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DOI: 10.1377/hlthaff.2013.0124  
HEALTH AFFAIRS 32,  
NO. 8 (2013): 1486-1492  
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The People-to-People Health  
Foundation, Inc.

# Operational Health Information Exchanges Show Substantial Growth, But Long-Term Funding Remains A Concern

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**ABSTRACT** Policy makers are actively promoting the electronic exchange of health information to improve the quality and efficiency of health care. We conducted a national survey of organizations facilitating health information exchange, to assess national progress. We found that 30 percent of hospitals and 10 percent of ambulatory practices now participate in one of the 119 operational health information exchange efforts across the United States, substantial growth from prior surveys. However, we also found that 74 percent of health information exchange efforts report struggling to develop a sustainable business model. Our findings suggest that despite progress, there is a substantial risk that many current efforts to promote health information exchange will fail when public funds supporting these initiatives are depleted.

**A** core aim of the Health Information Technology for Economic and Clinical Health (HITECH) Act of 2009 is to foster the development of broad-based electronic health information exchange, in which clinical data follow patients across delivery settings.<sup>1,2</sup> Health information exchange is a priority in HITECH because there is a strong consensus among policy makers that it can generate considerable gains in quality and efficiency, but it requires substantial policy intervention to become widespread.

In selected US markets there were health information exchange efforts prior to HITECH, many of which received early support from the Agency for Healthcare Research and Quality.<sup>3,4</sup> Outside of these markets, however, providers typically shared clinical data using manual methods such as letters and faxes, which are costly, often unavailable at the point of care, and not analyzable by computers. Achieving widespread electronic exchange of health information should lead to better care with potentially substantial savings.<sup>5,6</sup>

The push to achieve broad-based health

information exchange is also fueled by a consensus that exchanging such information is a critical component of any approach to improve the US health care delivery system. Without health information exchange, the US health care system will continue to contain islands of clinical data that are unnecessarily duplicative and that impede the ability to coordinate care across settings.<sup>7</sup>

In HITECH, federal policy makers promoted health information exchange through two main mechanisms. First, they included it in the meaningful-use criteria—the federal standards for use of electronic health records (EHRs) that physicians and hospitals must meet to receive financial incentives.<sup>8</sup> Second, they provided nearly \$600 million directly to states to build infrastructure capable of supporting health information exchange.<sup>1</sup> The goal of the State Health Information Exchange Cooperative Program is to give providers options for participating in health information exchange.<sup>9</sup> Some states have responded by creating their own entities to facilitate the exchange of health information, while other states are bolstering existing local and regional entities that support exchanging the

information.

The extent to which these policies have resulted in broad-based health information exchange and the primary barriers to the introduction of new options for providers to exchange clinical data are not well understood. To fill this important gap in knowledge, we undertook a national survey of all organizations engaged in facilitating health information exchange. Our goal was to understand how the size and scope of these efforts have changed under HITECH and to identify the challenges that policy makers will need to overcome to achieve greater levels of clinical data exchange.

Specifically, we sought to answer three sets of questions. First, how many health information exchange efforts are there in the United States, and how has this number changed since the passage of HITECH? Second, what types of stakeholders are participating, what types of data are being exchanged, and how many health information exchange entities are able to support the data-exchange capabilities needed to comply with stage 1 meaningful-use criteria? Third, what are the primary barriers facing efforts to exchange health information, and, in particular, to what extent do financial challenges threaten the future viability of such efforts?

## Study Data And Methods

**IDENTIFICATION OF ORGANIZATIONS** We sought to survey all organizations in the United States that facilitate the exchange of clinical data between independent entities—that is, organizations with no shared financial or governance structure.<sup>10</sup> We relied on our list of health information exchange efforts from three national surveys that we conducted between 2007 and 2010.<sup>11-13</sup>

We supplemented this list with data from the eHealth Initiative directory of health information exchange initiatives.<sup>14</sup> We also drew on two sources that had become available since our last survey: the State Health Information Exchange Cooperative Agreement Program's website,<sup>15</sup> which lists all state-level health information exchange efforts, and strategic plans created by each state that describe local health information exchange activity. This process resulted in the identification of 322 organizations that were potentially engaged in facilitating health information exchange.

