

**WHITE PAPER**

# STATEWIDE HEALTH INFORMATION EXCHANGE: BEST PRACTICE INSIGHTS FROM THE FIELD

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# INTRODUCTION

On Feb. 12, 2010, Health and Human Services (HHS) Secretary Kathleen Sebelius and U.S. Secretary of Labor Hilda Solis announced nearly \$400 million in American Recovery and Reinvestment Act (ARRA) Health Information Technology for Economic and Clinical Health (HITECH) awards.

These are part of the stimulus package to be apportioned by states, to help State-Designated Entities (SDEs) build a statewide backbone for Health Information Exchange (HIE). HHS also announced Regional Extension Center Awards and Job Training Awards grants to help healthcare providers adopt electronic health record (EHR) technology. Together these two initiatives — migrating from paper to online within provider facilities (EHR adoption) and exchanging information across providers (HIE) — are part of the federal government’s strategy to curb rising healthcare costs while improving quality of care.

From the healthcare provider’s perspective, these announcements are the first wave of a “carrot and stick” model to move the fragmented and competitive U.S. healthcare delivery landscape toward a coordinated system with the patient at its center. The carrots take the form of various Medicare and Medicaid incentive payments for meaningfully using healthcare information technology including HIEs — this period lasts till 2018. Starting in 2015, escalating penalties, in the form of reduced Centers for Medicare & Medicaid Services (CMS) reimbursements for non-compliance, take over.

With more than \$39 billion in incentive payments (over 5 years) coming online starting in October 2010, the federal government is concurrently undertaking several initiatives. While clearly related, the grants designated to help states (through governor-appointed SDEs and state Medicaid agencies) improve exchange infrastructure are distinct from the incentives for providers. Yet, given the inherent link between the two groups, there is often great confusion between incentives for providers and grants and matching funds available to SDEs and Medicaid agencies.

In spite of the disincentives and marketplace perversions that have derailed exchange efforts in the past, the carrot/stick structure of the HITECH Act is designed to overcome roadblocks that have previously seemed insurmountable. We believe, in the end, the HITECH Act will mark an inflection point in the evolution of the U.S. health system where:

- Providers who were previously reluctant to share patient information must now prepare for interoperable patient care records that will show the continuity of care across provider settings.
- Health Information Technology (HIT) vendors — who previously staked their claim on proprietary software and methods — must now conform to the National Health Information Network (NHIN) standards and governance to make it easier for clinical data to be extracted and exchanged.
- Providers accustomed to getting paid on a fee-for-service basis that pays for duplicative tests must now accept a system that encourages transparency and does not pay for redundancy.
- Payers and providers, in essence, the state Medicaid leadership, are working side-by-side to discuss and define the requirements of statewide exchange and the mutual benefits of providers achieving Meaningful Use of HIT.
- Resourceful service line managers, who previously didn't have to worry about what happened to the patient after discharge, are now adapting to changes in reimbursement policy that are tied to episodic payments covering the full spectrum of care delivery settings.
- Battle-hardened Integrated Delivery Network (IDN) and hospital leaders, who struggle to achieve positive operating margins each year within their government/commercial payer mix, are now staring down a 2015 Medicare penalty of 2 percent if they don't comply with HITECH requirements. When a significant and growing portion of a hospital's total revenue comes from Medicare, avoiding a 2 percent penalty is essential to keeping the doors open and the lights on.

The above changes represent a watershed moment in the recent history of our healthcare system. This realignment of relationships and alliances is disrupting the traditional service of technology providers within healthcare.

This white paper — designed for leaders in state agencies, hospital associations, and healthcare organizations — explores ten best practices for maximizing stimulus dollars. Initially, we offer some commentary on what a statewide HIE should look like and how to differentiate between the various pieces HITECH requires. Then, reaching back to the earliest efforts at exchange — starting with Community Health Information Networks (CHINs) of the '80s, the Regional Health Information Organizations (RHIOs) of the '90s, and the first generation HIEs of this past decade — we offer 10 best practices for building an effective HIE backbone. These suggestions have been gleaned from working in the field and analyzing the many failures littering the healthcare landscape. Finally, we will briefly review two case studies of successful HIEs in the marketplace today. These are HIEs poised to meet or exceed the HITECH Act's three-phase adoption and implementation process.

## WHAT IS A STATEWIDE HIE?

By now, most states have completed their submission to CMS and have started to receive their funding. (The first wave was announced on Feb. 12, 2010 by HHS.) As required by HITECH, most states have already begun their strategic and operational planning phase and have either released or are planning to release Requests for Information (RFIs) and Requests for Proposal (RFPs) based on the requirements defined by their stakeholder groups.

In reviewing several of these initial RFIs and RFPs, we have noticed that the definition of a statewide HIE varies greatly from state to state. Some RFI and RFP requirements blur the lines between a true HIE and other components like an Electronic Health Record EHR, a Computerized Provider Order Entry (CPOE) system, and financial exchanges used for billing and claims adjudication.

As your state finalizes requirements, reviews submissions from various solution providers, and prepares implementation plans, it is important to differentiate between these key components. Doing so makes certain that your stimulus dollars are focused on building out what you need, rather than wasting dollars reinventing the wheel or adding functionality that HITECH may discourage.

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*HIEs are critical to ensuring that we do not move from “paper-based silos to electronic silos.”*

President Barack Obama

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In this context, here are some guidelines for defining your statewide HIE:

**First**, and most importantly, the primary purpose of the statewide HIE is to collect all forms of clinical data from disparate sources, make them interoperable following NHIN standards, and provide easy input and output from various providers, RHIOs, and agencies throughout the state. A true statewide HIE is not solely the exchange of lab data, pharmacy data, biomedical imaging, or disease registry data, but rather, the ability to map, link, and standardize across *all forms of clinical data*. The most effective statewide HIEs will have proven methodologies for creating a master patient index that can securely integrate data and make it accessible in a federated model. Additionally, the HIE must also be able to feed some of its data to a centralized data repository to enable certain types of quality and performance reporting. These two requirements demand that the HIE be able to accommodate hybrid functionality.

