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Bluestocking

Health Information Exchanges and Megachange

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The United States faces a number of large-scale policy challenges. Economic development, job creation, deficit reduction, tax reform, health care, immigration, and national security all represent areas of high political, policy and organizational complexity. Each one faces enormous contentiousness over vision, goals, strategies, and tactics. There is little agreement on basic approaches to these policy subjects, and there are multiple organizations and government jurisdictions involved in administration and implementation. The sheer complexity of action in these areas makes it difficult to resolve conflict and implement effective solutions.¹

In this paper, we analyze state health information exchanges (HIEs) as an example of what MITRE researcher John Piescik calls “megachange” challenges.² According to the U.S. Department of Health and Human Services, HIEs are “efforts to rapidly build capacity for exchanging health information across the health care system both within and across states.”³ This includes insurance information for those without coverage and clinical and medical data in order to connect health care providers and payers. The goals are to increase the flow of information across relevant organizations and improve the efficiency and effectiveness of the health care system.

These organizational innovations are an interesting example of policy change in a big and complex area. Health care represents nearly one-sixth of the overall economy and has costs that are growing well beyond the inflation rate. There are multiple actors such as patients, physicians, hospitals, vendors, payers, and advocacy organizations that are important to health care. It generally has been difficult to forge policy agreements among the various constituencies who are involved in this domain.

To develop a better understanding of megachange and health care, we look at a variety of questions. Using interviews, case studies, and documentary research, we study how state-level HIEs are implemented, what drives policy and organizational change, what the opportunities for action are, what barriers come up, and how HIEs are moving forward to overcome particular problems.

Briefly, we find that state health information exchanges have made progress in establishing organizational frameworks, building technology-based connections, and bringing relevant groups to the table for discussion. However, barriers remain in terms of governance, financing, and policy vision. Many states and localities have experienced difficulties in producing consensus on strategies and approaches, and identifying consistent revenue streams. Some question whether the state level is the proper unit for HIEs given natural marketplaces centering on localities or regions. Until those problems are overcome, it will be impossible for HIEs to achieve their full potential.

These findings have ramifications for U.S. efforts to bring large-scale change to many different policy areas. Our analysis suggests that for megachange efforts to be effective, policymakers must present a clear vision, achieve consensus on key objectives, overcome organizational and market fragmentation, and work effectively with a range of different constituencies. There needs to be adequate financial resources and sustainable business models to support proposed changes

and public and private leaders must have incentives to work well together in relationships based on mutual trust.

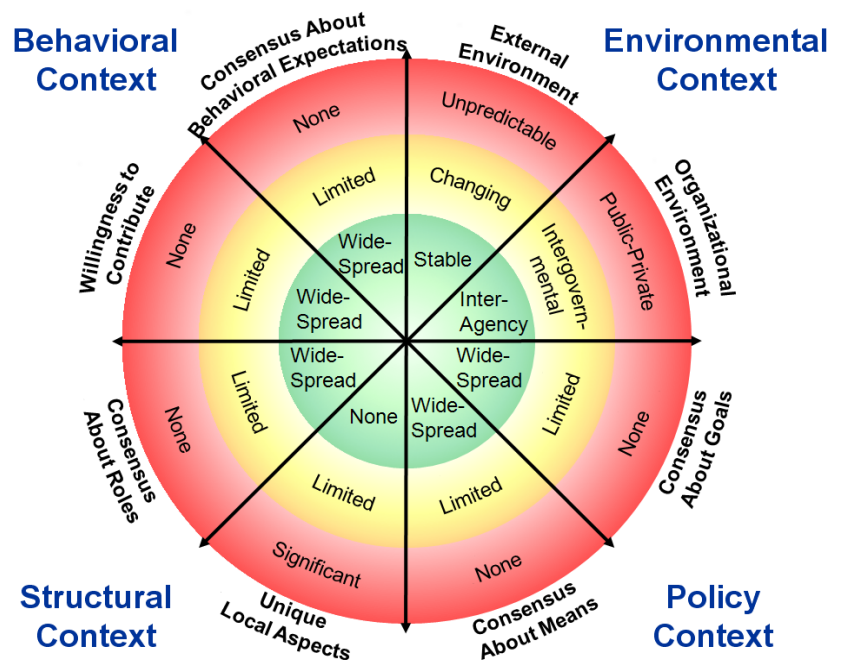
Drivers of Policy Change: A Megachange Perspective

The problems of large-scale policymaking are not unique to health care. In his analysis of megachange, MITRE researcher John Piescik identified 22 examples of “multi-billion dollar, inter-organizational change initiatives” over recent decades.⁴ This included programs such as the war on poverty, the global war on terror, environmental protection, homeland security, the war on drugs, emergency preparedness, financial market regulation, and air traffic control systems, among others. Each of these represented examples of challenging problems due to the complexity of the political, policy, and organizational situations.

Change Drivers

In analyzing what facilitated and inhibited large-scale change, Piescik argued that key factors included “leadership structure, management style, funding, the scope of cooperation required, and the core challenges associated with each initiative.”⁵ A later analysis by Rob Creekmore, John Piescik, and Nahum Gershon grouped change drivers into eight factors based on environmental, policy, structural, and behavioral contexts (see Figure 1).⁶ Relevant change drivers included: whether the external environment was unpredictable, changing, or stable; the organizational environment was public-private, intergovernmental, or inter-agency; the degree of consensus about goals, means, and roles; willingness to contribute in support of the change; consensus about behavioral expectations; and unique local aspects.

Figure 1 Note: This graphic identifies eight key variables agencies can use to determine the best strategies for managing individual changes that must be made to accomplish overall megachange initiatives. Each variable falls into one of four quadrants, each representing a particular change context. Red denotes areas of greatest challenge for megachange, yellow shows areas of some challenge, and green shows areas most conducive to megachange.



The megachange model shown in this figure identifies factors that influence the strategies for managing change and the probability of being successful in large-scale policy changes. The model predicts that the greatest success occurs in the inner circle of the model colored green where there is widespread consensus, inter-agency cooperation, a willingness on the part of major stakeholders to contribute financial and organizational resources to the megachange proposal, and few local dimensions that constrain change. Conversely, in the areas of the outer circle colored red, megachange is most difficult when there is little consensus about goals, tactics, and role orientations, limited inter-agency or public-private cooperation, an unpredictable external environment and little willingness to contribute financial or organizational resources.

Implementation Challenges

Brookings Institution Research Fellow Kent Weaver reviews implementation challenges in the federal government, and finds similar barriers. Among the difficulties he identifies include mission ambiguity, problems of organizational coordination, resource and organizational capacity constraints, political interference, and target compliance.⁷ Lack of clarity, consensus, and capacity limit the ability of policymakers to achieve desired goals, while more widespread consensus and willingness to work together facilitates change and leads to successful policy implementation.

Using these ideas, it is possible to analyze the forces that enable or constrain change and the barriers and/or opportunities that exist in each policy area. Multiple stakeholder groups are especially subject to implementation challenges because of the need to find common approaches and build consensus in situations of extensive fragmentation and conflicting market pressures. In looking at policy initiatives that under-performed or failed, Creekmore, Piescik, and Gershon argue that lack of consensus about goals, tactics, and strategies, insufficient funding, and inter-organizational competition are crucial to the ultimate outcomes. Unless those challenges are overcome, the megachange initiative is not likely to be successful.

Past Failures

As an example, the war on poverty failed because we continue to have a high number of Americans who live below the poverty line. In looking at where the federal program went wrong, it is clear that a number of policy and organizational problems torpedoed the effort, such as win-lose nature of income redistribution as a policy goal, insufficient cooperation among the relevant federal agencies, lack of clarity in program vision, and the bureaucratic nature of federal management style.⁸

In the following sections, we apply the megachange model to state implementation of health information exchanges. We review business plans, interview key participants, and identify factors that enable or discourage policy

change. By examining how different states have handled HIEs, we determine which management, policy, or environmental factors have undermined the ability of policymakers to produce large-scale policy change in health care.

Data Sharing and Health Information Exchanges

Health data sharing networks are crucial to quality improvements, cost containment, and health care accessibility. By enabling the flow of patient data across organizations, data sharing improves almost every aspect of healthcare in America, from insurance markets to better research. With costs rising rapidly and many Americans continuing to lack health care insurance, the development of technology infrastructure and data sharing are vital to modernizing the health care system and integrating data compiled by a number of different organizations.⁹

While electronic record use has grown substantially inside individual organizations, we are in the early stages of data sharing across healthcare providers. The reason is that data sharing is hard. Medical data are more voluminous and heterogeneous than financial records. The data itself are often stored in proprietary formats, and the diversity of legacy standards and provider practices makes interoperability difficult to achieve. Privacy and security are important: everyone wants their physician to have the data when its needed--otherwise, what's the point of building a new system--but that data should not be accessed by those without permission or reason. Managing access control in clinical care, and determining how much data to share for research without compromising privacy continue to present major challenges.

Technical standardization represents another major challenge. Problems of data compatibility, security and interoperability are substantial and organizations need mechanisms to overcome these barriers in the exchange of information. Who bears the costs? How are processes managed? What are the governance structures for data exchange? What are the incentives for competitors to collaborate?

Early Efforts

Early efforts at promoting data sharing were part of an overall trend to leverage the benefits of IT in healthcare through electronic medical records and related technologies. They were often either part of a specific government program, such as the need to standardize across the Department of Defense and the Department of Veterans Affairs, or smaller efforts promoted by philanthropic organizations, such as the Hartford Foundation's Community Health Management Information System or Markle Foundation's Connecting for Health. While some of these efforts were locally successful at creating data systems, they often floundered due to "lack of affordable and effective technology."¹⁰

In 2004, President George W. Bush established an Office of National

Data sharing is hard.... Managing access control in clinical care, and determining how much data to share without compromising privacy, is a major challenge.

Coordinator for Health IT (ONC), with the mandate to encourage health technology adoption.¹¹ This began the process of developing and promoting Regional Health Information Organizations (RHIOs) built around existing communities of medical providers in existing coherent regions, such as metropolitan areas or population centers.

