

Critical Access Hospitals and Meaningful Use of Health Information Technology

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Introduction

The American Recovery and Reinvestment Act of 2009 (ARRA) established financial incentives for hospitals, including CAHs, to become meaningful users of health information technology (HIT). The legislation requires use of certified electronic health record (EHR) technology that provides for “the exchange of health information to improve the quality of health care” and submission of information on clinical quality measures and other measures selected by the Secretary of Health and Human Services. The EHR must include patient demographic and clinical health information and have the capacity to provide clinical decision support, support physician order entry, capture and query information relevant to health care quality, and exchange and integrate electronic health information with other sources.¹

The Centers for Medicare and Medicaid Services (CMS) issued a proposed rule in January 2010 establishing criteria for eligible professionals and hospitals that participate in the Medicare and Medicaid programs to qualify for ARRA incentive payments based on their meaningful use of certified EHR technology.² The Office of the National Coordinator for Health Information Technology also issued an interim final rule in January 2010 setting forth an initial set of standards, implementation specifications, and certification criteria for EHR technology.³

The proposed CMS rule outlines a phased three-stage approach to implementing meaningful use.² The initial Stage 1 criteria focus on electronically capturing health information in a coded format; using the information to track key clinical conditions and for care coordination purposes; implementing clinical decision support tools to facilitate disease and medication management; and reporting clinical quality measures and public health information. CMS anticipates updating the criteria on a biennial basis. The criteria for Stage 2 (beginning in 2013) will focus on the use of health IT for continuous quality improvement at the point of care and the exchange of information. The criteria for Stage 3 (beginning in 2015) will focus on promoting improvements in quality, safety and efficiency, decision support for national high priority conditions, patient access to self management tools, access to comprehensive patient data and improving population health.

Key Findings

- Critical Access Hospitals (CAHs) are significantly less likely than other US hospitals to have adopted several key applications that are preconditions for “meaningful use” of health information technology.
- The most frequently adopted technology applications in CAHs are order communication systems, which have been adopted by almost two-thirds of CAHs, and radiology picture archiving communication systems (PACS), which have been adopted by over half of CAHs.
- Fewer than 14% of CAHs have an electronic medical record (EMR) with a clinical data repository and some clinical decision support capability.
- Fewer than three percent of CAHs have an EMR with Computerized Prescriber Order Entry (CPOE) and an electronic medication administration record (eMAR).

Purpose

The purpose of this report is to assess the availability of health information technology applications that are preconditions for meaningful use in CAHs, compared to other U.S. hospitals in 2008.

Background

Previous research has shown that smaller hospitals and those located in rural areas are not as likely to adopt HIT applications. An analysis of eight applications related to medication safety found that rural hospitals had about one-third the adoption rates of urban hospitals; larger, private not-for-profit, teaching, multi-system, accredited hospitals had higher adoption rates.⁴ A national survey of American Hospital Association members in 2008 found that comprehensive electronic record systems were uncommon and that larger hospitals, major teaching hospitals, system members, and urban hospitals were more likely to have adopted systems.⁵ A survey of Wisconsin hospitals found that the smallest rural hospitals had the lowest HIT adoption rates in the state.⁶

Research specifically focused on HIT adoption in CAHs has been limited. A national survey of CAHs conducted by the Flex Monitoring Team in 2006 found that 21% of CAHs used some type of electronic medical record; one-third of CAHs had electronic medication administration records; nurse charting was done electronically

in about 19% of CAHs; and 43% and 46% of CAHs had computerized clinician ordering of radiographs and lab tests respectively.⁷ Using their eight stage EMR Adoption Model, the Healthcare Information and Management Systems Society (HIMSS) found that CAHs had a mean score of 1.69 compared to 2.89 for general medical surgical hospitals and 3.65 for academic/teaching hospitals in early 2009.⁸

Approach

The study sample was constructed using the 2008 Healthcare Information and Management Systems Society (HIMSS) Analytics Database, the most comprehensive national source of hospital information technology adoption data. HIMSS data are collected primarily by phone surveys with multiple hospital staff, including senior health systems management and chief information officers. The number of rural hospitals in the sample has increased since 2004, and overall response rates exceed 90%. The sample encompasses 4,832 acute care, non-federal, US hospitals. The HIMSS data were merged with data on all CAHs maintained by the Flex Monitoring Team (FMT). A total of 1,277 of the 1,300 CAHs certified as of the end of 2008 had a matching record in the HIMSS database.

