A NATIONAL SURVEY ASSESSING HEALTH INFORMATION EXCHANGE: READINESS FOR CHANGES TO VETERANS AFFAIRS ACCESS STANDARDS

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Abstract

We conducted a national survey of Health Information Exchanges (HIEs), targeting both not-for profit geographic and enterprise or federated exchanges. The aim of this study is to identify current best practices when exchanging information between Veterans Affairs (VA) systems and non-VA health systems. We identified and classified current interactions between HIEs and VA systems given recent passage of the MISSION Act. The MISSION Act allows veterans to seek care outside the VA health system, necessitating the need to reconcile care planning between VA systems and private care settings. We identified several differing best practices concerning information exchange between VA health systems and HIEs and assessed capabilities for HIEs to appropriately identify eligible VA participants within extant databases.

Keywords: Health Information Exchange, VA Health System, MISSION Act, HIEs

Introduction

The Veterans Health Administration (VHA), one of three administrations within the Department of Veterans Affairs (VA), is the largest integrated health system in the United States. As a large healthcare delivery organization, effective information systems represent a pathway for efficient delivery of services that maximize value.[1] The need for the VHA to adopt new commercial, off-the-shelf electronic health record (EHR) technology is widely documented across peer reviewed and non-peer reviewed literature.[2] Key historical areas of technology focus for the VHA include longitudinal tracking of patient information, increased access to patient information, increasing the number of options for care delivery, and a long-term shift from healthcare facilities to enabling a system of "care anywhere" using telehealth and expansions beyond the VHA.[3]

The VHA has a long-standing practice of exchanging information among its own network of facilities for several years. Examples include exchange between the Department of Defense (DoD) and the current pursuit of engaging in health information exchange (HIE) with non-VHA institutions.[4] The current VA HIE initiative is part of the US government's Virtual Lifetime Electronic Record (VLER) Health program and is designed for military service members and veterans.[5] Recent policy changes have heightened the importance of understanding what types of patients are most likely to authorize data sharing via VLER Health and underscored the importance of efficient health data exchange.[6] Researchers have learned that there can be some limitations to working with VA data alone, since many Veteran's using the VA also receive some portion of their care from other healthcare providers, and encounterbased VA data may not capture everything relevant to a

patient's health or course of care.[7] For example, 21 percent of Blue Button[8] users shared VA health information with external health care providers. According to Turvey et al, 87 percent of respondents reported that the non-VA provider found the information somewhat or very helpful.[9] Several programs and policies impact a veterans ability to exchange information, including the Veterans Authorization Preferences (VAP) System, policies specific to certain medical conditions, technical platforms enabled by eHealth Exchange standards, and Data Use and Reciprocal Service Agreements (DURSAs).[10] However, much of the exchange of information remains confined to the utilization of information with existing DoD or VA approved systems, not external stakeholders as outlined in this study. The MISSION Act—recently passed legislation discussed below—signals a need to expand the scope of entities with which the VA system engages with to facilitate care.[11] Limited research fully addresses the important step of exchanging information between VA and non-VA locations of care, as most reported metrics skew toward interoperability of systems among non-federal healthcare settings.[12]

MISSION Act and Insurance Implications

The VA MISSION Act of 2018 *S.*2372, signed into public law on June 6, 2018, aims to provide greater access to both VA facilities and non-VA facilities under the program titled Community Care Providers.[13] The VA MISSION Act dedicates $50 million per year to a new Department of Veterans Affairs innovation center and would allow the VA to prioritize pilots that counterbalance underlying incentives, test episode-based payment approaches, and to further address veteran-specific needs.[14] The overall purpose of the VA MISSION Act is to establish an effective and more efficient Community Care Program for veterans and create a framework through which to modernize and realign the resources of the VHA.[15] Inherent in this policy approach is the necessity to adequately ensure the transfer of information between facilities and locations of patient care. HIEs provide a structured and geographically broad approach to effectively share information between VA health systems and private sector locations of care.

