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Interoperability among U.S. Non-federal Acute Care Hospitals, 2014

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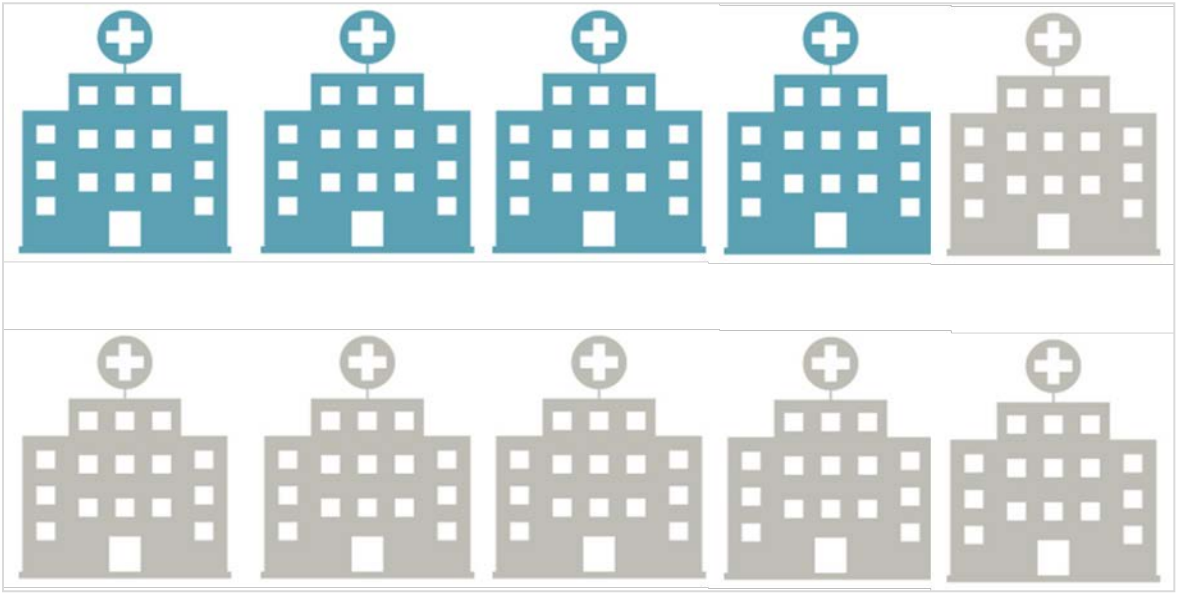
The draft Nationwide Interoperability Roadmap issued by the Office of the National Coordinator for Health IT (ONC) outlines strategies to enable nationwide interoperability so that individuals and providers across the care continuum can electronically send, receive, find, and use a common clinical data set (1). The availability of this key clinical information at the point of care has important implications for patient safety and care coordination. Prior analysis showed that hospitals have the infrastructure to enable exchange and are electronically exchanging health information with trading partners (2, 3). This brief presents baseline estimates on the state of interoperable exchange activity among U.S. non-federal acute care hospitals in 2014. This data brief defines interoperable exchange activity as the ability for hospitals to electronically find, send, receive, and use health information from other systems; where, "find" refers to hospitals' ability to query patients' health information from external sources and "use" is the ability to integrate summary of care records without manual entry. The brief also explores whether hospitals have essential patient information available from sources outside their system. Lastly, this brief describes interoperability barriers experienced by hospitals.

About four-in-ten hospitals have necessary patient information electronically available from care settings outside their systems.

Figure 1: Percent of U.S. non-federal acute care hospitals whose providers have necessary clinical information electronically available from outside providers or sources when treating a patient that was seen by another health care provider or setting, 2014.