Intermountain Healthcare in northern Utah and southeastern Idaho has developed an innovative data-sharing network covering providers, payers, medical patients, and 32,000 company employees. Because it serves 23 hospitals and a number of specialty clinics and physician offices, its IT system knits together patients, physicians, hospitals, vendors, and payers. Patients have a “MyHealth” electronic record that stores their medical information online and is easily accessible to medical providers who are given permission by patients. Those who are hospitalized or seek treatment at clinics or doctors’ offices can pay bills online and use the Intermountain portal at <http://intermountainhealthcare.org> to find doctors, hospitals, or clinics.

In the same way, widely-varying organizations such as Kaiser Permanente, Geisinger, Cerner, McKesson, the Mayo Clinic, Massachusetts General Hospital, and the Cleveland Clinic have launched medical networks in companies where they have business to share health-related information. This allows for the portability of medical records, the communication of relevant information, and IT systems that are compatible across a range of companies.

At the metropolitan level, RHIOs have developed in many places with the goal of collecting and sharing information. Regional networks include the Indianapolis Network for Patient Care and the Chesapeake Regional Information System for our Patients. These networks connect providers and payers in discrete geographical areas and share medical information within those jurisdictions.

More Recent Efforts

Most recently, states have developed HIEs with the goal of coordinating data sharing over broader geographic areas. Following the lead of Massachusetts and Utah, which were early innovators, states are playing a role in integrating the various local, regional and commercial entities within their jurisdiction. They vary considerably in their approach to governance, technical infrastructure, business model, and reliance on commercial networks. Vermont has tried a novel experiment with state tax financing of health information exchanges. Texas relies heavily on local commercial networks. Delaware has focused on earning revenue through public health and Centers for Disease Control reporting. Tennessee is considering a medical claims fee to finance health information exchanges.

Competitive pressures sometimes have precluded cooperation among private companies. Jon White pointed out that “health care deliverers don’t like to exchange information with competitors.” Businesses have to decide whether they want to compete on grounds other than information. Jennifer Covich Bordenick, the chief executive officer of eHealth Initiative, echoed this theme, saying,

“Competition can interfere with implementation. There are often problems when organizations need to connect to competitors.”

It also is important to note that fragmented governmental organizations or limited financial resources have made it difficult for states and localities to develop information-sharing networks. Often times, they have IT systems based on different standards or proprietary networks that don't connect well with one another. Public officials make decisions within the confines of rules and regulations in their states as well as the dictates of federal law. The complex legal and regulatory environment surrounding health care and the presence of multiple stakeholders makes it difficult to reach agreement on ways to move forward.

Federal Legislation

To deal with these marketplace challenges, the federal government has passed two pieces of major legislation designed to facilitate and fund health information exchanges. The first was the American Recovery and Reinvestment Act of 2009. The Health Information Technology for Economic and Clinical Health (HITECH) portion of the legislation authorized the spending of \$44 billion on electronic health records, data connectivity, and the development of privacy and security standards. It charged the ONC with establishing “meaningful use” IT standards for the deployment of electronic health records. Regional Extension Centers (RECs) were to be established in major areas to help physicians, especially those from small practices, successfully deploy electronic health records. The federal government provided \$643 million to fund the RECs, with an additional \$42 million in later years.

The second bill was the Patient Protection and Affordable Care Act of 2010. It sought to address the 40 million Americans without health insurance and directed every state to form a health insurance exchange (HIX). These exchanges would enable uninsured and self-employed individuals and those who work for small businesses to buy health insurance. The insurance exchanges depend on information exchanges to meet the goals of automated eligibility, easy enrollment and transparency about pricing and care, not to mention the broader goals of lowering costs. The federal government provided funding to the states in order to support the creation of the exchanges. If states do not form their organizations by 2014, people can buy insurance from health information exchanges run by the federal government.

Yet as we note below, many states have encountered significant obstacles at implementing data sharing and connecting health care providers. There are political, financial, technological, and organizational challenges that have complicated the task of making significant changes. These difficulties have slowed the efficacy of megachange in health care.

Building Organizational and Technical Infrastructure Across the Country

According to a 2011 national survey undertaken by the eHealth Initiative, a D.C.-based non-profit organization, there are currently 255 state, regional, and metropolitan HIE initiatives across the country based on different models.¹² This represents a nine percent increase over the preceding year. Ten HIEs closed in the last year and only 10 percent (24 in all) say they have a sustainable business model. About half (113 HIEs) report that they will incorporate the Direct Project protocol for simple exchanges into their service offerings through the Nationwide Health Information Network, and only one-quarter plan to support the accountable care organizations designed to control medical costs.

Covich Bordenick says “there has been a significant uptick in adoption over the past 18 months.” State planners and medical officials had made progress at implementing privacy controls and linking health records to laboratory tests and e-prescribing systems. Many HIEs “are going ahead without state and federal government and relying on the private marketplace,” she says.

A number of medical personnel report that their organizations are not participating in HIEs. According to the 2011 HIMSS Leadership Survey of senior IT executives, only 45 percent “reported that their organization participates in an HIE.” One-third say “they have not yet begun to plan to participate in an HIE.”

However, many are optimistic about the long-term potential of HIT. “Approximately 40 percent of respondents reported that IT can have the most impact on patient care by improving clinical and quality outcomes.”¹³

A 2009 survey of 179 regional health information organizations found that 75 of the 179 RHIOs were operational, covering 14 percent of U.S. hospitals and 3 percent of ambulatory practices. According to researchers, 67 percent of them “did not meet the criteria for financial viability.”¹⁴ This suggests that a number of states face challenges in terms of long-term financial sustainability.

Financial Problems

Financing has been a problem in a number of places. Covich Bordenick points out that “federal funding has been a fortunate source of seed money, but the question is how to survive after that and the need for sustainable models.” State and local HIEs have developed different business models based on service provision such as billing services, lab functionality, or EHR connectivity. Some rely on a subscription model from local providers, whereas others treat the HIE as a public utility focused on infrastructure development, according to Covich Bordenick.

“Health information exchange,” according to Janet Marchibroda, “isn't happening primarily due to the fact that there simply aren't incentives to share data. Payment reforms that reward better outcomes and the processes that

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support them will create the business case for health information exchange. Interviews that we conducted with various individuals indicate that HIEs across the country face challenges in numerous areas. As anticipated by a megachange model, there continues to be extensive contentiousness around health reform. A number of states have sued the federal government on grounds that the health care bill and the individual insurance mandate in particular are unconstitutional.¹⁵

Health information exchanges have encountered funding problems and difficulties in producing sustainable business models. There have been shifting mandates from the federal government as relevant actors argue over implementation approaches. With industry groups and medical providers worrying about the impact of data-sharing on market share and ability to compete, health information exchange administrative challenges loom large as states face a deadline for action.

With funding challenges and partisan differences over health care remaining quite strong, it has been a challenge to implement health information exchanges in an uncertain and volatile political and fiscal environment. “While some state level HIEs (SLHIEs) and/or their designated entities are moving forward quickly and successfully, some states are struggling with this effort,” noted Pam Matthews, the senior director of regional affairs for HIMSS. “A significant challenge for all SLHIEs as well as other HIE initiatives is finding a successful sustainability model that works for specifically for that organization. There is a lot of discussion to get to yes on how to move forward and this is hard work.” As of summer 2011, only two states (California and Maryland) had appointed health insurance exchange boards to implement HIXs.¹⁶

Some progress has been made on boosting adoption of electronic health records, which represent a key element of technology infrastructure. According to Mark Frisse of Vanderbilt University, “EHRs are not like a paper chart, but more like a telephone” designed to connect various users. They are crucial to knitting together the work of various providers, payers and vendors.

Physician practices need to automate in order to facilitate exchange. Overall, ONC national surveys of physicians show that EHR adoption has risen across the country.¹⁷ For basic compliance, it was 11 percent in 2006 and included systems that collect patient demographic information, patient problem lists, clinical notes, orders for prescriptions, and the ability to view lab and imaging results. But by 2009, 21.8 percent reported basic capabilities and compliance had increased to 24.9 percent in 2010.¹⁸

Lag in Full Compliance

Full compliance, though, has lagged. It is defined as all of the above, plus medical history and follow-ups, orders for tests, highlighting of out-of-range test levels, electronic images returned, and reminders for guideline-based interventions. In 2009, just 6.9 percent reported full capabilities and in 2010, this number increased to 10.1 percent.¹⁹

Progress has been uneven across different geographic areas and practice sizes. For example, EHR adoption rates decrease with size of the medical practice.²⁰ Regional Exchange Centers (RECs) were initially created to support those practices with fewer than 10 physicians. But it has been challenging to get the smallest providers to purchase EHRs.

Smart phones and mobile devices have grown in popularity among physicians. A national survey by the Manhattan Research Institute found that 81 percent are using smart phones in their medical practices. One medical resident noted “the mEHR has been extremely useful, pushing the wealth of information on the LMR [longitudinal medial record]. I use the mEHR on my iPhone to inform clinical decision-making without interrupting rounds, update patients without leaving their room, and check results, notes and clinic schedules from home. It generates enthusiasm from every clinician I have shown it to, all of whom are seeking ways to access critical information irrespective of time or place.”²¹ The dramatic increase in mobile technology has fueled mHealth applications for physicians as well as patients.

Health Information Exchanges: Indiana, Massachusetts, New York, Tennessee, and California

To look in greater depth at HIE implementation, we examined state experiences in Indiana, Massachusetts, New York, Tennessee, and California. We chose these states in order to include a range of geographic areas, state size, HIE performance, business models, and operational approaches. Even this small sample illustrates the range of approaches to tackling the challenges of sharing health information, with different histories, political environments and structures, and business models leading to different outcomes. We recognize, however, that there are limits to our ability to generalize from these particular cases. Any set of states has its own unique features that do not necessarily represent other areas. We use our five states to illustrate the issues that a variety of places have confronted and how each jurisdiction has sought to move forward.