The approach to privatization of payment for veterans is an ongoing policy discussion.[16] Veterans covered under VA insurance may have additional insurance beyond TRICARE, a form of insurance made available to qualified veterans. Other potential payers include Medicare, Medicaid, or any private insurance. While supplemental insurance is not required, it is often recommended for veterans. VA insurance typically only covers the veteran and not their family. In addition, funding for VA insurance can become limited at any time, and an individual may no longer qualify to utilize VA insurance.[17] We present this information not to provide commentary on appropriate course of action for payment but to inform the reader of the context of findings presented below and related to indexing or identifying patients who require a reconciliation of care resulting from expansion to

services laid out in the MISSION Act.

Public vs. Private or Enterprise Health Information Exchanges

There are two predominate types of HIEs in existence today. Public or community health information exchanges typically receive public funding, include diverse stakeholders, and traditionally focus on specific geographic locations.[18] Community HIEs include regional health information organizations (RHIOs) and certain state-designated entities.[19]

Conversely, many large multisite health systems and large health information technology firms providing software as a service engage in aggregation and sharing of information at an enterprise level or across potentially siloed systems.[20] This approach is typically referred to as an enterprise or federated HIE model.[21] Patient records contained within federated health information exchanges present challenges related to effective information sharing. While enterprise or federated HIEs are permitted broad access to information within their established pool of medical providers, such as hospitals they affiliate with or certain EHR platforms, these exchanges typically provide limited access by external nonmember institutions.[22] In published research VA physicians indicated the ability to share information with groups both outside and inside of their network, consequently resulting in a better quality of care or outcome for the patient.[23] Both community and enterprise HIEs support the aggregation of clinical data and following patients across settings of care. Although they can be complementary, community and enterprise HIEs nonetheless compete for providers' attention and organizational resources.[24]

Opt-In vs. Opt-Out Challenges

An important component of information exchange is establishing consent to share information while ensuring a patient's right to privacy. Two predominant forms of consent are opt-in or opt-out models. To opt in is for the patient to choose to participate in the exchange of patient records. With this, the standard would be to have no records shared unless the patient chooses to opt in.[25] Conversely, to opt out would be to share records automatically unless the patient makes a declaration not to share information, forcing the participation to opt out manually.[26] Both options come with benefits and challenges. Opting out provides greater distribution of data to potential participants and care settings. Opting in provides greater control to individuals over privacy of personal information. In addition, opting in and "signing off" on records forces the patient to become more educated surrounding the benefits of sharing their data.[27]

Currently, there is no universal US national policy enabling information sharing by consent; rather, there exists policies differing by state and legal requirements. According to the Office of the National

Coordinator (ONC) for Health Information Technology, an opt-out policy appears to be the most common across states.[28] Differing policies require individual patients to manually provide consent if the desire is for records to not be shared. Research indicates that opt-in policies are more likely to have barriers at both administrative and technical levels, which contribute to the prevalence of opt-out policies among states.[29] Several respondents to the survey discussed further below indicated the challenges of navigating a patchwork of state policies. At times, existing state case law, vendor implementation of required standards, and technological advancements can converge, creating inconsistencies within a given state's approach to consent, thus creating an additional policy barrier to effective and efficient exchange of health information.[30] Further, consent to exchange data by enrolled veterans remains low and impacts the ability to reconcile disparate records of treatment.[31]

Query Based vs. Active Data Exchange Protocols

For a complete overview regarding the current state of information exchange among healthcare providers, we direct readers to technical briefs No. 43 and 51 released by the ONC.[32] A main objective surrounding the adoption of EHRs and creation of HIEs is to share information impacting a patient's course of treatment more effectively. Key trends for effective data exchange outlined by the ONC over time include increased capabilities to send, receive, find, and integrate data into EHR systems.[33] From a technical perspective, there is a need to both send or transmit data (push exchange) as well as receive or reconcile (query) data sources. The treating clinicians must be willing to initiate a query as an end user, which may be automatic (via system alert or notification) or manual in nature (reviewing faxed documentation or opening a new platform). Widely utilized mechanisms for sending summary of care documents are presented below in descending order of stated use indicated among non-federal acute care hospitals responding to the American Hospital Association (AHA) supplemental survey:[34]