**SURVEY INSTRUMENT** Our survey instrument, modified from our prior surveys, consisted of two parts. The first part asked respondents various screening questions to determine whether, as of July 1, 2012, their organization was facilitating clinical data exchange among

independent entities or at least was pursuing this as a goal. Respondents who met these criteria were invited to complete the second part of the survey, which asked about organizational demographic characteristics (such as type of governance and numbers and types of stakeholders involved in data exchange), types of data exchanged, ability to enable participants to meet stage 1 meaningful-use criteria, funding sources, and barriers to development.

A prototype version of the survey instrument is available in the online Appendix.<sup>16</sup> We performed cognitive testing of the instrument with potential respondents and modified questions based on their feedback.

**SURVEY ADMINISTRATION** The survey was administered between August and November 2012. We first sent a link to an online version of the survey instrument to the directors of the 322 organizations on our list or to other people at the organizations who had responded to our prior surveys. Subsequently, we made available alternative methods of completing the survey, including by phone or through a Microsoft Word document. Respondents were offered a small financial incentive (a \$25 gift card) to complete the survey.

We reviewed responses for errors and inconsistencies and followed up with respondents for clarification if necessary. Nonrespondents received a minimum of three follow-up e-mail messages and three phone calls.

**DEFINITIONS** Both HITECH and the State Health Information Exchange Cooperative Agreement Program conceptualize health information exchange as the process of moving clinical data electronically across settings and do not specify the arrangement under which the exchange must occur.<sup>1</sup> We therefore used a relatively inclusive definition of efforts to exchange data.

We defined a health information exchange effort as *operational* if it actively facilitated the exchange of any type of clinical data between independent entities of any type (for example, hospitals, labs, and payers).<sup>10</sup> We classified efforts in pursuit of clinical data exchange that were not yet actively exchanging data as still in the planning stage.

**ANALYSIS** We calculated the number of planning and operational efforts among respondents and compared these figures to those from our 2009<sup>12</sup> and 2010<sup>11</sup> surveys to provide a longitudinal assessment of progress. We then identified the organizational characteristics of both planning and operational efforts, including time in operation, organization type, region of the country where they were located, and types of participants. We also examined current sources

of financial support, the financial viability of health information exchange efforts as measured by the number of efforts that could cover operating costs with revenue from the stakeholders participating in the exchange, and barriers to the efforts' development.

Next, we summed the number of practices and the number of hospitals that respondents reported were participating in health information exchange through the respondents' organizations. We divided the sums by the number of ambulatory practices (234,222) reported by the Medical Group Management Association and the number of short-term, acute care general medical or surgical hospitals (4,597) reported by the American Hospital Association, respectively, to determine the proportion of practices and hospitals that were actively engaged in health information exchange.

Finally, we assessed the number of health information exchange efforts that could enable participating providers to meet the stage 1 meaningful-use criteria for activities related to health information exchange and the geographic coverage of these efforts. As our geographic unit, we used Hospital Service Areas, which represent referral patterns for community-based hospital care.

We calculated the number of Hospital Service Areas in which there was a health information exchange effort that could support the original "core" stage 1 criterion: the "capability to electronically exchange key clinical information among providers and patient-authorized entities."<sup>8(p2)</sup> (Although this criterion was later removed from stage 1, it is a key goal of HITECH and relevant to future stages of meaningful use.) We also calculated the number of Hospital Service Areas with health information exchange efforts that could additionally support some or all of the stage 1 "menu" criteria: exchange of lab results; care record summaries; and three types of public health data—immunizations, syndromic surveillance (early indicators of disease outbreaks and community health status), and reportable lab results.