Indiana

Indiana has leveraged its history being an early innovator in health information technology and electronic connectivity with great success. Based on an HIE system that predates the current national initiatives, Indiana has created a centralized model, with data standards, benchmarking and an extensive business services model that provides valuable financial resources.

Its Indiana Network for Patient Care launched 15 years ago and paved the way for the Indiana Health Information Exchange (IHIE) and the Indiana Health Information Technology (IHIT), which is the official state designee for the ONC. IHIE was one of the earliest HIEs established in the United States when it was

created in 2004. Through its 13 health institutions and an association with Indiana University's Regenstrief Institute, it launched the Indiana Network for Patient Care (INPC), which holds medical and claims data on 6 million patients.

IHIT has a 12-person board of directors. There are representatives from government agencies, hospitals, physicians, rural health providers, a consumer representative, a privacy and security expert, a research scientist, an expert on medical informatics, and a representative with knowledge about black and minority health. It works closely with IHIE as well as HealthBridge, which serves Southern Indiana and Cincinnati and the Michiana Health Information Network serving South Bend, Indiana and parts of Michigan. IHIE has formalized several different governance structures for consultation with partners and relevant stakeholders in the community. This includes a board of directors with 17 members representing various hospitals, the health department, medical societies, the Regenstrief Institute, and four at-large members: a Physician Network, a Hospital Network, a Quality Health First management committee, and forums established for professional and public outreach (see its website at www.ihie.com). Some payers are represented under the at-large component of the board.

The exchange comprises 46 counties covering 43 percent of the state's population.²² At the end of 2010, IHIE included 70 hospitals, long-term facilities and health centers. Since 2004, "IHIE has delivered over 77 million clinical results; over 17 million were delivered in 2010."²³ Over 22 distinct health systems participate in IHIE and the exchange supports two Regional Extension Centers (the HealthBridge's Tri-State REC and Purdue University's health IT extension center). The IHIE received the largest sum from the \$50 million in HITECH funding. Over \$16 million was used to support the Beacon Community Program. Currently, based on its 2010 budget, IHIE has operating expenses of \$8.5 million and revenue of \$8.2 million, for an operating loss of \$274,329. This loss is down from the \$716,745 recorded in 2009.

Indiana's Quality Health First (QHF) Program uses real-time information to generate patient-specific quality reports for clinician and payer use on 30 different indicators. It also established the "DOCS4DOCS" system as a clinical messaging service.²⁴ The connection with the Regenstrief Institute has been important because its experts "understand the data and the technology, and the value of information in health care," according to Marc Overhage, the chief medical informatics officer at Siemens and previously the president of the Indiana Health Information Exchange.

According to Marc Overhage, QHF follows a "quilt" strategy in which you develop a variety of service "squares" for the quilt: "Once you have normalized data and the ability to communicate what services people will pay for, you put a square on the quilt." Its first service was clinical result delivery, and this was followed by searchable queries of patient medical care, public health result reporting, and quality health first performance measures. Payers and providers pay money to access this information and get data on health care trends and

performance.

The state uses what Jon White calls the “mothership” approach, whereby the state HIE provides standardized information across the board that enables data integration. This differs from places like Utah, which employs what he says is a “post office” approach that places greater limits on who has access to the information. The latter treats medical information the way the post office treats the mail, passing sealed envelopes from sender to recipient.

The state has set up ambitious benchmarks in terms of health outcomes. Its state report filed with the ONC in 2010 establishes the goals of improving the number of diabetic patients under treatment by 10 percent, reducing ambulatory admissions by three percent, cutting readmissions by 10 percent, reducing the number of unneeded radiologic tests by 10 percent, and increasing cancer screening and adult immunizations by five percent.²⁵

The state’s Beacon Community Program has created a “Learn from our Experience” page that shows case studies and visual materials plus a “Tool Kit” for partner organizations. According to its official reports, its central tenets are spreading the operating costs around, increasing the value of HIE services to customers, filling existing data gaps, and funding the development of new sustainable value-added services.

Its business model is based on service provision and links to regional market activities. Its strategic plan describes the state’s sustainability model as one in which:

[T]he HIOs collect fees from healthcare providers that are primary data sources, such as acute care and critical access hospitals, laboratories, radiology centers, etc., so that the data can be converted, processed, and routed to physician practices, rural health clinics, federally qualified health centers (FQHCs), and other recipients of the data. Secondly, physicians and these clinics, even though they also generate data from patient care visits and their own testing, are charged for the services they receive in only a few HIOs. HIE financial charges to the data source providers include one-time installation charges and ongoing service fees. As services have been developed for health plans, such as eligibility checking, the promotion of treatment guidelines, and patient sub-population analysis, they have also begun to compensate HIOs for these services.²⁶

Hospitals have developed applications for clinical messaging, physician performance assessment, the integration of clinical, claims, and cost data, web-based training instruction, and connections for area physicians and hospitals. Providers pay in order to access these data, and this has provided a sustainable basis to HIE operations. The state has sought to avoid over-dependence on federal grants for operational costs, and seeks to gain economies of scale across its geographic area.²⁷ It has focused on health outcomes and physician incentives for

quality improvements, but found it is “a challenge for the players to identify appropriate bonus payments to physicians based on this quality program.”²⁸

Figure 2 Summary of the Current Situation and Possible Strategies in Indiana Based on the Megachange Profiler (with red and orange showing areas of greatest challenge for megachange, yellow showing areas of some challenge, and dark and light green showing areas most conducive to megachange)

INDIANA		
	Current Situation	Possible Strategies
External Environment	Changing to Stable - The state's long track record on health IT has helped it deal with changes in standards, federal policy, medical practices, and health insurance models.	Continue to rely on IHIE and IHIT leadership in dealing with external stakeholders.
Organizational Environment	Public-Private - Stakeholders include states, CMS, CDC, physician offices, insurers, labs, Indiana and Purdue Universities, hospitals, local public health, and other providers.	Focal points, such as IHIE, IHIT, INPC, QHF, Beacon Community Program, have been and will continue to be keys to standardization and widespread adoption.
Consensus About Goals	Widespread - There is little conflict between various stakeholder communities, given the strong leadership at the state level over a 15 year period.	Little program change/strategy is required regarding goals due to general agreement.
Consensus About Means	Widespread - Key stakeholders appear in agreement on ways to move forward.	IU's Regenstrief Institute should continue to play key role in implementation given its past effectiveness.
Unique Local Aspects about the State	Limited to None - IHIT works with some regional HIEs in addition to IHIE, e.g., HealthBridge and Michiana Health Information Network.	Governance structures for coordinating stakeholder approaches already exist, such as through IHIE sponsored Board of Directors.
Consensus About Roles	Widespread - Roles have evolved and matured over 15 years.	Little program change/strategy is required regarding roles due to widespread agreement.
Willingness to Contribute Financial or Organizational Resources	Widespread - Stakeholders appear willing to buy business services and contribute financial and organizational resources.	IHIE and IHIT should encourage continuing contributions among stakeholders and shore up goodwill through recognition of existing contributions.
Consensus About Behavioral Expectations	Widespread - There appears to be consensus about expected behaviors as state implements various actions.	IHIE and IHIT should continue to promote transparency, recognition, performance reporting, and credentialing.

The trick on revenue generation through services, according to Overhage, is that it “takes time to get enough payers participating. You need enough physicians [or hospitals or health plans] to make the initial investment worthwhile.” He noted that the key is to “focus on value add services that people are willing to pay for.”

This widespread adoption enables the program to grow into new sectors over time. Recently, Indiana added long-term care to its HIE activities through funding provided by the ONC’s challenge grant program. According to John Kansky, the vice president of business development at IHIE, “we’ve had a fairly robust health information functionality in a good chunk of the state for more than 10 years – for the most part almost completely without the involvement of long-term care. Suddenly, we’ve got long-term care organizations involved, signed and connected.”²⁹

In summary, Indiana has made excellent progress in building consensus on goals, means, and roles for various stakeholders (see Figure 2). Its inclusive governance structures with different committees and advisory boards has worked well. The state coordinates effectively with various local and regional networks. Indiana University’s Regenstreief Institute has played a constructive role in health IT implementation. The state has pioneered a business model based on providing important services to stakeholders, and therefore is well-positioned for future sustainability. It has developed ambitious benchmarking goals that will help regional and state authorities to evaluate progress in future years.

Massachusetts

Massachusetts has one of the nation’s best developed hospital and healthcare systems, with similarly advanced electronic hospital records. Its HIE management follows a consortium model, led by academic medical centers and large medical providers, and focuses its efforts on technical support and private initiatives.

The state had the advantage of a well-developed hospital and state legislation enacted during the Governor Mitt Romney administration designed to make health care more affordable and accessible. Until recently, its hospitals were non-profit. However, in 2011, Steward Health operated by Ceribus Capital acquired Morton Hospital and Medical Center.

It was an early leader in cooperation for HIT. The eHealth Collaborative was launched in 2004 with \$50 million from Blue Cross and Blue Shield, when those organizations were under state political pressure regarding retention of their own non-profit status. The Collaborative had the goal of linking communities together through EHRs and HIEs. In 2009, a consortium of providers and payers formed the New England Healthcare Exchange Network (NEHEN) with the goal of providing a secure platform for the electronic exchange of health information. It resulted from the merger of MA-SHARE, a clinical health exchange organization, and the New England Healthcare EDI Network, which handled inpatient administration

transactions. Thirty member organizations pay anywhere from \$25,000 (small groups) to \$100,000 (large groups) to belong to NEHEN.

The network is HIPAA-compliant using the privacy framework developed by experts associated with the Markle Foundation and it provides business and technical services through the CSC vendor. It has an annual budget of \$8 million and has broken even each year since its inception. According to John Halamka, chief information officer of Beth Israel Deaconess Medical Center, it offers members vendor negotiating cost efficiencies, implementation assistance, and a centralized staff of health IT experts. It generates its income from “stakeholders who derive benefits” from the organization. It seeks to avoid government grants “that keep on costing.” The problem with many public sector awards is that they support establishment, but not maintenance, of particular infrastructures. When the money runs out, the grantee organization is left with the task of covering continuation costs.

