April 3, 2015

Karen DeSalvo, MD, MPH, MSc
National Coordinator
Office of National Coordinator for Health IT
Department of Health and Human Services
200 Independence Ave, SW
Washington, DC 20201

RE: Workgroup for Electronic Data Interchange Comment Letter on Connecting Health and Care for the Nation – A Shared Nationwide Interoperability Roadmap v1.0

Dear Dr. DeSalvo:

In its advisory role under the Health Insurance Portability and Accountability Act of 1996 (HIPAA), the Workgroup for Electronic Data Interchange (WEDI) periodically comments on issues related to healthcare information exchange and associated areas that it believes merit consideration by the Secretary of Health and Human Services.

The WEDI Board of Directors submits the attached comments for your consideration. WEDI appreciates the opportunity to collaborate with the Office of the National Coordinator for Health Information Technology and stands ready to assist in clarifying the attached as needed.

Devin Jopp, Ed. D., President and CEO of WEDI, or I would be pleased to answer further questions. You may contact Devin at djopp@wedi.org or (202) 618-8788.

Sincerely,

Jean P. Narcisi

Jean Narcisi
Chair, WEDI

CC: Lisa Lewis, Acting National Coordinator for Health Information Technology
WEDI Board of Directors

Workgroup for Electronic Data Interchange (WEDI)

Comments on the ONC Interoperability Roadmap

WEDI strongly supports ONC's efforts to establish an industry-wide interoperability roadmap and prioritize interoperability in the years ahead; however, we would urge the roadmap to better reflect the realities, gaps, challenges, and opportunities across the current landscape. A recent national survey conducted by WEDI indicates that there are significant barriers to interoperable electronic data exchange among health providers, health plans, and technology vendors that remain to be addressed. Key findings are further discussed on page 6 and results are provided in greater detail in the appendix.

Comment Area: General Comment

Comment 1: WEDI believes that the proposed timing and scope of the roadmap actions are aggressive and suggests that ONC prioritize actions. WEDI believes that the healthcare industry is still working on implementing the basic infrastructure in order to support the exchange of electronic health data. Given the nascent state of these efforts, and in light of competing deadlines (e.g. ICD-10, Administrative Simplification provisions, etc.). WEDI would encourage ONC to develop a prioritized list of actions and individual stakeholder assignments that can be achieved with reasonable effort. WEDI also suggests that future actions balance innovation with existing and proven industry initiatives (e.g. Healtheway and Direct).

Comment Area: Rules of Engagement and Governance / Governance

Comment 2: The changes required ahead will require more involvement of the healthcare industry, and less direct federal oversight. Over the past several years, ONC has played a key role in driving the development and adoption of core building blocks and standards for health information technology. As we move, however, into a more mature phase of building a health IT infrastructure, WEDI would encourage ONC to continue its shift away from a government-based governance and oversight program and move towards coordination and guidance with private industry partners. Given the success of efforts such as Healtheway, the industry would stand much to gain if ONC identifies additional priority areas for public-private collaboration.

Comment Area: Rules of Engagement and Governance / Patient Identification

Comment 3: The healthcare industry needs a sustainable and unified national patient matching strategy. Despite the advancements in health IT and analytics, the misidentification of patients continues to unnecessarily contribute to adverse patient events, errors, costs, waste and fraud and abuse. As originally noted in the 2013 WEDI Report, many of the interoperability challenges that exist today are related to the inability to accurately, efficiently, or consistently identify patients in disparate settings

across the continuum of care. Accordingly, WEDI would urge ONC to work to standardize the patient identification matching process.

Comment Area: Rules of Engagement and Governance / Patient Access to and Use of Health Information

Comment 4: Basic aspects of electronic clinical data exchange must be resolved first before addressing more complex capabilities around patient access to health information and individual choice. WEDI supports the vision that an individual healthcare consumer should ultimately have free-flowing, open, and transparent access to their personal health information - and be able to steward and manage their data across the continuum. Roadmap policies, however, need to build more support for electronic data exchange and avoid creating an overly complex environment that might inhibit how much data is shared during early stages of maturity. The health IT infrastructure is not fully in place to accommodate an opt-in paradigm that would allow personal health information to be compartmentalized, updated, and shared efficiently across disparate systems. ONC is therefore advised to further discuss this from a policy perspective and to further evaluate the balance between the burden and value of individual choice.

Comment 5: In addition to technical barriers to patient access to information, health IT literacy remains a significant challenge for healthcare consumers and caregivers. As noted in the 2013 WEDI Report, the healthcare industry must develop education and literacy programs that drive consumer use of mobile and online technologies. WEDI would urge ONC to partner and/or fund multi-stakeholder organizations (e.g. the Sullivan Institute for Healthcare Innovation) to launch a national initiative that educates healthcare consumers around the use of technology and electronic personal health information. WEDI supports the ONC vision for individuals to "interact easily and seamlessly with their care team as they transition into and out of the health care system, communicating remotely with their care team as needed over time".

Comment 6: Use cases of patient generated and patient updated health information need to be piloted and evaluated before applicable policy frameworks, standards, or trust environments are developed. While WEDI supports the need for an individual's access to and management of their personal health information, it is unclear how data can be effectively integrated into workflows or what value it might add for stakeholders. It is recommended that ONC pilot several use cases to study how the use of a patient's personal health information, both generated or updated, might close gaps in care delivery and management.

In 2014, WEDI in collaboration with the Louis W. Sullivan Institute of Healthcare Innovation and more than 40 stakeholders, began a project to develop, pilot, and evaluate a vendor-agnostic virtual clipboard that will facilitate portability and access of both basic health and insurance eligibility information. This effort is expected to drive significant efficiency gains upstream for providers and health plans and streamline the care experience for patients. WEDI suggests that ONC support these private industry initiatives that can help resolve key interoperability challenges.

Comment 7: The use and concrete value of patient-generated health data (PGHD) is nascent and unproven. As previously discussed in federal advisory committee meetings and reports, the industry has

yet to coalesce around a consistent definition of PGHD, much less standardized on how it should be collected and used. The use of PGHD has largely been limited due to concerns around data accuracy, governance, liability, quality, and integration into workflows. As noted in the 2013 WEDI Report, the industry must begin identifying approaches that effectively and consistently leverage PGHD. ONC is encouraged to further examine the legal and operational issues associated with PGHD, and develop a framework for how information that is passively and actively monitored can be effectively and consistently leveraged by stakeholders.

Comment Area: Supportive Environments

Comment 8: In the current environment, it is unlikely that new policy levers or financial incentives will be available to enable a business imperative for interoperability. Rather than impose upon health plans and purchasers to provide financial incentives, WEDI believes that market forces and value-based models of care should drive the use case and need for interoperability. There may be indirect levers – such as participation in a health information exchange – that will drive innovation as the market matures organically without additional oversight. Given the mobility of patients across disparate settings, it is important to avoid creating an infrastructure that is compartmentalized into 50 state-based silos. Accordingly, ONC should first evaluate current capabilities to exchange data beyond health information exchange (HIE) networks before implementing additional state-based policies through Medicaid program incentives suggested in the roadmap that might unnecessarily limit interoperability by geographic boundaries.