Operational health information exchange efforts were not necessarily able to support the capability to engage in health information exchange because the core stage 1 meaningful-use criterion defines *capability* as an exchange between EHR systems from different vendors. Some health information exchange efforts only enabled exchange among providers using the same EHR system, and others did not support exchange among providers at all (for example, some supported exchange only between labs and providers). Thus, some hospital service areas had operational efforts to exchange health

information, but they did not enable participants to meet the core stage 1 criterion for meaningful use.

**LIMITATIONS** Our study had several limitations. First, we relied on self-reported data and could not independently verify the accuracy of responses. Any reporting bias likely led to an overestimate of the extent to which health information exchange was occurring. For example, geographic coverage could have been overstated, and we could have counted twice a single practice that participated in multiple health information exchange efforts. However, we believe that such double counting occurred infrequently.

Second, we may not have identified some operational efforts. We used a comprehensive, multiprong approach along with substantial outreach. Nonetheless, we probably missed some health information exchanges, especially individual providers who set up private data-exchange agreements.

Finally, our survey instrument had important limitations. Among these was our inability to assess the size of participating hospitals and ambulatory practices or the number of transactions that took place.

## Study Results

We determined that 101 organizations on our initial list (31 percent) did not meet our inclusion criteria. The most frequent problem was a misclassification in our source data: incorrectly categorizing a participant in a broader health information exchange effort as an effort itself.

We received responses from 172 of the remaining 221 health information exchange efforts, for a response rate of 78 percent. Of those 172, 119 were operational (actively exchanging clinical data)—a substantial increase (61 percent) from the 75 such efforts we identified in our 2010 survey<sup>11</sup> (Exhibit 1). The majority of operational efforts were not for profit and had been actively exchanging clinical data for less than two years.

**PARTICIPANTS** We found that hospitals and ambulatory practices were the most common participants in data exchanges (Exhibit 2). They were also the stakeholders most likely to pay to participate.

Payers participated in exchanges and paid to participate in fewer than half of the operational efforts. Participation among independent pharmacies and other groups that could benefit from health information exchange was even more limited.

**TYPES OF DATA EXCHANGED** Test results were the most common type of data exchanged (in 82 percent of efforts), followed by summary care records for patients (79 percent of efforts;

# 61%

### More exchanging data

In 2012, 119 health information exchange efforts were actively exchanging clinical data—a 61% increase from 2010.

Appendix Exhibit 1).<sup>16</sup> Discharge summaries were the most common type of data from inpatient settings (66 percent of efforts), and clinical summaries were the most common type from ambulatory settings (61 percent of efforts).

**FINANCIAL SUSTAINABILITY AND BARRIERS TO DEVELOPMENT** We found that grants and contracts were the most substantial source of support for 52 percent of operational health information exchange efforts (Exhibit 1). Fewer than a quarter of the efforts reported that they were able to cover operating costs with revenue from participants (a standard definition of *financial sustainability*).

Developing a sustainable business model was identified as a moderate or substantial barrier by 74 percent of both planning and operational efforts (Exhibit 3). Lack of funding was also a widely cited barrier, especially by efforts still in the planning stage.

**PENETRATION** We found that 1,398 US hospitals (30 percent) and 23,341 ambulatory practices (10 percent) were participating in the 119 operational health information exchange efforts. This was more than double the proportion of hospitals that participated in such an effort in 2010 (14 percent) and more than triple the proportion of ambulatory practices (3 percent).<sup>11</sup>

**STAGE 1 MEANINGFUL USE** We found that 91 percent of operational health information exchange efforts enabled providers to demonstrate that they had the capability to exchange clinical information electronically—a relatively low bar. However, only 10 percent of the efforts could meet all six stage 1 meaningful-use criteria for health information exchange. The most common criterion met by the efforts was the ability to provide a summary care record for patients who were referred or transferred to another provider or setting (78 percent of operational efforts). Two criteria related to public health were met the least often: syndromic surveillance reporting (29 percent of efforts) and reportable lab results (26 percent of efforts).

