Hospital Characteristics Related to the Intention to Apply for Meaningful Use Incentive Payments

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Abstract

The Health Information Technology for Economic and Clinical Health (HITECH) Act of 2009 provides incentives for hospitals to fully adopt and use electronic health records (EHRs).

We used data from the 2009 American Hospital Association (AHA) Annual Survey Information Technology Supplement and the Centers for Medicare and Medicaid Services (CMS) 2008 Hospital Cost Reports to examine how various hospital characteristics are associated with the intention to pursue meaningful use incentives. Overall, 86 percent of hospitals indicated an intent to pursue HITECH incentives. However, hospitals that already have an EHR system, are larger, and are located in urban areas are more likely to indicate an intention to pursue incentives. Despite a high interest in HITECH incentives, certain hospital characteristics, including current EHR use, increase the proclivity for some hospitals to pursue meaningful use. Given these differences, there is the potential for the HITECH Act to inadvertently increase the digital divide between hospitals with certain characteristics and their counterparts without those characteristics. Policy makers should consider ways to alleviate barriers, especially for nonusers of EHRs, to realize the maximum benefits of the HITECH Act.

Key words: meaningful use incentives, HITECH Act, electronic heath records

Introduction

There is growing evidence that electronic health records (EHRs) have the potential to improve the quality and efficiency of care delivered in hospitals.[1–3] Much of the potential benefit of EHRs comes from decision support systems and the ability to share information among providers yet, EHR adoption among hospitals remains low, thus limiting the potential benefits of interoperability.[4-9] The Health Information Technology for Economic and Clinical Health (HITECH) Act of 2009 allocated billions of dollars for incentives that became available in fiscal year 2011 through the Centers for Medicare and Medicaid Services (CMS) for hospitals to adopt and meaningfully use EHRs, as defined by the Office of the National Coordinator for Health Information Technology.[10,11]

The goals of the legislation are to transform the healthcare system for improved quality and efficiency by increasing the adoption and use of EHRs, but it is unclear if providers will seek the incentive payments at the rates expected. Thus, a key policy question is, to what extent will hospitals adopt and meaningfully use EHR systems as a result of these incentives? Will hospitals that have not yet adopted EHRs do so (and achieve meaningful use) in an effort to gain access to the incentives, or will hospitals that have already adopted EHRs demonstrate meaningful use to gain access to the incentives? The former would potentially increase the EHR adoption rate among hospitals, while the latter would be more likely to reward those hospitals that have already adopted EHRs and thus not would completely fulfill the overall intent of the legislation, which is to increase the EHR adoption rate. Understanding the hospital characteristics that are associated with the intention to pursue incentives under the HITECH program can assist policy makers as they attempt to maximize the impact of the program.

The purpose of this study is to investigate the hospital and market characteristics associated with the stated intention to pursue incentive payments under the Medicare and Medicaid meaningful use programs. Moreover, we examine barriers among hospitals to the intention to apply for the HITECH incentives. We use data collected by the American Hospital Association (AHA) about the intention of hospitals to participate in the incentive program. This information is particularly important early in the meaningful use program because it will enable policy makers to adjust the program, as needed, to ensure its success.

Methods

The study utilizes a cross-sectional design using data from the 2009 AHA Annual Survey Information Technology Supplement and the CMS 2008 Hospital Cost Reports. The unit of analysis is the individual acute care hospital not operated by the federal government. The sample consists of all US hospitals with complete data reported for all the variables in the model.

We provide a descriptive summary of the intention to pursue meaningful use incentives, the timing of the intention to pursue incentives, and the barriers that hospitals reported in response to the question "Why are you not pursuing or unsure whether you will pursue Medicare/Medicaid meaningful use incentive payments?" These responses are cross-tabulated by frequency of responses and current level of EHR use.

The dependent variable in the logistic regression model is the hospital management's intention to seek HITECH funding, which is based on the following survey question: "Do you intend to apply for Medicare or Medicaid incentive payments for meaningful use of health IT?" Our model includes independent variables that we hypothesize would influence the decision to pursue incentives under the HITECH program, including current EHR use, bed size, geographic location, system membership, tax status (i.e., for-profit, nonprofit), percent of Medicare and Medicaid discharges, and teaching status. Moreover, we include a variable in the model that measures market-level competition as measured by the Herfindahl-Hirschman Index (HHI). The HHI measures competition by evaluating both the number of firms in a market and the market share each firm controls. We calculated the HHI as the sum of the squares of market share, measured using system-level bed size, with the county as the market. Consistent with the AHA data, we measured EHR use as full, partial, or none. We measured size as the number of staffed beds, and this measure was logged to facilitate analysis. Location, system membership, teaching status, and for-profit status were measured as binary indicators. In addition, the HITECH Act is designed to provide higher incentives to hospitals that provide care to a larger share of Medicare and Medicaid patients. Thus, we investigated whether payer mix is associated with the intention to seek incentives. Payer mix was measured as the percentage of the hospital's total discharges that were Medicare and Medicaid discharges, grouped into quartiles. We also estimated marginal effects because odds ratios may not reliably estimate the relative risk when the outcome of interest is not a rare event.