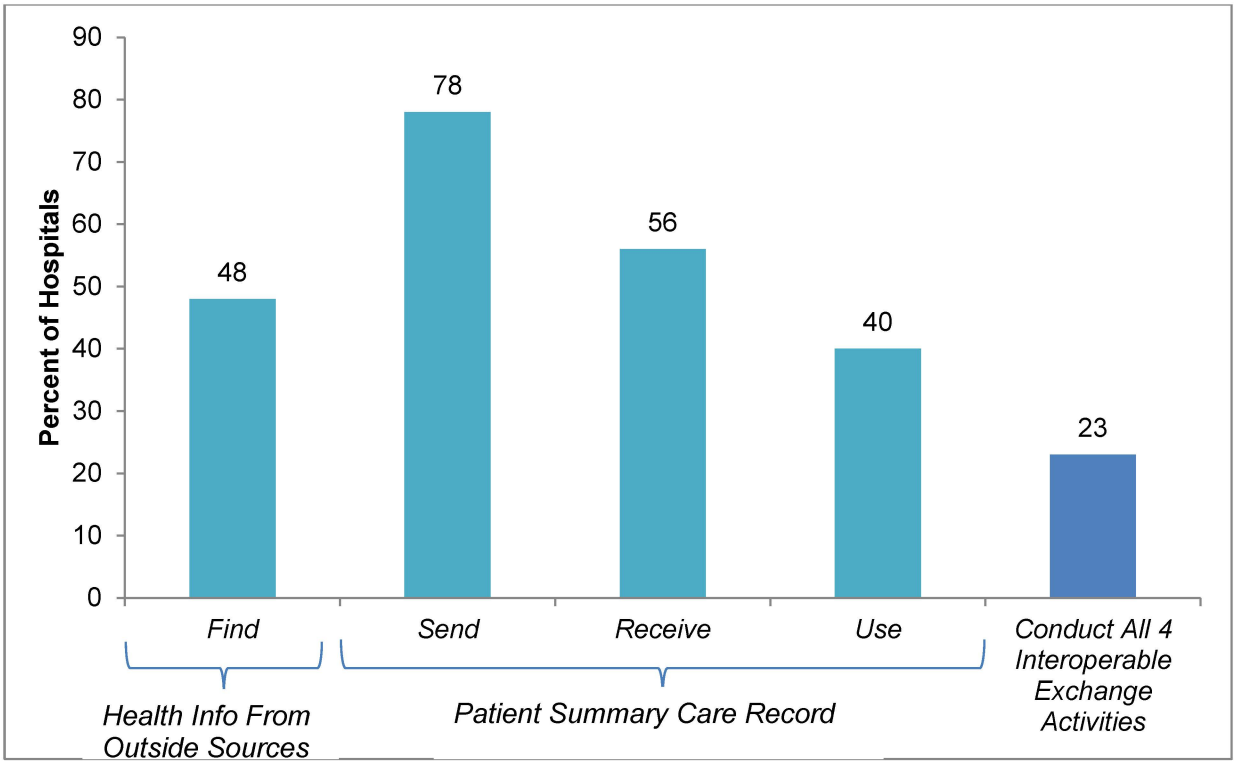


SOURCE: ONC/American Hospital Association (AHA), AHA Annual Survey Information Technology Supplement.

★ Forty-one percent of hospitals nationwide routinely have necessary clinical information electronically available from outside providers or sources when treating a patient.

Approximately one-quarter of hospitals engaged in all four activities related to interoperable exchange.

Figure 2: Percent of U.S. non-federal acute care hospitals that electronically find patient health information, and send, receive, and use patient summary of care records from sources outside their health system, 2014.

