

blue shield
of california
foundation

issue report

building
relationships,
building
networks

health information exchange

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contents

introduction	4
background	5
blue shield of california foundation supports HIE innovation	7
assessment findings	8
what's needed next?	17
conclusion	18

introduction

Health Information Exchange (HIE) is the capability to electronically move clinical information between disparate healthcare information systems to facilitate safe, timely, cost-effective, and efficient patient care. An HIE can be community-based (linking data across multiple sites from systems owned by different organizations) or proprietary (linking data across multiple sites and different systems owned by one organization).

While the concept of HIE stems from electronic claims/billing and the Community Health Information Networks (CHINs) of 30 years ago, it remains in its infancy. If the current generation of HIE is to succeed, it will require new and innovative business models with attention paid to technological, organizational, operational, financial, and legal structures and relationships.

background

With varying degrees of success, more than 165 HIE demonstration projects have been launched across the nation in the last decade to improve the quality of patient care.¹ Although most HIEs have developed under state-directed strategic information technology plans (with significant financial support), California HIEs have grown through a grassroots movement. HIE projects in California are attempting to address common healthcare issues such as over-crowded emergency rooms, enrollment of the uninsured in government programs, and increasingly complex management of chronic illness to improve care. While the path has been challenging, it holds the promise of improved patient safety, elimination of redundant information collection, and better coordination of care.

HIEs are rooted in the framework proposed by the President's Information Technology Advisory Committee (PITAC)², which aims to improve the overall quality and cost-effectiveness of 21st century healthcare information infrastructure. It calls for:

1. Electronic health records (EHRs) for all Americans that provide necessary clinical information to providers for clinical decision making and optimal care, while reducing costs and administrative overhead;
2. Computer-assisted Clinical Decision Support (CDS) tools to increase the ability of providers to take advantage of state-of-the-art, evidence-based medicine at the point of clinical decision making;
3. Computerized Practitioner Order Entry (CPOE), which includes tests, medicines, and procedures for inpatient and outpatient settings; and

¹ eHealth Initiative's Third Annual Survey of Health Information Exchanges. Ehealthinitiative.org

² The President's Information Technology Advisory Committee (PITAC), "Revolutionizing Health Care Through Information Technology," June 2004. http://www.nitrd.gov/pitac/meetings/2004/20040617/20040615_hit.pdf

4. Secure, private, interoperable, electronic Health Information Exchange, including both highly specific standards for capturing new data, and tools for capturing nonstandard-compliant electronic information from legacy systems.

Nationally, HIEs have faced growing pains with the development of new collaborative business models and relationships, sometimes bringing together longstanding partners with entirely new entities. Collaborating stakeholders may include hospitals, public health departments, medical groups and/or clinicians, laboratories, pharmacies, safety net providers, other HIE organizations, consumers, and payers.

While technologies used in HIE may be standard and used in other industries, what is new is their adaptation to the healthcare environment and the needs of HIEs, as well as the adoption requirements among community stakeholders. Creation of a community-based HIE requires a multi-million dollar effort, and most HIEs typically receive grant funding from multiple foundations and governmental agencies to finance the full scope of their projects.

To date, HIE development represents a great deal of experimentation with technology, business governance, operational and financial models, and testing of legal issues in privacy, security, and risk mitigation.

blue shield of california foundation supports HIE innovation

Over the past two years, Blue Shield of California Foundation's (BSCF) Health and Technology program has invested \$5.3 million in 15 organizations undertaking HIE projects of variable scope. These grants have supported essential activities such as:

- Planning and readiness assessment;
- Exchange of clinical and lab data between community clinics and emergency departments;
- Enrolling potential applicants in government programs;
- Prescribing and tracking medications among multiple sites; and
- Ensuring functionality of basic infrastructure supporting HIE systems.

Hoping to understand the current state of HIEs, including prevalent challenges and opportunities, Blue Shield of California Foundation commissioned an assessment to aggregate learning from its 15 grantees over the past two and a half years. This review included the following work:

1. A brief review of industry publications to determine how California and BSCF HIE projects compare with others throughout the country;
2. An examination of grantee project documents to understand scope and goals funded by BSCF;
3. Telephone interviews with each grantee to understand the project from their perspective;
4. Collection and analysis of online survey data from grantees to gauge progress towards the goal of interoperability across agencies; and
5. A convening of grantees in leadership roundtables to explore what constitutes the "burning platform" for HIE and the sustainability of HIE business models.

assessment findings

comparing BSCF grantee projects with published information about the status of HIE nationally.