Comment Area: Core Technical Standards and Functions

Comment 9: WEDI supports ONC's focus on improving technical standards and implementation guidance for a common clinical data set in the near term, and ultimately establish a foundation for interoperability that can be expanded over time. It is recommended that ONC and standards development organizations (SDO) wait until Meaningful Use Stage 2 has been fully implemented to assess how the common clinical data set is being leveraged before considering the addition of other standards or requirements.

Comment 10: WEDI supports the vision for holistic, longitudinal health data to enable innovation of care models and research in real-time. Currently, health IT systems are unable to effectively collect or integrate patient data from disparate sources to facilitate patient-centered care without impeding workflows. Nonetheless, as value-based care models mature, it will be increasingly critical to harmonize standards and enable clinical and administrative data to be better leveraged. As originally recommended in the 2013 WEDI Report, electronic clinical quality measures and reporting methods need to be more consistently aligned to reduce the burden of data collection, and ultimately support quality improvement. To help with these efforts, WEDI would volunteer to help ONC given our relationship and history of collaborating with federal agencies and private organizations to harmonize standards and processes required for migration.

Comment 11: The interoperability roadmap should focus on key challenges and gaps to a basic electronic health information exchange infrastructure in the near-term before looking too far down the road to the potential needs of a learning health system, big data analyses, or research. In the short-term, ONC should prioritize interoperable data portability. Electronic information exchange needs to be more harmonized so that data is consistently sent and received. Transport mechanisms still need to be developed that either normalize Direct- and query-based exchange, or support element-based exchange (using FHIR or other similar hybrids). WEDI supports ONC's emphasis on vendor-agnostic protocols that utilize SOAP and RESTful approaches and allow for easy configuration and modular implementation. Nonetheless, at this time, it is unclear what implications or security issues may arise with their widespread use. It will be important to continually scan for additional technologies and methods that may emerge and provide greater flexibility in the future. The roadmap needs to identify appropriate long-term actions for a health IT infrastructure to leverage the full spectrum of data required by a learning health system (particularly genomics) and fully derive value and knowledge from the growing volume and liquidity of electronic data.

Comment 12: ONC should coordinate and align ongoing efforts across public and private sectors. Alignment of current standards – rather than development of new standards – is the best route to facilitate data exchange without imposing an additional burden on stakeholders. As noted in the 2013 WEDI Report, reporting measures must be better aligned – and it is again recommended that ONC establish a clear and consistent federally funded testing process to harmonize both ONC and Centers for Medicare & Medicaid Services (CMS) standards. In addition to working with SDOs, ONC can further drive interoperability by coordinating policies and programs of federal agencies that provide or pay for health services. The roadmap should clarify how and when ONC would coordinate implementation of policies and programs beyond its jurisdiction – such as the proposed changes to security and privacy protocols, which would be under the purview of the Office of Civil Rights.

Priority Use Cases

WEDI encourages ONC to consider use cases that ultimately answer the needs of multiple stakeholders, such as the three priority areas below that target patients, providers, and health plans. Each use case was selected in recognition of its fulfilling a recommendation originally stated in the 2013 WEDI Report.

#31 Payers use integrated data from clinical and administrative sources to determine reimbursement in support of payment reform

It is becoming increasingly important for health plans to associate clinical and administrative data in order to effectively implement new fee-for-value arrangements. While there are over 100 new payment models currently in use across the United States, it is imperative that clinical and administrative data be normalized in order to reduce the administrative burdens with care coordination and payment between providers and health plans.

#35. Individuals have electronic access to an aggregated view of their health information including their immunization history.

As recommended in the 2013 WEDI Report, the healthcare industry must work toward better engaging healthcare consumers by providing more transparent and open access to pertinent healthcare information. More specifically, a standard subset of essential health information should be easily and quickly accessible by an individual and their designated provider. While this use case would close the gap, it would be essential to simplify access where possible and avoid requiring individuals to log into multiple portals to view their data. Secondly, while immunization history is important, it would be more impactful to ensure access to medication history and allergies.

#39. Primary care providers share a basic set of patient information with specialists during referrals; specialists "close the information loop" by sending updated basic information back to the primary care provider.

In the 2013 WEDI Report, the healthcare industry was charged to identify and promote methods for healthcare information exchange that would enhance care coordination. A pilot would serve to test and evaluate effectiveness of new methods and standards, and close the digital divide encountered between primary and specialty care. WEDI encourages ONC to provide federal funding for these pilots.

Industry Perceptions on Interoperability Progress

Over the past several years, ONC has focused its measurement efforts specifically around the Meaningful Use program. In preparing WEDI's comments, we thought it would be valuable to develop a multi-stakeholder survey on stakeholder's perceptions on the progress towards health information exchange interoperability. The survey was fielded online between March 10 and March 23, 2015, and responses were received from 372 organizations, including health plans, providers, health IT vendors, health information exchange organizations and other stakeholders. We would encourage ONC to use the survey results (provided in the appendix) as a data source to monitor progress at a national level. Below are some key observations from the survey findings:

Universal Patient Identifier

1. **Current patient matching methodologies are insufficient and ineffective.** Healthcare providers report that only 25 percent of electronic patient records are successfully matched on the first pass without manual intervention. In the absence of a standardized patient identification matching strategy, provider organizations are forced to adopt a patchwork framework of various solutions to locate and link electronic patient records.

2. **Stakeholders appear to be generally favorable towards a universal patient identifier (UPI)**. A UPI would be supported by 68 percent of organizations surveyed, including providers (62 percent), health plans (79 percent), and health IT vendors (70 percent). Providers and health plans collectively expect that a UPI would result in significant benefits, including improvements access to and exchange of electronic health information (81 percent), care coordination (74 percent), and efficiency of care (72 percent).

Security

3. **Health data is encrypted when in-transit to external organizations – however, organizations continue to lag in encrypting data internally and at-rest.** Health care providers report that some electronic health data, i.e. 51-100 percent, is encrypted when in-transit externally (49 percent), in-transit internally (35 percent), and at-rest (36 percent). Security concerns are reported to deter organizations from electronically exchanging data externally with non-affiliated organizations, but generally do not deter stakeholders from internally exchanging data.

Exchange Capabilities

4. **Direct is the primary method currently used by organizations to electronically exchange health information.** Direct is used routinely or occasionally by providers for internal exchange (81 percent) and external exchange (63 percent). Query and end-to-end integration are routinely used by half of organizations for internal exchange. For external exchange with non-affiliated organizations, query is used 21 percent and end-to-end is used only 30 percent.

