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A SURVEY OF RURAL HOSPITALS' PERSPECTIVES ON

HEALTH INFORMATION TECHNOLOGY OUTSOURCING

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ABSTRACT

Two rounds of surveys of rural hospitals were conducted in order to better understand their perspectives on health information technology (HIT) outsourcing and the role that hospital-to-hospital HIT partnerships (HHPs) can play as an outsourcing mechanism. The surveys sought to understand how HHPs might be leveraged for HIT implementation and the challenges and attitudes surrounding HIT outsourcing in general. The results suggest that HHPs have the potential to address rural hospitals' slow rate of HIT adoption, as well as identifying factors that play a role in the process of choosing to outsource. The findings of the study suggest a connection between experience with HIT outsourcing and receptiveness to future outsourcing initiatives. Improving common data standards, increasing options and improving IT literacy were all identified as potential ways to promote HIT outsourcing and partnerships.

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Chapter 1

Introduction

Access to high quality healthcare is a key challenge for people living in rural areas around the country. Rural hospitals are often faced with the increased challenge of providing quality healthcare while staying financially viable. As healthcare costs continue to increase, rural hospitals are looking for ways to maintain financial stability while still providing the best care possible to their patients.

One proposed solution to this challenge is implementing a strong health information technology (HIT) infrastructure within these hospitals. Furthermore, there has been increased US government effort to make HIT a fundamental part of hospitals[7]. A hospital that can effectively utilize HIT can not only lower operating costs, but also reduce medical errors[1]. However, as seen in adoption rates of HIT, not all hospitals have the resources to take advantage of HIT. This is especially true of rural hospitals[5]. Often, smaller rural hospitals with limited resources lack the ability to invest the financial or human resources needed to build and maintain an effective HIT infrastructure. For this reason, it is important that rural hospitals explore innovative approaches to acquiring and maintaining HIT.

Outsourcing the design and maintenance of this infrastructure to traditional HIT vendors is problematic because of the significant differences in scale. Surveys of IT outsourcing activity by hospitals reveal that in 2005 fewer than 15% of the IT functions were outsourced[11]. Large HIT vendors find it difficult and unprofitable to engage in the myriad of relationships with small rural hospitals and small rural hospitals cannot afford the large contract fees nor do they have the expertise or resources needed to initiate and manage such relationships[12].

In response to this problem, an innovative approach to outsourcing was put forth by Reddy, et al.[10] who proposed that the smaller rural hospital outsources its HIT to a larger, more technologically advanced, regional hospital. This approach has been termed the *hospital-to-hospital HIT partnership (HHP)* model, and has been shown to be successful in a rural four-hospital setting. However, there is a need to further explore the perspectives of rural hospitals concerning their HIT issues and whether a model such as HHP would be beneficial to them. These needs have also been identified by US government agencies, who have put forth rural healthcare initiatives to better understand the needs of rural hospitals and provide them with resources to help expand their IT infrastructures[13,14].

Therefore, in an attempt to further our understanding about rural hospitals' perspectives on HIT, this project presents two rounds of survey results using the same survey instrument (Appendix A). The discussion of the first round focuses on identifying how rural hospitals view the benefits and challenges of HIT, the benefits and challenges of the HHP model, interest in outsourcing, and their awareness of resources available to them. The second round then focuses on better understanding the current environment of HIT and HIT outsourcing in rural hospitals. In particular, we looked at hospitals who are part of or might benefit from forming hospital-to-hospital IT partnerships (HHPs) in order to meet their HIT needs through outsourcing. We then discuss potential factors that are influencing the perception of challenges with HIT outsourcing and HHP implementation.

Chapter 2

Background

HIT can play an important role in a hospital's ability to care for its patients. HIT has been found to improve patient care, lower operating costs, and reduce medical errors[1]. However, not all hospitals have adopted HIT at the same rate[2,3]. Several factors have been identified that affect this rate of adoption. These factors include the size of the hospital, whether it is for profit, membership in a larger system and its location in a rural or urban community, among others. Large hospitals have access to more resources, are often located in urban areas with better information technology infrastructure, and can share resources with other hospitals[1]. At the other end of the spectrum, small hospitals in rural areas, without access to the infrastructure or partnerships of their larger counterparts, were found to have the slowest rates of adoption.

Challenges to HIT Adoption

The research into rural hospitals' adoption of HIT seeks to understand the specific challenges these organizations face[4]. Many are stand-alone providers without a larger hospital network to support them. They also tend to be smaller, with less staff that focuses on issues such as HIT. While those at rural hospitals understood the benefits of HIT, they have also identified several challenges that have hindered adoption[4].Several studies have looked at HIT adoption in these rural hospitals[5,7,8]. These studies suggest that rural hospitals understand the importance of these technologies and motivation is not an issue in their adoption[7]. Many administrative tasks are regularly handled using HIT, including patient registration, admission and scheduling, as well as billing and financial management[5,7]. However, more recent HIT advancements, such as electronic

medical records (EMR) and computerized provider order entry (CPOE) systems have not been widely adopted[8]. While financial incentives have been provided for these applications, it is not believed that these alone will be enough to increase the rate of adoption[5,8]. For many hospitals the cost is too high to support on their own for both initial implementation and long term maintenance of these systems[1,5].

Critical Access Hospitals

One particular class of rural hospitals this study was concerned with were Critical Access Hospitals (CAHs). These are rural hospitals designated for special funding meeting certain criteria[8]. These criteria include having no more than 25 beds, being at least 35 miles from any other hospital and limiting stays for inpatient care to 96 hours. These hospitals focus on providing critical and lifesaving care to those in immediate need, and often have a small staff and budget[8].

Rural Hospitals and HIT

One question often raised by the slow adoption of HIT by rural hospitals is whether or not these technologies will be of particular benefit to those hospitals. Surveys of rural hospitals suggest that these new technologies are seen as being potentially beneficial[7,8,9]. Those surveyed largely agreed that advances in HIT would enable them to provide better care for their patients. However several key challenges to adoption were identified, relating to the disruption caused by implementing a new system[9]. Rural hospitals often lack trained IT professionals who are able to maintain new systems and train others to use them. The concerns about breaches in confidentiality and the creation of new standards were also identified as factors limiting adoption[9].

Identifying Solutions

While the challenges to HIT adoption at rural hospitals have been widely studied, less work has been done to identify potential solutions to these challenges. Although public funding is available to these hospitals for HIT, they still lag behind their urban counterparts, suggesting that funding alone will not solve the problem[4,7]. One way rural hospitals can leverage this funding to address these challenges is through HIT outsourcing. However, potential partners for outsourcing are limited[12]. In the case of rural hospitals, non-traditional models for outsourcing may need to be considered.

One case study investigated how three rural hospitals and one larger regional hospital formed a hospital-to-hospital HIT outsourcing partnership (HHP)[10]. In these hospitals, it was found that sharing resources reduced the financial burden of HIT for the rural hospitals and also gave them access to the trained IT staff of the larger regional hospital. While the participants largely found the arrangement to be favorable, challenges did arise both in the complexity of the relationship and in issues of autonomy for the rural hospitals.

HIT Outsourcing Challenges

HIT can often benefit hospitals by reducing costs and improving care[1]. However, rural hospitals do not have access to the same resources as their larger counterparts, whether this is because of a lower local population, lack of hospitals to partner with or even geographical location[5]. Outsourcing and HHPs have been identified as ways that these hospitals could reduce their individual costs of adopting HITs, however, outsourcing itself provides a new obstacle to HIT adoption[10]. The first round of surveys were used to better understand hospitals' general attitudes towards HIT and outsourcing, as well as receptiveness to this HHP model.

Several factors have been found to increase an organization's willingness to engage in technology outsourcing. These include the support of an organization's management, knowledge about IT outsourcing, efficiency of the outsourcing process, how much current IT will be improved and new innovations that are made available[25]. These factors were found to be the case at many kinds of private organizations. The second round of survey results were studied in the context of these factors to see if this held for rural hospitals as well.

Chapter 3

Methodology

In this study, we surveyed rural hospitals' attitudes towards HIT, outsourcing, and the HHP model based on existing literature. It was conducted in two rounds of surveys of rural hospitals nationwide. The data was then analyzed to see if new insights into how to address the issues surrounding HIT and outsourcing in relation to rural hospitals could be found. This section outlines how the survey was created, how participants were identified and how the data was analyzed.