1. Utilization of DIRECT messaging – a national encryption standard to send information similar in function to email.
2. Participation in state, regional, or local information organization and outlined above.
3. Participation in single EHR vendor networks, outlined above as federated or private information organizations.
4. Utilization of e-Health Exchange – A large consortium of 293 data-contributing participants, including many not-for-profit HIEs and federated HIEs.

From a study design and background perspective, it is important to note that ONC technical briefs utilizing findings from the AHA supplemental survey on information technology (IT) include responses only from non-federal acute care hospitals. Federal systems do not receive the supplemental AHA survey on health IT. Some researchers have outlined the increased importance

and development of a nationwide HIE network as well as the impacts of varied and sometimes fragmented mechanisms to exchange data which informed study design.[35,36] We approached study design cognizant of limited research on information exchange between federal and non-federal locations of care, ongoing issues of policymaking related to system interoperability, and broad approaches to information exchange discussed above.

Methods

We conducted a cross-sectional study of HIEs using a novel online survey instrument to determine the HIEs' ability to support expanded access standards set forth in the MISSION Act. We also assessed HIEs' attempts to successfully exchange information with local VA Health Systems. We conducted a pilot assessment of the survey instrument with two regional HIEs to ensure survey instrument validity and respondent comprehension of questions. The pilot survey instrument included a free text response area to capture respondent feedback, issues, or challenges answering any question to improve the quality of the survey instrument. As a result, two questions were changed to further identify mechanisms of data exchange and classification of geographic locations. Prior to survey distribution, the researchers obtained institutional review board (IRB) approval and constructed a novel database of potential HIEs.

The constructed database included approximately (n=65) enterprise, federated information networks, and (n=72) not for profit regional HIEs. Population estimates for active HIEs within the US have ranged as high as 200+ during peak funding associated with the Health Information Technology for Economic and Clinical Health (HITECH) Act circa 2011 to 106 in 2021.[37,38] While respondents were not directly or personally identified, the survey instrument included questions on the name of the responding institution, which was compared against the compiled database of eligible participants to ensure study eligibility. Data collection began in May of 2019 and concluded in October of 2019. Respondents received an email link to a web-based survey tool and subsequent follow-up via email with a request to complete the survey. We conducted three rounds of follow-up communications utilizing the database of potential outstanding respondents. The survey tool collected information ranging from geographic location of HIEs to VA health systems, approaches to information exchange, and capabilities to potentially identify veteran status for care coordination within extant HIE databases. The survey consisted of (n=13) questions with (n=3) questions utilizing pre-programed survey logic to reduce respondent fatigue and increase survey completion rates. We focused study design on the role and impact HIEs play in the active exchange of information between VA health systems and specific to a regional level. In using the term "active information exchange," we limited the scope of the survey instrument to include electronic data transfer mechanisms that can readily be automated and do not require a manual process. As such, we did not focus on the role of mail, fax, or granting access to remote EHRs as covered in other national reports on the exchange of health information. This context is important, as regional or local HIEs represent a critical pathway for the aggregation of patient information and as outlined in the ONC

brief and movement toward interoperability of healthcare related systems.[39]

We received a total of 40 complete and semi-complete responses from qualified participants yielding approximately a 56 percent response rate (out of 72 not for profit regional HIEs within our database) for public or community based HIEs when compared against the sample population identified above (see **Figure 1**). Surprisingly, we received no responses for the remaining federated or enterprise information networks contained within the constructed database of potential study participants.

Results

All survey responses originated from not-for-profit public or community based HIEs upon review of respondent organization by name. No enterprise or private exchanges participated in the study. **Figure 1** presents the geographic distribution of respondents' organizations by state.

