Insights & Analysis

Real-World Data

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While Progress Has Been Made, Barriers Still Impede Fully Interoperable Health Information Technology

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Summary

On behalf of The Pew Charitable Trusts, Avalere conducted research to identify current barriers to interoperability and some of the best potential solutions in the current political and business environments.

Healthcare providers in the United States have made substantial strides over the last decade in adopting health information technology (HIT), especially electronic health records (EHRs), to support and improve care delivery. Through the 2009 HIT for Economic and Clinical Health (HITECH) Act, the federal government has invested over $31 billion in incentive payments to providers for the meaningful use (MU) of EHR systems. Recent statistics show that over 75 percent of hospitals had a basic EHR system in place by the end of 2014, up from 59 percent in 2013. The recently passed 2015 Medicare Access and CHIP Reauthorization Act (MACRA) contains several HIT-related provisions intended to encourage deeper interoperability. Despite these federal efforts, the vision of a completely connected healthcare system – where providers, hospitals, and patients seamlessly exchange health information – has not been fully realized. The nation’s HIT systems still face several barriers in achieving the truly systemic interoperability needed to facilitate the shift to value-based healthcare.
Methodology and Summary of Results

Avalere conducted interviews with key HIT stakeholders representing diverse perspectives in the healthcare space, including policymakers, HIT companies, Health Information Exchange (HIE) organizations, standards development organizations (SDOs), providers and health systems, collaboratives, and professional societies. Avalere conducted the interviews using a structured discussion guide that included questions around successes of health information exchange, federal programs and legislation, data blocking and proprietary systems, patient matching, barriers to interoperability, and interoperability solutions. The research gleaned from the stakeholder interviews and internal Avalere analysis led to valuable insights around barriers and solutions for HIT interoperability. Below are the three key barriers that continue to inhibit progress, outlined with their respective solutions:

Barrier 1: Inconsistent implementation of standards

Existing standards are not implemented in a way that is conducive to completely seamless exchange that offers easy access of information to end users as well as retains the clinical meaning of the information:

- Current, widely-used data exchange standards often include too much information that is not clinically relevant, making it difficult to find the data elements of interest. While the standard may technically be able to transmit data from one provider to another, often the data received cannot be easily processed and integrated into patient records because the Consolidated Clinical Document Architecture (C-CDA) allows for free text entries that systems may not recognize.
- Limited alignment in the structure, format, and definition of clinical data elements constrains the linking of diverse datasets from different locations. For example, one system may include Logical Observation Identifiers Names and Codes (LOINC®) codes, and one may use only current procedural terminology (CPT) codes. While both of these are valid code sets, LOINC codes have a higher degree of clinical specificity than CPT codes and may include more detail.
- Incomplete and imprecise implementation guidance issued by standards developers and certification bodies adds to inconsistent interpretation by HIT vendors and variable application by developers and end users. For example, one organization may use a Health Level 7 (HL7) implementation guide for the C-CDA and another may use an Integrating the Healthcare Enterprise (IHE) implementation guide for the same standard. As a result, different implementations of the same standard can occur, resulting in significant variability in data format, exchange, and clinical meaning.

Solutions
Adopt innovative, end-user focused standards.

- Fast Health Interoperability Resources (FHIR), an emerging HL7 standard for clinical data exchange, is built on common standards widely used in basic internet development. FHIR has a degree of optionality that allows it to be used in a variety of domains, as well as on an international level. While this optionality is appealing to developers, it may lead to the creation of FHIR profiles that are not semantically sound. For example, two profiles for heart rate could be developed, one that specifies a valid unit for measurement, and another that leaves the units of measurement up to the user.
- As a result, FHIR users will need to agree on local, information-model level constraints of FHIR resources to ensure consistent application by users. FHIR also requires more successful implementations to demonstrate its capabilities and validate its potential for more widespread success. HL7 should continue to refine the implementation guidance for FHIR, and ensure that pilot projects for FHIR assess the uniformity of the standard’s implementation and the opinions of the end users of the data.

Further develop and align standards-related implementation guidance

- Uniform implementation ensures that the clinical information being translated will retain both its format and its meaning to the end user. Though there has been a proliferation of standards, not all of them have appropriate implementation guidance available, and therefore are not being used consistently in data exchange.
- The Office of the National Coordinator (ONC) could also include the successful testing of implementation guides in its vendor certification process as a part of future regulation. This testing would ensure that the HIT users can successfully apply implementation guides to certified technology, resulting in correct and uniform use of the standards.