Data Collection

Survey Instrument

In order to assess the current status of rural hospital HIT and the hospitals' perspectives on HIT partnerships, we developed a survey instrument that was based on prior HIT literature[1-5,9-12,15-24] (Table 1). This literature informed our survey by providing relevant options for participants to rate within each survey question. For example, the options for challenges of HIT implementation were previously identified in prior studies and included lack of support from hospital management, security concerns related to data, and unavailability of well-trained IT staff.

The survey was created in both paper and online form. The paper survey was sent to the hospitals with a cover letter explaining the purpose of the research and asking the participants to either complete the enclosed paper survey or visit the link to the online web survey. The Penn State Survey Center hosted the online web survey and assigned each participant a unique survey number.

The survey center also handled the distribution and collection of the data. The survey was approved

by the Penn State University Institutional Review Board.

Table 1: Prior research informing survey questions

Survey Topic	*Related Research*
Hospital characteristics	Burke et al., 2002; AHA, 2005; Casey et al., 2005; Ward et al., 2006; AHA, 2007; Schoenman, 2007
Types of hospital IT tasks	Burke et al., 2002; AHA, 2005; Casey et al., 2005; Ward et al., 2006; AHA, 2007; Schoenman, 2007; Bahensky et al., 2011
Benefits of hospital HIT implementation	Fonkych & Taylor, 2005; Gans et al., 2005; Schoenman, 2007
Challenges/barriers of hospital HIT implementation	AHA, 2005; Fonkych & Taylor, 2005; Gans et al., 2005; Menachemi et al., 2005; AHA, 2007; Schoenman, 2007; Bahensky et al., 2008
Funding opportunities for HIT or rural hospitals	Schoenman, 2007
Federal programs for HIT or rural hospitals	Schoenman, 2007
Potential HHP benefits	Reddy et al., 2008
Potential HHP challenges	Earl, 1996; Reddy et al., 2008
Types of components for hospitals to outsource	Lorence & Spink, 2004; Menachemi et al., 2007; Diana, 2009
Types of applications for hospitals to outsource	Lorence & Spink, 2004; Menachemi et al., 2005; Menachemi et al., 2007; Diana, 2009
Predictors of hospital HIT outsourcing	Nam et al., 1996; Aubert et al., 2002; Tiwana & Bush, 2007

Participants

Since there is no standard definition for "rural hospitals" in current research, hospitals were selected for participation based on Schoenman's research on rural hospitals[4]. This research used the non-metropolitan classification within the US Census. Any hospital whose county was classified as "non-metropolitan" was considered a rural hospital for this study.

For round one of the study The Critical Access Hospital Coordinator at the Pennsylvania Office of Rural Health provided a recent report of rural hospital information, which was cross-referenced against the American Hospital Associations' 2011 Hospital Guide. In order to scope our study, we identified 8 northeastern US states to include in the study: Pennsylvania, New York, Maine, New Hampshire, Vermont, Rhode Island, Connecticut, and Massachusetts. Within these states, any hospital located in a non-metropolitan county was included in the study. The name of the CIO or CEO and the mailing address for each hospital was recorded to mail the survey to each hospital. The hospital's demographic information (e.g., number of beds) was also recorded.

The survey was sent to 308 hospitals in round one. We incentivized participants to respond by adding them into a drawing for one of twenty-five $100 Visa/Mastercard gift cards. Follow-up phone calls were made to any hospitals that did not respond within two months. We received a total of 69 surveys. Of those surveys, there were 8 returned stating that the hospital did not consider themselves "rural". Consequently, the total number of completed surveys was 61 hospitals, a 20% response rate.

For round one of the survey, the Penn State Survey Center was used as the online survey tool. At the conclusion of the survey process, the Penn State Survey Center compiled the responses into an Excel spreadsheet. This data was then anonymized and used for the first round of data analysis though an independent list of respondents was retained. Incomplete responses were removed leaving 61 total respondents for round one.

For round two of the survey The Critical Access Hospital Coordinator at the Pennsylvania Office of Rural Health also assisted in sending the survey, this time nation-wide. The survey information was sent to the CAH coordinator in the 45 states with critical access hospitals (thereby excluding Maryland, Delaware, New Jersey, Rhode Island and Connecticut). These coordinators then sent the survey out to hospitals in their state. During the second round of the survey, the responses were collected online using Survey Monkey. The data summaries made available by the Survey Monkey tool were then used to compile the responses. A total of 120 responses were collected in this second round of collection. This set of data was first compared to the respondent list from the first round to eliminate any duplicate responses and then anonymized. Incomplete responses were also removed, leaving 118 total respondents for round two.

Between the two surveys, usable responses from 179 hospitals were collected.

Research Questions

In this study we sought to address two major research questions, relating to HIT and HIT outsourcing:

R1: What are rural hospital's attitudes towards HIT?

R2: What are their attitudes towards HIT outsourcing?

Data Analysis

The two rounds of surveys were analyzed independently. This was done so the insights from the first round could inform the analysis process of the second. As different online survey tools were used for each round of data collection, there were some differences between the two rounds regarding data processing. These differences, discussed below, were functional and did

not have an impact on the analysis methodology itself. As each round of the survey was also seeking to answer a new set of questions, two different coding structures were used on the data sets, the differences of which are also discussed below.

The two sets of data were then analyzed using an open coding methodology. Two sets of codes were developed as each round of data was being analyzed in respect to a different set of questions. Literature from the survey creation process as well as a model of IT adoption factors were used to inform the coding process[25].

For round one, related questions were grouped by topic. The responses regarding HIT attitudes were then compared to the current literature to identify whether the results confirmed or contradicted what was in the literature. Since there was little information about HIT outsourcing for rural hospitals, the questions related to outsourcing and HHPs were analyzed to find new insights. The results were also divided based on respondent and hospital characteristics to identify whether different groups had different perspectives. In particular, we looked for instances of consensus across groups, and where expectations did not match the responses. We identified several themes based on the responses and discussed their implications within the context of the HHP model.

For round two, responses were grouped based on hospital attributes relating to outsourcing. We looked to see if there were insights into how different hospitals' experience with HIT outsourcing were related to the presence of factors influencing outsourcing. In order to get a better understanding about how different hospitals approached the problem of HIT outsourcing the respondents were divided into four groups based on their HIT outsourcing experience and if they had current interorganizational relationships with other hospitals.

By dividing the respondents this way, we were able to get a better picture of how a hospital's current HIT outsourcing configuration related to its attitudes towards HIT and HHPs.

The responses from each group were then analyzed using Brcar and Bukovec's model of increased technology outsourcing[25]. Responses were coded based on the five contributing factors (Management, Knowledge, Performance, Quality, and Innovation) as well as if those responses indicated either the presence or absence of those factors. This gave us a picture of how important the different groups of hospitals felt these factors were to their own technology outsourcing decisions and if they were present in current technology outsourcing.

Chapter 4

Results

As different analyses were done on each of the sets of survey results, the findings for each round of data collection are presented separately. Round one's results are presented as a summary of response data, while round two focuses on the responses in relation to the IT outsourcing adoption model.

Round One

Presented here is a summary of the responses to round one of the survey process. In particular, hospitals' particular attitudes to outsourcing and HHPs are discussed as well as how different factors influence their receptiveness to the HHP model.

Hospital Characteristics and Participant Information

While all the respondents came from rural hospitals, there was some variety among those hospitals. The majority (97%) of hospitals were non-for-profit. 72% were standalone hospitals, 23% were part of a multi-hospital system with the remaining 5% having some other formal relationship with other hospitals. All of the standalone or semi-independent hospitals reported having their own Chief Information Officer (CIO) or another individual in a full-time IT position, while none of the hospitals that were part of larger systems had someone in this role. 92% of hospitals had an individual who spearheaded IT initiatives, with only 8% lacking anyone in an IT leadership position. The respondents themselves held a variety of positions (Figure 1).