Geographic Characteristics of Respondents

Most HIEs operationalized their service area based on either geographic (*n* = 17, 42.5 percent) or statewide level (*n* = 19, 47.5 percent). Almost half of HIEs (*n* = 19, 47.5 percent) were located less than 25 miles from a military base (see **Table 1**), and most respondents indicated a military base within 50 miles of the geographic service location (*n* = 32, 80 percent). In addition to geographic distance to military bases, we probed respondents for geographic distance from VA hospital locations within indicated service areas. Few HIEs indicated that no VA hospitals exist within their defined service area (*n* = 3, 7.5 percent). Most HIEs indicated either one VA hospital (*n* =15, 37.5 percent) or between two or three VA hospitals (*n* = 12, 30 percent) within an area of service. One-quarter of respondents indicated four or more VA hospital facilities located within a geographic service area (*n* = 10, 25 percent).

Current Approaches to Information Exchange

In addition to understanding HIE service areas and geographic relationships to either military bases or VA hospitals, our survey instrument included questions regarding HIEs' capabilities to either identify or index veteran's status within existing data repositories. The majority of HIEs (*n* = 23, 62.1 percent) either did not have a capability to identify or indicated difficulty calculating the percent or number of individuals eligible to utilize VA health systems or services within their clinical data repository or exchange (see **Table 2**). Approximately 11 percent (*n* = 4, 10.8 percent) of respondent HIEs had identified current VA eligibility within the HIEs' data repository, and a further 27 percent of respondents indicating a calculation could be made if needed but has not been conducted (*n* =10, 27 percent).

Our survey instrument also explored current practices regarding active exchange between HIEs and VA hospitals. Most HIE respondents (*n* = 23, 62.2 percent) did not engage in active exchange of information with regional VA health systems (see **Table 2**). Only 14 HIEs (37.8 percent of

respondents) indicated a current active exchange of information with any number of VA hospitals within their coverage area (see **Table 2**). Based on logical question programming within the survey tool, HIEs indicating active exchange were provided an additional question to further understand technical aspects of information exchange between parties. Among the most popular mechanisms of information transfer are via eHealth Exchange (10 HIEs). eHealth Exchange is a query-based platform leveraging unique access to multiple regional not-for-profit and some enterprise HIE networks. Participation in eHealth Exchange occurs via establishment of a DURSA and common login to initiate a query and based on prioritization of potential volume.[40] Only four HIEs indicated utilization of Health Level 7 (HL7) interfaces (which, at the time of writing, these include Fast Healthcare Interface Resource Application Programming Interface (FHIR API), Consolidated Clinical Documentation (C-CDA), Admit Discharge Transfer (ADT), or other common encounter notification messaging), and another four respondents employing direct messaging as formats to exchange information. **Table 3** presents the cross-tabulation of the extent of engagement and information transfer mechanisms.

Post Hoc Stakeholder Follow-Up

Upon review of the findings, we initiated a post hoc stakeholder follow-up using email to better understand responses to questions and skewed responses. Our questions focused on the opportunities to improve access to VA health data, common challenges to reconcile care for VA patients, and barriers to the identification of veterans status among extant health information exchanges.

Question 1: What is the easiest data exchange query method to obtain information on VA patients?

HIE 1 Response: eHealth Exchange

HIE 2 Response: eHealth Exchange

Question 2: What are the biggest challenges or opportunities with providing a continuum (reconciliation) of care to VA patients?

HIE 1 Response: Data quality issues.

HIE 2 Response: Large volumes and duplicate data in clinical document architecture (CDA).

Question 3: What is the challenge with identifying veterans status within current HIEs/RHIO data repositories?

HIE 1 Response: No eligibility files, which makes it difficult to identify veterans.

HIE 2 Response: No mechanism to identify veterans other than review VA eHealth Exchange query audit logs.