**Second**, a statewide HIE must make the function of *clinical* exchange its first priority. There is confusion in the market about HIEs providing eligibility verification and claims submission — to be *financial* exchanges. HITECH is very clear about using HIT technology to improve clinical decision-making. You can create an implementation plan that allows financial exchange to piggyback on your statewide backbone, just don't let the financial exchange requirements drive the bus. There are already numerous, viable solutions out there and you don't want to spend your limited dollars reinventing them.

**Third,** an HIE is *not* an electronic health record. It is an interoperable format for accessing and sharing data across the state in a secure and standardized way. The ability for a provider to connect to an HIE is an early Meaningful Use requirement, but HIEs — in and of themselves — do not have to be “meaningfully used.” EHRs must be meaningfully used. This is a very important distinction that appears to be lost in the early RFIs and RFPs we have reviewed. The HITECH Act calls for Medicaid HIE dollars to be applied to building the statewide backbone. Providers use a separate source of funding to beef up their HIT infrastructure so they can connect to the exchange and expand EHR functionality.

**Fourth,** an HIE is *not* a CPOE. Yes, there are very specific Meaningful Use requirements that directly relate to the acquisition and implementation of a CPOE. But the state does not have to provide a CPOE for providers. Providers need to assure that happens for themselves.

**Fifth,** the HIE — by itself — cannot meet all Meaningful Use provisions. The HIE, in combination with EHRs, CPOE systems, and financial exchanges, will be able to meet Meaningful Use provisions.

It is difficult to avoid the amalgamation that often results from massive federal efforts like the HITECH Act. Very often, the policies and their interpretations become a grab bag of requirements and many states attempt to combine too many of them together. Don’t allow your state to fall into this trap. An HIE doesn’t have to be a statewide, interoperable backbone, plus an EHR, CPOE, and a financial exchange. If you are to fully maximize your dollars, you need to focus your investment wisely. Clearly differentiate what your state needs to build, what the providers need to do for their own internal workflow, and what existing solutions can be leveraged.

## TEN BEST PRACTICES FOR BUILDING YOUR HIE

“Five years from now, when dozens of new HIEs are sharing data between diverse electronic health record (EHR) systems, laboratories, pharmacies, and other sources, will physicians be using this information to make better decisions?” asks Jerry Osheroff, MD, FACP, FACMI, chief clinical informatics officer for Thomson Reuters. “Will hospitals and ambulatory practices reduce costs through IT efficiencies? Will the organizations that pay for healthcare — from Medicare to public and private employers — see healthcare costs controlled and quality improved?”

At Thomson Reuters, we believe the answers will depend on whether these HIEs are wed to advanced analytic capabilities that allow the data they carry to be transformed into meaningful, valuable information.”<sup>1</sup>

Admittedly, there are numerous ways a state could fall short of the ambitious requirements laid out in the ARRA HITECH Act. An HIE can be mischaracterized (a portal shared by providers), too narrowly shaped (exchanges only lab data), or lose its primary focus (tries to become a financial exchange).

A Feb. 11, 2010 article by Joseph Conn in *Modern Healthcare* discussed findings from a survey of HIE users conducted by HIT vendor-performance rating company KLAS Enterprises, Orem, Utah: “Laboratory orders and results were the most commonly transported data elements by the commercial HIE systems, exchanged by 93 percent of the exchange organizations surveyed, followed by medications, 83 percent, and radiology results, 81 percent (image sharing was done by just 29 percent); and records of patient allergies, 74 percent. After that, though, most HIEs begin running out of things they can exchange.

For example, only about half (48 percent) could move a complete record summary in the Continuity of Care Record or the Continuity of Care Document formats, according to the survey.”<sup>2</sup>

Likewise, there are numerous ways a state can burn through its stimulus funding and fall short of its goal: too many months in strategy development; too many hours in stakeholder meetings without achieving consensus; too many technicians designing functionality and not enough caregivers validating value; and too little data to excite physicians about adopting the technology. The list of pitfalls is numerous and the landscape is strewn with failed efforts that stretch from Pennsylvania all the way to Southern California.

So, what can you do to ensure that your state can define and implement a true HIE? What can you do to ensure the right appropriation of funds that leads to the establishment of a viable, operational, and sustainable statewide HIE?

To answer these questions, we have reviewed HIE evolution from CHINs to RHIOs to first generation HIE installations started this decade. In the process, we have observed key patterns of failure and success, which we used to identify ten best practices for designing and implementing a successful, statewide HIE.

### 1. Obsess About Tactics, Not Strategy

The eHealth Initiative’s 2009 Survey on Health Information Exchange shows that no matter which stakeholders are gathered around the conference table to determine the course of a state’s HIE, all states are driven by some combination of the following motivators:

- Improving quality of healthcare
- Improving patient safety
- Overcoming inefficiencies experienced by providers who need better information to support patient care
- Increased attention on HIT and HIE at the national level
- Rising healthcare costs
- Public health surveillance needs<sup>3</sup>

The first three items on the list above have been the highest ranking for the past two years. Clearly, there are great similarities in the challenges and strategic needs of every HIE. Yet, consistently, each founding group is determined to perceive itself as highly unique. Typically this orientation leads to frequent, long, and tedious meetings in the strategy phase of the project between providers, state agency people, large employers, and state university staff. A lot of states did not succeed because, after spending three years on strategy, they were never able to build anything, and they had spent all their money.

The California Regional Health Information Organization (CalRHIO) is a case in point: “[CalRHIO] was to be a public-private entity encompassing healthcare providers, payers, patients, insurers, government agencies, and consumer organizations with two main goals: investment in IT and the secure exchange of information using that technology.

Now, four years and many meetings later, the California Regional Health Information Organization says it’s ready to take its show on the road across the state and beyond, if the opportunity arises.”<sup>4</sup>

Just 10 months after the article referenced above appeared in *California Healthline*, Chilmark Research reported on Jan. 18, 2010, “RHIO Failure: CalRHIO Goes Belly-up.”

