1. Figure 9 shows the study population distribution for this variable.

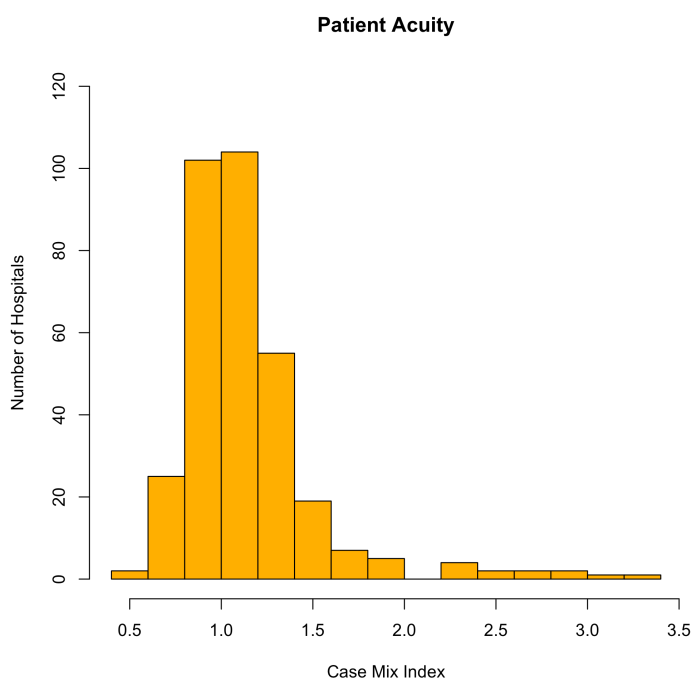


Figure 9. Histogram of study hospitals by patient acuity as OSHPD case mix index.

Hospitals licensed in 2007 with data averaged from 2006 to 2008; $n = 331$.

Case mix index has been used in previous research by the Congressional Budget Office (2006), and in the absence of an index, patient complexity has been measured with scope of services by Banks, Paterson, and Wendel (1997).

Analysis

The study included both descriptive and logistic regression analyses conducted in R, which is free software for statistics and graphics available from The R Project for Statistical Computing at <http://www.r-project.org/>. Built by statisticians as an environment for graphics and computing, this program was used primarily for its extensibility. Data were read into the R workspace from .csv files, which were saved from OSHPD's HAFD Report (.xls) files downloaded on September 22, 2009, from <http://www.oshpd.ca.gov>. The analysis of the data followed the three aims of the research.

To achieve the first aim—to investigate and compare annual safety-net participation from 2006 to 2008 among the study hospitals—the research provided descriptive information about hospital revenue for safety-net populations. This information included measures of central tendency, range, and standard deviation as well as frequency histograms of the distribution of revenues across all study hospitals. The distributions showed isomorphism among participants with low safety-net revenues and variance with safety-net revenue above the means. Consequently, the research subsequently focused on subgroups of high-performing hospitals.

Fulfilling the second aim involved comparing descriptive statistics on all environmental and organizational factors. Populations included all study hospitals and the

subgroups of high performers identified by the findings of Aim 1. This analysis identified potential factors of influence through unadjusted results. Descriptive analysis included measures of central tendency, range, and standard deviation or categorical contingencies by percentage.

The third aim of the study required testing to determine whether environmental and organizational resources affected the odds of high safety-net participation. Outcomes were established by the subgroups identified by the findings of Aim 1. Logistic regression was used to test main effects on these outcomes, and the model took the general form $\text{logit}(Y) = \alpha + \beta_1 X_1 + \beta_2 X_2$ in which

- $\text{logit}(Y)$ = log odds of participation in the hospital safety net,
- $\beta_1 X_1$ = differences within individual market resources among hospitals, and
- $\beta_2 X_2$ = differences within individual organizational resources among hospitals.¹⁹

R produced summary data, including significance, and odds ratios (exponentiated coefficients) with confidence intervals. Ownership, the key variable of policy interest, was also tested for interaction with those measures associated with organizational power (e.g., competition, system affiliation) as well as culture (e.g., mission and case mix). The analysis used Chi-square goodness-of-fit tests on the difference in deviance and degrees of freedom between the residual and null models to establish significance. Additional goodness-of-fit tests on the differences between main effects and interaction models were

19. Variables for both environmental and organizational resources were represented separately according to concept (e.g., competition, demand, profit, culture, and power).

used to establish equal or significant improvement for at least one of the outcome variables. Complete findings on the analysis appear in Chapter 5.

Summary Contribution

This research was designed to provide a better understanding of hospital participation in hospital safety-net revenue in the state of California between 2006 and 2008. Existing research on safety-net hospitals has identified a need for more attention to definitions of safety-net participation (McHugh, Kang, & Hasnain-Wynia, 2009) and new approaches to measure hospitals' charitable work (Gray, 2009).

Through a framework of resource dependence theory that isolates hospital safety-net participation from other types of participation as responsive behavior, this study has attempted to respond to these needs. It has defined safety-net participation as sharing in the \$11.5 billion (20%) of state specific revenues associated with low-income and indigent patients. It has calculated individual hospital sharing by type and level, establishing that high participation occurs primarily above 1) an organizational share of safety-net revenue at 20% of total revenue or 2) an equal (1.00) county market share of safety-net revenue.

The research framed this safety-net revenue participation as responsively adaptive to California's need for enhanced access to hospital care—an important hospital community benefit and an economically theoretical option for nonprofit hospitals. By operationalizing concepts of environmental competition and demand as well as the institutional logics and governance structures of organizational culture and power (Table 10), this analysis was able to test these factors for influence.

Although not a longitudinal study, this study was designed to provide a broad perspective on hospital safety-net participation over a three-year averaged period from 2006 to 2008. This study both updates research from the past four decades and provides a baseline for future work.

Table 10

Environmental and Organizational Measures Associated with Safety-Net Revenue Participation

Variable	Coding/unit
Environmental/economic factors (competition and demand)	
Herfindahl	Each 0.0001 of HHI equals one one-thousandth of a proportionate
Hirschman Index	concentration of staffed beds.
Low-income	0.01 as a percentage of total county population at or below 300% of
population	the federal poverty level (FPL)
Adjusted gross	Adjusted gross income (AGI) for hospital's ZIP code divided by
income by ZIP code	\$100,000
Organizational factors (culture and power)	
Net profit margin	\$0.01 profit per dollar of revenue
Ownership	Nonprofit, Investor, Public (City/County and District)
System affiliation	No, dummy-coded to 0
	Yes, dummy-coded to 1
Mission	General, Small/Rural, or Teaching
Size	Number of staffed beds divided by 100
Case mix	0.01 as a weight to average patient cost for comparison of patient
	acuity among hospitals. Weighting established by patients' resource
	consumption per nationwide average per number of patients.
	Calculated as sum of DRG weights / # of patients.

Chapter 5: Results

Results from the analysis of hospital safety-net revenues in California from 2006 through 2008 show that environmental and organizational factors affected subgroups of hospitals differently according to their level and type of safety-net participation. The presentation of these findings has been organized according to the three aims of the research. The first aim was to compare hospital safety-net revenues across diverse local markets under standardized Medicaid eligibility rules (e.g., in one state). The second was to describe the general environmental and organizational characteristics of hospitals by their level and type of safety-net participation. These characteristics included measures of theoretical interest described in previous chapters: competition and demand as well as organizational culture and power. The third aim of the research was to test the effect of organizational and market characteristics on participation in hospital safety net revenue. The following sections describe the findings for each of these aims.

Aim 1. Hospital Safety-Net Participation as Revenue

The 331²⁰ licensed hospitals that met the inclusion criteria for this study reported a total of \$54.8 billion in net patient revenue for 2007. Approximately \$11.5 billion (20%) of that total was associated with safety-net patients.

As explained in the previous chapter, hospital participation in safety-net revenue was measured in two ways—as an organizational share (OS) of total hospital net patient

20. As explained in Chapter 4, “Methodology,” revenue figures were not available for 28 Kaiser Health Plan facilities, two Shriner Hospitals, and the Nelson M. Holderman State Hospital. Thus, this study used $n = 331$ (362 - 31).

revenue and as a market share (MS) of total county safety-net revenue. Preliminary findings showed the following.