Against this focus on provider-led growth of HIT, government initiatives have been slow. The commonwealth established the Massachusetts health Institute (MeHI), and it received initial state funding of \$15 million in 2008 and then an ONC federal grant of \$13.4 million to support connectivity for medical providers. According to its 2010 strategic plan, “MeHI estimates that the full cost of implementing the statewide HIE over a four year period is approximately \$45 million.”³⁰

MeHI was established as a division of the Massachusetts Technology Collaborative (MTC), with the approval of the MTC executive committee and the state’s health IT Council. The MTC executive committee has seven members drawn from state officials, attorneys, universities, and private research groups and a board of 14 comprised of individuals from universities, state offices, unions, and private companies. The health IT Council has 10 members drawn from state health officials, Massachusetts General Hospital, Boston Medical Center, universities, and a consumer advocate. It has a number of ad hoc working groups covering privacy and security, consumer engagement, clinical quality, regional extension centers, health information exchanges, and workforce development.³¹

Since then, public and private leaders have worked to align the governance structures of these various enterprises. Micky Tripathi, the CEO of the eHealth Collaborative, says there have been questions about ‘how the federal program fit in with the private organizations...They are headed in roughly the same, but not exactly the same, direction.’

One challenge has been aligning the various projects underway in each public and private organization, including the state Medicaid program. This involves assuring that health officials are working together on phasing-in various program activities. Currently, leaders envision three phases of program activity, according to Tripathi. The first involves secure routing and the creation of an information highway across the state. The second focuses on data aggregation and the creation of registries and repositories such as public health and quality data warehouses.

The third is a query service based on record location and consent management.

Another concerns the role of the federal government and the state organizations it has established as part of health care reform. The ONC launched its Program Information Notification (PIN) Priority Exchanges designed to connect lab test reporting and e-prescribing. But the program has been “wildly under-managed,” stated Tripathi. Its strength has been the “focus on simple, actionable things we can measure,” but the problem has been that “we haven’t seen much progress in the necessary performance.” It took a while for the state plans to get approved and there have been some delays due to differences of opinion between former versus current officials. According to the 2010 Massachusetts Strategic Plan, “48 percent of commercial labs can deliver structured lab results” and “12 percent of commercial labs can electronically receive lab orders.” However, “97 percent of pharmacies in Massachusetts have the capacity to accept electronic prescriptions and issue refill requests.”³² This growth, however, has been primarily driven by market demand and cooperation with local providers.

The Regional Extension Center has enrolled over 2,500 primary care providers in its program to become “meaningful users of HIT.” Of the 62 RECs from across the country, Massachusetts was the first one to meet its recruitment target. According to Bethany Gilboard, director of health technologies for the Massachusetts eHealth Institute, “we had three clinical relationship managers who are exceptional in working with the small physician practice.”³³ Its enrollees “include 45 percent of providers in small practices, 29 percent from community health centers, 16 percent from small practice consortia, and 10 percent from public hospitals.”³⁴

The state leads the country in health care coverage, with 98 percent of its residents having health insurance. In addition, Governor Deval Patrick points out that “forty-five percent of [the state’s] doctors have adopted electronic records, nearly triple the national average, and SureScripts has named Massachusetts the number one e-prescribing state in the country the past two years. More than 50 percent of hospitals have adopted Computer Physician Order entry, more than five times the national average.”³⁵

Massachusetts is part of a six-state regional consortium known as the New England States Consortium Systems Organization that is designing a health insurance exchange (HIX) using a federal grant of \$35.5 million. According to John Halamka, the HIX “has many components that are common and hence can be developed just once for the region/country. At the moment, HIX has a strong policy directive, appropriate funding, excellent leadership, and multi-stakeholder governance.”³⁶

To summarize, Massachusetts has been a strong performer on health care. It has strong governance structures with lots of advisory committees composed of major stakeholders (see Figure 3). It has been helped by having strong academic medical centers with a demonstrated track record of innovation and implementation. Participants have worked in a cooperative manner and relied on

Figure 3 Summary of the Current Situation and Possible Strategies in Massachusetts Based on the Megachange Profiler (with red and orange showing areas of greatest challenge for megachange, yellow showing areas of some challenge, and dark and light green showing areas most conducive to megachange)

MASSACHUSETTS

	Current Situation	Possible Strategies
External Environment	Changing - The state has strong academic medical centers and large health care providers that are committed to health care innovation and connectivity.	Experiment and disseminate best practices within and outside the state.
Organizational Environment	Public-Private - Stakeholders include physician offices, insurers, labs, major Universities, hospitals, local public health officials, and health care providers.	State appears to have strong governance model for involving various stakeholders.
Consensus About Goals	Widespread - Statewide consensus appears to have been driven by major nonprofit payer and academic medical centers, spreading beyond the state to New England.	Continue to build on strong academic medical centers.
Consensus About Means	Limited to Widespread - Standards-based approach with an intermediary model, but some parties want to evolve rapidly to a clearinghouse model with more shared data to support research objectives.	Need to determine best means to move forward on HIE implementation.
Unique Local Aspects about the State	Limited - The state has some geographic divisions between the Boston area and the Western part of the state.	Need to bridge gap between various parts of the state and make sure all are linked into health information exchanges.
Consensus About Roles	Limited - Roles of publicly funded initiatives versus private initiatives have not been fully harmonized.	Need to work to develop consensus about roles of various public and private stakeholders.
Willingness to Contribute Financial or Organizational Resources	Limited to Widespread - Major stakeholders have contributed financial and organizational resources to health information exchanges.	Continue to offer new services and maintain sustainable business model for NEHIN.
Consensus About Behavioral Expectations	Limited to Widespread - It appears that most parties have a fairly good understanding of needed behaviors to share data and connect various providers.	State appears well-positioned to move forward in the future.

open source code that is shared between large and small organizations. The state has been very successful at winning federal grants to support health IT and gaining state financial resources to implement health information exchanges. It is working to integrate its greater Boston area networks with the rest of the state and appears well-positioned for the future.

New York

Like many political issues in the state, New York's HIE efforts have focused on navigating the differences between New York City and the rest of the state. Statewide initiatives have worked through the RHIOs, but have exerted leadership in stressing the importance of independent business models to drive sustainability, and encouraging greater interoperability and standardization. Progress has not been fast, but it has been measurable.

Regional differences in the type of health care providers complicate large-scale policy change. For example, upstate New York has non-profit health plans that have "bought into RHIOs due to their interest in managing costs and population health," according to Rachel Block, the deputy commissioner of health IT transformation for the New York State Health Foundation. They provide significant in-kind resources for HIEs. In contrast, New York City and Long Island are more fragmented, have strong academic medical centers, and feature large numbers of patients with government-provided health insurance. In the Bronx, Block noted, "70 percent of health coverage is Medicare and Medicaid." Private health insurers are less central to medical care in that and other areas. Block said that large academic medical centers "drive change in New York City" more than upstate. They are interested in accountable care organizations (ACOs) and "view RHIOs as a means to the end of expanding integrated delivery models and integrating doctors into their networks."

In the Hudson Valley, MedAllies has partnered with the Taconic Health Information Network and Community (THINC) to establish a secure regional HIE. They connect over 800 providers in 62 different practices and process nearly 50,000 lab results per month. Their goal is to connect physicians and health care organizations and promote access to clinical and administrative data.³⁷

The state works with two REC: the New York City Regional Electronic Adoption Center for Health (REACH) focusing on the city and the New York eHealth Collaborative (NYeC), which is a public-private partnership for the rest of the state. REACH won \$21.7 million in federal funding, while NYeC got \$26.5 million. The former set a goal of connecting 4,543 providers, while NYeC aims to connect 5,107 providers.³⁸ The state also works with HIXNY, a RHIO based around Albany founded in 1999 by two provider networks.

REACH has a budget of \$60 million and builds on the work of the Primary Care Information Project launched by the Department of Health and Mental Hygiene in 2005 to subsidize purchases of EHRs serving the poor. To qualify, doctors must have practices where at least 30 percent of patients receive Medicaid.

Nearly 40 percent of recipients practice in offices that have only one or two providers. Over 2,400 physicians in the metropolitan area have received PCIP grant to facilitate the use of electronic records.³⁹

Together with NYeC, REACH launched a rigorous procurement process for certified EHRs. There were 200 different vendors for electronic records, but the state demanded that to be eligible, companies had to have “1,000 installations nationally, CCHIT-certification, [and] HIPAA-compliance.”⁴⁰ This cut the number of vendors to 25, 10 of which were chosen for vendor demonstrations. They selected five to serve as preferred vendors: eClinicalWorks, Eclipsys, Greenway, NextGen, and Sage.

The funding model has successfully evolved towards a more sustainable direction. In its early days, organizations’ budgets came mainly from government grants and member fees. According to Block, funding has progressed through different stages. The initial series of \$50 million in grants came in 2006 and it followed the strategy of using seed funding to let “a thousand flowers bloom.” Officials wanted to stimulate innovation in a variety of organizations around the state so money was dispersed broadly. This was followed by more targeted grants in which the state wants to “set the strategic policy framework.” “The RHIO,” Block explained, “provides connectivity between the HER, connecting EHRs to each other.”

Now, the HIEs rely on “a mixed revenue model comprised of membership assessments, contract work, and subscription services.”⁴¹ All of the state government grants require a 50 percent local match, either in terms of dollars or in-kind services. This assures local buy-in and encourages a more sustainable operation.

More so than other states, New York has focused on a “statewide HIE utility” whereby the HIE infrastructure is “procured and managed using a statewide, public utility model.”⁴² Other states have preferred a facilitator model in which private companies build the infrastructure while the state HIE provides guidance to make sure it connects relevant people and organizations.