Four years of strategizing and planning went up in smoke. Statistically, the CalRHIO experience isn’t uncommon. Most HIE projects die on the strategy table simply because they fail to transition into production pilots. For this reason, we recommend no less than 60 percent of an HIE’s planning budget be invested in planning the tactical aspects of the project that will lead to an actual production pilot. By getting very tactical, states can maximize their money and have enough left over to actually build a viable HIE.

Bottom line: the real purpose of the planning exercise should be to define a meaningful pilot that meets the needs of the local stakeholders.

## 2. Plan for Mistakes — Ensure They are Small and Cheap

A perfect corollary to the problem of over-strategizing the HIE is the tendency of many state organizations to define project phases and milestones that are far too ambitious. Execution risks are enormous when there are huge costs that have already been incurred and lavish expenditure of time and users’ engagement.

It is far more expedient to get a small HIE project up and running, so your group has something practical to consider and expand upon. Don’t feel you should reinvent the HIE for each ZIP code. Plan to grow and expand your pilot, making use of what you learn through the process, and tweaking it along the way.

If you’ve spent all your funds on strategy and you only have the money left over to fund your big pilot, it puts enormous pressure on the pilot to prove efficacy and to show sustainability. By starting small, you allow yourself to make some mistakes along the way and to build your coalition more effectively.

Mistakes are part of executing any strategy. It is vital to create a culture on your team that not only expects them, but also expects to learn from them.

Santa Barbara County Care Data Exchange (SBCCDE) provides a salient example. “The SBCCDE only partially met its main goal of becoming a lab for RHIO innovation and therefore is unlikely to serve as a model for other exchanges. Without a fully operational exchange network (after nearly eight years), participants and staff could not learn by doing. Nor could they incrementally evolve the RHIO so that it might increasingly offer useful data and services.”<sup>5</sup>

### 3. Avoid the Conference Room Design Trap

The conference room can be an expensive trap for the HIE initiative. It's far too easy to get caught up in the grand design of a huge statewide project and ultimately never generate anything more substantive than a couple of white papers and a broad idea of what a few stakeholders would like to see in the project.

Get clinicians and physicians involved from the outset. Find out what will be most beneficial on the frontline where patients are served. Then, together, define a short milestone, perhaps connecting a few practices with an emergency room to test how the system works. The point is, if you have \$5 million to spend, it's not responsible to spend \$2.5 million on the design phase and then, after you've run out of money, have one large project that may turn out to be unviable.

Tampa Bay RHIO, established in 2005 after years of planning, has discovered that not actively negotiating with key stakeholders over features such as legal agreements, technical architecture, and governance structure has slowed down their HIE's evolution and potential for sustainability.<sup>6</sup>

### 4. Take Baby Steps — Go Live with Something

Nothing is ever going to be perfect, including your HIE network pilot. The natural urge of every HIE team is to tweak the grand design toward perfection, at the expense of launching something small and manageable that reveals a wealth of information you can use in your long-term plans. The team should spend its grant money making something happen, not simply using it to attempt to secure future grant money.

There needs to be a sense of urgency on your team of stakeholders to get something into the pilot phase, but that pilot should be small and manageable so you can learn something valuable at an affordable cost.

### 5. Avoid the Empty HIE Syndrome

HIE is a means to an end. It must not be an end in itself. The quality of your HIE network is only as good as the information it can serve up to users.

After working with a small group to launch a pilot, releasing that pilot to a larger group of stakeholders revealed many road blocks. Hospitals within the Tampa Bay RHIO were not convinced of the value of participating. One-way data sharing was not adding anything to their processes as physicians already had electronic access to hospital data. They felt two-way communication was much more valuable, requesting pre-admission data from primary care offices and immunization records.<sup>7</sup>

As stated previously, the ability to view electronic data is not enough of a reason to pursue an undertaking of the magnitude of building a HIE. Physicians and clinicians need to be able to apply the knowledge that's available through the HIE to make more informed decisions about treatments, tests, and other kinds of interventions to optimize health. If the HIE is going to deliver maximum value to patients, it needs to provide physicians with as many different types of information from as many different sources as possible.

Information in our national healthcare system is very fragmented. There are records at the hospital, in the emergency room, the physician's office, the lab, and the pharmacy. The HIE must be a means of bringing all that information together for the good of the patient.

To adequately demonstrate your HIE's potential value, it is important to begin your pilot HIE with as much pre-populated information as possible. In our experience, striking a balance between "broad and shallow" information and "narrow and deep" data is the best approach. If possible, anchor your initiative by leveraging state or regional historical claims data, representing a broad populace (broad and shallow). The narrow and deep data will flow from real-time clinical data sources as they evolve through current patient contacts.

During the early phases, the availability of the historical datasets through the HIE reduces the problem of a physician pulling up a blank screen, which does little to sell the value of — and win an advocate for — the HIE. In addition, we recommend recruiting provider organizations, reference labs, pharmacies, and other such organizations to supplement the shallow data reserves and enhance the "network effect" before significant real-time data begins accumulating in the HIE.

The early fax machine is a good analogy for why we need to quickly populate the HIE network. If you happen to be one of the people who bought one of the first fax models, you may remember thinking, "What's the use of this machine? Nobody else has a fax, so even though it's capable of sending and receiving documents, there's nobody with whom to communicate. It's pretty useless." It took a few months for more companies to bring the technology into their offices, but the true value of the fax machine soon became apparent. The quicker you can add viable content to your HIE, the sooner the value case will be established within your medical community.

## 6. Focus on the Clinical Use Case First

An HIE network will ultimately encompass many functions including reporting, biosurveillance, eligibility checking, claims/administrative data transmission, and consumer communication. However, the first and most important focus of the HIE network must be its clinical use. This is the dominant objective of the HIE network: to provide information that leads to better outcomes for patients. There is no higher moral authority than this by which to recruit participation.

Secondly, the opportunity for information exchange afforded by the TPO (Treatment, Payment, or Operation) exemption in HIPAA law is forfeited if the clinical use case is not made the primary focus of the HIE. If this is lost, the initiative will be subjected to a much more stringent interpretation of privacy laws which could derail the effort.