Results

Our sample included 2,980 nonfederal acute care hospitals, of which 2,860 answered the question about the intention to apply for incentives. Most responding hospitals were not-for-profit (89 percent), were in urban settings (60 percent), and were not teaching hospitals (93 percent). Slightly more than half (51 percent) were members of a hospital system. The mean bed size was 181 (SD = 201.5), and the mean payer mix was 0.56 Medicare and Medicaid (SD = 0.15). The mean HHI was 0.57 (SD = 0.34). Overall, 2,434 hospitals responded to the question "Does your hospital have an electronic health record?" Of the hospitals responding to this question, 18% had not adopted EHRs, 61% had partially adopted EHRs, and 21% had fully adopted EHRs. (See the Appendix for further details on the study sample.)

As shown in Table 1, most hospitals that responded to the question of whether they intended to seek meaningful use incentives indicated that they would pursue incentives through Medicare (n = 452; 19.1 percent) or both Medicare and Medicaid (n = 1,598; 67.2 percent). Most hospitals that intended to pursue meaningful use incentives planned to make their first application in 2011 (n = 1,129; 54.7 percent) or 2012 (n = 563; 27.3 percent).

Table 1
Hospital Intention to Seek HITECH Incentives for Meaningful Use

	No EHR Use,	**Partial EHR Use,**	**Full EHR Use,**	
Survey Question	***n* (%)**	***n* (%)**	***n* (%)**	***p*-value**
Do you intend to apply for Medicare or Medicaid incentive payments for meaningful use of health IT?	N = 423	N = 1,451	N = 493	
Yes, Medicare	67 (15.8)	306 (21.1)	79 (16.0)	.008

Survey Question	No EHR Use, *n* (%)	Partial EHR Use, *n* (%)	Full EHR Use, *n* (%)	*p*-value
Yes, Medicaid	2 (0.5)	9 (0.6)	0 (0)	.216
Both	246 (58.2)	971 (66.9)	381 (77.3)	<.001
Neither	9 (2.1)	5 (0.3)	3 (0.6)	.001
Undecided	41 (9.7)	80 (5.5)	14 (2.8)	<.001
Do not know	58 (13.7)	80 (5.5)	16 (3.3	<.001
In what federal fiscal year (Oct. 1–Sept. 30) do you plan to make your first application?	*N* = 325	*N* = 1,282	*N* = 456	
2011	150 (46.2)	685 (53.4)	294 (64.5)	<.001
2012	92 (28.3)	360 (28.1)	111 (24.3)	.28
2013	35 (10.8)	127 (9.9)	15 (3.3)	<.001
2014–2016	7 (2.2)	17 (1.3)	4 (0.9)	.31
Do not know	41 (12.6)	93 (7.3)	32 (7.0)	.004

Table 2 presents reasons for not pursuing incentives by hospital EHR adoption status. The most common reason given for not pursuing incentives was the challenge of meeting meaningful use requirements (*n* = 133, 49.6 percent), followed closely by cost (*n* = 125, 46.6 percent). Lack of access to capital (*n* = 89, 33.2 percent), uncertainty about the certification process (*n* = 88, 32.8 percent), and reasons listed as "other" (*n* = 85, 31.7 percent) were also cited as common barriers. Upon further examination, many free-form responses to the "other" category indicated some variation on the response that the decision to pursue incentives was being made at the system level, not at the hospital level (data not shown).