Figure 1: Positions held by round one respondents
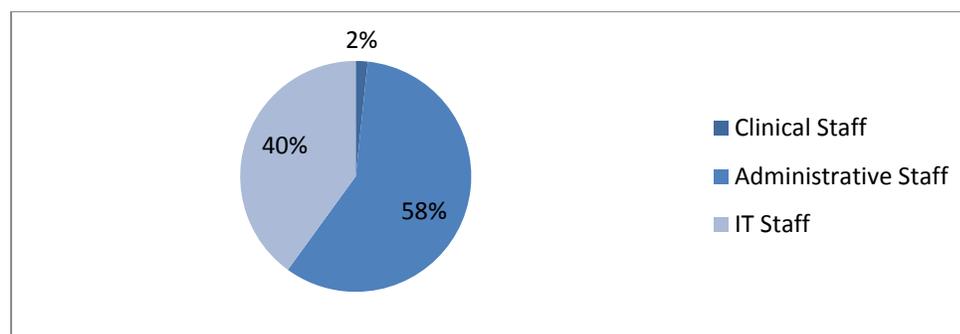

Current Hospital IT Infrastructure

A majority of respondents reported that their hospital performed basic IT tasks, with a smaller majority performing business process analysis tasks. Most respondents agreed that HIT implementation could increase compliance with regulatory/accrediting bodies (98%), reduce medical errors (93%), improve patient satisfaction (76%), increase productivity (68%), and increase patient care revenue (60%). However, only a small percentage of hospitals agree that HIT implementation can reduce hospital staff (22%).

Most respondents agreed that lack of acceptance from end-users (72%), unavailability of well-trained IT staff (68%), privacy (62%), loss of productivity during transition period (62%), data security (60%), difficulty in qualifying IT benefits (60%), and lack of interoperability (53%) and were challenges to HIT implementation. Only a small percentage of respondents believed that lack of management support (15%) and difficulty in identifying technology that meet hospital needs (27%) were challenges. Our findings were consistent with those in previous studies[4,5,7,8] regarding attitudes towards HIT.

Perspectives on Hospital-to-Hospital Information Technology Partnerships

The respondents had mixed experience with outsourcing HIT services. Just over a third of respondents (37%) said their hospitals outsourced for HIT needs, while the remaining 63% did not. The different services which they outsourced can be seen in Figure 2.

Figure 2: Current outsourcing for HIT Services
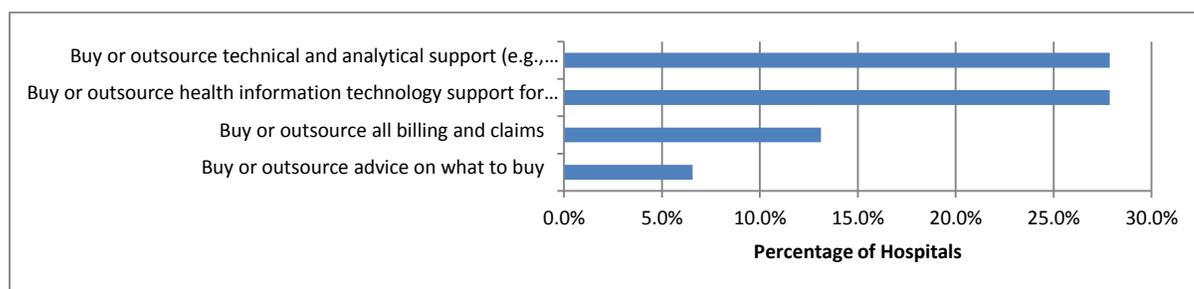
Respondents were also asked about the impact of various policy and funding options when it came to their consideration of adopting an HHP model, seen in Figure 3. Non-loan funding and measures for ensuring the quality of HIT services provided were the most agreed upon factors in this decision-making process.

Figure 3: Impact of policy and funding on HHPs
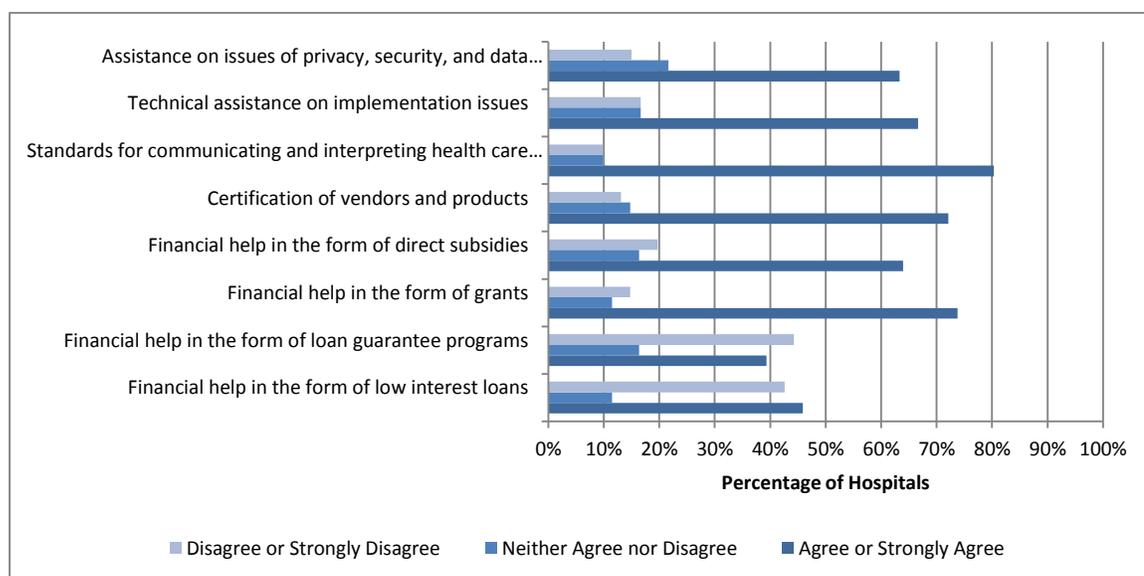
When asked about federal programs that might influence the formation of an HHP (Figure 4), respondents identified programs such as the HITECH Act as being important to their decision-making process. Not all programs were seen as equally valuable.

Figure 4: Importance of federal programs on the formation of HHPs
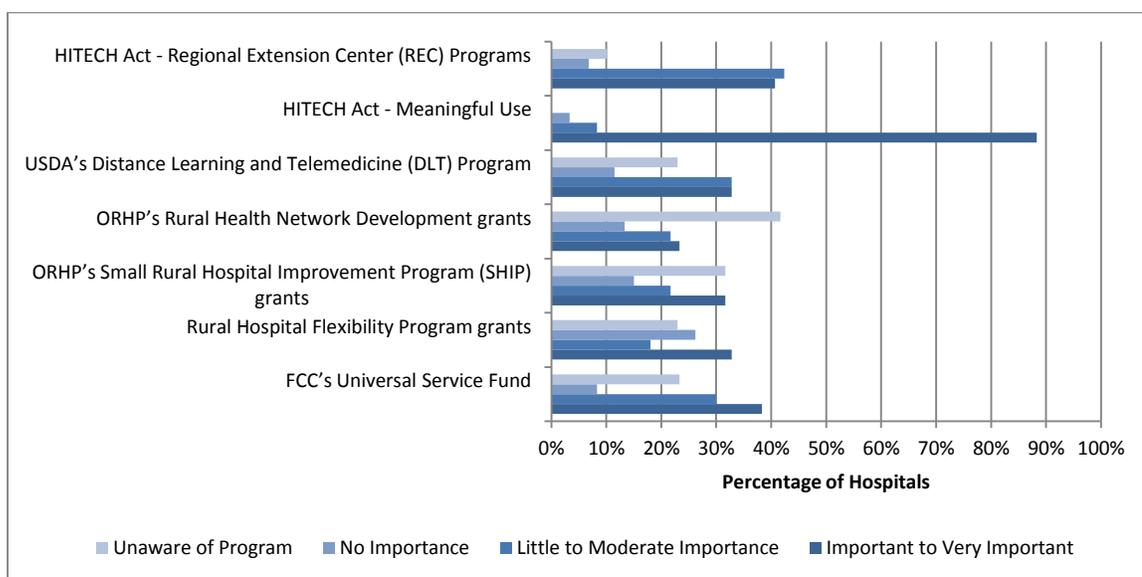
When it came to the perceived benefits of HHPs (Figure 5), respondents broadly felt that they would enable better service through increased access to new HIT and more efficient implementation of existing services.