Based on the eHealth Initiative HIE stage of development framework, individual BSCF grantee projects were slightly more mature than HIEs nationally. The majority of BSCF grantee projects were in implementation stages and transmitting data compared to the national cohort, which was focused on developing tactics, drafting business plans, and early implementation. What is notable is that on the state level, California lags behind the majority of the nation in government leadership and development of an HIE strategy. This underscores the remarkable grassroots development of HIEs in California – and raises challenges for the acceleration of future governance, financing, and interoperability.

Health plans surveyed by American Health Insurance Plans (AHIP) in 2007 stated that over one-third participated in an HIE or Regional Health Information Organization (RHIO). Yet only one BSCF grantee had health plan participation. Nevertheless, grantee activities showed significant alignment with the priorities of national payers in the survey. The top four grantee activities (EMRs, clinical notes, test results, and medication history/e-prescribing) match directly with the health plan top priority of getting information to physicians at the point of care. In addition, the clinical data collected by these HIEs is critical to meeting additional health plan priorities of interoperable electronic health records and quality-improvement programs.

The table below depicts the alignment of BSCF's grantees with the priorities of surveyed health plans. Within the table, the term "supports" indicates that the technical infrastructure of the HIE permits the reuse of clinical data collected for one purpose to fulfill another. For example, the connectivity implemented for physicians to access clinic notes from remote locations will also be essential to their use of electronic health records. Similarly, access to lab results and medications assists in identifying patients who may require enrollment in a chronic disease program.

alignment of BSCF grantees and surveyed health plans

national payer priorities for HIE	grantee most common activities (current and planned)			
	#1: EMR (10 of 13)	#2: Clinical notes (9 of 13)	#3: Delivery of test results (8 of 13)	#4: Medication history and e-prescribing (7 of 13)
#1: Information to physicians at point of care	yes	yes	yes	yes
#2: Interoperable electronic health records	yes	supports	supports	supports
#3: Provide quality-improvement programs	supports	supports	supports	supports

During the third quarter of 2007³ and the first quarter of 2008,⁴ IDC Health Industry Insights surveyed hospital leadership. They found an increasing number of hospitals were participating in proprietary HIEs and that more of them expect to participate within one year. Of the BSCF grantees, only one is developing a proprietary HIE, while the other 12 are developing community-based HIEs. Of note, 10 of the 13 BSCF HIE grantees have hospital participation.

BSCF HIE grantees' progress on interoperability

The interoperability survey showed that grantees were actively exchanging data either uni-directionally or bi-directionally across a continuum of clinical data types. They were pursuing multiple data types simultaneously, consistent with the fact that 10 out of 13 grantees were planning for or implementing EMRs. HL-7 and national billing-related terminology standards were quite prevalent, however other communications and clinical terminology standards were used less consistently.

All grantees had HIPAA policies in place and were using a variety of privacy strategies, including opt-in, opt-in for sensitive health information only, and opt-out. Grantees were evenly split between centralized and federated IT architectures. And, finally, grantees showed that they had invested in staff resources and new skill sets to implement their HIE projects but still needed to supplement in-house staff with outside resources that could bring expertise in technical planning, vendor selection, implementation planning, and financial planning.

Taken together, these findings showed progress toward interoperability, but they also demonstrate some clear gaps.

3 IDC-HII's Leading Indicators Survey, Q3 2007.

4 IDC-HII straw poll of community hospital CIOs, Q1 2008.

challenges reported by grantees

Interviews and surveys yielded the following important information about the hurdles, barriers, and frustrations encountered by the grantees endeavoring to bring HIEs to their communities.

- A general impatience is pervasive among grantees over perceived slowness in progress in achieving HIEs' promise, even though the majority of efforts started only four years ago.
- Funding is a conundrum. Most grantees do not have sustainable business models, yet they all agreed on the need to tackle this issue in the near-term. Only two of the 13 grantees reported that financial sustainability without grant funding is within reach.
- Payer and lab participation is inadequate and problematic. Health plans are not actively participating in grantee HIE activities, and laboratory companies are resistant to dedicating resources to local HIEs, particularly those that were small and/or rural.
- Managing stakeholder collaboration is challenging. One of the toughest tasks for grantees is shepherding stakeholders with competing priorities toward an agreement to support what is good for the entire community or the larger organization.
- Peer and expert support is needed. Grantees identified the need for expert and peer assistance in core areas such as governance, financial sustainability, medical informatics, change management, and operational development.

promising practices identified

In addressing these challenges and pioneering their individual HIE efforts, the grantees displayed four common traits.