5. **Healthcare providers are unable to easily exchange clinical information electronically with non-affiliated healthcare organizations.** It is generally more difficult for providers to exchange information with other healthcare delivery organizations than with laboratories and pharmacies. With the exception of sending to pharmacies, less than 25 percent of provider organizations are able to easily send information to most non-affiliated healthcare organizations. Less than 20 percent are able to easily receive clinical information electronically from most non-affiliated organizations other than pharmacies and laboratories.

6. **Health plans are also unable to easily exchange clinical information electronically with other organizations.** Health plans report moderate to high difficulty exchanging information, particularly with other healthcare delivery and health information exchange organizations. Less than 33 percent of health plans are able to easily send information to

most non-affiliated healthcare organizations and less than half are able to easily receive clinical information electronically from other organizations.

Barriers and Challenges

7. **Organizations have difficulty with leveraging electronic data – particularly the process of blending structured and unstructured data.** Provider and health plans report difficulties with blending structured and unstructured data (56 percent) and integrating different types of data (44 percent).

8. **The majority of organizations find financial barriers to be a challenge to electronic data exchange, from developing capabilities to ongoing maintenance and fees.** Provider organizations are challenged by financial barriers such as infrastructure costs (67 percent), connection and set-up fees (64 percent), ongoing transactional fees for exchanging data (63 percent), training staff (61 percent), and ongoing membership fees for participating in an HIE (59 percent). Health plans report similar levels of financial challenges with infrastructure costs (70 percent), ongoing transactional fees (61 percent), and connection and set-up fees (57 percent).

Impact

9. **To date, the electronic exchange of health information is slow to yield strong improvements among healthcare stakeholders.** Less than half of provider organizations report that electronic information exchange has improved performance measures such as care coordination (48 percent), information flow (42 percent), quality of care (40 percent), and safety (40 percent).

   In comparison, the electronic exchange of health information is yielding slightly stronger improvements for health plans. More than half of health plans report that electronic information exchange has improved performance measures such as care coordination (70 percent) and information flow (57 percent). Unlike providers, health plans saw significantly higher improvements in new payment models (45 percent)

10. **Organizations are optimistic that electronic exchange of health information will contribute to improvements in the next year.** Providers expect exchange to improve care coordination (69 percent), quality of care (66 percent), and information flow (66 percent), and worsen cost of care (7 percent) and provider satisfaction (7 percent). Similarly, plans expect exchange to improve care coordination (57 percent) and information flow (59 percent), in addition to population health management (52 percent); plans do not expect that exchange will significantly worsen performance.

Health IT Market

11. **Vendor systems provide mixed levels of exchange functionality with other health IT products.** Vendors report that their systems (self-built or in partnership with other vendors) currently facilitate external data exchange of data types such as demographics (84 percent), insurance enrollment/eligibility status and benefits (77 percent), hospital ADT (68 percent), and summary of care records (65 percent). Despite the needs of care teams or Meaningful Use requirements, fewer products are reported to facilitate exchange of

allergy lists (48 percent), imaging (36 percent), problem lists (46 percent), and vital signs (44 percent).

12. **Vendor systems are still nascent in their patient-centered capabilities.** Little functionality is available to facilitate exchange of patient-centered information such as patient-reported data (38 percent) and advanced directive (43 percent). 54 percent of vendor systems currently allow patients to view, download, and/or share their medical records through web portal platforms. While mobile capabilities are currently offered by 15 percent of systems, 73 percent of vendors plan to develop them in the future.

13. **Vendor systems can generally offer strong data exchange capabilities.** Systems are equipped to exchange structured clinical data (81 percent) and administrative data (88 percent), as well as unstructured clinical data (74 percent) and administrative data (81 percent). The majority of systems surveyed offer query exchange capabilities (85 percent), direct exchange capabilities (88 percent), and end-to-end integration (69 percent).

14. **A minority of vendors have developed revenue models from providers sending and receiving electronic health information, including transactional, monthly, and annual fee structures.** Among the EHR vendors surveyed, the most common form of revenue is a monthly fee (33 percent); no EHR vendors reported other fee structures.

15. **More alignment among vendors is needed to advance interoperability**. Vendors report a number of barriers to the electronic exchange of health information, including the lack of interoperability with other vendor systems (67 percent), unstable market (62 percent), cost of development (63 percent), and lack of consensus around required data standards (59 percent). Vendors report that challenges to developing an interoperable health IT solution include a lack of industry consensus around required data standards (52 percent), lack of cooperation with other vendors (48 percent), and lack of guidance from the federal government (52 percent).

Based on the survey results, industry stakeholders appear to continue to move forward in their efforts to exchange clinical information but growth is inhibited due to implementation costs and limited visible impact on clinical and business outcomes. WEDI offers our support to ONC to help measure and monitor interoperability.

2015 WEDI Survey Questions and Results

Listed below are survey results divided into four separate tracks of stakeholder organizations:

Provider Track	**10**
Health Plan Track	**18**
Vendor Track	**23**

*Notes:

- Survey details for those selecting "Other" are not included. Additional time is needed to align these respondents into the correct categories for data analysis.
- Due to rounding, not all percentages will add up to 100 percent.

Please describe your organization type.
The following table illustrates the number of survey respondents by type of entity:

Organization Type	Responses
Health Plan (Total)	**56**
Commercial Health Plan	36
State Or Federal Medicaid Plan	20
Health Provider (Total)	**163**
Ambulatory Practice	27
Hospital	75
Independent Practice Association	31
Integrated Delivery System	20
Long-Term And Post-Acute Care (LTPAC)	10
Vendor (Total)	**66**
EHR Vendor	16
Practice Management Vendor	5
Other Health IT Vendor	45
Other	**91**
Total	**376**

Provider Track

If your organization is an ambulatory practice, IPA, or LTPAC, please indicate the size of your organization according to the number of employed practitioners.

Size	Responses
Small (1-20)	64%
Medium (21-100)	12%
Large (more than 100)	24%

If your organization is a hospital or IDN, please indicate the size of your organization according to the number of beds.

Size	Responses
Small (51-100 beds)	21%
Medium (101-500 beds)	36%
Large (more than 500 beds)	43%

Which best describes your primary market?

Market	Responses
Urban	39%
Suburban	36%
Rural	20%
Unknown	5%

Approximately what percentage of electronic patient records from non-affiliated organizations are able to be successfully matched electronically on the first pass without manual intervention?

On average, provider respondents reported that 25 percent of electronic patient records from non-affiliated organizations are successfully matched electronically on the first pass without manual intervention. When evaluated by provider type, the integrated delivery system had a higher success rate of 47 percent and long-term/post-acute care (LTPAC) providers saw a 33 percent success rate. With 35 percent of provider respondents unable to match a single electronic patient record without manual review and only 20 percent of provider respondents able to match more than half of electronic patient records without manual review, it is clear that interoperability is still a significant opportunity.

