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Denise L. Anthony¹, Ajit Appari², and
M. Eric Johnson³

Abstract

Health care in the United States is highly regulated, yet compliance with regulations is variable. For example, compliance with two rules for securing electronic health information in the 1996 Health Insurance Portability and Accountability Act took longer than expected and was highly uneven across U.S. hospitals. We analyzed 3,321 medium and large hospitals using data from the 2003 Health Information and Management Systems Society Analytics Database. We find that organizational strategies and institutional environments influence hospital compliance, and further that institutional logics moderate the effect of some strategies, indicating the interplay of regulation, institutions, and organizations that contribute to the extensive variation that characterizes the U.S. health care system. Understanding whether and how health care organizations like hospitals respond to new regulation has important implications both for creating desired health care reform and for medical sociologists interested in the changing organizational structure of health care.

Keywords

health care organizations, health information technology, HIPAA, institutional logic, neoinstitutional theory, regulatory compliance

Health care is one of the most regulated industries in the United States (Walshe and Shortell 2004). The recent passage of the Patient Protection and Affordable Care Act brings a whole new level of regulatory oversight to health care through mandatory insurance, federal and state health insurance exchanges, and expanded Medicaid programs. Another current focus of federal regulation in health care has been the conversion of patients' protected health information (PHI) from paper to electronic records. Though the significant push for electronic health records has been relatively recent (e.g., 2009 Health Information Technology for Economic and Clinical Health [HITECH] Act), government attention and regulation has been focused on electronic PHI for nearly two decades. In 1996, Congress enacted the Health Insurance Portability and

Accountability Act (HIPAA),¹ which, though primarily focused on extending insurance coverage, also included an "administrative simplification" addressing the privacy and security of PHI. Subsequently, the Department of Health and Human Services adopted two rules to protect PHI: the Privacy Rule and the Security Rule, which became

¹Department of Sociology, Dartmouth College, Hanover, NH, USA

²University of Texas School of Public Health, Houston, TX, USA

³Vanderbilt University, Nashville, TN, USA

Corresponding Author:

Denise Anthony, Department of Sociology, Dartmouth College, HB 6104, Hanover, NH, 03755, USA.
E-mail: denise.anthony@dartmouth.edu

effective in 2003 and 2005, respectively (see below for more details about the specific rules). Despite federal mandates for compliance with these HIPAA Rules, industry surveys in the following years presented a fairly bleak picture of compliance. According to the American Health Information Management Association, a 2006 survey found that only 39 percent of covered health care organizations (including both hospitals and physician practices) were fully compliant with the Privacy Rule, and even fewer, 25 percent, were fully compliant with the Security Rule (American Health Information Management Association 2005).

This article examines compliance with the HIPAA Privacy and Security Rules among medium and large acute-care hospitals in 2003, the initial year of mandatory compliance. Given the current use of federal legislation to (attempt to) change and improve the U.S. health care system, understanding the likelihood and patterns of compliance and noncompliance is important for both policymakers and practitioners. For sociologists, hospital compliance patterns may shed light on some of the factors contributing to the extensive variation—in organizations, practices, and health outcomes—that exist across the U.S. health care system. Despite general neglect of the study of both health care organizations (Currie et al. 2012) and health policy (Kronenfeld 2011) in medical sociology, sociologists have contributed key insights into major changes in the organization and delivery of medicine and health care (D'Aunno, Succi, and Alexander 2000; Flood and Fennell 1995; Light 2001; Rundall, Shortell, and Alexander 2004; Scott et al. 2000). Finally, hospital compliance with the HIPAA Rules has important implications for the security and privacy of health information, which undergirds patient expectations of confidentiality and trust in the medical system (Caronna 2011; Mechanic 1998; Wright 2011).

According to organizational theorists, regulation often leads to isomorphic organizational forms and behavior (DiMaggio and Powell 1983; Edelman and Suchman 1997), suggesting that federal legislation will lead to more uniformity across health care organizations. Yet, while the U.S. health care system is characterized by significant regulatory oversight, it also shows great variation in organizational forms and practices across the country (Alexander and Scott 1984; Scott et al. 2000; Wennberg 2010). We contribute to the literatures on health care organizations, health policy, and information security and privacy by examining

how hospital compliance with the HIPAA Rules varies, testing the effects of organizational strategies and environments, while exploring whether these effects are moderated by competing institutional logics of profit-status operating in U.S. hospitals. Such factors shed light on why, despite being a highly regulated industry, U.S. health care is also so highly variable.

BACKGROUND

Regulation and Organizational Compliance

State regulation to promote specific organizational forms and practices has a long history in the U.S. health care industry (Alexander and Scott 1984; Enthoven 1980; Stevens 1989). Though state regulations coercively influence the spread of policies and practices across organizations (Campbell, Hollingsworth, and Lindberg 1991; DiMaggio and Powell 1983), actual regulatory compliance varies widely (D'Aunno et al. 2000; Walshe and Shortell 2004). Research examining variation in regulatory compliance has generally followed three lines of analysis. First, the *form of regulation* can affect compliance (Braithwaite and Makkai 1991; Kagan, Gunningham, and Thornton 2003; Short and Toffel 2010). Modern regulation mostly consists of the traditional command-and-control type in which organizational compliance is mandatory, but the past two decades have seen a “crisis of command” with the introduction of new regulatory forms promoting voluntary compliance (Schneiberg and Bartley 2008; Strange 1996). According to this line of inquiry, compliance depends on the type (e.g., mandatory or voluntary) and character (e.g., incomplete or ambiguous) of regulation, and it's enforcement over time (Campbell et al. 1991; Reuf and Scott 1998; Schneiberg and Bartley 2008). Here we follow Schneiberg and Bartley (2008) who argue for more systematic analyses of whether and how the *forms of regulation* affect organizations.

A second line of analysis on organizational compliance highlights the role of *organizational strategy*, in which organizations strategically determine whether and how to respond to regulatory demands (DiMaggio 1988; Oliver 1991). Some organizations may simply resist or delay any compliance activities (Campbell et al. 1991; Perrow 1986). Others make changes to internal control structures, though such changes do not necessarily guarantee compliance (Edelman, Erlanger, and

Lande 1993; Kalev, Kelly, and Dobbin 2006; Meyer and Rowan 1977). Within the organization, *institutional entrepreneurs* may seek to direct organizational strategies in particular ways consistent with their own interests (Beckert 1999; DiMaggio 1988). For example, art museum directors facilitated the growth and quality of museum collections while simultaneously strengthening their professional status in the art world (DiMaggio 1991).