1. Grantee leaders were motivated by their HIE vision and passion, not by the financial reward. They were entrepreneurial risk takers and showed the prerequisite innovation and hard work that comes with being a pioneer.
2. They used a patient-centered approach to focus competing perspectives of stakeholders.
3. They were politically savvy and modeled behaviors that promoted collaboration. These leaders were attentive to fostering trust among their stakeholders, knowing that it could evaporate quickly.
4. Their projects had the early involvement and engagement of a dynamic physician champion who understood HIE and articulated how HIE would meet stakeholders' needs.

Several promising practices were also identified among BSCF's grantees:

- Strategic and business planning can convert the collective vision and goals for HIE into concrete plans. It can also clarify stakeholders' commitments by establishing requirements for budgetary and staffing resources.
- Governance serves as the foundation for trust and collaboration across stakeholders; it operates as the basis for commitment to the HIE (including budgetary and staffing resources).
- The use of change management principles helps in understanding and navigating the political dynamics across stakeholders. It also facilitates the development and execution of plans to manage organizational stress.
- They adopt implementation approaches that identify necessary changes to policies and/or identify potential new policies, procedures, roles, responsibilities, and skill sets to support full operational status.

the burning platform for HIE

Daryl R. Conner, in his book "Managing at the Speed of Change," adopted the metaphor of the "burning platform" to indicate that point when an individual faces dire consequences and has to make an immediate decision. Around 30 leaders at BSCF's *Burning Platform for HIE* roundtable discussed this topic. Many have talked about HIE and its promise to solve some of our healthcare woes, but a small number have taken the leap into implementing HIE. The group was asked the following questions:

- Is there a burning platform for HIE?
- If so, what is it?
- What does a healthcare world with perfected HIE look like?
- What do we need to achieve the vision?

Dean Germano, executive director of Shasta Community Health Center, described his burning platform as the unsustainable workload of paper-based healthcare management. He described the increasing burden on his staff and physicians as they chased paper to identify patients needing specific interventions, organized the care given, made documentation for quality, sought reimbursement, and, finally, attempted to evaluate the effectiveness of that care for their patient population.

While the hospital's stakeholders had a culture of continuous quality improvement and an excellent cadre of physicians furthering that agenda,

their existing information systems actually supplemented extensive manual data collection processes that could not deliver what was needed in a timely way. Operational efficiency and comprehensive, accessible patient data was the driving need that spurred Shasta to implement an electronic health record connected to ancillary providers for results, pharmacies for e-prescribing, and hospitals for easy, view-only access for physicians.

While these needs and goals were supported by hospital leaders, public health departments, community clinics, funders, and consulting organizations, it was acknowledged by the group that California consumers are not demanding HIE. Many consumers, in fact, believe their health history is available when they go to the ER. They are simply not aware of the fragmentation. In order to generate the demand, care providers would have to “out” themselves and baldly reveal the dysfunction of the U. S. healthcare system.

The three leaders of Tehachapi’s East Kern County Integrated Technology Association (EKCIITA), Dr. Kim Horowitz, Professor Kiki Nocella, and Assistant Administrator Jami Young, described how a HIE project healed a rift in their rural community. Two years ago, Dr. Horowitz and his fellow physicians in the rural community bordering the Mojave Desert, were so mistrustful of the hospital that they would send patients as far as Bakersfield. But a federal grant awarded to the Tehachapi Valley Hospital District to help them plan for HIE started a series of conversations that uncovered a common goal: improving public health in the region.

After two years, EKCIITA gained the commitment of 100 percent of the physicians, the hospital, and three rural health centers to collaborate and share patient information so that all of the providers could deliver high-quality care with up-to-date and comprehensive data.