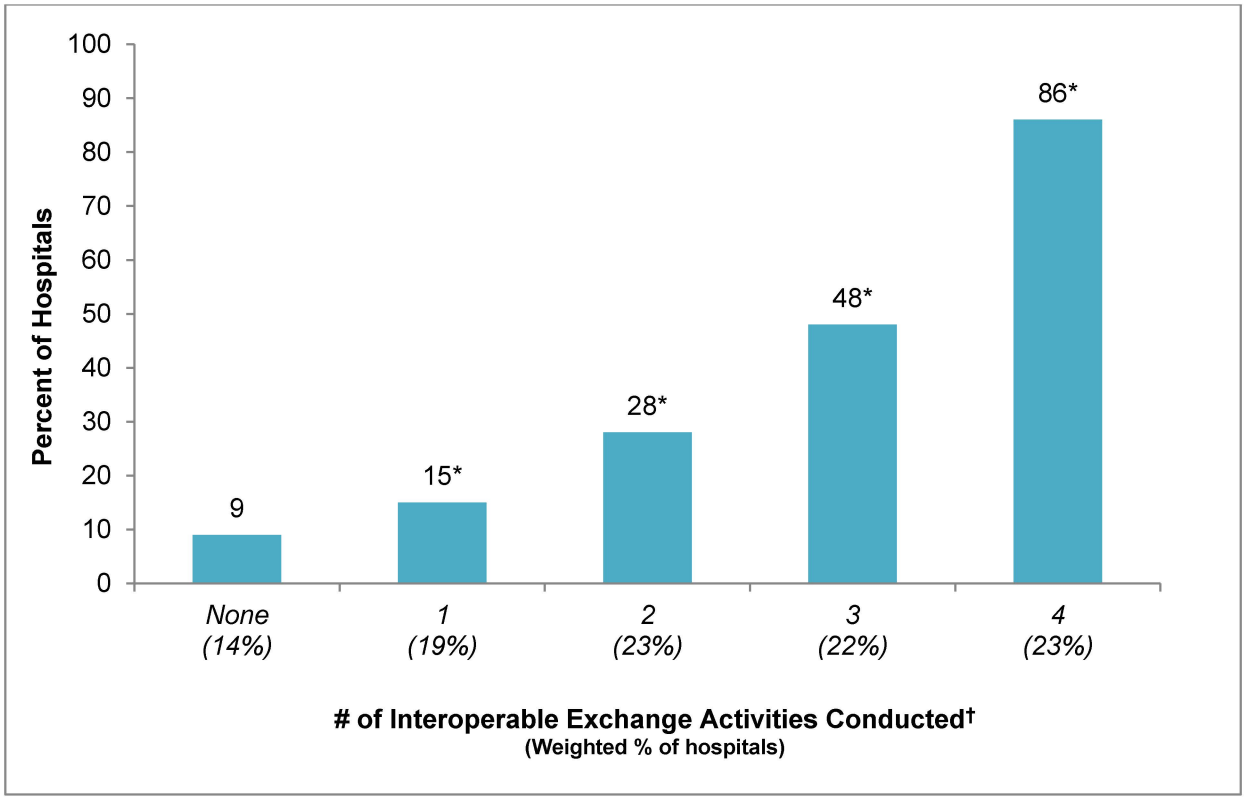


SOURCE: ONC/American Hospital Association (AHA), AHA Annual Survey Information Technology Supplement.
NOTES: "Find" is only interoperable exchange ac ivity not specific to summary of care records. Find refers to query. "Send" and "Receive" include routine exchange using secure messaging using an EHR, using a provider portal, OR via health information exchange organization or other third party. "Use" requires that the records are integrated into the hospital's EHR system without the need for manual entry. See the Appendix Table for more details.

- ★ Over three quarters (78%) of hospitals sent patient summary of care records; however, only about half (56%) received summary of care records from outside sources.
- ★ Four-in-ten (40%) hospitals were able to use (i.e., integrate) summary of care records received without manual entry.
- ★ Nearly half (48%) of hospitals reported their providers engaged in electronically finding (i.e. querying) their patients' health information from sources outside their organization or hospital system.

Hospitals engaging in more interoperable exchange activity have higher levels of information electronically available from outside settings.

Figure 3: Percent of U.S. non-federal acute care hospitals whose providers have electronically available necessary clinical information from outside providers or sources when treating a patient that was seen by another health care provider or setting by the number of interoperable activities conducted, 2014.