- All hospitals participated in the average annual \$11.5 billion revenue associated with safety-net patients.
- Hospitals showed isomorphism toward low revenue participation, with the group's mean shares (22.6% OS and 1.00 MS) exceeding its median shares (15.4% OS and 0.59 MS).
- Variation in participation occurred primarily above the means of the distribution for each measure, and these values corresponded to an equal distribution of safety net revenue among all study hospitals:
 - an organizational share of 20% of total hospital revenue and
 - a proportional market share of 1.00 of total county safety-net revenue.

Table 11 describes hospital participation as each of these types of measures.

Approximately 40% (136) of all study hospitals reported safety-net revenue at or above 20% of total revenue, and 32% (105) of study hospitals reported at or above an equal share (1.00) market revenue. Across hospital quartiles, measures of central tendency indicated a generally linear doubling increase moving from the lowest quartile to the highest.

For both measures, more variation in participation appeared among hospitals with higher values. The standard deviation for hospitals reporting safety-net revenue at or above 20% of total revenue was three times higher than the standard deviation for hospitals with lower revenue participation. The subgroup of hospitals with market share

at or above an equal proportionate share (1.00) showed a standard deviation that was six times higher than that of the lower performing subgroup.

Table 11

Hospital Safety-Net Revenue by Type of Share and Level of Participation

Outcome	Measure				
	<u><i>n</i></u>	<u>Range</u>	<u>Mean</u>	<u>Median</u>	<u>SD</u>
Organizational share					
≥ 20%	136	20.1%-97.2%	42.5%	37.0%	18.7%
< 20%	195	-4.6%-19.9%	8.7%	8.2%	5.6%
Q4	83	31.1%-97.2%	53.3%	48.7%	16.5%
Q3	83	15.4%-30.9%	22.8%	22.7%	4.8%
Q2	83	6.6%-15.1%	10.8%	10.7%	2.4%
Q1	82	-4.6%-6.6%	3.3%	3.3%	2.3%
Market share					
≥ 1.00	105	1.00-12.03	2.36	1.62	1.90
< 1.00	226	-0.59-0.99	0.37	0.31	0.29
Q4	83	1.08-12.03	2.72	1.92	1.99
Q3	83	0.59-1.06	0.83	0.80	0.15
Q2	83	0.19-0.58	0.37	0.35	0.11
Q1	82	-0.59-0.19	0.07	0.08	0.09

Note. $n = 331$.

Additional descriptive analysis compared the 241 (136 + 105) measures at or above an organizational share of 20% of hospital patient revenue and a market share of 1.00. High revenue measures were reported by a total of 171 hospitals, as summarized in Table 12, and their total safety-net revenue receipts further confirmed isomorphism toward low participation. Among all of the hospitals reporting high revenue participation, 70 (41%) reported both shares at a high level of participation, with \$7.7 billion (67%) of total safety-net revenue; 35 (20%) reported high market share only and a total of \$1.1

billion (10%) in safety net revenue; and 66 (39%) reported high organizational share only, with a total of \$1 billion (9%) in safety-net revenue.

Table 12

Hospital High Participation in Safety-Net Revenue by Type and Level

Level of participation	<i>n</i> by type of high performance			
	<u>OS only</u>	<u>MS only</u>	<u>OS and MS</u>	<u>Total</u>
Mean to 0.25 only	27 (16%)	8 (5%)	9 (5%)	44 (26%)
OS mean to 0.25 and MS > 0.25			17 (10%)	17 (10%)
MS mean to 0.25 and OS > 0.25			5 (3%)	5 (3%)
> 0.25	39 (23%)	27 (15%)	39 (23%)	105 (61%)
Total high performance	66 (39%)	35 (20%)	70 (41%)	171 (100%)

Type of revenue	Average revenue by type of high performance			
	<u>OS only</u>	<u>MS only</u>	<u>OS and MS</u>	<u>Total</u>
Safety-net revenue	\$15,447,405	\$33,325,239	\$110,326,884	\$57,946,164
Safety-net revenue per staffed bed	\$151,979	\$148,863	\$440,912	\$269,618
Net patient revenue	\$45,907,423	\$286,070,999	\$234,420,431	\$172,232,778
Net patient revenue per staffed bed	\$444,112	\$1,260,422	\$917,122	\$804,823

Note. *n* = 171.

The 160 study hospitals with no measure of high performance accounted for \$1.7 billion (15%) of the total safety-net revenue, with an average \$10.9 million, or \$70,254 per staffed bed. Their total revenue averaged \$159.3 million at \$952,402 per staffed bed.

Together, Tables 11 and 12 show less distinction in the level of high safety-net revenue performance than in the type of participation—organizational or market share. Twenty-two hospitals reported one measure in each level of high participation, and these measures defined distinct subgroups of hospitals. Among the 66 hospitals with only a high organizational share, market share scores were low. Just two had market share scores that were close (0.9) to the threshold of high market share reporting (1.0), and 44 had market share below 0.6. However, among the 35 hospitals reporting only high market share participation, 13 had an organizational share of at least 15%, which was close to the threshold for high organizational participation.

Additional analysis was conducted to see how these facilities were distributed throughout the state. Findings by location and number of facilities showed a higher percentage of participation in counties with fewer facilities, although participation as only organizational share was higher among the larger counties. Tables 13, 14, and 15 show the distribution of hospitals by safety-net revenue from the largest to the smallest county in terms of number of hospitals.

Table 13

Counties with Seven or More Study Hospitals by Type of High Safety-Net Revenue

County	<i>n</i>	<i>n</i> by type of high performance			
		<u>OS only</u>	<u>MS only</u>	<u>OS and MS</u>	<u>Total</u>
Los Angeles	83	21	4	19	44
Orange	29	5		6	11
San Diego	20	3	1	3	7
San Bernardino	17	6		3	9
Riverside	14	2	1	3	6
Alameda	10	1	1	2	4
Santa Clara	10	1		2	3
Kern	9	4		2	6
San Francisco	8	1	1	2	4
Fresno	7	4		1	5
Sacramento	7	1	1	1	3
Ventura	7	1		1	2
Total	221	50 (23%)	9 (4%)	45 (20%)	104 (47%)

Table 14

Counties with Three to Six Study Hospitals by Type of High Safety-Net Revenue

County	<i>n</i>	<i>n</i> by type of high performance			
		<u>OS only</u>	<u>MS only</u>	<u>OS and MS</u>	<u>Total</u>
Stanislaus	6	1	1	1	3
San Joaquin	6		1	1	2
Sonoma	6		1	1	2
Contra Costa	6			1	1
Santa Barbara	5	1	2		3
San Mateo	5			1	1
Butte	4	1	1	1	3
San Luis Obispo	4		3		3
Humboldt	4	1	1		2
Monterey	4	1		1	2
Merced	3	2		1	3
Tulare	3	2		1	3
Kings	3	1		1	2
Plumas	3	1		1	2
Shasta	3	1	1		2
Solano	3	1		1	2
Mendocino	3			1	1
Total	71	13 (18%)	11 (16%)	13 (18%)	37 (52%)

Table 15

Counties with One or Two Study Hospitals by Type of High Safety-Net Revenue

County	<i>n</i>	<i>n</i> by type of high performance			
		<u>OS only</u>	<u>MS only</u>	<u>OS and MS</u>	<u>Total</u>
Imperial	2			2	2
Inyo	2	1	1		2
Madera	2	1		1	2
Modoc	2	1		1	2
Lake	2			1	1
Santa Cruz	2			1	1
El Dorado	2		1		1
Marin	2		1		1
Napa	2		1		1
Nevada	2		1		1
Placer	2		1		1
Siskiyou	2		1		1
Yolo	2		1		1
Mariposa	1			1	1
San Benito	1			1	1
Glenn	1			1	1
Trinity	1			1	1
Tuolumne	1			1	1
Yuba	1			1	1
Amador	1		1		1
Calaveras	1		1		1
Colusa	1		1		1
Del Norte	1		1		1
Lassen	1		1		1
Mono	1		1		1
Tehama	1		1		1
Total	39	3 (8%)	15 (38%)	12 (31%)	30 (77%)

These findings from Aim 1 highlight meaningful subgroups in hospital safety-net revenue participation. Variation in hospital safety-net revenue participation occurred primarily above the means of the statewide distributions for both measures—at an

organizational share of 20% of hospital patient revenue and a market share of 1.00 (proportionately equal).