Figure 5: Potential benefits of HHPs
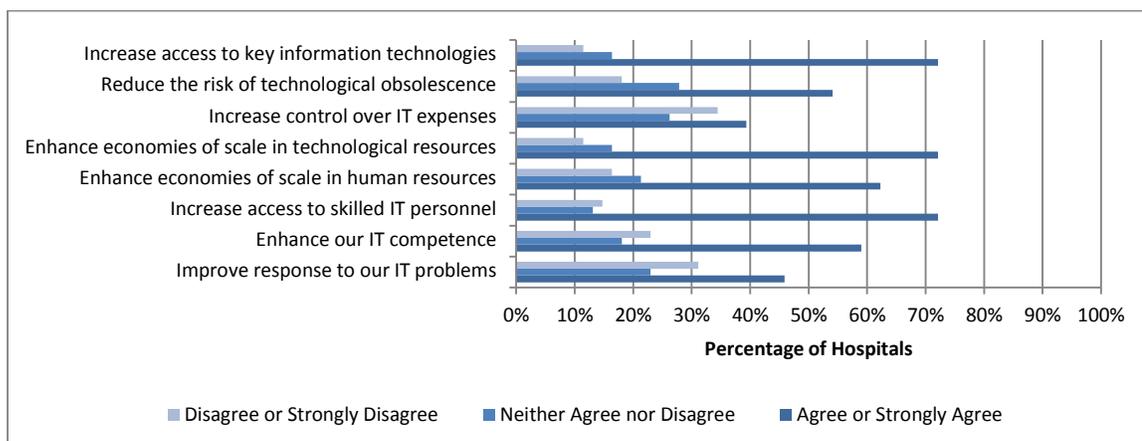
Despite these benefits, respondents felt there were many challenges to HHPs that needed to be addressed (Figure 6). In particular, the challenges regarding integrating systems were of concern to a majority of respondents, with issues of planning and implementation being identified as the most common challenges. It is important to note that a minority of respondents identified a lack of internal support from hospital management as being a challenge, suggesting that there would not be resistance to these partnerships at an administrative level if these other challenges could be addressed.

Figure 6: Challenges to HHPs
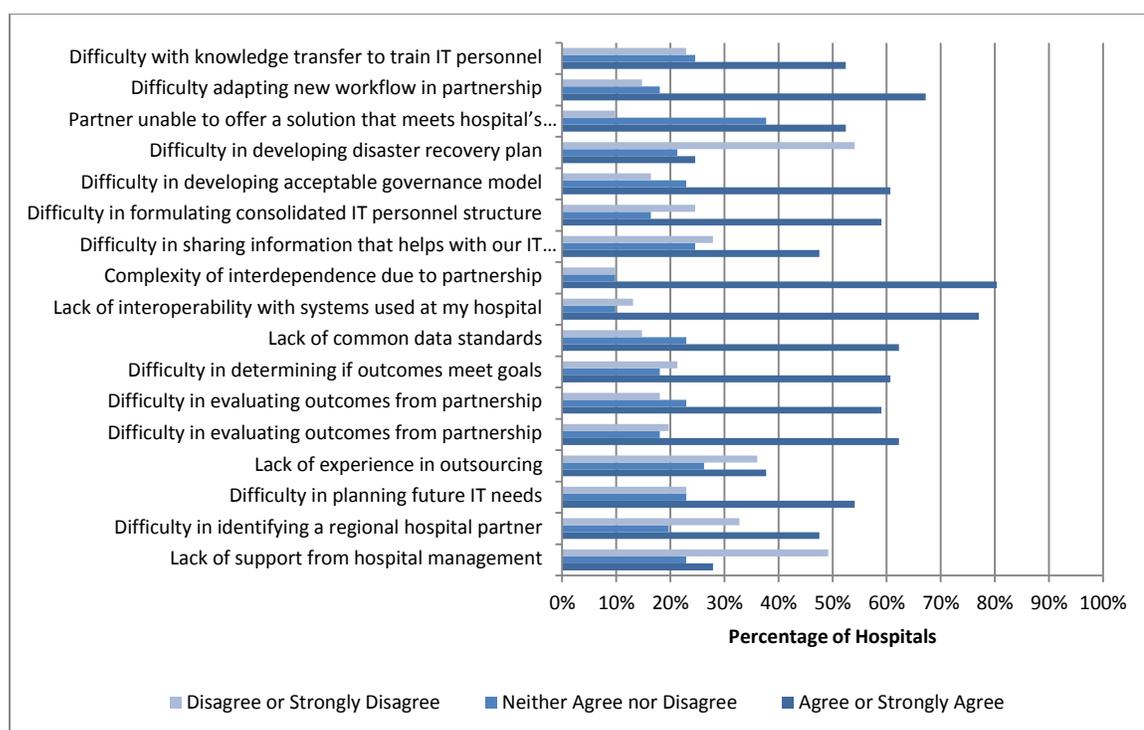
When looking at specific IT infrastructure and HIT applications to be outsourced as part of an HHP, respondents favored outsourcing data infrastructure and electronic record applications (Figures 7 & 8). Respondents seemed willing to have data stored at external locations, which would be necessary in an HHP.

Figure 7: Potential infrastructure outsourcing using a HHP
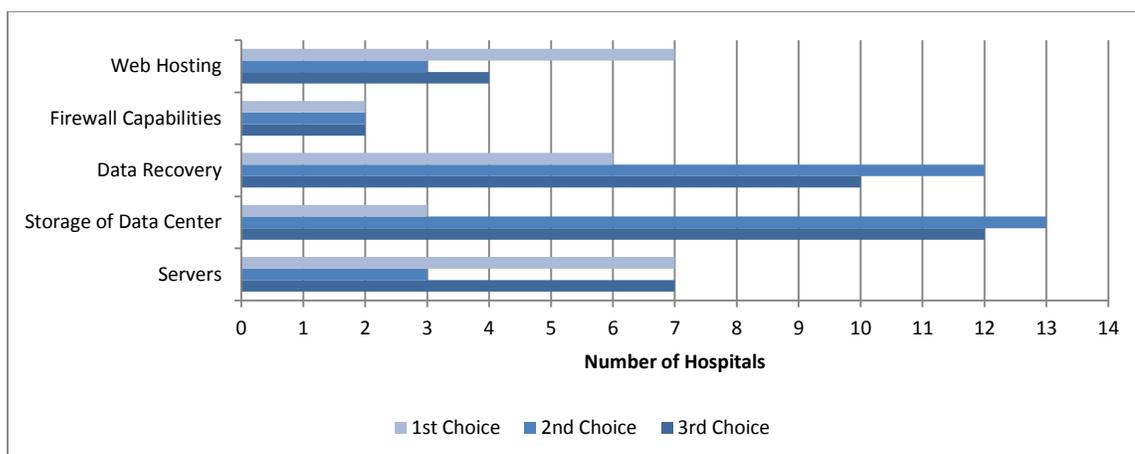
A majority of respondents also picked more recent technologies such as electronic

medical records (EMRs) and telemedicine as their top choices for application outsourcing (Figure

8). With the use of EMRs and related technologies being identified as one area where rural

hospitals lag behind in HIT[2,7], this suggests that an HHP could be used to address this issue.

Figure 8: Potential application outsourcing using a HHP
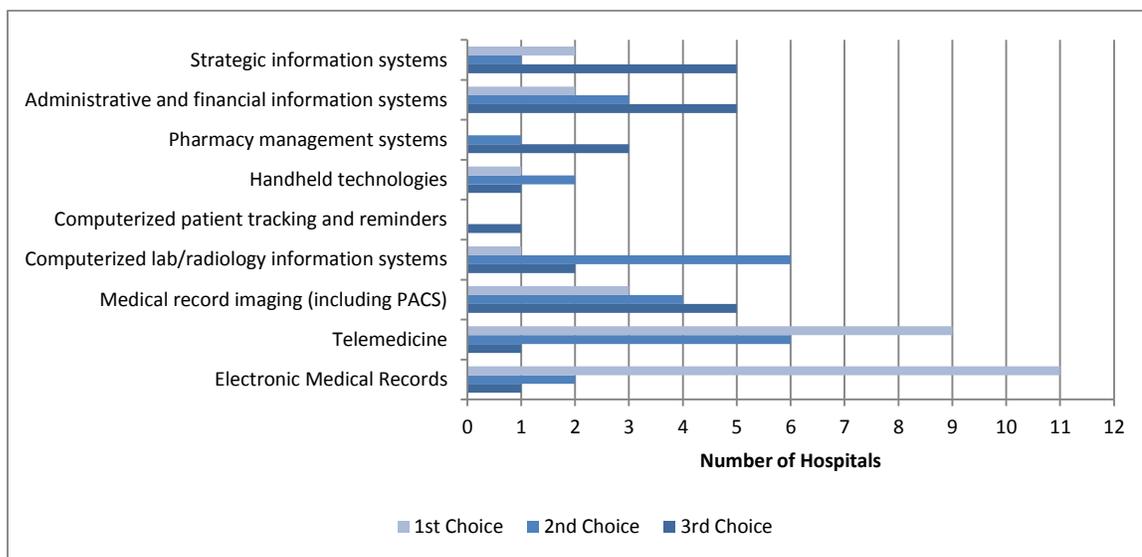
Round Two

Presented here is a summary of round two of the survey process, including hospital characteristic information as well the presence of factors from the outsourcing adoption model.