In addition, organizational strategies may be influenced by *institutional logics*, that is, the fundamental organizing principles, values, and assumptions that guide action and interpretation within particular domains (Friedland and Alford 1991; Thornton and Ocasio 1999, 2008). Rather than being a property merely of the organization, institutional logics operate as an organizing framework for an entire field of organizations. Thornton and Ocasio (1999:804) define institutional logics as “the socially constructed, historical patterns of material practices, assumptions, values, beliefs, and rules by which individuals produce and reproduce their material subsistence, organize time and space, and provide meaning to their social reality.” For example, the institutional logic of the “market” entails values and practices of efficiency, competition, and profit maximization, which vary from the logic of the professions, entailing values and practices of exclusivity, expert knowledge, and service to clients.

Organizations may resist or adapt to regulation differently depending on the prevailing logic and their strategic orientation to it (Fox-Wolfgramm, Boal, and Hunt 1998). Though many organizational fields are dominated by a single institutional logic, some are subject to competing logics operating simultaneously (Lounsbury 2007; Marquis and Lounsbury 2007). Health care in the United States is an exemplar case of a field characterized by competing and shifting logics of the market, the profession of medicine, and the logic of the state, which entails coercive and bureaucratic values and practices (Kitchener 2002; Light 2001; Reay and Hinings 2009; Scott et al. 2000).

The third line of research on organizational compliance recognizes the role played by the organizational *environment*. Some models consider the *market environment* of firms, examining how competitive forces influence organizational compliance (Shaffer 1995; Stigler 1971). In contrast, neoinstitutional theories identify pressures stemming from the *institutional environment*, in which firms pursue or avoid compliance because they seek legitimacy with peers, and/or with best practices and

other professional norms, as well as with government regulations (DiMaggio and Powell 1983; Edelman and Suchman 1997; Tolbert and Zucker 1983). Organizational theorists recognize that both institutional and market forces jointly affect organizations, particularly in health care (D’Aunno et al. 2000).

We argue that variation in hospital compliance with HIPAA regulations can be understood by examining organizational strategies, market and institutional forces, and competing institutional logics operating in U.S. hospitals. Furthermore, in 2003, the HIPAA rules for privacy and security (see below) operated as different *regulatory forms*: (1) a *mandatory* regulation in which hospitals were required to be compliant with the privacy rule and (2) a *voluntary* regulation in which hospitals could comply with the security rule but were not required to do so until 2005. Since the security rule eventually became mandatory—but was essentially voluntary for two years—we term compliance with the security rule “early” compliance and see it as a variant of voluntary forms of regulation. The sequencing of the two HIPAA rules provides a unique opportunity to explore whether and how early compliance differs from mandatory compliance among the same set of organizations.

HIPAA Information Rules

Before considering how existing theories of organizational compliance apply to the case of HIPAA compliance in U.S. hospitals, we briefly describe the key rules for information privacy and security defined by HIPAA. The HIPAA Privacy Rule sets national standards to protect individuals’ PHI held by health care providers like hospitals. The Privacy Rule mandates safeguards to protect the privacy of PHI, imposes limits and conditions on the uses and disclosures of PHI, and gives patients select rights over their health information. The HIPAA Privacy Rule became effective on April 14, 2003. The HIPAA Security Rule specifies a series of administrative, technical, physical, and organizational security standards to ensure the confidentiality and security of electronic PHI. While the technical and physical safeguards address significant information security conditions, such as data integrity, user authentication systems, and transmission security, the administrative safeguards require significant organizational changes such as security awareness and training, security incident procedures, contingency planning, and business associate contracts. Given the increased requirements of the Security

Rule over the Privacy Rule, health care entities were given an extra two years to achieve compliance with the Security Rule, which became effective on April 20, 2005. More recently, the 2009 HITECH Act strengthened the civil and criminal enforcement of these HIPAA information rules.

Organizational Strategies for Compliance

Compliance with regulations may depend on the degree to which organizations can modify internal structures and processes to accommodate the regulation (Dobbin and Kelly 2007; Ungson, James, and Spicer 1985). Dedicated professionals inside organizations are often key actors in achieving compliance (Dobbin and Kelly 2007) both because they can directly influence internal colleagues and decision makers and because they focus their own activities on compliance. Regulation can give rise to strategies in which particular organizational actors promote changes to management cultural models as well as to internal structures and practices (Fligstein 1990; Kellogg 2011). Regulatory change can disrupt existing organizational forms and practices, enabling the emergence of *institutional entrepreneurs* who use the regulatory changes as a means of advancing their own interests within the organization (DiMaggio 1988; Greenwood, Suddaby, and Hinings 2002).

The HIPAA information rules require hospitals to identify an administrator with responsibility for the organization's information security and privacy efforts (Choi et al. 2006). According to industry reports, many hospitals responded to this requirement by assigning the responsibilities of HIPAA compliance to executives from other existing functional areas, including finance, quality, and operations (Health Care Compliance Association 2002). Executives with primary responsibilities for core organizational functions separate from, and in addition to, HIPAA compliance may see compliance activities as less important than other responsibilities. In addition, they may not have the resources, occupational knowledge, or training necessary for achieving compliance (Chattopadhyay et al. 1999). Other hospitals, in contrast, responded by creating the new organizational role of a dedicated compliance officer whose primary responsibility was to implement and manage policies, procedures, and technologies necessary to achieve compliance. By pursuing compliance strategies explicitly and directly, dedicated compliance officers can reinforce and justify their position while advancing their own interests within the organization (DiMaggio 1988).

In addition, hospitals that appointed dedicated compliance officers signal a strong organizational commitment to compliance (Short and Toffel 2010).