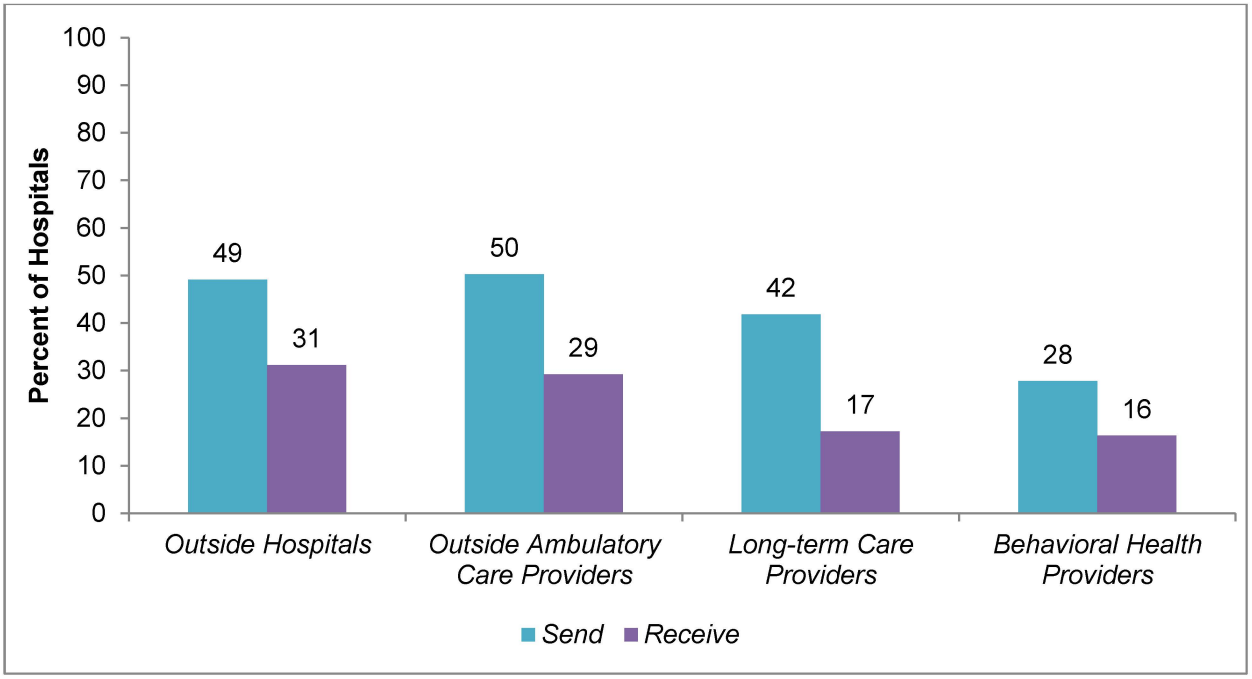


SOURCE: ONC/American Hospital Association (AHA), AHA Annual Survey Information Technology Supplement.
Notes: * indicates that the value is significantly different from the preceding value.
† These activities are the same as found in Figure 2: "Find" is only interoperable exchange activity not specific to summary of care records. "Send" and "Receive" include routine exchange using secure messaging using an EHR, using a provider portal, OR via health information exchange organization or other third party. "Integrate" requires that the records are integrated into he hospital's EHR system without the need for manual entry. See the Appendix Table for more details.

- ★ Nearly nine-in-ten hospitals that engage in all four interoperable exchange activities (i.e., send, receive, find, and use) have necessary clinical information electronically available from outside providers or sources when treating patients.
- ★ Hospitals that conduct all four interoperable exchange activities are over nine times more likely (86%) to have necessary clinical information electronically available from outside providers or sources at the point of care than hospitals that conduct none of these activities (9%).
- ★ Hospitals' electronic availability of necessary clinical information from outside providers or sources significantly increases with each additional activity they undertake.
- ★ Nearly half (45%) of hospitals engage in three or more interoperable exchange activities.

Rates of sending and receiving summary of care records between hospitals and other providers vary by provider type.

Figure 4: Percent of U.S. non-federal acute care hospitals that send or receive summary of care records with hospitals and ambulatory care providers outside their system, long-term care providers, and behavioral health providers, 2014.