Hospital Characteristics and Participant Information

The respondents in round two also came from rural hospitals, however, there was a difference in the makeup from round one. This can be attributed to the second round focusing solely on Critical Access Hospitals in a wider geographic area. The majority (74%) of hospitals were non-for-profit, with another 21% being government owned. All of the self-sufficient or outsourcer hospitals reported having their own Chief Information Officer (CIO) or another individual in a full-time IT position, while only 40% of the hybrid did. Most interestingly, of the networked hospitals all either had their own head of IT or indicated that this role was managed at another hospital in their system. Of the respondents 28% lacked anyone in an IT leadership position, with all of them indicating they were too small to have someone in this role. The respondents themselves held a variety of positions, seen in figure 9.

Figure 9: Positions held by round two respondents
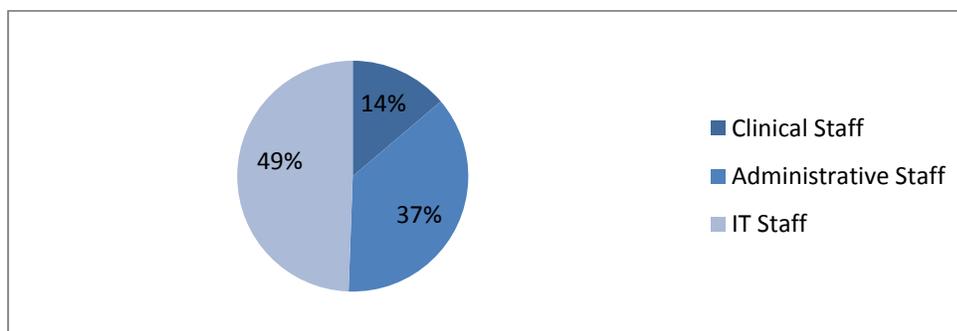
HIT Outsourcing Adoption Factors

We found among the four groups evidence that four of the five factors were playing a role in these hospital's outsourcing decisions[25]. The fifth, IT Innovation, did not seem to be a priority for hospital IT outsourcing. Considering that many of these hospitals are still using outdated HIT systems and HIT is a support to a hospital's primary goals and function, a lower emphasis on innovation makes sense.

The groups and the attributes used to divide them can be seen in Table 2.

Table 2: HIT Outsourcing Types in round two

	Stand Alone	Part of a Multi-Hospital System
Does Outsource for HIT	55 (*Outsourcer*)	15 (*Hybrid*)
Doesn't Outsource for HIT	23 (*Self-Sufficient*)	25 (*Networked*)

Outsourcer

The Outsourcers was the largest group represented among our respondents. These hospitals are those with no existing relationships with other hospitals, but have turned to external vendors to provide for their HIT needs.

This group was the most likely to indicate management was supportive of IT outsourcing initiatives (Figure 10).

Figure 10: Proportion with someone who spearheads IT initiatives
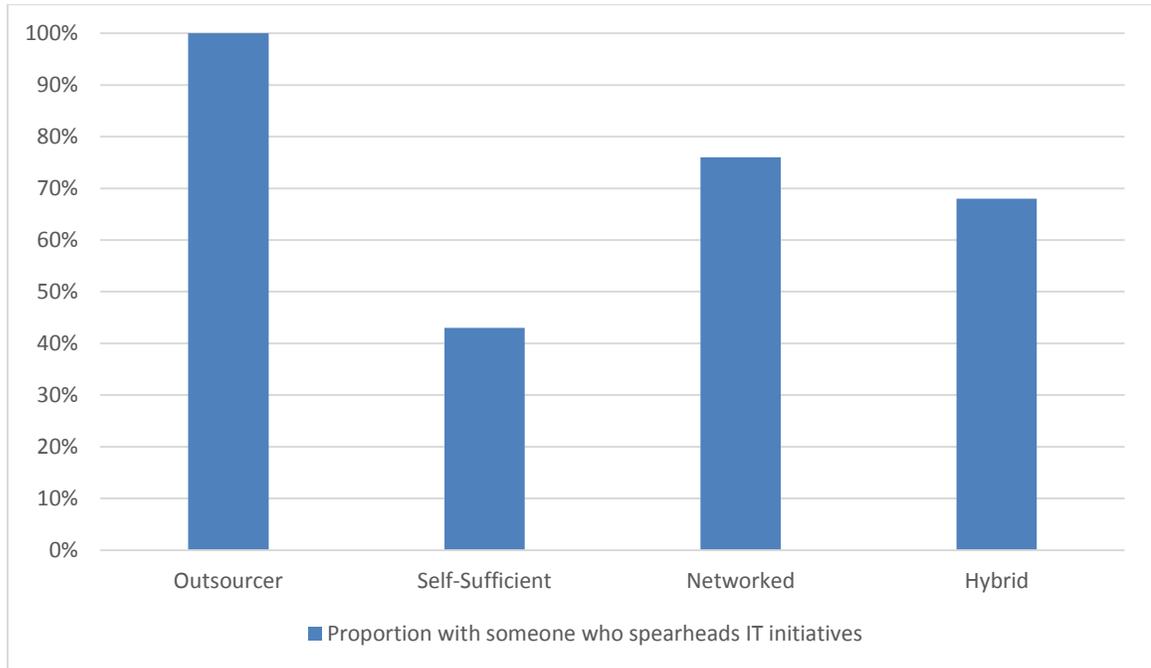
Many of these hospitals indicated they were part of ongoing IT outsourcing projects already. However, it was also indicated that a major constraint for these projects was a lack of trained personnel who could sustain larger projects, limiting the scope of new projects. These hospitals also felt like their current partnerships with vendors were more effective than partnering with other hospitals, with difficulty with interoperability and lack of common data standards being seen as the biggest challenge (Figure 11).

Figure 11: Challenges to HHPs identified by Outsourcers
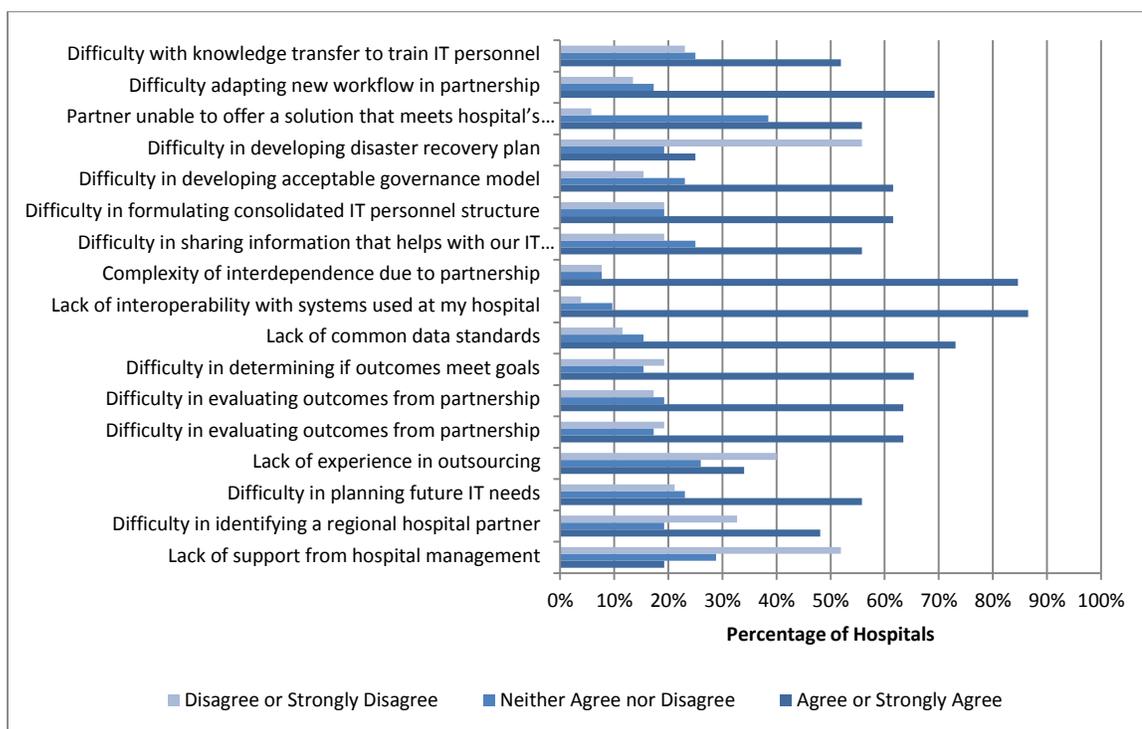
One respondent in this category discussed how they had been part of a hospital partnership that had dissolved due to difficulty in setting common IT standards and practices. These hospitals also felt that outsourcing had a positive impact on the quality of their HIT systems and see it as a future avenue to improving these systems.