Distinct differences above this threshold of participation did not appear, but the type of high participation suggested distinct subgroups. Hospitals with high organizational participation only were disproportionately concentrated in markets with three or more facilities and showed no tendency toward high market participation. High organizational share of safety-net revenue appeared to be an independent characteristic for many of these hospitals.

In the other subgroup of hospitals reporting only one high value were hospitals with high market participation. These hospitals were fewer in number and were located primarily in areas with fewer than seven facilities. Also, many of them (13 of 35) reported organizational shares of at least 15% of total patient revenue. These differences supported testing hospitals separately by type of participation.

The following sections present analysis of factors associated with safety-net revenue participation. Aims 2 and 3 of the study described and analyzed the effects of environmental and organizational resources on the four hospital subgroups identified by their type of participation: those with 1) high organizational share of safety net revenue, 2) high market share of safety net revenue, 3) high organizational and high market shares of safety net revenue, and 4) total high safety-net revenue participation (e.g, high organizational share, high market share, and high organizational and high market share).

Aim 2. Factors Associated with Hospital Safety-Net Revenue

This aim described the resources and characteristics associated with the different types of high safety-net revenue participation established by Aim 1.²¹ Table 16 shows descriptive information on environmental and organizational characteristics for high safety-net participation by type of measure. Results show striking differences for competition, size, and case mix according to the type of safety-net revenue participation.

Environmental factors. Differences among the high-performing groups of hospitals included increased competition (lower average HHI) for hospitals with high organizational shares and low market shares. Hospitals with only high market share showed a slightly higher percentage of county low-income population. Additionally, average adjusted gross income by ZIP code was lower for both groups of hospitals with only one high measure of safety-net revenue.

21. High participation in safety-net revenue was established as an organizational share at 20% of hospital patient revenue and a market share at 1.00 (proportionately equal).

Table 16

Descriptions of Environmental and Organizational Factors for Different Types of High Safety-Net Participation

Variable	Descriptive values by type of high participation			
	OS only (<i>n</i> = 66)	MS only (<i>n</i> = 35)	OS and MS (<i>n</i> = 70)	Total (<i>n</i> = 171)
Environmental factors: Competition and demand average measures				
HHI	0.17	0.45	0.25	0.26
Low-income population	52.7%	48.1%	50.9%	51.0%
AGI by ZIP	\$637,051	\$675,487	\$823,440	\$721,218
Independent factors: Organizational resources (culture and power)				
Lagged profit (2004–2005) average measures				
Net profit	0.53	0.48	0.51	0.51
Ownership: Percentage of hospitals				
Investor	40.9%	5.7%	15.7%	23.4%
Nonprofit	28.8%	88.6%	47.1%	48.5%
Public	30.3%	5.7%	37.2%	28.1%
System affiliation: Percentage of hospitals				
No	74.2%	25.7%	67.1%	61.4%
Yes	25.8%	74.3%	32.9%	38.6%
Mission: Percentage of hospitals				
General	62.1%	62.9%	61.4%	62.0%
Small/rural	37.9%	28.6%	14.3%	26.3%
Teaching	0.0%	8.5%	24.3%	11.7%
Size and patient acuity average measures				
Staffed beds	110	221	267	197
Case mix	0.93	1.18	1.03	1.02

Organizational factors. The high-performing groups also showed differences regarding their measures of culture and power. Ownership percentages showed that public²² hospitals were concentrated among facilities with both high organizational and high market shares. Also, more than 80% of the high market hospitals with low organizational share (31 of 35) were nonprofit while investor facilities were concentrated among the other group with only one high (organizational) measure. More than one half of the high-performing investor-owned facilities reported high organizational share only.

System affiliation was associated primarily with high market and low organizational participation. This characteristic appeared to be underrepresented in hospitals with only high organizational share. Among all affiliated hospitals, 40% had high participation, with half reporting only one high share.

Almost all of the teaching hospitals reported high performance for both safety-net revenue measures (17 of 23), and only three did not report any high performance. Small/rural hospitals were overrepresented among the hospitals with only high organizational participation. Table 17 lists all of the city/county–owned teaching hospitals, which reported high safety-net revenue for both measures. Table 18 shows all nonprofit teaching hospitals, their counties, and their safety-net revenue outcomes. All public teaching hospitals had high market and high organizational shares. Among the

22. As explained in the previous chapter on methods, ownership was tested for main and interaction effects in three categories: investor, public, and nonprofit. This process was followed due to the small number of city/county facilities.

nonprofit teaching hospitals, six facilities reported one or more measures of low safety-net revenue.

Average hospital size was smaller for the group with high organizational share only and was larger among facilities with both types of high participation. Additionally, average case mix was lower for the hospitals with high organizational performance only.

Table 17

Public (City/County) Teaching Hospitals with High OS and MS

Facility name	County
Alameda County Medical Center	Alameda
Kern Medical Center	Kern
LAC/Harbor – UCLA Medical Center	Los Angeles
LAC/USC Medical Center	Los Angeles
LAC/Martin Luther King Jr./Drew Medical Center	Los Angeles
LAC/Olive View –UCLA Medical Center	Los Angeles
Riverside County Regional Medical Center	Riverside
Arrowhead Regional Medical Center	San Bernardino
San Francisco General Hospital Medical Center	San Francisco
Santa Clara Valley Medical Center	Santa Clara

Table 18

Nonprofit Teaching Hospitals by System Affiliation and Type of Safety-Net Participation

Hospital Name (System)	County	Safety net revenue	
		<u>Low</u>	<u>High</u>
University of California			
San Diego Medical Center	San Diego		OS, MS
Irvine Medical Center	Orange		OS, MS
Davis Medical Center	Sacramento		OS, MS
Los Angeles Medical Center	Los Angeles	OS	MS
San Francisco Medical Center	San Francisco	OS	MS
Other system affiliated			
White Memorial Medical Center (Adventist)	Los Angeles		OS, MS
Scripps Mercy Hospital (Scripps)	San Diego		OS, MS
Long Beach Medical Center (Memorial)	Los Angeles	OS, MS	
California Pacific Medical Center (Sutter)	San Francisco	OS, MS	
Independently operated			
Community Medical Center – Fresno	Fresno		OS, MS
Stanford University Hospital	Santa Clara	OS, MS	
Loma Linda University Medical Center	San Bernardino		OS, MS
Cedars-Sinai Medical Center	Los Angeles	OS	MS

Aim 3. High Safety-Net Revenue and Effect of Specific Factors

As explained in Chapter 4, this study used logistic regression to test factor effects on the odds of high safety-net revenue participation. Models were used to test for effects of multiple factors on four high outcome levels:

- organizational share at or above 20% of net patient revenue, which reflected an equal distribution of safety-net revenue among all of the study hospitals ($n = 66$);
- market share at or above a complete proportional share (1.00) of county revenue, which reflected an equal local distribution ($n = 35$);

- both organizational and market shares at or above the established thresholds ($n = 70$); and
- total shares of safety-net revenue measures at or above the established thresholds ($n = 171$ hospitals).

Main effects, which appear in Table 19, showed that only one of the nine model variables produced no significant influence on any outcome of safety-net revenue participation: (lagged) net profit margin. The other seven measures showed significant influence on at least one safety-net revenue outcome. These results were supported by statistical significance and colinearity tests, which appear in Tables 20 and 21.

Additionally, interaction tests showed that the effect of case mix on safety-net revenue participation varied by ownership type. The following sections describe all logistic results in detail.

Main effects of environmental factors with significant influence on safety-net revenue outcomes. Total high hospital participation in safety-net revenue showed significant negative influence from competition and location in a ZIP code with higher adjusted gross income. The following sections describe these findings by individual factor.