In New York City, more than half the physicians are connected through EHRs and the rest of the state is just below that level. The state is “funding care coordination at the local level focusing on patient-centered medical homes” stated Block.

One substantial challenge at this point, according to Block, is “removing residual policy differences and achieving greater standardization.” For example, there are variations across certain communities in consent policy dealing with privacy. State officials spent two years dealing with privacy and security. “Some people expected a consumer backlash, but it didn’t happen here,” Block said. Unlike other states that operate through a consent “opt-out” method, New York relies on “opt-in” for consent to access and consent to disclose information. It adopted this more stringent standard because of state laws requiring patient consent in cases of HIV/AIDS and sexually transmitted diseases. Consumers have

to check boxes indicating that medical groups can provide access to other organizations.

Figure 4 Summary of the Current Situation and Possible Strategies in New York Based on the Megachange Profiler (with red and orange showing areas of greatest challenge for megachange, yellow showing areas of some challenge, and dark and light green showing areas most conducive to megachange)

NEW YORK

	Current Situation	Possible Strategies
External Environment	Changing - The state has made progress in adapting to new developments in technology, standards, medical practices, and health insurance models.	Disseminate best practices elsewhere and scan work by other states.
Organizational Environment	Public-Private - Stakeholders include a complex blend of public and private players, both in New York City and in upstate New York.	Use RECs and RHIOs as focal points to reach complex stakeholder set.
Consensus About Goals	Limited to None - NYC hospitals would like to use HIE to enable ACOs to function, while some others prefer to focus on care coordination and quality improvements.	Need to have better consensus on overall goals such as public health and care coordination for public programs in NYC versus cost containment underwritten by insurers upstate.
Consensus About Means	Limited- Agreed on small set of preferred EHRs and utility model.	Evolve data standards in concert with national stakeholder community, including vendors.
Unique Local Aspects about the State	Significant - Major differences in payer ecosystems between upstate and NYC. Major payers cover most care upstate but public programs have huge insurance market share in NYC.	Integrate upstate and greater New York City data sharing.
Consensus About Roles	Limited - Payers prominent in upstate HIEs but not NYC.	Build consensus about roles.
Consensus About Behavioral Expectations	Limited to Widespread - Significant progress on EHR adoption and connectivity across providers.	Build in flexibility to support regional variations in organizational goals and motivations, perhaps with different combinations of services for local contexts.

There also are differences in data collection and record quality. Now that clinical information is flowing through data sharing networks, officials have discovered variations in record keeping. Some hospitals develop a new medical record every time a patient goes to a medical facility, while others use a single record for each patient and update it with each visit. This is where officials “learn the icky things about data” and the lack of uniformity and quality across institutions, indicated Block.

Health information exchanges relying on government grants will face problems in one to two years, according to Block. Federal funding linked to the American Recovery and Reinvestment Act runs out in two years and some state grants will have to be renewed in a year to a year and a half. NYeC has no private funds, although it “could leverage Medicaid funding through enhanced matching grants.” Private groups put their own money into HIEs, but have “not made progress commensurate with the money put in,” according to Jon White. According to the state’s strategic plan, over \$840 million has been invested in health information technology and health information exchanges.⁴³ In terms of future funding, its plan features “potential partnerships with medical devices companies, pharmaceutical and biotech companies, lab companies, insurance entities, medical networks, Medicaid FFP, and large employers.”⁴⁴

In short, New York has made progress on implementing health information exchanges (see Figure 4). Of the states we analyzed, it has the clearest focus on a utility model for linking various health care providers. It has used a combination of state and federal funding, and made creative use of Medicaid money to build its data sharing networks. There are different challenges between upstate New York and the greater New York City metropolitan area in terms of governance, policymaking, and HIE implementation. The state has the strongest privacy policy with its emphasis on opt-in, as opposed to the opt-out model that is common in many other states.

Tennessee

Tennessee has also chosen to build on existing RHIO efforts. Its approach to statewide management has been to enable some interoperability between existing organizations, while the organizations themselves either thrive or flounder. Tennessee’s ONC-authorized entity is the Health Information Partnership for Tennessee (HIP TN). It is a public-private partnership with a 13-member board consisting of representatives from physicians, nurses, hospitals, insurers, pharmacists, regional health information organizations, and patients. It differs from other states in having pharmacists, nurses, and RHIOs formally represented on the board.

It uses a “network of networks” approach, according to Will Rice, the executive director of the Tennessee Office of e-Health Initiatives. The state leverages existing networks at the local and regional levels and provides a universal bus layer of

connectivity. There was prolonged discussion among nearly 300 stakeholders about how to define qualified organizations. Some wanted an open definition with it being possible for anything from medical group practices to medical centers to rural providers to qualify, while others preferred a more narrow definition. After discussion, the state defined qualified organizations as those providing a “community of care.” This definition was not based on geographic area and included an “exception clause” for entities that wanted to be considered but did not meet the formal criteria.

Its regional extension center is known as tnREC. That organization provides guidance to state providers interested in adopting electronic health records. Through the use of federal funds, it offers up to \$44,000 for providers seeking to use EHRs to meet federal meaningful use standards.

One of the state’s regional health information organizations was CareSpark, which formed in 2005. That entity attracted considerable attention for serving Appalachian areas in southwestern Virginia and eastern Tennessee. At its peak, CareSpark linked medical data from 38 health organizations and had 1,500 participating physicians.⁴⁵ It had success in providing a technical demonstration of interoperability that was useful to other HIEs both in Tennessee and around the country.

But the facility was forced to close in summer of 2011, four years after its launch, due to legacy debt and difficulties in shifting from a grant and contract model to one based on subscriptions from local payers and providers. When area hospitals chose not to participate in the organization and it lost a contract from the Social Security Administration, revenues dropped dramatically, debt increased, and Jerry Miller, the chairman of the CareSpark board, concluded, “we did not have a sustainable plan.”⁴⁶ According to Mark Frisse, the problem with many HIEs is that they are too complicated in their technology and “try to build version 6.0 first.” He says exchanges should “build version 1.0 first” and “do a few things well.” Will Rice added that it is “important to be very specific in the focus.”

The state had better fortune with its lesser-known health information exchange focused on greater Memphis, established with guidance from Frisse and other health care experts from Vanderbilt University. It covers a regional area serving 1.2 million individuals and is serviced by a commercial vendor and governed by a locally appointed board. It has implemented easy-to-use health information technology and emphasized the exchange of basic medical data and formation of a sustainable business model.

Its basic technology had an operational cost of \$800,000, Frisse said, and this emphasis on “low cost technology” has helped the exchange become sustainable. There is some evidence that the Memphis program was effective due to its focus on reducing emergency room visits.

The state has launched the Middle Tennessee eHealth Connect initiative serving the greater Nashville area.⁴⁷ It started with an annual budget of \$2 million and aims to connect the health IT systems of local hospitals and health care

providers.⁴⁸ It works with electronic health records and administrative systems run by local organizations. The operation has 11 partners, including the Vanderbilt University Medical Center.

Figure 5 Summary of the Current Situation and Possible Strategies in Tennessee Based on the Megachange Profiler (with red and orange showing areas of greatest challenge for megachange, yellow showing areas of some challenge, and dark and light green showing areas most conducive to megachange)

TENNESSEE

	Current Situation	Possible Strategies
External Environment	Changing - The state needs to adapt to changing standards and medical practices.	Use RECs to disseminate information and best practices.
Organizational Environment	Public-Private.	Use RHIOs and RECs as focal points for large numbers of stakeholders.
Consensus About Goals	Limited to None - There are differing goals across geographic regions, which have complicated data sharing and health connectivity.	Build consensus at state and regional levels on major goals.
Consensus About Means	Limited to None - There also are differing views about the best means of moving forward.	Bring RHIOs together to foster consensus about means.
Unique Local Aspects about the State	Significant - There have been differences in approaches taken in various metropolitan areas. The collapse of CareSpark has created uncertainty in that part of the state.	State effort needs to focus on communications standards and reporting processes, and allow technical services and business model to develop at local and regional levels.
Consensus About Roles	Limited to None - There are some trust barriers that have created difficulties in building consensus.	Build consensus on roles in conjunction with consensus on goals and means.
Willingness to Contribute Financial or Organizational Resources	Limited - Lower-cost RHIOs appear to have a shot at succeeding. High cost seems to exceed willingness of stakeholders to contribute.	Experiment with business models and keep costs down. Demonstrate that data can make a meaningful impact on high cost problems such as hospital readmissions.
Consensus About Behavioral Expectations	Limited - Major stakeholders appear to have differing expectations in terms of best way to implement HIEs.	Build consensus on stakeholder expectations.

In general, the state has had problems sustaining parts of its HIEs. Between 2004 and 2008, the state raised \$65 million for its HIE. This included \$10 million from the federal government, \$29 million from the state, \$25 million from payers, and \$1.3 million from providers and employers.⁴⁹ More recently, it got \$11.6 million in ONC cooperative grant and \$13 million in state funding.

Unlike HIEs such as Indiana, HIP TN does not yet offer paid services to health providers. The state is in the process of developing services and infrastructure for the secure electronic exchange and use of health information data. It has done little in the way of benchmarking clinical quality performance. The state would like to do that, but it needs access to clinical data and there remain barriers that inhibit cooperation across providers.

In summary, Tennessee has made some progress, but also encountered some setbacks, such as the collapse of CareSpark (see Figure 5). There have been some governance challenges in connecting regional exchanges with one another and integrating state-level activities with the rest of the state. The state needs to focus on how to develop a HIE business model that is sustainable in the long-run. It needs to think about how to benchmark success and evaluate future progress.

California

California faces a number of challenges endemic to a large and complex state featuring multiple health care markets and having a difficult budget situation. Earlier efforts towards sharing information were oriented around smaller regions within the state, and rather than rewrite this, California is adopting a more federated approach of working with the smaller extant HIEs. Initial false starts and persistent funding problems have limited results thus far, but there are signs of progress as the state strategy evolves.