Additionally, the latest Office of the National Coordinator (ONC) for Health Information Technology requirements regarding Meaningful Use are heavily focused on demonstrating the clinical use case.

In the beginning, the way your team is going to establish value is by demonstrating clinical use and viability. It's not just a matter of moving data around. By 2015, the law will require physicians to be able to use data to make informed decisions that lead to positive health outcomes for the patient, and that save money by reducing unnecessary tests and procedures.

In looking over the HITECH Act's requirements for the HIE, a few deal with insurance eligibility, submitting claims, and similar issues. Handling these requirements has derailed many an HIE task force bent on including everything in their network at the outset.

The truth is, there are already solutions in the marketplace that do an excellent job of handling these administrative/financial functions. We encourage state groups to incorporate these outstanding systems into their exchange, and focus all effort and energy toward proving the clinical use case at the outset.

"If you build a system you've got to ensure that it is valuable enough that physicians are going to use it," said Andy Davidson, president and chief executive officer of the Oregon Association of Hospitals and Health Systems.<sup>8</sup>

The Portland, Ore. regional health information organization he spoke about faltered in 2007. Without firmly establishing the clinical use case, an HIE loses its viability.

Addressing the clinical use case is the most direct path to demonstrating value in your HIE.

## 7. Say No to an Opt-In Consent Policy

The goal of an HIE is to make pertinent health information available for the good of the patient, but to provide that information only to the right people. How this is managed without infringing on privacy rights is a delicate matter. It is vital to protect the rights of the patient, but it has also been demonstrated that creating an opt-in environment impedes patient participation.

Recently a RHIO in New York revised its consent policy in hopes of increasing patient participation:

“A New York-based regional health information organization (NYCLIX) is tweaking its privacy policy to agree with the state’s more liberal consent requirements, which officials believe should result in greater use of the exchange.

NYCLIX’s policy called for patient consent to put data in the exchange and to take data out of the exchange. The state only requires consent for taking data out of the exchange.

‘NYCLIX is now adjusting its policy to be consistent with the state, a move that requires technical changes to the exchange. But once the revamped consent policy is in place, the exchange will be more clinician friendly,’ Dr. Gilad Kuperman, executive director of NYCLIX said.”<sup>9</sup>

Our research indicates that it is impractical to begin an HIE with a consent model that requires express patient consent: opt-in. If undertaken for the clinical use case, an amended Notice of Privacy Practices (NPP) is all that is required to begin operating the exchange.

That being said, we strongly recommend the adoption of a clear opt-out model for the HIE. In this case, patients are considered to be *in* the exchange unless they expressly choose to opt-out of participation.

We further recommend patient opt-out be administered through the provider’s office. The participating physician would log on to a Web site and opt the patient out of the HIE network. The logic of this is clear. Patients consider their primary care physician their main contact with the healthcare system. If a change needs to be made to their status, they will logically want to handle it through their primary care physician.

We caution against allowing patients to restrict access to certain physicians and facilities or to restrict the sharing of certain diagnoses. Although accomplishing either of these is technically possible, it is not feasible. For example, if a physician is restricted from the records that are made available to a hospital with which he later becomes associated, he will, by default, have access to the records. If a patient restricts the revelation of certain diagnoses, but the patient’s pharmaceutical record is available, it is often easily possible to ascertain diagnoses despite the restriction.

Our best recommendation is to make the opt-out decision be an “all-or-nothing” decision. According to the Nation Committee on Vital and Health Statistics, “...where individuals have the right to put restrictions on disclosure of sensitive health information, people rarely elect to do so, but they strongly value having the right and ability to do so.”<sup>10</sup>

## 8. Caregivers Can't Drink from a Fire Hose

A medical office, hospital, or clinic is a world filled with data. Clinicians are already overwhelmed with information. If the HIE your state initiates deals up an even bigger sea of data, it can seem unmanageable and even discouraging to those it is meant to help.

Traditional episode-of-care-based viewers (which include all current EHR and most HIE products) simply divide a summary screen into four to six groups, showing — in reverse chronological order — lists of diagnoses, procedures, medications, providers, lab work, and other entries. This may give an acceptable review of what the patient has experienced in the past week. However, it fails to deliver a continuity-of-care view that highlights the health history of a patient. For the 20 percent of patients with chronic disease who consume 80 percent of healthcare resources, these traditional approaches fall short.<sup>11</sup>

Many HIE providers proudly tout that they can connect all the health records in the hospital with emergency room data, patient and disease registries, lab data, and pharmacy data, then deliver to doctors a longitudinal patient record that is 20 pages or longer.

This is not completing the mission of Meaningful Use of an HIE. Completing the mission requires data to be organized in a way that a physician can digest, understand, and use to treat patients. If a vendor focuses on technical capabilities and not on physician usability, we recommend your group talk to a different vendor. All this vendor will do is drown your physicians in non-meaningful patient data.

For example, if you reviewed an EHR for someone with Chronic Obstructive Pulmonary Disease (COPD) and diabetes, you might see five years of medical history and you would have pages and pages of information to review. One of the problems that physicians face in the hospital is what you could call “tab hell.” Most hospitals have an EHR in the emergency room, an EHR in medical surgery, and an EHR in the group practice. With all these disparate electronic health record systems, when the physician wants to review the record, he or she has to tab through an endless array of records to even begin to get a picture of the patient’s healthcare journey. It does become a kind of tab hell and that is not something any state would want to inflict upon its care providers.

The right HIE can solve this problem. HIE has the potential to deliver an enormous amount of data to a clinician. However, unless filtered and organized for easy viewing and use, it is too much, too fast — like a fire hose.

This can be especially important when treating a Medicaid population. Typically, the individuals within this group rely heavily on emergency services for their healthcare. Often, their treatment histories are disjointed and frustrating to those called upon for treatment. Now an excellent HIE is not going to eliminate this problem, but it can ameliorate it to some degree by organizing the information. Because the HIE makes information readily available from throughout the patient’s care history, when a Medicaid patient goes to an emergency room, physicians are not starting from scratch. They are not repeating tests that were just done across town. Thus, physicians have a much better opportunity to determine exactly what is going on with the patient and orchestrate a positive outcome.