Sixty-seven percent of the hospital service areas (2,309 of 3,434) had an operational effort that could enable providers to meet at least the core health information exchange criterion. That is, twenty-three percent (777) had an effort that could support only the core criterion, another 20 percent (693) had an effort that could enable providers to meet the core and at least half of the menu measures, and the remaining 24 percent (839) had an effort that enabled providers to meet both core and menu criteria. The East North Central states (Illinois, Indiana, Michigan, Ohio, and Wisconsin) and the West South Central states (Arkansas, Louisiana, Oklahoma, and Texas) had more Hospital

## EXHIBIT 1

### Characteristics Of Health Information Exchange Efforts

Characteristic	Planning stage		Operational stage	
	Number	Percent	Number	Percent
<b>NUMBER OF EFFORTS IN VARIOUS YEARS</b>				
2009	42	— <sup>a</sup>	55	— <sup>a</sup>
2010	73	— <sup>a</sup>	75	— <sup>a</sup>
2012	53	— <sup>a</sup>	119	— <sup>a</sup>
<b>TIME IN PLANNING STAGE (2012)</b>				
<1 year	4	8	12	10
1–2 years	25	47	65	55
3–4 years	13	25	29	24
≥5 years	11	21	12	10
<b>TYPE OF ORGANIZATION (2012)</b>				
Not for profit	34	64	79	67
Government	7	13	13	11
For profit	5	9	11	9
Other <sup>b</sup>	7	13	16	13
<b>GEOGRAPHIC REGION (2012)</b>				
Northeast	10	19	30	25
Midwest	10	19	24	20
South	18	34	42	35
West	17	32	34	29
<b>MAJOR SOURCE OF SUPPORT (2012)</b>				
Grants and contracts	28	53	62	52
Participants' fees	6	11	33	28
Other	1	2	14	12
Not reported	18	34	10	8
<b>OPERATING COSTS COVERED BY REVENUE FROM PARTICIPANTS (2012)</b>				
Yes	9	17	28	24
No	18	34	68	57
Unsure	26	49	23	19

**SOURCE** Authors' analysis. **NOTE** Percentages may not sum to 100 because of rounding, missing responses, or—in the case of geographic region—efforts that operate in more than one region. <sup>a</sup>Not applicable. <sup>b</sup>Informal consortia, virtual models, entities with no legal status (for example, formed under a contractual arrangement), and public-private partnerships.

Service Areas covered by these efforts than other regions did.

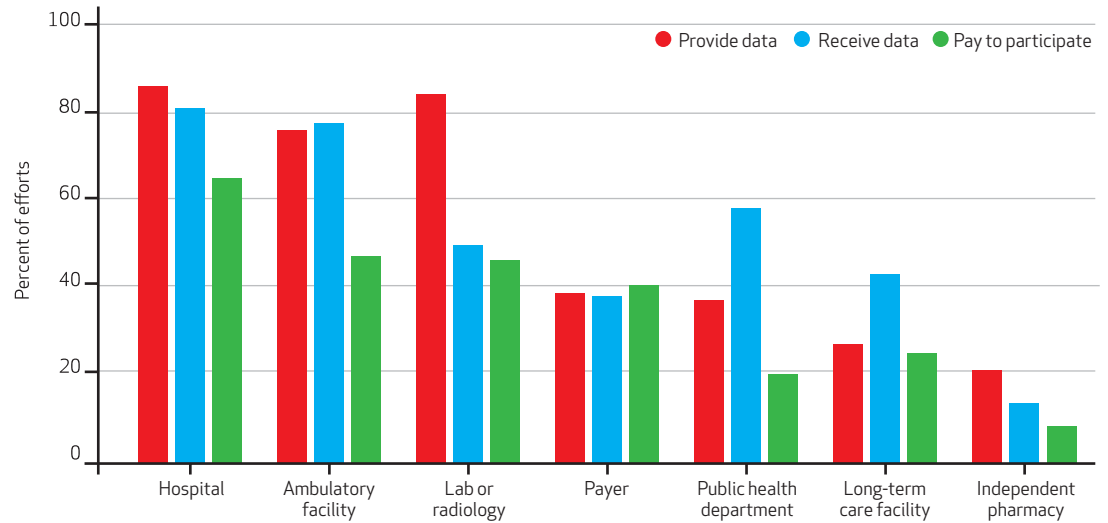
## Discussion

In a national survey of all organizations engaged in facilitating the electronic exchange of clinical data across unaffiliated entities, we found substantial progress since 2010. There has been notable growth in the number of operational health information exchange efforts, and these efforts have achieved broad geographic coverage in their ability to support stage 1 meaningful use. Almost one in three hospitals now engage in clinical data exchange through these entities, as do approximately one in ten physician practices.