In 2003, the Privacy Rule was a mandatory regulation while compliance with the Security Rule was voluntary. Dedicated compliance officers were in the best position to understand the resources needed to achieve mandatory compliance and, as suggested above, they had strong interests in pursuing and achieving mandatory compliance as a way to demonstrate their own value. One might think they would also want to pursue early compliance, but dedicated compliance officers understood better than anyone else the high costs of investments in IT and personnel required for compliance with the Security Rule (e.g., Kilbridge 2003). Pursuing early compliance could reduce the resources available for mandatory compliance activities. Such reasoning suggests that, compared to an officer with compliance as a secondary responsibility, a dedicated compliance officer would be more likely to achieve mandatory compliance but less likely to pursue early compliance. (Table 1 summarizes all hypotheses.)

Hypothesis 1—mandatory (1m): Hospitals with dedicated compliance officers will be *more likely* to achieve *mandatory compliance* than hospitals with dual-role compliance officers.

Hypothesis 1—early (1e): Hospitals with dedicated compliance officers will be *less likely* to achieve *early compliance* than hospitals with dual-role compliance officers.

A different organizational strategy in the face of new regulations is to hire external experts to help achieve compliance. Outside professional experts often provide the ideas and cultural resources that organizational actors need to make and justify organizational change (Campbell 1998; Fligstein 2001). External consultants bring knowledge about best practices and industrywide norms (Tushman and Moore 1988) and act as facilitators of organizational learning and transformation (Irvine 2007; Massey and Walker 1999). For example, professional standards organizations and other professional associations have been a major force facilitating organizational IT adoption and standardization (e.g., Benders, Batenburg, and Van der Blonk 2006). Though potentially more costly in the short run than internal organizational change, external consultants are contracted to achieve specific organizational goals in a defined timeframe and budget, potentially with the stipulation that

Table 1. Hypotheses of Mandatory and Early Health Insurance Portability and Accountability Act Compliance in U.S. Hospitals.

	Form of Regulation	
	Mandatory Compliance: Privacy Rule	Early Compliance: Security Rule
Organizational strategies		
H1: Compliance officer	Positive (+)	Negative (-)
H2: External consultant	Positive (+)	Negative (-)
Institutional environment		
H3: Coercive: State disclosure statutes	Positive (+)	Positive (+)
H4: Mimetic: Peer compliance	Positive (+)	Positive (+)
Market environment		
H5: Competitiveness: Hirschman-Herfindahl index	Positive (+)	Negative (-)
Institutional logic		
H6: For-Profit	Positive (+)	Negative (-)
H7: For-Profit × Compliance Officer	Positive (+)	Negative (-)
H8: For-Profit × External Consultant	Positive (+)	Negative (-)

Note: H = Hypothesis.

they do not get paid unless the goals are achieved on time.

Hospitals in 2003 needed, first and foremost, mandatory compliance with the HIPAA Privacy Rule, so external consultants would have been hired with this as the primary goal. It is unlikely that consultants would have recommended or initiated the additional organizational costs of achieving early compliance of the security rule in 2003, making early compliance less likely in hospitals that hired external consultants.

Hypothesis 2m: Hospitals using external consultants will be *more likely* to achieve *mandatory compliance* than hospitals that don't use consultants.

Hypothesis 2e: Hospitals using external consultants will be *less likely* to achieve *early compliance* than hospitals that don't use consultants.

Organizational Environments— Institutions

Neoinstitutional theories argue that firms seek not only profits and efficiency but also legitimacy, that is, “the perception that actions . . . are desirable, proper or appropriate within some socially constructed system” comprising laws, rules, norms, values, and cognitive frameworks (Deephouse and Suchman 2008; Suchman 1995: 574). One of the strongest institutional forces affecting organizational legitimacy is the

legal environment, where “law appears as a system of substantive edicts, invoking societal authority over various aspects of organizational life” (Edelman and Suchman 1997:483) yet institutional forces, including legal environments, can vary in intensity and impact across regions and organizational fields (D’Aunno et al. 2000; DiMaggio and Powell 1983; Reuf and Scott 1998).

In the federal HIPAA regulation, the Privacy and Security Rules define a *floor* of regulatory requirements, allowing state laws to supersede them with more stringent requirements for protecting PHI. Indeed many states had statutes governing PHI in place prior to the HIPAA rules that remained in effect. Hospitals in states with more existing statutes governing PHI face greater regulatory pressure consistent with HIPAA compliance than hospitals in states with fewer statutes. While this state regulatory pressure is expected to be especially encouraging of mandatory compliance, we expect that such a regulatory environment would be conducive to early compliance as well, given that hospitals are required to comply with state requirements.

Hypothesis 3m: Hospitals located in states with more information disclosure policies will be *more likely* to achieve *mandatory compliance* than hospitals in states with fewer policies.

Hypothesis 3e: Hospitals located in states with more information disclosure policies will be

more likely to achieve *early compliance* than hospitals in states with fewer policies.

In situations of uncertainty, organizations often seek legitimacy by imitating other organizations, particularly successful peers or others in their environment (DiMaggio and Powell 1983; March and Olsen 1976; Oliver 1991). Such mimetic processes have been found to have significant effects on organizational practices over time (Greve 2000; Lee and Pennings 2002). For example, Miller and Tucker (2009) find empirical evidence that hospitals are more likely to adopt an electronic medical record system when a high proportion of hospitals in the state have already adopted such systems.

In 2003 the HIPAA information rules were still new and viewed skeptically by many health care stakeholders (Annas 2002; Califf and Muhlbaier 2003; Shen et al. 2006). Observing peer hospitals implement the HIPAA rules could influence both mandatory and early compliance as hospitals sought to maintain their legitimacy with common external constituencies (e.g., peers, patients, and payers).

Hypothesis 4m: Hospitals located in regions with a higher proportion of other hospitals in mandatory compliance will be *more likely* to achieve *mandatory compliance*.

Hypothesis 4e: Hospitals located in regions with a higher proportion of other hospitals in early compliance will be *more likely* to achieve *early compliance*.

Market Environment

Firms that fail to comply with mandatory government regulations risk facing government-imposed penalties. If the organizational costs necessary to become compliant are higher than fines for non-compliance, firms may resist or delay compliance. Noncompliance carries other costs in addition to government fines, however, including the potential loss of legitimacy with customers, suppliers, or others in the marketplace (Baum and Oliver 1991; Reuf and Scott 1998). In highly competitive markets, hospitals may want to avoid both the cost of fines and the loss of reputation that may accompany noncompliance. Thus, hospitals are likely to seek mandatory compliance so that they can avoid penalties and maintain access to key market resources.