In addition to current first and last name, please rate the following data attributes below in terms of importance in electronically matching patient records at your organization.

Size	Unimportant	Neither Unimportant Or Important	Important	Unknown	N/A
Current middle or second given name	2%	21%	72%	5%	0%
Previous last or family name	10%	19%	60%	10%	2%
Suffix	18%	32%	32%	10%	8%
Date of birth	0%	0%	98%	2%	0%
Current address	0%	26%	70%	2%	2%
Historical address	14%	48%	29%	7%	2%
Current phone number	5%	26%	64%	2%	2%
Gender	5%	7%	84%	2%	2%
Social security number	9%	9%	72%	5%	5%

WEDI's survey results validate that for provider respondents, the most important data elements for electronically matching patients currently, in order of importance are date of birth, gender, current middle/second given name, social security number, current address, previous last/family name and middle names.

How often are the following used by your organization for locating and/or linking electronic patient records?

Component	Routinely	Sometimes	Rarely	Never	Unknown	N/A
Master patient index (MPI)	60%	12%	5%	5%	9%	9%
Record locator service (RLS)	8%	20%	15%	18%	22%	18%
Cross-community patient discovery (XCPD)	8%	2%	20%	20%	30%	20%
Patient identity cross-reference adds/updates (PIX)	0%	15%	12%	17%	37%	20%
Patient demographic query (PQQ)	22%	22%	8%	12%	18%	18%

Providers reported that the master patient index (MPI) is the most routinely referenced tool in locating and linking electronic patient records. This was fairly consistent across all providers, although ambulatory practices used a MPI less while integrated delivery systems used it more than other provider types. This is most likely contributable to the variances in their system sophistication. LTPAC providers were outliers with respect to how electronic patient records are located/linked. These respondents were evenly split in terms of what was used and there was no significant usage from one approach over another.

What is your organization's level of support for a universal patient identifier?

Level of Support	Responses
Strongly oppose	2%
Somewhat oppose	5%
Neither oppose or support	32%
Somewhat support	32%
Strongly support	30%

Provider respondents indicate 62 percent somewhat or strongly support a universal patient identifier with only 7 percent opposing one.

How would a universal patient identifier impact the following issues at your organization?

Issue	Hinder	No Impact	Improve	Unknown	N/A
Access to and exchange of accurate electronic health information	2%	2%	77%	16%	2%
Cost containment	7%	25%	36%	30%	2%
Coordination of care	2%	7%	73%	16%	2%
Safety	5%	9%	70%	14%	2%
Efficiency of care	2%	14%	68%	14%	2%
Security	9%	2%	58%	28%	2%

Provider respondents indicate that use of a universal patient identifier will provide a benefit across all the measures surveyed (access to accurate information, coordination of care, safety, efficiency of care and security) with the exception of cost containment. None of the measures, however, were identified by provider respondents as creating any significant hindrance or no return on investment. This finding related to cost containment was consistent across all respondent groups, which leads us to deduce that value of a universal patient identifier is much more operational workflow than cost related.

Please indicate the approximate percentage of electronic health data that is encrypted in the states below.

State of Data	0-25%	26-50%	51-75%	76-100%	Unknown
At-rest	10%	0%	5%	31%	55%
Internal (in-transit)	10%	7%	2%	33%	48%
External (in-transit)	0%	0%	0%	49%	51%

Data encryption is an area of opportunity for future surveys to delve into further, given the largest group of respondents are unaware of this information. The 49 percent of encryption for external data is encouraging, but with the increased sensitivities around data security within the industry, a higher overall percent in this response is desirable.

Do security concerns deter your organization from electronically exchanging health data in the following contexts?

Context of Electronic Data Exchange	Yes	Somewhat	No
Within your organization	5%	12%	84%
Outside your organization to affiliated organizations	28%	33%	40%
Outside your organization to non-affiliated organizations	49%	26%	26%

The survey results for this question are not surprising. Security concerns when sharing data internally within an organization are very low while when sharing data externally, concerns increase, especially when sharing with non-affiliated organizations. Data security continues to be of the utmost importance within healthcare.

How often are the following methods used to electronically exchange health information within your own organization?

Method	Never	Occasionally	Routinely	Unknown	N/A
Direct (secure electronic messaging)	7%	30%	51%	9%	2%
Query (retrieval of data from centralized repository)	16%	21%	49%	12%	2%
End-to-End Integration (interfaces automatically "push" information without requiring user initiation)	16%	12%	51%	12%	9%
Open RESTful API (web-based Representational State Transfer architecture)	33%	12%	7%	37%	12%

The results here align with what was found in the recent WEDI Blue Button® 2014 survey, that Direct is used much more than RESTful API by providers. Ambulatory practices indicated a greater use of query retrieval as opposed to automatic push exchange whereas; independent practice associations indicated use of push with no use of query retrieval. These differences are likely simply the difference in practice operations and workflows.

How often are the following methods used to electronically exchange health information with non-affiliated organizations?

Method	Never	Occasionally	Routinely	Unknown	N/A
Direct (secure electronic messaging)	16%	30%	33%	12%	9%
Distributed query (retrieval of data from independently hosted system)	33%	21%	16%	21%	9%
Centralized query (retrieval of data from centralized repository)	43%	14%	21%	14%	7%
End-to-End Integration (interfaces automatically "push" information without requiring user initiation))	28%	12%	30%	21%	9%

When evaluating provider exchange with non-affiliated entities, it is markedly lower. Given the responses earlier related to security concerns and the increased concern related to exchange with non-affiliated entities, we surmise the decrease here is more related to security concerns than system capabilities.

Please indicate the level of difficulty with which your organization is able to send/receive clinical information electronically to the following non-affiliated healthcare organizations.

Send

Non-Affiliated Healthcare Organization	Easy	Medium	Difficult	Unknown	N/A
Physician or dental offices	17%	26%	29%	19%	10%
Health information exchange organizations (state, community, and/or regional)	23%	28%	26%	14%	9%
Health plans	21%	30%	21%	16%	12%
Hospital or health systems	19%	26%	30%	14%	12%
Imaging centers	5%	31%	26%	21%	17%
Laboratories	14%	33%	23%	19%	12%
Long-term and post-acute care	7%	19%	44%	14%	16%
Patients and caregivers	19%	30%	26%	16%	9%
Pharmacies	35%	26%	12%	19%	9%
Public health departments (local, city, county, and/or state)	24%	31%	21%	14%	10%

Receive

Non-Affiliated Healthcare Organization	Easy	Medium	Difficult	Unknown	N/A
Physician or dental offices	14%	26%	31%	21%	7%
Health information exchange organizations (state, community, and/or regional)	12%	29%	26%	26%	7%
Health plans	12%	31%	24%	24%	10%
Hospital or health systems	14%	21%	36%	21%	7%
Imaging centers	10%	24%	31%	26%	10%
Laboratories	25%	22%	25%	20%	8%
Long-term and post-acute care	5%	10%	51%	22%	12%
Patients and caregivers	14%	12%	38%	19%	17%
Pharmacies	21%	29%	21%	21%	7%
Public health departments (local, city, county, and/or state)	17%	17%	27%	29%	10%

When reviewing all respondent provider types combined, the exchange for both sending and receiving is primarily medium to difficult. Some variance was seen in the exchange with laboratories, in that there was an even amount indicating receiving data was easy, medium or difficult. The highest percentage of difficult were for exchanging with LTPAC, which is consistent when looking at the results for LTPAC respondents, in which none indicated sending or receiving was easy. There was a higher percentage of unknown with ambulatory practice and LTPAC respondents and a much lower percentage of unknown with integrated delivery system (IDS) respondents. This is likely a result of operations and workflow, e.g. dedicated IT staff is less likely with ambulatory practices and LTPAC providers.