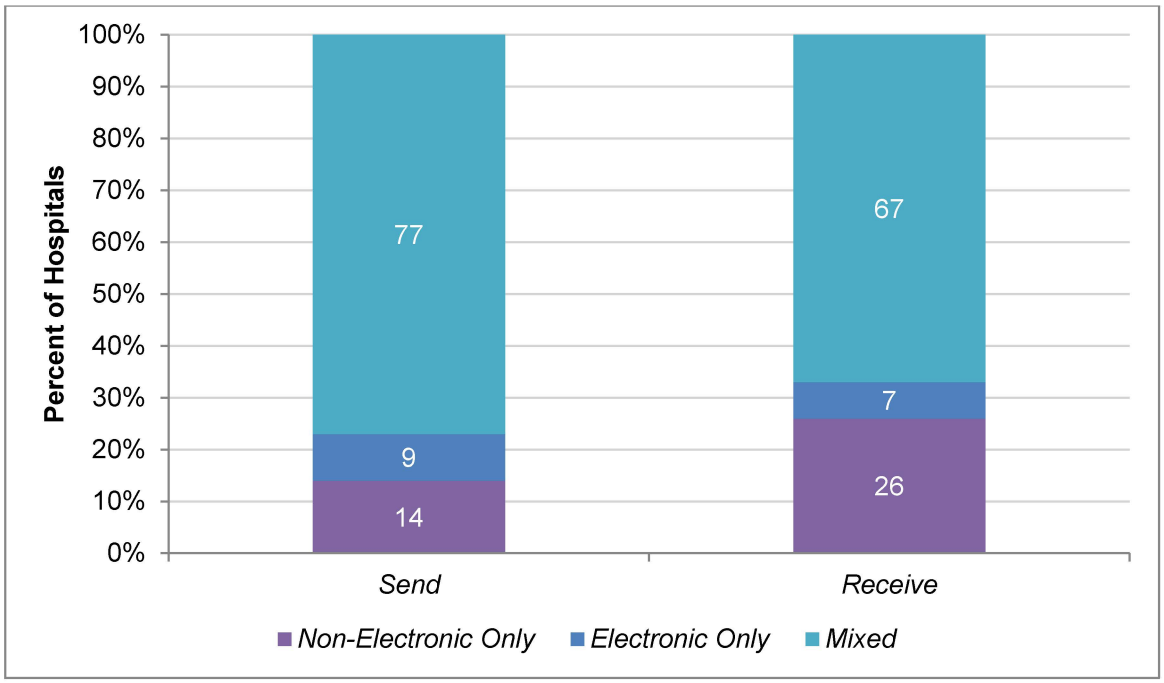


SOURCE: ONC/American Hospital Association (AHA), AHA Annual Survey Information Technology Supplement.
Notes: Does not include "eFax." Summary of care records are in a structured format (e.g., CCDA). Exchange with long-term care providers and behavioral health providers includes both those inside and outside the hospital's health system..

- ★ Rates of both sending and receiving summary of care records between hospitals and ambulatory care providers outside their hospital system are higher than rates of electronic exchange with long-term care providers and behavioral health care providers.
- ★ Approximately half of hospitals send data to outside hospitals and ambulatory care providers; whereas four-in-ten (42%) hospitals reported sending summary of care records to long-term care providers (inside and outside their system) and fewer than three-in-ten (28%) hospitals reported sending summary of care records to behavioral health providers (inside and outside their system).
- ★ In 2014, approximately three-in-ten hospitals received summary of care records from outside hospitals and ambulatory care providers; whereas only one in six hospitals reported receiving summary of care records from long-term care providers (17%) and behavioral health providers (16%).

Fewer than one-in-ten hospitals use only electronic means of exchanging summary of care records with outside sources.

Figure 5: Percent of U.S. non-federal acute care hospitals that send or receive summary of care records to/from outside sources by electronic and non-electronic methods, 2014.