Such reasoning does not apply to voluntary compliance. According to economists, because voluntary

regulations do not impose fines but do generally entail organizational costs to achieve compliance, firms will pursue voluntary compliance only when they can expect some benefit, such as a competitive advantage through higher market share (Arora and Cason 1996) or increased reputation (Prakash and Potoski 2006) or by raising the bar for competitors also facing increased costs of compliance (Barrett 1991).

In 2003 only the Privacy Rule was mandatory, so hospitals would incur penalties for noncompliance, but they faced no penalties for noncompliance with the Security Rule. If hospitals could expect a competitive advantage with customers or payers from early compliance with the Security Rule, economic evidence on voluntary regulations suggests that hospitals may pursue it even though it was not required. In reality, however, the organizational costs of pursuing Security compliance were fairly high (Kilbridge 2003). Also, there were no obvious customer or competitive advantages to achieving early compliance since the information security requirements were all related to internal systems. Indeed, the more relevant question may be: Why would any hospitals achieve early compliance, given its costs? Based on these conditions we would expect that more competitive environments would *inhibit* early compliance. However, competitive environments would have the opposite effect on mandatory compliance; hospitals would avoid penalties and would maintain or possibly gain competitive advantage vis-à-vis other hospitals in their markets.

Hypothesis 5m: Hospitals located in more competitive markets will be *more likely* to achieve *mandatory compliance* than those in less competitive markets.

Hypothesis 5e: Hospitals in more competitive markets will be *less likely* to achieve *early compliance* than those in less competitive markets.

Institutional Logics

Though market forces have played an increasingly strong role in the health care industry for at least two decades (Robinson 1999), health care historically has been a more professional, bureaucratic, and institutionally bound industry in which decisions are expected to be consistent with clinical professional standards, and not necessarily efficiency standards under a market logic (Freidson 1988; Light 2001; Scott et al. 2000). Today, however, health care in the United States is defined by multiple, competing logics of the market *and* professions (Kitchener 2002;

Reay and Hinings 2009; Rundall et al. 2004). For-profit hospitals, for example, are oriented more strongly than not-for-profits to a market logic in which issues of efficiency and profit are primary (Caronna 2011). In comparison, not-for-profit hospitals are more oriented to a professional logic in which the clinical authority and autonomy of physicians is still primary. Of course, changes over the past few decades have disrupted previous “institutional alignments” that imply simple distinctions between for-profit and not-for-profit hospitals; today both types of hospitals are influenced to some extent by both market and professional logics (Caronna 2004), even while profit status continues to influence patterns of practice and outcome (e.g., Mathias, Feinglass, and Baker 2012).

Not-for-profit hospitals, operating more squarely under a logic of medical professionalism, were likely to include many providers willing to question whether the HIPAA information rules were consistent with the professional practice of medicine (Annas 2002; Califf and Muhlbaier 2003). In contrast, for-profit hospitals were likely to be more sensitive to the cost trade-offs related to the HIPAA rules (e.g., fines from noncompliance with mandatory rules, high costs of early compliance). Given the penalties associated with noncompliance with mandatory rules, but the increased costs and unclear benefits associated with early compliance, for-profit hospitals, oriented more to values of efficiency and profit, are expected to pursue mandatory compliance more strongly than not-for-profit hospitals but be less likely to pursue early compliance compared to not-for-profit hospitals.

Hypothesis 6m: For-profit hospitals will be *more likely* to achieve *mandatory compliance* than not-for-profit hospitals.

Hypothesis 6e: For-profit hospitals will be *less likely* to achieve *early compliance* than not-for-profit hospitals.

In addition, institutional logics focus the attention of key decision makers on specific issues and solutions (Ocasio 1997), leading to logic-consistent organizational strategies that reinforce organizational identities (Thornton 2002). Given the stronger market logic operating in for-profit hospitals, both dedicated compliance officers and external consultants are expected to have more pressures to achieve mandatory compliance while having even greater difficulty justifying the increased costs of early compliance. Therefore, we posit that dedicated compliance officers and external

consultants will have effects consistent with hypotheses 1 and 2, particularly in for-profit hospitals (i.e., there will be interaction effects of for-profit and dedicated compliance officers as well as for-profit and external consultants).

Hypothesis 7m: For-profit hospitals with dedicated HIPAA compliance officers will be *more likely* to achieve *mandatory compliance* than not-for-profit hospitals.

Hypothesis 7e: For-profit hospitals with dedicated HIPAA compliance officers will be *less likely* to achieve *early compliance* than not-for-profit hospitals.

Hypothesis 8m: For-profit hospitals using external consultants will be *more likely* to achieve *mandatory compliance* than not-for-profit hospitals.

Hypothesis 8e: For-profit hospitals using external consultants will be *less likely* to achieve *early compliance* than not-for-profit hospitals.

DATA AND METHODS

We use data from the 2003 Health Information and Management Systems Society (HIMSS) Analytics Database,² which includes hospital characteristics and information about health IT systems and activities in U.S. hospitals. In 2003 HIMSS asked hospitals to report their status on each of the HIPAA information rules and describe their strategies for achieving compliance. The 2003 database includes 3,998 nonfederal acute-care hospitals.³ In any given year, the HIMSS Analytics Database represents nearly all medium to large hospitals, and more than 90 percent of all hospitals in the United States (McCullough 2008). Given the incomplete coverage of small hospitals, and because the HIPAA regulations gave small hospitals extended time to achieve compliance, we restrict our analysis to hospitals with 50 or more beds ($n = 3,321$).

The HIMSS survey asked hospitals to report HIPAA compliance with each of the two rules. This question had a 66 percent response rate ($n = 2186/3321$),⁴ so while we drop all cases that did not respond to this question, we are able to control for the selective response bias by considering how hospital characteristics are associated with the *reporting* of compliance (details below). Some hospitals reported their compliance status for each rule in categories of less than 50 percent, 50 to 75 percent, 75 to 99 percent, or 100 percent compliant, while others simply reported whether they were or

were not in compliance with each rule. We create indicator variables for *mandatory compliance* (including the categories of “100 percent compliant” or the statement “Privacy compliant” versus categories less than 100 percent or statements of “not Privacy compliant”), and *early compliance* (categories of “100 percent compliant with Security Rule” or statements of “Security Rule compliant” versus categories less than 100 percent or statements of “not Security compliant”), coded as *compliant* (= 1) or *not compliant* (= 0). Other studies of compliance use self-reported data (e.g., Magat and Viscusi 1990; Shimshack and Ward 2005). Given that only two thirds of hospitals report mandatory compliance and only 16 percent report early compliance, it seems unlikely that there is significant overestimation of compliance in this self-reported data.