Discussion and Recommendations

Most not-for profit HIEs reported limited ability to adequately identify a patient based on a designated veteran's status within their respective patient databases. In addition, a majority of HIEs reported no real-time active data exchange with VA Health systems despite a high number of HIEs indicating a VA location in close geographic proximity to the HIE region. While several respondents did indicate limited interactions with VA systems using query-based search or pooling of data using eHealth Exchange as an intermediary, these findings suggest potential future problems in the reconciliation of care as patients increasingly move between VA and non-VA healthcare systems.

Limitations of our study include the lack of participation by any private or enterprise wide HIEs. We note the opportunity to focus additional research efforts on this specific demographic in future work. Our relatively small sample size of not-for-profit HIEs (n=40) also prevented attempts at generalized linear regression modeling to identify any causal associations or interactions. However, we do note that a strength or our study is a robust response originating from not-for profit HIEs. Our findings suggest an ongoing patchwork approach to HIEs engaging with regional VA Health Systems for the purpose of exchanging information in line with findings in other peer reviewed literature.[41] There is limited evidence among survey participants to suggest that VA Health systems routinely connect to both public and private HIEs to engage in real-time data exchange to support goals outlined within the MISSION Act. To this end we provide the following recommendations considering the findings above.

1. Increase the Utilization of HIEs by VA Health Systems – A key finding of our work is limited utilization of not-for-profit HIE services and diffuse practices with regards to establishing connectivity between regional VA Health Systems and public not-for-profit HIEs. Search based or end-user-initiated queries were the most common approach to exchange information using a portal to access the HIE by the VA Health System conducting a search. Real-time exchanges of information such as active alerts or encounter notifications services were less frequently reported by HIEs when interacting with VA Health Systems or VA locations of care. A key advantage of real-time information exchange is the ability to automate a service fully or partially, or to reduce potential errors in preforming a user-initiated search (e.g., misspelling of names or change of patient residency).[42]
2. HL7 Capability to Document Eligibility or Insurance Status – Another key finding of this work is in highlighting the difficulty for HIEs to appropriately index existing databases for patient status based on VA health system or TRICARE eligibility. The ability to appropriately convey and exchange "veteran status" is a necessary step in fulfilling the requirements associated with the MISSON Act and to reconcile care among potential insurance types. To appropriately index extant databases for information on current VA health system reliability, we recommend consideration by HL7 to update Level 3 Administrative FHIR[43] frameworks to include veteran status as a base resource. HL7 operates on a consensus and member-driven voting process with open commenting on changes to proposed standards. Inclusion of a criterion as a

standard for information exchange would assist in future data exchange efforts. This resource would aid in determination of eligibility, resource management, and establishing continuity in the delivery of care.[44] We also note an ongoing discussion for the inclusion of veteran status within SNOMED CT, HL7 data standards as well as United States Core Data for Interoperability (USCDI) future versions where the findings of this work support the inclusion of such a data class.[45]

3. Identification of Current Best Practices to Exchange Information – We note several emerging best practices for successful engagement between HIEs and regional VA Health Systems. Real time push of data, which includes encounter alerts and sharing of lab results, is critical to reduce the duplication of tests and make sure the primary care physicians and care coordinators get information as a push transaction versus the current query only model using eHealth Exchange or the Sequoia hub. The VA and DoD should publish all their provider DIRECT addresses and establish internal workflows that support transition of care (ToC) documents. Notifications should be channeled to providers who are managing the care of the veterans resulting from increased access to non-VA health systems and the community care program.

In summary, the most prevalent approach employed between HIEs and regional VA health systems is utilization of eHealth Exchange as a common platform to query (post hoc) patient eligibility. Another notable finding is that the majority of not-for-profit HIEs lack the ability to identify or index existing databases to further understand potential veteran populations. A key directive of the MISSION Act is to increase access to care for veterans into the private sector. However, the ability to fully reconcile eligibility or status within existing HIE databases remains problematic when surveying public not-for profit HIEs, making coordination of care problematic for HIEs. We recommend continued support of existing query-based models of data exchange. However, given the complex issues surrounding increased access by veterans, a shift should occur toward utilization of active data exchange protocols.

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