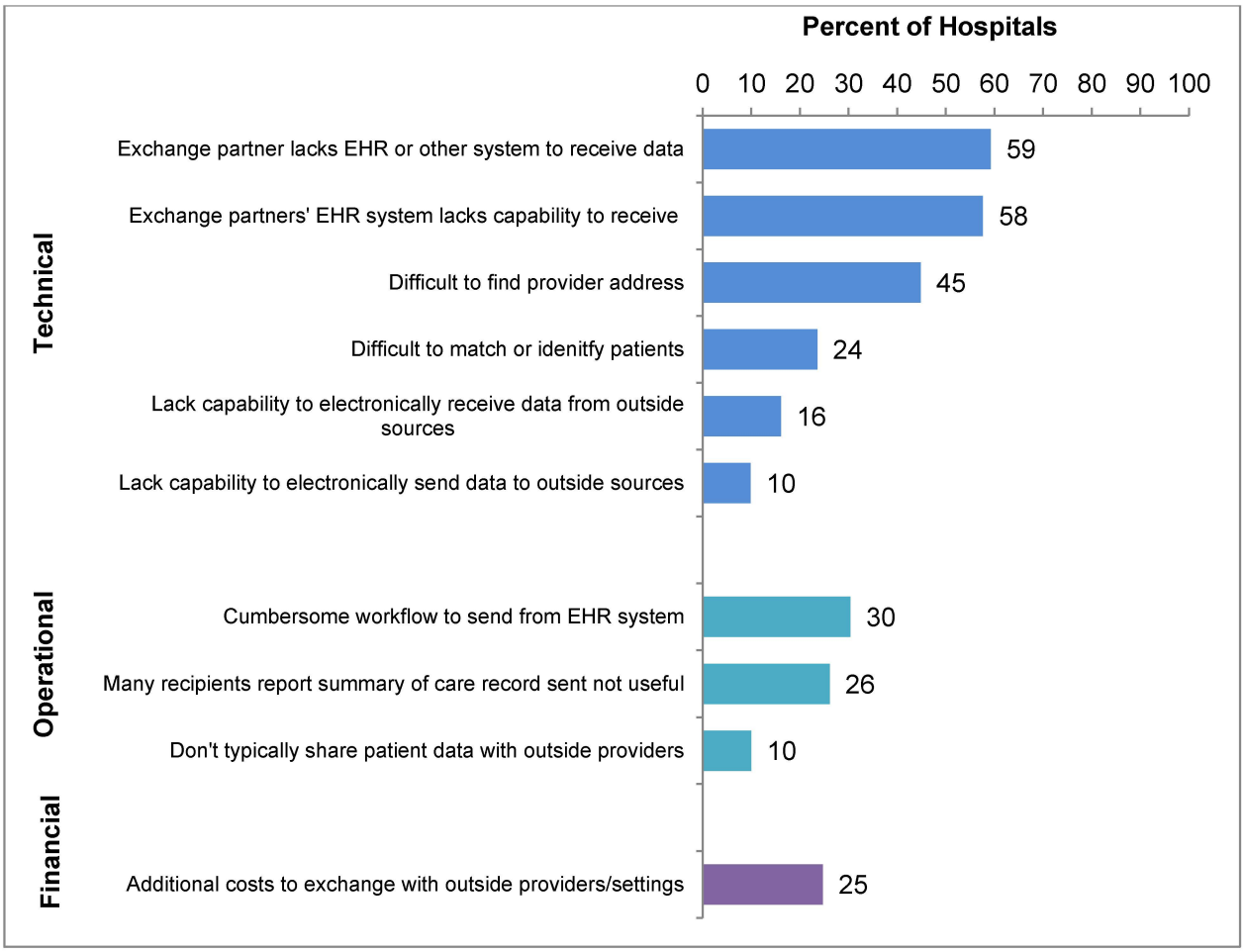


SOURCE: ONC/American Hospital Association (AHA), AHA Annual Survey Information Technology Supplement.
NOTES: Non-electronic methods include Mail, Fax, or eFax. Electronic methods include secure messaging using an EHR, provider portals, or via health information exchange organizations or other third parties.