Please rate the level of difficulty with which your organization is able to perform the data activities below.

Data Activity	Easy	Medium	Difficult	Unknown	N/A
Collect data electronically from different sources (EHR, devices, portal, etc.)	22%	42%	28%	2%	5%
Locate and link patient health records	22%	38%	22%	12%	5%
Integrate different types of electronic data (administrative, claims, patient-reported, etc.) without manual entry or review	20%	22%	42%	8%	8%
Blend structured and unstructured electronic data	10%	25%	42%	15%	8%

Provider respondents indicate much better success with their ability to collect data electronically from different sources and their ability to locate and link patient health records than the other two data activities. Independent practice associations reported the most difficulty across all data activities and ambulatory practices reported more difficulty with blending structured and unstructured data. Even IDS', while being more evenly split across the easy, medium and difficult options, still had 83 percent medium and difficult combined for blending structured and unstructured data. We anticipate this might shift somewhat as the industry moves toward Meaningful Use Stage 3 incentives and EHR certification programs as well as Administrative Simplification Health Claim Attachments in the coming years.

Has your organization participated in the Meaningful Use EHR Incentive Program?

Participation	Responses
Yes, we are currently participating	67%
Yes, we participated in Stage 1 and 2 but are dropping out	10%
Yes, we participated in Stage 1 but then dropped out	5%
No, we are eligible but have not participated	13%
No, we are not eligible and have not participated	5%

Of the surveyed providers, all provider types are currently participating. Of those intending to drop out after Stage 2, it was ambulatory practices, IPAs and IDS only. Only ambulatory practices and IPAs indicated they dropped out after Stage 1. Those eligible but not participating were hospitals or LTPAC providers. The only ineligible providers were ambulatory practices or LTPAC providers. In future surveys, it may be helpful to delve further into why various provider types choose to drop out of future stages after participating initially in Meaningful Use incentive programs.

Please rate the level of financial challenges to electronic data exchange for the following at your organization.

Financial Barrier	Significantly Challenging	Challenging	Somewhat Challenging	Not A Challenge At All	N/A
Infrastructure costs	35%	32%	20%	5%	8%
Connection and set-up fees	33%	31%	21%	8%	8%
Ongoing transactional fees for exchanging data	25%	38%	20%	10%	8%
Ongoing membership fees for participating in a Health Information Exchange network	23%	36%	23%	3%	15%
Training of staff	33%	28%	23%	8%	8%

Attention to health care costs continues to be significant, especially considering in the “National Health Expenditure Projections, 2013-2023: Faster Growth Expected With Expanded Coverage And Improving Economy” from HealthAffairs, October 2014, indicated the gross domestic product will go from 17.2 percent in 2012 to 19.3 percent in 2023. Financial challenges are likely to be a significant barrier to the electronic exchange of health information, especially with less than 10 percent of providers indicating costs are not challenge at all. Independent practice associations indicated costs are a significant challenge for all potential barriers while LTPAC providers indicated costs are a significant challenge for infrastructure and staff training and challenging for connection and set-up fees. The remaining provider types, while identifying costs across the challenge spectrum, were primarily challenged to somewhat challenged for all financial barriers.

If your organization is currently electronically exchanging health information, how have the areas below been impacted?

Area of Impact	Worsened	No Impact	Improved	Unknown	N/A
Flow of information	12%	9%	42%	14%	23%
Efficiency of care (wait time, referrals, e-prescribing, etc.)	5%	21%	37%	14%	23%
Coordination of care	5%	14%	48%	14%	19%
Cost of care	16%	21%	21%	21%	21%
New payment models	9%	19%	12%	33%	28%
Provider satisfaction	21%	12%	26%	17%	24%
Population health management	5%	19%	23%	28%	26%
Quality of care	7%	14%	40%	19%	21%
Safety of care	5%	12%	40%	20%	23%

Providers did not indicate any areas of impact significantly improved nor significantly worsened. Provider satisfaction received the highest overall worsened percentage, and we found that ambulatory practices and IPAs reported a greater percentage of worsened than improved, where hospitals and integrated delivery systems reported greater improvement than worsening. LTPAC providers reported primarily not applicable.

If your organization plans to improve interoperability of electronic health information exchange in the next year, how are the areas below <u>expected</u> to be impacted?

Area of Impact	Worsen	No Impact	Improve	Unknown	N/A
Flow of information	0%	2%	66%	12%	20%
Efficiency of care (wait time, referrals, e-prescribing, etc.)	0%	12%	60%	12%	17%
Coordination of care	0%	5%	69%	10%	17%
Cost of care	7%	12%	48%	14%	19%
New payment models	2%	14%	40%	21%	21%
Provider satisfaction	7%	2%	60%	12%	19%
Population health management	0%	5%	55%	15%	25%
Quality	0%	5%	66%	10%	20%

Expectations of improvement to areas of impact if interoperability is enhanced in the next year are encouraging. All providers expect that interoperability will improve electronic health information exchange, which is encouraging given current experiences above where there is some indication that some things have worsened. Provider openness to improving interoperability is key to the success of efforts to achieve greater exchange of electronic health information.

Health Plan Track

Please estimate the size of your organization in terms of the number of lives covered.

Size	Responses
Very small (1-250,000)	18%
Small (250,001-500,000)	0%
Medium (500,001-2 million)	45%
Large (2 million - 5 million)	18%
Very large (more than 5 million)	18%

What is your organization's level of support for a universal patient identifier?

Level of Support	Responses
Strongly oppose	4%
Somewhat oppose	0%
Neither oppose or support	17%
Somewhat support	54%
Strongly support	25%

The survey results indicate fairly strong support also exists among health plans for a universal patient identifier. There is 77 percent somewhat support and only 8 percent strong support by commercial health plans as compared to is 27 percent somewhat support and 45 percent strong support by Medicaid plans. Neutral support was reported by 8 percent of commercial plans and 27 percent of Medicaid plans. No Medicaid plans indicated opposition to a universal patient identifier.