Competition. Unit increases in HHI, which reflect less competition and more concentration in a market, showed a significant positive influence on all safety-net revenue outcomes except one. Lower competition, or greater market concentration, showed a significant negative influence on high organization share with low market share.

Demand. The percentage of a county's low-income population showed influence on hospitals with only high organizational share. Higher adjusted gross income for a hospital's ZIP code showed significant negative influence on high safety-net revenue participation in general. Effects on high organizational share with low market share and high shares of both types were not significant.

Main effects of organizational factors with significant influence on safety-net revenue outcomes. Total measures of high safety-net revenue participation showed significant influence from these measures of culture and power: ownership, mission, size, and patient acuity, or severity of illness. The following sections describe the findings for effects on high safety-net participation from all organizational factors.

Ownership. When investor-owned hospitals were compared with nonprofit hospitals, investor ownership was shown to have a significant positive influence on high safety-net revenue participation in general. Investor-owned hospitals were more than twice as likely as nonprofit hospitals to report high safety-net revenue of any type. Public ownership, compared with a nonprofit model, showed a significant negative influence on participation as high market/low organizational shares.

System affiliation. Hospital affiliation with three or more other facilities was shown to have a highly significant ($p < 0.05$) and positive effect (OR 4.46) on high market and low organizational safety-net revenue. Also, a range in confidence interval from 1.64 to more than 13 indicated a very strong influence among some facilities. Other revenue outcomes showed insignificant negative influence from system affiliation by a hospital.

Mission. The mission measure allowed the comparison of two types of hospitals—teaching and small/rural—with all other general facilities. Compared with a general mission, teaching status was shown to have a highly significant and positive influence on high safety-net revenue in general and as both high organization and high market shares in combination. Confidence intervals ranged highly upward from more than 4.

Additionally, when compared with general hospitals, small/rural hospitals showed a significant negative association (OR 0.14) with high-revenue participation as both organizational and market shares. General hospitals were seven times more likely (OR 1/0.14) than small/rural hospitals to report high organizational and high market shares.

Size (staffed beds). Size by staffed beds was shown to have a significant mixed influence on high safety-net revenue. High participation as only an organizational share was negatively associated with higher numbers of staffed beds. All other outcomes showed a positive association with greater size.

Patient acuity (case mix index weighting). High patient acuity, which requires more complex and expensive treatment, was shown to have a strong negative influence on participation in safety-net revenue for all high-reporting subgroups except one. Hospitals that reported only high market participation in safety-net revenues showed no significant effect for case mix. All other revenue outcomes showed high significant negative influence (OR 0.01, 0.02, and 0.01) as the patient complexity weight increased by 0.1 in weight (which, as shown in Chapter 4, ranged from 0.5 to 1.5 for most hospitals).

Table 19

Logistic Regression for High Safety-Net Revenue Participation: Main Effects

Characteristic (Unit)	High OS only <i>n</i> = 66			High MS only <i>n</i> = 35			High OS and MS <i>n</i> = 70			Total High Participation <i>n</i> = 171		
	OR	95% CI	P	OR	95% CI	P	OR	95% CI	P	OR	95% CI	P
Intercept	42.25	1.14-NA ^a	0.050	0.00	0.00-0.20	0.006	2.45	0.09-68.19	0.594	17.07	1.23-260.28	0.037
	Environmental Resources: Competition and demand											
HHI (0.0001)	0.01	0.00-0.08	0.000	187.4	25.97-NA	0.000	16.97	3.53-86.19	0.000	29.48	6.01-171.60	0.000
Low-income population (10%)	75.44	0.81-NA	0.068	0.52	0.00-56.29	0.783	7.11	0.16-374.8	0.319	12.72	0.54-318.33	0.117
Mean AGI by ZIP code (\$0.00001)	0.95	0.88-1.02	0.154	0.93	0.86-1.00	0.061	0.97	0.92-1.03	0.371	0.94	0.90-0.99	0.014
	Organizational resources: Culture and power											
Net profit margin (10%)	0.38	0.08-3.36	0.271	107.94	0.34-NA	0.137	0.35	0.06-5.95	0.352	0.47	0.11-3.78	0.382
	Ownership compared to nonprofit											
Investor	2.29	0.95-5.67	0.068	0.41	0.06-1.74	0.278	1.13	0.45-2.78	0.791	2.07	1.03-4.20	0.042
Public	1.30	0.47-3.52	0.608	0.14	0.02-0.77	0.039	2.24	0.88-5.85	0.093	1.20	0.51-2.88	0.676
System affiliation—yes	0.47	0.21-1.04	0.067	4.46	1.64-13.85	0.005	0.59	0.27-1.25	0.169	0.67	0.36-1.21	0.181
	Mission compared to general											
Small/rural	2.22	0.72-6.97	0.166	1.25	0.29-4.99	0.754	0.14	0.04-0.47	0.002	0.72	0.28-1.79	0.475
Teaching	0.00	0.00-NA	0.989	0.32	0.04-1.85	0.222	19.75	4.65-96.21	0.000	18.53	4.19-107.2	0.000
Staffed beds (0.01)	0.53	0.32-0.82	0.008	1.67	1.20-2.36	0.002	1.56	1.18-2.12	0.03	1.44	1.12-1.88	0.006
Case mix (0.10)	0.01	0.00-0.04	0.000	2.25	0.36-9.60	0.324	0.02	0.00-0.10	0.000	0.01	0.00-0.05	0.000

Significance: 0 **** 0.001 *** 0.01 ** 0.05 * 0.1

^a NA (not applicable) refers to ratios > 1,000, which have occurred due to low or no variance.

Significance of main effects models. Tests of each main effects model showed highly significant predictive difference from its corresponding null model (p at < 0.005). Results of this testing appear in Table 20.

Table 20

Chi-square Tests of Significance on Main Effects Models

Factor	Measure of high safety-net revenue participation							
	OS only		MS only		OS and MS		Total	
	<u>-2LL</u>	<u>DF</u>	<u>-2LL</u>	<u>DF</u>	<u>-2LL</u>	<u>DF</u>	<u>-2LL</u>	<u>DF</u>
Null								
deviance	330.71	330	223.44	330	341.53	330	458.50	330
Residual								
deviance	210.71	319	144.07	319	244.34	319	327.37	319
Difference	120.00	11	79.37	11	97.19	11	131.13	11
Chi-square	0.00*		0.00*		0.00*		0.00*	

* $p < .001$.

Additional testing for colinearity among the variables, which appears in Table 21, further supported the findings from the main effects models. Some potential for colinearity appeared in mission, especially for hospitals with both organizational and market share above the means, and in ownership for hospitals reporting only high organizational share of safety-net revenue.

Table 21

Variable Tolerance (VIF)

Characteristic	Measure of high safety-net revenue participation			
	<u>OS only</u>	<u>MS only</u>	<u>OS and MS</u>	<u>Total</u>
Competition	2.02	1.98	1.82	1.50
Low-income population	1.26	1.42	1.36	1.24
Adjusted gross income	1.40	1.31	1.38	1.30
Net profit margin	1.18	1.16	1.17	1.11
Ownership	2.04	1.61	2.02	1.82
System affiliation	1.22	1.30	1.35	1.26
Mission	2.30	3.02	3.85	2.51
Size — staffed beds	1.55	2.52	1.96	1.73
Case mix	1.24	1.35	1.81	1.45

Interaction effects of theoretical importance and statistical significance on safety-net revenue outcomes. As explained earlier, ownership, the key variable of policy interest, was tested for interaction with measures associated with environmental power (competition) and organizational culture (system affiliation and mission). Additionally, ownership was tested for interaction with case mix index, another measure of culture, because economic theory indicates that nonprofit hospitals may pursue enhanced services and quality rather than access. Such a pursuit could facilitate treatment of more medically complicated patients. The following sections describe the results of this testing, including Chi-square goodness-of-fit tests on the interaction models. In brief, results showed a significant interaction only between ownership and case mix for total high participation.

Ownership and competition. The main effects model showed a significant positive effect from investor ownership compared with the nonprofit type on high safety-net participation in general. Interaction models for ownership and competition, however, did not show significance on any of the four outcome safety-net revenue measures at $p < 0.1$.