HIMSS asked hospitals if the chief compliance officer had sole functional responsibility for compliance or whether the compliance officer’s function is part of another functional role such as CFO, COO, or director of quality management. We code the dedicated compliance officer as “1” if the officer has sole compliance responsibilities and as “0” if not. In hospital systems where a hospital did not designate a compliance officer at the individual hospital facility, the functional role of the compliance officer at the system level was used to code the individual facility.

HIMSS asked hospitals whether they used external consultants to achieve HIPAA compliance. We code external consultants as “1” if consultants were used at a hospital and as “0” otherwise. To operationalize the extent of state regulation of information disclosure we used Pritts and colleagues’ (2003:vols. 1 and 2) comprehensive review of state health disclosure statutes—rules defining protections of specific types of health information and governing the disclosure of that information—in 2002. Based on this review, we code each state for the existence of regulations for each of 10 statutes (coded as “1” if a regulation exists and as “0” otherwise), sum across these 10, and divide by 10 to assign each state a value between 0 and 1 to represent state disclosure policies. To measure mimetic institutional pressures, we observe peer compliance as the proportion of other hospitals in the local hospital referral region (HRR) that are in mandatory and early compliance, respectively (excluding the focal hospital).

A key variable in our analysis is the *profit status* of the hospital as this is an indicator of competing institutional logics among hospitals. Profit status is

coded as “1” if it is for-profit and “0” if not-for-profit. We use the Hirschman-Herfindahl index (HHI) to measure the intensity of market competition in the HRR, based on concentration of beds (Harrison 2007). The HHIs were estimated by considering all hospitals competing in a market including smaller hospitals (i.e., less than 50 beds). HHI takes a value from $1/N$ to 1 (where N is the number of providers in the market), with 1 meaning complete monopolization of a market (i.e., lack of competitive market) and small values (approaching 0) for large N indicating more competitive markets.

In the analyses reported below we control for a number of hospital characteristics. First, we calculate the number of advanced clinical IT systems (0–4) in use at each hospital as reported in HIMSS. Advanced clinical IT systems are beyond basic laboratory, pharmacy, and radiology information systems and include systems of computerized patient records, clinical documentation, clinical data repository, and clinical decision support. The number of IT systems has implications for the complexity and difficulty of implementing HIPAA information rules, particularly for early compliance since the Security Rule requires implementing data security (Huston 2001), data encryption, and authentication techniques (Chao, Twu, and Hsu 2005). However, hospitals with more advanced IT systems may have greater organizational capabilities for implementing the information security and privacy requirements of HIPAA.

The unit of analysis is the individual hospital, including stand-alone hospitals and members of integrated health delivery systems. Hospitals that are members of multihospital integrated health delivery systems are coded as “1” if system affiliated and as “0” otherwise. We also control for the teaching status of the hospitals, coded as “1” if a hospital is a teaching hospital and as “0” otherwise. Finally, we also control for the number of licensed beds per hospital in each model.

Recall that 34 percent of hospitals did not report compliance status to HIMSS. Given that nonreporting of compliance may be related to compliance status, we ran a Heckman selection model (Berk 1983; Heckman 1979) to account for this potential bias. The selection bias is akin to an omitted variable problem, and the Heckman procedure is similar to using an instrumental variable analysis. The Heckman correction was carried out in two stages: First, the probability of *reporting* compliance status was predicted using a logistic regression with month of survey completion, profit status, teaching status, and system affiliation as predictors. In the second

stage, the “hazard” rate from the first-stage regression was used as an offset term in the logistic regressions to predict compliance status in the sample of hospitals reporting both mandatory and early compliance ($n = 2,186$).

Since each of the dependent variables (mandatory and early compliance) is binary, the logistic procedure was used to fit the regression model (Stata 11.1). The coefficients in logistic regression are interpreted as the logarithm of the odds of an event's occurring given independent variables specified in the equation. We estimated robust standard errors to adjust for clustering in local markets (HRR) to account for potential bias due to omitted geographic factors.

RESULTS

Table 2 shows the descriptive statistics for all variables in the analyses, for all hospitals in the analytic sample, and stratified by profit status. About two thirds of hospitals achieved mandatory compliance in 2003, with for-profit hospitals' being significantly more likely than not-for-profit hospitals to be compliant. In contrast, only 16 percent of hospitals have achieved early compliance in 2003, with for-profit hospitals' being significantly less likely to be early compliant than not-for-profit hospitals.

Overall 47 percent of hospitals named dedicated compliance officers, with for-profit hospitals less likely than not-for-profit hospitals to have done so. In considering the organizational strategy of hiring external consultants, about 31 percent overall hire consultants, with the same percentage in both for-profit and not-for-profit hospitals.⁵

Scores for state-level statutes governing PHI vary from .3 to 1.0, with a mean value of .79, which is identical in for-profit and not-for-profit hospitals. The proportion of peer hospitals in mandatory compliance is 47 percent for all hospitals, with for-profit hospitals exposed to significantly greater levels of peer mandatory compliance than not-for-profit hospitals. The proportion of peer hospitals in early compliance is 12 percent, with for-profit hospitals exposed to lower levels of peer early compliance than not-for-profit hospitals. The HHI ranges from .02 to 1.0, with a mean of .12, indicating a fairly highly competitive market for hospitals. On average, for-profit hospitals are in more competitive markets than are not-for-profit hospitals ($.10 < .12, p \leq .01$).

Out of a possible total of 4 clinical IT systems, hospitals have on average about 2.5 systems, with

for-profit hospitals' having significantly more than not-for-profit hospitals ($2.6 > 2.4, p \leq .01$). Nearly three quarters of hospitals are affiliated with a multi-hospital integrated health care delivery system. The vast majority of for-profit hospitals are affiliated with a health care system, while only two thirds of not-for-profit hospitals are. Hospital bed size ranges from 50 to 1,868, with a mean of 245. For-profit hospitals have fewer beds on average than not-for-profit hospitals. Finally, less than 10 percent of hospitals are teaching hospitals, with for-profits being significantly less likely to be teaching hospitals than not-for-profit hospitals.