How would a universal patient identifier impact the following issues at your organization?

Issue	Hinder	No Impact	Improve	Unknown
Access to and exchange of accurate electronic health information	4%	4%	88%	4%
Cost containment	8%	12%	54%	25%
Coordination of care	4%	8%	75%	12%
Quality	4%	17%	58%	21%
Efficiency	4%	4%	79%	12%
Security	8%	12%	50%	29%

Collectively, 50 percent or more of all health plan respondents indicated that identified issues would be improved. Both plan types see the most improvement would come through access to and exchange of accurate electronic health information. Medicaid plans indicated that a universal patient identifier will improve coordination of care and efficiency slightly more than commercial plans (care coordination 64 vs. 46 percent; efficiency 82 vs. 76 percent) and that it will improve significantly cost containment and quality (cost containment 64 vs. 46 percent; quality 73 vs. 46 percent). No plan indicated this was not applicable to their organization.

The results from these two questions reflect that many commercial plans have already implemented a way to universally identify patients to meet their business needs related to quality, care coordination, etc. and a universal approach might create greater effort or rework to current implementations, hence some reticence to strongly support without more detailed information.

Do security concerns deter your organization from electronically exchanging health data in the following contexts?

Context of Electronic Data Exchange	Yes	Somewhat	No
Within your organization	4%	17%	79%
Outside your organization to affiliated organizations	17%	42%	42%
Outside your organization to non-affiliated organizations	50%	46%	4%

These results are fairly consistent with that of other respondent types, identifying that security concerns do not deter internal organizational exchange of data and concerns related to exchanging with external organizations are directly related to the relationship, i.e. type of affiliation between the organizations. When comparing security concerns related to exchanging data with affiliated vs. non-affiliated organizations, it goes from 62 percent to 100 percent of commercial plans and 54 percent to 91 percent of Medicaid plans (Yes and somewhat combined).

Please indicate if your organization currently participates in the following health information exchange organizations.

Health Information Exchange Organization	Responses
Health information exchange organization (regional, state, or multi-state)	92%
CommonWell Health Alliance	0%
Healtheway eHealth Exchange	8%
Other	8%

Participation in health information exchange organizations is strong among health plan respondents. All Medicaid plans participate and 86 percent of commercial plans participate. Participation in other than regional, state or multi-state HIE organizations was identified as minimal.

Please indicate the level of difficulty with which your organization is able to <u>send/receive</u> clinical information electronically to the following healthcare organizations.

Send

Non-Affiliated Healthcare Organization	Easy	Medium	Difficult	Unknown	N/A
All-Payer claims database	17%	29%	21%	12%	21%
Physician or dental offices	29%	50%	12%	8%	0%
Hospital or health systems	33%	50%	12%	4%	0%
Health information exchange organizations (state, community, and/or regional)	26%	30%	30%	9%	4%
Imaging centers	17%	30%	17%	30%	4%
Laboratories	21%	46%	17%	17%	0%

Long-term and post-acute care	17%	33%	21%	25%	4%
Patients and caregivers	25%	29%	21%	21%	4%
Pharmacies	26%	35%	4%	13%	22%
Public health departments (local, city, county, and/or state)	26%	30%	22%	13%	9%

Receive

Non-Affiliated Healthcare Organization	Easy	Medium	Difficult	Unknown	N/A
All-Payer claims database	21%	21%	21%	12%	25%
Physician or dental offices	38%	38%	25%	0%	0%
Hospital or health systems	42%	33%	25%	0%	0%
Health information exchange organizations (state, community, and/or regional)	29%	17%	29%	12%	12%
Imaging centers	25%	29%	33%	8%	4%
Laboratories	38%	38%	21%	4%	0%
Long-term and post-acute care	21%	38%	25%	12%	4%
Patients and caregivers	29%	25%	38%	4%	4%
Pharmacies	46%	29%	8%	8%	8%
Public health departments (local, city, county, and/or state)	17%	38%	21%	12%	12%

While respondent health plans reported some level of difficulty in sending data to or receiving data from other healthcare organizations, less than 50 percent indicated it was difficult. Primarily plans reported a medium level of difficulty in sending and an easy level of difficulty in receiving clinical information electronically. While both commercial and Medicaid plans reported a medium level, more commercial plans find sending data to practitioner offices difficult (54 percent) as compared to Medicaid plans (45 percent). This was simply reversed in terms of sending data to hospital or health systems (commercial plans 46 percent, Medicaid plans 56 percent).

Receiving data was identified as easiest from hospital or health systems and pharmacies, more so by commercial plans at 46 and 38 percent respectively as compared to Medicaid plans at 27 and 30 percent respectively.

Please rate the level of difficulty with which your organization is able to perform the data activities below.

Data Activity	Easy	Medium	Difficult	Unknown	N/A
Collect data electronically from different sources (EHR, devices, portal, etc.)	4%	22%	57%	9%	9%
Locate and link patient health records	4%	33%	54%	4%	4%
Integrate different types of electronic data (administrative, claims, patient-reported, etc.) without manual entry or review	4%	35%	48%	4%	9%
Blend structured and unstructured electronic data	4%	4%	78%	9%	4%

The data activities above are all key to successful interoperability, so the level of difficulty identified by respondent health plans provides some insight into opportunities to focus on. The ability to blend structured and unstructured data was rated difficult by a significant number of both commercial (84 percent) and Medicaid (70 percent) plans. The remaining 30 percent of Medicaid plans indicated either difficulty was unknown (20 percent) or not applicable (10 percent), i.e. no Medicaid plans indicated blending this data was easy or even of medium difficulty. In terms of collecting form different sources, more Medicaid plans rated this as difficult (80 percent) as compared to commercial plans (38 percent). For the other two data activities, roughly 20 percent more Medicaid plans indicated this is difficult than commercial plans.

Please rate the level of financial challenges to electronic data exchange for the following at your organization.

Financial Barrier	Significantly Challenging	Challenging	Somewhat Challenging	Not A Challenge At All	N/A
Infrastructure costs	22%	48%	26%	4%	0%
Connection and set-up fees	22%	35%	35%	4%	4%
Ongoing transactional fees for exchanging data	22%	39%	22%	17%	0%
Ongoing membership fees for participating in a Health Information Exchange network	22%	22%	22%	17%	17%
Training of staff	9%	41%	41%	5%	5%

As discussed earlier with respect to provider financial challenges, costs will be a significant barrier to interoperability as long as they continue to increase as expected against the gross domestic product. With the exception of ongoing membership fees for participating in a HIE network, providers and health plans overall were consistent in that these items present some level of challenge financially. While providers tended to indicate all items were more significantly challenging financially, with the exception noted previously, when tallying the respondents indicating significantly challenging, challenging and somewhat challenging, overall health plans indicated greater financial challenge than providers: infrastructure costs plans 96 percent, providers 87 percent; connection and set-up fees plans 92 percent, 85 percent; ongoing transactional fees plans 83 percent, providers 83 percent; staff training plans 91 percent, providers 84 percent.