Ownership and system affiliation. System affiliation appeared to be most pertinent to investor and nonprofit hospitals; few public hospitals affiliate with each other, as shown in Table 22. Interaction models for ownership and system affiliation did not show significance on any safety-net revenue outcomes at $p < 0.1$.

Table 22

Cross-tabulation of Study Hospitals by Ownership and System Affiliation

Owner	No	Yes	Total
Investor	52 (16%)	41 (12%)	93
Nonprofit	76 (23%)	97 (29%)	173
Public	60 (18%)	5 (2%)	65
Total	188	143	331

Ownership and mission. Frequencies of hospitals by mission and ownership (Table 23) show that only three investor hospitals operated as small/rural facilities and that none were teaching facilities. Chi-square tests on the difference in residual deviance (-211) between main effects and interactions between ownership and mission for all four safety-net revenue outcomes show no significance at $p < 0.1$.

Table 23

Cross-tabulation of Study Hospitals by Ownership and Mission

Owner	General	Small/rural	Teaching	Total
Investor	90	3	0	93
Nonprofit	133	27	13	173
Public	22	33	10	65
Total	245	63	23	331

Ownership and case mix index (patient acuity). The negative main effect on total high safety-net revenue from an increase in patients who were more medically complicated and costly was greater for nonprofit hospitals than for the other hospitals as a single group (Table 24). For each unit increase in the average cost and complexity of patient diagnoses, the odds of nonprofit hospitals' high participation decreased less than they did for either investor or public hospitals' high participation. The wide confidence intervals, however, indicated some variation in these findings, especially between the investor and nonprofit groups. The range of values for investor hospitals exceeded that of nonprofits in both directions. Some investor hospitals are more sensitive to case mix than some nonprofits are.

This interaction model also indicated a close to significant ($p < 0.10$) positive influence from the percentage of the county population that is low income. With each 10% increase in low-income population, high safety-net revenue became 25 times more likely. Confidence intervals, however, also ranged widely for this measure (0.99–706), indicating variation in this effect.

This ownership and case-mix interaction model for total high participation in safety-net revenue was the only interaction model of significance when compared with its corresponding main effects model. Chi-square tests on differences in deviance between main and interaction models appeared significant ($p = 0.01$) for regression testing on total high reporting (of all measures of safety-net revenue). Residual deviance in -2ll decreased 8.22 (327.37 – 316.15) and 2 degrees of freedom (319 –317) for the nested interaction model. Tolerance testing of variables showed all values below 2 except Mission (2.57) and Public Ownership (2.69).

Table 24

Logistic Regression for High Safety-Net Revenue Participation: Interaction Effects for Ownership and Case Mix

Characteristic (unit)	Total high participation (<i>n</i> = 171)			
	OR	95% CI	<i>p</i>	
Intercept	0.08	0.01-0.57	0.01	*
Environmental resources: Competition and demand				
HHI (0.0001)	27.90	5.6-164.62	0.00	***
Low-income population (10%)	25.37	0.99-706.51	0.05	.
Mean AGI by ZIP code (\$0.00001)	0.95	0.90-0.99	0.03	*
Organizational resources: Culture and power				
Net profit margin (10%)	0.37	0.07-3.42	0.30	
Ownership compared to nonprofit				
Investor	1.52	0.69-3.26	0.28	
Public	0.44	0.12-1.50	0.20	
System affiliation—yes	0.68	0.37-1.23	0.21	
Mission compared to general				
Small/rural	0.61	0.23-1.58	0.32	
Teaching	17.77	3.89-111.03	0.00	***
Number of staffed beds (0.0010)	1.38	1.10-1.80	0.01	**
Case mix				
Nonprofit (0.1)	0.07	0.00-0.58	0.03	*
Investor (0.1)	0.02	0.01-0.42	0.01	**
Public (0.1)	0.00	0.00-0.13	0.01	*

Significance codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1

Summary

Findings from this research have established different types of high-level participation in hospital safety-net revenues. They have described the factors associated

with this participation and determined the effect of these factors on the odds of high participation.

High values were reported by a total of 171 hospitals. Safety-net revenue represented \$11.5 billion, or 20% of the total patient revenue earned annually between 2006 and 2008 at study hospitals. For approximately 40% (136) of the study hospitals, safety-net revenue represented the same share: 20% of net patient revenues. Additionally, 32% (105) of the hospitals received at least a proportionately equal share of their county safety-net revenue.

Description of hospitals by their safety-net revenue participation found that all facilities reporting high levels of safety-net revenue were associated with a less competitive location, a ZIP code with lower adjusted gross income, higher numbers of staffed beds, and clinical teaching. Also, increased average medical complexity of patients showed a negative association with high safety-net performance, and this effect was stronger among nonprofit facilities.

Additionally, these hospitals with high safety-net participation comprised three subgroups with some differences in characteristics. The 70 hospitals with high values for both organizational and market shares of safety-net revenue accounted for \$7.7 billion (70%) of the total safety-net revenue in the study. These hospitals were positively associated with concentrated markets (fewer hospitals), clinical teaching, larger size, and less medically complex patients. Most of them were operated under city/county or nonprofit ownership.

Hospitals with a high market share and low organizational participation earned approximately \$1.1 billion (10%) of total annual safety-net revenue. These facilities were

also positively associated with location in a concentrated market, increased size, and nonprofit ownership. In contrast to the other hospitals, however, this group was more likely to be affiliated with a health system or network and showed no significant association with patient acuity.

Finally, the hospitals with a high organizational share of safety-net revenue and low market participation earned approximately \$1 billion (9%) of total safety-net revenues. This group was more likely than the others to be located in a more competitive county and to be independently operated by investors or a public district. Also, hospitals in this group were distinct in their positive association with smaller size. Like the hospitals with both types of high performance, however, this group showed positive influence from a less medically complicated and expensive mix of patients.

The significance and limitations of these findings are explored in the next chapter.

Chapter 6: Discussion

This paper has described new research on hospital safety-net participation in the state of California from 2006 through 2008. It is the first known study to use the hospital revenue associated with specific vulnerable populations as the primary measure of participation in safety-net hospital care. The analysis supports the following three conclusions: 1) hospitals exhibited isomorphism toward low participation in safety-net revenue, 2) the use of two measures of participation—organizational commitment and market share—provided insight into subgroups of responsive participants, and 3) highly responsive participation was positively associated with reduced competition, clinical teaching, larger size, and—especially among nonprofit facilities—a mix of patients with less complicated conditions than average nationwide. These results generally support previous research on other measures of safety-net participation.

The following sections explain the meaning and significance of this analysis within the contexts of previous research and this study's theoretical framework. The paper then concludes with a description of the analytical limitations of this research and with recommendations and considerations for future research in this area.

Meaning and Significance

From the perspective of the reviewed literature and the resource dependence framework explained in Chapter 3, this study has provided new information on safety-net participation by general hospitals in California.

Aim 1. This component of the analysis illustrates that a select group of hospitals responsively adapted to the constraint of caring for low-income populations between 2006 and 2008. Although all the hospitals participated in the state's annual safety-net

revenue of \$11.5 billion, isomorphism toward low participation appeared in the distribution of measures and in the corresponding allocation of total safety-net revenue. This isomorphism reflected findings in previous research. Other measures of hospital safety-net participation such as uncompensated care and Medicaid caseload showed similar skewed distributions (Congressional Budget Office, 2006; McHugh & Hasnain-Wynia, 2009).

Additional analysis of safety-net revenues by type of comparative measure established a threshold for high values at equal distribution (20% organizational share and 1.00 market share). To capture a larger perspective on participation, these thresholds were intentionally lower than the deciles previously used in national research on uncompensated care (Zuckerman, Bazzoli, Davidoff, & LoSasso, 2001; Bazzoli, Lindrooth, Kang, & Hasnain-Wynia, 2006; McHugh, Kang, & Hasnain-Wynia, 2009).