However, health information exchange efforts remain heavily dependent on grant funding—much of it from the government—and many are struggling to achieve long-term financial

**EXHIBIT 2**

**Types Of Participants In Operational Health Information Exchange Efforts**



**SOURCE** Authors' analysis. **NOTES** N = 119. "Lab or radiology" is independent laboratory or radiology facility.

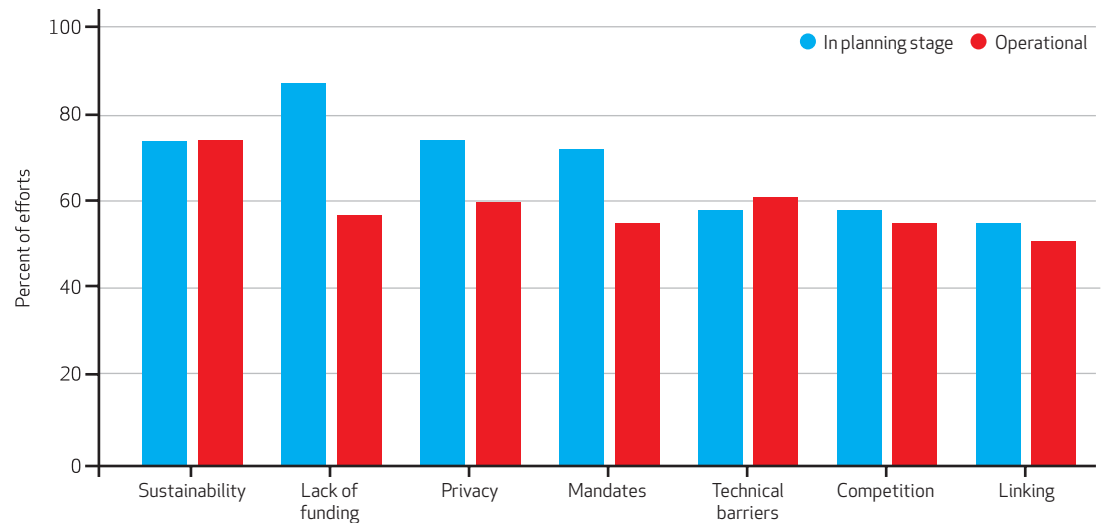
viability. Taken as a whole, these findings are good news for current federal policy efforts but raise real concerns about the future.

The growth in the number of organizations that are facilitating health information exchange likely stems from the explicit support provided by HITECH. Federal activities may have prompted many efforts to start and may have encouraged others that were struggling to con-

tinue to try to become operational. In particular, the State Health Information Exchange Cooperative Agreement Program funding and the explicit goal of ensuring that all providers have at least one option to meet the meaningful-use criteria that are related to health information exchange probably led states to either build exchanges themselves or create more hospitable conditions for existing efforts to expand. These

**EXHIBIT 3**

**Barriers To The Development Of Health Information Exchange Efforts**



**SOURCE** Authors' analysis. **NOTES** N = 172, 53 in the planning stage and 119 in the operational stage. "Sustainability" is developing a sustainable business model. "Privacy" is stakeholder privacy and confidentiality concerns. "Mandates" is government policy and mandates. "Competition" is stakeholders' concerns about competition. "Linking" is accurately linking patient data from different sources.

activities seem to have resulted not only in more operational efforts, but in broader geographic coverage and greater provider engagement as well.