Today, there is a small group of entrepreneurial providers and public health organizations forging ahead with HIE, driven by a vision of a connected future. The roundtable participants reiterated a comment made by Tommy Thompson, former U.S. Secretary for Health and Human Services: today’s healthcare system uses a 19th century technology (paper) to manage a 20th century patient care model centered on a three-way relationship between patient, physician, and payer.⁵

⁵ Secretary Tommy G. Thompson, remarks at the Health Information Technology Summit, Washington, D.C., May 6, 2004. <http://www.hhs.gov/news/speech/2004/040506.html>

HIE can catapult health care to 21st century technology where standardized, comprehensive data provides the opportunity to improve early detection of and intervention for illness, and enhance decision making in treatments. However, if the healthcare model continues to cling to a reimbursement system that supports one-to-one, face-to-face visits – with little attention paid to population wellness or patient self-responsibility – there will be minimal gains from HIE.

A significant opportunity exists for HIE in the compilation of aggregated, population-wide data, which could:

- Highlight gaps in services throughout a community;
- Identify the emergence of promising practices;
- Support rigorous evaluation and determination of best practices; and
- Inform rational expenditures of resources on beneficial care.

Achieving the promise of this new model requires community collaboration to overtake the preeminent, silo-like hospitals and physician offices of last century's healthcare model. Instead, better outcomes and decreased costs are realized through widespread access to health information.

sustainable business model: crossing the chasm from startup to stayup

When John Gressman, executive director of the San Francisco Community Clinic Consortium (SFCCC), began implementing HIE 10 years ago, he collaborated with the public health department and San Francisco General Hospital (SFGH). Together, they installed a lifetime clinical record system connected by a secure Virtual Private Network (VPN). More recently, they implemented an eReferral system – built by gastroenterologists and IT staff of SFGH – and expanded it to other specialties.

While this work has been supported by grants, the public health department has subsidized the basic business model since inception, justified by cost reductions from inappropriate ER utilization and specialty referrals. As they evolve their HIE, improve reliability of the VPN, and add functionality incrementally, they continue to strengthen the close partnership that is the bedrock of their success.

As evident by the innovative collaboration in San Francisco, HIEs are changing the use of technology, the nature of collaboration within communities, and the organizational structures and business

models needed to support them. The 30 leaders who participated in the *Sustainable Business Model: Crossing the Chasm from Startup to Stayup* roundtable discussed ways to sustain HIEs over the short- and long-term in order to realize their promise. The group tackled such questions as:

- What does a sustainable business model look like?
- What quantifiable value does HIE deliver?
- What are the challenges to creating such models?
- What is needed to move us toward them?

The basic purpose of a business model is to delineate the value that a venture creates and how that value can be captured in monetary terms. While many HIEs are nonprofits and therefore lack a profit motive, a steady revenue stream is nevertheless crucial to ongoing operations and for assigning a monetary value to an endeavor. The brainstorming at this roundtable generated ideas on how HIEs today could demonstrate the creation and capturing of value.

The following table summarizes the ideas that the group generated. “Inputs” refers to the raw materials used in the production of a product or service. “Targets” refers to the customers or users for whom the product or service has value. “Outcomes” refers to the resulting value delivered. And, finally, “Revenue” refers to the form of payment.

HIE business model elements

Value Creation		Value Capture		
Inputs	Product/Service	Targets	Outcomes	Revenue
Money	Collaboration services	Hospitals, community clinics, public health	Partnership	Partner contributions
Data	Interface management	Hospitals, data sources	Functional data exchange	Service fees
Partners				
Technology	Technical product/service	Physicians, patients	User applications: e.g. PHR, EMR, registry	Transaction license fees
Entrepreneurs	Aggregated health information	Physicians, patients, hospitals, health plans	Improved decisions	Transaction/user fees
Staff			Reduced ER utilization excess	Partner contribution, subsidization
			Population management	
	Vision making	Public health, state, county, providers, clinics		

Several of the session participants shared their early experience in developing business models. Long Beach Network for Health's vision was to create a medical home for the underserved. They base their model

on reducing ER utilization by improving coordination and primary care. They received startup funds from grants, performance contracts through the Office of the National Coordinator for Health Information Technology (ONCHIT), and will continue to look at other revenue streams as they evolve.

Another participant, Community Health Center Network (CHCN), based in Alameda, uses the collective resources of the member clinics – in the form of the shared managed-care risk pool – to support the planning of their HIE. They currently use an eReferral system to refer patients to the Alameda County Medical Center for specialty care, and they are in the beginning stages of a more comprehensive case-management and disease-management program.