This difference in the threshold increased the ratio of study hospitals with high values from approximately 15% in previous national studies (McHugh & Hasnain-Wynia, 2009) to 50%. High values in this analysis were reported by a total of 171 hospitals that earned \$10 billion (86%) of the total \$11.5 billion in safety-net revenue for the study group. The 70 hospitals that reported both high organizational and high market participation accounted for \$7.7 billion of the total safety-net revenue. Such a disparity, despite the fact that this research used lower thresholds than have been previously employed (Bazzoli, Lindrooth, Kang, & Hasnain-Wynia, 2006), provides support for the idea of “core” safety-net hospitals (p. 3).

Aim 2. Results from Aim 2 place the study hospitals in a context of competition, demand, culture, and power according to their participation in safety-net revenue.

Findings showed differences with and similarities to those of previous nationwide research on uncompensated care as published by Bazzoli, Manheim, and Waters, 2003; Bazzoli, Kang, Hasnain-Wynia, and Lindrooth, 2005; and McHugh, Kang and Hasnain-Wynia, 2009.

The differences primarily concern the total study group. The California hospitals showed more participation from investor-owned facilities, a finding that may indicate that these hospitals participate in the safety net primarily for payment. Additionally, the average number of staffed beds for the California study group is much smaller than for the study hospitals used in the national studies. This average compares most favorably with the averages of those hospitals in the nationwide studies that reported high organizational commitment and low market share or that reported low performance. These differences raise questions about the behavior of investor hospitals and about the ways in which California as an area of study may differ from the rest of the country as a whole.

Descriptive findings on individual hospital groups by participation, however, showed numerous similarities to the previous national research:

- Public hospitals were concentrated among the highly responsive facilities—with both high organizational and high market shares. Teaching hospitals were almost completely concentrated among these highest performing hospitals, and no teaching hospitals operated under investor ownership. System-affiliated hospitals showed lower representation among highly responsive hospitals.

- More than 80% of the hospitals with high market participation and low organizational commitment (31 of 35) were of nonprofit ownership.
- Hospitals with a high organizational commitment to safety-net care and low market participation on average showed a more competitive location, fewer staffed beds, and an average patient mix with less complicated and costly diagnoses. Investor-owned facilities were overrepresented in this group of hospitals.

Aim 3. Findings from logistic regression testing also showed effects that were generally consistent with those found in previous research. Profitability showed no effect on any outcomes, and previous findings regarding this factor's influence on uncompensated care have been mixed (Thorpe & Phelps, 1991; Fishman, 1997). The following sections briefly review this study's findings on individual factors as compared with those of previous research.

Competition. This study found that competition had a negative influence on safety-net revenue for most high-performing hospitals. Hospitals with only high organizational participation showed a positive association with competition. Previous research has found that market concentration was positively associated with increased provision of uncompensated care (Mann, Melnick, Bamezai, & Zwanziger, 1995; Thorpe & Phelps, 1991). Hospitals located in concentrated markets have more of a monopoly position and may face higher demand for safety-net care than hospitals in other markets (Thorpe & Phelps, 1991). They also share local safety-net revenues with fewer other hospitals.

Ownership. In previous research, ownership has shown mixed effects on hospital safety-net participation with most studies showing higher average participation by the nonprofit sector (Clement, White, & Valdmanis, 2002; Mann, Melnick, Bamezai, & Zwanziger, 1995; Kim, McCue, & Thompson, 2009). This study showed that investor ownership had a slight positive effect on high organizational commitment to hospital safety-net care in combination with low market participation. This result supports other findings from the Congressional Budget Office (2006) that nonprofit hospitals had lower share of Medicaid patients than for-profit hospitals.

Additionally, this study found greater sensitivity to the negative effect of higher case mix among nonprofit hospitals. Although used as a control in some studies (Frank & Salkever, 1991; Congressional Budget Office, 2006) and frequently used in studies of hospital quality (Goldman, Vittinghoff, & Dudley, 2007), this variable has been rarely mentioned in the literature on hospital access. It was, however, mentioned by Currie and Fahr (2004) in connection with increased uncompensated care costs at nonprofit and public hospitals from the late 1980s through the mid-1990s. They supposed that this increase was potential evidence of an increase in patients with more complex diagnoses than the nationwide average. They also noted that only the non-profit hospitals were earning correspondingly higher revenues.

System Affiliation. Hospital affiliation with a system owning three or more hospitals showed a positive effect on high participation only as a market share. These hospitals also were associated with ZIP codes with lower adjusted gross income.

The reviewed literature showed that the effect of system affiliation on safety-net participation was negatively influenced by market pressure (Bazzoli, Manheim, & Waters,

2003) and by location in a market with low Medicaid eligibility (Shortell et al., 1986). However, the effect was positively influenced by regulatory rate review (Shortell et al., 1986).

Mission. Consistent with previous research on uncompensated care (Thorpe & Phelps, 1991; Sloan, Valvona, & Mullner, 1986; Bazzoli, Lindrooth, Kang, & Hasnain-Wynia, 2006), this study showed that teaching mission maintained a significant influence on safety-net participation. Small/rural status showed a negative association with high values for both measures of participation.

Case Mix. As discussed in the previous section on ownership, the measure of case mix has primarily been used, if at all, as a control in previous research on hospital safety-net access (Frank & Salkever, 1991; Congressional Budget Office, 2006). Although the concept has been widely considered in quality research, often as *risk-adjustment* (Goldman, Vittinghoff, & Dudley, 2007), it has not been widely used in connection with access. The finding in this study of a negative correlation between case mix and access seems important to pursue, especially in light of the interaction with nonprofit ownership.

Summary of Importance

This research has advanced research and policy on hospital community benefit and safety-net participation through the use of institutional and economic concepts in a framework of resource dependence theory. It has tested hospital participation in the direct provision of safety-net care as an adaptation to social, political, and fiscal constraint to control relationships and resources.

Results showed significant positive influence on high general participation in hospital safety-net care from market concentration (less competition), teaching status, and

low patient acuity. Nonprofit hospitals were more sensitive to the negative effect of patient acuity than the other hospitals as a combined group were.

These findings are important in their illustration of the hospital safety net as a dynamic field of activity with factors of influence interacting and affecting levels and measures of safety-net participation differently. This study complements other research that has shown that the definition of *participation* changes the effect of predictors such as ownership (Congressional Budget Office, 2006) and quality (McHugh, Kang, & Hasnain-Wynia, 2009).

These findings also raise interesting questions about the hospital safety net in California. For example, in descriptive comparisons with previous research this study found that California's average hospital size is smaller than the nation's. Additionally, smaller hospitals everywhere are associated with lower hospital safety-net participation. What does this finding mean for California's supply of hospital care and its ability to provide safety-net care if funding issues could be improved?

Implications for Theory, Methods, and Policy

This study has implications for sociological and economic theories as well as for research methods for studying hospital safety-net care and community benefits. It also informs policy on hospital safety-net care and nonprofit hospital tax exemptions.

Theory. In sociological terms, the research supports the presence of both organizational institutionalization and responsive action regarding safety-net hospital care throughout California in 2007. It also supports tenets of competition from economics. Descriptive results for both measures of hospital participation in direct provision of safety net care show institutionalization toward low provisions of safety-net access. Although

all of the study hospitals maintained some orientation to the safety net, more than half reported a less-than-equal share in associated revenues. In light of the ongoing pressure to provide community benefits, this isomorphism may also suggest the presence of *decoupling*. As explained in Chapter 3, this is a phenomenon in which organizations respond to pressure by separating and protecting their technical core and other structural elements (Meyer & Rowan, 1991, pp. 356–357). Hospital revenue represents such a foundational component, and administrators and physicians may be protecting high reimbursement care by restricting admissions of patients who lack comprehensive insurance and/or wealth.

Additionally, the theoretical implications of this research suggest insights relating not only to the structure but also to the dynamics of the field of hospital care and safety net participation. From a perspective of resource dependence theory, the study hospitals demonstrated facilities adapting to lower reimbursements for services, or fiscal constraint, and responding to the needs of vulnerable populations. The results also show the nonprofit hospitals adapting to the government mandate that they provide emergency care regardless of a patient's ability to pay, and they show the nonprofit hospitals responding to their obligation to fulfill a charitable mission. Of the 331 study hospitals, more than half (171) reported some high participation in the safety net, and 70 hospitals reported high values for both measures of participation.