Table 2
Barriers to Pursuing Meaningful Use Incentive Payments

Survey Question	No EHR Use, *n* (%)	Partial EHR Use, *n* (%)	Full EHR Use, *n* (%)	*p*-value
Why are you not pursuing or unsure whether you will pursue Medicare/Medicaid meaningful use incentivepayments?	*N* = 93	*N* = 145	*N* = 30	
Cost	53 (57.0	62 (42.8)	10 (33.3)	.030
Lack of access to capital	40 (43.0)	43 (29.7)	6 (20.0)	.027
Resistance to implementation	20 (21.5)	34 (23.4)	2 (6.7)	.118
Concerns about security or	11 (11.8)	12 (8.3)	2 (6.7)	.569
liability for privacy breaches				
Uncertainty about certification	25 (26.9)	51 (35.2)	12 (40.0)	.279
process				
Lack of vendor capacity	10 (10.8)	21 (14.5)	4 (13.3)	.706
Lack of adequate information	36 (38.7)	41 (28.3)	1 (3.3)	.001
technology (IT) personnel in the hospital to support implementation/maintenance				

Survey Question	No EHR Use, *n* (%)	Partial EHR Use, *n* (%)	Full EHR Use, *n* (%)	*p*-value
Challenge of meeting all meaningful use criteria within implementation timeline	43 (46.2)	79 (54.5)	11 (36.7)	.149
Other	25 (26.9)	46 (31.7	14 (46.7)	.129

Table 3 presents the results of the logistic regression examining hospital factors associated with the intention to seek funding under the meaningful use program. Hospitals that have partial (OR = 1.85; 95% CI 1.33–2.57; marginal effect = +7.3) or full EHRs (OR = 3.61; 95% CI 2.13–6.12; marginal effect = +12.6) are significantly more likely than those that have not adopted EHRs to indicate an intention to pursue incentives. Hospital bed size (OR = 1.26; 95% CI 1.06–1.50; marginal effect = +2.3) and urban location (OR = 1.88; 95% CI 1.21–2.91; marginal effect = +6.2) are significantly positively related to the intention to pursue incentives, while for-profit hospitals (OR = 0.25; 95% CI 0.17–0.36; marginal effect = –13.8) and system members (OR = 0.52; 95% CI 0.39–0.71; marginal effect = –6.4) are significantly less likely to indicate an intention to pursue incentives. We did not find a correlation between intention to apply for incentives and the percentage of Medicare or Medicaid discharges, competition, or teaching status.

Table 3
Logistic Regression Results for Hospitals Planning to Seek HITECH Incentives (*N* = 2,014)

Hospital Characteristics	Odds Ratio (95% CI)	Marginal Effect (%)
EHR status		
No EHR use	1.00	
Partial EHR use	1.85 (1.33, 2.57)***	+7.3
Full EHR use	3.61 (2.13, 6.12)***	+12.6
Percentage of Medicare discharges		
1st quartile	1.00	
2nd quartile	1.03 (0.67, 1.59)	+0.3
3rd quartile	1.01 (0.65, 1.56)	+0.1
4th quartile	1.19 (0.74, 1.91)	+1.7
Percentage of Medicaid discharges		
1st quartile	1.00	
2nd quartile	1.32 (0.9, 1.94)	+2.8
3rd quartile	1.40 (0.93, 2.12)	+3.3
4th quartile	1.08 (0.72, 1.63)	+0.8
Natural log of bed size	1.26 (1.06, 1.50)*	+2.3
For-profit tax status	0.25 (0.17, 0.36)***	–13.8
Urban location	1.88 (1.21, 2.91)***	+6.2
Competition (Herfindahl-Hirschman Index)	1.11 (0.61, 2.03)	+1.1
Teaching hospital	1.22 (0.52, 2.87)	+2.0
System member	0.52 (0.39, 0.71)***	–6.4

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

Discussion

The goals of the HITECH Act are to transform the healthcare system for improved quality and efficiency through increased and improved EHR use. A key policy question is, to what extent will hospitals adopt and meaningfully use EHR systems based on the incentives? It is important to have an understanding of the characteristics of hospitals that indicate an intention to pursue meaningful use incentives in order to assess the anticipated impact of the policy and guide any adjustments needed to improve its effectiveness.

Our main finding is that a high proportion of hospitals are interested in pursuing incentives, but certain characteristics are associated with a higher likelihood of intention to pursue incentives. In particular, having EHRs already in place greatly increases the likelihood of intention to pursue incentives. In fact, current EHR use is the highest positive correlate in our model as indicated by the marginal effect. The policy goals of the HITECH Act depend on meaningful use of EHRs, which in turn depends on EHR adoption. However, it appears that the Medicare and Medicaid incentive policy may not be encouraging nonadopters to adopt EHRs and become meaningful EHR users at the same rates as their counterparts who have already adopted or began their migrations to EHRs.

The goals of the HITECH Act are to improve the efficiency and quality of the healthcare system, and there are incremental benefits to both EHR adoption and achieving meaningful use.[12] The HITECH Act may disproportionately move current EHR users to meaningful use at the expense of moving non-EHR users to EHR adoption and meaningful use. The marginal benefit of moving current users to meaningful use may not outweigh the intended benefits anticipated from moving nonusers to adoption and meaningful use. Because the marginal benefit of having those hospitals that already use EHRs becoming meaningful users is unclear, the impact of the HITECH Act could be attenuated.