The previous table does not represent a comprehensive list of possible models but rather an initial glimpse of the current grantee thinking about sustainable business models. The group agreed that much more work was still needed, and they identified specific challenges to the development of appropriate business models and suggestions on where targeted efforts could assist HIEs. Those challenges include:

1. Healthcare is not a pure, competitive market. Customers, payers, providers, vendors, and the government interact in varied ways that don't follow the rules of a market-based economy. Participants noted that for the safety net sector, reliance on subsidies is the norm (in the form of reimbursements from government payers and grants from foundations and private individuals to fund initiatives, capital, and ongoing operations). While, as one participant noted, consumers will line up hours in advance to be the first to buy a new consumer product, they will also protest healthcare costs. This doesn't mean that people do not value their health care but rather that utilizing the stock rules of business in the healthcare industry may not be adequate. The models must adapt or new ones must be devised to accomplish the goal.
2. HIEs have not clearly articulated the problems they can solve, their value proposition and how they will achieve that value. While many have laudable missions, they've been unsuccessful in convincing a critical mass of stakeholders to adopt their solutions – often due to insufficient communication about concrete or quantitative data. The participants accepted accountability to improve their performance in articulating HIEs' value so that stakeholders can adopt a clear and compelling reason to utilize it.

3. Most HIEs, certainly those at the roundtable, are working on shoestring budgets with minimal staff. They rely on passionate and committed volunteers who are often the executives and physician leaders of the collaborating partners – and therefore are extremely busy. There is very little “bench strength” to leverage for the research, analysis, and testing needed to develop and implement a business model. In addition, the staff and volunteers may not have the expertise or tools.

what's needed next?

While HIE is often a discussion of information technology, the promise lies in its ability to spur revolutionary change in our healthcare system. What's needed to accomplish HIE is similarly large in scope. There are some immediate next steps that would benefit the field, and the following suggestions were synthesized from both roundtables and the interviews.

healthcare

- Recognition from the healthcare industry that the platform is burning
- Consumer advocacy that extends beyond privacy and focuses on partnership for better health

HIEs

- Entrepreneurs who will take risks and innovate
- Responsibility and accountability for HIE success, including quantifiable measures of outcomes and demonstrable measures of impact

funders

- Continued faith in HIE and financial investment to achieve sustainability
- Support research on business models, effectiveness, and best practices
- Sponsor access to technical assistance in a business model's development, assessment, and planning at each stage, and facilitate peer learning/networking opportunities

technology

- Commitment of legacy vendors and enterprise customers to interoperability
- Open industry standards

policy

- Coordinate efforts to engage payers, purchasers, and lab and technology vendors by entities that have influence
- Reimbursement for use of HIE in care settings

conclusion

Health information exchange is at a critical juncture in this country. The hope for community-wide interoperability on a large scale requires long-term vision and commitment. It offers grand opportunities for innovation but is also fraught with challenges.

There are over 200 HIEs, most of which are primarily grassroots ventures that sprouted within the last several years out of excitement fueled by a presidential mandate and federal government attention and funding. They are in the early stages of formation and demonstration.

BSCF's HIE grantees are slightly more mature than national HIEs. It is during this mid-stage when they demonstrate proof of concept, and it is during full-scale implementation when there is a high risk for execution failure, management capability, and capacity and financial needs. The grantees have displayed promising practices in the development and growth of HIEs.

How quickly HIEs move up the adoption curve will depend on the resourcefulness and innovation of these entrepreneurs, the support they receive from funders and stakeholders (e.g., hospitals, health plans, purchasers, and consumers), and the success of policy efforts to pave the way.

The widely expressed need for maturity and sustainability of HIE reveals our collective belief in its ultimate value. Yet, there is also a growing impatience with the pace of maturation. If the industry is distracted by this and fails to support HIE, it will not progress. Perhaps the industry needs to move beyond reliance on local entrepreneurs alone and look toward leadership on a broader level, regional or state, that can push HIE to the next stage. As shown in this brief, HIEs themselves are looking for broader collaboration and partnering – coalitions that can accomplish more than small initiatives on their own.

We have witnessed HIEs form at a rapid pace, conduct demonstrations on a small scale, and a few that are coordinating at the state level. The question at hand is whether the industry will move beyond this current stage to build coalitions that deliver true community-wide interoperability and that solidify efforts for long-term sustainability. It will take extraordinary leadership to accomplish this critical task for the health of our communities.

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