The HIMSS data allow us to observe some key technological preconditions for meaningful use.

In particular, meaningful use will require an electronic medical record with a clinical data repository, clinical decision support capabilities, and computerized physician/provider order entry (CPOE). Ideally, systems should be linked to the pharmacy services and be accessible to nursing functions. Finally, this suite of health IT components should interact with radiology and laboratory services.

Table 1 briefly describes HIMSS definitions for several key technological applications, including computerized physician/provider order entry (CPOE), electronic medical records (EMR), electronic medication administration records (eMAR),

Table 1. HIMSS Definitions of Health Information Technology Applications

Application	Definition
Clinical Data Repository (CDR)	Centralized database that allows organizations to collect, store, access and report on clinical, administrative, and financial information collected from various applications within or across the healthcare organization.
Clinical Decision Support (CDS)	Uses pre-established rules and guidelines that can be created and edited by the healthcare organization, and integrates clinical data from several sources to generate alerts and treatment suggestions.
Computerized Physician (or Provider) Order Entry (CPOE)	Used by providers to directly order prescriptions, tests, and images.
Electronic Medical Record (EMR)	Performs the traditional functions of a paper medical record but may integrate data from disparate care services such as the lab and pharmacy.
Electronic Medication Administration Records (eMAR)	Manages and monitors medication administration process. May integrate with order entry and pharmacy applications.
Nurse charting/documentation	Documents treatment, therapy, and vital signs. Facilitates nursing care plan implementation.
Order communication systems	Allows entry of orders (e.g., lab orders) from multiple sites including nursing stations, selected ancillary departments, and other service areas; allows viewing of single and composite results for each patient order.
Picture archiving communications systems (PACS)	Automates radiology images; storage and review for clinical diagnosis.

Source: HIMSS Analytics

Table 2. Constructed EMR, CPOE and PACS Measures Used in Study

Constructed Measures	Definition
Electronic Medical Record (EMR)	Computerized patient record (EMR in the HIMSS raw data), clinical data repository (CDR), and clinical decision support capability (CDS).
EMR with CPOE	EMR (as defined above) with Computerized Prescriber Order Entry (CPOE).
EMR with CPOE and eMAR	EMR (as defined above) with CPOE and electronic Medication Administration Records (eMAR).
Cardiology picture archiving and communication system (CARDIOLOGY PACS)	Any of the following cardiology imaging services are PACS capable: Catherization lab, Cardiology CT, Endocardiology, Intravascular ultrasound, Nuclear cardiology, Angiography.
Radiology picture archiving and communication system (RADIOLOGY PACS)	Any of the following radiology imaging services are PACS capable: computed radiography, CT, digital fluoroscopy, digital mammography, MRI, nuclear medicine, orthopedic, ultrasound.

nurse charting/documentation, lab order entry and communications, and picture archiving communications systems (PACS).

There is tremendous heterogeneity in the capabilities and implementation of each of these systems. Levels of technology use found in studies depend on the definitions of EMR and CPOE used. Studies that use a very comprehensive EMR definition such as Jha et. al.⁵ find lower levels of implementation. The basic EMR definition in the HIMSS data may not include some components that are important for meaningful use. Consequently, for this study, we constructed EMR and CPOE definitions based on the presence of a set of application components, using a similar approach as previous research⁹ (Table 2).

T-tests were calculated to determine the significance of differences between CAHs and other hospitals in the probability of having adopted each of these technologies.

Results

Figure 1 shows the availability of key health information technology applications that are preconditions for meaningful use in CAHs and non-CAH hospitals in 2008. CAHs are significantly less likely ($p < .001$) than other hospitals to have adopted these applications.

The most frequently adopted applications in CAHs are order communication systems, which have been adopted by 66% of CAHs, and radiology PACS, which have been adopted by 53% of CAHs. Just over one-third of

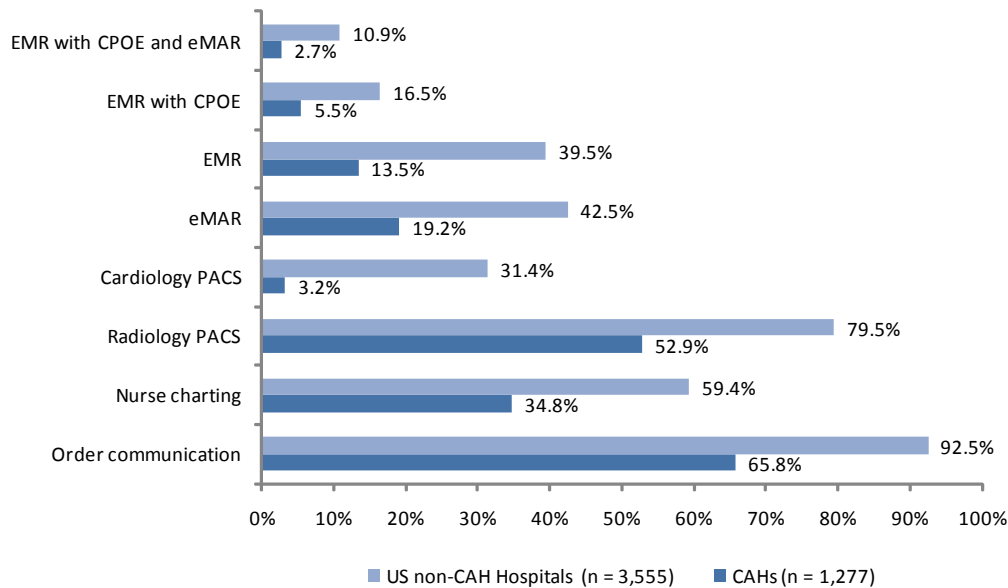
CAHs have electronic nursing charting/documentation systems, and 19% of CAHs have electronic medication administration records (eMARs). Fewer than 14% of CAHs have an EMR with a clinical data repository and clinical decision support capability. Fewer than three percent of CAHs have an EMR with CPOE and eMAR. (The percent of CAHs with EMRs is lower than previously found⁷ because different definitions were used.)

One of the Stage 1 meaningful use measures for hospitals is that 10% of all orders¹⁰ be directly entered by authorizing providers through CPOE.² The HIMSS data include information on the percent of medication or medical orders entered electronically, but these data are missing for the vast majority of hospitals with CPOE using either definition. Consequently, we do not present detailed tables regarding CPOE utilization rates for CPOE adopters.

Policy Implications

Our results indicate that CAHs are significantly less likely than other hospitals to have adopted several key applications that are preconditions for meaningful use of health information technology. Although ARRA includes financial incentives for CAHs, these incentives are comparatively much lower than the incentives for hospitals that are not CAHs.¹¹ Given the overall financial status of CAHs¹² and their current state of HIT implementation, it appears unlikely that these incentives will be sufficient to encourage a significant proportion of CAHs to implement systems capable of meeting the “meaningful use” requirements during the timeframe established by ARRA.

Figure 1. Availability of Key Health Information Technology Applications in Critical Access Hospitals (CAHs) and non-CAH Hospitals in 2008



Therefore, CAHs are going to need a combination of expanded incentives, additional financial assistance in the form of federal grants and/or loans for purchasing HIT, and a longer timeframe for implementation to achieve the ARRA meaningful use goal.

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Acknowledgements:

We gratefully acknowledge HIMSS Analytics for providing the data used in this analysis, and Michele Burlew for expert programming assistance.