Self-Sufficient

Similar to the Outsourcers, the Self-Sufficient group also operated independently from other hospitals, however, they had found internal solutions to address their HIT needs.

Management was the least supportive of outsourcing in this group though this did not translate into a concurrent lack of support for HIT in general. This group was the most likely to have a formal HIT plan (96%), had the highest average full-time-equivalent personnel to support their IT infrastructure (20.5 FTE) and handled a majority of IT maintenance and support tasks in

house. Conversely, though they had the most IT staff, this group was least confident in the abilities of their hospital's end users (health care providers, nurses, administrative staff) and saw this as a barrier to implementing new HIT systems (Figure 12).

Figure 12: IT Literacy as Challenge to HHPs
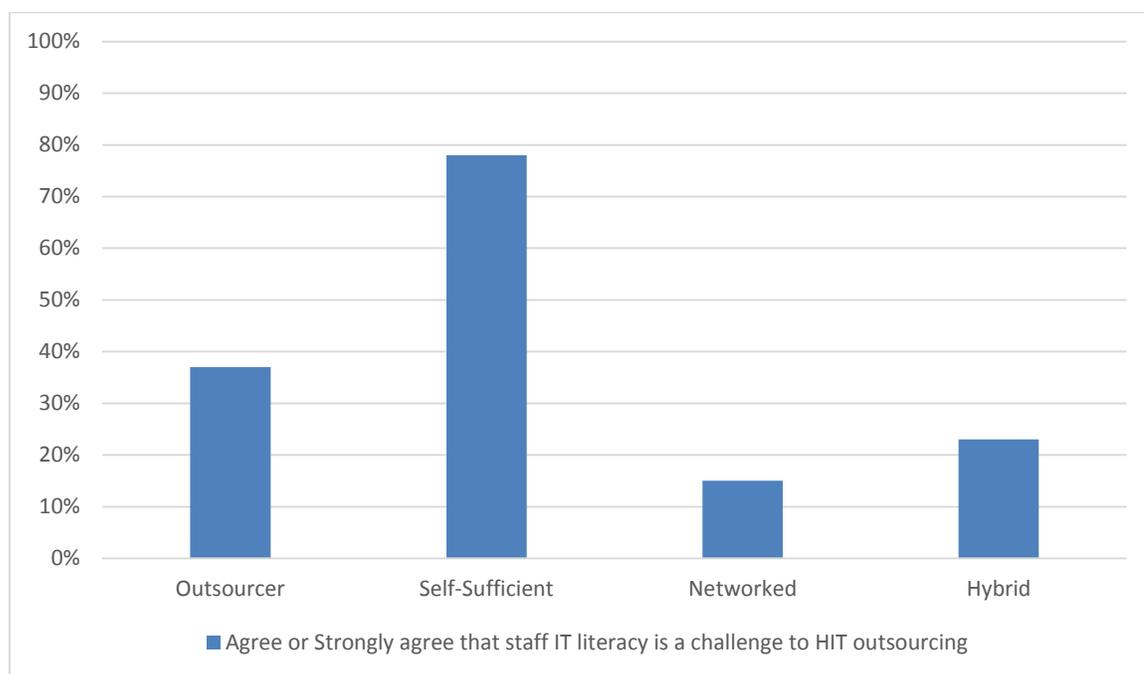
While these hospitals strongly felt that IT outsourcing would put a strain on current resources, would be difficult to implement and would be prohibitively costly, they were at the same time confident that if these challenges could be overcome, a hypothetical partnership could be beneficial to improving the overall quality of HIT.

Networked

Networked hospitals were those that relied on their status as a member of a multiple hospital system for their HIT needs. Whether they had their own internal HIT department or received HIT support from a system staff, they did not have any relationships with outside HIT vendors.

In terms of management, these hospitals once again indicated support of HIT initiatives. However, most of these hospitals did not have their own IT plans, as they left this to their larger hospital network (Figure 13).

Figure 13: Presence of a formal IT Plan
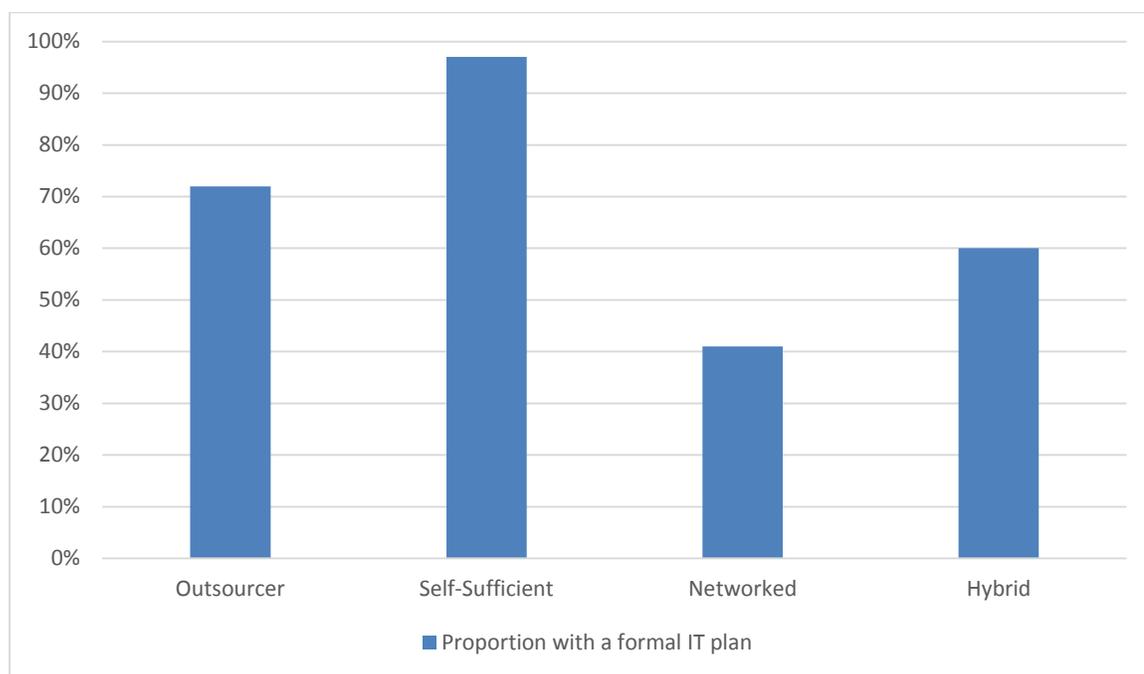
Conversely, they were the most confident in their employee's IT competency, some citing system-wide technology training programs as a reason for this. This group was happy with their outsourcing relationships with their parent system, but some were dismissive of vendor outsourcing, claiming that they did not have the authority or resources to make their own IT outsourcing decisions. These hospitals were also happy with the quality of IT provided by their current situation, with many claiming to have the best HIT infrastructure of any other non-partner hospital in their region.

Hybrid

The Hybrid group were those that received HIT support both from other hospitals in their system as well as having their own IT contracts. Some of these hospitals indicated that they were the central hospital for their system, while others split support for different HITs between their system and outside vendors.

This final group had the most varied opinions on the different factors as a result of their diverse situations. Some had strong management support, while a few voiced throughout the open-ended responses that their particular management was resistant to change. Many of the larger central hospitals fell in line with the networked hospitals in terms of IT competence, while others were more like the pure outsourcers, relying on a core IT staff to handle most technical problems. These hospitals all felt that HIT outsourcing's greatest challenge was the complexity of relationships between organizations (86%), though some hospitals had formed their own partnerships despite these challenges.

Chapter 5

Discussion

The results from both rounds of the survey are discussed here. In some cases, the two rounds are discussed separately, as new findings from round two gave insight into round one observations. The discussion includes observations on the attitudes towards HIT outsourcing in general, perceptions of the benefits and challenges to HIT outsourcing and recommendations to improve policies and standards to promote HIT outsourcing in the future.