The most useful HIEs have embedded analytic capabilities that deliver an intelligent presentation of information to better support a physician's decision-making. With a Medical Episode Grouper (MEG), the HIE can digest a tremendous amount of data and fit it all onto one screen that deals with the episodes of care.

The airline ticketing Web site, Expedia.com is a good analogy for how this works. Your HIE should be designed to present medical information similar to the way Expedia presents airline flights. Remember back when we all had to search the Web for the best flight? You had to go to separate Web sites for United Airlines, Southwest Airlines, Delta Airlines, and Alaska Airlines, writing down all possible fares, number of stops, and departure times. Once you had all the information in one place, you would make your decision and hope that a seat was still available by the time you returned to the airline's Web site to book your flight. Now, with the advent of Expedia, you can go to one site, enter the day and time you wish to fly, and the Web site will instantly provide a full list of every possible flight on every possible airline going to your destination city, its cost, and its number of stops. Then, you simply book your ticket right from Expedia and you're done. The right HIE will simplify information presentation in the same way.

### 9. Build Analytics Into the System at Start-up

It is impossible for an HIE that just serves up an ocean of information to fulfill Meaningful Use requirements. Mere messaging is nowhere near enough. Systems designed to simply deliver content from one end to the other do not scale well to perform more sophisticated functions that require analysis.

Analytic readiness and data transformation must take place as the data moves through the system, so that each edge system is not required to embed intelligence. It is prohibitively expensive to fix data at the receiving edge.

The HIE system you select should be undergirded with the ability to:

- Link clinical and administrative data
- Apply data standardization that enables analytical readiness
- Select specific clinical and administrative data fields for centralized decision support
- Develop reliable measures for evaluating and demonstrating Meaningful Use, measuring quality outcomes, and validating cost savings

Decision support is about gathering up all the pertinent medical knowledge and relevant data about the patient and helping the clinical team process and filter that information to guide decision making to achieve the best outcome for the patient.

The system needs to have the intelligence to determine what data is pertinent to the patient's situation at that particular moment. It also requires the capability to deliver rules and alerts that call attention proactively to pieces of critical data that might otherwise be ignored. This will naturally yield better medical treatment decisions and better outcomes.

## 10. Don't Become the State EHR Provider — Focus on Exchange

It is easy to understand why many State Designated Entities (SDEs) fall into the roll of EHR provider. It seems to be what the users want. However, it is actually counterproductive to the state's mission as designated by the ONC. Simply meeting the challenge of facilitating exchange is enough — without the added responsibilities of EHRs and education.

In addition, we recently have begun seeing detrimental effects when SDE efforts to be the EHR provider conflict with hospital/Independent Delivery Network (IDN) efforts to provide sponsored EHRs to their referring physicians. Too often these efforts are seen as competition and that can be very destructive to the spirit of cooperation essential to establishing a strong HIE network.

Health information exchange must remain job one for SDEs.

Every state in the country will get significant federal funds to create an exchange that essentially works like an interstate highway connecting the entire state. State governments need to create the "interstate" and then — like neighborhoods, towns, and cities along an interstate highway — the hospitals, pharmacies, labs, and physicians offices can build on-ramps to the "interstate" so they can connect to the information exchange.

To carry the analogy a little further, the federal government is paying to help lay down the asphalt for the HIEs — the health information exchange part of the infrastructure that is a state's medical information interstate. They are *not* paying for all the work that the regions need to do to build their own neighborhoods and on-ramps to connect to the interstate.

Let the physicians and hospitals do what they do with EHR and have the SDE focus solely on laying down their "interstate" — the exchange network.

## ARRA AND MEANINGFUL USE

Through ARRA, funds were set aside for healthcare. A component of those funds was specifically allocated to improve health information technology.

The way the legislation was written, it essentially says, "We're not going to pay people for implementing the technology." It's not, "Here's \$50,000, go buy a CPOE system or an EHR." The funds were specifically allocated to serve as incentives for using this technology in meaningful ways. To this end, the law lays out in broad terms what Meaningful Use includes (see Table 1). It all condenses down to dealing with the basic issues of making healthcare delivery better, safer, of higher quality, and more cost effective.

TABLE 1	STAGE 1 CRITERIA
15	Provide patients with an electronic copy of their health information (including diagnostic test results, problem list, medication lists, allergies, discharge summary, and procedures), upon request.
16	Provide patients with an electronic copy of their discharge instructions and procedures at time of discharge...
17	Capability to exchange key clinical information (for example, discharge summary, procedures, problem list, medication list, allergies, diagnostic test results), among providers of care and patient-authorized entities electronically.
18	Perform medication reconciliation at relevant encounters and each transition of care.
19	Provide summary care record for each transition of care and referral.
20	Capability to submit electronic data to immunization registries and actual submission where required and accepted.
21	Capability to provide electronic submission of reportable lab results to public health agencies and actual submission...
22	Capability to provide electronic syndromic surveillance data to public health agencies and actual transmission...

It means that an HIE must provide more than just moving data around among providers. By 2015, the HIE must address the actual use: How is the data being used to improve healthcare decisions and patient outcomes?

When it comes to crafting the architecture of your Meaningful Use response, the prudent approach, based on field experience discussed in this paper, is to structure your HIE to handle the function for which it is best suited: clinical data exchange. The case studies in the following section show how two states are tackling this challenge.

## CASE STUDIES

### NORTH CAROLINA

*Building the North Carolina Health Information Exchange (NCHEX) by Leveraging the North Carolina Hospital Emergency Surveillance System (NCHESS).*

**The Situation:** North Carolina needs to establish a statewide HIE in order to comply with requirements of the HITECH Act. North Carolina Division of Public Health (NC DPH) partnered with the North Carolina Hospital Association and collaborated with Thomson Reuters to connect hospitals to a comprehensive public health surveillance system known as North Carolina Hospital Emergency Surveillance System (NCHESS). The plan is to leverage learnings from this undertaking to create NCHEX, an expansive Health Information Exchange. Several of the Phase I Meaningful Use requirements are already being addressed by NCHESS.