If your organization is currently electronically exchanging health information, how have the areas below been impacted?

Area	Worsened	No Impact	Improved	Unknown	N/A
Flow of information	10%	5%	57%	14%	14%
Claims adjudication and processing	0%	38%	33%	10%	19%
Coordination of care	5%	15%	70%	0%	10%
New payment models	5%	35%	45%	5%	10%
Population health management	10%	19%	48%	10%	14%
Cost (duplicative testing, etc.)	14%	19%	24%	29%	14%
Member/patient engagement	5%	30%	30%	20%	15%
Provider satisfaction	10%	25%	40%	10%	15%

The most notable improvement identified by health plans is coordination of care, followed by information flow. More Medicaid plans report improvement for both of these than commercial plans, care coordination 75 vs. 67 percent and information flow 67 vs. 50 percent. Medicaid plans only reported a worsening for information flow (11 percent of respondents) and provider satisfaction (12 percent of respondents) while less than 10 percent of commercial plans reported a worse impact to all areas except for cost (25 percent of respondents).

While improvements to population health were also identified by 48 percent of health plans overall, only 25 percent of commercial plans indicated seeing improvements in this area as opposed to 78 percent of Medicaid plans.

If your organization plans to improve interoperability of electronic health information exchange in the next year, how are the areas below expected to be impacted?

Area	Worsened	No Impact	Improved	Unknown	N/A
Flow of information	5%	5%	59%	14%	18%
Claims adjudication and processing	4%	29%	25%	25%	17%
Coordination of care	4%	9%	57%	13%	17%
New payment models	4%	22%	26%	30%	17%
Population health management	4%	9%	52%	17%	17%
Cost (duplicative testing, etc.)	9%	17%	30%	30%	13%
Member/patient engagement	4%	21%	29%	33%	12%
Provider satisfaction	4%	25%	25%	29%	17%

Those health plans intending to improve interoperability expect to see improvement in the same areas as plans indicated they currently experience improvement in. More Medicaid plans expect improvement in these areas than commercial plans: care coordination 60 percent of Medicaid plans vs. 54 percent commercial plans; information flow 67 percent of Medicaid plans vs. 54 percent commercial plans.

The expectation for improvement in population heath, however was identified by more plans overall than those currently experiencing improvement. Expectations were more aligned here as well with 60 percent Medicaid plans and 54 percent of commercial plans.

Vendor Track

What market segment(s) does your organization primarily serve?

Market Segment	Responses
Ambulatory / outpatient care	59%
Inpatient care	41%
Behavioral healthcare	48%
Long-term and post-acute care (home health, hospice, skilled nursing facilities, etc.	41%
Health information exchange organization (HIO)	30%
Health insurance plans	44%

Does your system (self-built or in partnership with another vendor) currently facilitate the external exchange of the data types below with other IT products?

Data Type	Yes, It's Generally Available Or Released	No, It's In Development Or Testing	No, It's On Our Long-Term Roadmap	No, There Are No Plans To Incorporate	N/A
Advance directive	43%	4%	13%	13%	26%
Allergy list	48%	8%	4%	12%	28%
Behavioral health data (not incl. substance abuse)	36%	12%	20%	16%	16%
Care plan	48%	16%	16%	4%	16%
Demographics	84%	12%	4%	0%	0%
Hospital admission, discharge, and transfer data	68%	12%	8%	0%	12%
Imaging	36%	12%	20%	8%	24%
Immunization history	54%	12%	8%	12%	15%
Insurance enrollment or eligibility status and benefits	77%	4%	12%	8%	0%
Lab/test results	64%	8%	4%	8%	16%
Medication/problem list	52%	12%	8%	8%	20%
Patient-reported data	38%	8%	25%	12%	17%
Problem list	46%	12%	12%	8%	23%
Procedures performed	62%	12%	4%	4%	19%
Summary of care record for transitions or referrals	65%	15%	0%	8%	12%
Vital signs	44%	16%	8%	8%	24%

Most vendors reported supporting or plan to support all the data types identified. In the instances where one or more data types were identified as no plans to incorporate, that was found to align with the data type combined with the market segment that the vendor serves, e.g. vendors serving ambulatory/outpatient care or long-term/post-acute care were the only vendors that indicated no plans to incorporate behavioral health data. One vendor supporting health insurance plans and health information exchange organizations also indicated no plans to incorporate behavioral health data. It is likely that this is related to the sensitivity of behavioral health data and the additional privacy and security requirements related to this data.

Does your system (self-built or in partnership with another vendor) allow patients to view, download, and/or share their medical records through the platforms below?

Platform	Yes, It's Generally Available Or Released	No, It's In Development Or Testing	No, It's On Our Long-Term Roadmap	No, There Are No Plans To Incorporate	N/A
Web portal	54%	19%	19%	4%	4%
Mobile app	15%	35%	38%	4%	8%

Results show at least than 88 percent of vendors already support, are in the process of supporting or have included on a long term roadmap both web portal and mobile app capabilities for patient medical record view, download or sharing, When analyzing by vendor type, 67 percent of practice management vendors indicated mobile app sharing capabilities are generally available and the remaining 33 percent indicated no applicability, as compared to 50 percent of EHR vendors and 41 percent of Other IT vendors only have it on their long-term roadmap and 16 percent of EHR vendors indicated no plans to incorporate. EHR vendors showed similar percentages for web portal sharing capabilities. Practice management and Other IT vendors both indicated that web portal sharing capabilities are generally available, 67 percent and 61 percent respectively.

Please rate the level of customer demand from your customer base requesting to share electronic health data between healthcare organizations

Level of Demand	Responses
Very low demand	7%
Low demand	19%
Mixed demand	30%
High demand	26%
Very high demand	19%

Only 45 percent of vendors report high levels of customer demand requesting to share health data electronically between healthcare organizations. EHR vendors identified 50 percent mixed demand and 33 percent very low demand while PM vendors identified 67 percent low demand and 33 percent high demand. It was Other IT vendors that indicated 28 percent mixed demand and 56 percent high or very high demand. This indicates overall that customer desire to share data electronically varies by customer type.

What is your organization's level of support for a universal patient identifier?

Level of Support	Responses
Strongly oppose	0%
Somewhat oppose	4%
Neither oppose or support	26%
Somewhat support	22%
Strongly support	48%

The survey results indicate that generally strong support exists for a universal patient identifier, with 70 percent of vendors indicating medium to high levels of support. EHR and Other IT vendors showed the strongest support, 50 percent for each while only 33 percent of PM vendors strongly supported. The remaining 67 percent of PM vendors indicated neither supporting or opposing while EHR vendors either supported or neither opposed or supported a universal patient identifier.