- ★ A majority of hospitals use a combination of electronic and non-electronic means to send (77%) and receive (67%) summary of care records to/from outside sources.
- ★ A quarter (26%) of hospitals receive summary of care records in non-electronic format only (e.g., mail, fax or eFax) only.
- ★ Few hospitals send (9%) or receive (7%) summary of care records to/from outside sources only in electronic formats.

Lack of exchange partners with the capability to electronically receive information was a barrier to interoperability for most hospitals.

Figure 6: Percent of U.S. non-federal acute care hospitals that identified the following issues when try trying to electronically send, receive, or find patient health information to/from other care settings or organizations.



SOURCE: ONC/American Hospital Association (AHA), AHA Annual Survey Information Technology Supplement.

- ★ One-quarter of hospitals reported that they have to pay additional costs to send/receive data with trading partners outside of their organization.
- ★ Almost half of hospitals reported difficulty locating providers and about a quarter reported difficulty matching or identifying patients.
- ★ Three-in-ten hospitals reported a cumbersome workflow to send information from their EHR system.
- ★ One-in-ten hospitals reported that they do not typically share their patient data with care settings outside their system.

Summary

Prior analysis shows that three-quarters of hospitals electronically exchanged health information in 2014; representing an 85 percent increase since 2008 (3). This brief finds that in that same year, four-in-ten non-federal acute care hospitals nationwide reported having the necessary clinical information available electronically from outside providers or sources when treating a patient that was seen by another provider or setting. This represents a new baseline estimate regarding whether hospitals have essential patient health information electronically available at the point of care from sources outside their system. The availability of key clinical information at the point of care has important implications for patient safety and care coordination (4, 5). Increasing the availability of information is also critical to support the expansion of care transformation efforts nationwide (6).

Electronic sharing of data can help address information gaps that commonly occur during transitions (7). While most hospitals sent summary of care records, less than half received these data and only four-in-ten were able to use the information contained in summary of care records in their EHR without manual entry. Close to half of hospitals reported that their providers electronically engaged in finding or querying their patients' health information from sources outside their organization or hospital system.

About one-quarter of hospitals reported that they engaged in all four interoperable exchange activities (e.g., find, send, receive, and use). Hospitals engaging in more interoperable exchange activities had significantly higher rates of necessary patient information electronically available from outside sources and providers. Nearly nine-in-ten hospitals that conducted all four activities associated with interoperability had information available from outside settings. This is nine times higher than hospitals that did not conduct any of these activities.

Despite the potential benefits of electronic exchange, a majority of hospitals used a mixture of paper and electronic methods to exchange information. Few hospitals used only electronic means of sending (9%) and receiving (7%) summary of care records electronically. This might be due to exchange partners' limited capability to receive information, which was considered by hospitals to be the top barrier to interoperability. Long-term care and behavioral health care providers, in particular, have limited capabilities to electronically exchange data with outside providers (8, 9, 10). Hospitals' rates of both sending and receiving patient summary of care records to and from long-term care and behavioral health care providers were considerably lower than electronic exchange with outside hospitals and ambulatory care providers.

Findings in this brief also provide insight on technical, operational and financial barriers to interoperability, while highlighting the need for future policies like the Roadmap to address these barriers. Frequently reported technical barriers related to provider directories and patient matching, which are key priorities that the Roadmap seeks to address (1). Common operational barriers experienced by hospitals included a cumbersome workflow to send information from their EHR system and recipients of patient summary of care records did not consider the information useful. Additionally, few hospitals (10%) reported that they typically don't share data with outside providers. This finding has implications for health information blocking; which has also been identified as a barrier to interoperability by ONC (11).

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Definitions

Non-federal acute care hospital: Includes acute care general medical and surgical, children's general, and cancer hospitals owned by private/not-for-profit, investor-owned/for-profit, or state/local government and located within the 50 states and District of Columbia.

Interoperability: The ability of a system to exchange electronic health information with and use electronic health information from other systems without special effort on the part of the user (1). This brief further specifies interoperability as the ability for health systems to electronically send, receive, find, and use health information with other electronic systems outside their organization.

Use: Whether the EHR integrates summary of care record received electronically (not eFax) from providers or sources outside your hospital system/organization without the need for manual entry.