NCHESS:

- Collects data twice daily from all 111 hospital emergency department (ED) visits in the state for public health surveillance and situational awareness using the state Web-based early event detection and timely public health surveillance system -- The North Carolina Disease Event Tracking and Epidemiologic Collection Tool (NC DETECT) developed by UNC Department of Emergency Medicine (UNC DEM).
- Provides real-time monitoring and alerting of selected public health conditions as they emerge in 48 North Carolina hospitals.
- Allows immediate “reach back” by the NC DPH to investigate the hospitals’ EHR data for suspected communicable disease.

- Provides access to hundreds of clinical and administrative data elements from multiple hospital systems and vendors as part of the alerting and reach-back capability.

**TABLE 2: CAPTURE COMPREHENSIVE DATA IN REAL-TIME, 365 X 24 X 7**

**COLLECTS DATA FROM THESE HOSPITAL SYSTEMS**

- |                 |             |
|-----------------|-------------|
| • Admissions    | • Orders    |
| • Laboratory    | • Pharmacy  |
| • Transcription | • Nursing   |
| • Billing       | • Emergency |

- Delivers data of national importance. Of the 432 public hospitals that are part of the Centers for Disease Control and Prevention’s (CDC’s) BioSense surveillance system that monitors public health, 25 percent of them are hospitals that NCHES contributes.

**CHART 1: NCHES HOSPITALS PROVIDE ~25% OF ALL HOSPITAL DATA TO THE CDC’S BIOSENSE SURVEILLANCE SYSTEM**



*“This [NCHES] will allow us to do a better job of protecting the public in the event of a major disease outbreak or a bioterrorism incident. This electronic system will literally save lives.”<sup>12</sup>*

Leah Devlin, DDS, MPH  
Former State Health Director  
North Carolina Division of Public Health

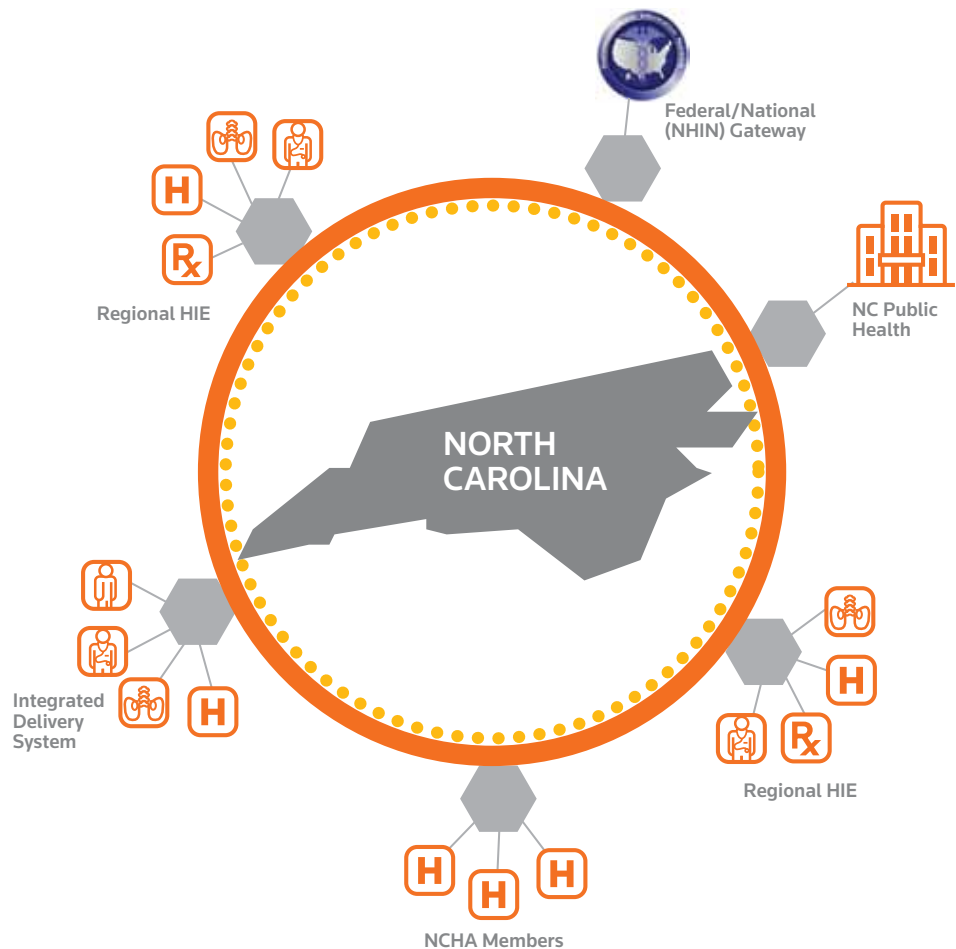
NCHEX will build upon a strong network and the learnings of NCHESS to deliver:

- An exchange that supports a secure patient-centric Continuity of Care view for providers.
- A network that reduces costs and implementation times by building upon the existing NCHESS infrastructure.
- A network that supports interoperability between HIEs and Meaningful Use-quality reporting requirements for hospitals.
- A statewide HIE that supports the needs of the state government, the state's providers, and most importantly, supports the state's patients receiving better care.
- Everything the HITECH Act expects a Health Information Exchange to deliver in supporting the clinical use case of Meaningful Use.
- A means for sharing a Web-based, read-only view of HIE-linked information with community physicians across North Carolina via a Continuity of Care view. Offers the ability to scale-up to full HIE functionality for these physicians as they adopt certified EHR systems in the future.
- The ability to connect with and leverage existing community HIEs/RHIOs to rapidly expand HIE reach and coverage.