Is your organization's solution (self-built or in partnership with another vendor) able to exchange the data below?

Type of Data	Yes	Somewhat	No	Unknown	N/A
Structured clinical data	62%	19%	4%	8%	8%
Unstructured clinical data	52%	22%	7%	11%	7%
Structured administrative data	69%	19%	12%	0%	0%
Unstructured administrative data	58%	23%	15%	4%	0%

Vendors indicated greater capability to share administrative data than clinical data, which makes sense as administrative data is used for payment purposes while clinical data is needed for purposes of treatment and care coordination. Administrative data would be shared primarily for patient use but our survey did not delve into the purposes for which data is shared. It is interesting to note that both PM and Other IT vendors indicated greater than 60 percent ability (responded "yes") to share structured and unstructured clinical data while EHR vendors only indicated 50 percent for structured and 17 percent for unstructured clinical data. PM vendors indicated 100 percent ability (responded "yes") for both forms of administrative data and Other IT vendors were at 71 percent for both. EHR vendors however, were only at 50 percent for structured and zero percent for unstructured administrative data.

Does your solution (self-built or in partnership with another vendor) support the following exchange capabilities?

Exchange Capability	Yes	Somewhat	No	Unknown	N/A
Direct (secure electronic messaging)	69%	19%	4%	8%	0%
Query (retrieval of data from centralized repository)	74%	11%	11%	4%	0%
Per IHE profile (XDR, XDS, XDM)	44%	15%	11%	22%	7%
End-to-End Integration (interfaces automatically "push" information without requiring user initiation)	50%	19%	23%	8%	0%

Direct and query are supported most for exchange capabilities by vendors. EHR vendors are the only vendor types that indicated no support for Direct (17 percent) while 33 percent of both EHR and Other IT vendors reported no support for Direct or query capabilities. End-to-end integration is the least supported by vendors overall. PM vendors reported 100 percent support while EHR vendors reported 67 percent no support. This is another indicator that interoperability has some ways to go yet within our industry.

Does your organization's solution (self-built or in partnership with another vendor) support the standards below?

Standards	Yes, We Currently Support	No, It's In Development Or Testing	No, It's On Our Long-Term Roadmap	No, There Are No Plans To Incorporate	Unknown	N/A
DICOM	19%	8%	8%	15%	42%	8%
FHIR	7%	33%	4%	7%	41%	7%
HL7 v.3.x	62%	8%	4%	12%	15%	0%
RESTful	27%	19%	0%	8%	38%	8%
S/MIME or SMTP standards	63%	8%	0%	4%	22%	4%
SOAP	70%	11%	0%	4%	15%	0%
XD* (XDR, XDS, XCA)	44%	4%	ў%	7%	30%	7%

The standards supported the most by vendor solutions are SOAP (70 percent) and S/MIME or SMTP (63 percent), which aligns with connectivity standards for electronic Administrative Simplification transactions, e.g. ASC X12 270/271 eligibility request and response. HL7v.3.x is also strongly supported at 62 percent but 12 percent of vendors reported no plans to incorporate this standard at all. Of PM vendors responding, 50 percent indicated no plans to incorporate HL7 v3.x. Of EHR vendors responding, 17 percent indicated no plans to incorporate all standards on the list except for DICOM, which there was 33 percent indicating no plans to incorporate. While FHIR is a newer standard in development at HL7, only 7 percent of vendors overall indicated no plans to incorporate capabilities to support it.

What is your revenue model for providers to send and/or receive electronic health information from non-affiliated organizations?

Revenue Model	Responses
Transactional fee	7%
Monthly fee	33%
Annual fee	11%
N/A	33%
Other	15%

Revenue models are varied across vendor solutions. PM vendors utilized a monthly fee for 67 percent of electronic health information exchange, with EHR vendors only utilizing this for 33 percent and other IT vendors only utilizing for 28 percent of their solutions. EHR vendors reported fees are not applicable for 67 percent of electronic health information exchange by providers. Other IT vendors also indicated transactional fees (11 percent), annual fees (17

percent) or fees are not applicable (28 percent). Understanding the various fees will be important for providers as they move into greater use of electronic health information exchange or adopt electronic health information exchange capabilities in their operations.

Please rate the following as barriers to the electronic exchange of health information.

Barrier	Significantly Challenging	Challenging	Somewhat Challenging	Not A Challenge At All	N/A
Lack of interoperability with other vendor systems	41%	26%	22%	7%	4%
Lack of interoperability among other vendor systems with your product(s)	30%	22%	30%	15%	4%
Lack of trained staff at client sites	23%	23%	23%	12%	19%
Lack of consensus around required data standards, protocols, and formats	37%	22%	15%	19%	7%
Cost of development	26%	37%	15%	11%	11%
Lack of cost-savings for client	15%	19%	35%	27%	4%
Lack of customer demand	19%	27%	27%	19%	8%
Lack of stable market	31%	31%	15%	15%	8%

Lack of interoperability with other vendor systems, lack of a stable market and development costs were the three barriers identified as the most significantly challenging. PM vendors reported all three of these are significant challenging for 67 percent of respondents. EHR vendors only reported it is significantly challenging for 33 percent in terms of lack of interoperability and development cost barriers with zero percent for lack of a stable market. In terms of development costs, 50 percent of EHR vendors reported this as challenging with only 33 percent reporting as challenging for PM and Other IT vendors. Other barriers that ranked higher as challenging or somewhat challenging are lack of customer demand and lack of cost-savings for clients. Lack of cost-savings for clients was reported by all three vendor types at 33-35 percent.

These barriers become significant as the industry moves toward greater interoperability as that will likely entail additional costs, at least initially.

Please rate the following as challenges to the developing of an interoperable health IT solution by your company.

Barrier	Significantly Challenging	Challenging	Somewhat Challenging	Not A Challenge At All	N/A
Lack of industry consensus around required data standards, protocols, and formats	26%	26%	22%	19%	7%
Lack of cooperation with other vendors	26%	22%	37%	4%	11%
Lack of guidance from the federal government	30%	22%	19%	22%	7%
Lack of demand from clients	12%	19%	35%	27%	8%
Cost	31%	12%	23%	27%	8%

In terms of challenges to developing interoperable solutions, lack of industry consensus on data standards, protocols and formats, lack of cooperation with other vendors and lack of guidance from the federal government were identified as most challenging across all vendors. PM vendors ranked all barriers at 100 percent for significantly challenging and challenging combined. EHR vendors ranked all barriers at 67 percent or higher when combining significant challenging and challenging with lack of industry consensus and cost at 83 percent. Other IT vendors ranked all barriers in the 29-39 percent range when combining these two options except for lack of client demand was only 12 percent.

This is another indicator that there are some basic steps that need to be worked through and considered on the path to interoperability.