Find: Whether providers at your hospital query electronically for patients' health information (e.g., medications, outside encounters) from sources outside of your organization or hospital system

Data Source and Methods

Data are from the American Hospital Association (AHA) Information Technology (IT) Supplement to the AHA Annual Survey. Since 2008, ONC has partnered with the AHA to measure the adoption and use of health IT in U.S. hospitals. ONC funded the 2014 AHA IT Supplement to track hospital adoption and use of EHRs and the exchange of clinical data.

The chief executive officer of each U.S. hospital was invited to participate in the survey regardless of AHA membership status. The person most knowledgeable about the hospital's health IT (typically the chief information officer) was requested to provide the information via a mail survey or secure online site. Non-respondents received follow-up mailings and phone calls to encourage response. The survey was fielded from November 2014 to the end of February 2015.

The survey was fielded from November 2014 to the end of February 2015. The response rate for non-federal acute care hospitals was 60%. A logistic regression model was used to predict the propensity of survey response as a function of hospital characteristics, including size, ownership, teaching status, system membership, and availability of a cardiac intensive care unit, urban status, and region. Hospital-level weights were derived by the inverse of the predicted propensity.

Estimates considered unreliable had a relative standard error adjusted for finite populations greater than 0.49. Responses with missing values were assigned zero values. Significant differences were tested using $p < 0.05$ as the threshold.

About the Authors

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Appendix

Appendix Table: Survey questions assessing interoperability among hospitals.

Question Text	Response Options
When a patient transitions to or from another care setting or organization, does your hospital routinely electronically send and/or receive (NOT eFax) a summary of care record in a structured format (e.g. CCDA) with the following providers? Check *all* that apply.	Send | Receive| Don't Know ▪ Other Hospitals outside your system ▪ Ambulatory Care Providers outside your system ▪ Long-term Care Providers (inside or outside system) ▪ Long-term Care Providers (inside or outside system)
Does your EHR integrate any type of clinical information received electronically (not eFax) from providers or sources outside your hospital system/organization without the need for manual entry? *This could be done using software to convert scanned documents into indexed, discrete data that can be integrated into EHR.*	▪ Yes, routinely | Yes, but not routinely | No | Do not know | NA
If yes, does your EHR integrate the information contained in summary of care records received electronically (not eFax) without the need for manual entry? *This could be done using software to convert scanned documents into indexed, discrete data that can be integrated into EHR.*	▪ Yes, routinely | Yes, but not routinely | No | Do not know | NA
Do providers at your hospital query electronically for patients' health information (e.g. medications, outside encounters) from sources outside of your organization or hospital system?	▪ Yes | No | No, don't have capability | Do not know
When a patient transitions to another care setting or organization outside your hospital system, how does your hospital routinely send and/or receive a summary of care record? Check all that apply.	Send | Receive| Don't Know ▪ Mail or fax ▪ eFax using EHR ▪ Secure messaging using EHR (via DIRECT or other secure protocol) ▪ Provider portal (i.e., post to portal or download from portal) ▪ Via health information exchange organization or other third party
Which of the following issues has your hospital experienced when trying to electronically (not eFax) send, receive or find (query) patient health information to/from other care settings or organizations? (Check *all* that apply)	▪ We lack the capability to electronically send patient health information to outside providers or other sources ▪ We lack the capability to electronically receive patient health information from outside providers or other sources ▪ Providers we would like to electronically send patient health information to do not have an EHR or other electronic system with capability to receive the information ▪ Providers we would like to electronically send patient health information to have an EHR; however, it often lacks the capability to receive the information ▪ Many recipients of our electronic care summaries (e.g., CCDA) report that the information is not useful ▪ Cumbersome workflow to send (not eFax) the information from our EHR system ▪ Difficult to match or identify the correct patient between systems ▪ Difficult to locate the address of the provider to send the information (e.g., lack of provider directory) ▪ We have to pay additional costs to send/receive data with care settings/organizations outside our system ▪ We don't typically share our patient data with care settings/organizations outside our system