In Table 3 we show the logistic regression analyses of mandatory and early compliance in U.S. hospitals. In response to HIPAA regulations some hospitals created the new position of compliance officer rather than assigning the compliance activities to another functional role, and we expected them to increase the likelihood of mandatory compliance but have the opposite effect on early compliance (Hypothesis 1m, Hypothesis 1e). Results shown in Table 3 (Model 1 in mandatory and early compliance models) confirm these hypotheses. We also expected that these effects would be stronger in for-profit hospitals (Hypothesis 7m, Hypothesis 7e). As shown in Model 2 for each type of compliance, we find that for-profit hospitals with dedicated compliance officers were more likely to achieve mandatory compliance (consistent with Hypothesis 7m) but no more or less likely to achieve early compliance (no support for Hypothesis 7e).

A different organizational strategy is to hire external consultants, who we expected to increase the likelihood of mandatory compliance but decrease the likelihood of early compliance. Table 3 shows that consultants do indeed decrease the likelihood of early compliance (consistent with Hypothesis 2e), but unexpectedly they also decrease the likelihood of mandatory compliance (not consistent with Hypothesis 2m). Yet, Model 2 in the mandatory compliance model sheds some light on this finding, showing that the effect of external consultants differs by the institutional logic operating in the hospital: Consultants have a positive effect on mandatory compliance in for-profit hospitals only (consistent with Hypothesis 8m); the negative coefficient for the direct effect of consultants in Model 2 of mandatory compliance indicates that in not-for-profit hospitals consultants *decrease* the likelihood of mandatory compliance. For early compliance we see that the interaction of for-profit and consultants in Model 2 is negative (as expected by Hypothesis 8e) but not significant.

Table 2. Descriptive Statistics for U.S. Acute-Care Hospitals with 50+ Beds in 2003 Health Information and Management Systems Society (HIMSS) Analytics Database.

Variable	All N = 2,186	Institutional Logic	
		For-Profit n = 463	Not-For-Profit n = 1,723
<i>Dependent variables</i>			
Mandatory compliance [Privacy Rule yes = 1, no = 0]	.65 (.48)	.88 (.33)***	.59 (.49)
Early compliance [Security Rule yes = 1, no = 0]	.16 (.37)	.06 (.24)***	.19 (.39)
<i>Independent variables</i>			
<i>Organizational strategy</i>			
Dedicated compliance officer [yes = 1, no = 0]	.47 (.50)	.37 (.48)***	.50 (.50)
External consultant [yes = 1, no = 0]	.31 (.46)	.31 (.46)	.31 (.46)
<i>Institutional environment</i>			
Coercive: state disclosure statutes [range 0 to 1]	.79 (.14)	.79 (.14)	.79 (.14)
Mimetic: peer mandatory compliance	.47 (.21)	.52 (.20)***	.46 (.21)
Mimetic: peer early compliance	.12 (.13)	.10 (.12)***	.12 (.13)
<i>Market environment</i>			
Herfindahl-Hirschman index of competitive intensity [range 0 to 1]	.12 (.11)	.10 (.11)**	.12 (.11)
<i>Control variables</i>			
Number of clinical IT systems [range 0 to 4]	2.47 (1.28)	2.61 (1.07)**	2.44 (1.32)
System affiliated [yes = 1, no = 0]	.72 (.45)	.95 (.22)***	.65 (.48)
Number of beds (in 100's)	2.45 (1.77)	2.13 (1.37)***	2.53 (1.85)
Teaching hospital [yes = 1, no = 0]	.09 (.29)	.03 (.17)***	.11 (.31)

Note: Standard deviations are in parentheses. Statistical differences between for-profit and not-for-profit hospitals are based on a univariate ANOVA *F* test.

p* < .01, *p* < .001, (two-tailed).

The main effect of consultants remains negative and significant indicating consultants decrease the likelihood of early compliance as expected by Hypothesis 2e, but only in not-for-profit hospitals.⁶ The different effects of external consultants between for-profit and not-for-profit hospitals illustrate that competing logics not only can coexist in the same organizational field but also can have significantly divergent effects on organizations (Lounsbury 2007; Marquis and Lounsbury 2007; Reay and Hinings 2009). This finding supports the view that competing logics can remain independent and enduring rather than necessarily promoting rivalry between logics (Lounsbury 2007; Reay, Golden-Biddle, and Germann 2006).

We gain further insight into the role of competing institutional logics by examining how hospital profit status directly affects organizational compliance. In Table 3, consistent with hypotheses, we see that for-profit hospitals are significantly more likely to achieve mandatory compliance (Hypothesis 6m) but significantly less likely to achieve early compliance (Hypothesis 6e). These findings can be understood

from the simple economic cost differences between early versus mandatory compliance, but only when coupled with an understanding of the institutional logic of profit maximization in for-profit hospitals. Consistent with a market logic, for-profit hospitals are less likely than not-for-profits to invest in costly compliance activities with unclear benefits, as in early compliance, but more likely to devote resources to mandatory compliance where the costs of noncompliance (e.g., fines) are known and expected.

Neoinstitutionalists explain that features of the institutional environment influence organizational compliance. One important institutional feature is coercive state law. Table 3 shows that state statutes governing PHI are positively associated with mandatory compliance (consistent with Hypothesis 3m) but are not significantly associated with early compliance (no support for Hypothesis 3e). Neoinstitutionalists also theorize about the importance of mimetic forces. Table 3 shows strong peer effects in which a greater proportion of hospitals in the referral region that are compliant significantly increases the likelihood of

Table 3. Mandatory and Early Health Insurance Portability and Accountability Act Compliance in U.S. Hospitals.