The state had one of our nation's earliest data sharing networks with the Santa Barbara County Care Data Exchange, which was established in 1999. Led by David Brailer, who later became the first national coordinator under President George W. Bush, this initiative sought to create a technical infrastructure for sharing health information at the local level. It set up a "federated" site that "allowed clinical data at each participating organization to stay in place, but provided a single way to query and display that data at each disparate site."⁵⁰ However, the exchange closed in December 2006, according to outside observers, because it did not have "a value proposition to benefit participants' bottom line."⁵¹

Statewide initiatives exist for insurance. In 2010, Governor Arnold Schwarzenegger signed a bill establishing the California Health Benefit Exchange as country's first health benefit exchange. It was set up "to help consumers and small businesses shop for and buy health insurance at competitive rates."⁵² Among the other organizations offering connections are the National Indian Regional Extension Center, Cal-HIPSO, COREC, and Health Information Technology Regional Extension Center. Each is "designed to make sure that primary care clinicians get the help they need to use EHRs."⁵³

To further statewide information exchange, Cal eConnect was launched with \$38.8 million in federal grant support. The organization has a 22-person board with representation from the government health department, universities, hospitals, labor unions, medical associations, consumer groups, and payers. Unlike Indiana, which put no health payers or union representatives on its board, California took a broader approach to representation and has members from Blue Shield of California, LA Care Health Plan, and the Service Employees International Union (SEIU).⁵⁴

The exchange enables many different approaches to health information exchanges. While this diversity can be difficult to manage, it is necessary given the diversity of regional partners. It works with the California Regional Health Information Organization (CalRHIO) and several community-based HIEs. They include Access El Dorado, Eastern Kern County, Health-e-LA, the Long Beach Network for Health, Orange County, Redwood Mednet, and the Santa Cruz HIE. Each takes different approaches to organization, technology, and operational approach. Some are unincorporated, while others are 501(c)3 or hospital-based organizations. In terms of technology, some of them are federated systems with organizations tapping into shared networks developed by the HIE, while others are hybrid systems with open source systems.⁵⁵ Alternative models have included geographic-based HIEs, a state-supported utility, or a “neutral connectivity” approach, though the state has favored the neutral connectivity model.⁵⁶ The state funds five regional health organizations for a total of \$3 million.

Its 2011 budget calls for \$15.433 million in income and \$15.358 in expenses, with a projected surplus of \$75,000. Two-thirds of its expenditures (\$10.3 million) go for contracts and subgrants. Nearly all of its revenue (\$14.543 million) comes from U.S. American Recovery and Reinvestment Act funding that will expire in the near couple of years.⁵⁷

Long-term sustainability is a major challenge for it as well as many other exchanges around the country. Mark Elson, Cal eConnect’s chief policy and program officer, noted that “most community HIE efforts currently rely on grant funding. The goal is to reach a tipping point by the end of the Cooperative Agreement grant cycle in two and one-half years so that use of HIE is widespread enough to generate sufficient revenue for sustainability.”

The state is transitioning from a model where it provided exchange infrastructure to one where it takes more of a coordination role with existing RHIOs. “Cal eConnect’s HIE Community of Practice provides a forum for all the HIEs to meet regularly and exchange best practices and technical assistance. And our five advisory groups meet monthly and enable a cross-section of knowledgeable stakeholders to inform our direction in areas such as policy, technology, business, and consumer engagement,” stated Elson.

Cal eConnect has gone through a leadership transition. Its CEO resigned amidst concerns over implementation challenges and has been replaced by someone with greater administrative experience. Its governing board has open

meetings and it has been difficult to find the proper balance between transparency and effectiveness in running the health information exchange.

Figure 6 Summary of the Current Situation and Possible Strategies in California Based on the Megachange Profiler (with red and orange showing areas of greatest challenge for megachange, yellow showing areas of some challenge, and dark and light green showing areas most conducive to megachange)

CALIFORNIA

	Current Situation	Possible Strategies
External Environment	Changing - The state is working on adapting to a changing environment for standards and medical practices.	Make sure state responds to changing fiscal and market conditions.
Organizational Environment	Public-Private - The state-level HIE has gone through a leadership transition and experienced some implementation challenges.	Use RECs and RHIOs as focal points to reach complex stakeholder set.
Consensus About Goals	None - With a history of regional HIEs, it has been difficult for the state to reach a consensus about the broader goals of its HIEs.	Need to build relationship between state and regional HIEs.
Consensus About Means	Limited to None - There also is a lack of consensus on means, and a need to work out the proper relationship between state and regional HIEs.	Need to establish shared vision at state level.
Unique Local Aspects about the State	Limited to Significant - The state is noteworthy for having a number of differences in market operations and stakeholders based on geographic area.	RHIOs may be more sustainable than state HIE.
Consensus About Roles	Limited - Varies by region.	Need to establish shared vision at state level
Willingness to Contribute Financial or Organizational Resources	Limited to None - Heavy reliance on federal grants. Large health organizations may already be satisfied with their coordination of care and payers may not be trusted to underwrite exchanges. Severe fiscal restraints on the state budget impedes further HIE funding by state.	Need to move beyond federal funding and establish sustainable business models at state and regional levels. Perhaps give more flexibility to regional HIEs.
Consensus About Behavioral Expectations	Limited to None - Unclear whether there is a shared set of behavioral expectations for providers and other stakeholders; may vary by region or is still emerging.	Need to establish shared vision about how to move forward.

There are promising signs of progress in spite of the administrative and budgetary challenges. The percentage of physicians reporting EHR usage increased from 20 to 48 percent between 2008 and 2011.⁵⁸ According to the California Healthcare Foundation, the use of decision support tools grew between 2008 and 2011. Nearly 90 percent of Californian hospitals had clinical decision support systems in 2011, but only 40 percent reported having installed order entry systems installed.⁵⁹ However, the state has estimated that it will need at least \$2 billion fully to implement health information exchanges.

In short, California faces a number of different challenges in HIE implementation (see Figure 6). It is a large and diverse state with a number of metropolitan areas. The state has massive budgetary problems that affect a variety of policy areas including health care. Its funding model relies heavily on federal money, especially for the state HIE. That organization has new leadership and has the goal of improving coordination with regional health exchanges. But despite these challenges, the state is making progress and it has increased the use of health information technology both by physicians and hospitals.

Implementation Drivers: Dominant Players, Effective Governance, and Degree of Consensus

In looking at activities across the states, we found a number of factors that affect implementation. These considerations help explain variation across states and forces that enable meaningful implementation and policy action.

Governance Mechanisms

Effective governance mechanisms among relevant stakeholders have a big impact on implementation. In many states, according to Janet Marchibroda, “there is fairly good consensus on what stakeholders should be at the table.” Most states bring together representatives from hospitals, medical societies, government health departments, universities, physicians, and public representatives. States vary in the extent to which they involve health care payers or unions. Many do not put them on the board but involve them in management committees or advisory groups.

For governance to work, according to Mark Frisse, there needs to be a “trusted base” of partner organizations. Key stakeholders must have the incentives and structures to come together, discuss alternatives, and negotiate differences. Organizational mechanisms for conflict resolution are vital to the implementation of health information exchanges.

But there are disagreements over who should sit on exchange boards. In the case of health information exchanges, states have reached different decisions

regarding the proper approach to governance.⁶⁰ Some HIE boards involve payers (California and New York). California includes union representation and Massachusetts has a labor representative on its MTC board, which oversees MeHI. Most other states do not have union members serving on their boards. Tennessee has pharmacists and nurses represented on its board, which is something not found on many other state boards.

With health insurance exchanges, there are even greater differences of opinion about board representation. Consumer advocates decry having insurance companies sit on boards that will make decisions about the implementation of insurance exchanges. They argue that ‘it’s the equivalent of the fox guarding the hen house.’⁶¹ Ron Pollack of Families USA says “since some of the decisions need to be made by exchanges include whether to retain or drop a health plan in the exchange, it’s very hard to have confidence in a governance system if there’s a conflict of interest.”⁶² Yet the U.S. Department of Health and Human Services issued a ruling that enable health insurers and insurance agents to sit on boards as long as they don’t dominate board composition.

Governance has been very divisive in the Colorado health insurance board. “Four of the nine members are managed-care or insurance company executives and a fifth is an IT executive with ties to some of the companies represented on the board,” according to reports.⁶³ This suggests the need for clear conflict of interest rules for individuals serving on exchange boards.

Overhage argues the problem is that states are unsure “whether they are capable of implementing health insurance exchanges. Any state is trying to be cautious on whether they can do this. It is not high on the priority list and it requires sophisticated insights and understanding about the market. A lot of states don’t have that expertise on staff.”

These and other controversies over board representation demonstrate how real or perceived competition over data undermines the ability to share information and build organizational trust. As long as providers, payers and vendors jockey for market advantage, it will be complicated to build HIEs and HIXs. Conflict over governance is one of the reasons only 13 states have passed legislation establishing health insurance exchanges.

Degree of Consensus

As predicted by a megachange model, the degree of consensus on policy direction affects implementation. Marchibroda points out “there is no consensus among health care leaders on the path forward.” Many different aspects of health care reform are contentious from the question of technical standards to strategy, tactics, and goals.

There also are tensions in some states between local and regional health information organizations and new state health information exchanges set up to oversee and connect existing networks. In some places, there are differences of opinion about how to move from regional to state models.

Since the requirements for health information exchanges and health insurance exchanges were part of President Barack Obama's Patient Protection and Affordable Care Act, the partisan controversy over health care reform spills over into implementation issues. Some states have not liked federal mandates that accompany funding for health insurance exchanges and have turned down the grants. The lack of consensus on these core topics creates many complications on health information exchanges.⁶⁴

Role of the Federal Government

The role of the federal government in general and the ONC in particular is crucial to program success. For example, there have been some issues regarding the Direct Program. That initiative was designed to provide "simple and secure messaging protocols" for medical providers.⁶⁵ With many IT vendors expressing their support for the system, the hope was that it would connect the large number of physicians, hospitals, and medical providers and provide a simple way to move from paper to electronic exchange.