Experience with HIT Outsourcing

In round one of the survey, we observed a direct relationship between the use of HIT outsourcing and willingness to form HHPs. There were three distinct groups when it came to hospitals' experiences with HIT outsourcing and their interest in forming partnerships (Table 3). The first were those that already outsourced some HIT services. This group expressed the greatest interest in forming HHPs. Of those that did not outsource, some were interested in HHPs while others were not. This final group was the most strong in their opinions about the challenges to HHPs, particularly those relating to the logistics of integrating systems and changing procedures. One respondent said that any consideration of the benefits of and challenges to HHPs had no bearing on their hospital's decision-making process, as a desire to keep services "in-house" overrode any other consideration.

Table 3: Experience with HIT Outsourcing among round one respondents

	Outsources HIT	*Does not outsource HIT*
Interest in HHPs	37%	29%
No interest or Unsure about HHPs	0%	34%

For hospitals willing to outsource HIT, the HHP model may be a viable solution. Those who expressed a disinterest in HHPs may be doing so due to a more general resistance to HIT outsourcing. Our findings also suggest that rural hospitals that already engage in HIT outsourcing should be considered as primary candidates for new HHPs.

In round two, across the groups, there was little disagreement that outsourcing was a possible solution to improving HIT, one that hospitals in three of the four groups had taken advantage of. However, looking at the factors influencing the decision to outsource, some key obstacles these hospitals face became evident. Of the factors, the fear that the challenge of forming and maintaining a partnership outweighing any improvements to efficiency and effectiveness seemed to be the most prominent. There were two particular areas where this factor seemed to come into play.

Each of the two methods of outsourcing looked at, client-vendor and HHP, had their own challenges that the round two respondents identified. They felt that increased complexity and reduced effectiveness were major risks of HIT outsourcing in both cases. The client-vendor model was one of scope, where the initial cost and challenge of new projects was more than hospital could handle. This was particularly evident with the Outsourcing hospitals who would implement more ambitious HIT projects if they felt their IT staff could sustain them. HHPs had their own set of challenges, where a lack of common data standards and channels of communication makes forming interorganizational relationships very difficult, as existing

systems must first be integrated before new projects (the intended purpose of these partnerships) can be pursued.

Benefits and Challenges of HIT Outsourcing

The development of successful HHPs will require first and foremost participation. With nearly a third of respondents in both rounds of the survey being either unsure or having no interest in forming partnerships of any kind, this could be problematic if these attitudes are more widespread. The issues of lack of interoperability and the complexity of the relationship were identified as the most important factors that are keeping these hospitals from forming partnerships. However, hospitals that had experience with outsourcing seemed much more receptive to the idea of HHPs and outsourcing in general. As often is the case in organizations with limited resources, the long-term benefits have to be balanced with the short-term challenges that might arise. Many respondents said they were unaware of many of the funding programs available to the hospitals, though all of those that identified themselves as administrators were aware of all the programs in both rounds.

When it came to identifying specific benefits to HHPs, respondents in round one were split based on their desire to form HHPs. Those with an interest agreed with many of the identified benefits, while those without an interest disagreed with the benefits. We could not conclude from this round one whether this is a result of previously held opinions about outsourcing having an effect on perceived benefits, or if these were only in relation to the HHP model specifically.

In round two, we saw that there was a difference in the opinions regarding outsourcing and HHPs, with hospitals distinguishing between the traditional client-vendor model and the HHP model. Hospitals that used both models were supportive of both, while those with experience with

only one were more wary of the model they did not use. This continues to suggest that experience is a major factor in perceptions of HIT outsourcing options. When it came to challenges towards HIT outsourcing, we saw different factors identified between the various groups in round two.

Promoting HIT Outsourcing

The results of round one suggested that funding initiatives may be useful in promoting HIT outsourcing. One of the few responses that had consensus across both rounds of results was the importance of funding options, such as the HITECH Act, in the decision to form HHPs. Only two respondents in either round identified this act as unimportant in their decision to form partnerships, one of whom categorically denied interest in any form of outsourcing. Having access to additional funding may allay some of the perceptions of risk in forming partnerships. Rural hospitals could use these funding opportunities to upgrade infrastructure to better integrate with other hospitals' systems, hire more IT professionals to ensure a smooth transition and provide HIT training to hospital staff. As previous studies identified[4,7], funding was not enough on its own to increase and accelerate rural HIT adoption. Solutions such as HHPs may be a useful way to leverage that funding.

In round two of the survey, finding a regional partner was another major challenge to partnerships, particularly among already stand-alone hospitals. Those with enough resources and who were not discouraged by the difficulty in forming client-vendor relationships had found a way to operate independently while still getting access to up to date HIT. Those hospitals that had not adopted any outsourcing solutions were those that indicated they were most concerned about the costs of outsourcing, while paradoxically were also those spending the most on in-house IT support. If a cost effective model for transitioning from in-house to outsourced HIT could be developed, these hospitals may be more willing to change.

Respondents in both rounds were also concerned about interoperability of systems and common data standards. Another solution to increase HIT outsourcing may be to set more common standards for HIT systems such as electronic medical record systems. This would in turn reduce many of the technical challenges faced by hospitals seeking to form new interorganizational relationships. Those that still engage in client-vendor outsourcing would also be more confident that their systems would be less likely to become obsolete, and the barrier of changing and improving systems would be reduced. Additionally, hospitals should be more active in promoting technical literacy among their employees. Having more confidence that their staff can adapt to new systems will also promote further HIT adoption.

If HHPs were to be implemented, respondents said they would use them to implement key HIT technologies that rural hospitals have been slow to adopt. This is the most promising finding for the potential for HHPs to address the issues of HIT adoption in these hospitals. If they can be put in place, these systems would greatly increase rural hospitals' ability to provide effective care to their patients.

Limitations

Due to the limited number of respondents, significant statistical conclusions could not be drawn from the data. Further research will be required to determine if the trends observed hold for a wider population. Respondents were also unable to participate in follow-up interviews, limiting the data to that collected through the survey alone. However, the collected responses were able to provide us important descriptive insights into the views of the rural hospitals about HIT outsourcing that have not been reported in previous literature.

Chapter 6

Conclusion

In regards to our research questions, we did find that, as the literature suggested, rural hospitals were receptive to adopting new HIT systems if feasible. Our findings also suggest that rural hospitals have differing attitudes towards HIT outsourcing, and that the HHP model was an appealing solution to those willing to outsource. However, there are still many challenges that respondents said they must overcome to implement these partnerships.

Moving forward, several changes may make the HHP model, and HIT outsourcing in general more feasible. The first would be common data standards between HIT systems, particularly electronic medical records. This is a major barrier to fast digital collaboration between hospitals. Second, technical training programs for clinical staff would make it easier for hospitals to adopt new HIT systems. This problem may begin to self-correct, as new clinical staff may already have necessary training to use systems such as EMRs. Finally, hospitals should be applying funding to support the implementation of these systems, allowing HHPs to then cover the costs of maintenance and development of those systems. This may help overcome some of the barriers to entry for adopting HIT.

Further studies of rural hospitals that have overcome these challenges and those hospitals support of the proposed solutions will be useful in understanding how HHPs can be developed. In depth interviews with administrative, clinical and support staff may give more insight into the specific challenges these hospitals face. In addition, this study supports the model of IT outsourcing adoption and further surveys would be useful to consider this model in more detail in relation to HIT outsourcing[25]. The findings support the existing understanding of rural hospitals' attitudes to HIT and suggest that new solutions for outsourcing, such as HHPs, could be used to promote adoption.

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Appendix

Survey Instrument

1. Please provide your name:

2. Do you want your name to be included in a drawing for a $100 Visa/MasterCard gift card?

    a. No

    b. Yes – Please provide your e-mail address:

3. Please indicate what best describes your position.

    a. Physician

    b. Physician Assistant

    c. Nurse or Nurse Practitioner

    d. Administrative Staff

    e. IT Staff

    f. Other (please specify):

4. What is the name of your hospital?

    a. Please choose the state that your hospital is located in

5. What is your hospital's tax status?

    a. Not-for-Profit

    b. For-Profit

    c. Government-Owned

6. Which of the following best describes your hospital?

    a. Stand-alone hospital

    b. Part of a multi-hospital system with shared ownership and governance

          i.   What is the name of your multi-hospital system that you are a part of?

    c.   Other (please specify):

7. Does your hospital currently have a full-time Chief Information Officer (CIO) or an equivalent full-time IT leadership position?

    a.   Yes

    b.   No - Please state the position of the person in charge of IT operations:

8. How many full-time equivalent (FTE) personnel support your hospital's IT infrastructure and services?

9. Does your hospital currently have a primary advocate who spearheads health IT initiatives?

    a.   Yes

          i.   What is the position of the primary advocate who spearheads health IT initiatives?