A second important finding is that for-profit hospitals and system members are less likely to indicate an intention to pursue meaningful use incentives. For-profit hospitals may be more likely to conduct a traditional return-on-investment calculation, which may lead to the conclusion that the cost of applying for incentives or the process itself outweighs any potential incentive payments or penalties. Our study's finding that "cost" is one of the major reasons for not pursuing incentives supports this explanation. System hospitals may also face complexities arising from their structure and the size of their enterprise that discourage them from wanting to pursue incentives, especially if those incentives are not viewed as financially worthwhile. A large number of the free-form responses to the "other" category of reasons for not pursuing incentives related to the decision's resting with the system rather than the hospital. We were not able to quantify these qualitative responses, but they do suggest that the effect of the system is important. The incentives may not be sufficient for system hospitals that may have a more difficult time implementing meaningful EHR use across many facilities. Future research should focus on system hospitals and determine if certain system types impact the decision to pursue meaningful use incentives.[13]

Third, the percentage of Medicare and Medicaid discharges does not appear to influence the intention to pursue incentives. This finding was consistent across all ranges of Medicare and Medicaid volume. The most likely explanation for this finding is that hospitals believe that the size of additional incentives for higher Medicare or Medicaid patient volumes is not sufficient to overcome the barriers of adopting EHRs and achieving meaningful use.

Lastly, our findings suggest that rural hospitals are less likely to indicate an intention to pursue meaningful use incentives. Previous research has indicated that rural hospitals are less likely to adopt EHRs.[14] Some rural hospitals may find it challenging to attract EHR vendors, and when they do, they may find that vendor products do not meet their unique needs. Furthermore, rural hospitals may not have the financial or human resource capacity to manage EHR implementation and achieve meaningful use, and recruiting such talent to isolated areas could be difficult. Other HITECH programs such as the Regional Extension Centers are focused primarily on small physician practices and a subset of rural hospitals (e.g., critical access hospitals), which may leave other rural hospitals with little support for EHR adoption and meaningful use. Policy makers should consider adjustments to the meaningful use incentive program that address these findings.

A limitation of this study is that it analyzes the stated intention to pursue meaningful use incentives, which may not reflect the actual pursuit of incentives. It is reasonable to suggest, however, that the actual pursuit of incentives will be less than intended, given the difficulty and complexity of achieving meaningful use. Nevertheless, now is the time for policy makers and decision makers to ensure that issues that threaten the maximum impact of the HITECH Act are addressed. Second, the analysis relies on self-reported secondary data from 2009, which may introduce recall and selection biases.[15] To address the issue of selection bias, we compared respondents to our dependent variable with nonrespondents and did not find any differences

based on hospital characteristics. Lastly, the measurement of EHR adoption in secondary sources has known reliability and validity issues.[16] It is unknown whether these measurement issues are influencing our results.

Our findings indicate that the policy goals of the HITECH Act may not be optimally achieved based on the indicated intention of hospitals to pursue meaningful use. However, the program is still in its early stages, with incentive payments beginning in fiscal year 2011. Our data provide CMS and state Medicaid agencies the opportunity to make adjustments that may improve the chances of achieving the overall policy goals. For example, they could modify incentive payments based on the distance hospitals are from achieving meaningful use so that hospitals that have yet to adopt EHRs may stand to receive higher incentives than those that have already adopted them. They could also focus on for-profit and system hospitals, perhaps in combination with their EHR adoption status. Lastly, they may consider higher incentive payments to rural hospitals to provide additional motivation for EHR adoption and additional financial resources for these facilities.

Appendix

Organizational Characteristics of Hospitals

	Acute Care Hospitals in the 2008 AHA Survey	Acute Care Hospitals in the Study Sample
Sample size	4,816	2,860
Mean bed size (SD)	168 (189)	181 (201)
Size category		
Small (<125 beds)	2,674 (56%)	1,512 (53%)
Medium (126–399 beds)	1,651 (34%)	1,013 (35%)
Large (400+ beds)	474 (10%)	335 (12%)
Tax status		
For-profit	756 (16%)	322 (11%)
Not-for-profit	4,060 (84%)	2,538 (89%)
System affiliated		
Yes	2,694 (56%)	1,448 (51%)
No	2,122 (44%)	1,412 (49%)
Geographic location		
Urban	2,457 (51%)	1,702 (60%)
Rural	2,359 (49%)	1,110 (39%)
Unknown	0 (0%)	48 (2%)

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