	Form of Regulation			
	Mandatory Compliance: Privacy Rule		Early Compliance: Security Rule	
	Model 1	Model 2	Model 1	Model 2
Organizational strategies				
H1: Compliance officer	.55 (.12) ***	.45 (.13) ***	-.33 (.16) *	-.31 (.17)
H2: External consultant	-1.15 (.16) ***	-1.44 (.17) ***	-1.58 (.31) ***	-1.56 (.31) ***
Institutional environment				
H3: Coercive: state disclosure statutes	1.03 (.44) *	.83 (.43) +	.12 (.47)	.13 (.47)
H4: Mimetic: peer compliance	2.37 (.32) ***	2.36 (.32) ***	4.01 (.47) ***	4.02 (.47) ***
Market environment				
H5: Competitiveness: Hirschman-Herfindahl index	-.41 (.50)	-.35 (.50)	-1.37 (.71) *	-1.37 (.71) *
Institutional logic				
H6: For-Profit	1.63 (.25) ***	.36 (.27)	-1.47 (.33) ***	-1.36 (.40) ***
H7: For-Profit × Compliance Officer	—	3.51 (.57) ***	—	-2.21 (.43)
H8: For-Profit × External Consultant	—	2.00 (.60) ***	—	-.37 (.88)
Control variables included^a				
Intercept	-1.87 (.40) ***	-1.62 (.39) ***	-2.08 (.45) ***	-2.09 (.45) ***
Wald chi ² (9)	262.1	278.9	155.5	201.8
Pseudo R ²	.177	.205	.149	.149
Log pseudolikelihood	-1611.5	-1556.9	-1273.2	-1272.9
N	2,186	2,186	2,186	2,186

Note: Robust standard errors clustered at hospital referral region are shown in parentheses. To account for potential selection bias in reporting of compliance, Heckman correction was used in two stages: First, the probability of reporting compliance was predicted using logistic regression with month of survey completion, profit status, teaching status, and system affiliation as predictors. In the second stage, the "hazard" rate of reporting compliance was used as an offset term in the logistic equation of compliance. H = Hypothesis. Dashes indicate that those variables are not included in the model.

^aControl variables include number of advanced IT systems, number of licensed beds, integrated system-affiliated hospital or not, teaching hospital or not.

* $p < .10$, ** $p < .05$, *** $p < .01$, **** $p < .001$.

both mandatory (Hypothesis 4m) and early (Hypothesis 4e) compliance.

We expected to see a positive effect of market competition on mandatory compliance (Hypothesis 5m). Recall that HHI measures competitive markets as having lower values, so we should expect to see a negative effect of HHI if competitiveness has a positive effect as hypothesized in Hypothesis 5m. In Table 3, however, we see the coefficient for HHI is negative but not significant in Model 1 of mandatory compliance (no support for Hypothesis 5m). In contrast, competitive market conditions are expected to inhibit early compliance (Hypothesis

5e); thus, we should see a positive effect of HHI, but as results show, the HHI coefficient is negative and significant for early compliance. This suggests that hospitals in competitive markets saw an advantage in achieving early compliance. Indeed, it may be the case that given the considerable uncertainty among hospitals regarding how aggressively the federal government was going to enforce, fine, and publicize information breaches under HIPAA, hospitals in especially competitive markets may have concluded that pursuing HIPAA Security Rule compliance, despite the costs, was worthy of early investment.⁷ In addition, hospitals may have sought

to gain recognition as technology leaders by pursuing IT security in competitive markets. For example, the industry publication *Hospitals and Health Networks* began giving Most Wired Hospital Awards to hospitals with the most extensive and advanced IT systems in 2002.

DISCUSSION

Hospitals in the United States are highly regulated yet also highly variable in organizational form, practices, and outcomes. Understanding how acute-care hospitals respond to new regulation, and what determines whether they comply, has important implications both for creating desired reform of health care in the United States and for medical sociologists interested in the structure and organization of health care more generally. Here we examined how organizational strategies, institutional forces, and market conditions shaped compliance with major federal regulation in health care, the HIPAA Privacy and Security Rules. In addition, we considered whether the competing institutional logics in U.S. acute-care hospitals moderate some of those effects.

We find, consistent with neoinstitutional theories, that both coercive (state-level statutes governing PHI) and mimetic (compliance in peer hospitals) institutional forces influence mandatory compliance, but only mimetic forces are associated with early compliance. Also, as expected, for-profit hospitals were significantly more likely to achieve mandatory compliance but significantly less likely to be in early compliance, consistent with an institutional logic attentive to costs and benefits (i.e., avoiding fines from noncompliance with mandatory regulation while also avoiding costs associated with early compliance). Institutional logics may also affect internal organizational approaches that we cannot examine with these data. For example, not-for-profit hospitals may pursue incremental changes to address compliance with both rules simultaneously, while for-profit hospitals may focus more directly and efficiently on mandatory regulation only. Future research examining phased compliance regulations, such as the 2009 HITECH Act's meaningful use objectives, should consider the role of competing institutional logics in U.S. hospitals.

We also find that hospital strategies affect compliance differently depending on the regulatory form. Dedicated compliance officers in hospitals increase the likelihood of mandatory compliance but decrease early compliance. These findings support

ideas about the importance of institutional entrepreneurs inside organizations who can mobilize resources to motivate behavior consistent with their own interests. The increasing prevalence of compliance officers in U.S. hospitals today illustrates the ongoing impact of regulation on hospital organizational structure. Given that the position of compliance officer (and the resources controlled by the person in that position) is in the nonclinical bureaucratic administration of the hospital, this finding also raises questions regarding how compliance officers might influence subsequent changes within the hospital (e.g., implementation of HITECH meaningful use objectives).

In contrast to compliance officers, we find that the external consultants who bring industry best practices into the hospital appear to operate differently, despite both being sources of professional knowledge. Though both for-profit and not-for-profit hospitals pursued the strategy of hiring external consultants, the success of consultants in achieving mandatory compliance varied dramatically between for-profit (increasing compliance) and not-for-profit (decreasing compliance) hospitals. It may be the case that consultants hired by for-profit hospitals are more skilled or that they can demand greater resources for compliance activities. Alternatively, the managerial practices brought by external consultants may fit with the market logic in for-profit hospitals but conflict with a professional-medical logic in non-profit hospitals, making their success in non-profit hospitals less likely. We cannot examine such questions with these data, but we recognize the importance of exploring further how consultants, and dedicated compliance officers, operate within the hospital to produce compliance. These findings suggest empirical support for qualitative findings that micro-institutional processes inside the organization (something we cannot examine with our data) influence organizational compliance, particularly in the face of internal resistance (Kellogg 2011). Given the increasing role of professional consultants in health care (e.g., the National Society of Certified Healthcare Business Consultants was founded in 2006), the findings of differential effects of consultants across hospitals should suggest caution by practitioners and policy makers alike in pursuing this strategy for organizational reform of the delivery system.