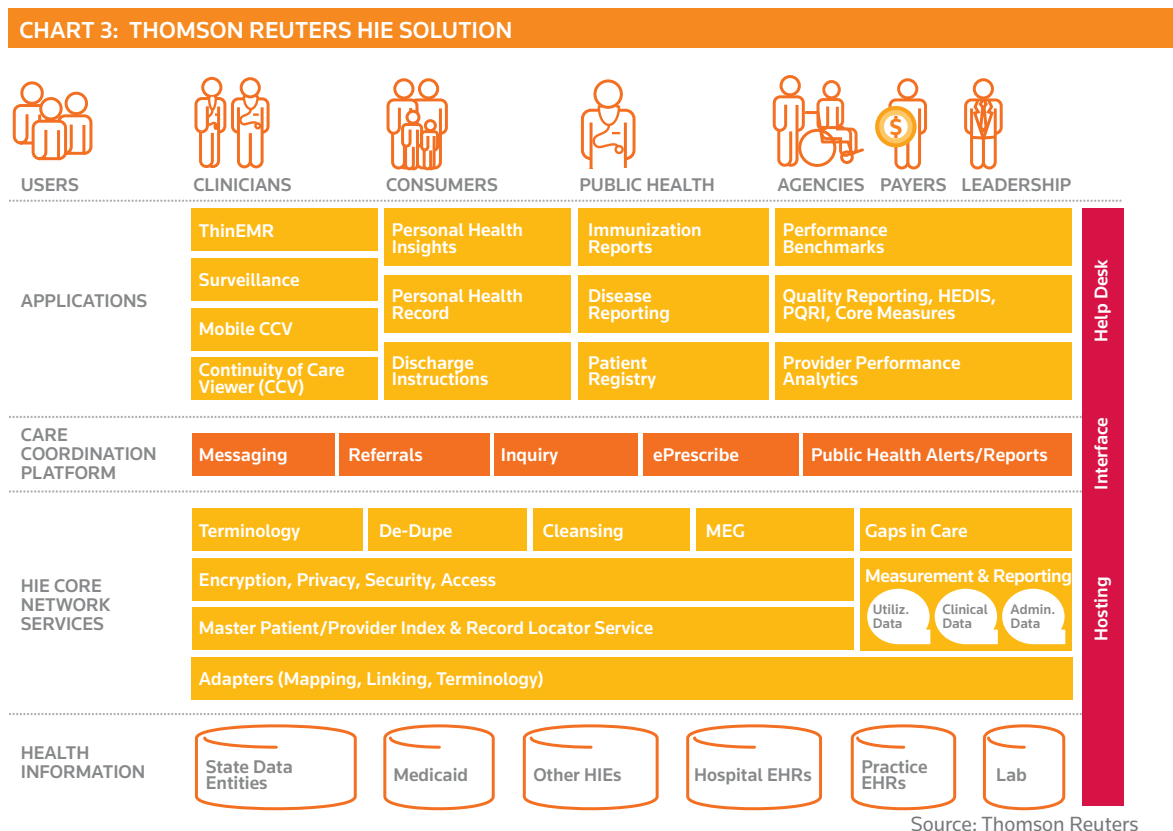
## CHART 2: NCHEX 2010 VISION

### NCHEX 2010 VISION

CONNECTING NC HOSPITALS, REGIONAL HIES AND OTHER EARLY ADOPTERS



Ultimately, the Thomson Reuters/CareEvolution HIE solution meets the needs of the state in ways outlined in this diagram:



## SOUTH CAROLINA

*The South Carolina Health Information Exchange (SCHIEx): Developing a state-level information highway that connects local healthcare providers and stakeholders throughout the state.*

**The Situation:** Healthcare participants across the state had a nearly universal need to be able to connect to one another, but lacked the means to pursue such efforts. This was particularly true for those focused on delivering services to the under or uninsured populations. In these highly vulnerable populations, care was quite fragmented across time and geography among a multitude of disparate caregivers. The state needed a way to coalesce clinical information from a multitude of participants.

*“SCHIEx has always been very practically focused, so we didn’t do a lot of meeting about big-design kinds of things, but instead focused on practical problems as they were faced by doctors and patients. That’s probably a key to our success, our focus on the concrete and on patient care.”*

**David Patterson, PhD**

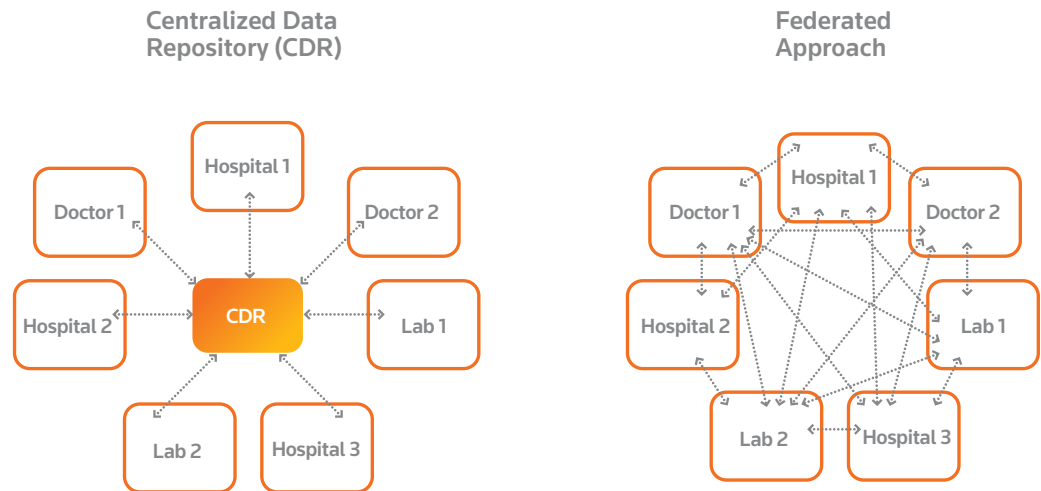
Chief of Health and Demographics  
South Carolina Budget and Control Board

SCHIEx, built by the state in partnership with CareEvolution, was envisioned as a healthcare data utility to help meet these needs in South Carolina.

### Five Keys to Success of SCHIEx:

1. **SCHIEx is built on a federated architecture model** that provides health information for more than four million South Carolina citizens. This means that disparate databases are interconnected in a way that minimizes central authority, but still supports partial sharing and coordination among database systems.