              1.   Physician

              2.   Physician Assistant

              3.   Nurse or Nurse Practitioner

              4.   Administrative Staff

              5.   IT Staff

              6.   Other (please specify):

    b.   No - Please explain why not:

10. Please provide information on hospital IT tasks that are performed by your hospital employees. (Yes or No)

    a.   Evaluate IT services and products

    b.   Select products that are most appropriate to hospital needs.

    c.   Configure infrastructure required for selected products

    d.   Install purchased products

    e.   Maintain technologies and applications

    f.   Upgrade technologies and applications

    g.   Troubleshoot technology problems

    h.   Perform business process analysis and documentation

    i.   Manage IT projects

11. Please provide information on whether these hospital IT tasks are supported by a

    Regional Extension Center (REC). (Yes or No)

    a.   Evaluate IT services and products

    b.   Select products that are most appropriate to hospital needs.

    c.   Configure infrastructure required for selected products

    d.   Install purchased products

    e.   Maintain technologies and applications

    f.   Upgrade technologies and applications

    g.   Troubleshoot technology problems

    h.   Perform business process analysis and documentation

    i.   Manage IT projects

12. Please rate the extent to which you believe that each of the following benefits could be

    realized from health information technology (HIT) implementation at your hospital.

    (Strongly Agree/Agree/Neither Agree Nor Disagree/Disagree/Strongly Disagree)

    a.   Reduce medical errors

    b.   Increase productivity

    c.   Reduce hospital staffing

    d.   Reduce operating costs

    e.   Increase patient care revenues

  f. Improve patient satisfaction

  g. Increase compliance with regulatory or accrediting bodies

  h. Establish a competitive advantage

  i. Other (please specify):

13. Please rate the extent to which you believe each of the following challenges may arise from health information technology (HIT) implementation at your hospital. (Strongly Agree/Agree/Neither Agree Nor Disagree/Disagree/Strongly Disagree)

  a. Lack of support from hospital management

  b. Security concerns related to data

  c. Privacy concerns related to data

  d. Difficulty in quantifying benefits from IT investment

  e. Unavailability of well-trained IT staff

  f. Legal or regulatory concerns (e.g., HIPAA)

  g. Lack of acceptance from end users/clinical staff

  h. Inadequate funding for initial and ongoing IT infrastructure investments

  i. Inadequate funding for ongoing broadband services

  j. Lack of interoperability with existing systems used at my hospital

  k. Loss of productivity during transition period

  l. Difficulty in identifying technology that meets hospital needs

  m. Lack of computer literacy among users/clinical staff

  n. Other (please specify):

14. Please describe the health IT infrastructure of your hospital. (Yes or No)

  a. Your hospital has a formal information technology plan

  b. Your hospital budget includes funding for IT purchase and services

  c. Your hospital has a website

    d.   Your hospital uses secure email technologies

    e.   Your clinicians use PDAs for patient care

15. Which one of the following best describes the type of Internet access at your hospital?

    a.   None

    b.   Dial-up only

    c.   High speed only

    d.   Wireless only

    e.   High speed and wireless

    f.   Dial-up plus high speed

    g.   Dial-up plus wireless

    h.   Dial-up plus high speed and wireless

    i.   Don't know

16. Does your hospital share information with any of the following? Please select all that apply.

    a.   Private practice physician offices

    b.   Laboratories

    c.   Payers

    d.   Other hospitals

    e.   Rural Health Clinics

    f.   Federally Qualified Health Centers (FQHCs)

    g.   Public health departments

    h.   Long-term care facilities

    i.   Freestanding imaging centers

    j.   Retail pharmacies

    k.   Other (please specify):

17. Do you currently buy or outsource health IT services or support from outside vendors?

    a. Yes - What types of services do you outsource? Please check all that apply.

        i. Buy or outsource advice on what to buy

        ii. Buy or outsource all billing and claims

        iii. Buy or outsource health information technology support for clinical activities

        iv. Buy or outsource technical and analytical support (e.g., helpdesk, application support, etc.)

    b. No

18. How important are the following funding and policy offerings to your decision to adopt a hospital-to-hospital IT partnership? (Very Important/Important/Moderately Important/Of Little Importance/Not Important)

    a. Financial help in the form of low interest loans

    b. Financial help in the form of loan guarantee programs

    c. Financial help in the form of grants

    d. Financial help in the form of direct subsidies

    e. Certification of vendors and products

    f. Availability of standards for communicating and interpreting health care data

    g. Providing technical assistance on implementation issues

    h. Providing assistance on issues of privacy, security, and data confidentiality

    i. Other (please specify):

19. How important would the following federal programs be in your decision to adopt a hospital-to-hospital IT partnership? (Very Important/Important/Moderately Important/Of Little Importance/Not Important)

    a. FCC's Universal Service Fund

    b.   Rural Hospital Flexibility Program grants

    c.   ORHP's Small Rural Hospital Improvement Program (SHIP) grants

    d.   ORHP's Rural Health Network Development grants

    e.   USDA's Distance Learning and Telemedicine (DLT) Program

    f.   HITECH Act - Meaningful Use

    g.   HITECH Act - Regional Extension Center (REC) Programs

20. Think about a potential hospital-to-hospital IT partnership between your hospital and a larger more technologically advanced hospital in your region. Please rate the extent to which you believe that each of the following benefits could be realized if you participate in a hospital-to-hospital IT partnership. (Strongly Agree/Agree/Neither Agree Nor Disagree/Disagree/Strongly Disagree)

    a.   Improve response to our IT problems

    b.   Enhance our IT competence

    c.   Increase access to skilled IT personnel

    d.   Enhance economies of scale in human resources

    e.   Enhance economies of scale in technological resources

    f.   Increase control over IT expenses

    g.   Reduce the risk of technological obsolescence

    h.   Increase access to key information technologies

    i.   Other (please specify):

21. Think about a potential hospital-to-hospital IT partnership between your hospital and a larger more technologically advanced hospital in your region. Please rate the extent to which you believe the following challenges may arise as you consider a hospital-to-hospital IT partnership. (Strongly Agree/Agree/Neither Agree Nor Disagree/Disagree/Strongly Disagree)

a. Lack of support from hospital management

b. Difficulty in identifying a regional hospital partner

c. Difficulty in planning future IT needs

d. Lack of experience in outsourcing

e. Difficulty in identifying objective data to evaluate outcomes from partnership

f. Difficulty in developing quantifiable measures to evaluate outcomes from partnership

g. Difficulty in accurately and reliably measuring whether outcomes from partnership meet the goals

h. Lack of common data standards

i. Lack of interoperability with systems used at my hospital

j. Complexity of interdependence due to partnership

k. Difficulty in sharing information that helps with our IT planning

l. Difficulty in formulating consolidated IT personnel structure

m. Difficulty in developing acceptable governance model

n. Difficulty in developing effective disaster recovery and contingency planning

o. Inability of partner to offer a customized solution that meets my hospital's needs

p. Difficulty with workflow reengineering to obtain efficiency and create synergy in a partnership

q. Difficulty with knowledge transfer to enhance expertise of IT personnel

r. Other (please specify):

22. Please review the following list of IT infrastructure components and rank the top 3 components that your hospital would be potentially interested in outsourcing as part of a hospital-to-hospital partnership.

a. Servers

b. Storage of Data Center

c. Data Recovery

d. Firewall Capabilities

e. Web Hosting

f. Other (please specify):

23. Please review the following list of IT applications and rank the top 3 applications that your hospital would be potentially interested in outsourcing as part of a hospital-to-hospital IT partnership.

a. Electronic Medical Records

b. Telemedicine

c. Medical record imaging

d. Computerized lab/radiology information systems

e. Computerized patient tracking and reminders

f. Handheld technologies

g. Pharmacy management systems

h. Administrative and financial information systems

i. Strategic information systems

j. Other (please specify):

24. Would your hospital be interested in this type of hospital-to-hospital IT partnership with a regional hospital in your area?

a. Very interested

b. Somewhat interested

c. Not interested

d. Not sure

e. Please explain your answer. Also, if you are interested, please provide the name of a potential target regional hospital:

25. If you are NOT interested in partnering with a larger, more technologically advanced hospital in your region, would you be interested in working together with other small or rural hospitals to collectively acquire information technology resources and services?

a. Very Interested

b. Somewhat Interested

c. Not Interested

d. Not Sure

e. Why or why not:

26. Please feel free to provide any other comments: