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CAH Staff Perspectives on Use of EHRs for Quality Measure Activities

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KEY FINDINGS

- Interviews with eight Critical Access Hospitals (CAHs) throughout the country revealed a variety of uses for Electronic Health Records (EHRs) in quality measurement. These responses focused on the ability to flexibly monitor and report performance data.

- Facilitating factors for quality-related EHR use in CAHs include the ability to improve upstream data input, technical capabilities for analyzing and reporting, and the availability of outside resource supports.

- Challenges persist for CAHs using their EHRs to support quality activities, including continued reliance on manual processes, competing priorities, data accuracy and other data-related limitations, high costs, and insufficient training.

- When prompted about the new health equity and social drivers of health quality measures collected by the Centers for Medicare and Medicaid Services (CMS), participating CAHs discussed their current practices and preparations for these measures, including collection of demographic and social needs data in their EHR and generating reports to identify health disparities.

PURPOSE

While Critical Access Hospitals (CAHs) have managed to maintain a similar pace of Electronic Health Record (EHR) adoption as other health care facilities, they continue to lag in implementing advanced EHR functionalities.[1] There remains a lack of comprehensive knowledge regarding the ways in which CAHs leverage their EHRs to bolster quality improvement initiatives and quality measure reporting, and how facilitators and challenges of this work are shaped by the unique CAH operating environment. This study describes the utilization of EHRs by eight CAHs for quality-related activities, pinpoints their strengths and obstacles in this context, and gauges the readiness of these CAHs to report on health equity and social drivers of health quality measures recently introduced by the Centers for Medicare and Medicaid Services (CMS).

BACKGROUND

Hospitals and other clinical settings use EHRs to document details of a patient's visit, medical history, and other critical information for patient care. CAHs and rural prospective payment system hospitals have largely caught up to urban hospitals in EHR adoption, but lag in using advanced EHR functions for data analytics, such as performance dashboards, clinical decision making, and monitoring patient safety.[1] This gap is due to barriers such as high implementation costs, fewer trained and experienced IT staff, and a limited digital infrastructure in rural areas.[2–5] Specifically, CAHs continue to lag in consistent use of electronic methods for interoperability, and this trend appears to be even greater for independent CAHs compared to system-owned CAHs.[6]

Over time, EHRs have expanded functionality to allow for some advances in quality measure reporting as well, with some EHRs having the ability to create relevant reports, real-time dashboards, and submit quality measures. However, considerable debate has ensued over the degree to which EHRs actually improve quality.[7] Though evidence is mixed, recent studies suggest that advanced use of health information technology (HIT) functionality can improve quality.[7] Quality performance and hospital mortality rates have been shown to improve more in the years following EHR adoption, as the EHR system has time to mature.[8,9] Ability to leverage and act upon performance data (i.e. advances in quality measure monitoring and reporting) is a key mechanism proposed to explain this relationship between EHR use and patient outcomes.[9] It is therefore critical to understand how CAHs have progressed not just in overall EHR capability, but specifically in the ability to leverage digital quality measurement.

CAHs have been found to underutilize EHRs for quality measurement and reporting, as they have historically been exempt from quality reporting to CMS.[10–12] Starting in 2011, the Medicare Beneficiary Quality Improvement Program (MBQIP) operated through Medicare Rural Hospital Flexibility (Flex) Program has encouraged CAH reporting of CMS quality measures.[13] Only recently has CMS required electronic clinical quality measure (eCQM) reporting for CAHs for full payment under the Medicare Promoting Interoperability Program,[14] raising potential concerns about their ability to meet these requirements given the historical divide in EHR use and exemptions from quality reporting programs.

As part of ongoing efforts to implement meaningful measures, transition to fully electronic measures,[15] and improve health equity,[16] CMS has added three health equity and social drivers of health measures to their Hospital Inpatient Quality Reporting (IQR) Program.[17] While CAHs are not required to report IQR measures, these measures are proposed to be added

to MBQIP for CAHs as well. These measures include some elements related to EHR capabilities and HIT. One measure includes the attestation that reads "our hospital inputs demographic and/or social determinant of health information collected from patients into structured, interoperable data elements using certified EHR technology."[18] There is also a measure for social drivers of health screening and a social drivers of health screen positive rate.[19] While these two measures do not have specific EHR requirements, having capabilities to capture and analyze this screening information within the EHR may be advantageous for all hospitals, including CAHs, to collect and report these measures.

While CAHs have kept up with other hospitals in terms of EHR adoption, there are persistent gaps in advanced EHR functions, and little is known about how CAHs use their EHRs to support quality improvement activities and reporting. This study aims to describe how CAHs use their EHRs for quality activities, identify common strengths and challenges in this area, and assess how prepared CAHs may be for reporting the new health equity measures.

APPROACH

We used data from the 2019 American Hospital Association Information Technology Supplement (AHAIT) survey to inform our sampling approach. This survey included 696 CAHs (out of 1351 designated CAHs as of December 31, 2019). The sample frame included 528 CAHs that reported on both advanced clinical data analytics capabilities and interoperability progress (the latter suggestive of the ability to externally report/share quality information). The advanced clinical data analytics included for this sampling were informed by previous literature[1] and included using electronical clinical data from the EHR to create performance dashboards at the organizational, unit, and individual levels, establish clinician data query capabilities, measure clinical guideline adherence, identify care gaps for specific patient populations, generate reports to inform strategic planning, support continuous process

improvement efforts, monitor patient safety, and identify high-risk patients for follow-up care. CAHs were placed into the more advanced use group if they had eight or more of these ten advanced clinical analytics capabilities[1] and three or more of four interoperability measures. CAHs were considered less advanced if they had fewer than eight advanced clinical analytics reported and two or fewer interoperability measures.

To capture a range of perspectives, we reduced the sample to include just one CAH per hospital system selected at random. For two of the four groups (non-system advanced and system less advanced), we attempted to contact all CAHs in these groups because there were relatively few CAHs (20 and 12 respectively). For the remaining two groups (system advanced and non-system less advanced), we stratified by census region to ensure geographic diversity, and then randomly selected five CAHs from each census region. In both the system and non-system groups, since there were only three CAHs in the Northeast we attempted to contact all six.

This sample included 68 CAHs from 31 states. We emailed representatives from CAH quality departments with information about the study and requested an interview. Interviews included questions about how CAHs use their EHR for quality measurement, strengths and challenges of their EHR as it relates to quality activities, where they seek support for these activities, and insights on how prepared they are to report the new health equity and social drivers of health measures. Interviews were conducted via Zoom, transcribed, and analyzed using inductive coding and summative content analysis in Dedoose software[20] by three members of the research team.

TABLE 1: Sample Selection for CAH Interviews

Category	System	Non-system
Advanced users • Any EHR functionality level (less than basic, basic, comprehensive) • 8 or more of the 10 advanced clinical analytics • 3 or more of the 4 interoperability measures	134 CAHs (contacted 18) • Selected 1 from each system at random • Stratified by census region, selected 5 from each randomly (only 3 in Northeast region)	20 CAHs (contacted 20) • Attempted to contact all
Less advanced users • Any EHR functionality level (less than basic, basic, comprehensive) • Fewer than 8 of the more advanced clinical analytics • 2 or fewer of the 4 interoperability measures	30 CAHs (contacted 12) • Selected 1 from each system at random (resulted in 12 CAHs) • Attempted to contact all	111 CAHs (contacted 18) • Stratified by census region, selected 5 from each randomly (only 3 in Northeast region)

RESULTS

Eight interviews were conducted in total, with the following CAH characteristics:

- **Geographic distribution:** Interviewed CAHs represented six states in three of the four U.S. census regions, including four Midwest CAHs, three West CAHs, and one Northeast CAH.
- **System affiliation:** Two CAHs were owned by a larger hospital system and six CAHs were operated independently; however, four of these six had affiliations with hospital systems for use of their EHRs that we learned about during our interviews.
- **Advanced EHR use:** Two interviewed CAHs were in the less advanced user group and six CAHs were in the more advanced user group.
- **Roles:** All individuals interviewed worked in their hospital's quality department and included staff with titles such as Quality Director, Quality Improvement Manager, and Director of Organizational Excellence. Some staff had additional roles or responsibilities in areas such as risk management and infection control.
- **EHR vendors:** The EHR vendors utilized by these CAHs included Epic (5), Cerner (1), Medisolv (1), and Meditech Expanse (1).

Utilization

When asked to describe generally how their CAH uses their EHR for quality activities, interviewee responses fell into five main themes, shown in Figure 1. The predominant theme, **reports,** included mentions of EHR-generated reports of quality measures, quality indicator tracking within the EHR, and other parties building reports of quality metrics (e.g., IT or external vendors). A related theme, **quality measurement,** referred to other activities such as manual tracking, and these descriptions were typically more general than mentions of reports, dashboards, or other specific processes. There were five distinct mentions about **quality measure submission,** where interviewees described either direct submission from their EHR or EHR-based tools that assist them with submission. Another theme, **dashboards,** included responses about using real-time dashboards of quality measure data that are part of the EHR or built by their staff or external vendors. The last theme, **clinician reminders/tools,** included mentions of best practice alerts for clinicians (some of which are related to quality measures) and tools for sepsis and venous thromboembolism (VTE) prophylaxis that are meant to aid clinical decision-making and help ensure consistent documentation for quality measure tracking. Of note, four of the eight CAHs mentioned using a third-party vendor or contractor to help with one or more of these activities.

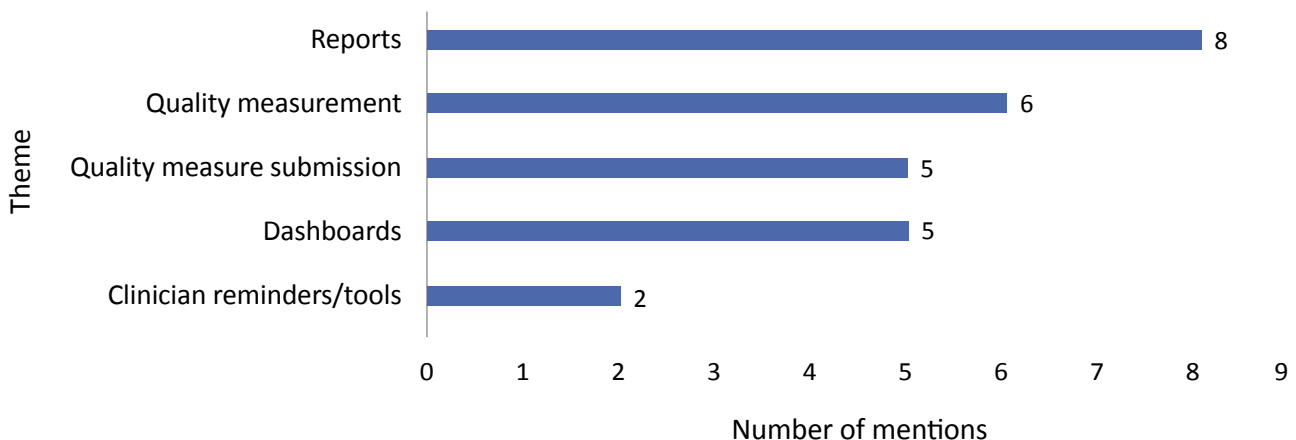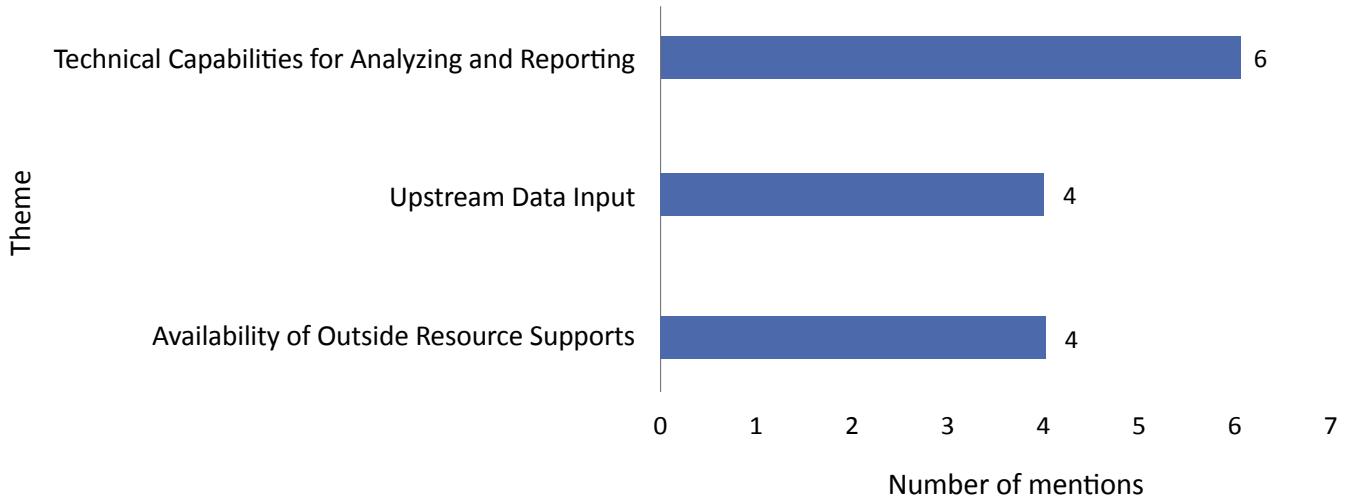**FIGURE 1: How CAHs Use Their EHR for Quality Activities**

FIGURE 2: Strengths of EHR and Quality Activities in CAHs

Strengths

Participants described strengths of their EHR as it relates to quality activities in three main themes, shown in Figure 2: **technical capabilities for analyzing and reporting, upstream data input,** and **availability of outside resource supports.** In terms of **technical capabilities for analyzing and reporting** quality measures, interviewees discussed the strength of using reports and dashboards, as well as time saved by using the EHR to submit quality measures. In the **upstream data input** theme, participants noted the usefulness of advisor tools such as best practice alerts, interoperability with other hospitals and clinics to access patient records, and provider incentives tied to specific quality metrics that promote focused clinical effort and more consistent documentation of those efforts.

Lastly, some interviewees mentioned the **availability of outside resources and support** from their health system and third-party vendors in a variety of areas as critical strengths of their EHR. Some examples include clinician training on how their EHR is used for quality measurement and improvement and analytic assistance (via vendors or system IT staff) to build customized reports for measures of interest. One participant said,

"We make suggestions and then they [the hospital system] work with us to get what we need on our end. So, I'd say the system is a well-rounded system. We have support 24/7."

When asked specifically about where they seek support, interviewees mentioned a wide range of organizations, including their EHR vendor, hospital leadership and other non-quality staff, hospital system, and other organizations such as the Flex Program, Hospital Quality Improvement Contractors (HQICs), and federal guidelines or resources. In terms of the type or mode of support, most participants described training or webinars and direct technical assistance as being useful. Some participants also mentioned written guidelines or other resources.

Challenges

Participants described a wide range of challenges with their EHR as it relates to quality measurement; these challenges fit into five main categories, described in Table 2. The first theme, **manual processes** (11 mentions), includes any component of quality measurement and reporting that is not done through an automatic electronic method. Most mentions that fell under this theme are related to abstraction of data and building reports.

TABLE 2: EHR Challenges for Quality Activities in CAHs

Theme (# of mentions)	Description	Quotes Demonstrating Challenges
Manual processes (11)	Data abstraction and manually building reports	"So, 90% of what we do is 100% chart abstraction. We use the report to give us the people, and then we have to go into each individual chart to find what we need." "To participate in eCQMs, we're totally reliant on our IT department. And it's a lot of work for them to do what needs to be done to automatically extract that data, put it in the format, and it can be submitted to CMS."
System EHR challenges (7)	Limited ability to customize EHR or reports for CAH-specific quality needs	"We're a Community Connect site, we're not an actual Epic site. So, we can't just request something. We can request something, but unless 2 or 3 other hospitals want it, we're not going to get it." "It can be challenging at times because it [an EHR request] might not be on the top of their docket. But it's like, 'I want this done now!' You can't always have it that way. But you know, for the most part, if it's a need and a lot of us here recognize it, we can usually get it built."
Data limitations (6)	Concerns about the accuracy of data in automated reports or dashboards	"We've unfortunately had quite a few [dashboards] that we've done a lot of work to make them accurate. So, then we do feel better about it. But yes, they're - quite often, it's either something's not working in the background, sometimes it's that there's a workflow that's wrong, which definitely needs to be us fixing that, but typically it's just something's not working." "Well, if you can trust [the report]. In Epic, you can run 2 separate reports… today, I did that. I want to run this report on OB deliveries and this report on OB deliveries for the month of May. One had 3 deliveries, one had 4. I don't know. I'm glad I ran both, because we actually had 4, not 3."
Costs (5)	Costs associated with the EHR itself, customization of reports and dashboards, and training	"So yes, we can create reports or build reports, but it's very costly." "And it's very expensive to just do like a one-day webinar and it's $250 or more. It's hard for smaller organizations to justify paying that. So, you know, we try to use what we can from a free perspective or leverage our vendors." "Half of it is, most of us don't have enough staff to really abstract and go through all these charts to find that data."
Education (3)	Working with non-quality staff to understand the importance of certain EHR functions for quality measurement and reporting	"All of this data has to be in discrete fields, and I think that's a really hard concept for clinicians to understand. [Documenting] in their note, and they want someone to go read their note and find it and fill it out. That doesn't work anymore. And then it will be even harder in the future." "I think one of the challenges that we have is those of us that work in my department very specifically understand the quality measure, but sometimes we run into problems with IT not understanding why we need things in certain places in order to go get the data later."

The second theme, **system EHR challenges,** applies to CAHs that are either system-owned or have an affiliation with another hospital or system for their EHR (7 mentions). Examples in this theme include limitations on customizing the EHR or EHR-generated reports to suit their CAH-specific needs, which may not be a priority for the hospital system managing the EHR. Another common theme was related to **data limitations** (6 mentions), such as concerns about data validity in automated reports or dashboards, or limited ways to validate these data.

Financial cost was another common challenge (5 mentions). This includes the cost of the EHR itself, but more often participants referred to the cost of customizing reports and dashboards or pursuing advanced training for staff. The final theme, **education,** refers to the need to work with clinicians and hospital staff outside of the quality department to help them understand the importance of consistent use of specific EHR functions and documentation practices for quality measurement and improvement (3 mentions). One interviewee noted that the focus of EHRs is generally not on quality measurement and improvement, saying "that seems like a big thing with just EMRs in general, their reporting capabilities are not quality-focused, they are clinical-focused. So, the things that clinical leaders need day-to-day, they'll get out of the system, but quality measures, quality reporting, that is just really not the focus of my experience with EHRs." This tension between clinical and quality needs presents a challenge and an opportunity for education and collaboration between different staff to find the best ways to optimize the EHR functions available to them.

Health Equity Measures

Participants were asked broadly how their hospital uses their EHR (if at all) to measure health disparities and screen for social needs, as well as if they had concerns about the new CMS health equity and social drivers of health measures as they relate to their EHR capabilities. Participants shared a wide range of responses in both areas; thus, these responses were not grouped into themes like the previous topics, but rather described as examples below.

Current Practices

Overall, participants discussed progress in collecting self-reported demographic data in their EHRs and efforts to screen for social drivers of health. Interviewees mentioned challenges in screening as well as refining EHR referral processes and reports to address factors like transportation, utilities, housing, and food insecurity. Participants noted that their hospitals have made progress in ensuring demographic data (such as race, ethnicity, and gender identity) are self-reported from the patient and clearly captured in the EHR. As one participant described, "we've been working on the REL [race, ethnicity, language] data… Working with our patient access staff to make sure that they're asking it every time. And we're going to a new product that's a self-registration product where the patient will go in and put in their own information before they ever come in for testing or whatever. So that should help with that also." Another interviewee described how they can use those data in conjunction with quality measures, saying "[the dashboard] also breaks down every one of our quality measures. So, safe use of opioids, cesarean birth, et cetera, by race, gender, ethnicity, and financial class."

Participants also shared their current work on scaling up screening practices for social drivers of health while still trying to optimize the best approach in each setting. One participant reported,

"we're doing it manually in our outpatient clinics and struggling a bit… We're far from being proficient at it or being prepared to give any information or any statistics on it… [but] we've been doing those questions in our outpatient clinics for a couple years now… Now, we need to work more on inpatients too."

Participants also described the importance of customized reports and referral practices that consider co-occurring social drivers of health concerns. One

participant described using their food insecurity screening as a "gateway" to other health related social needs. If a patient screens positive for food insecurity, a referral is sent to their community health team to ask additional questions to determine what else might be needed. Screening for these social drivers will allow CAHs to give patient referrals as needed, and also better equip them to report the new CMS social drivers of health measure. By doing so electronically through their EHR, this process could also be more accurate and efficient.

Health Equity Measures Concerns

Some participants had concerns about the technical aspect of finding and reporting the information required for the new measures, particularly when it comes to screening for social drivers of health. One participant reported that these were not standard content built into the EHR, in the way some other fields and reports are, and that they will need to have their IT department build and implement it. These activities require time and financial resources that are often already stretched for CAHs. This participant also mentioned that their EHR does not have a place to track any referrals after a patient screens positive for one of these social drivers, which may be an important next step in addressing health inequities.

Interviewees also noted some concerns about encouraging their staff to ask the questions, particularly on social drivers of health. One participant described the challenge:

"The other thing that I feel like we're struggling with that may be more of a Critical Access kind of small-town thing is that our provider group is nervous about asking these questions. Because they feel like they're liable then for whatever the patient says they need. And we've continued to try to help them understand that it's really so that you could [prescribe] like, warfarin instead of Eliquis because they've indicated they can't pay their bills, it isn't that you have to figure out how to turn on their utility."

Lastly, in discussing these new measures, some interviewees noted that this has driven giving more attention to identifying issues for vulnerable populations in their community. One participant noted, "in Critical Access Hospitals as far as diversity, I think we're struggling a lot with the fact that we're all pretty white bread here… And so for us to find our niche… maybe our niche is figuring out, like we've got a very high rate of Medicaid population that don't get prenatal care. Should we be focusing more on that? Should we be focusing on farmers who need emotional support? There's a high rate of suicide in farmers." These comments reflect the need for tailored approaches to support health equity measurement work in CAH-served communities.

DISCUSSION

Improving functionality of EHRs to support quality measurement has become even more important in recent years, with a renewed focus on eCQMs from CMS and particularly for CAHs with new measures proposed for MBQIP. Some of these measures, such as a key component of the health equity attestation measure, are directly dependent on EHR capabilities and the hospital's ability to use these functions. Other measures, such as screening for social drivers of health, could be made more efficient and accurate through use of an EHR. These new measures will require hospitals to report the percent of patients screened for all five defined health-related social needs, as well as report a "screen positive" rate. By using an EHR to facilitate the collection and/or analysis of these data, hospitals may find this measure to be easier to report. In discussing the new health equity and social drivers of health measures with the interviewed CAHs, we found that many of the CAHs already collect these data in their EHR or are starting implementation of a data collection process in their EHR. These activities are not without their challenges, however, and CAHs mentioned concerns about the technical capabilities of their EHR to capture needed information, buy-in from their staff to ask questions about social needs, and the challenges of addressing health inequities in

a small community. These challenges span different parts of this process; including asking the screening questions, documenting responses to those questions, analyzing the data, and then using the data to address health inequities in the patient population. As reporting on these quality measures begins, further work may assess which parts of this process are facilitated by an EHR and how. Overall, the interviewed CAHs are already working toward these new measures and if given adequate support, interviewees expressed generally positive reactions to the new measures and the possibility of capturing these electronically.

This focus on increasing the involvement of HIT in hospital quality measurement also necessitates a corresponding emphasis on both provider and quality department education to ensure effective data collection and utilization of these measures. In our interviews, CAHs mentioned a range of sources that they utilize for support for using their EHR for quality work as well as a variety of types of support they receive. Many interviewees mentioned their EHR vendor as a key provider of support, as well as their hospital, hospital system, and other organizations such as HQICs and their State Flex Program. Ongoing support from multiple sources and in various modes (e.g., webinars, written materials, and direct technical assistance) seems to be a key component of continuing to advance EHR use for quality activities for CAHs.

There are also significant costs associated with EHRs, including the software itself, maintenance costs, and system upgrades.[21] As noted by many of our participants, building and customizing reports for quality measures can be expensive as well, which is of particular relevance as new measures are added to MBQIP and other programs. The high financial burden may impede the ability of CAHs to fully embrace EHRs and associated quality improvement measures, especially for CAHs that are already operating with limited financial resources. Transitioning to a different EHR also comes with substantial costs in addition to purchasing and implementing the new software,

which may be a barrier for CAHs to change systems or pursue technological advancements.[22] Further, a recent study found that advanced EHR functionality is associated with lower operating costs in urban hospitals but not in rural hospitals.[23] Thus, it may also be challenging for CAHs to justify purchasing a more advanced EHR without promise of financial benefit. Adapting the EHR they currently have may be more cost-efficient for some CAHs than investing in an entirely new system, though both have costs associated with them. Exploring alternative funding sources to support changes in EHR systems or in the development of new reports associated with new measures could be helpful for CAHs. This funding could come from private sources, state, or federal funding; some potential funding opportunities are available on the Rural Health Information Hub. CAHs that participate in the Small Rural Hospital Improvement Program (SHIP) may want to utilize funding to update or upgrade their EHR software, hardware, or training. State SHIP staff should reach out to their Federal Project Officers or SHIP-Technical Assistance, review the SHIP Allowable Investment Tool, or other SHIP grant guidance resources for additional information or clarification. CAHs may also consider exploring different relationships with hospitals and systems to share EHR systems and reduce EHR costs, as many participants in these interviews mentioned.

The connection between EHRs and interoperability (the ability to access and exchange health information within and across health systems) further emphasizes the need for advancing EHR functionality to facilitate seamless data exchange. Interoperability becomes particularly crucial in scenarios involving patient transfers, especially for CAHs, which have a relatively high volume of outbound patient transfers.[24] However, there is some concern about the limited interoperability of small, rural hospitals,[25] particularly those that are independent,[6] which could in turn affect timely access to information and patient safety.[26]

As part of the National CAH Quality Inventory and Assessment, the Flex Monitoring Team (FMT), State Flex Programs (SFPs), and Federal Office of Rural Health Policy (FORHP) will gain access to information about each CAH's EHR vendor and how they use their EHR for collecting and/or reporting quality data. This will provide a unique opportunity for states to leverage information on EHR vendors and use it to share best practices and foster collaboration among CAHs and states. For example, SFPs could create learning collaboratives of CAHs that use the same EHR to learn from each other's experiences, ultimately improving the overall quality of care. This collaborative approach has been used by the Colorado SFP[27] and has the potential to not only enhance CAHs' ability to implement EHRs effectively, but also contribute to a broader culture of continuous quality improvement in health care delivery. These data will be available to states in 2024.

There are some limitations of this study to consider. First, the findings presented here are not meant to be representative of all CAHs, as they are the results of interviews with only eight hospitals. Despite our sampling strategy to contact many CAHs with different levels of EHR advancement, system affiliation, and geographic diversity, we had a relatively small number of CAHs that were responsive to our request for an interview.

CONCLUSION

Overall, these interviews highlighted diverse uses of EHRs in quality measurement, strengths, and sources of support. To address concerns raised regarding manual processes, conflicting EHR priorities when working with a health system, and costs, CAHs require tailored support from the Flex Program, EHR vendors, hospital systems, and community sharing of best practices. As HIT continues to advance and evolve, it will continue to be important to consider the specific needs of CAHs so they are not left behind.

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