Incorporate field-testing requirements into EHR certification

- ONC could extend the EHR certification testing requirements to ensure that they produce the desired outcomes for end users, which would ensure more uniform, consistent implementation.
- Legislation should require EHRs to meet certification standards for the end-user outcomes of data exchange (e.g. a clinician’s ability to use exchanged data in patient care) as well as their methodology. Moreover, to better ensure that the certified technologies will truly address the needs of the end users, the federal government should ensure that input from system clinical users and developers is incorporated into HIT certification program criteria.

Drive toward consensus-based vocabulary and code sets

- Using structured clinical vocabulary and coding will decrease and potentially eliminate the need for HIT systems to deconstruct data into useful formats upon arrival, resulting in more
actionable data use in clinical decision support, quality measurement, clinical registry input, and clinical effectiveness research.

- HIT developers, users, clinicians, and professional societies could form a coalition to collectively determine the most effective clinical vocabularies to use for different therapeutic areas and/or care settings. Alternatively, ONC can require certain vocabularies and code sets in certification requirements for HIT, which could further encourage use of consistent terminologies by HIT developers and as a result, those exchanging data.

### Barrier 2: Inability to consistently identify and match patients

Though techniques used for patient identification and matching are more sophisticated than in the past, it is still considered one of the biggest barriers in accurate health information exchange. Many organizations have developed sophisticated, successful strategies and algorithms for matching patients. However, there is no single, widely adopted solution, indicating that most organizations have developed patient matching solutions that satisfy their internal needs alone. Variability in methodology creates a lack of consistency in patient tracking across both providers and within HIT systems, making it extremely difficult to maintain patient records and ensure patient safety in both procedural treatment and medication management.

### Solutions

**Support and implement a national patient identifier**

- In the absence of a unique patient identifier (UPI), systems must match each patient record by using unique primary and secondary variables shared by the two records (e.g., name, date of birth, sex at birth, and race). The errors in matching would be decreased with the use of a singular identification number for each patient.
- While patient privacy advocates continue to argue against the use of UPI, stating that the risk faced in terms of patient privacy and security far outweigh the benefits, there is potential for the federal government to safely institute a national patient identifier.

**Standardize the required patient identifying attributes in data exchange transactions**

- A defined and standardized set of data attributes in ONC’s certification criteria would improve patient matching accuracy a variety of relevant clinical activities, such as querying for patient data, linking lab results or documents sent to a provider, and linking within master patient indices.
- Examples of patient identifying attributes that should be standardized include name (first, middle, last), suffix, date of birth, current address, historical address, current phone number, historical phone number, and gender.
- Use of common definitions (e.g., United State Postal Service universal address) and standards
would also help improve consistency across patient records.

**Barrier 3: Misaligned incentives in current healthcare payment systems**

Physicians want to support care coordination activities for their patients to ensure they receive efficient, complete treatment, a concept supported by the exchange of patient data among clinicians. This data exchange and the required technical infrastructure, however, are not typically reimbursed under the fee-for-service system, which has traditionally resulted in low prioritization by clinicians. Similarly, hospitals are reticent to exchange data with other hospitals or physicians not associated with their system because they are considered direct competitors in the market. Hospitals have financial incentives to increase market share and keep patients, as well as lucrative services, within their system. Ultimately, competing interests and a weak business case for health information exchange is impeding progress towards greater interoperability.

**Solutions**

**Continue to shift healthcare payment models away from fee-for-service**

- HHS should continue to explore opportunities to promote interoperability through increasing participation in value-based payment and encouraging those that are currently participating in public and private initiatives.
- Currently, there is no comprehensive analysis of the return on investment of interoperability for different delivery system participants (such as hospitals, accountable care organizations, health plans, skilled nursing facilities, etc.), or for the impact of effective HIE on the entire healthcare system. A system-wide ROI analysis could be a catalyst that engages stakeholders more broadly in participating and developing interoperability solutions, as well as motivating government action.
- Along with public sector efforts, commercial health plans have developed and deployed a wide range of value-based payment programs within their provider networks that offer new opportunities to focus attention on and generate demand for interoperability.

**Pursue direct financial incentives to promote interoperability goals**

- While the recently passed Merit-Based Incentive Payment System (MIPS) does include some interoperability-stimulating provisions, they are not fully formed and lack the specificity required to spur true system-wide interoperability. MIPS is also, as a regulation, not fully developed. The Centers for Medicare & Medicaid Services (CMS) should continue to use public comments from important stakeholders to adjust MIPS such that it not only include furthers HIT provisions but also lays the groundwork for participation through additional incentives.
• CMS and ONC could also use MIPS as a regulatory way to update and improve EHR certification requirements so that they better serve the needs of end-users

Conclusion

Funding for this work was provided by The Pew Charitable Trusts. To learn more about barriers and solutions around fully interoperable HIT, please contact Caryn Just at CJust@avalere.com.