Moreover, findings on case mix support the tenet of economics that patient acuity may be intentionally modified to strategically modify production costs, a concept also referred to as economies of scale. This interaction also supports additional tenets of resource dependence and institutional theory. Resources are highly interrelated in fields

with low domain separation, such as hospital services, and resource dependence theory maintains that this interconnection changes the effects of responsive action. Low domain separation in an organizational field transforms responsive action into proactive behavior, which ultimately changes the system of constraints. From an economic perspective, this dynamic is competition at work. From a sociological perspective, this dynamic is the power to aggravate or reduce the negative effects of a social problem.

Methods. This study has implications for the methods used to study the safety net and hospital community benefits. To the best of the author's knowledge, this is the first paper to use share of safety-net revenue as a measure of community benefit. Reviewed literature has used high Medicaid caseload (of services or patients) to study quality (McHugh, Kang, & Hasnain-Wynia, 2009) and uncompensated care as both dependent and independent variables (Kennedy, McWhorter, Troyer, & Stroup, 2005; Congressional Budget Office, 2006; Shortell et al., 1986). Other articles have used Medicaid revenue or coverage as a control variable to study service provision (Shen, Cochran, & Moseley, 2008; White, Chou, & Dandi, 2010).

Moreover, this study maintains a focus on hospital treatment and services. Recent research on community benefits has increasingly focused on community services, wellness programs, and proactive efforts by hospitals to reduce demand for hospital care. (Proenca, Rosko, & Zinn, 2000, 2003; Ginn & Moseley, 2006; Gray & Schlesinger, 2009). The direct provision of hospital care to the safety net, however, remains critical as *responsive* behavior from hospitals. If hospitals can promote wellness and demonstrate that they are reducing the need for treatment, especially among vulnerable populations,

they should be applauded, but their performance in providing access to hospital-based services for vulnerable populations should also be measured and assessed.

Safety-net revenue offers a promising measure of this performance. It is a continuous fiscal measure of commitment to Medicaid and indigent patients that thus far has been tracked by all hospitals and shared with the public through a state agency that ultimately audits the data. Also, unlike utilization measures, safety-net revenue combines income from inpatient and outpatient services; and unlike uncompensated care, it does not require cost estimations.

Additionally, the combination of organizational share with market share has proven useful. Originally developed by Zuckerman, Bazzoli, Davidoff, and LoSasso (2001) from the work of Fishman and Bentley (1997) this approach has been institutionalized over the past 10 years (McHugh, Kang, & Hasnain-Wynia, 2009). When this model is applied to the study of safety-net revenue, a broader perspective on hospital safety-net participation can be attained. It has been widely recognized for some time that the term *uncompensated care* is a misnomer (Gray, 1986). Payment for services comes from somewhere, and by studying all revenues associated with safety-net patients (e.g., donations, subsidies from state and local governments, and Medicaid payments), one gains a more comprehensive view of hospitals' responsive engagement with the safety net. For example, findings from this research show more participation from for-profit hospitals in safety-net care than studies of uncompensated care find (McHugh, Kang, & Hasnain-Wynia, 2009). The participation of these hospitals should be studied, especially given their theoretical incentive to treat only the most profitable diagnoses from the

Medicaid population, or bring the cost and quality of the care that they provide to the lowest point that the market will bear.

Additionally, there are reasons to assume that over time hospital patients with Medicaid coverage will also become hospital patients who need uncompensated care. Patients may miss coverage renewal deadlines due to stress or mental illness, or they may find that a low-paying job that they took ended their Medicaid eligibility but did not provide health coverage. Research over the past 10 years has shown that Medicaid care has a negative correlation with uncompensated care (Kim, McCue, & Thompson, 2009; Rosko, 2004; Davidoff, LoSasso, Bazzoli, & Zuckerman, 2000). And yet Medicaid has been the foundation of the safety net (Lewin & Altman, 2001, p. xxiv).

Studies on safety-net revenue seem increasingly valuable in light of the times. Plans for implementation of the Patient Protection and Affordable Care Act include an expansion of Medicaid coverage with cost constraints. It seems likely that this development will influence hospital behavior, making a comprehensive view of the ways that hospitals fund their safety-net care especially useful.

Policy. This study has policy implications for hospital safety-net care in three primary areas: 1) its general distribution among facilities, 2) the role of teaching hospitals, and 3) expectations for different ownership models.

First, the study shows that all study hospitals participated in the direct provision of hospital safety-net care, although fiscal responsibility for providing hospital services to the most financially vulnerable patients has been distributed very unequally. Moreover, the cost of such inequality may have serious consequences since other recent findings have associated high Medicaid revenue and financial distress at hospitals (Kim, McHugh,

& Thompson, 2010), as well as reduced Medicaid compensation, with lower uncompensated care (Bazzoli, Lindrooth, Kang, & Hasnain-Wynia, 2006). As hospital safety-net care has diminished relative to its need over the past 40 years, policy makers need new ways to encourage more equitable and efficient provision of the safety net.

Second, this research has confirmed yet again that teaching hospitals serve as a critical source of hospital care for the disproportionately needy. This access to hospital care for the needy through training facilities raises questions about health care segregation and disparities for low-income individuals as well as questions about clinical education in the United States. Recent reviews of quality studies on safety-net hospitals, especially when they are classified as teaching institutions (McHugh, Kang, & Hasnain-Wynia, 2009), confirm the importance of this issue regarding patient access to hospital care.

Findings on case mix raise additional questions about quality of care and disparities in health and access to care, especially regarding nonprofit hospitals. If high case mix is negatively associated with safety-net access, and safety-net access is negatively associated with quality, is a high case mix associated with higher quality? Are hospitals that provide more complex treatments less accessible for safety-net patients?

Finally, this study confirms (again) that many nonprofit facilities—which are obligated to maintain a charitable status—are not sharing equally in the provision of direct care and services at low reimbursement to specific vulnerable individuals. Competitive pressure and ineffective oversight have compromised general hospital orientation to the safety net, a situation that makes the burden of caring for the safety-net population that much greater and potentially destabilizing for other hospitals.

Yet the nonprofit sector offers tremendous promise in this area. These hospitals occupy a unique and powerful place in U.S. health care. They constitute 60% of the U.S. market and operate under a legal mandate to partially forego profit considerations and to contribute to health care services in areas where markets fail by not providing adequate quality or supply. Nonprofit hospitals are structurally positioned to provide socially desirable services more easily than for-profit facilities can, and historically and empirically many of them have contributed to critical social goals and public goods. Their *proactive* behavior regarding health care has been increasingly well documented (Gray & Schlesinger, 2009; Ginn & Lee, 2006).

Questions remain, however, about the *responsive* behavior of nonprofit hospitals regarding the need for improved access to hospital services for safety-net patients. Additionally, the ongoing dominance of nonprofit hospitals in a nation plagued by increasing health care costs, complicated access to health services and treatment, and opaque pricing and revenue accounting have encouraged attacks on the entire sector (Clark, 1980). The cost (and hence the funding) of low-margin hospital care must be shared more openly and equitably.

Additionally, the link between case mix and safety-net participation needs additional exploration. Research on quality has raised concerns about safety-net hospitals. This research indicates that safety-net hospitals have patients with less complicated and costly diagnoses. Are nonprofit hospitals pursuing quality in complex specialty procedures to the exclusion of participating in the hospital safety net?

Economic theory indicates that nonprofit firms may pursue higher quality or more innovative services than a market might otherwise support. Marmor, Schlesinger, and

Smithey (1987) have maintained that physicians play a critical role in maintaining nonprofit hospitals, which are currently needed to promote new expensive services that pose more risk and less return (p. 230). Should nonprofits use their tax exemptions primarily to subsidize high-quality, innovative treatments for well-insured patients? Can nonprofit regulation be used to discourage the high costs associated with this type of care, expand access for patients with less wealth, and yet retain quality and innovative treatments? More analysis of the intersection of cost, quality, and access is needed.