But some observers claim that the program undermines broader efforts at health care connectivity by focusing on what critics call "point-to-point" infrastructure. Originally, data sharing was envisioned as having well-connected and integrated information systems. But in the eyes of certain state-level health officials, the ONC announcement in 2010 weakened this kind of connectivity.

Overhage says based on experience in his state, there isn't much demand for that kind of service. He explained that "we aren't getting any [Direct Program] requests from hospitals or physicians." The problem with point-to-point communication, he says, is that providers "won't think to push the data." Instead, he said it is better to have searchable databases that can be queried so that health officials can find information on specific topics when they need it. He felt the ONC Connect Gateway represented a better way to integrate databases because it allowed local providers to talk to Wellpoint, Veterans Affairs, or the Social Security Administration.

A white paper published by the Electronic Health Record Association argued "a short-term approach to health information exchange transport that is overly reliant on point-to-point solutions will fail to meet the nation's challenges and miss the opportunity to take advantage of a broader range of standards, existing capabilities, and infrastructure in which the industry is already invested."⁶⁶ Its authors suggested that in addition to point-to-point communications, there needed to be "community sharing health information exchange" and a "nationwide health information network exchange."

New York health officials preferred a focus on building the HIE infrastructure rather than boosting Direct email adoption. This is the reason the state has devoted \$400 million to building a state health information network.

Others, though, defended the program. Mark Frisse described the federal initiative as a "smart idea for point-to-point communications." It is a way to

standardize the simple task of sending messages over secure networks, he said. The bigger problem, he felt, was that federal regulation has been too tight. His concern is that change is being generated only through a top-down "push" and that "we have to manage the market" and "tell doctors what to do in great detail."

Acknowledging the value Stage 1 Meaningful Use's massive "push" and the ongoing need for additional standards activities, he suggests that an alternative course now might be simply to focus on the "pull" of rational markets where they exist in health care. He believes that at this juncture if these markets simply "tell people what quality and care you will pay for, people will figure out how to adapt, use, and evolve the technology."

Will Rice feels that the Direct Program is useful to small providers looking for inexpensive health communications options. Direct is "disruptive in a good way" he added, benefiting payers by providing low-cost alternatives: There are "innovative ways [Direct] can be deployed to help regional health information organizations to provide low-cost interfacing" he said. The organizations he believes are most concerned about Direct are vendors selling electronic health records. For \$10 per month in cost for secure email, he said, it beats EHR systems that charge \$10,000 or \$50,000. John Halamka points out that the federal government is good at offering "a policy framework and standards that constrain optionality." But he said: "We still need local implementation because every state has its own politics."

Security and Privacy

Another national issue that draws the conflict between federal policy and local demand is the challenge of data security and privacy. Privacy continues to complicate HIE implementation, despite some positive steps forward. Since data sharing involves common conceptions of privacy and consent, it has been challenging for local organizations to reach agreement on appropriate standards. Eighty percent of the American public believes that privacy safeguards are important for health information technology.⁶⁷ Uncertainty about privacy can be lethal to an information exchange: One such initiative in the 1990s was torpedoed by physicians who felt it lacked appropriate precautions.⁶⁸ Providers take their cues on internal policies from the HIPAA Privacy Rule, but this offers insufficient guidance for sharing information across organizations.

But as Jon White has pointed out, there are major policy debates on the matter of "who has access to health information and under what circumstances." Although some privacy advocates prefer an "opt-in" approach, many HIEs prefer "opt-out" due to its administrative simplicity and ease of implementation. Some states have additional regulations on top of federal HIPAA rules.

An opt-in approach "prohibits the network from automatically including a patient's information in the data that is passed from the provider - such as a hospital or insurance company - to the HIE without the patient having provided direct consent for that express purpose." In contrast, the opt-out model "a data

provider passes to the HIE all patient information that is not otherwise restricted.”⁶⁹ In Nebraska’s Health Information Initiative, which uses opt-out, few (1.5 to 2.6 percent) have actually opted out. Massachusetts allows either opt-in or opt-out.⁷⁰

John Halamka distinguishes between privacy in “push” versus “pull” technologies. He says privacy protection is easier in push transactions because a provider requests data access and a patient agrees to the request. Pull transactions are more complex because if someone shows up unconscious in a hospital emergency room and physicians use queries to find out the patient’s medical history, it is not clear how to handle consent.

Patients, payers, and providers have different incentives for accessing information so there needs to be clear rules on who can see health records. This is especially the case with mental health history and sexual issues, where there is concern about patient confidentiality and who has access to medical information.

Funding Barriers, Business Models, and Politics

One of the important HIE challenges is the funding difficulties and political controversies surrounding health care reform. Each of these issues has been difficult in a number of states and complicated implementation of health information exchanges.

Budget Sustainability

With federal, state, and local government budgets being cut, it is challenging for health authorities to support health information exchanges.⁷¹ If basic services are being compromised, it is hard to fund new initiatives that remain untested and without a strong political base. Many states are in dire financial peril,” noted Mark Frissee. “Withdrawal of federal funds would jeopardize their solvency.”

Seven states were given a collective \$241 million this year in federal money to launch Health Insurance Exchanges (HIXs): \$35.6 million for Massachusetts, \$31.5 million for Kansas, \$54.6 million for Oklahoma, \$37.8 million for Wisconsin, \$48.1 million for Oregon, \$27.4 million for New York, and \$6.2 million for Maryland. These funds were designed to establish a place where consumers and small businesses could shop for affordable health insurance.

On the funding side, many states have gone beyond member or subscription fees to providing services in particular areas that demonstrate clear value to those using the network. According to Matthews, the Federal HITECH funding awarded to states for SLHIE is not enough to successfully sustain these SLHIEs long term. In addition to meeting the SLHIE agreement requirements, states are trying to determine additional services that will keep the organization running over the next five years and beyond.

Among the options being tried are offering public health services tied to the Centers for Disease Control, behavioral health services, remote hosting services for physicians or electronic health records, data analytical services, and providing exchange services to other states. But she says that “many states are not very transparent about meeting milestones. They share little information and it is hard to evaluate their performance.”

In order to help with long-term sustainability, the Health Information Partnership for Tennessee has proposed a one percent “claims tax” whose revenues would be earmarked for health information exchanges. Every medical claim would be subject to a charge, and the money would help HIEs finance needed investments in health information technology.

Political Divisions

The challenge of funding HIEs hits a particular wrinkle because of the politics surrounding the broader healthcare reform package of which they are a part. Both Kansas and Oklahoma turned down federal HIE money because of concern over national health care reform, state budget worries, and unhappiness over federal mandates accompanying the funding. The announcement by Kansas Governor Sam Brownback indicated that federal mandates cost more than they deliver. “There is much uncertainty surrounding the ability of the federal government to meet its already budgeted future spending obligations,” Brownback noted. “Every state should be preparing for fewer federal resources, not more. To deal with that reality, Kansas needs to maintain maximum flexibility. That requires freeing Kansas from the strings attached to the Early Innovator Grant.”⁷²

Oklahoma officials were even more direct in their criticism of health care reform. Republican State Senator Gary Stanislawski noted that “when we looked at the grant application, as well as the acceptance to that grant, it tied us into Obamacare. Because of that, it deterred us from taking it. This way, we can do health reform on our own terms.”⁷³

Two governors (Nathan Deal of Georgia and Susana Martinez of New Mexico) have vetoed health insurance exchanges and 15 states, including Mississippi and Arkansas, have failed to enact exchange legislation. Three states (Louisiana, Florida, and South Carolina) “have pledged not to take additional federal funds to create health [insurance] exchanges.”⁷⁴ Tea Party protests plus political changes in state legislatures and/or governorships have made it difficult in some places to build the support required to launch new organizations.⁷⁵

The electoral tidal wave in many states following the 2010 elections has had ramifications for health information exchanges. Many health IT coordinators have left their positions or been replaced due to changes in governorships. Pam Matthews of HIMSS noted that “governor elections can produce changes at the helm that impacts work efforts for SLHIEs.” There are many new leaders in executive branch agencies as well as state legislatures based on recent elections. Marc Overhage noted that “you need a five-year view” when implementing major

policy changes. States that have a short time horizon due to electoral or political changes face an uphill battle because “it is difficult to make progress in two years,” he said.

Massachusetts experienced some change in direction following the departure of Governor Mitt Romney and election of Deval Patrick in 2006. According to Tripathi, “the Romney Administration took more of a private sector facilitation approach. It saw its role as providing input and guidance, but it wanted to nurture the private sector.” However, under Governor Patrick, the state took on a “more affirmative role” based on defining and funding health care. Tripathi noted that “the state sets the vision and defines it in a tactical way.”

Controversies over federal funding plus uncertainty regarding future vision place additional pressure on health exchanges to develop sustainable business models. They need to identify alternative revenue sources and determine how to charge for services and convince member organizations to support their activities.

In response to unhappiness in various states, the Department of Health and Human Services announced its decision in July 2011 to allow “‘conditional approval’ of health exchanges that are not quite ready to meet federal deadlines for the marketplaces.” For places that can’t meet the January 1, 2013 deadline to have a certified health insurance exchange up and running, the federal government is offering greater flexibility on the timetable and approach. But it remains to be seen whether that addresses the concerns of state officials.

A few companies have stepped into the policy breach and offered private health insurance exchanges. Blue Cross Blue Shield of Michigan and Medica in Minnesota have set up “an online marketplace and choose from more than a dozen insurance plans – with their employers footing a certain chunk of the bill.”⁷⁶ This serves a similar purpose as the publicly-run exchanges, but is administered by health insurance companies.

Lessons for Health Information Exchanges

To summarize, there has been substantial growth in the number and type of HIEs around the country. There now are 255 HIE initiatives at the state, regional, and local levels. But ten of them closed in the last year, including the CareSpark organization serving Appalachia. More worrisome is the fact that only 10 percent (24 in all) report they have a sustainable business model.