Most importantly, this research demonstrates the significance of institutional logics both in U.S. health care and in organizational change more generally. Institutional logics influence not necessarily

the strategies hospitals pursue but rather the success of those strategies. Our findings show that institutional logics influence hospital compliance directly (i.e., significant direct effect of profit status) and also that logics moderate how organizational strategies affect compliance, at least with respect to external consultants. Though some scholars have focused on how competing institutional logics shift and are replaced over time (Reay and Hinings 2005; Scott et al. 2000), this research furthers our understanding of organizational behavior and change in the face of multiple logics operating simultaneously (Caronna 2011; Lounsbury 2007).

Furthermore, the findings shed light on the interaction of organizational, institutional, and market forces in understanding the effects of regulation. Such findings are particularly important in health care, an industry with a long history of both state-sponsored and private regulation to promote specific organizational forms and practices (Alexander and Scott 1984; Starr 1982; Stevens 1989). Institutional theories expect regulation to drive organizational consistency across an industry, but instead we find that regulations are filtered through varying market and institutional environments, to organizations that respond with various strategies. Further complicating these forces of variation in health care are the competing logics in for-profit (market logic) versus not-for-profit (professional logic) hospitals, in which the same organizational strategies produce differing results on compliance. Thus, uniform government regulations end up contributing not only to different rates of regulatory compliance but also to organizational variation itself.

CONCLUSION

The entire health care industry is currently undergoing dramatic changes with the widespread implementation of information technologies such as electronic health records. The demand for more systematic analysis of clinical information is driven not only by regulation as analyzed here but also by various stakeholders' interests in evaluating, monitoring, and controlling clinical information (e.g., Buntin et al. 2011; Institute of Medicine 2003). Changes in information monitoring and control typically require modifications to organizations since new technology is generally disruptive to existing organizational structures and routines (Barley 1986; Harrison, Koppel, and Barlev 2007; Orlikowski and Barley 2001; Wright 2011). Here

we explored how hospitals' response to specific government regulation for health information privacy and security—the HIPAA information rules—demonstrates how and why regulation leads to organizational variation rather than uniformity in health care. Though health care is a latecomer to the Information Age, the dramatic changes currently under way in the U.S. health care system related to the control and use of electronic patient information are producing significant organizational changes that will have lasting implications for the medical professions, the vast health marketplace, and not least of all, the patients in the U.S. health care system.

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NOTES

1. The Health Insurance Portability and Accountability Act (HIPAA) legislation included two key parts: Title I and Title II. Title I of HIPAA regulates the availability and coverage of group health plans and certain individual health insurance policies. Title I also limits restrictions that a group health plan can place on benefits for preexisting conditions. Under the new legislation, individuals may reduce the exclusion period if they had group health plan coverage or health insurance prior to enrolling in the plan. Title II of HIPAA contains the "administrative simplifications" that cover electronic information exchange and transactions generally and include the Privacy and Security Rules examined in this article.
2. Health Information and Management Systems Society (HIMSS) has been used extensively in

- health IT research (e.g., Appari, Johnson, and Anthony 2012; Kazley and Ozcan 2008; Miller and Tucker 2009). HIMSS conducts an annual in-depth health IT inventory survey completed by hospital administrators. HIMSS provides benchmarking reports to respondents as an incentive for participation. Recent comparative analyses of HIMSS and other data sources for health IT find gaps and year-to-year inconsistencies in all data sets, particularly with regard to adoption of specific IT systems (Kazley, Diana, and Menachemi 2011).
3. Our sample of acute-care hospitals includes hospitals that are referred to by the American Hospital Association as “community hospitals,” defined as “all nonfederal, short-term general, and other special hospitals” (<http://www.aha.org/research/rc/statstudies/fast-facts.shtml#community>).
 4. For comparison, a survey administered by the American Hospital Association on health IT use that has been used extensively to analyze IT in hospitals had a response rate of 63.1 percent (see Jha et al. 2009).
 5. About 13 percent of hospitals follow both strategies, that is, appointing a dedicated compliance officer and hiring external consultants, including 8.2 percent of for-profit hospitals and 14.3 percent of not-for-profit hospitals. Including a variable for the interaction of compliance officer and external consultants in the models had no substantive or significant effects. The interaction term was never significant, and it caused no changes to the individual items or to other variables in the model.
 6. In subsequent analyses to test the robustness of these findings (data not shown), we stratified the sample between for-profit and not-for-profit hospitals. Stratifying the sample is like interacting every independent variable with profit status. In the stratified analyses we find patterns that are entirely consistent with those reported in the article. For mandatory compliance, external consultants are positive and significant among for-profit hospitals but negative and significant among not-for-profit hospitals. For early compliance, external consultants are negative and significant for both for-profit and not-for-profit hospitals. All other independent variables are consistent with results reported here with the exception that state disclosure statutes are positive and significant for mandatory compliance among for-profit hospitals only.
 7. We thank an anonymous *Journal of Health and Social Behavior* reviewer for this point.

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AUTHOR BIOGRAPHIES

Denise L. Anthony is an associate professor of sociology at Dartmouth College. Her work explores issues of cooperation, trust, and privacy in settings from health care to micro-credit borrowing groups to online groups such as Wikipedia and Prosper.com. Her current work examines the use and implications of information technology in health care and for privacy. Her multidisciplinary research has been published in sociology as well as in health policy and computer science journals. She holds a PhD in sociology from the University of Connecticut.

Ajit Appari is an assistant professor in the Division of Management, Policy and Community Health at the School of Public Health, University of Texas Health Science Center at Houston. His teaching and research focuses on the economics of health information technology and the economics of health care delivery. He holds a PhD in business administration from Syracuse University and an MTech in quality, reliability, and operations research from Indian Statistical Institute.

M. Eric Johnson is the dean of the Owen Graduate School of Management at Vanderbilt University. His teaching and research focuses on the impact of information technology on the extended enterprise. His recent book, *The Economics of Financial and Medical Identity Theft* (Springer 2012), examines the security failures and economic incentives that drive identity theft. He has authored patents on interface design and has testified before the U.S. Congress on information security. He holds a PhD in engineering from Stanford University.