CHART 4: CENTRALIZED VERSUS FEDERATED



Source: SCHIEx

2. **SCHIEx leveraged data already available in the state's data warehouse** to initially seed the data available through the HIE, giving the system over four million records at start up.
3. **SCHIEx initially focused on resolving "pain-points" for providers** to deliver the information the agencies wanted most so as to encourage participation.
4. **SCHIEx fostered public and private partnerships** in the development phase, gathering support from a wide range of agencies, companies, and other institutions.
5. **SCHIEx developed in baby steps**, frequently adapting to a changing environment.

South Carolina's medical community has already seen many improvements since the initiation of the HIE. Two unexpected bonus improvements include a significant improvement in compliance with standards of care for diabetics and an improvement in the care for the uninsured by shoring up the state's health safety net.

*"My advice to other states is to be very transparent, make small mistakes early, and try to contain costs – rather than trying to do this as some grand master plan kind of project. That way, if you get a little off track, it's easy to do a course correction."*

David Patterson, PhD

## CONCLUSION

In contemplating Health Information Exchange at the state level, the overriding objective is to provide infrastructure that will support the efficient sharing of information among the thousands of stakeholders within a state's boundaries. This is breakthrough technology, a new day for the medical community in your state.

As when the Internet first came into service in the '80s, there will be starts and stops, progress and setbacks, in the development process. The infrastructure and operation will become better, more useful, and stronger with each generation of development.

We encourage you to follow the 10 best practices outlined in this paper. They will help you avoid many of the costly pitfalls others have encountered in pursuit of a viable, interoperable HIE.

Also, choose a technology partner with a track record of success in designing and deploying HIEs. The task ahead may seem insurmountable, but with the right partner, this great feat can be accomplished within the timeframe laid out in the HITECH Act.

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## ACRONYM DEFINITIONS

**ARRA** – American Recovery and Reinvestment Act, commonly abbreviated ARRA is the economic stimulus legislation enacted by the United States Congress and signed into law by the President in February 2009.

**CDC** – Centers for Disease Control and Prevention

**CHIN** – Community Health Information Network

**CMS** – Centers for Medicare & Medicaid Services, which was formerly known as the Health Care Financing Administration (HCFA). This is the federal agency that administers Medicare, Medicaid, CHIP (Children’s Health Insurance), HIPAA (Health Insurance Portability and Accountability Act), CLIA (Clinical Laboratory Improvement Amendments), and a number of other health-related programs.

**CPOE** – Computerized Provider Order Entry, a system whereby a prescriber enters medical orders directly into a computer system.

**DURSA** – The Data Use and Reciprocal Support Agreement that establishes the rules of engagement and obligations to which all NHIN Participants agree and that all NHIN Participants sign as a condition of joining the NHIN community.

**EHR** – Electronic Health Record, a paperless, digital way to maintain patient data that allows cross-institutional data sharing.

**HHS** – U.S. Department of Health and Human Services, the government’s principal agency for protecting the health of all Americans and providing essential human services, especially for those who are least able to help themselves.

**HITECH** – Health Information Technology for Economic and Clinical Health Act

**HIE** – Health Information Exchange is an initiative focused on electronic data exchange between organizations or stakeholders. The exchange typically includes clinical, administrative, and financial data across a medical and/or business trading area.

**HIPAA** – Health Insurance Portability and Accountability Act. Passed by Congress in 1996, HIPAA helps U.S. workers be able to continue healthcare coverage when they change or lose their jobs; reduces healthcare fraud; mandates industry-wide standards for healthcare information on electronic billing; and stipulates the protection and confidentiality of protected health information.

**HIT** – Health Information Technology is the network backbone for management and exchange of health information.

**IDN** – Integrated Delivery Network is a network of providers and facilities who work together to provide a continuum of care to a specific geographic area.

**MEG** – Medical Episode Grouper® from Thomson Reuters, enables government agencies to analyze patient treatments, evaluate quality of care, and manage associated costs. It does so by grouping inpatient, outpatient, and pharmaceutical claims into clinically homogeneous units of analysis called episodes that describe a patient’s complete course of care for a single illness or condition. The result is a sophisticated methodology that is used for a wide range of applications such as provider profiling, disease management, quality improvement, and cost and use analysis. Agencies can incorporate MEG into their existing information system, or it can serve as an integrated component of Thomson Reuters Advantage Suite®.

**NCVHS** – National Committee on Vital and Health Statistics.

**NHIN** – The Nationwide Healthcare Information Network describes the technologies, standards, laws, policies, programs, and practices that enable health information to be electronically shared among multiple stakeholders and decision makers to promote improved healthcare delivery.

**NPP** – Notice of Privacy Practices

**ONC** – Office of the National Coordinator for Health Information Technology provides counsel to the Secretary of Health and Human Services and departmental leadership for the development and nationwide implementation of an interoperable health information technology infrastructure.

**RFI** – Request for Information

**RFP** – Request for Proposal

**RHIO** – A Regional Health Information Organization is a group of organizations and stakeholders that come together for the purpose of data exchange. The effort is focused on improving the quality, safety, and efficiency of healthcare delivery.

**SDE** – State Designated Entities

**TPO** – Treatment, Payment, or Operations. TPO is significant because it permits clinicians to use or disclose their patient’s health information – without securing the patient’s permission – if the purpose of their use or disclosure is for treatment, payment, or healthcare operations.

## RESOURCES

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Matthew Bates and Vik Kheterpal met as the result of a collaboration between Thomson Reuters and CareEvolution. Together, they developed HIE Advantage, a customizable off-the-shelf solution for a statewide HIE that is mature, intelligent, secure, and capable of allowing states to satisfactorily meet key dates outlined in the HITECH Act. The two companies, one the foremost provider of health information and analytics, the other the leading provider of secure Health Information Exchange solutions, have achieved a proven track record working with leadership in North and South Carolina. During the design and implementation of these leading statewide HIEs, the authors have had interactions with numerous stakeholders in both states that cut across the continuum of providers and state health agencies.

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