Limitations

The limitations of this research include its scope, market definition, and hospitals' fiscal data. The scope of the study was limited to three years of hospital revenues in the state of California. It does not include approximately 30 hospitals operated throughout the state by the nonprofit Kaiser Permanente health plan. This nonprofit organization does not report hospital revenue data to OSHPD and provides access to nonemergency services primarily to member patients rather than to Medi-Cal or indigent individuals. It does, however, exert competitive pressure within the California hospital industry, and the effects of this pressure have not been considered in this study.

This research also had limitations in the scope of its measures. Although the broad concepts of *market competition*, *demand*, *culture* and *power* have clearly been represented, numerous additional factors could have added nuance and insight to the study. These include racial and ethnic demographics, the scope of services offered by hospitals, physician status as employees or contractors, and additional fiscal information on pricing and cash flow.

The definition of a hospital's *market* as a county also placed limitations on this research, although any single definition of a market would pose limitations since this term can be defined with validity in various ways according to different conflicting factors. Counties vary widely in size and population, and different procedures and types of health care can have different boundaries. Patients who require expensive specialty procedures may need to travel to receive specific services. Also, hospital systems have been transferring revenue among their disparate facilities. For example, in 2007, 93 of the 188 system-affiliated study hospitals reported an intercompany transfer:

- 63 hospitals with negative values ranging from -\$72,685,751 to -\$70,900
- 30 hospitals with positive values ranging from \$1,190 to \$100,851,722

This fiscal activity indicates that there are regional aspects to markets. Initial demand for care, however, continues to occur locally, and some urban hospitals located in low-income neighborhoods have been shown to experience higher demand for safety-net care (Brown, 2001).

Data limitations in this research stem primarily from hospitals' self-reporting figures (that had not been audited as of the beginning of this project). Various hospitals may classify patients slightly differently, and some hospitals report multiple facilities as one licensed organization. Also, in general, hospital executives are not likely to use OHSPD data to make decisions. Since hospital fiscal operations and accounting systems have grown increasingly more sophisticated, future research would benefit if hospitals allowed better access to their data. The benefit to research would be especially great if nonprofit facilities that use cost accounting reported their data accordingly. New IRS reporting requirements for nonprofit facilities are expected to provide some relief for data

opacity through validation of OSHPD fiscal data and new information on community benefits in general.

Future Research

The findings, implications, and limitations of this research recommend specific directions for additional study of hospitals, their ownership, and their participation in the safety net as a community benefit. These recommendations include maintaining a perspective on hospital safety-net participation as proactive, responsive, or symbolic behavior while capturing any responsive engagement with the safety net from health plan hospitals.

From the resource dependence framework, Kaiser Permanente's participation in the safety net is best characterized as proactive—through primary care, wellness grants, and other donations to schools and clinics. Direct provision of safety-net care, however, may be occurring through organizations such as Operation Access, which depend on compensation for facility usage and physicians and other staff. This study highly recommends examining this type of participation, especially to promote a better understanding of the role of physicians in the hospital safety net.

Most economic and organizational theories treat hospitals as one firm, but both administrators and doctors play critical decision-making roles, which may differ by facility (Rundall, Shortell, & Alexander, 2004). More professionalism in the field is theoretically associated with increased isomorphism (DiMaggio & Powell, 1983). Research on the ways that relations between doctors and administrators affect safety-net participation may yield useful information, especially for health policy and regulation.

System affiliation also requires additional research. Bazzoli, Manheim, and

Waters (2003) noted, “Affiliation may be increasingly attractive as markets become more competitive, payers become more powerful, and slack resources become even less available” (p. 7). An investigation of network and system affiliation could dovetail nicely with new or comparative definitions of markets and could illuminate the practice of “intercompany transfers.” Some comparison of states would also be useful in approaching the effects of different Medicaid regulations on hospital behavior.

Also, given the findings from this research that the lagged net profit margin has no effect on safety-net orientation, it seems probable that hospital executives who monitor budgets and revenues throughout the year adapt more quickly to revenue fluctuations by payer than was expected by this research. Exploring the relationship between profit and safety-net revenues in the same year may be useful, especially in light of the need for researchers’ attention to fiscal stability and safety-net participation (Schlesinger & Gray, 2006).

Finally, this research recommends additional study of patient acuity and the ways in which its negative association with access may relate to studies on hospital cost or quality, especially for safety-net care. If lower case mix is positively and strongly associated with specific hospitals that have high safety-net participation, how does the cost and quality of their safety-net care vary from other hospitals? Does treatment of well-insured patients with highly complex conditions warrant tax exemptions for nonprofit facilities?

Conclusion

This study has contributed to a large body of research on hospital ownership and safety-net care. Its findings relate to organization theory, quantitative research methods

for hospital safety-net participation, and nonprofit community benefits as well as health policy.

From a framework of resource dependence theory, the research postulates that hospitals responsively address demand for access to hospital care from vulnerable populations according to resources associated with market competition and demand as well as those associated with organizational culture and power.

Since the constraints of safety-net care are primarily financial, adaptation was operationalized in fiscal terms. Responsive behavior was measured as hospital participation in the state revenues associated with low-income individuals and those disabled by serious mental illness. Also, participation was measured as both organizational commitment and market participation.

The study showed that measurement and analysis of safety net revenues and associated factors in California produce useful findings that complement existing research in this area. As a group, low-performing hospitals tend to be located in more competitive markets and within ZIP codes with higher adjusted gross incomes. They also tend to be smaller and to serve patients with more complex diagnoses than are average throughout the nation.

High performance in general is positively associated with a less-competitive area and a ZIP code with a lower adjusted gross income than that of other areas. It is also positively associated with clinical teaching, larger facilities, and a less severely ill patient mix than the average nationwide. Additionally, subgroups with unique characteristics and different types of participation exist within the high performers. As a group, hospitals with a low share of their county markets for safety-net care but with a high organizational

commitment to participation tend to be smaller, independent investor, or district hospitals treating patients who have less complicated and costly diagnoses than the national average. They are also located in more competitive markets than other hospitals.

The hospital group with a high market share of safety-net participation but with relatively low organizational commitment is more likely to be made up of larger, system-affiliated, nonprofit hospitals in less competitive markets.

Finally, hospitals reporting both high market participation and high organizational commitment to the direct provision of safety-net care received 80% (\$7.7 billion) of the total funding associated with safety-net patients. These hospitals are associated with areas of lower competition than other counties with study hospitals, provision of clinical teaching programs, a larger size, and a patient mix that is less complicated to treat than the national average is.

As a policy product, this research enters an area rife with contention. Disagreements over nonprofit hospital tax exemptions and community benefits range from the ideological to the practical, and the amount of research that offers recommendations is overwhelming. This paper has attempted to encourage applying a broader perspective on the issue by analyzing safety-net revenue through a framework of resource dependence theory. Understanding community benefit as proactive, responsive, or symbolic behavior may help policy makers create and enforce better requirements for subsidized hospitals.

This paper presents some new thinking and evidence regarding the hospital safety net, the ways that it is funded, and the role of nonprofit hospitals in meeting a charitable obligation. Primarily, it recommends additional study on the intersection of access and

quality in safety-net hospital care with a broader approach to measuring access. It is not intended to discourage investment in the nonprofit hospital sector. A public health perspective suggests that the nonprofit model can best be used to achieve balance between the libertarian and egalitarian ideologies in conflict throughout the United States and to pursue enhanced access and quality of hospital care.

Alford (1972) refers to the forces in health care as either “professional monopolists” or “market rationalizers” (p. 163). He argues that the struggle to protect each group’s interests ultimately prevents reform that could be meaningful to patients:

Given a system which cannot provide decent care for all because of the domination by the private sector, and thus a continuing “crisis,” there is increasing pressure upon government to step in. But, again, because of the dominance of the private sector, government cannot act in a way which could change the system without altering the basic principle of private control over the major resources of society. Thus, the health system exhibits a continuous contradiction between the expectations of the people for decent health care, the impossibility of the private sector to provide decent and *equal* health care for all, and the impossibility of the public sector to compensate for the inadequacies of the private sector.” (Alford, 1972, p. 163, italics in original)

This paper is written with the hope that he has missed something and that there is another aspect to this story that remains to be told.

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