Longterm Funding Challenges

With funding uncertainty at the state and federal levels, there is a question of whether there is the political will and financial support to sustain HIEs over the long run. A recent Booz, Allen Hamilton report concludes, “at this point, clinical data exchange remains mostly theoretical; even the exchange of administrative data is fraught with challenges.”⁷⁷ Another study of hospital technology adoption

by Joshua Vest of Texas A&M University found that “getting hospitals to adopt HIE may require additional investments in technology support or incentivizing the purchase of even more technologies.”⁷⁸ He argued that officials need to pay attention to factors such as presence of physician portals, network membership, non-profit status, and emergency room visits because they affect HIE implementation.

The lessons for HIEs are instructive. As noted by the Megachange Profiler, market fragmentation and political divisions are problematic for HIE implementation. The Profiler was developed as a way for stakeholders to come together and have meaningful dialogue concerning goals, means, and tactics. The less consensus on broader objectives, the more difficult it is for policymakers to make decisions, implement exchanges, and resolve conflicts. Stakeholders need to cooperate and pull together in order to make meaningful progress on HIEs. Private sector buy-in is crucial for the long-term effectiveness of health information exchanges.

In its review of HIE success factors, the National eHealth Collaborative finds that “aligning stakeholders with HIE priorities” is one of the most critical ingredient in effective implementation.⁷⁹ It notes that stakeholders typically are “diverse, evolving, and often competing groups” and “creating a shared vision” is vital to long-term success. Those organizations that have done the best job generally have been able to develop “win-win” collaborations among important stakeholders.

Some states have made efforts to find alternative revenue sources. Rather than be dependent on state or federal funding, they are earning money by providing needed services for health care providers. In some cases, they are hosting electronic health records or mHealth applications. And in other examples, they offer services such as de-identifying data, analyzing data, or serving other states as a way to finance their operations.

The Proper Level of Government

There is uncertainty regarding the proper level of government for health information exchanges. Historically, HIEs emerged at the local or regional levels. Early innovators worked along natural market boundaries and built organizations around existing networks. Some early experiments were based on the county because that was the unit that incorporated relevant health care providers and natural boundaries. Other opening projects focused on metropolitan areas or regional clusters.

The recent thrust of federal health policy, though, has centered on state-level exchanges. The idea was that there needed to be coordination of existing exchanges at the local and regional levels, and that states therefore were the logical unit of analysis. State organizations could coordinate networks across localities and link providers and consumers along state lines.

Some observers, however, question the usefulness of this approach. Marc

Overhage maintains that “the state is the wrong unit to move HIEs. Health care doesn’t fall along political markets.” In his state of Indiana, he points out that the natural clusters are the greater Indianapolis area, Chicago and northwestern regions, Cincinnati and southeastern areas, South Bend and southern Michigan, and Ft. Wayne and parts of Ohio. California’s Elson argues, “It is important to convey that statewide initiatives are really sensitive to local concerns.”

In some respects, disagreements over federal policy has stymied progress on HIEs. ONC started with draft requirements that mandated effective electronic linkages within two years, but providers argued they could not meet that timeline. As a result, the final guidelines approved by that agency softened the rules and “slowed the intended progression of a time-bounded incentive program” and encouraged “more point-to-point exchange.”⁸⁰

While understandable given the political climate, these and other federal changes have made it difficult to implement HIEs. The future of HIEs is tied to initiatives such as electronic health records, privacy policy, and meaningful use requirements. Getting all these policies aligned correctly is necessary to achieve the desired policy results. Right now, according to Will Rice, there is some tension in implementation between meaningful use requirements mandating EHR certification and connecting HIE networks to local providers. Some EHRs are better at sending than receiving data and there needs to be a web portal with two-way communications features.

Balancing Federal and State Priorities

Balancing federal and state priorities is a challenge. ONC emphasized exchanges with strong privacy and security features, but according to some in the states didn’t provide clear guidance on what those standards should look like. According to health administrators, it is challenging to move forward quickly when state officials are unsure what the national guidance will be.

John Halamka suggests that additional enhancements would improve system functionality. For example, there is no nationwide provider contact list. It would be helpful, he pointed out, “if every physician had a webpage providing relevant information necessary to route messages.” Searchable directories also would be advantageous in transferring data and optimizing systems for search engines.

In regard to exchanges, he cites “Robert Metcalfe’s law,” which claims that “the value the network goes up by the square of the number of users.”⁸¹ Adding providers as well as service and transaction capacity will dramatically improve data sharing and make health information exchanges more valuable to providers, payers, patients, and policymakers. If true, this suggests that the long-term prognosis for data sharing networks is positive.

According to many of the individuals we interviewed, there are different ways to take advantage of this logic. Many felt that it is important to “build on what you have.” It makes no sense to create alternative networks or organizations, they say, if there are ways to link existing networks and take advantage of the infrastructure

that has developed in recent years in the private sector. Following a “network of networks” approach offers the virtue of building on past efforts. That would provide a glide path that would enable health providers to get from what we have now to where we need to be in the future.

Holes in Private Networks

But it also is important to point out that private networks leave holes in them. Public officials have to be careful that some communities are not left behind since everyone acknowledges there are gaps in data sharing networks across geographic locations. There is a role for the government when national agencies cover a big percentage of health care through Medicare, Medicaid, the Department of Veterans Affairs, and the Department of Defense, and the private market doesn’t cover people without jobs.

Lessons for Megachange

A divided political climate undermines effective implementation of HIE and increases uncertainty about revenue streams.

There also are instructive lessons from the health care area about ways to produce policy megachange. In looking at the experiences of Indiana, Massachusetts, New York, Tennessee, and California, we find a wide range of approaches, tactics, and outcomes. Each state differs in how it has organized, financed, and delivered health information exchanges. In general, Indiana and Massachusetts have made significant progress, New York has made moderate progress, and Tennessee and California have made limited progress on HIE implementation.

Current State Progress

Figure 7 summarizes the progress in each state when it comes to health information exchanges. The more green across the eight megachange dimensions indicates greater progress while yellow indicates moderate progress, and orange and red suggest limited progress. This graphic shows that Indiana has achieved a green status on seven of the eight dimensions, while Massachusetts has done so on four and New York has made progress on one. Neither Tennessee nor California have demonstrated green progress on any of the eight dimensions, although each has had some limited success on a few of the measures.

Lack of Consensus

From our analysis, it is clear that a lack of consensus surrounding goals, strategies, and tactics undermines efforts at large-scale change. Divisions in the stakeholder community or political tensions surrounding particular policy areas creates problems at several different levels. It weakens efforts to forge agreement regarding goals, tactics, and roles among various actors. A divided political climate undermines effective implementation because policy battles get fought and refought, with a resulting environment of uncertainty that delays later

implementation decision-making. And it complicates business models because it increases uncertainty about revenue streams.

In their paper on HIE implementation, researchers Claude Sicotte and Guy Pare assess risk during health information exchange projects and find that “cultural, financial, technical, political or organizational factors” affect the change process. They conclude that risk factors are intertwined and we are in a situation where “risk interdependencies, therefore, grew over time in a snowball effect that became increasingly difficult to alter.” According to them, this increases the “risk dynamic” of HIEs.⁸²

Figure 7 Overall Summary of Progress in Five States Dealing with Megachange Variables (with dark and light green denoting greater progress, yellow denoting some progress, orange denoting and red denoting little progress).

	California	Tennessee	New York	Massachusetts	Indiana
External Environment	Yellow	Yellow	Yellow	Yellow	Light Green
Organizational Environment	Red	Red	Red	Red	Red
Consensus About Goals	Red	Orange	Orange	Light Green	Light Green
Consensus About Means	Orange	Orange	Yellow	Light Green	Light Green
Unique Local Aspects	Orange	Red	Red	White	Light Green
Consensus About Roles	Yellow	Orange	Yellow	Yellow	Light Green
Willingness to Contribute	Orange	Yellow	Yellow	Light Green	Light Green
Consensus About Behavioral Expectations	Orange	Yellow	Light Green	Light Green	Light Green

Need for Clear Performance Metrics

To make progress moving forward, states and localities need clear performance metrics. Many of the states have established assessment guidelines based on percent of participating physicians and hospitals, percent of health plans with electronic eligibility and claims transactions, percent of pharmacies having e-prescribing and refills, percent of clinical labs using electronic transmission, and percent of clinical summary exchanges. Future assessments should monitor performance against these benchmarks and see the extent to which HIEs meet their performance targets. Several state leaders noted that clear performance metrics would help them move forward with HIEs.

Health information exchanges monitor treatment levels and patient responses, and compare the results across individuals, health care providers, and geographic areas. Sometimes, they find treatment differences across regions, and are able to identify which physicians are responsible for excessive use of certain tests. This is an example of the types of analyses that HIEs can undertake that would be helpful to consumers, providers, payers, and policymakers and allow themselves to monitor progress towards implementing health care exchanges.

Importance of Organizational Dynamics

Understanding organizational dynamics and stakeholder consensus is important to megachange. But it also is important to determine how political and economic factors constrain or enable policy change. On a subject such as health care, the political polarization and budgetary limitations have had a substantial impact on the ability of states to implement health information exchanges. The outcome for HIEs depends not just on having the right decision-making and consultation processes but on political agreement regarding the proper policy path forward and financial resources to fund implementation.

Need for Varied Approaches

Our analysis suggests that there is no one approach that works in every place. The states of Indiana and Massachusetts have been remarkably successful following different models. Indiana has used its long-time experience with health IT to connect networks and develop a sustainable business model based on getting stakeholders to pay for needed services. Massachusetts has employed its strong academic medical centers to link hospitals, physicians, and providers into data sharing networks. New York has made progress in linking networks in the metropolitan area, and needs to connect data sharing to the rest of the state. Tennessee and California are earlier in the path to effective implementation, but are considering transaction taxes as a way to finance their efforts. Each state has to identify its own strengths and build its health information exchange in a way that leverages those advantages and sustains its path going forward.

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