**CHALLENGES** Nonetheless, several formidable challenges lie ahead. Most health care providers, including two-thirds of hospitals and 90 percent of physician practices, are not yet participating in these efforts. Meaningful-use criteria do not require that providers use these entities for exchange. However, the other options—including Direct, a point-to-point secure approach resembling e-mail<sup>17</sup>—are limited in their functionality.

Although some providers are clearly using these other methods, we suspect that most are still not engaging in health information exchange in a substantial way. Creating widespread demand for health information exchange among providers may require delivery system changes far beyond what HITECH alone can accomplish.

Long-term financial sustainability for organizations facilitating health information exchange appears to be the most pressing challenge. The fact that three-quarters of efforts cite developing a sustainable business model as a major barrier is a warning to policy makers that the growth in health information exchange will likely falter unless these efforts become self-sustaining or there is a long-term public commitment to their financing.

This finding is not a surprise: Financial viability has been the Achilles' heel of health information exchange. Efforts to exchange health information struggle to become viable because payers participate in fewer than half of the efforts and pay to participate in an even smaller proportion of them. These low rates persist despite the fact that payers are generally seen as the primary beneficiary of such exchanges, because sharing health information could reduce the number of redundant tests and procedures.

Exchanging health information is also valuable to other stakeholders, such as patients—who, with exchanges, would no longer have to request medical records from one provider and deliver them to another. However, it is difficult to capture that more diffuse value in a way that would generate adequate revenue. Identifying and promoting successful business models in which those who benefit from health information exchange pay to support it are essential to ensure that the progress made under HITECH is not undone.

**RELATED RESEARCH** Our study adds to the growing literature on health information exchange in the United States. Although there has not been a recent national survey of efforts to exchange health information, new empirical work has examined provider and patient engage-

ment as well as broader facilitators and barriers to health information exchange.<sup>18–22</sup>

Most relevant to our findings are two studies that examined the challenges facing health information exchange expansion under HITECH. The results of both studies, which were primarily qualitative, underscore our key finding that the business model for health information exchange remains uncertain and point to additional barriers that remain unaddressed.<sup>19,23</sup> Future studies that add to the growing empirical evidence evaluating the benefits of health information exchange would be helpful, especially in regions with large numbers of small providers and hospitals in which the business case is particularly challenging.<sup>24–26</sup>

**POLICY IMPLICATIONS** Policy makers need to continue to work toward nationwide exchange of health information. In addition, our findings suggest that much more attention needs to be devoted to ensuring that the progress already achieved is sustainable. This will require an explicit focus on identifying ways to help health information exchange efforts become financially viable as they expand coverage and offer new functionalities and services.

Encouraging more providers to engage in health information exchange efforts is a start. However, specific approaches are also needed to ensure that providers' willingness to pay for health information exchange catches up with their growing participation. Among the promising starts are future stages of meaningful use that substantially increase the requirements for such exchange and health care reform that holds providers accountable for coordinated care.

These efforts will likely need to be accompanied by approaches to ensure that all stakeholders who benefit from health information exchange pay to support it. In particular, efforts to exchange health information need to better engage private payers. A clear understanding of what is preventing payers from participating would help. Various models for securing ongoing payer and public contributions have been suggested, many of which require policy interventions such as mandated per claim fees and public assessments through state taxes. No matter which approach is chosen, given the substantial public investment in health information exchange to date, a top policy priority must be determining how exchange efforts can generate enough value to be viable.

**CONCLUSION** We examined the state of health information exchange in the United States and found notable progress since the passage of the HITECH Act. More health information exchange efforts are operational, more providers are en-

90%

**Of practices**

Most health care providers—including 90% of physician practices—are not yet participating in health information exchange efforts.

gaged in such efforts, and the majority of Hospital Service Areas contain an effort that can help providers meet stage 1 meaningful-use criteria for exchanging health information.

For this progress to continue, the policy challenge is to help these efforts identify and implement sustainable business models. ■

Funding for the research was provided by the Robert Wood Johnson Foundation. [Published online July 9, 2013.]

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